TURNING TOOLS / ROTATING TOOLS / TOOLING SOLUTIONS

MITSUBISHI

MITSUBISHI MATERIALS

C006A
2013-2014



USING THIS CATALOG

●This catalog was made in APRIL 2013.

●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 2013)**
- ★ : **Inventory maintained in Japan.**
- ▲ : **To be replaced by new products.**
- □ : **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.

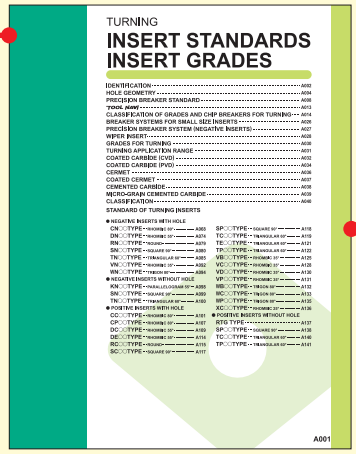
The classification page of each block provides the series of products to be selected according to applications and purposes.

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.

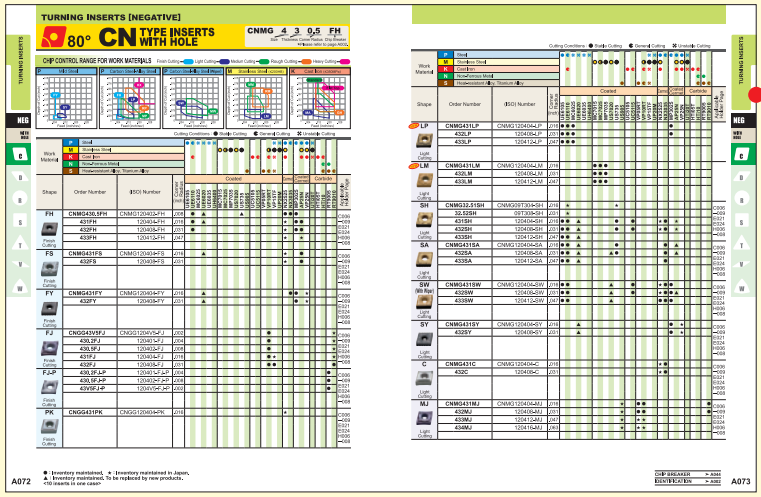


Left Page of the Inside Title Classification coloring for turning tools.

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 PR11.

CUTTING TOOLS

2013-2014

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MITSUBISHI

MITSUBISHI MATERIALS

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剛 Strong

速 Fast

美 Beautiful

Coated carbide grades for stainless steels
MC7015/MC7025/MP7035

CVD coated carbide grade for steels
MC6025

PVD coated cermet grade for steels
MP3025

Multi corner insert type
general purpose face milling cutters
AHX640S

Milling cutters for titanium alloys
VFX5/VFX6

Strong edge insert type
shoulder milling cutters for cast irons
VOX400

Exchangeable-head end mills
iMX

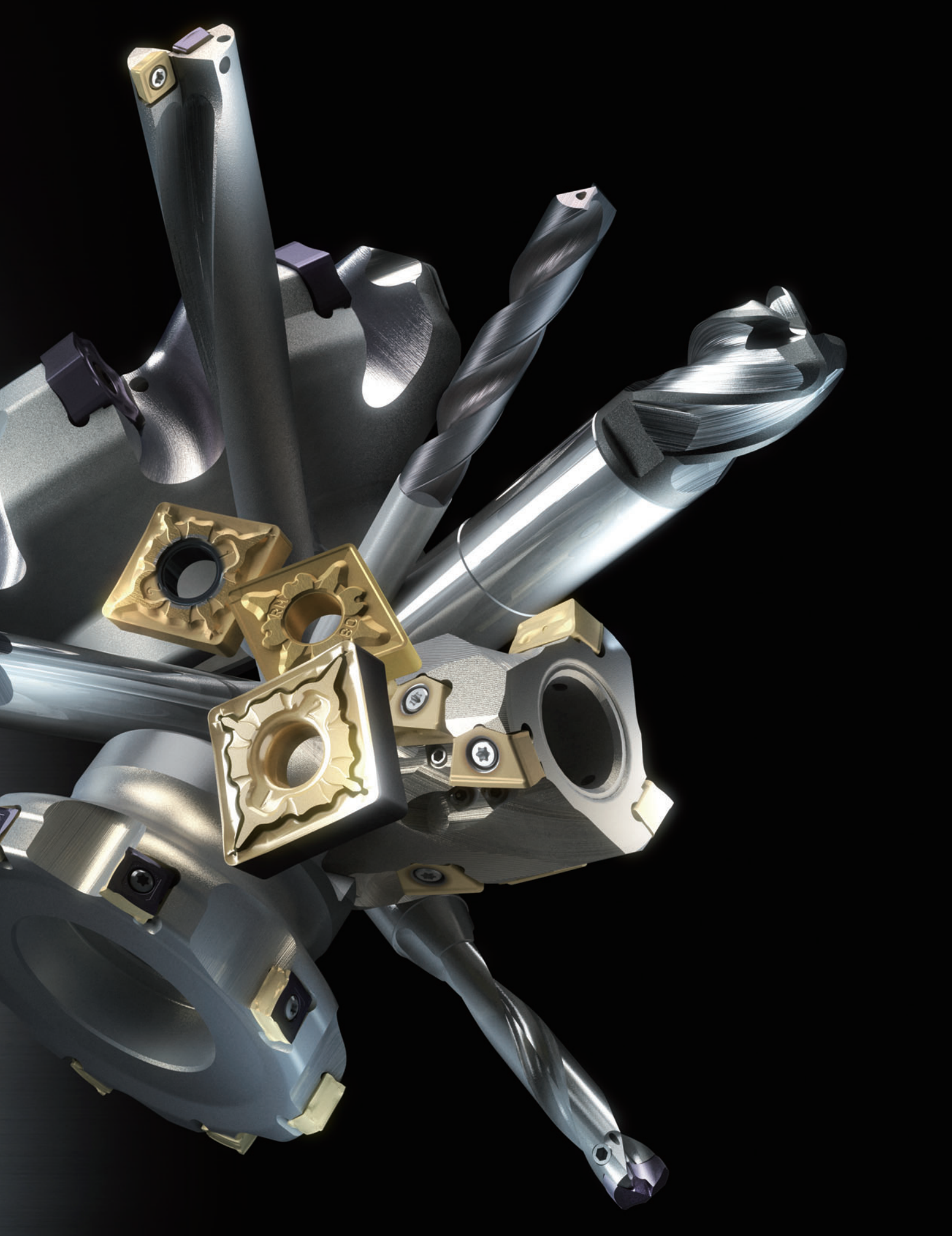
Vibration control end mills for difficult-to-cut materials
SMART MIRACLE®

New-generation indexable drills
MVX

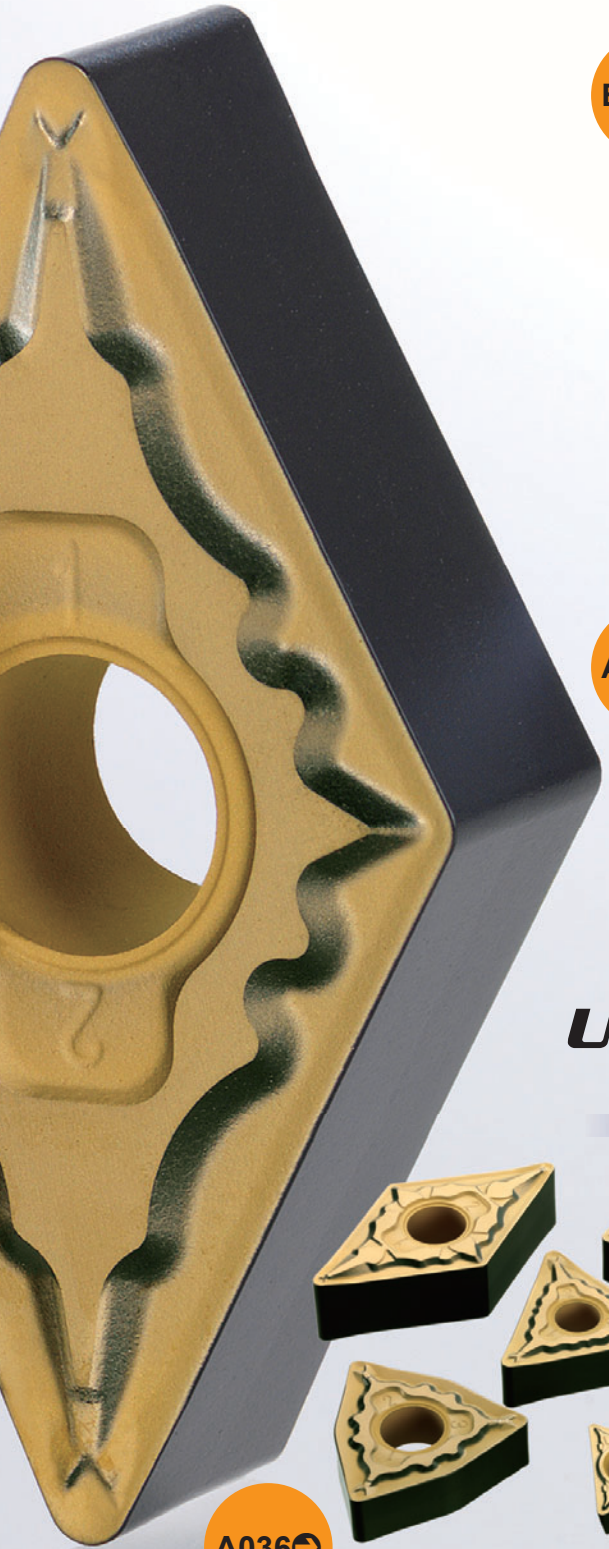
General purpose solid carbide drills
MVE/MVS



NEW PRODUCTS



TURNING



B005



General purpose coated CBN grade for hardened steels

BC8020

B009



CBN for powdered metals

MB4020

A036



CVD coated carbide grade for steels

UE6105/UE6110/ UE6035

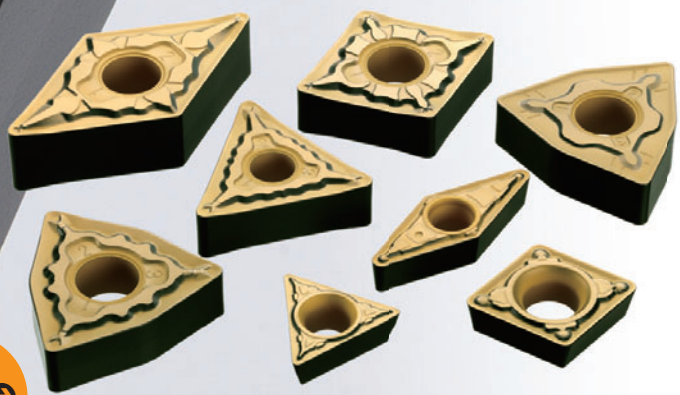
F004



Grooving tools

GY series

A036



CVD coated carbide grade for steels

MC6025

***MP/LP/RP* breaker**

D002



Small tools

Small tools

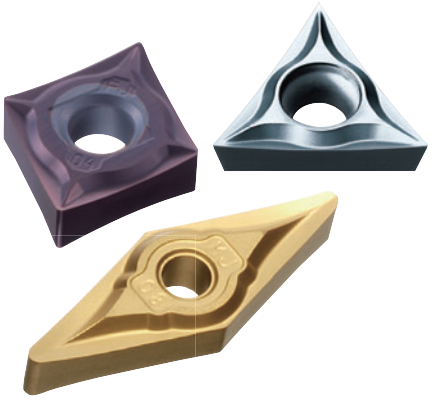
A039



Cermet grade for steel and cast iron

NX3035

A044
A052



Special breakers for difficult-to-cut materials

FJ/FJ-P/MJ/MJ-P/GJ/MS breaker

US905/VP05RT/VP10RT/ RT9005/RT9010

A040



PVD coated cermet grade for steels

MP3025

MP/LP/RP breaker

G010



Threading tools

MMT series

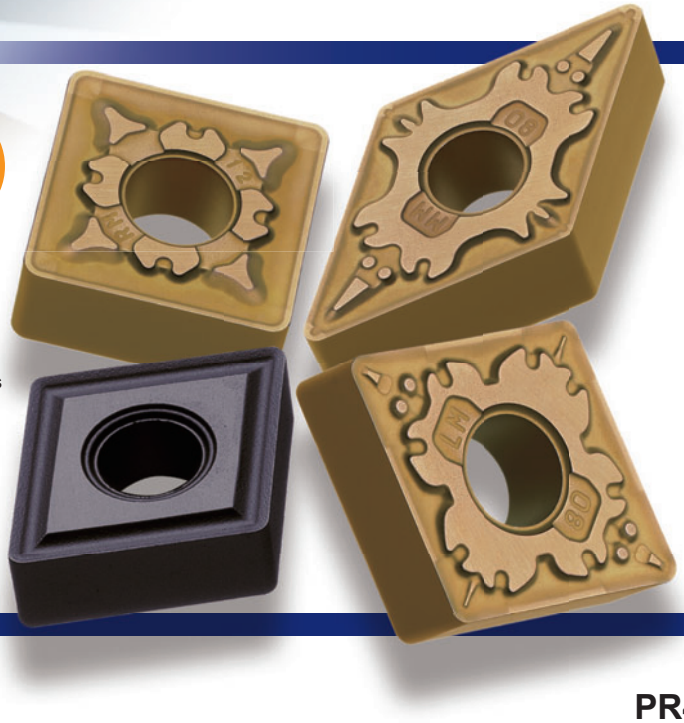
C038



Copying tools

Profile tools

A036



Coated carbide grade for stainless steels

MC7015/ MC7025/ MP7035

LM/MM/GM/RM breaker

MILLING



I139

Vibration control end mills
for difficult-to-cut materials

SMART MIRACLE® VQ type



I151

IMPACT MIRACLE end mills

IMPACT MIRACLE VF type



I210

End mills for aluminum alloys

ALIMASTER



I197

CVD diamond coated end mills for CFRP

DFC

SOLID END MILL

I156



IMPACT MIRACLE end mills
with multiple internal through coolant holes

COOLSTAR

I014



Standard end mill series

DIAMOND STAR

I050



MSTAR end mills

MSTAR



End mills for copper electrodes

CRN

I208



End mills for finishing of hardened steels

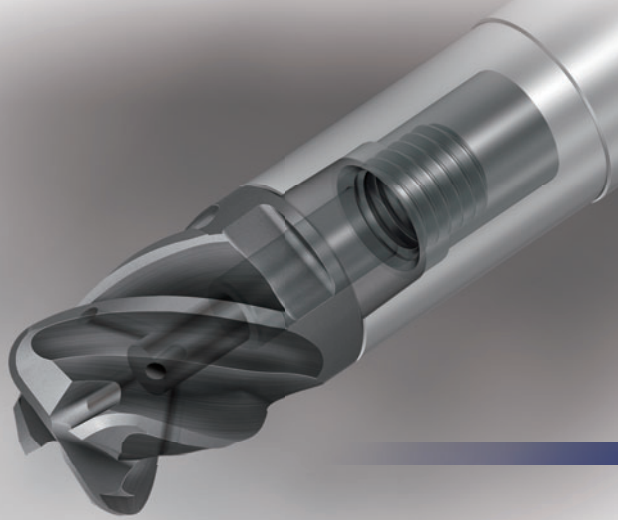
CBN

I199



CVD diamond coated end mills for graphite

DF



Exchangeable-head end mills

iMX



MILLING



K019➔



Multi corner insert type face milling cutters for cast irons

AHX640W

K028➔



Screw-on type shoulder milling cutters

ASX400



K078➔

Milling cutters
for titanium alloys

VFX5/ VFX6



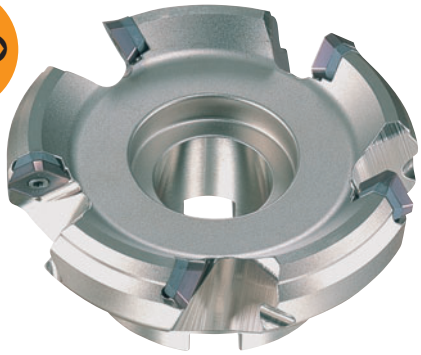
K023➔

Strong edge insert type
shoulder milling cutters for cast irons

VOX400

CUTTER

K008



Screw-on type general purpose face milling cutters

ASX445

K034



Multi-functional indexable end mills

APX3000/ APX4000

K088



Indexable end mills with center cutting edge

AQX

K054



Milling cutters for aluminum alloys

AXD4000/ AXD7000

K122



Indexable ball nose end mills for finishing/
Indexable corner radius end mills for finishing

SRF/SUF

K096



Ultra high feed rate radius milling cutters

AJX

K014



Multi corner insert type
general purpose face milling cutters

AHX640S

K072



End mills for deep shoulder milling

SPX

DRILLING



L006

L154

New-generation indexable drills

MVX

General purpose solid carbide drills

MVE/MVS

L148



Micro solid carbide gun drill

MICRO-MGS

L178



WSTAR insert drills

TAW

L168



WSTAR insert drills

STAW

L082



Solid carbide drills for stainless steels

MMS

L152



Solid carbide drills for CFRP

MCS

L030



Solid carbide drills with full range of diameter/
Solid carbide drills for deep hole drilling

MWS/MWS SUPER LONG

L094



Solid carbide drills for die & mold

MHS

L106



Solid carbide drills for aluminum alloys

MNS

WEB CATALOG

Renewal in January 2013

www.mitsubishicarbide.net/mmus/en/



Web catalog benefits

1. You can select the optimum tools by using the Product Search function.
   Searches can also be specified by using cutting mode, workpiece and cutting conditions.
2. Ultra quick search function.
3. You can download the images and the list of tools by each series.
4. Includes the CAD data (DXF, STEP) of approximately 20,000 items.
5. Up to date information.
6. Useful tools are provided in the Technical Information Section.
   (Formulas and Workpiece Material Dictionary, etc.)

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MAS○○○○○MB	MAS type drill (Inch type)	L120
MAS○○○○LB/MB	MAS type drill (Metric type)	L122–L126
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MBAU100016H	Clamp screw (For AJX type cutter)	M008
MBAU75016H	Clamp screw (For AJX type cutter)	M008
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MBF○○○○○○○	Insert (For MBD type end mill)	J022,K132
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MCLNR/L-○○○	Multiple clamp holder	C007
MCLNR/L-○○○○	Multiple clamp holder	C007
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M-FSVJCR/L-○○○-C	Screw clamp DIMPLE BAR (Heavy metal shank)	E010
M-FSVPBR/L-○○○-C	Screw clamp DIMPLE BAR (Heavy metal shank)	E010
M-FSVPCR/L-○○○-C	Screw clamp DIMPLE BAR (Heavy metal shank)	E010
M-FSVUBR/L-○○○-C	Screw clamp DIMPLE BAR (Heavy metal shank)	E009
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MMS○○○○X3DB/5DB	MMS type drill	L082—L091
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MSDNN-○○○	Multiple clamp type holder	C016
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OEMX○○○○ETR1-JS	Insert (For BOE type cutter)	J019,K116

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VCMDSC	MIRACLE end mill (Metric type)	I113
VCMH	MIRACLE end mill (Metric type)	I115
VCMHDRB	MIRACLE end mill (Metric type)	I134
VCMT○○○	Insert (Class M tolerance)	A138
VCMT○○○FM	Insert (Class M tolerance)	A137
VCMT○○○FP	Insert (Class M tolerance)	A137
VCMT○○○FV	Insert (Class M tolerance)	A137
VCMT○○○LM	Insert (Class M tolerance)	A138
VCMT○○○LP	Insert (Class M tolerance)	A137
VCMT○○○MM	Insert (Class M tolerance)	A138
VCMT○○○MP	Insert (Class M tolerance)	A138
VCMT○○○MV	Insert (Class M tolerance)	A138
VCMT○○○SV	Insert (Class M tolerance)	A138
VCMW○○○	Insert (Class M tolerance)	A139
VCPSRB	MIRACLE end mill (Metric type)	I126
VCSFPR	MIRACLE end mill (Metric type)	I118
VCXB	MIRACLE end mill (Metric type)	I122
VDGX○○○R/L	Insert (Class G tolerance)	A140
VDGX○○○R/LF	Insert (Class G tolerance)	B067
VF2MV	IMPACT MIRACLE end mill (Metric type)	I153
VF2SB	IMPACT MIRACLE end mill (Metric type)	I170
VF2SB	IMPACT MIRACLE end mill (Inch type)	I172
VF2SDB	IMPACT MIRACLE end mill (Metric type)	I173
VF2SDBL	IMPACT MIRACLE end mill (Metric type)	I174
VF2SSB	IMPACT MIRACLE end mill (Metric type)	I169
VF2WB	IMPACT MIRACLE end mill (Metric type)	I168
VF2XL	IMPACT MIRACLE end mill (Metric type)	I151
VF2XLB	IMPACT MIRACLE end mill (Metric type)	I176
VF2XLB	IMPACT MIRACLE end mill (Inch type)	I181
VF2XLBS	IMPACT MIRACLE end mill (Metric type)	I175
VF3XB	IMPACT MIRACLE end mill (Metric type)	I182
VF4MB	IMPACT MIRACLE end mill (Metric type)	I185
VF4MV	IMPACT MIRACLE end mill (Metric type)	I154
VF4SVB	IMPACT MIRACLE end mill (Metric type)	I186
VF6MHV	IMPACT MIRACLE end mill (Metric type)	I158
VF6MHVCH	IMPACT MIRACLE end mill (Metric type)	I159
VF6MHVRB	IMPACT MIRACLE end mill (Metric type)	I194
VF6MHVRBCH	IMPACT MIRACLE end mill (Metric type)	I195
VF6SVRCH	IMPACT MIRACLE end mill (Metric type)	I152
VF8MHVCH	IMPACT MIRACLE end mill (Metric type)	I160
VF8MHVRBCH	IMPACT MIRACLE end mill (Metric type)	I196
VFHVRB	IMPACT MIRACLE end mill (Metric type)	I187
VFHVRB	IMPACT MIRACLE end mill (Inch type)	I189
VFJHV	IMPACT MIRACLE end mill (Metric type)	I157
VFMD	IMPACT MIRACLE end mill (Metric type)	I162
VFMD	IMPACT MIRACLE end mill (Inch type)	I163
VFMFPR	IMPACT MIRACLE end mill (Metric type)	I167
VFMHV	IMPACT MIRACLE end mill (Metric type)	I155
VFMHVCH	IMPACT MIRACLE end mill (Metric type)	I156
VFMHVRB	IMPACT MIRACLE end mill (Metric type)	I192
VFMHVRBCH	IMPACT MIRACLE end mill (Metric type)	I193
VFSD	IMPACT MIRACLE end mill (Metric type)	I161
VFSFPR	IMPACT MIRACLE end mill (Metric type)	I164
VFSFPRCH	IMPACT MIRACLE end mill (Metric type)	I165
VFX5-○○○○○○A○○R	VFX5 type end mill (Metric type)	K079
VFX5UR○○○○○A○○	VFX5 type end mill (Inch type)	K078
VFX6-○○○A○○A○○○R	VFX6 type end mill (Metric type)	K083
VFX6UR○○○○○A○○	VFX6 type end mill (Inch type)	K082
VNGA○○○	Insert (Class G tolerance)	A099,B033,B057
VNGG○○○FJ	Insert (Class G tolerance)	A097
VNGG○○○R/L	Insert (Class G tolerance)	A099
VNGG○○○R/LF	Insert (Class G tolerance)	A097
VNGM○○○MJ	Insert (Class G tolerance)	A098
VNMG○○○	Insert (Class M tolerance)	A099
VNMG○○○FH	Insert (Class M tolerance)	A097
VNMG○○○FS	Insert (Class M tolerance)	A097
VNMG○○○GM	Insert (Class M tolerance)	A098
VNMG○○○LM	Insert (Class M tolerance)	A097
VNMG○○○LP	Insert (Class M tolerance)	A097
VNMG○○○MA	Insert (Class M tolerance)	A099
VNMG○○○MH	Insert (Class M tolerance)	A099
VNMG○○○MJ	Insert (Class M tolerance)	A098
VNMG○○○MM	Insert (Class M tolerance)	A098
VNMG○○○MP	Insert (Class M tolerance)	A098
VNMG○○○MS	Insert (Class M tolerance)	A099
VNMG○○○SH	Insert (Class M tolerance)	A098
VOX400-○○○A○○R	VOX400 type face mill (Metric type)	K025
VOX400R○○○○○○	VOX400 type face mill (Metric type)	K024
VOX400UR○○○○○	VOX400 type face mill (Inch type)	K023
VPET○○○R/LSRF	Insert (Class E tolerance)	A141
VPGT○○○MSMG	Insert (Class G tolerance)	A141
VQ4SVB	SMART MIRACLE end mill (Metric type)	I145
VQMHV	SMART MIRACLE end mill (Metric type)	I139
VQMHV	SMART MIRACLE end mill (Inch type)	I141
VQMHVRB	SMART MIRACLE end mill (Metric type)	I146
VQMHVRB	SMART MIRACLE end mill (Inch type)	I148
VQMHVRBF	SMART MIRACLE end mill (Metric type)	I149
VQMHZV	SMART MIRACLE end mill (Metric type)	I143
VQMHZV	SMART MIRACLE end mill (Inch type)	I144
VQMHZVOH	SMART MIRACLE end mill (Metric type)	I142

ORDER NUMBER	PRODUCT NAME	PAGE
W		
WBGT○○○R/LF	Insert (Class G tolerance)	A142
WBMT○○○R/LMV	Insert (Class M tolerance)	A142
WCGT○○○FJ	Insert (Class G tolerance)	A143
WCGT○○○FJ-P	Insert (Class G tolerance)	A143
WCGT○○○MJ	Insert (Class G tolerance)	A143
WCGT○○○MJ-P	Insert (Class G tolerance)	A143
WCGT○○○R/L	Insert (Class G tolerance)	A143
WCMT○○○	Insert (Class M tolerance)	A144
WCMW○○○	Insert (Class M tolerance)	B065
WCS503507H	Shim screw	M007
WEC○○AF○R5C	Wiper insert (For SE445/545 type face mill)	J024,J025,J035
WEC42AFER10C	Wiper insert (For SE445 type face mill)	J025
WEC42EF○R5C	Wiper insert (For SE415 type face mill)	J024
WEC42EFER10C	Wiper insert (For SE415 type face mill)	J024
WEEW13T3AG○R8C	Wiper insert (For ASX445 type face mill)	J016,K011
WFC42ZFER2	Wiper insert (For BF407 type face mill)	J035
WNEU2006ZEN7C-WK	Wiper insert (For AHX640W type face mill)	J012,K017,K019
WNEU2007ZEN7C-WP	Wiper insert (For AHX640S type face mill)	J012,K017
WNMA○○○	Insert (Class M tolerance)	A103
WNMG○○○	Insert (Class M tolerance)	A102
WNMG○○○C	Insert (Class M tolerance)	A101
WNMG○○○FH	Insert (Class M tolerance)	A100
WNMG○○○FS	Insert (Class M tolerance)	A100
WNMG○○○FY	Insert (Class M tolerance)	A100
WNMG○○○GH	Insert (Class M tolerance)	A103
WNMG○○○GJ	Insert (Class M tolerance)	A103
WNMG○○○GM	Insert (Class M tolerance)	A102
WNMG○○○LM	Insert (Class M tolerance)	A100
WNMG○○○LP	Insert (Class M tolerance)	A100
WNMG○○○MA	Insert (Class M tolerance)	A102
WNMG○○○MH	Insert (Class M tolerance)	A102
WNMG○○○MJ	Insert (Class M tolerance)	A101
WNMG○○○MM	Insert (Class M tolerance)	A102
WNMG○○○MP	Insert (Class M tolerance)	A101
WNMG○○○MS	Insert (Class M tolerance)	A103
WNMG○○○MW	Insert (Class M tolerance)	A103
WNMG○○○RM	Insert (Class M tolerance)	A103
WNMG○○○RP	Insert (Class M tolerance)	A103
WNMG○○○SA	Insert (Class M tolerance)	A101
WNMG○○○SH	Insert (Class M tolerance)	A101
WNMG○○○SW	Insert (Class M tolerance)	A101
WNMG○○○SY	Insert (Class M tolerance)	A101
WOEW12T308PE○R8C	Wiper insert (For ASX400 type face mill)	J015,K029
WOEX1206PER5C	Wiper insert (For ASX400 type face mill)	J030,K023
WPC42EEER/L10C	Wiper insert (For FBP415 type face mill)	J021
WPC42EETR10C	Wiper insert (For FBP415 type face mill)	J035
WPGT○○○	Insert (Class G tolerance)	B065
WPGT○○○R/LFS	Insert (Class G tolerance)	A145
WPMT○○○MV	Insert (Class M tolerance)	A145
WS○○○○○○T	Clamp screw (For TAW type drill)	M007
WS○○○○○○TPS	Internal screw (For STAW type drill)	L176
WS○○LH	Stopper (For STAW type drill)	L176
X		
XCMT○○○SVX	Insert (Class M tolerance)	A146
XDGT1550PD○R-G○○	Insert (For BXD4000 type cutter)	J020,K068
XDGT1550PD○R-GL○○	Insert (For BXD4000 type cutter)	J020,K068
XDGX1750○○PDFR-GL	Insert (For AXD4000 type cutter)	J016,K059
XDGX2270○○PDFR-GL	Insert (For AXD7000 type cutter)	J017,K065
XNMU160○○○R-○S	Insert (For VFX5 type end mill)	J029,K080
XNMU190○○○R-○S	Insert (For VFX6 type end mill)	J030,K084
XNS○○	Clamp screw	M007
XNS○○○	Clamp screw	M007
XPGT13T3PD○R-G○	Insert (For BAP3500 type cutter)	J018
XPMT13T3PDER-M○	Insert (For BAP3500 type cutter)	J018
Z		
ZCMX○○○○○○ER○	Insert (For LER type end mill)	J021,K086

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

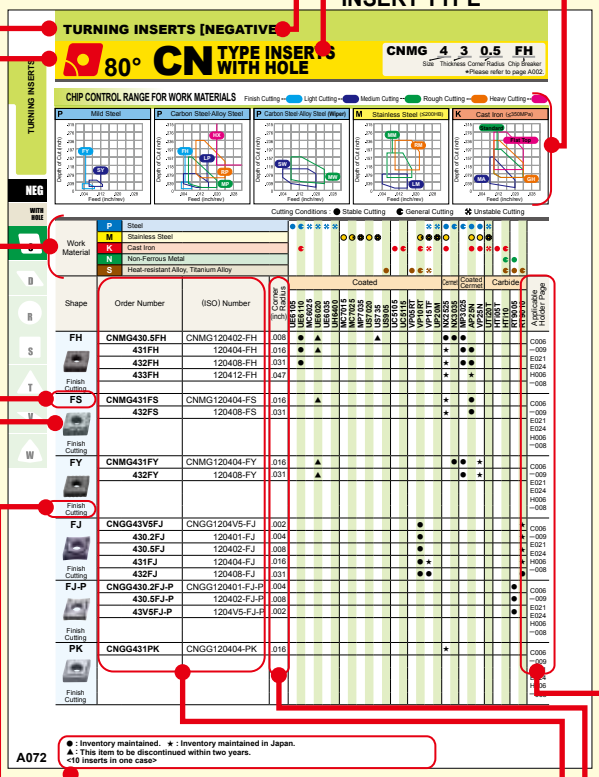
TITLE OF PRODUCT ACCORDING TO THE INSERT TYPE

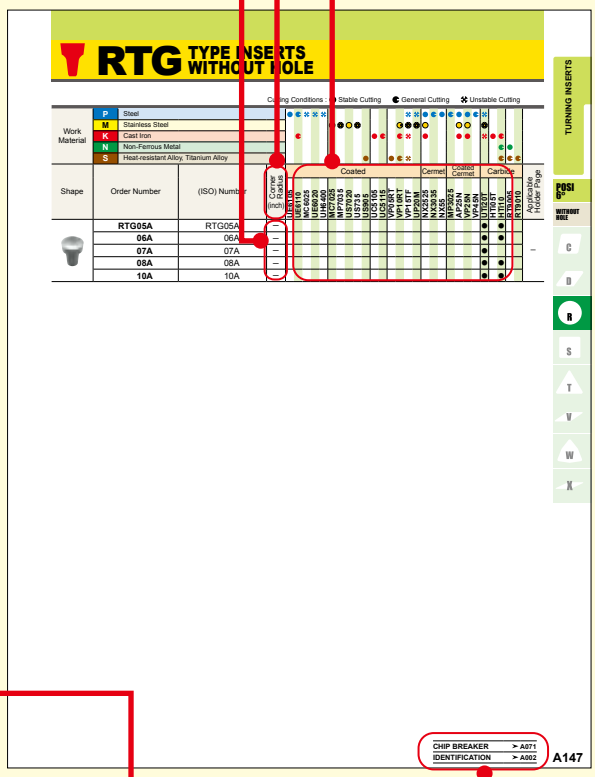
PRODUCT SECTION

INSERT DIMENSIONS

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→Routh→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

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) A036
COATED CARBIDE (PVD) A038
CERMET A039
COATED CERMET A040
CEMENTED CARBIDE A041
MICRO-GRAIN CEMENTED CARBIDE A042
CLASSIFICATION A044

STANDARD OF TURNING INSERTS

● NEGATIVE INSERTS WITH HOLE

CN○○TYPE ··· RHOMBIC 80° A072
DN○○TYPE ··· RHOMBIC 55° A078
RN○○TYPE ··· ROUND A084
SN○○TYPE ··· SQUARE 90° A085
TN○○TYPE ··· TRIANGULAR 60° A090
VN○○TYPE ··· RHOMBIC 35° A097
WN○○TYPE ··· TRIGON 80° A100

● NEGATIVE INSERTS WITHOUT HOLE

KN○○TYPE ··· PARALLELOGRAM 55° ··· A104
SN○○TYPE ··· SQUARE 90° A105
TN○○TYPE ··· TRIANGULAR 60° A106

● POSITIVE INSERTS WITH HOLE

CC○○TYPE ··· RHOMBIC 80° A107
CP○○TYPE ··· RHOMBIC 80° A114
DC○○TYPE ··· RHOMBIC 55° A116
DE○○TYPE ··· RHOMBIC 55° A121
RC○○TYPE ··· ROUND A122
SC○○TYPE ··· SQUARE 90° A123
SP○○TYPE ··· SQUARE 90° A125
TC○○TYPE ··· TRIANGULAR 60° A126
TE○○TYPE ··· TRIANGULAR 60° A129
TP○○TYPE ··· TRIANGULAR 60° A130
VB○○TYPE ··· RHOMBIC 35° A133
VC○○TYPE ··· RHOMBIC 35° A137
VD○○TYPE ··· RHOMBIC 35° A140
VP○○TYPE ··· RHOMBIC 35° A141
WB○○TYPE ··· TRIGON 80° A142
WC○○TYPE ··· TRIGON 80° A143
WP○○TYPE ··· TRIGON 80° A145
XC○○TYPE ··· RHOMBIC 25° A146

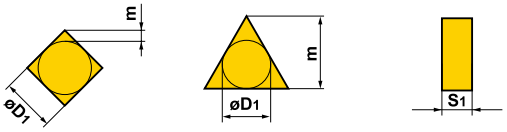
● POSITIVE INSERTS WITHOUT HOLE

RTG TYPE A147
SP○○TYPE ··· SQUARE 90° A148
TC○○TYPE ··· TRIANGULAR 60° A149
TP○○TYPE ··· TRIANGULAR 60° A150

IDENTIFICATION

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

① Symbol for Insert Shape





Triangular insert with a facet (Secondary Cutting Edge)

③ Symbol for Tolerance Class

Symbol	Tolerance of Nose Height **m** (inch)	Tolerance of Inscribed Circle **ϕD1** (inch)	Tolerance of Thickness **S1** (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 **ϕD1** (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 Figure	Inch I.C. .250" and over	Inch I.C. under .250"	Metric 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						

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

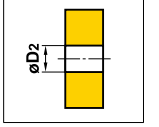
Figure	Hand	Symbol
	Right	**R**
	Left	**L**
	Neutral	**N**

⑩ Symbol for Chip Breaker

LP	**MP**	**RP**
		
LM	**MM**	**RM**
		
MA	**Standard**	**GH**
		
FJ	**MJ**	**GJ**
		
FV	**SV**	**MV**
		
FH	**SH**	**MH**
		
HZ	**HX**	**HV**
		

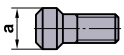
HOLE GEOMETRY

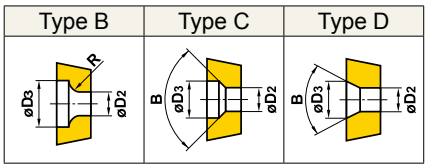
Type A



NEGATIVE

Insert Number		(ISO) Number		Dimension (inch)	Hole Type
				D2	
CNGA CNGG CNMA CNMG CNMM CNMP	32◌	CNGA CNGG CNMA CNMG CNMM CNMP	0903◌◌	.150	A
	33◌		0904◌◌	.150	A
	43◌		1204◌◌	.203	A
	54◌		1606◌◌	.250	A
	64◌		1906◌◌	.312	A
	86◌		2509◌◌	.359	A
DNGA DNGG DNGM DNMA DNMG DNMM DNMX	33◌	DNGA DNGG DNGM DNMA DNMG DNMM DNMX	1104◌◌	.150	A
	43◌		1504◌◌	.203	A
	44◌		1506◌◌	.203	A
SNGA SNGG SNMA SNMG SNMM	32◌	SNGA SNGG SNMA SNMG SNMM	0903◌◌	.150	A
	43◌		1204◌◌	.203	A
	54◌		1506◌◌	.250	A
	64◌		1906◌◌	.312	A
	85◌		2507◌◌	.359	A
	86◌		2509◌◌	.359	A
TNGA TNGG TNMA TNMG TNMM TNMX	22◌	TNGA TNGG TNMA TNMG TNMM TNMX	1103◌◌	.089	A
	32◌		1603◌◌	.150	A
	33◌		1604◌◌	.150	A
	43◌		2204◌◌	.203	A
	54◌		2706◌◌	.250	A
	66◌		3309◌◌	.312	A
VNGA VNGG VNGM VNMG VNMM	33◌	VNGA VNGG VNGM VNMG VNMM	1604◌◌	.150	A
WNMA WNMG	32◌	WNMA WNMG	0603◌◌	.150	A
	32.5◌		06T3◌◌	.150	A
	33◌		0604◌◌	.150	A
	43◌		0804◌◌	.203	A
RNMG	43	RNMG	120400	.203	A

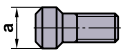


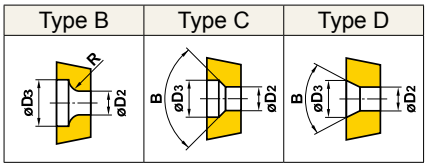


POSITIVE

Insert Number		(ISO) Number		Dimension (inch)			Applicable Screw	Hole Type
				D_2	D_3	B (°)		
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

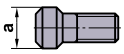
HOLE GEOMETRY

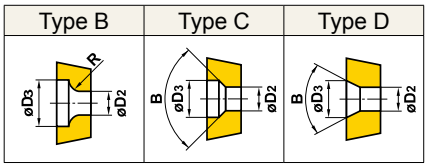




POSITIVE

Insert Number		(ISO) Number		Dimension (inch)			Applicable Screw	Hole Type
				D2	D3	B (°)		
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
RCMT RCGT	0602M0	RCMT RCGT	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
SPMW	32○	SPMW	0903○○	.181	.236	R	TS (M4) with **a** = .213″	B
	42○		1203○○	.224	.295	R	TS (M5) with **a** = .268″	B
SPMT	32○	SPMT	0903○○	.173	.236	R	TS (M4) with **a** = .213″	B
	42○		1203○○	.217	.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
TPGX	22○	TPGX	1103○○	.138	.189	88°	TS (M3) with **a** = .161″	C
	32○		1603○○	.189	.250	58°	TS (M4) with **a** = .213″	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
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





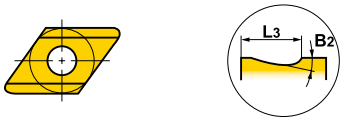
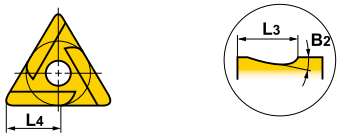
POSITIVE

Insert Number		(ISO) Number		Dimension (inch)			Applicable Screw	Hole Type
				D_2	D_3	B (°)		
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
TPMX	22○	TPMX	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	VCMT	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

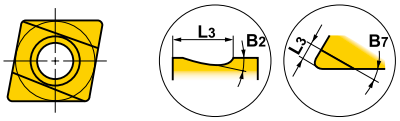
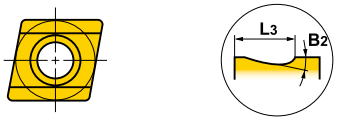
PRECISION BREAKER STANDARD

STANDARD OF LEFT AND RIGHT HAND INSERTS

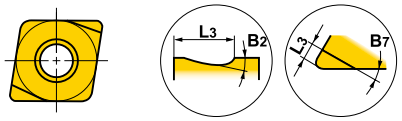
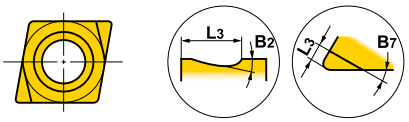
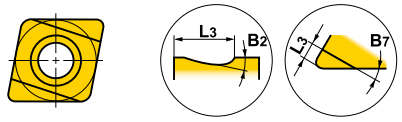
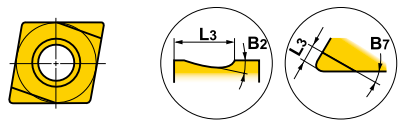
NEGATIVE INSERTS

Geometry	Insert Number	(ISO) Number	L3	L4	B2	B7
 Right hand insert shown.	**DNGG431R/L**	DNGG150404R/L	.110	—	15°	—
	432R/L	150408R/L	.110	—	15°	—
 Right hand insert shown.	**SNGG321L**	SNGG090304L	.071	.063	15°	—
	432R	120408R	.091	.146	15°	—
 Right hand insert shown.	**TNGG321L**	TNGG160304L	.091	.213	15°	—
	331L	160404L	.091	.213	15°	—
	431R/L	220404R/L	.110	.370	15°	—

POSITIVE INSERTS

Geometry	Insert Number	(ISO) Number	L3	L4	B2	B7
 Right hand insert shown.	**CCET21.5V3R/LSR**	CCET0602V3R/L-SR	.087	—	30°	20°
	21.50.2R/LSR	060201R/L-SR	.087	—	30°	20°
	21.50.5R/LSR	060202R/L-SR	.087	—	30°	20°
	21.51R/LSR	060204R/L-SR	.087	—	30°	20°
	32.5V3R/LSR	09T3V3R/L-SR	.126	—	30°	20°
	32.50.2R/LSR	09T301R/L-SR	.126	—	30°	20°
	32.50.5R/LSR	09T302R/L-SR	.126	—	30°	20°
	32.51R/LSR	09T304R/L-SR	.126	—	30°	20°
 Right hand insert shown.	**CCET21.5V0R/LSN**	CCET060200R/L-SN	.039	—	20°	—
	21.5V3R/LSN	0602V3R/L-SN	.039	—	20°	—
	21.50.2R/LSN	060201R/L-SN	.039	—	20°	—
	21.50.5R/LSN	060202R/L-SN	.039	—	20°	—
	21.51R/LSN	060204R/L-SN	.039	—	20°	—
	32.5V0R/LSN	09T300R/L-SN	.059	—	20°	—
	32.5V3R/LSN	09T3V3R/L-SN	.059	—	20°	—
	32.50.2R/LSN	09T301R/L-SN	.059	—	20°	—
	32.50.5R/LSN	09T302R/L-SN	.059	—	20°	—
	32.51R/LSN	09T304R/L-SN	.059	—	20°	—
 Right hand insert shown.	**CCET21.5V3R/LWSN**	CCET0602V3R/LW-SN	.039	—	20°	—
	32.5V3R/LWSN	09T3V3R/LW-SN	.059	—	20°	—

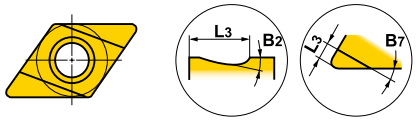
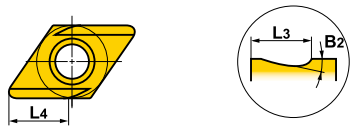
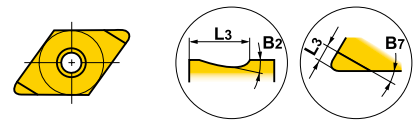
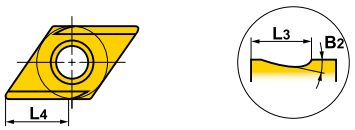
POSITIVE INSERTS

Geometry	Insert Number	(ISO) Number	L_3	L_4	B_2	B_7
 Right hand insert shown.	**CCGH21.50.5R/LF**	CCGH060202R/L-F	.047	—	15°	20°
	21.51R/LF	060204R/L-F	.055	—	15°	20°
 Right hand insert shown.	**CCGT21.5V3RSN**	CCGT0602V3R-SN	.039	.118	20°	—
	21.50.2R/LSN	060201R/L-SN	.039	.118	20°	—
	21.50.5R/LSN	060202R/L-SN	.039	.118	20°	—
	32.5V3R/LSN	09T3V3R/L-SN	.059	.197	20°	—
	32.50.2R/LSN	09T301R/L-SN	.059	.197	20°	—
	32.50.5R/LSN	09T302R/L-SN	.059	.197	20°	—
	32.51R/LSN	09T304R/L-SN	.059	.197	20°	—
 Left hand insert only.	**CCGT03S1V3L-F**	CCGT03S1V3L-F	.031	—	17°	35°
	03S101L-F	03S101L-F	.031	—	17°	35°
	03S102L-F	03S102L-F	.031	—	17°	35°
	03S104L-F	03S104L-F	.031	—	17°	35°
	04T0V3L-F	04T0V3L-F	.039	—	17°	35°
	04T001L-F	04T001L-F	.039	—	17°	35°
	04T002L-F	04T002L-F	.039	—	17°	35°
	04T004L-F	04T004L-F	.039	—	17°	35°
 Right hand insert shown.	**CCGT21.5V3R/LSS**	CCGT0602V3R/L-SS	.039	.118	14°	—
	21.50.2R/LSS	060201R/L-SS	.039	.118	14°	—
	21.50.5R/LSS	060202R/L-SS	.039	.118	14°	—
	32.5V3R/LSS	09T3V3R/L-SS	.039	.197	14°	—
	32.50.2R/LSS	09T301R/L-SS	.039	.197	14°	—
	32.50.5R/LSS	09T302R/L-SS	.039	.197	14°	—
 Right hand insert shown.	**CPGT2.51.51R/LF**	CPGT080204R/L-F	.071	—	15°	20°
	320.5R/LF	090302R/L-F	.071	—	15°	20°
	321R/LF	090304R/L-F	.071	—	15°	20°
 Right hand insert shown.	**CPMH2.51.51R/LF**	CPMH080204R/L-F	.039	—	15°	20°
	321R/LF	090304R/L-F	.055	—	15°	20°

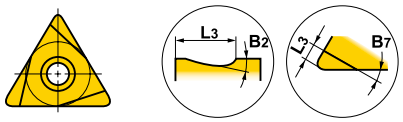
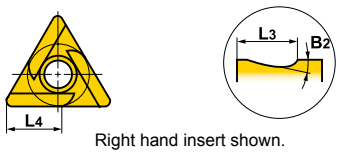
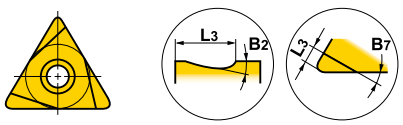
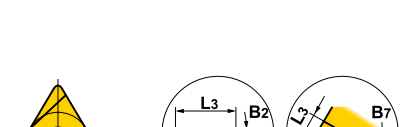
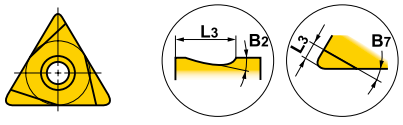
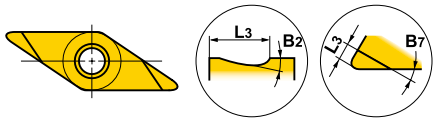
PRECISION BREAKER STANDARD

STANDARD OF LEFT AND RIGHT HAND INSERTS

POSITIVE INSERTS

Geometry	Insert Number	(ISO) Number	L_3	L_4	B_2	B_7
 Right hand insert shown.	**DCET21.5V3R/LSR**	DCET0702V3R/L-SR	.098	—	30°	20°
	21.50.2R/LSR	070201R/L-SR	.098	—	30°	20°
	21.50.5R/LSR	070202R/L-SR	.098	—	30°	20°
	21.51R/LSR	070204R/L-SR	.098	—	30°	20°
	32.5V3R/LSR	11T3V3R/L-SR	.146	—	30°	20°
	32.50.2R/LSR	11T301R/L-SR	.146	—	30°	20°
	32.50.5R/LSR	11T302R/L-SR	.146	—	30°	20°
	32.51R/LSR	11T304R/L-SR	.146	—	30°	20°
 Right hand insert shown.	**DCET21.5V0R/LSN**	DCET070200R/L-SN	.039	—	20°	—
	21.5V3R/LSN	0702V3R/L-SN	.039	—	20°	—
	21.50.2R/LSN	070201R/L-SN	.039	—	20°	—
	21.50.5R/LSN	070202R/L-SN	.039	—	20°	—
	21.51R/LSN	070204R/L-SN	.039	—	20°	—
	32.5V0R/LSN	11T300R/L-SN	.059	—	20°	—
	32.5V3R/LSN	11T3V3R/L-SN	.059	—	20°	—
	32.50.2R/LSN	11T301R/L-SN	.059	—	20°	—
	32.50.5R/LSN	11T302R/L-SN	.059	—	20°	—
	32.51R/LSN	11T304RL-SN	.059	—	20°	—
 Right hand insert shown.	**DCET21.5V3R/LWSN**	DCET0702V3R/LW-SN	.039	—	20°	—
	32.5V3R/LWSN	11T3V3R/LW-SN	.059	—	20°	—
 Right hand insert shown.	**DCGT21.5V3RSN**	DCGT0702V3R-SN	.039	.138	20°	—
	21.50.2RSN	070201R-SN	.039	.138	20°	—
	21.50.5R/LSN	070202R/L-SN	.039	.138	20°	—
	32.5V3R/LSN	11T3V3R/L-SN	.059	.256	20°	—
	32.50.2R/LSN	11T301R/L-SN	.059	.256	20°	—
	32.50.5R/LSN	11T302R/L-SN	.059	.256	20°	—
	32.51R/LSN	11T304R/L-SN	.059	.256	20°	—
 Right hand insert shown.	**DCGT21.50.5R/LF**	DCGT070202R/L-F	.039	—	17°	20°
	21.51R/LF	070204R/L-F	.039	—	17°	20°
	32.50.5R/LF	11T302R/L-F	.039	—	14°	20°
	32.51R/LF	11T304R/L-F	.039	—	14°	20°
 Right hand insert shown.	**DCGT21.5V3R/LSS**	DCGT0702V3R/L-SS	.039	.138	14°	—
	21.50.2R/LSS	070201R/L-SS	.039	.138	14°	—
	21.50.5R/LSS	070202R/L-SS	.039	.138	14°	—
	32.5V3RSS	11T3V3R-SS	.039	.256	14°	—
	32.50.2RSS	11T301R-SS	.039	.256	14°	—
	32.50.5RSS	11T302R-SS	.039	.256	14°	—

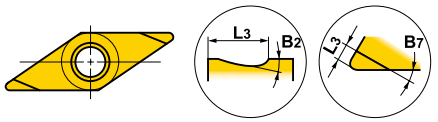
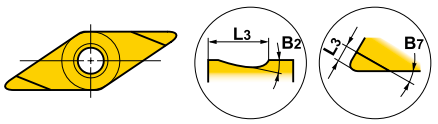
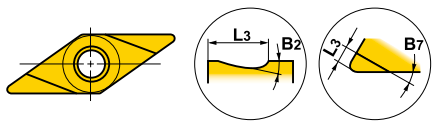
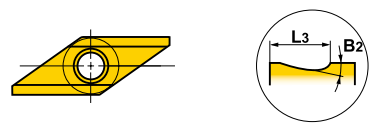
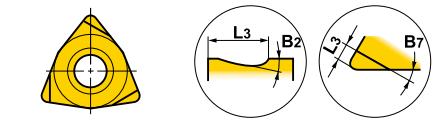
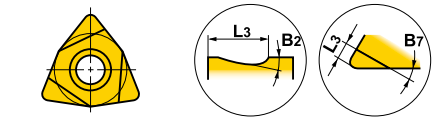
POSITIVE INSERTS

Geometry	Insert Number	(ISO) Number	L3	L4	B2	B7
 Right hand insert shown.	**DEGX430.5R/L**	DEGX150402R/L	.110	—	20°	—
	431R/L	150404R/L	.110	—	20°	—
	432R/L	150408R/L	.110	—	20°	—
 Left hand insert only.	**TCGT1.21V3LF**	TCGT0601V3L-F	.039	—	14°	20°
	1.210.2LF	060101L-F	.039	—	14°	20°
	1.210.5LF	060102L-F	.039	—	14°	20°
	1.211LF	060104L-F	.039	—	14°	20°
 Right hand insert shown.	**TEGX320.5R/L**	TEGX160302R/L	.079	.236	20°	—
	321R/L	160304R/L	.079	.236	20°	—
 Right hand insert shown.	**TPGH1.51.50.5R/LFS**	TPGH080202R/L-FS	.035	—	15°	20°
	1.51.51R/LFS	080204R/L-FS	.035	—	15°	20°
	1.81.50.5R/LFS	090202R/L-FS	.039	—	15°	20°
	1.81.51R/LFS	090204R/L-FS	.039	—	15°	20°
	220.5R/LFS	110302R/L-FS	.055	—	15°	20°
	221R/LFS	110304R/L-FS	.055	—	15°	20°
 Right hand insert shown.	**TPGX1.51.50.5R/L**	TPGX080202R/L	.051	—	10°	20°
	1.51.51R/L	080204R/L	.051	—	10°	20°
	1.81.50.5R/L	090202R/L	.063	—	10°	20°
	1.81.51R/L	090204R/L	.063	—	10°	20°
	1.81.52R/L	090208R/L	.055	—	10°	20°
	220.5L	110302L	.071	—	10°	20°
	221R/L	110304R/L	.071	—	10°	20°
	222R/L	110308R/L	.071	—	10°	20°
 Right hand insert shown.	**TPGV1.81.50.5LF**	TPGV090202L-F	.063	—	10°	20°
	1.81.51R/LF	090204R/L-F	.063	—	10°	20°
	220.5LF	110302L-F	.071	—	10°	20°
	221R/LF	110304R/L-F	.071	—	10°	20°
 Right hand insert shown.	**VCGT1.51.50.5R/LF**	VCGT080202R/L-F	.031	—	13°	20°
	1.51.51R/LF	080204R/L-F	.031	—	13°	20°

PRECISION BREAKER STANDARD

STANDARD OF LEFT AND RIGHT HAND INSERTS

POSITIVE INSERTS

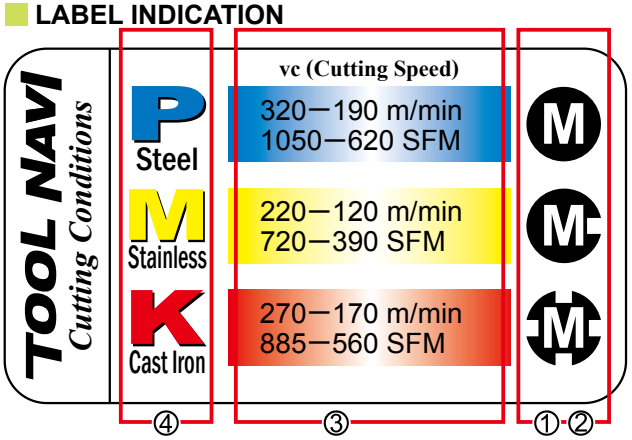
Geometry	Insert Number	(ISO) Number	L_3	L_4	B_2	B_7
 Right hand insert shown.	**VDGX320.5R/L**	VDGX160302R/L	.079	–	25°	20°
	321R/L	160304R/L	.079	–	25°	20°
 Right hand insert shown.	**VBGT220.5R/LF**	VBGT110302R/L-F	.039	–	13°	20°
	221R/LF	110304R/L-F	.039	–	13°	20°
	330.5R/LF	160402R/L-F	.059	–	13°	20°
	331R/LF	160404R/L-F	.059	–	13°	20°
 Right hand insert shown.	**VBET22V3R/LSR**	VBET1103V3R/L-SR	.098	–	30°	20°
	220.2R/LSR	110301R/L-SR	.098	–	30°	20°
	220.5R/LSR	110302R/L-SR	.098	–	30°	20°
	221R/LSR	110304R/L-SR	.098	–	30°	20°
 Right hand insert shown.	**VBET22V0R/LSN**	VBET110300R/L-SN	.039	–	20°	–
	22V3R/LSN	1103V3R/L-SN	.039	–	20°	–
	220.2R/LSN	110301R/L-SN	.039	–	20°	–
	220.5R/LSN	110302R/L-SN	.039	–	20°	–
	221R/LSN	110304R/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°
	1.210.2LF	020101L-F	.039	–	13°	30°
	1.210.5LF	020102L-F	.039	–	13°	30°
	1.211LF	020104L-F	.039	–	13°	30°
	1.51.5V3LF	L302V3L-F	.039	–	13°	30°
	1.51.50.2LF	L30201L-F	.039	–	13°	30°
	1.51.50.5R/LF	L30202R/L-F	.039	–	13°	30°
	1.51.51R/LF	L30204R/L-F	.039	–	13°	30°
 Right hand insert shown.	**WCGT1.210.5R/L**	WCGT020102R/L	.039	–	15°	30°
	1.211R/L	020104R/L	.039	–	15°	30°
	1.51.50.5R	L30202R	.039	–	15°	30°
	1.51.51L	L30204L	.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 Cutting conditions

● Stable cutting ◐ General cutting ✠ Unstable cutting

② Cutting areas (ap: Depth of cut per side)

F : Finishing (ap≤.020") **L** : Light Cutting (ap=.020"—.060")
M : Medium Cutting (ap=.060"—.157") **R** : Rough Cutting (ap=.157"—.276")

③ Cutting speed standards

(Performance versus tool life)
Cutting speed for maximum performance : Tool life is 15min.
Cutting speed for maximum tool life : Tool life is 90min.

④ Workpiece 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)

TOOL LIFE

Cutting speed affects tool life. Mitsubishi's TOOL NAVI suggests cutting speeds for 15/90-minute tool life and is based on Taylor's equation (Relationship for tool grade, cutting conditions and tool life). 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
UE6110	1.00	0.82	0.72	0.67	0.59
UE6025	1.00	0.83	0.75	0.69	0.62
UE6020	1.00	0.83	0.74	0.69	0.62
UE6035	1.00	0.88	0.82	0.78	0.73
AP25N	1.00	0.84	0.76	0.71	0.64
VP25N	1.00	0.84	0.76	0.71	0.64
MP3025	1.00	0.85	0.77	0.72	0.65

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
US7020	1.00	0.70	0.57	0.49	0.40
VP15TF	1.00	0.78	0.67	0.61	0.52
AP25N	1.00	0.76	0.65	0.57	0.49

K Grade (Cast Iron) cutting speed coefficient values.

Grade \ Tool life	15min	30min	45min	60min	90min
UC5105	1.00	0.79	0.69	0.63	0.55
UC5115	1.00	0.79	0.69	0.63	0.55
AP25N	1.00	0.87	0.80	0.75	0.69
VP25N	1.00	0.87	0.80	0.75	0.69

(ex.) Medium cutting of steel
The 1st recommendation : UE6110
Indexable inserts : CNMG432MA
Recommended cutting speed : vc = 1065SFM
(Tool life : 15min.)

↓

Tool life required by the customer : 30min.
1065×0.82 = 873SFM

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

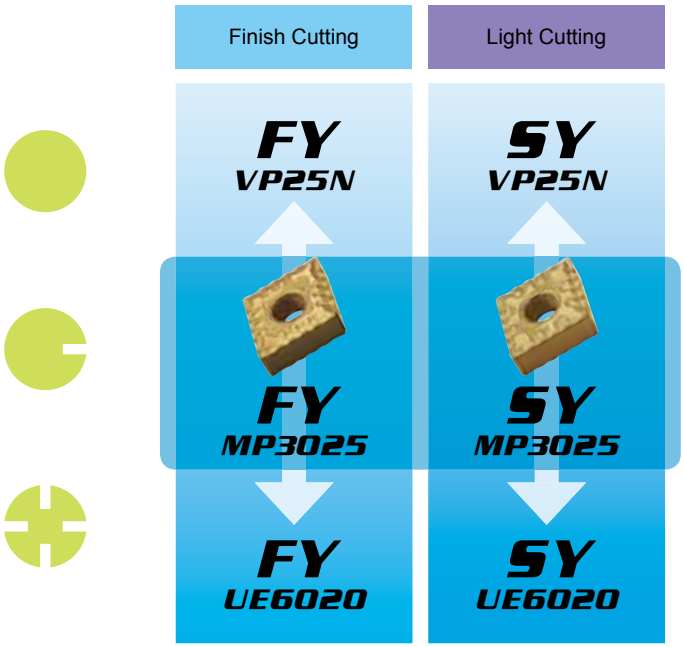
Stable Cutting	Continuous Cutting Constant Depth of Cut Pre-Machined Securely Clamped Component
General Cutting	
Unstable Cutting	Heavy Interrupted Cutting Irregular Depth of Cut Low Clamping Rigidity

CUTTING AREA

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

P Mild Steel

NEGATIVE INSERTS



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

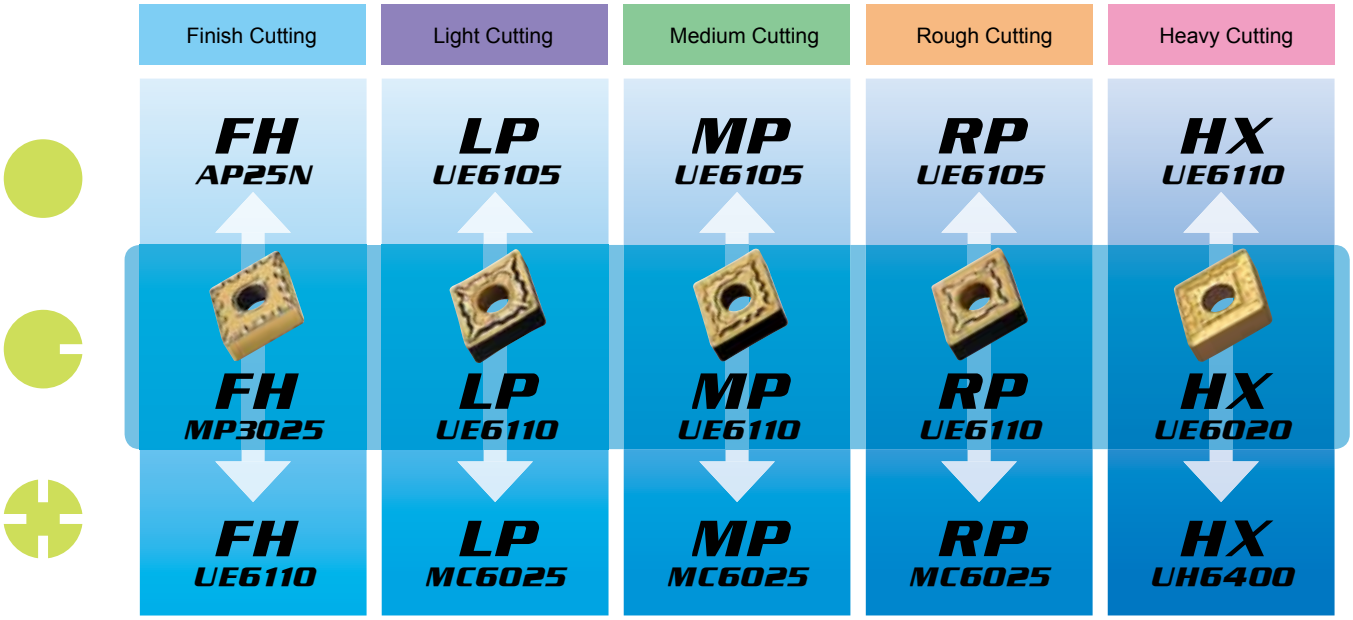
	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	FY	VP25N	935—1460	.004—.010	.008—.032
	L	SY	VP25N	850—1330	.007—.013	.020—.048
General Cutting	F	FY	MP3025	900—1380	.004—.010	.008—.032
	L	SY	MP3025	820—1260	.007—.013	.020—.048
Unstable Cutting	F	FY	UE6020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

Stable Cutting
General Cutting
Unstable Cutting

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

P Carbon Steel • Alloy Steel

NEGATIVE INSERTS



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

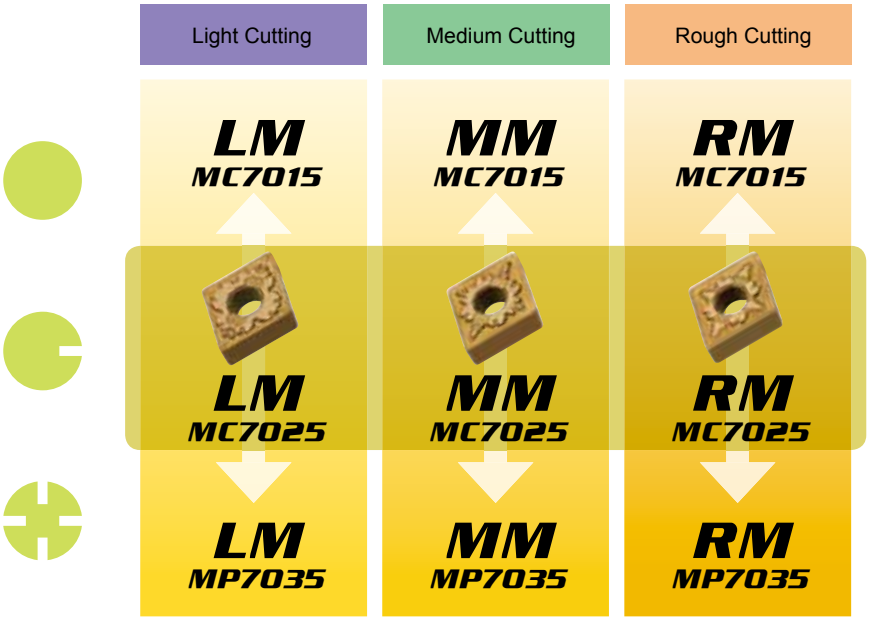
	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	FH	AP25N	705—1115	.004—.008	.008—.040
	L	LP	UE6105	720—1330	.004—.016	.012—.079
	M	MP	UE6105	655—1215	.007—.020	.012—.158
	R	RP	UE6105	620—1150	.010—.024	.060—.237
	H	HX	UE6110	525—900	.020—.050	.119—.434
General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

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

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	MA	UC5105	560—1030	.008—.020	.012—.158
	M	Standard	UC5105	560—1030	.010—.024	.060—.197
	R	GH	UC5105	540—985	.010—.024	.060—.237
	H	Flat Top	UC5105	540—985	.008—.024	.099—.237
General Cutting	L	MA	UC5115	540—1000	.008—.020	.012—.158
	M	Standard	UC5115	540—1000	.010—.024	.060—.197
	R	GH	UC5115	525—950	.010—.024	.060—.237
	H	Flat Top	UC5115	525—950	.008—.024	.099—.237
Unstable Cutting	L	MA	UC5115	540—1000	.008—.020	.012—.158
	M	Standard	UC5115	540—1000	.010—.024	.060—.197
	R	GH	UC5115	525—950	.010—.024	.060—.237
	H	Flat Top	UC5115	525—950	.008—.024	.099—.237

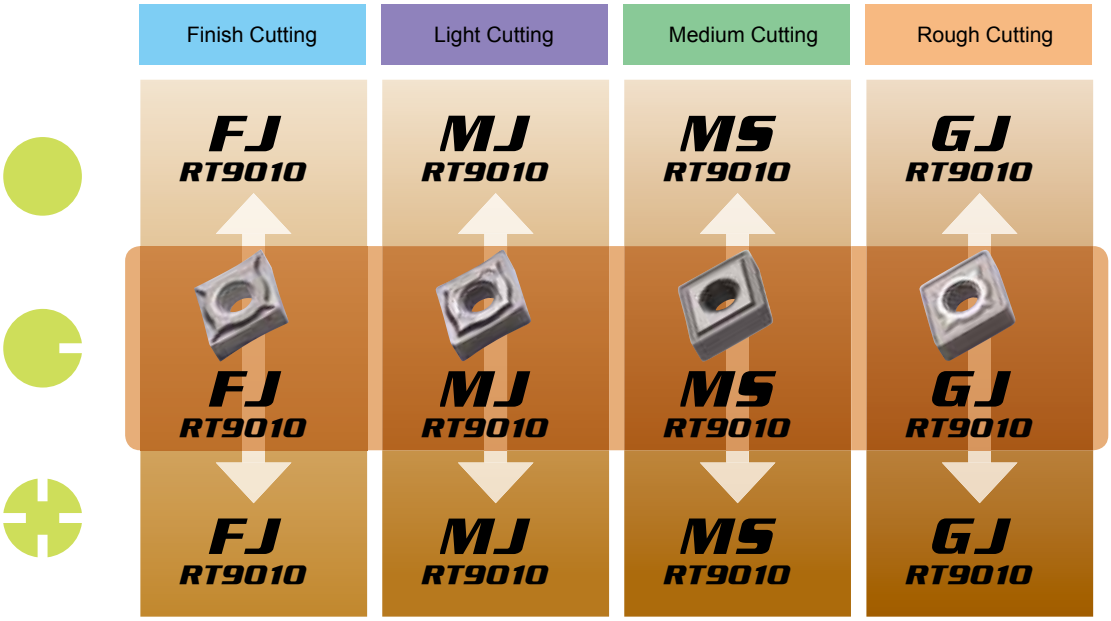
CLASSIFICATION OF GRADES AND CHIP BREAKERS FOR TURNING

Stable Cutting
General Cutting
Unstable Cutting

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

S Titanium Alloy

NEGATIVE INSERTS



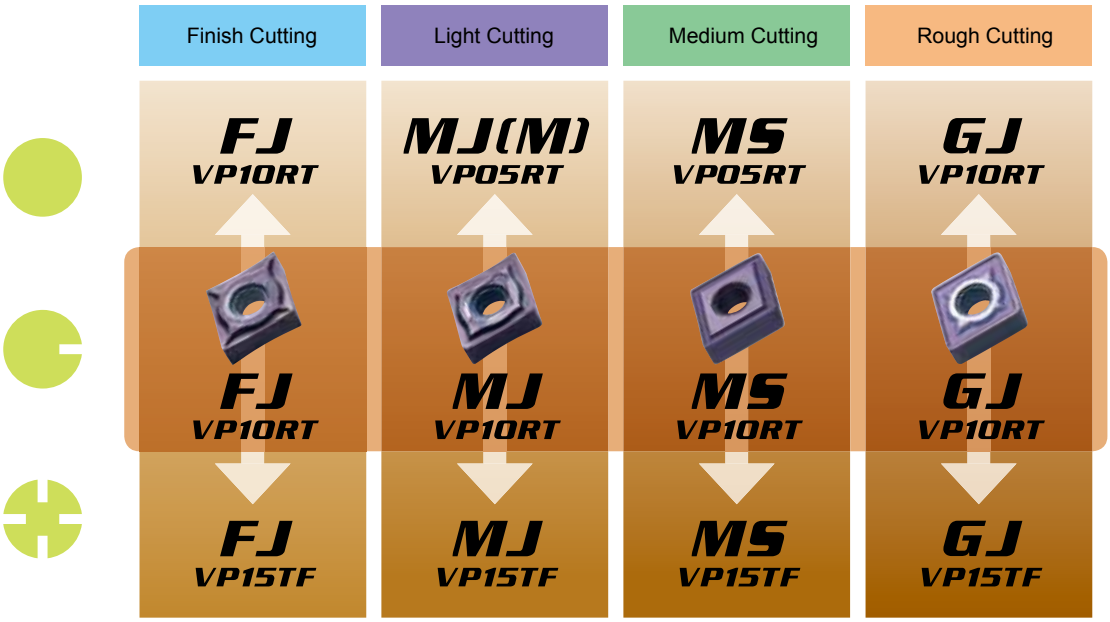
vc : Cutting speed
f : Feed
ap : Depth of cut.

	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	MJ(M)	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
General Cutting	F	FJ	RT9010	150—310	.003—.008	.004—.040
	L	MJ(M)	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
Unstable Cutting	F	FJ	RT9010	150—310	.003—.008	.004—.040
	L	MJ(M)	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

NEGATIVE INSERTS



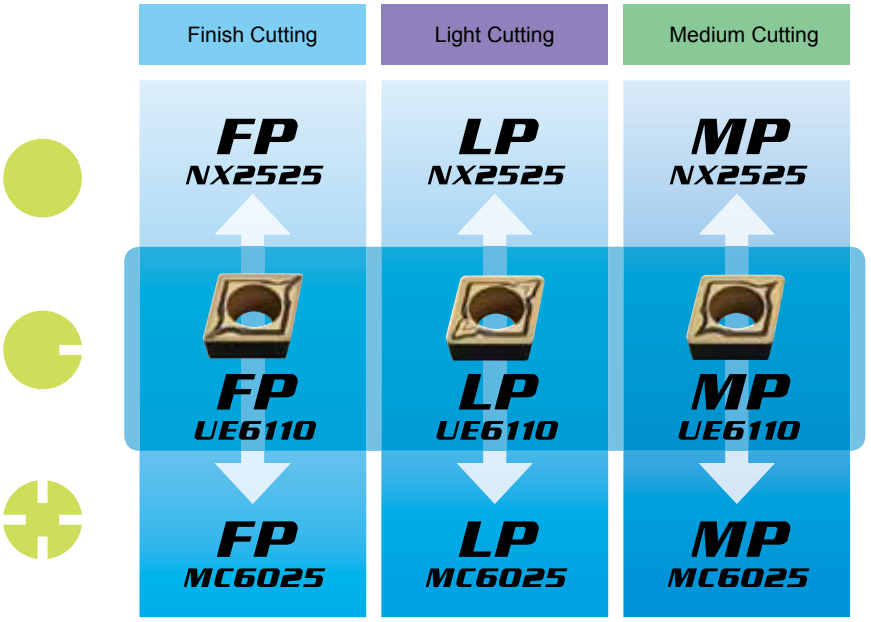
vc : Cutting speed
f : Feed
ap : Depth of cut.

	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	MJ(M)	VP05RT	100—195	.003—.010	.016—.060
	M	MS	VP05RT	100—195	.004—.010	.020—.158
	R	GJ	VP10RT	65—150	.007—.014	.040—.119
General Cutting	F	FJ	VP10RT	100—195	.003—.008	.004—.040
	L	MJ(M)	VP10RT	80—165	.003—.010	.016—.060
	M	MS	VP10RT	80—165	.004—.010	.020—.158
	R	GJ	VP10RT	65—150	.007—.014	.040—.119
Unstable Cutting	F	FJ	VP15TF	65—130	.003—.008	.004—.040
	L	MJ(M)	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

P Mild Steel

7° POSITIVE INSERTS WITH HOLE



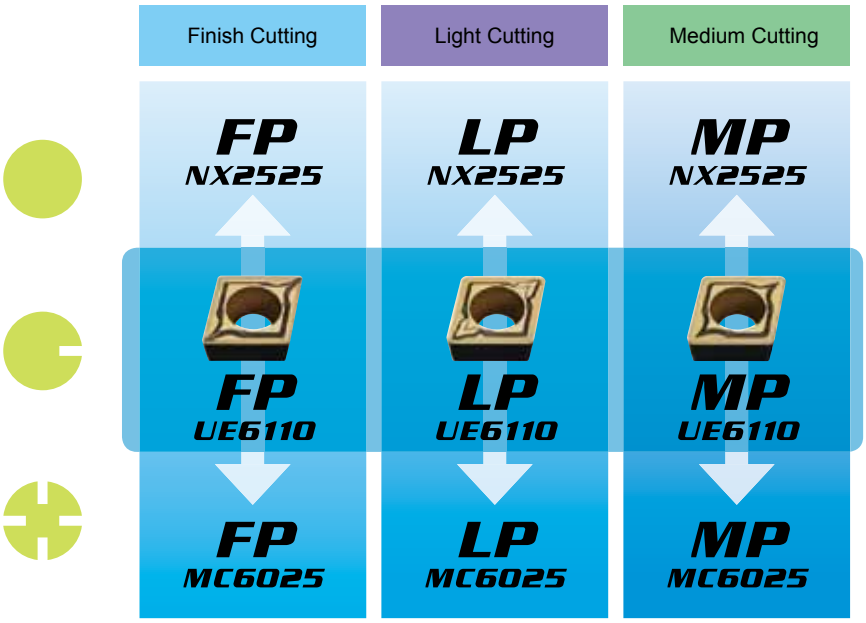
- Stable Cutting
- General Cutting
- Unstable Cutting
- F Finish Cutting
- L Light Cutting
- M Medium Cutting

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	UE6110	820—1395	.002—.008	.008—.036
	L	LP	UE6110	820—1395	.003—.010	.008—.040
	M	MP	UE6110	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

P Carbon Steel • Alloy Steel

7° POSITIVE INSERTS WITH HOLE



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

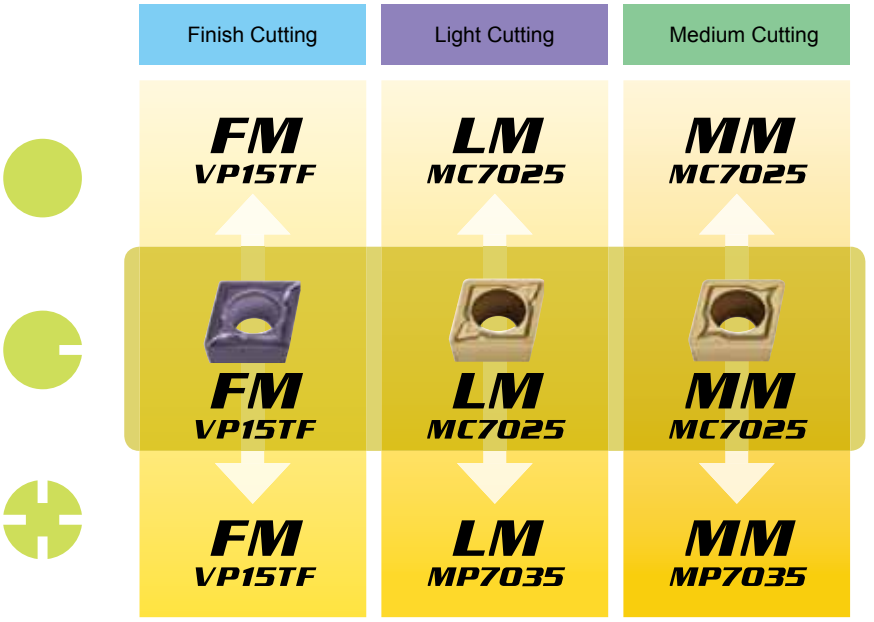
vc : Cutting speed
f : Feed
ap : Depth of cut.

	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	UE6110	605—1015	.002—.008	.008—.036
	L	LP	UE6110	605—1015	.003—.010	.008—.040
	M	MP	UE6110	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

7° POSITIVE INSERTS WITH HOLE



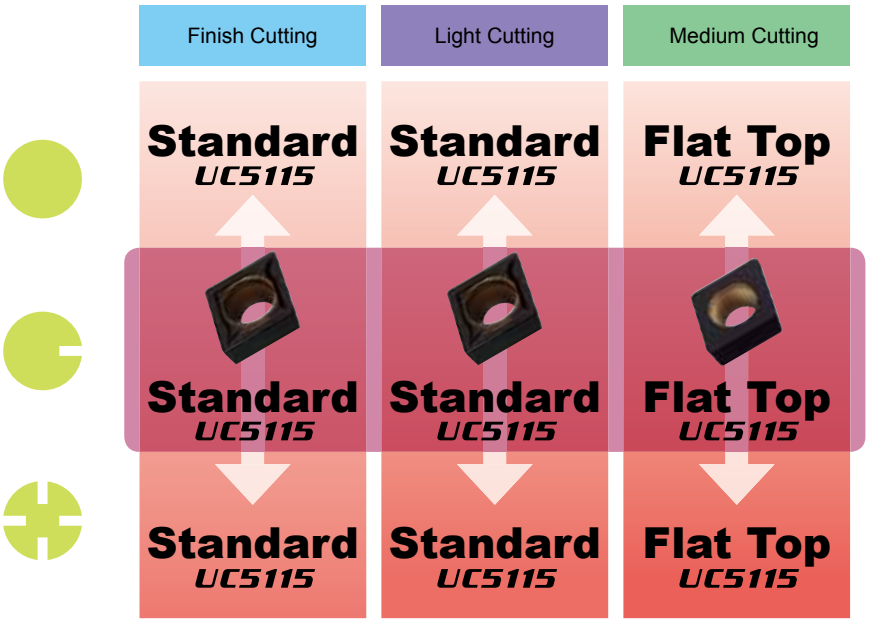
- Stable Cutting
- General Cutting
- Unstable Cutting
- F Finish Cutting
- L Light Cutting
- M Medium Cutting

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

K Cast Iron • Ductile Cast Iron

7° POSITIVE INSERTS WITH HOLE



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

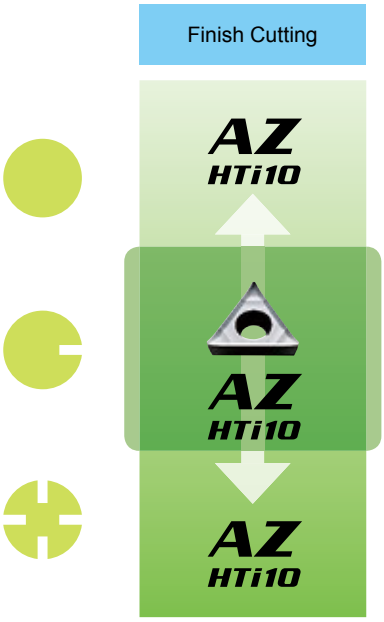
vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	**Standard**	**UC5115**	425—805	.004—.012	.012—.079
	L	**Standard**	**UC5115**	425—805	.004—.012	.012—.079
	M	**Flat Top**	**UC5115**	425—805	.004—.012	.012—.079
General Cutting	F	**Standard**	**UC5115**	425—805	.004—.012	.012—.079
	L	**Standard**	**UC5115**	425—805	.004—.012	.012—.079
	M	**Flat Top**	**UC5115**	425—805	.004—.012	.012—.079
Unstable Cutting	F	**Standard**	**UC5115**	425—805	.004—.012	.012—.079
	L	**Standard**	**UC5115**	425—805	.004—.012	.012—.079
	M	**Flat Top**	**UC5115**	425—805	.004—.012	.012—.079

CLASSIFICATION OF GRADES AND CHIP BREAKERS FOR TURNING

N Aluminum Alloy

7° POSITIVE INSERTS WITH HOLE



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

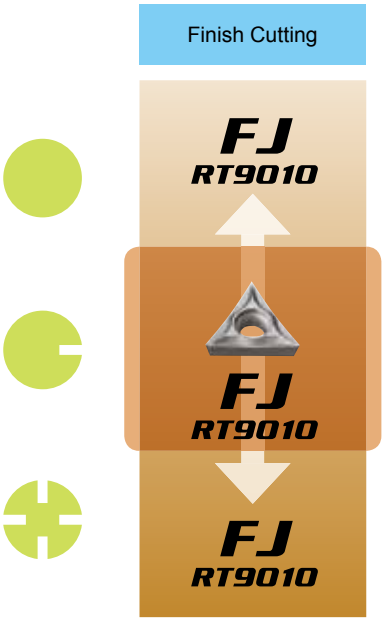
vc : Cutting speed
f : Feed
ap : Depth of cut.

	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

S Titanium Alloy

7° POSITIVE INSERTS WITH HOLE

Stable Cutting
General Cutting
Unstable Cutting
F Finish Cutting



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

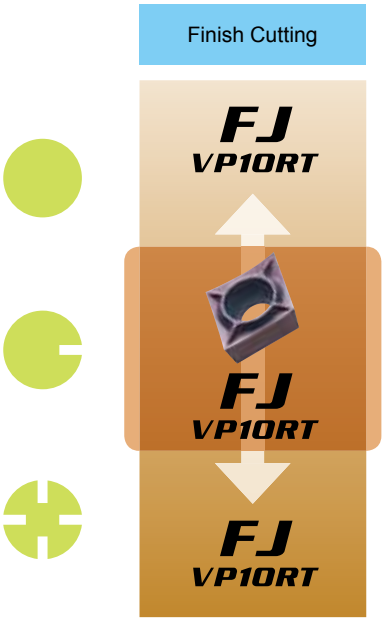
	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	**FJ**	**RT9010**	115—245	.002—.005	.008—.056
General Cutting	F	**FJ**	**RT9010**	115—245	.002—.005	.008—.056
Unstable Cutting	F	**FJ**	**RT9010**	115—245	.002—.005	.008—.056

CLASSIFICATION OF GRADES AND CHIP BREAKERS FOR TURNING

S Ni, Co-Based Alloy

7° POSITIVE INSERTS WITH HOLE

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

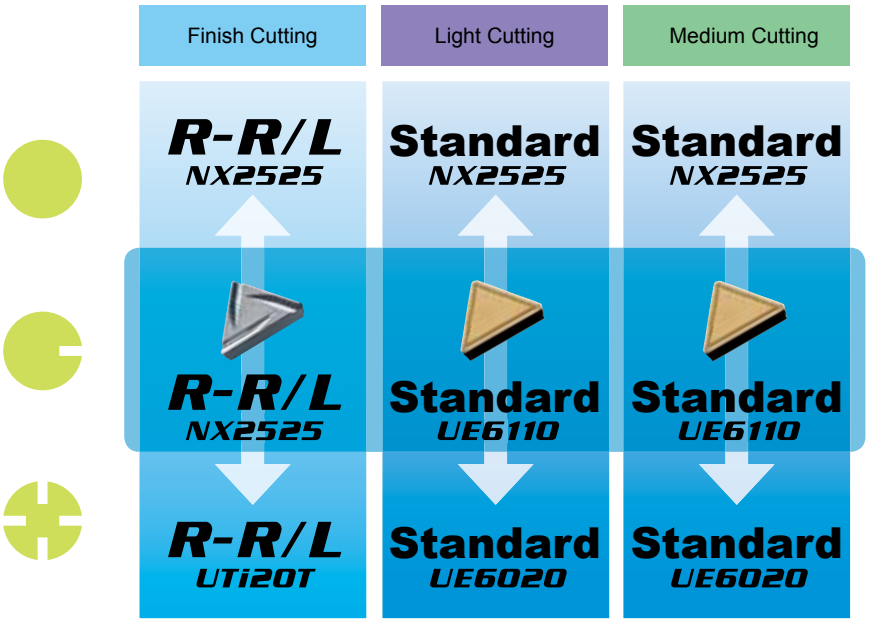


vc : Cutting speed
f : Feed
ap : Depth of cut.

	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

P Mild Steel

11° POSITIVE INSERTS WITHOUT HOLE



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

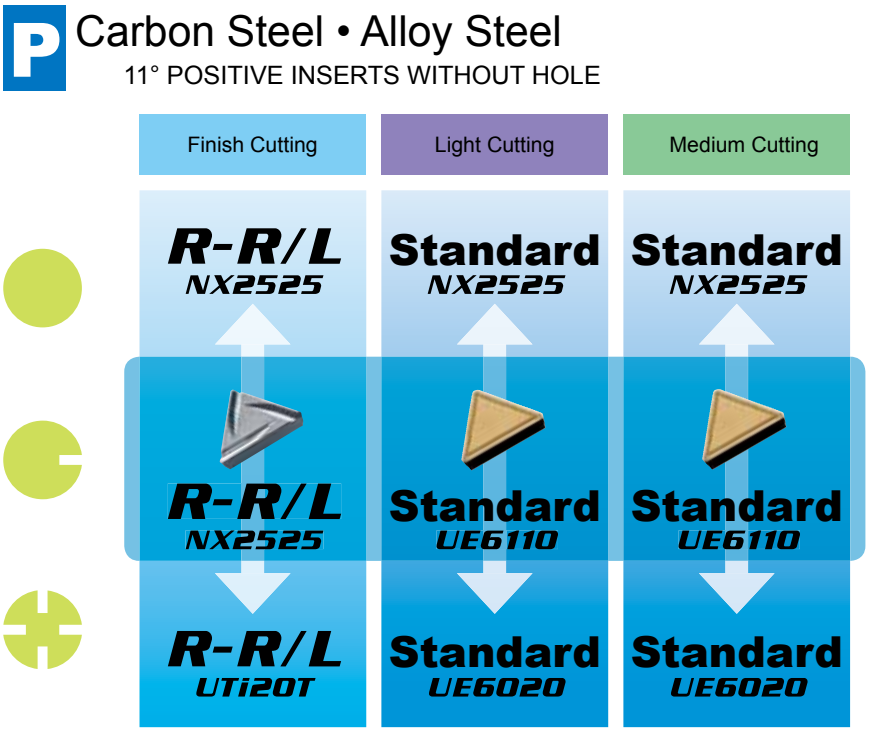
vc : Cutting speed
f : Feed
ap : Depth of cut.

	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

P Carbon Steel • Alloy Steel

11° POSITIVE INSERTS WITHOUT HOLE



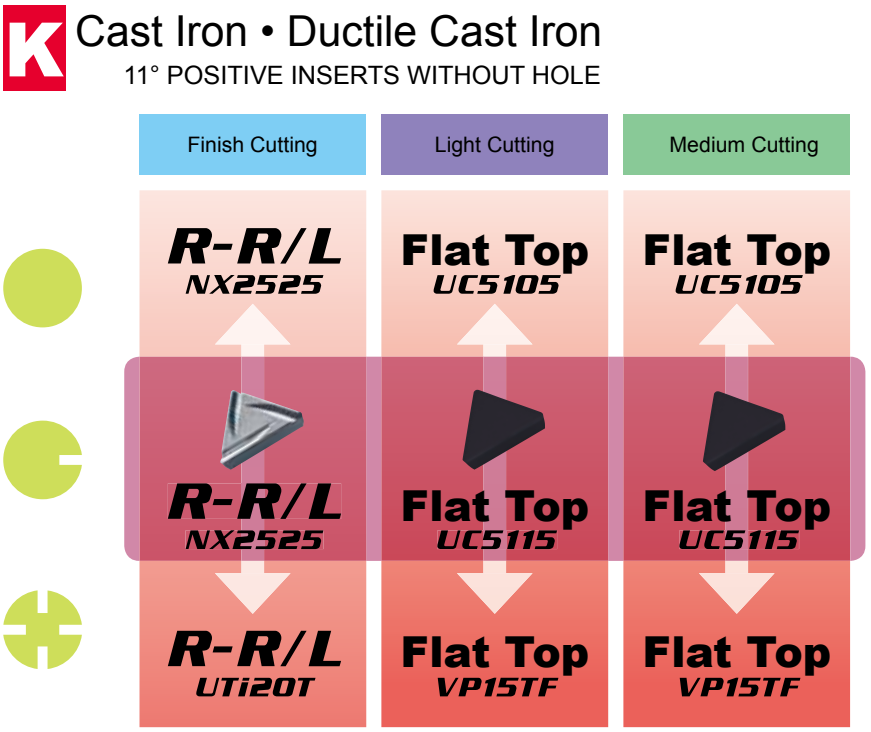
- Stable Cutting
- General Cutting
- Unstable Cutting
- F Finish Cutting
- L Light Cutting
- M Medium Cutting

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

Cast Iron • Ductile Cast Iron

11° POSITIVE INSERTS WITHOUT HOLE



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

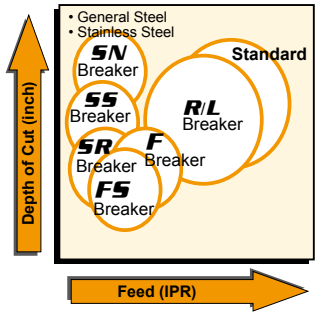
vc : Cutting speed
f : Feed
ap : Depth of cut.

	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

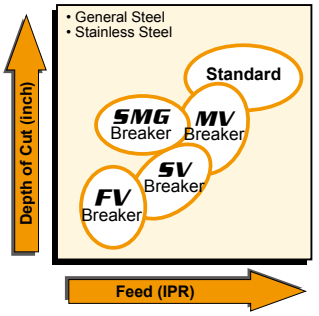
ANGULAR AND PARALLEL CHIP BREAKER

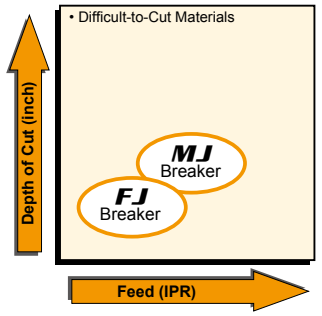
CHIP CONTROL RANGES



3-DIMENSIONAL CHIP BREAKER

CHIP CONTROL RANGES

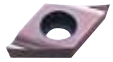
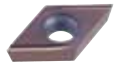
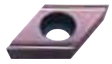
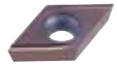




FEATURES OF CHIP BREAKER

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 moulded 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.		—	—			—		—	

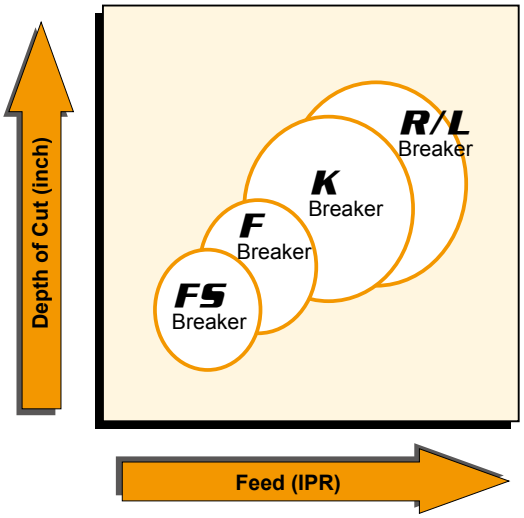
Breaker	Features	CCGH/CCGT Type	CPGT Type	DCGT Type	TPGH Type	TPGV/TPGT Type	TCGT Type	VBGT/VCGT Type	WBGT Type	WCGT Type	WPGT Type
FS	● For precision finishing. ● Narrow angled breaker provides optimal chip control. ● Sharp cutting edge generates excellent surface finish.	—	—	—		—	—	—	—	—	
F	● For finish 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.					

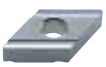
PRECISION BREAKER SYSTEM (NEGATIVE INSERTS)

ANGULAR AND PARALLEL CHIP BREAKERS (NEGATIVE INSERTS)

CHIP CONTROL RANGES



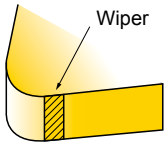
FEATURES OF CHIP BREAKER

Breaker	Features	DNGG Type	SNGG Type	TNGG Type	VNGG Type
FS	● For precision finishing. ● Narrow width angled breaker for good chip c.ontrol. ● 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.



●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.

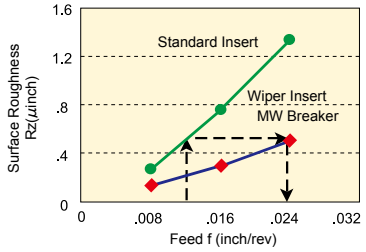
●Improving Chip Control
Under high feed conditions, the chips generated become thicker and are more easily broken, thus, chip control is improved.

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.)

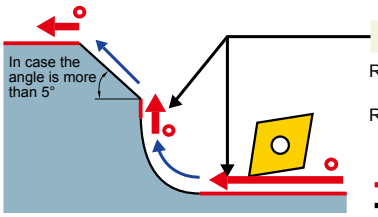
- Reducing cost
- Increased productivity
- Reduced machine down time

<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.



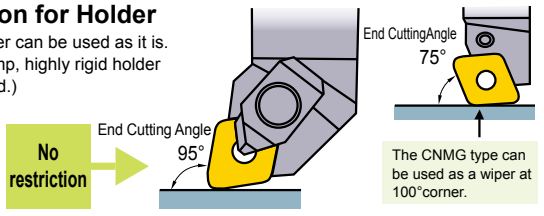
Rz(W)=Rz×0.5

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

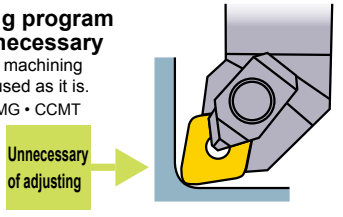
Effective uses of a wiper insert
Non effective uses of a wiper insert

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.)



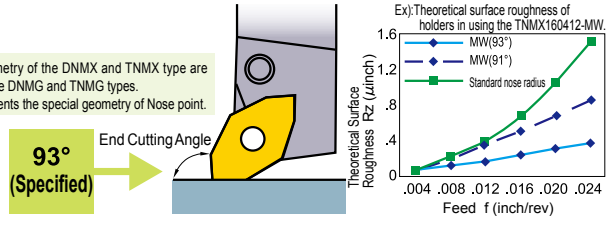
No machining program adjustment necessary
The conventional machining program can be used as it is.
(The CNMG • WNMG • CCMT types are based on ISO/ANSI standards.)



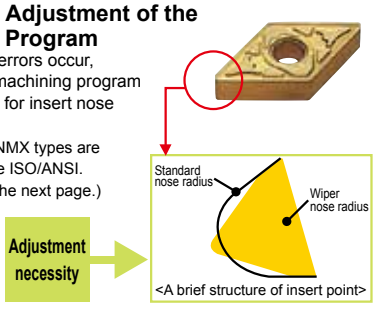
Special attention is necessary when using DNMX • TNMX types due to the special top face geometry

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.)



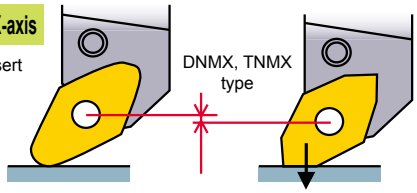
MACHINING PROGRAM ADJUSTMENTS FOR DNMX AND TNMX INSERTS

A) Turning and facing

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

Adjusting toward X-axis

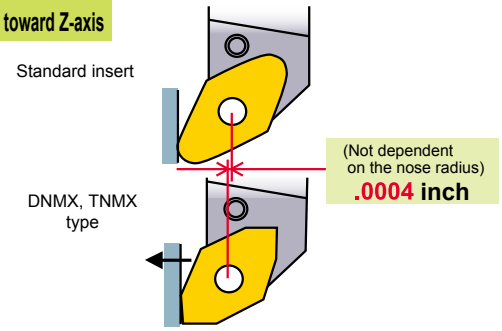
Standard insert



Nose radius .016,.031: **.0016 inch**
Nose radius .047 : **.0020 inch**

Adjusting toward Z-axis

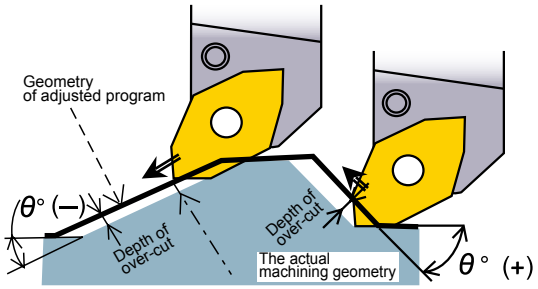
Standard insert



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)

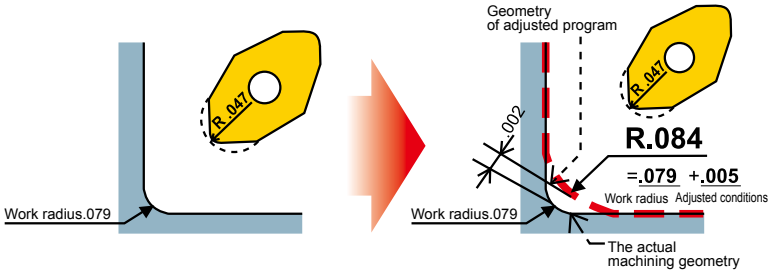
C) Compensation when machining a corner radius

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.

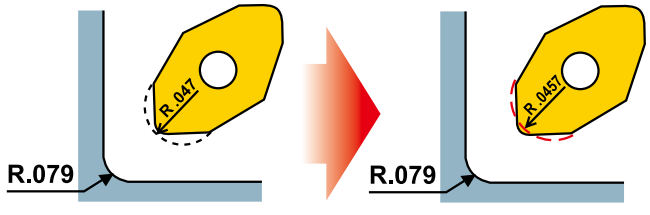


2) Nose radius adjustment method

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"**

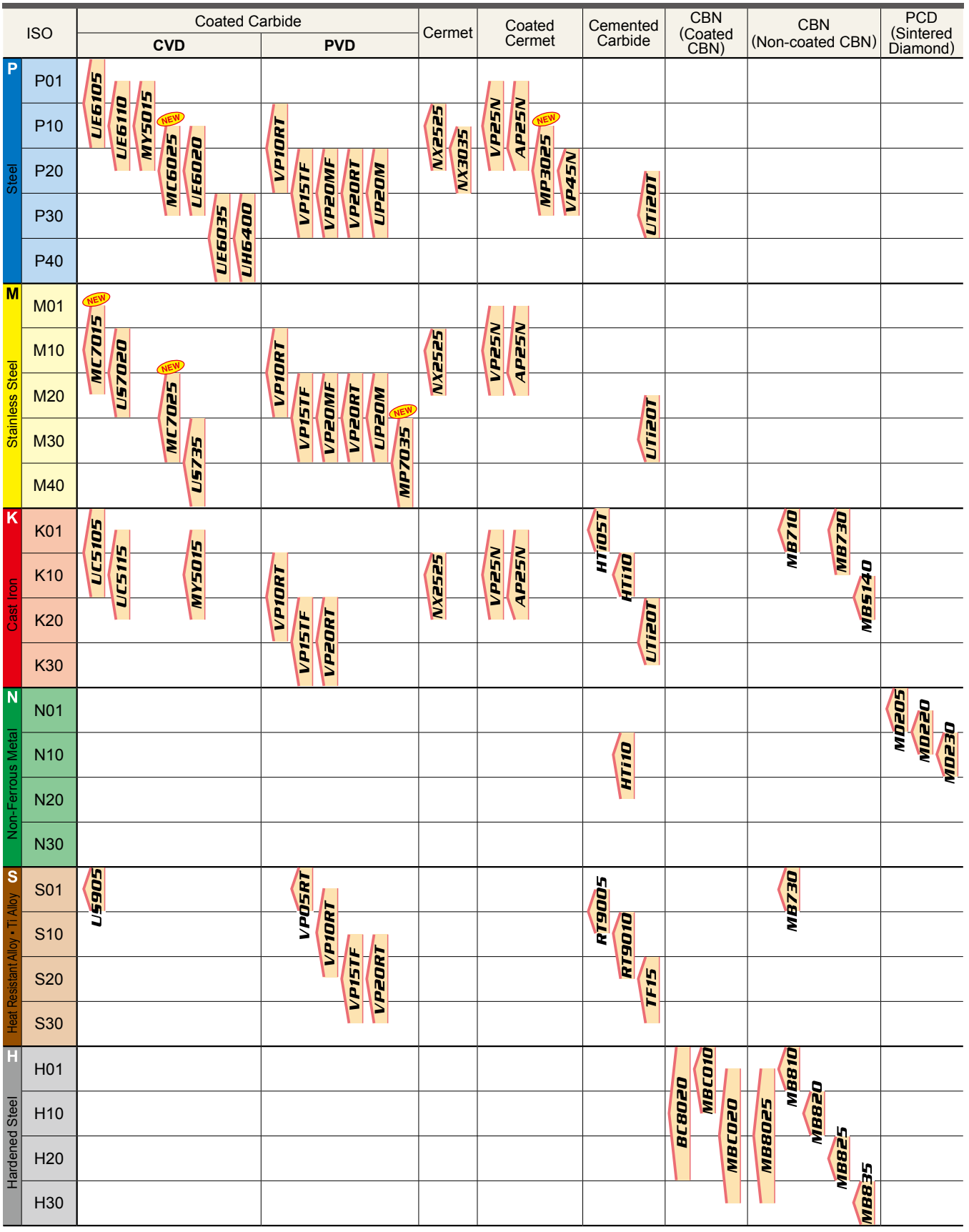
Ex): In the case of machining a corner with a radius R .079 when using an insert with a nose radius R .047.



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

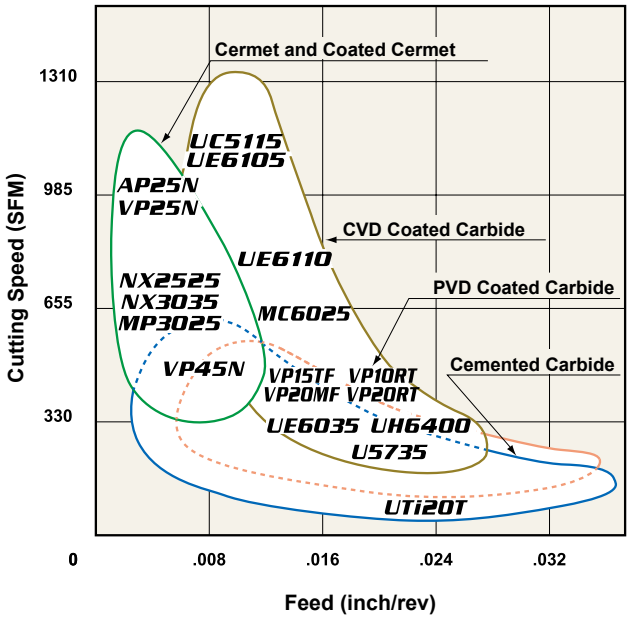
GRADES FOR TURNING

● INDEXABLE INSERT GRADES FOR TURNING

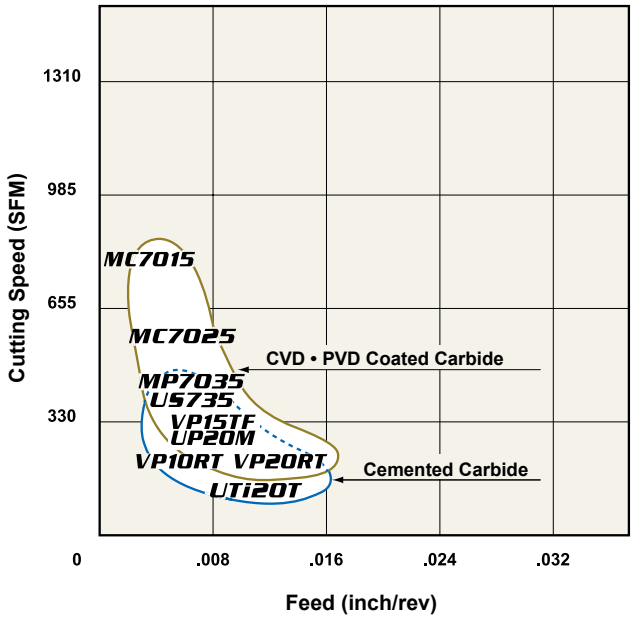


TURNING APPLICATION RANGE

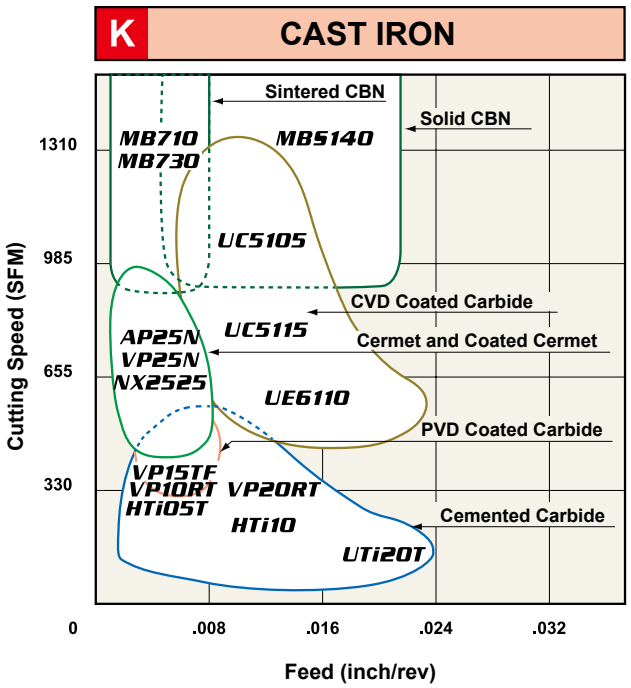
P STEEL



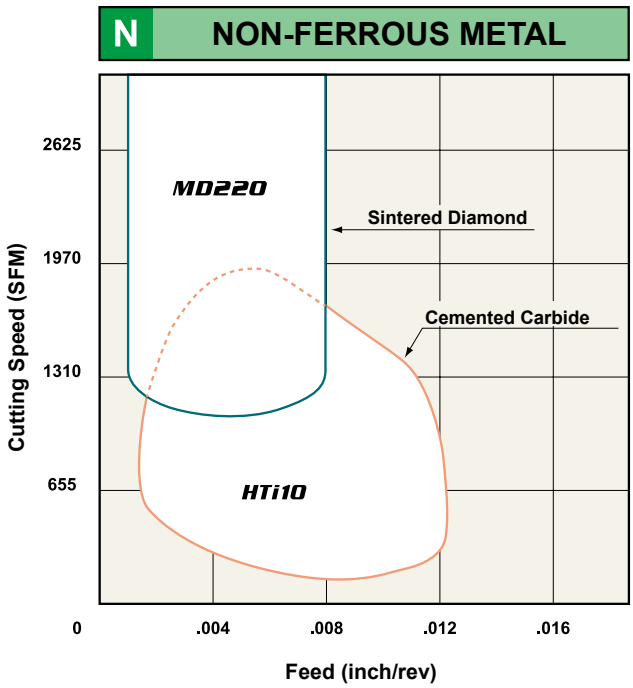
M STAINLESS STEEL



K CAST IRON



N NON-FERROUS METAL



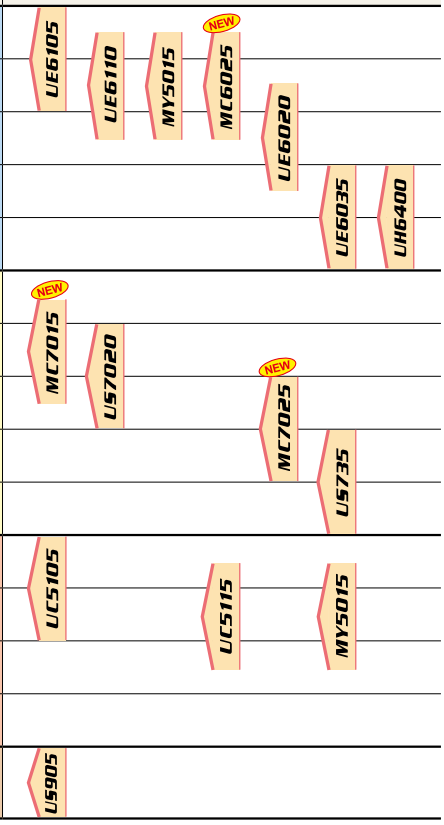
COATED CARBIDE (CVD)

- 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
P	Steel	Continuous Cutting	**UE6105**	1150 (655 – 1800)	P01
			UE6110	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
			MC7025	490 (390 – 655)	M10
		Continuous and Interrupted Cutting			M20
			US735	330 (260 – 390)	M30
					M40
K	Cast Iron Ductile Cast Iron	Continuous Cutting	**UC5105**	985 (655 – 1315)	K01
					K10
		Interrupted Cutting	**UC5115**	820 (490 – 985)	K20
					K30
S	Heat Resistant Alloys	Continuous and Interrupted	**US905**	260 (165 – 330)	S01



High reliability for a wide range of steel machining.

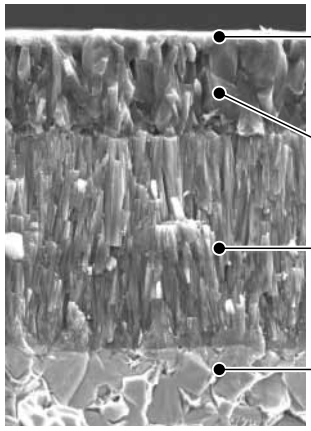
NEW

MC6025

MC6025 provides stable cutting edge strength and wear resistance with a combination of specially engineered substrate, with significantly improves edge toughness, and a highly wear resistant CVD coating.



Black Super Smooth Coating



Smooth coating surface

Prevent abnormal damage and weld chipping

Flat Al_2O_3

Excellent heat resistance

Microscopic TiCN

High wear resistance

Newly developed

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
UC5115	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
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

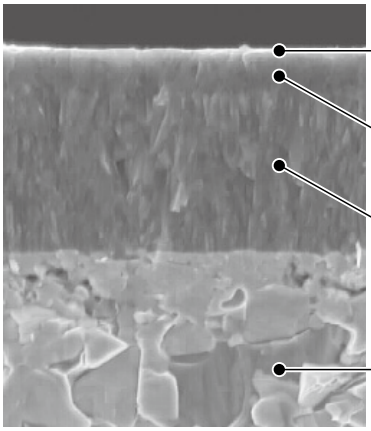
Excellent machining efficiency in general-purpose machining and high speed machining of stainless steel.

NEW

MC7015/MC7025

MC7015/MC7025 achieve stable, highly efficient, machining of stainless steels from medium to high SFM applications through a combination of specially engineered substrate, with excellent plastic deformation resistance, and tough CVD coating.





Smooth cutting edge

Prevents welding

Thin layer, Nano-texture Al_2O_3

Controls abnormal damage

Tough, Nano-texture TiCN

High wear resistance

Newly developed

Special carbide substrate

Resists chipping & plastic deformation

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	Coating Name	Recommended Grade	Recommended Cutting Speed (SFM)	ISO	Application Range
P	Steel	VP Coating	**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	
		UP Coating	**UP20M**	390 (330 — 490)	P40	
M	Stainless Steel	VP Coating	**VP10RT**	390 (330 — 490)	M01	
			VP15TF	390 (330 — 490)	M10	VP10RT
			VP20MF	390 (330 — 490)	M20	VP15TF, VP20MF, VP20RT, UP20M, NEW MP7035
			VP20RT	390 (330 — 490)	M30	
			MP7035	390 (330 — 490)	M40	
		UP Coating	**UP20M**	390 (330 — 490)		
K	Cast Iron	VP Coating	**VP10RT**	390 (330 — 490)	K01	
			VP15TF	390 (330 — 490)	K10	VP10RT
			VP20RT	390 (330 — 490)	K20	VP15TF, VP20RT
					K30	
S	Heat Resistant Alloy	VP Coating	**VP05RT**	165 (65 — 230)	S01	VP05RT
			VP10RT	130 (65 — 165)	S10	VP10RT
			VP20RT	130 (65 — 165)	S20	VP15TF, VP20RT
			VP15TF	130 (65 — 165)	S30	

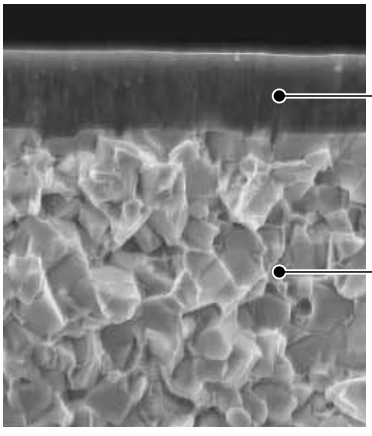
High reliability in unstable machining of stainless steel.

NEW

MP7035

MP7035 excels in low SFM, unstable, stainless steel applications through a combination of (Al,Ti)N coating, with excellent heat resistance, and a substrate engineered for high resistance to chipping and notching.





(Al, Ti)N coating

Prevents welding

Special carbide substrate

Improved fracture & thermal shock resistance

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	Substrate			
	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, NEW MP3025, AP25N
					P10	
		Interrupted Cutting	**MP3025**	590 (460 – 655)	P20	VP45N
					P30	
K	Cast Iron Ductile Cast Iron	Finishing	**VP25N AP25N**	720 (555 – 820)	K01	VP25N, AP25N
					K10	
					K20	

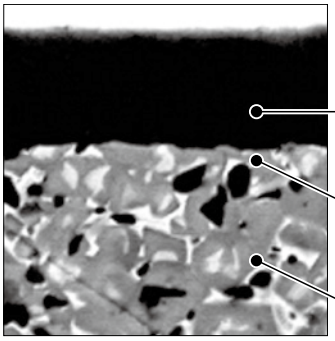
Effective for production of small parts.

NEW

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.





Ti-compound PVD coating provides excellent wear and welding resistance.

Substrate surface provides excellent adhesion strength for coating layer.

Substrate with superior fracture resistance and thermal shock resistance.

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
				K20	UTi20T
		UTi20T	330 (165 – 490)	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	RT9005
		RT9010	195 (130 – 260)	S10	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
	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

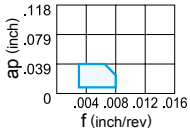
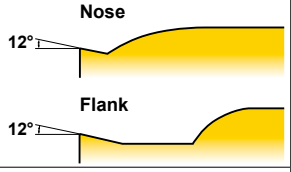
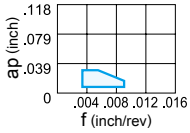
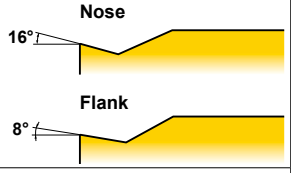
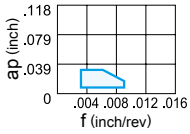
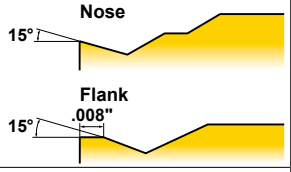
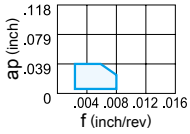
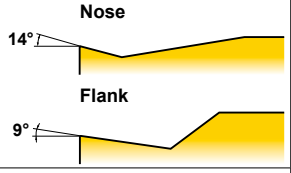
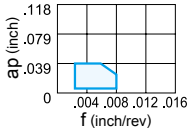
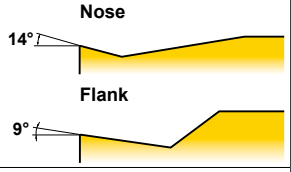
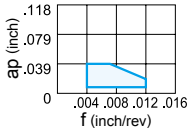
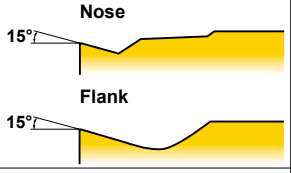
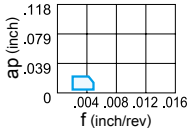
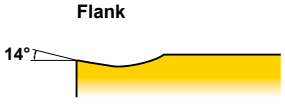
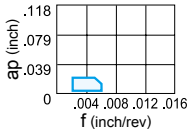
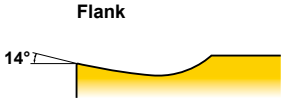
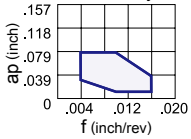
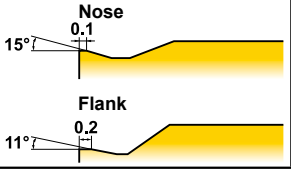
Grade	Grade Characteristics			ISO	Wear Resistance	Fracture Resistance	Corrosion Resistance
	Specific Gravity	Hardness (HRA)	T.R.S (Gpa)*				
TF15	**14.5**	91.5	2.5	K20	◎	○	◎

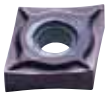
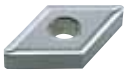
* 1GPa=102kg/mm^2

Memo

CLASSIFICATION

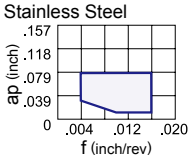
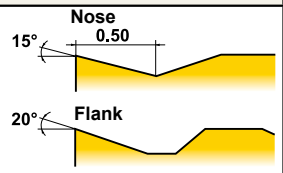
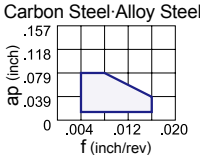
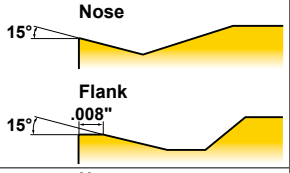
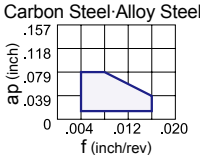
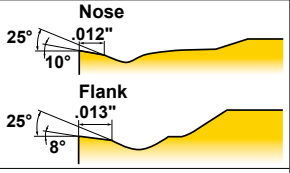
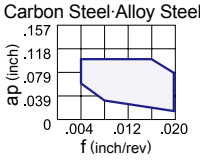
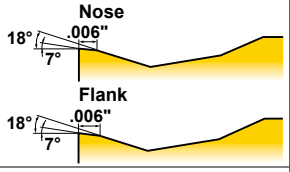
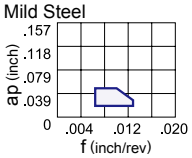
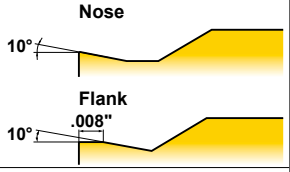
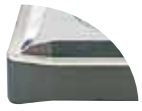
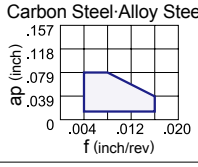
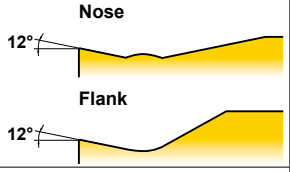
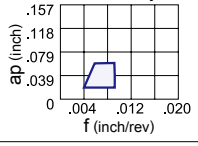
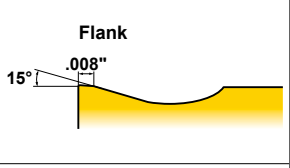
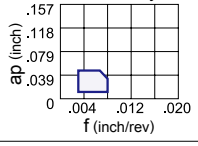
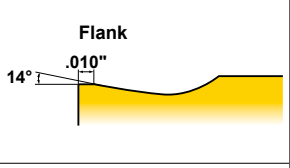
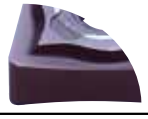
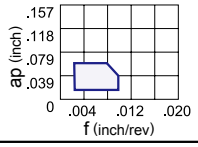
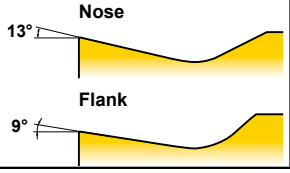
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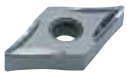
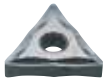
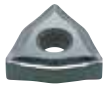
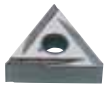
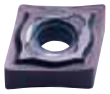
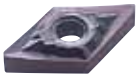
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	M Class	**FH** 	**First recommendation for finishing carbon steel, alloy steel and stainless steel** Double sided chipbreaker. Stable chip control even at small depth of cut.	Carbon Steel·Alloy Steel  
		FS 	**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	NEW **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  A072	DNMG_FH  A078	SNMG_FH  A085	TNMG_FH  A090	VNMG_FH  A097	WNMG_FH  A100	
	CNMG_FS  A072	DNMG_FS  A078	SNMG_FS  A085	TNMG_FS  A090	VNMG_FS  A097	WNMG_FS  A100	
	CNMG_FY  A072	DNMG_FY  A078		TNMG_FY  A090		WNMG_FY  A100	
	CNGG_FJ  A072	DNGG_FJ  A078			VNGG_FJ  A097		
	CNGG_FJ-P  A072						
	CNGG_PK  A072	DNGG_PK  A078		TNGG_PK  A090			
				TNGG_R/L FS  A090			
				TNGG_R/L F  A090	VNGG_R/L-F  A097		
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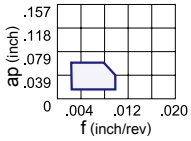
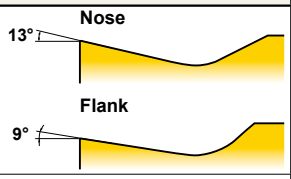
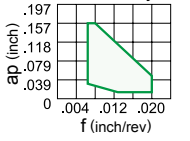
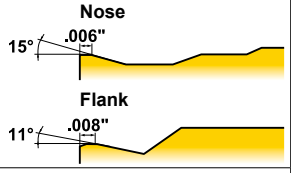
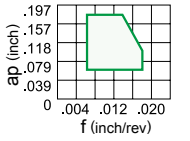
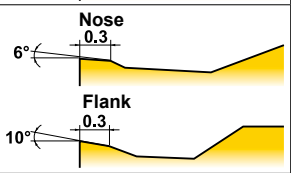
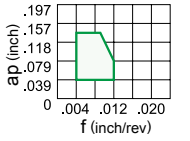
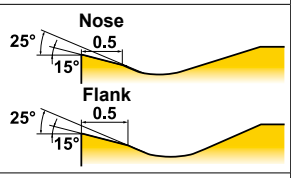
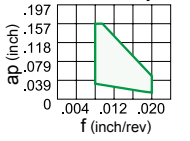
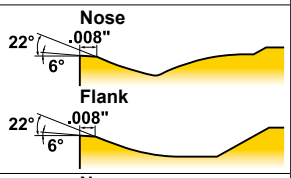
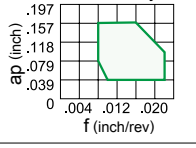
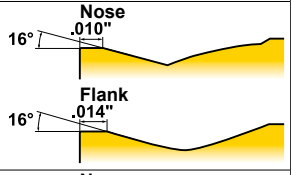
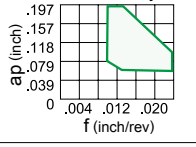
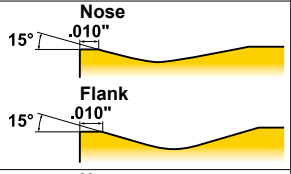
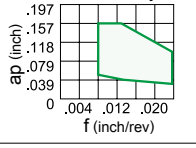
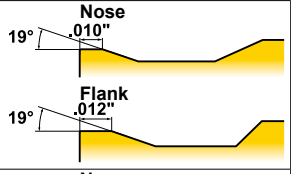
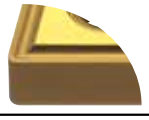
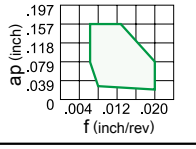
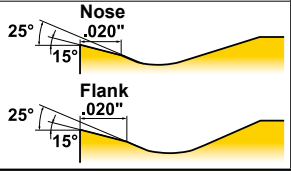
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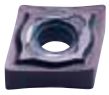
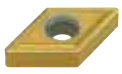
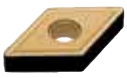
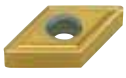
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Light Cutting	M Class	NEW **LM** 	**First recommendation for light cutting of stainless steel** Double sided chipbreaker. Stable chip control in light cutting range. Breaker with high rake angle provides excellent burr control.	Stainless Steel  
		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  
	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  
	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  

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CNMG_LM NEW  A073	DNMG_LM NEW  A079	SNMG_LM NEW  A085	TNMG_LM NEW  A091	VNMG_LM NEW  A097	WNMG_LM NEW  A100	
	CNMG_SH  A073	DNMG_SH  A079	SNMG_SH  A085	TNMG_SH  A091	VNMG_SH  A098	WNMG_SH  A101	
	CNMG_SA  A073	DNMG_SA  A079	SNMG_SA  A085	TNMG_SA  A091		WNMG_SA  A101	
	CNMG_SW  A073	DNMX_SW  A079		TNMX_SW  A091		WNMG_SW  A101	
	CNMG_SY  A073	DNMG_SY  A080	SNMG_SY  A086	TNMG_SY  A091		WNMG_SY  A101	
	CNMG_C  A073	DNMG_C  A080	SNMG_C  A086	TNMG_C  A091		WNMG_C  A101	
			SNMG_R/L 1G  A086	TNMG_R/L 1G  A091			
				TNGG_R/L K  A092			
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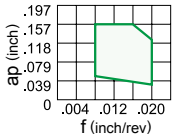
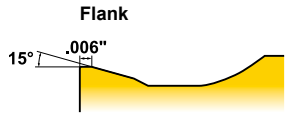
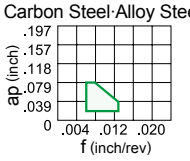
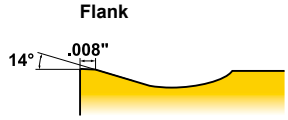
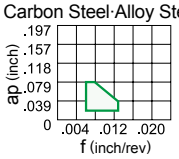
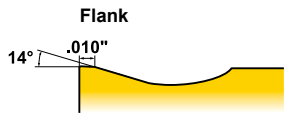
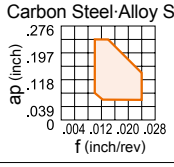
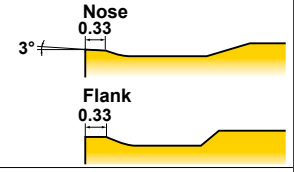
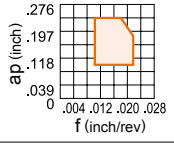
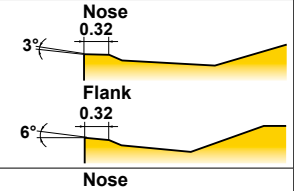
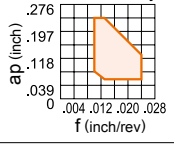
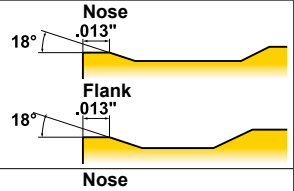
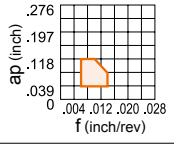
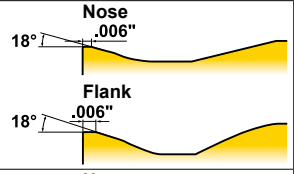
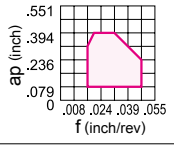
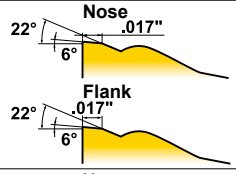
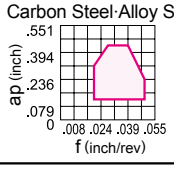
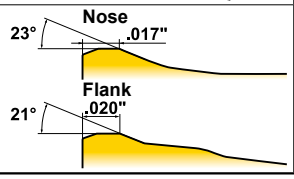
NEGATIVE INSERTS WITH HOLE

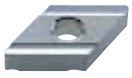
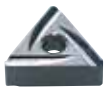
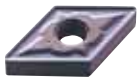
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Light Cutting	G Class	**MJ** 	**First recommendation for light cutting of difficult-to-cut materials** Double sided chipbreaker, Single sided chipbreaker. G class insert tolerance is suitable for workpieces requiring close dimensional tolerances. Ideal for heat-resistant alloy and titanium alloy. The sharp edge produces excellent surface finishes.	Difficult-to-Cut Materials  
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  
		MM NEW 	**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  
		GM NEW 	**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  
		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  
		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  
		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  

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CNGG_MJ  A074	DNGM_MJ  A080			VNGM_MJ  A098		
	CNMG_MP  A074	DNMG_MP  A080	SNMG_MP  A086	TNMG_MP  A092	VNMG_MP  A098	WNMG_MP  A101	
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	CNMG_MW  A075	DNMX_MW  A081		TNMX_MW  A093		WNMG_MW  A103	
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CLASSIFICATION

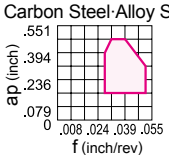
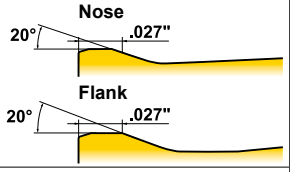
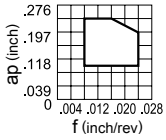
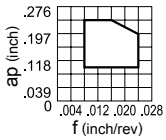
NEGATIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	M Class	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	NEW 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  
		NEW 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  
		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  

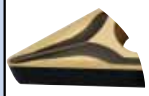
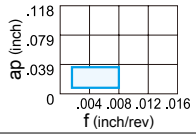
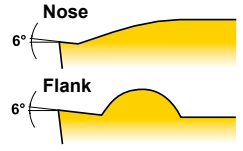
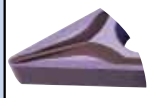
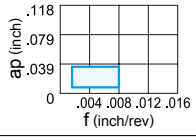
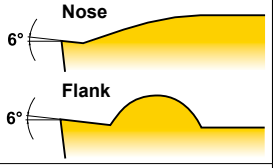
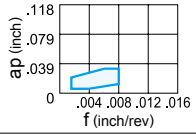
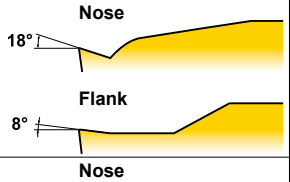
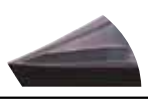
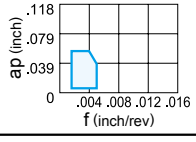
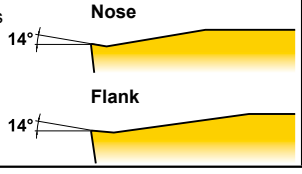
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				TNMG_R/L 2G  A094			
		DNGG_R/L  A082	SNGG_R/L  A088	TNGG_R/L  A094	VNGG_R/L  A099		
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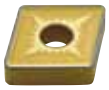
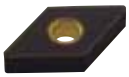
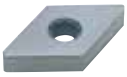
CLASSIFICATION

NEGATIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Heavy Cutting	M Class	**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  

5° POSITIVE INSERTS WITH HOLE

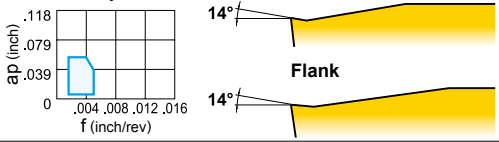
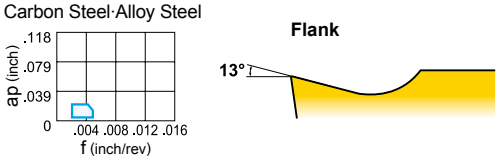
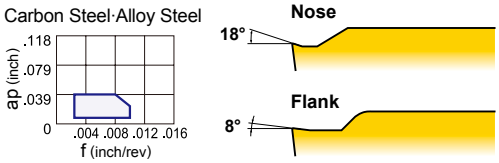
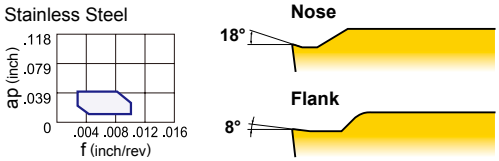
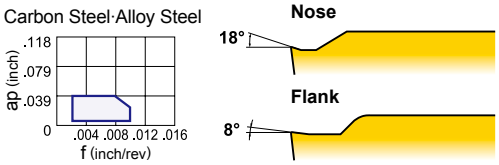
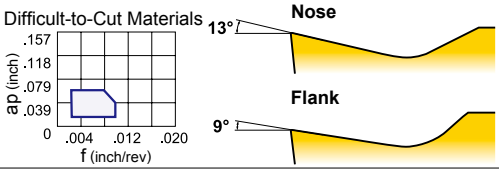
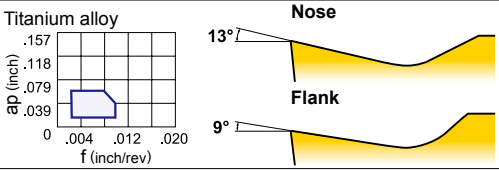
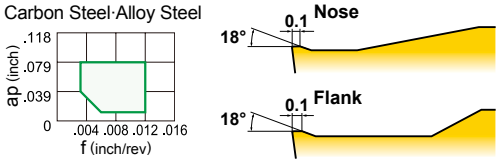
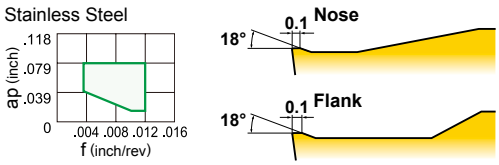
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	M Class	NEW **FP** 	**First recommendation for finishing carbon steel and alloy steel** Chip breaker peninsula controls chips even at small depth of cut. Maintains the edge strength at the corner and prevents sudden fractures.	Carbon Steel·Alloy Steel  
		NEW **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, 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  
	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  

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CNMM_HV  A077		**SNMM_HV**  A089				
	CNMA  A077	**DNMA**  A083	**SNMA**  A089	**TNMA**  A095		**WNMA**  A103	
		DNGA  A083	**SNGA**  A089	**TNGA**  A096	**VNGA**  A099		

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
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					VBMT_FM NEW  A133		
					VBMT_FV  A133		
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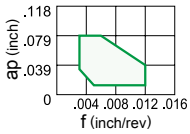
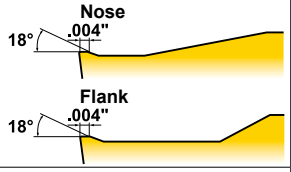
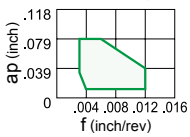
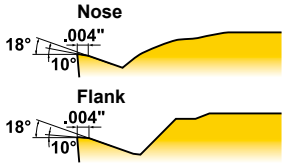
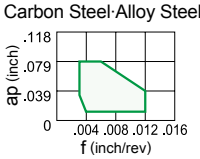
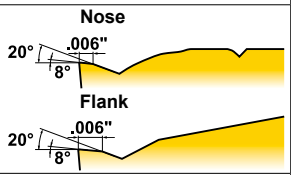
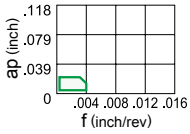
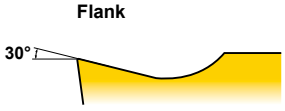
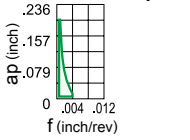
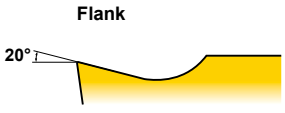
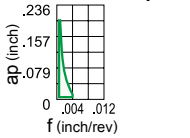
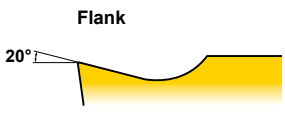
5° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	G Class	**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 
		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 
Light Cutting	M Class	NEW **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 
		NEW **LM** 	**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.	Stainless Steel 
	G Class	**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 
		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	NEW **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 
		NEW **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 

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
					VBGT_FJ-P  A133		
					VBGT_R/L F  A134	WBGT_R/L F  A142	
					VBMT_LP NEW  A134		
					VBMT_LM NEW  A134		
					VBMT_SV  A134		
					VBGT_MJ  A134		
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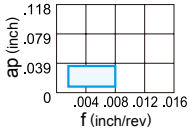
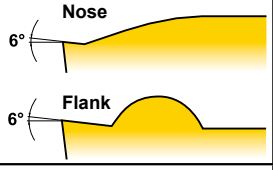
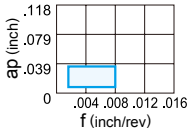
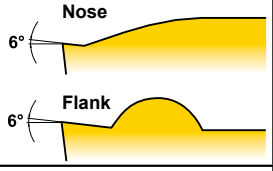
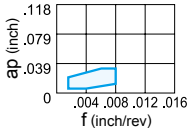
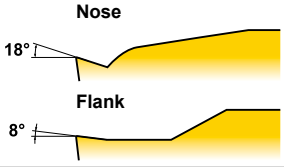
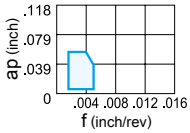
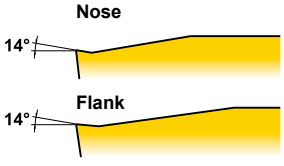
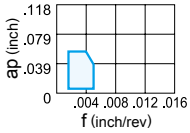
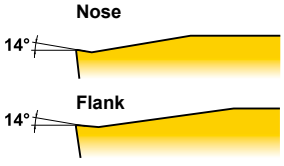
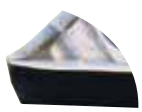
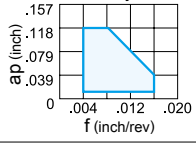
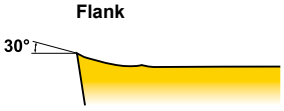
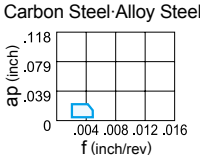
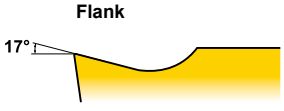
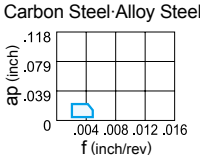
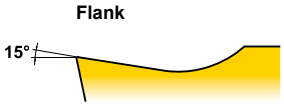
5° POSITIVE INSERTS WITH HOLE

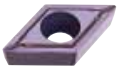
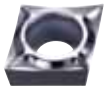
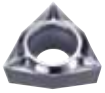
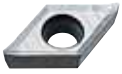
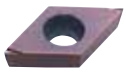
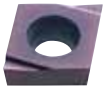
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	M Class	**Standard** 	**Medium cutting of carbon steel, alloy steel and stainless steel** The high rake angle combined with a small flat land provide a balance of strength and sharpness.	Carbon Steel·Alloy Steel  
		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
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					VBMT_MV  A135		
						WBMT_R/L MV  A142	
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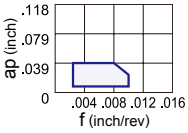
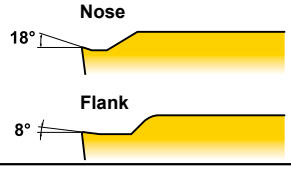
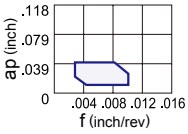
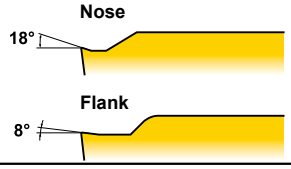
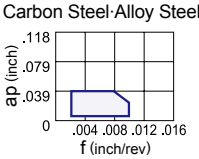
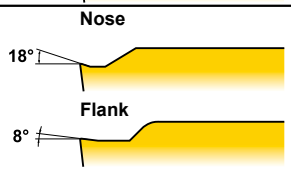
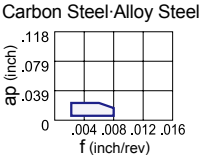
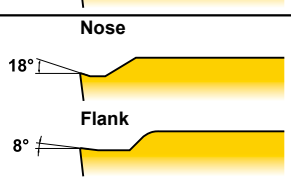
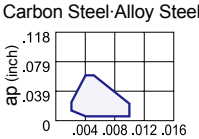
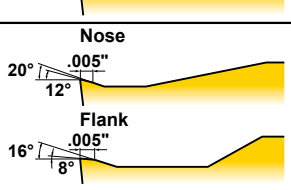
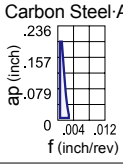
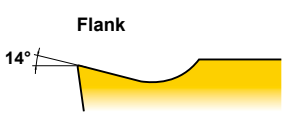
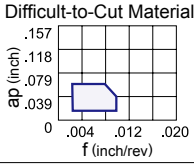
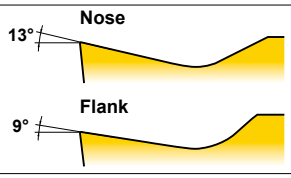
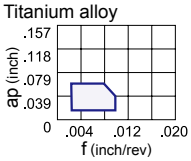
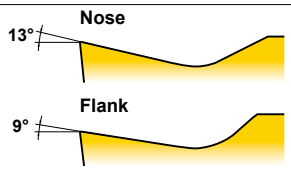
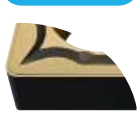
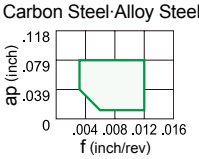
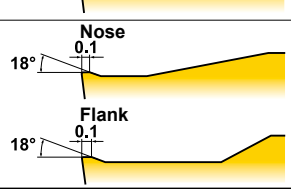
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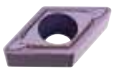
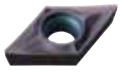
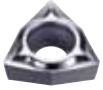
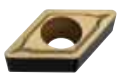
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	M Class	NEW **FP** 	**First recommendation for finishing carbon steel and alloy steel** Chip breaker peninsula controls chips even at small depth of cut. Maintains the edge strength at the corner and prevents sudden fractures.	Carbon Steel·Alloy Steel  
		NEW **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
	CCMT_FP NEW  A107	DCMT_FP NEW  A116	SCMT_FP NEW  A123	TCMT_FP NEW  A126	VCMT_FP NEW  A137			
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	CCMT_FV  A107	DCMT_FV  A116	SCMT_FV  A123	TCMT_FV  A126	VCMT_FV  A137			
	CCGT_FJ  A107	DCGT_FJ  A116		TCGT_FJ  A126		WCGT_FJ  A143		
	CCGT_FJ-P  A107	DCGT_FJ-P  A116		TCGT_FJ-P  A126		WCGT_FJ-P  A143		
	CCGT_AZ  A108	DCGT_AZ  A117		TCGT_AZ  A127	VCGT_AZ  A137			RCGT-AZ  A122
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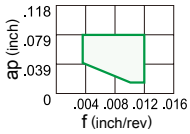
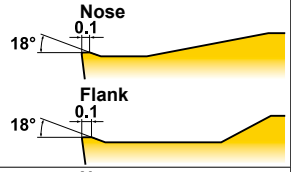
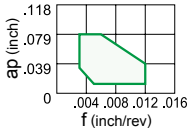
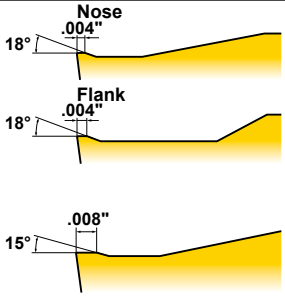
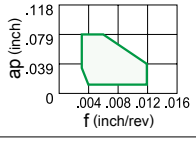
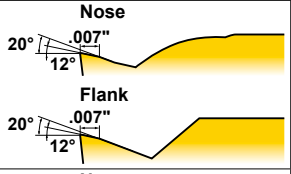
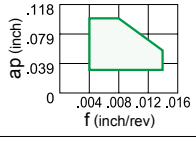
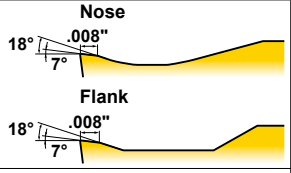
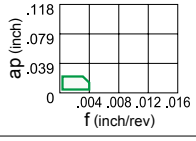
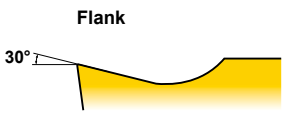
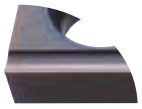
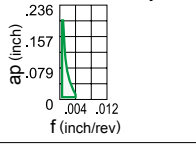
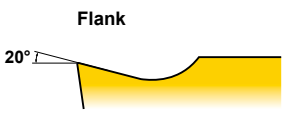
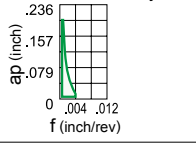
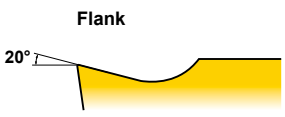
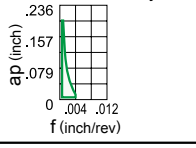
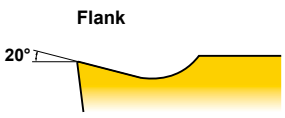
7° POSITIVE INSERTS WITH HOLE

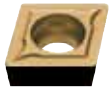
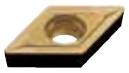
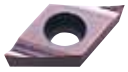
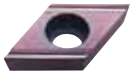
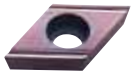
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Light Cutting	M Class	NEW **LP** 	**First recommendation for light cutting of carbon and alloy steel** Sharp cutting edge due to a high rake angle. Prevents chip welding on cutting edge and controls cloudiness of surface finish. Chip breaker peninsula matched to depth of cut capability provides excellent chip control.	Carbon Steel·Alloy Steel  
		NEW **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  
		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  
		SVX 	**Light cutting of carbon steel and alloy steel** Breaker geometry appropriate for copying. Excellent chip control.	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	NEW **MP** 	**First recommendation for medium 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  

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Rhombic 25°	Round
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	CCMT_LM NEW  A108	DCMT_LM NEW  A117	SCMT_LM NEW  A123	TCMT_LM NEW  A127	VCMT_LM NEW  A138			
	CCMH_SV  A109	DCMT_SV  A117			VCMT_SV  A138			
							XCMT_SVX  A146	
	CCMT_SW  A109							
	CCGT_R/L SS  A109	DCGT_R/L SS  A117						
	CCGT_MJ  A109	DCGT_MJ  A118		TCGT_MJ  A127		WCGT_MJ  A143		
	CCGT_MJ-P  A109	DCGT_MJ-P  A118		TCGT_MJ-P  A127		WCGT_MJ-P  A143		
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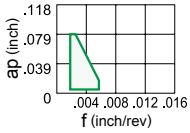
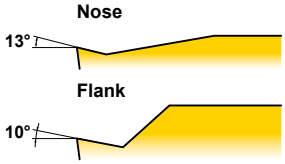
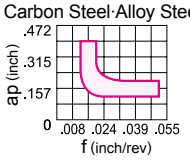
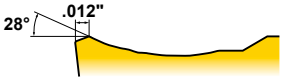
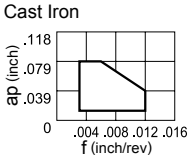
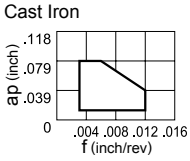
7° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	M Class	NEW **MM** 	**First recommendation for medium cutting of stainless 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.	Stainless Steel  
		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-shaped 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** The 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  
	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  

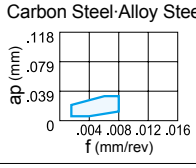
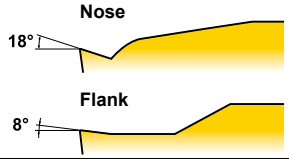
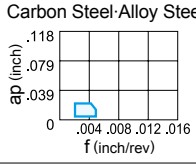
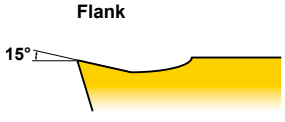
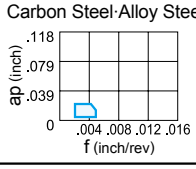
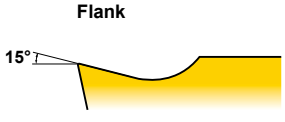
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	CCMT_MW  A110						
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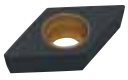
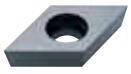
CLASSIFICATION

7° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	G Class	**SMG** 	**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.	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

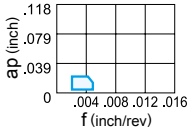
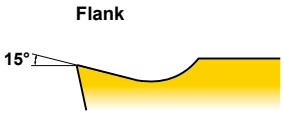
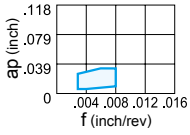
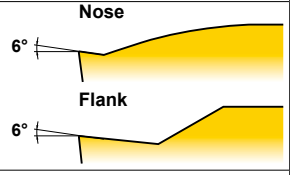
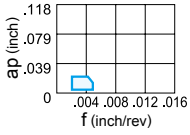
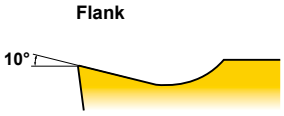
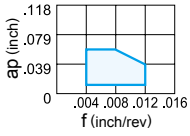
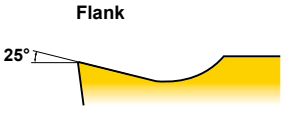
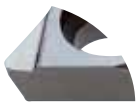
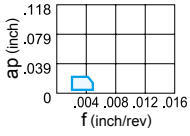
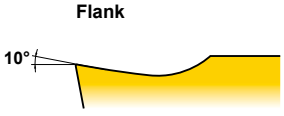
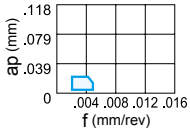
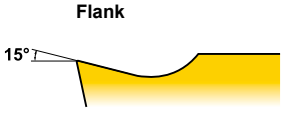
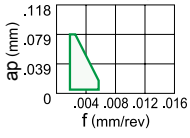
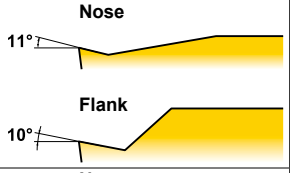
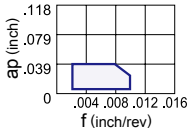
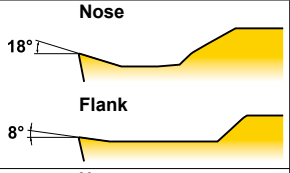
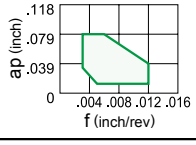
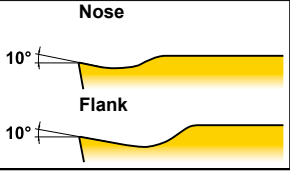
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	M Class	**FV** 	**First recommendation for finishing carbon steel, alloy steel, mild steel and stainless steel** Suitable for low depth of cut and low feed rate applications. Sharp cutting edge and low resistance 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  

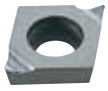
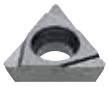
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	CCMW  A112	DCMW  A120	SCMW  A124	TCMW  A128	VCMW  A139		
	CCGW  A113	DCGW  A120					

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
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				TPGH_R/L FS  A130		WPGT_R/L FS  A145	
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CLASSIFICATION

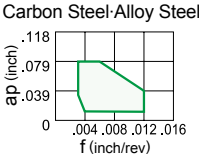
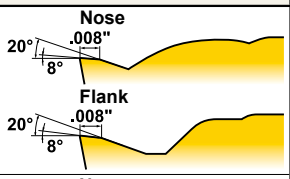
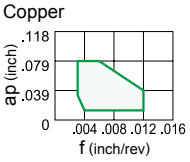
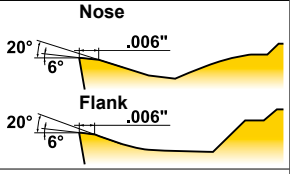
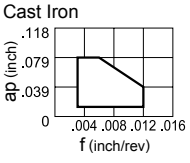
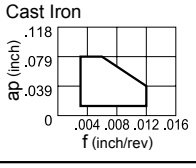
11° POSITIVE INSERTS WITH HOLE

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.	Copper  
	G Class	**R/L** 	**Light 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  
Finish Cutting	G Class	**SMG** 	**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.	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  

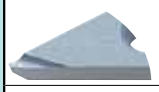
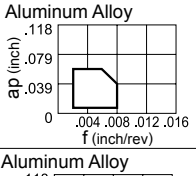
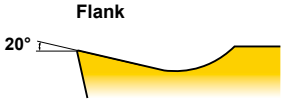
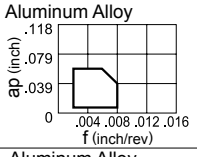
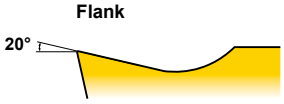
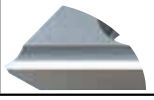
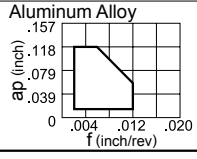
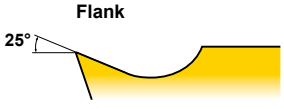
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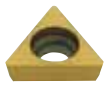
CLASSIFICATION

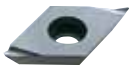
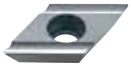
11° POSITIVE INSERTS WITH HOLE

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

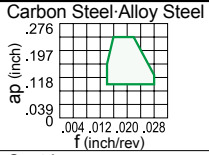
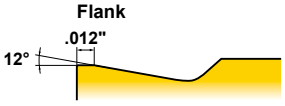
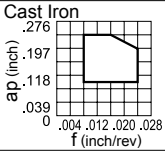
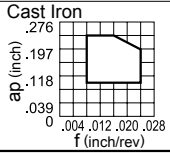
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
For Aluminum Alloy	G Class	**R/L** 	**For aluminum cutting** Angled chipbreaker. Sharp cutting edge produces excellent surface finishes.	Aluminum Alloy  
		R/L F 	**For aluminum cutting** Angled chipbreaker. Sharp cutting 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  A115			**TPMH_MV**  A132		**WPMT_MV**  A145	
	CPMT_MQ  A115			**TPMT_MQ**  A132			
			SPMW  A125				
			SPGX  A125	**TPGX**  A132			

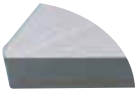
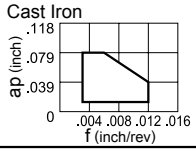
	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
					VDGX_R/L  A140		
		DEGX_R/L F  A121					
		DEGX_R/L  A121		**TEGX_R/L**  A129			

CLASSIFICATION

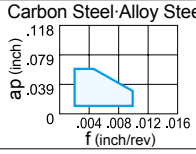
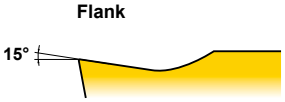
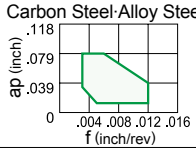
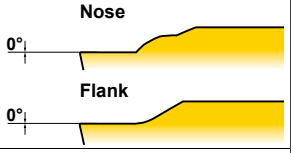
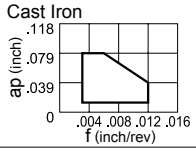
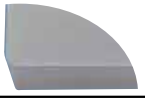
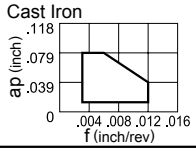
NEGATIVE INSERTS WITHOUT HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Rough 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  
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  
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  
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  A104
	SNMN  A105	TNMN  A106	
	SNG  A105	TNG  A106	

	Triangular 60°
	TCG  A149

SPECIAL PURPOSE INSERTS

	Square 90°	Triangular 60°
	SPGR_R  A148	TPGR_R/L  A150
	SPMR  A148	TPMR  A150
	SPMN  A148	TPMN  A150
	SPG  A148	TPG  A151

Application	Tolerance	Tool Holder Type	Inserts
Special	G Class	TL Type	RTG  A147

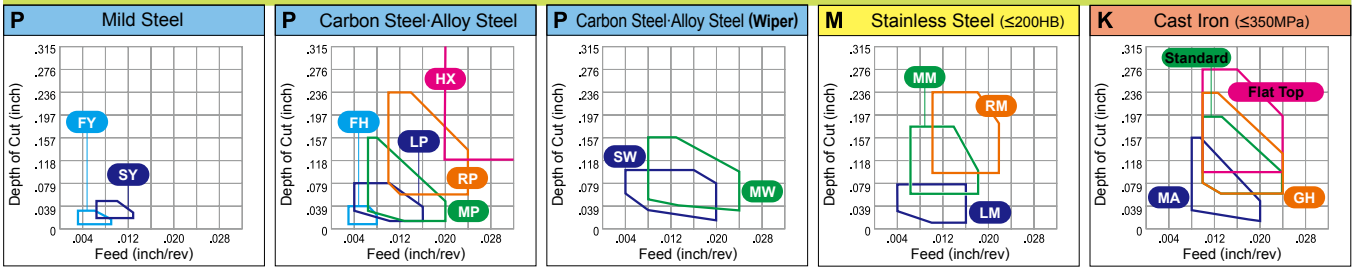
TURNING INSERTS [NEGATIVE]

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														Cermet		Coated Cermet			Carbide					Applicable Holder Page
				UE6105	UE6110	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
FH	**CNMG430.5FH**	CNMG120402-FH	.008	●		▲								▲								●	●	●								C006 −009 E021 E024 H006 −008
	**431FH**	120404-FH	.016	●		▲																★		●	●							
Finish Cutting	**432FH**	120408-FH	.031	●																		★		●	●							
	433FH	120412-FH	.047																			★			★							
FS	**CNMG431FS**	CNMG120404-FS	.016			▲																★			●							C006 −009 E021 E024 H006 −008
	**432FS**	120408-FS	.031																			★			●							
Finish Cutting																																
FY	**CNMG431FY**	CNMG120404-FY	.016			▲																	●	●		★						C006 −009 E021 E024 H006 −008
	**432FY**	120408-FY	.031			▲																		●		★						
Finish Cutting																																
FJ	**CNGG43V5FJ**	CNGG1204V5-FJ	.002																●												★	C006 −009 E021 E024 H006 −008
	**430.2FJ**	120401-FJ	.004																●												★	
Finish Cutting	**430.5FJ**	120402-FJ	.008																●												★	
	431FJ	120404-FJ	.016																●	★											★	
	432FJ	120408-FJ	.031																●	●											●	
FJ-P	**CNGG430.2FJ-P**	CNGG120401-FJ-P	.004																											●		C006 −009 E021 E024 H006 −008
	**430.5FJ-P**	120402-FJ-P	.008																											●		
Finish Cutting	**43V5FJ-P**	1204V5-FJ-P	.002																											●		
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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
NEW LP	**CNMG431LP**	CNMG120404-LP	.016	●	●	●																		●								C006 −009 E021 E024 H006 −008
	432LP	120408-LP	.031	●	●	●																		●								
	433LP	120412-LP	.047	●	●	●																										
Light Cutting																																
NEW LM	**CNMG431LM**	CNMG120404-LM	.016							●	●	●																				C006 −009 E021 E024 H006 −008
	432LM	120408-LM	.031							●	●	●																				
	433LM	120412-LM	.047							●	●	●																				
Light Cutting																																
SH	**CNMG32.51SH**	CNMG09T304-SH	.016		★									★																		C006 −009 E021 E024 H006 −008
	32.52SH	09T308-SH	.031		★																											
	431SH	120404-SH	.016	●	●		▲							●			●					★	●		★							
	432SH	120408-SH	.031	●	●		▲							●			●					★	●		★							
	433SH	120412-SH	.047	●	●		▲																									
Light Cutting																																
SA	**CNMG431SA**	CNMG120404-SA	.016	●	●		▲							●									●		●							C006 −009 E021 E024 H006 −008
	432SA	120408-SA	.031	●	●		▲						▲	●									●		●							
	433SA	120412-SA	.047	●	●		▲																●									
Light Cutting																																
SW (With Wiper)	* **CNMG431SW**	CNMG120404-SW	.016	●	●								▲				●					★	●	●								C006 −009 E021 E024 H006 −008
	* **432SW**	120408-SW	.031	●	●								▲				●					★	●	●	▲							
	* **433SW**	120412-SW	.047	●	●								▲									●	●	●								
Light Cutting																																
SY	**CNMG431SY**	CNMG120404-SY	.016				▲																	●	★							C006 −009 E021 E024 H006 −008
	432SY	120408-SY	.031				▲																	●	★							
Light Cutting																																
C	**CNMG431C**	CNMG120404-C	.016																			★	●									C006 −009 E021 E024 H006 −008
	432C	120408-C	.031																			★	●									
Light Cutting																																
MJ	**CNMG431MJ**	CNMG120404-MJ	.016											★				●	●												●	C006 −009 E021 E024 H006 −008
	432MJ	120408-MJ	.031											★				●	●												●	
	433MJ	120412-MJ	.047											★				★	★													
	434MJ	120416-MJ	.063											★				★	★													
Light Cutting																																

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

CHIP BREAKER ➤ A044
IDENTIFICATION ➤ A002

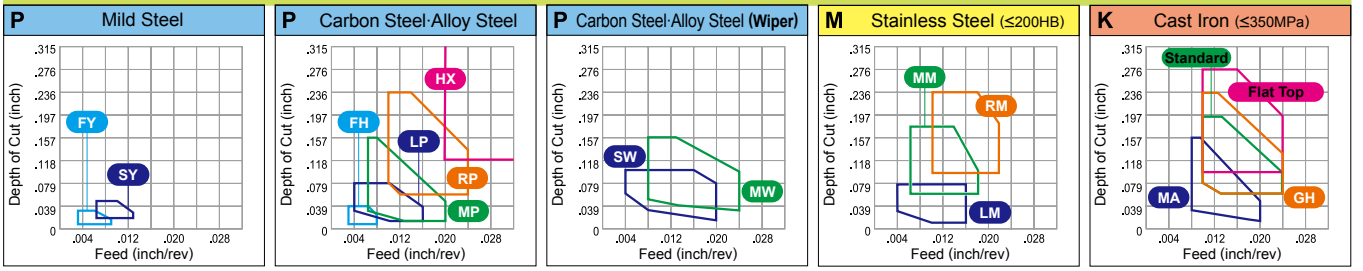
TURNING INSERTS [NEGATIVE]

80° CN TYPE INSERTS WITH HOLE

CNGG 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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
MJ	CNGG431MJ	CNGG120404-MJ	.016																●	●									●		●	C006 −009 E021 E024 H006 −008
	432MJ	120408-MJ	.031																●	●									●		●	
Light Cutting																																
MP	CNMG431MP	CNMG120404-MP	.016	●	●	●	▲										●							●								C006 −009 E021 E024 H006 −008
	432MP	120408-MP	.031	●	●	●	▲										●							●								
	433MP	120412-MP	.047	●	●	●	▲										●							●								
	434MP	120416-MP	.063	●	●	●	▲										●															
	542MP	160608-MP	.031	●	●	●	▲										●															
	543MP	160612-MP	.047	●	●	●	▲										●															
	544MP	160616-MP	.063	●	●	●	▲										●															
NEW MM	CNMG432MM	CNMG120408-MM	.031							●	●	●																				C006 −009 E021 E024 H006 −008
	433MM	120412-MM	.047							●	●	●																				
	434MM	120416-MM	.063							●	●	●																				
	542MM	160608-MM	.031							●	●	●																				
	543MM	160612-MM	.047							●	●	●																				
	544MM	160616-MM	.063							●	●	●																				
	642MM	190608-MM	.031							●	●	●																				
	643MM	190612-MM	.047							●	●	●																				
	644MM	190616-MM	.063							●	●	●																				
Medium Cutting																																
NEW GM	CNMG431GM	CNMG120404-GM	.016							●	●	●																				C006 −009 E021 E024 H006 −008
	432GM	120408-GM	.031							●	●	●																				
	433GM	120412-GM	.047							●	●	●																				
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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
MA	**CNMG431MA**	CNMG120404-MA	.016	●	●	●	▲				●	●	▲	●		●	●			●			●								
	432MA	120408-MA	.031	●	●	●	▲	●			●	●	▲	●		●	●			●			●								
	433MA	120412-MA	.047	●	●	●	▲	●			●	●	▲	●		●	●			●			●								
	434MA	120416-MA	.063	●	●		▲						▲	★			●														
	542MA	160608-MA	.031	●	●		▲	●						★			●														
	543MA	160612-MA	.047	●	●		▲	●					▲	●			●														
	544MA	160616-MA	.063	●	●									●			●														
	643MA	190612-MA	.047	●	●		▲	●					▲	●		●	●														
Medium Cutting	**644MA**	190616-MA	.063		●		▲							●			●														C006 −009 E021 E024 H006 −008
MH	**CNMG431MH**	CNMG120404-MH	.016	●	●		▲	★					▲																		
	432MH	120408-MH	.031	●	●		▲	●					▲				●														
	433MH	120412-MH	.047	●	●		▲	●					▲				●														
	434MH	120416-MH	.063	●	●		▲										●														
	542MH	160608-MH	.031	●	★												●														
	543MH	160612-MH	.047	●	●		▲						▲				●														
	544MH	160616-MH	.063	●	★												★														
	643MH	190612-MH	.047	●	●		▲	●					▲				★														
Medium Cutting	**644MH**	190616-MH	.063	●	●		▲																								C006 −009 E021 E024 H006 −008
Standard	**CNMG322**	CNMG090308	.031		●																										
	32.51	09T304	.016		★																	★									
	32.52	09T308	.031		★																	★									
	431	120404	.016	●	●	●	▲	●								●	●					★	●	●		●		●			
	432	120408	.031	●	●	●	▲	●								●	●			●		★		●		●		●			
	433	120412	.047	●	●	●	▲	★								●	●			●		★									
	434	120416	.063	●	●											★	★														
	542	160608	.031	●	●	●	▲																								
	543	160612	.047	●	●	●	▲									●	●														
	544	160616	.063	●	●	●										★	★														
	642	190608	.031	●	●	●	▲	★																							
	643	190612	.047	●	●	●	▲	●								●	●														
Medium Cutting	**644**	190616	.063	●	●	●	▲	●									★														C006 −009 E021 E024 H006 −008
MW (With Wiper)	* **CNMG432MW**	CNMG120408-MW	.031	●	●	●	▲						▲			●	●														
	* **433MW**	120412-MW	.047	●	●	●	▲						▲			●	●														
Medium Cutting																															C006 −009 E021 E024 H006 −008

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

NEG
WITH HOLE
C
D
R
S
T
V
W

CHIP BREAKER ➤ A044
IDENTIFICATION ➤ A002

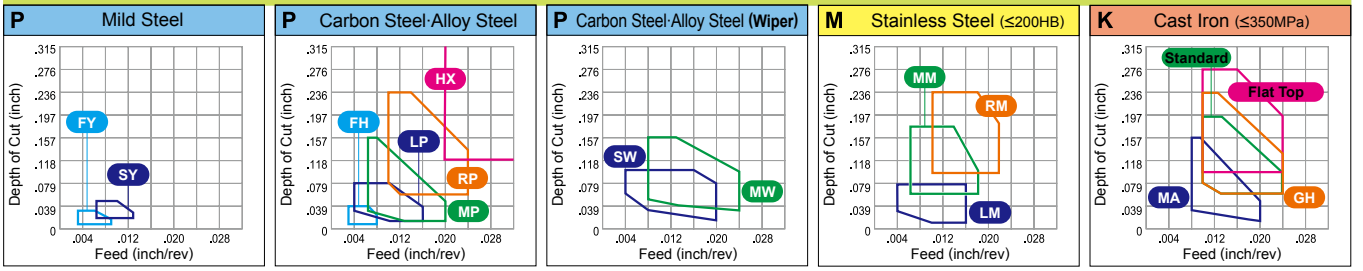
TURNING INSERTS [NEGATIVE]

80° CN TYPE INSERTS WITH HOLE

CNMG 4 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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
MS	**CNMG321MS**	CNMG090304-MS	.016											●													★					
	322MS	090308-MS	.031		●									●																		
	32.51MS	09T304-MS	.016											★																		
	32.52MS	09T308-MS	.031		★									★																		
	431MS	120404-MS	.016		●		▲						▲	●	●			●	●	●	●								★		●	C006 −009 E021 E024 H006 −008
	432MS	120408-MS	.031		●		▲						▲	●	●			●	●	●	●						●		★		●	
	433MS	120412-MS	.047		●								▲	●	●			★	●	●											★	
	542MS	160608-MS	.031											★																		
	543MS	160612-MS	.047											●																	●	
	643MS	190612-MS	.047											●																		
Medium Cutting	**644MS**	190616-MS	.063											●																		
	CNMP432	CNMP120408	.031											●																		C006 −009 E021 E024 H006 −008
Medium Cutting																																
NEW **RP**	**CNMG432RP**	CNMG120408-RP	.031	●	●	●																										C006 −009 E021 E024 H006 −008
	433RP	120412-RP	.047	●	●	●																										
	434RP	120416-RP	.063	●	●	●																										
	543RP	160612-RP	.047	●	●	●																										
	544RP	160616-RP	.063	●	●	●																										
	643RP	190612-RP	.047	●	●	●																										
Rough Cutting	**644RP**	190616-RP	.063	●	●	●																										
NEW **RM**	**CNMG432RM**	CNMG120408-RM	.031							●	●	●																				C006 −009 E021 E024 H006 −008
	433RM	120412-RM	.047							●	●	●																				
	434RM	120416-RM	.063							●	●	●																				
	543RM	160612-RM	.047							●	●	●																				
	544RM	160616-RM	.063							●	●	●																				
	643RM	190612-RM	.047							●	●	●																				
Rough Cutting	**644RM**	190616-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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
GH	**CNMG432GH**	CNMG120408-GH	.031	●	●		▲	●					▲	●		●	●														
	433GH	120412-GH	.047	●	●		▲						▲	●		●	●														C006 −009 E021 E024 H006 −008
	434GH	120416-GH	.063	●	★											●	●														
	543GH	160612-GH	.047	●	●		▲						▲	●		●	●														
	544GH	160616-GH	.063	●	●											●	●														
	643GH	190612-GH	.047	●	●		▲							●		●	●														
Rough Cutting	**644GH**	190616-GH	.063	●	●		▲						▲	●		●	●														
GJ	**CNMG432GJ**	CNMG120408-GJ	.031												●				●	●										●	
	433GJ	120412-GJ	.047												●				●	●										●	C006 −009 E021 E024 H006 −008
	434GJ	120416-GJ	.063												●				★	★										★	
	543GJ	160612-GJ	.047												●				●											●	
Rough Cutting	**643GJ**	190612-GJ	.047												●				●											●	
	644GJ	190616-GJ	.063												●				●											●	
HZ	**CNMM432HZ**	CNMM120408-HZ	.031		●		▲																								
	433HZ	120412-HZ	.047		●		▲																								C006 −009 E021 E024 H006 −008
	543HZ	160612-HZ	.047		●		▲																								
	544HZ	160616-HZ	.063		●		▲																								
	643HZ	190612-HZ	.047		●		▲		★																						
Heavy Cutting	**644HZ**	190616-HZ	.063		●		▲		★																						
HX	**CNMM643HX**	CNMM190612-HX	.047		●		▲		★																						
	644HX	190616-HX	.063		●		▲		★																						C007 −009 E024
	646HX	190624-HX	.094		●		▲		★																						
	866HX	250924-HX	.094		●		▲		★																						
Heavy Cutting																															
HV	**CNMM644HV**	CNMM190616-HV	.063		●		▲		★																						
	646HV	190624-HV	.094		●		▲		★																						C007 −009 E024
	866HV	250924-HV	.094		●		▲		★																						
Heavy Cutting																															
Flat Top	**CNMA431**	CNMA120404	.016													●	●											★	●		
	432	120408	.031													●	●											★	●		
	433	120412	.047													●	●														C006 −009 E021 E024 H006 −008
	434	120416	.063													●	●														
	543	160612	.047													●	●														
	544	160616	.063													●	●														
	643	190612	.047													●	●														
	644	190616	.063													●	●														

CHIP BREAKER ➤ A044
IDENTIFICATION ➤ A002

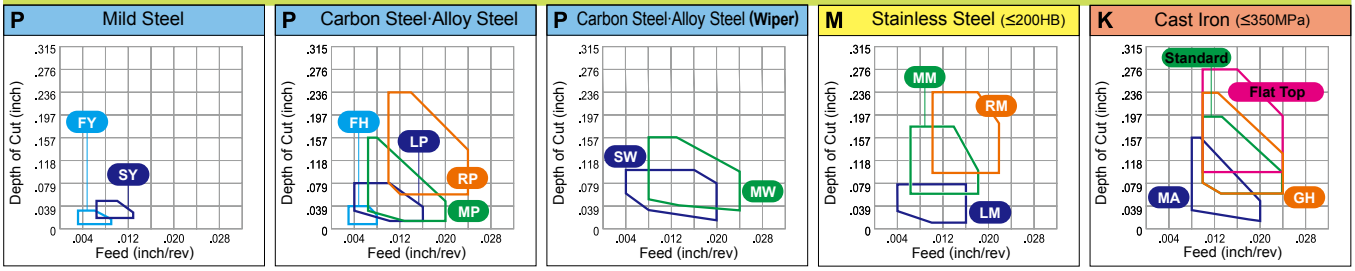
TURNING INSERTS [NEGATIVE]

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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
FH	DNMG430.5FH	DNMG150402-FH	.008	●		▲								▲								●	●	●								C010 −012 E021 E024 H009 −011
	431FH	150404-FH	.016	●										▲								★	●	●	●							
	432FH	150408-FH	.031	●																		★		●	●							
	440.5FH	150602-FH	.008	●		▲								▲								★	★	●								
	441FH	150604-FH	.016	★		▲																		●								
	442FH	150608-FH	.031	★		▲																		●								
Finish Cutting																																
FS	DNMG431FS	DNMG150404-FS	.016																			★			●							C010 −012 E021 E024 H009 −011
	432FS	150408-FS	.031			▲																★			●							
Finish Cutting																																
FY	DNMG431FY	DNMG150404-FY	.016			▲																●		●		★						C010 −012 E021 E024 H009 −011
	432FY	150408-FY	.031			▲																		●		★						
	441FY	150604-FY	.016																					★								
	442FY	150608-FY	.031			▲																		★								
Finish Cutting																																
FJ	DNGG431FJ	DNGG150404-FJ	.016																★	★											★	C010 −012 E021 E024 H009 −011
	432FJ	150408-FJ	.031																●	●											●	
Finish Cutting																																
PK	DNGG431PK	DNGG150404-PK	.016																			★										C010 −012 E021 E024 H009 −011
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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
NEW LP	**DNMG331LP**	DNMG110404-LP	.016	●	●	●																	●								C010 −012 E021 E024 H009 −011
	332LP	110408-LP	.031	●	●	●																	●								
	431LP	150404-LP	.016	●	●	●																	●								
	432LP	150408-LP	.031	●	●	●																	●								
	433LP	150412-LP	.047	●	●	●																	●								
	441LP	150604-LP	.016	●	●	●																	●								
	442LP	150608-LP	.031	●	●	●																	●								
Light Cutting	**443LP**	150612-LP	.047	●	●	●																	●								
NEW LM	**DNMG331LM**	DNMG110404-LM	.016							●	●	●																				C010 −012 E021 E024 H009 −011
	332LM	110408-LM	.031							●	●	●																				
	431LM	150404-LM	.016							●	●	●																				
	432LM	150408-LM	.031							●	●	●																				
	433LM	150412-LM	.047							●	●	●																				
	441LM	150604-LM	.016							●	●	●																				
	442LM	150608-LM	.031							●	●	●																				
Light Cutting	**443LM**	150612-LM	.047							●	●	●																				
SH	**DNMG331SH**	DNMG110404-SH	.016	●	●									★																		C010 −012 E021 E024 H009 −011
	332SH	110408-SH	.031	●	●									●																		
	431SH	150404-SH	.016	●	●	▲								●		●						★	●		★							
	432SH	150408-SH	.031	●	●	▲								●		●						★	●		★							
	433SH	150412-SH	.047	●	●	▲								●		★						★			★							
	441SH	150604-SH	.016	★	★																											
	442SH	150608-SH	.031	★	★											★																
Light Cutting	**443SH**	150612-SH	.047	★	★											★																
SA	**DNMG431SA**	DNMG150404-SA	.016	●	●	▲																	●		▲							C010 −012 E021 E024 H009 −011
	432SA	150408-SA	.031	●	●	▲							▲	●									●									
	433SA	150412-SA	.047	●	●	▲																	●								
	441SA	150604-SA	.016	★	★	▲																	★								
	442SA	150608-SA	.031	★	★	▲																	★								
Light Cutting	**443SA**	150612-SA	.047	★	★	▲																	★								
SW (With Wiper)	* **DNMX331SW**	DNMX110404-SW	.016	●																												C010 E021 H009 H011
	* **332SW**	110408-SW	.031	●																												
	* **431SW**	150404-SW	.016	●	●								▲									★	●	●		▲						
	* **432SW**	150408-SW	.031	●	●								▲									★	●	●		▲						
	* **433SW**	150412-SW	.047	●	●								▲									●	●									
	* **441SW**	150604-SW	.016	●	●								▲									★	★	★								
	* **442SW**	150608-SW	.031	●	●								▲									★	★	★								
Light Cutting	* **443SW**	150612-SW	.047	●	●								▲									●	●									

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

CHIP BREAKER ➤ A044
IDENTIFICATION ➤ A002

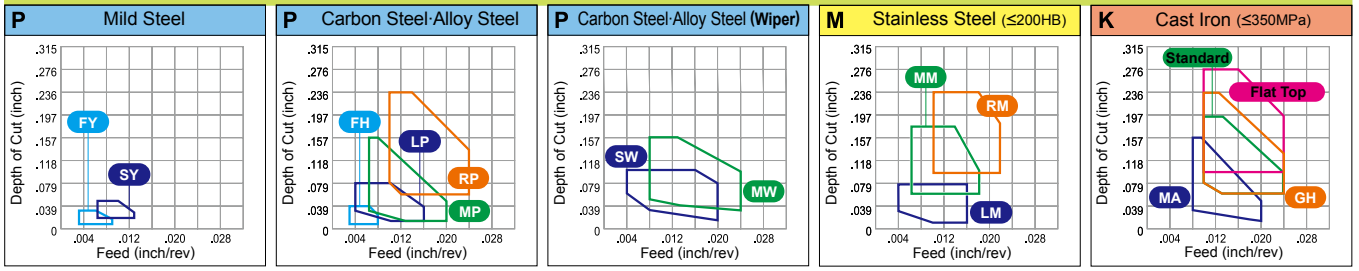
TURNING INSERTS [NEGATIVE]

55° DN TYPE INSERTS WITH HOLE

DNMG 4 3 1 SY
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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
SY	DNMG431SY	DNMG150404-SY	.016			▲																●		●								
	432SY	150408-SY	.031			▲																		●	★							C010 −012 E021 E024 H009 −011
	441SY	150604-SY	.016																					★								
	442SY	150608-SY	.031			▲																		★								
Light Cutting																																
C	DNMG431C	DNMG150404-C	.016																			★	●									
	432C	150408-C	.031																			★	●								C010 −012 E021 E024 H009 −011
	441C	150604-C	.016																			★	★									
	442C	150608-C	.031																			★	★									
Light Cutting																																
MJ	DNMG431MJ	DNMG150404-MJ	.016												★			●	●												●	
	432MJ	150408-MJ	.031												★			●	●												●	
	433MJ	150412-MJ	.047												★			★	★													C010 −012 E021 E024 H009 −011
	434MJ	150416-MJ	.063												★			★	★													
	441MJ	150604-MJ	.016												★			★	★													
	442MJ	150608-MJ	.031												★			★	★													
	443MJ	150612-MJ	.047												★			★	★													
	444MJ	150616-MJ	.063												★			★	★													
Light Cutting																																
MJ	DNGM431MJ	DNMG150404-MJ	.016																●	★										●		●	
	432MJ	150408-MJ	.031																●	★										●		●	C010 −012 E021 E024 H009 −011
Light Cutting																																
MP	DNMG431MP	DNMG150404-MP	.016	●	●	●	▲										●							●								
	432MP	150408-MP	.031	●	●	●	▲										●							●								C010 −012 E021 E024 H009 −011
	433MP	150412-MP	.047	●	●	●	▲										●							●								
	434MP	150416-MP	.063	●	●	●	▲										●															
	441MP	150604-MP	.016	★	★	●	▲										★							★								
	442MP	150608-MP	.031	★	★	●	▲										★							★								
	443MP	150612-MP	.047	★	★	●	▲										★							★								
Medium Cutting	444MP	150616-MP	.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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
NEW **MM**	**DNMG432MM**	DNMG150408-MM	.031							●	●	●																			C010 −012 E021 E024 H009 −011
	433MM	150412-MM	.047							●	●	●																			
	442MM	150608-MM	.031							●	●	●																			
Medium Cutting	**443MM**	150612-MM	.047							●	●	●																			
NEW **GM**	**DNMG431GM**	DNMG150404-GM	.016							●	●	●																			C010 −012 E021 E024 H009 −011
	432GM	150408-GM	.031							●	●	●																			
	433GM	150412-GM	.047							●	●	●																			
	441GM	150604-GM	.016							●	●	●																			
	442GM	150608-GM	.031							●	●	●																			
Medium Cutting	**443GM**	150612-GM	.047							●	●	●																			
MA	**DNMG331MA**	DNMG110404-MA	.016	●	●									●																	C010 −012 E021 E024 H009 −011
	332MA	110408-MA	.031	●	●									●																	
	333MA	110412-MA	.047	●	★																										
	431MA	150404-MA	.016	●	●	●	▲				●	●	▲	●		●	●			●			●								
	432MA	150408-MA	.031	●	●	●	▲	●			●	●	▲	●		●	●			●			●								
	433MA	150412-MA	.047	●	●	●	▲	●			●	●		●			●			●			●								
	441MA	150604-MA	.016	★	●	●	▲				●	●	▲	★						●			★								
	442MA	150608-MA	.031	★	●	●	▲	★			●	●	▲	★		★	★			●			★								
Medium Cutting	**443MA**	150612-MA	.047	★	●	●	▲				●	●	▲	★		★	★			●			★								
	444MA	150616-MA	.063		★																										
MH	**DNMG431MH**	DNMG150404-MH	.016	●	●		▲																								C010 −012 E021 E024 H009 −011
	432MH	150408-MH	.031	●	●		▲	●					▲			●														
	433MH	150412-MH	.047	●	●		▲						▲			●														
	441MH	150604-MH	.016	★	★											★														
	442MH	150608-MH	.031	★	★		▲						▲			★														
Medium Cutting	**443MH**	150612-MH	.047	★	★		▲									★														
Standard	**DNMG332**	DNMG110408	.031		●																										C010 −012 E021 E024 H009 −011
	431	150404	.016	●	●	●	▲									●	●					★	●	●					●		
	432	150408	.031	●	●	●	▲									●	●			●		★	●	●					●		
	433	150412	.047	●	●	●	▲									●	●			●		★									
	434	150416	.063		●																										
	441	150604	.016	★	★		▲									★	★					★		★							
	442	150608	.031	★	●	●	▲									★	★			●		★		★							
Medium Cutting	**443**	150612	.047	★	★	●	▲									★	★			●											
	444	150616	.063		●																										
MW (With Wiper)	* **DNMX432MW**	DNMX150408-MW	.031	●	●											●	●														C010 E021 H009 H011
	* **433MW**	150412-MW	.047	●	●											●	●														
	* **442MW**	150608-MW	.031	★	●								▲			★	★														
Medium Cutting	* **443MW**	150612-MW	.047	★	●																										

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

CHIP BREAKER ➤ A044
IDENTIFICATION ➤ A002

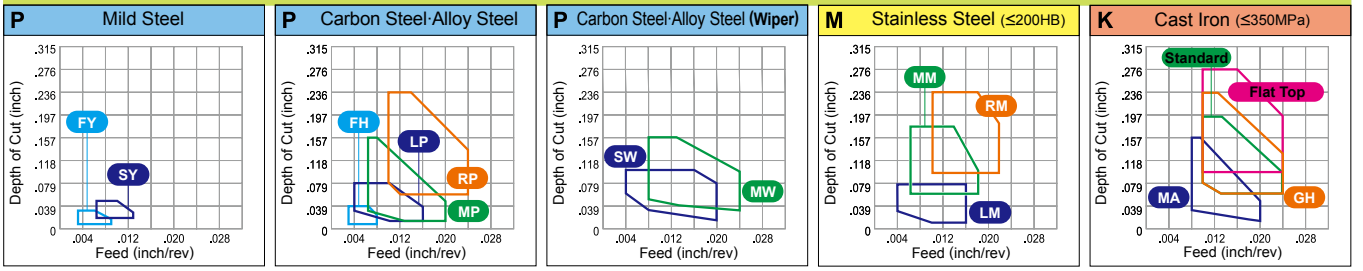
TURNING INSERTS [NEGATIVE]

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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
MS	DNMG332MS	DNMG110408-MS	.031	●										★																		
	431MS	150404-MS	.016	●		▲							▲	●	●			●	●	●												C010 –012 E021 E024 H009 –011
	432MS	150408-MS	.031	●									▲	●	●			●	●	●	●										●	
	433MS	150412-MS	.047	★										●	●			★	★													
	441MS	150604-MS	.016	★									▲	★	★			●	★		★											
	442MS	150608-MS	.031	★									▲	★	★			●	★													
Medium Cutting	443MS	150612-MS	.047	★											★			●	★													
R/L	DNGG431R	DNGG150404R	.016																			★	●				★		★			
	431L	150404L	.016																			★	●				★		★			
	432R	150408R	.031																			★	●				★					C010 –012 E021 E024 H009 –011
	432L	150408L	.031																			★	●									
	441R	150604R	.016																				★				★					
	441L	150604L	.016																				★									
	442R	150608R	.031																				★									
Medium Cutting	442L	150608L	.031																				★									
NEW RP	DNMG432RP	DNMG150408-RP	.031	●	●	●																										
	433RP	150412-RP	.047	●	●	●																										
	434RP	150416-RP	.063	●	●	●																										
	442RP	150608-RP	.031	●	●	●																										C010 –012 E021 E024 H009 –011
	443RP	150612-RP	.047	●	●	●																										
Rough Cutting	444RP	150616-RP	.063	●	●	●																										
NEW RM	DNMG432RM	DNMG150408-RM	.031							●	●	●																				
	433RM	150412-RM	.047							●	●	●																				
	434RM	150416-RM	.063							●	●	●																				
	442RM	150608-RM	.031							●	●	●																				C010 –012 E021 E024 H009 –011
	443RM	150612-RM	.047							●	●	●																				
Rough Cutting	444RM	150616-RM	.063							●	●	●																				
GH	DNMG432GH	DNMG150408-GH	.031	●	●		▲							●		●	●															
	433GH	150412-GH	.047	●	●		▲						▲	●		●	●															
	442GH	150608-GH	.031	★	●		▲							★		★	★															
	443GH	150612-GH	.047	★	●		▲							★		★	★															
Rough 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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
GJ	**DNMG432GJ**	DNMG150408-GJ	.031												●				●	●										●	C010 −012 E021 E024 H009 −011
	433GJ	150412-GJ	.047												●				●	●										●	
	434GJ	150416-GJ	.063												●				★	★										★	
	442GJ	150608-GJ	.031												★				★												
	443GJ	150612-GJ	.047												★				★												
Semi-Heavy Cutting	**444GJ**	150616-GJ	.063												★				★												
HZ	**DNMM432HZ**	DNMM150408-HZ	.031		●	▲																									C010 −012 E021 E024 H009 −011
	433HZ	150412-HZ	.047		●	▲																									
	442HZ	150608-HZ	.031		●	▲																									
Heavy Cutting	**443HZ**	150612-HZ	.047		●	▲																									
Flat Top	**DNMA431**	DNMA150404	.016													●	●											★			C010 −012 E021 E024 H009 −011
	432	150408	.031													●	●					★						★	★		
	433	150412	.047													●	●														
	442	150608	.031													★	★														
	443	150612	.047													★	★														
Flat Top	**DNGA431**	150404	.016																									★			C010 −012 E021 E024 H009 −011
	432	150408	.031																									★	★		

NEG
WITH HOLE
C
D
R
S
T
V
W

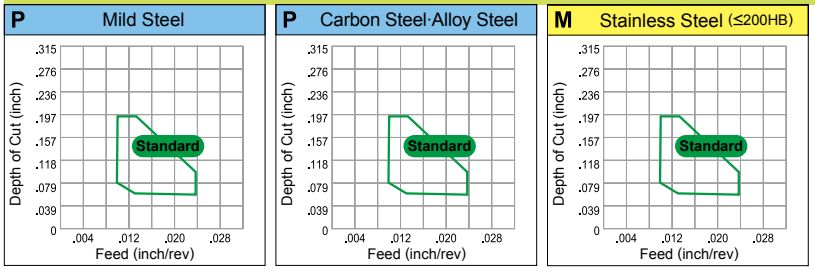
CHIP BREAKER ➤ A044
IDENTIFICATION ➤ A002

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																Cermet		Coated Cermet			Carbide				Applicable Holder Page
				UE6105	UE6110	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
Standard	**RNMG43**	RNMG120400	–		●	▲																								
 Medium Cutting																														C013

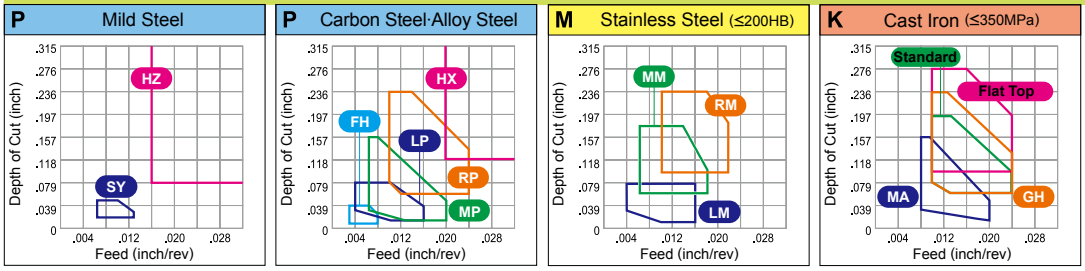
● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
FH	**SNMG321FH**	SNMG090304-FH	.016																			★										
	322FH	090308-FH	.031																			★			●							C014 −017 E022 E025
	431FH	120404-FH	.016		★																	★		●								
	432FH	120408-FH	.031		●																			●								
Finish Cutting																																
FS	**SNMG432FS**	SNMG120408-FS	.031																			★										
Finish Cutting																																C014 −017 E022 E025
NEW **LP**	**SNMG431LP**	SNMG120404-LP	.016	●	●	●																		●								
	432LP	120408-LP	.031	●	●	●																		●								C014 −017 E022 E025
	433LP	120412-LP	.047	●	●	●																										
Light Cutting																																
NEW **LM**	**SNMG431LM**	SNMG120404-LM	.016							●	●	●																				
	432LM	120408-LM	.031							●	●	●																				C014 −017 E022 E025
Light Cutting																																
SH	**SNMG431SH**	SNMG120404-SH	.016		★												●															
	432SH	120408-SH	.031	●	●		▲										●					★										C014 −017 E022 E025
	433SH	120412-SH	.047		★		▲										★															
Light Cutting																																
SA	**SNMG431SA**	SNMG120404-SA	.016		●																	●										
	432SA	120408-SA	.031	●	●		▲															●										C014 −017 E022 E025
	433SA	120412-SA	.047		●		▲															●										
Light Cutting																																

CHIP BREAKER ➤ A044
IDENTIFICATION ➤ A002

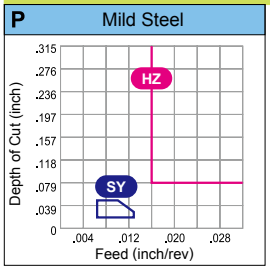
TURNING INSERTS [NEGATIVE]

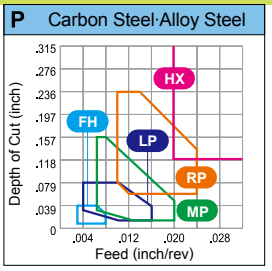
90° SN TYPE INSERTS WITH HOLE

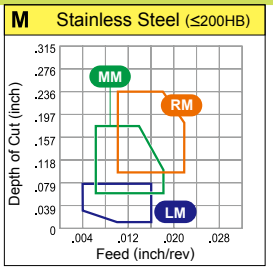
SNMG 4 3 2 SY
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

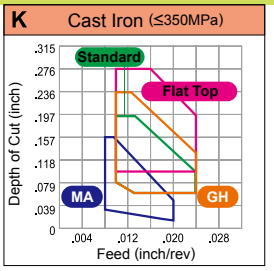
CHIP CONTROL RANGE FOR WORK MATERIALS

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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
SY	**SNMG432SY**	SNMG120408-SY	.031				▲																	●								C014 −017 E022 E025
Light Cutting																																
C	**SNMG321C**	SNMG090304-C	.016																			★										
	322C	090308-C	.031																			★										C014 −017 E022 E025
	432C	120408-C	.031																			★	●									
	434C	120416-C	.063																			★										
Light Cutting																																
R/L 1G	**SNMG431R1G**	SNMG120404R-1G	.016																			★										
	431L1G	120404L-1G	.016																			★										C014 −017 E022 E025
	432R1G	120408R-1G	.031																			★										
Light Cutting																																
MP	**SNMG431MP**	SNMG120404-MP	.016	●	●	●	▲										●							●									
	432MP	120408-MP	.031	●	●	●	▲										★							●									C014 −017 E022 E025
	433MP	120412-MP	.047	●	●	●	▲										★							●									
Medium Cutting																																
NEW **MM**	**SNMG432MM**	SNMG120408-MM	.031							●	●	●																				
	433MM	120412-MM	.047							●	●	●																				
	434MM	120416-MM	.063							●	●	●																				
	542MM	150608-MM	.031							●	●	●																				C014 −017 E022 E025
	543MM	150612-MM	.047							●	●	●																				
	544MM	150616-MM	.063							●	●	●																				
	643MM	190612-MM	.047							●	●	●																				
Medium Cutting	**644MM**	190616-MM	.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			UE6105	UE6110	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010
	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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
NEW GM	**SNMG431GM**	SNMG120404-GM	.016							●	●	●																			
	432GM	120408-GM	.031							●	●	●																			C014 −017 E022 E025
	433GM	120412-GM	.047							●	●	●																			
Medium Cutting																															
MA	**SNMG431MA**	SNMG120404-MA	.016	●	●	●	▲			●	●		●			●			●			●									
	432MA	120408-MA	.031	●	●	●	▲	●		●	●	▲	●			●	●		●			●									
	433MA	120412-MA	.047	●	●	●	▲			●	●	▲	●			●	●		●			●									
	434MA	120416-MA	.063													●															
	542MA	150608-MA	.031	●	●		▲	●					★																		C014 −017 E022 E025
	543MA	150612-MA	.047	●	★		▲	●					●			★														
	544MA	150616-MA	.063		★																										
	643MA	190612-MA	.047	●	●		▲	●					●			●														
Medium Cutting	**644MA**	190616-MA	.063	★	●		▲	●					★																		
MH	**SNMG432MH**	SNMG120408-MH	.031	●	●		▲						▲			●															
	433MH	120412-MH	.047	●	●		▲						▲			●															C014 −017 E022 E025
	643MH	190612-MH	.047	★	●		▲									★															
	644MH	190616-MH	.063	★	●		▲																								
Medium Cutting																															
Standard	**SNMG321**	SNMG090304	.016	★	●	●	▲															★	●	●			●					
	322	090308	.031	★	●	●	▲															★	●	●			●	★	★			
	431	120404	.016	●	●	●	▲															★		●			●		★			
	432	120408	.031	●	●	●	▲	●								★	★			●		★	●	●			●	★	★			C014 −017 E022 E025
	433	120412	.047	●	●	●	▲									★	★					●					●	★				
	434	120416	.063		●	●	▲									●	●					●					●					
	435	120420	.079			●	▲																									
	543	150612	.047	●	●	●	▲	●								●	●															
Medium Cutting	**643**	190612	.047	●	●	●	▲	●								★	★										●					
	644	190616	.063	★	●	●	▲	●									★										●					
MS	**SNMG321MS**	SNMG090304-MS	.016										★																			
	322MS	090308-MS	.031										★																			
	431MS	120404-MS	.016		★								▲	●																		C014 −017 E022 E025
	432MS	120408-MS	.031		●		▲						▲	●	●			★	★	★	●						●				●	
	433MS	120412-MS	.047		★								▲	●	●			★	★	★												
	434MS	120416-MS	.063											★																		
Medium Cutting	**644MS**	190616-MS	.063											★																		

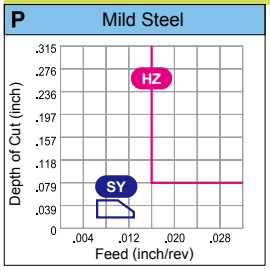
CHIP BREAKER ➤ A044
IDENTIFICATION ➤ A002

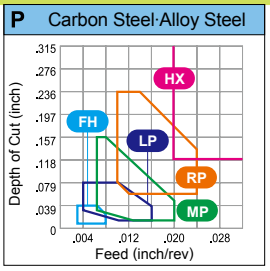
90° SN TYPE INSERTS WITH HOLE

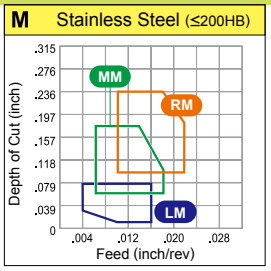
SNGG 3 2 1 R
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

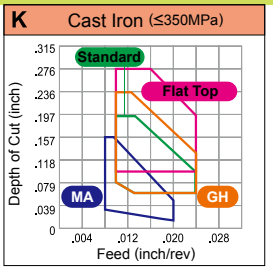
CHIP CONTROL RANGE FOR WORK MATERIALS

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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
R/L	**SNGG321R**	SNGG090304R	.016																			★	★				★		★			
	321L	090304L	.016																			★	★				★					
	322R	090308R	.031																			★	★									
	322L	090308L	.031																			★	★									C014 −017 E022 E025
	431R	120404R	.016																			★	★	●			★					
	431L	120404L	.016																			★	★	●			★					
	432R	120408R	.031																			★	★	●								
Medium Cutting	**432L**	120408L	.031																			★	★	●			★		★			
NEW RP	**SNMG432RP**	SNMG120408-RP	.031	●	●	●																										
	433RP	120412-RP	.047	●	●	●																										
	434RP	120416-RP	.063	●	●	●																										
	543RP	150612-RP	.047	●	●	●																										C014 −017 E022 E025
	544RP	150616-RP	.063	●	●	●																										
	643RP	190612-RP	.047	●	●	●																										
Rough Cutting	**644RP**	190616-RP	.063	●	●	●																										
NEW RM	**SNMG432RM**	SNMG120408-RM	.031							●	●	●																				
	433RM	120412-RM	.047							●	●	●																				
	434RM	120416-RM	.063							●	●	●																				
	543RM	150612-RM	.047							●	●	●																				C014 −017 E022 E025
	544RM	150616-RM	.063							●	●	●																				
	643RM	190612-RM	.047							●	●	●																				
Rough Cutting	**644RM**	190616-RM	.063							●	●	●																				
GH	**SNMG432GH**	SNMG120408-GH	.031	●	●		▲						▲	★		●	●															
	433GH	120412-GH	.047	●	●		▲						▲	★		●	●															
	434GH	120416-GH	.063	●	●									★																		
	543GH	150612-GH	.047	★	●																											C014 −017 E022 E025
	544GH	150616-GH	.063		●																											
	643GH	190612-GH	.047	★	●			●						●																		
	644GH	190616-GH	.063	●	●			●					▲	●																		
Rough Cutting	**866GH**	250924-GH	.094				▲							●																		

● : 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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
HZ	**SNMM432HZ**	SNMM120408-HZ	.031	●	▲																									
	433HZ	120412-HZ	.047	●	▲																									C014 –017 E022 E025
	543HZ	150612-HZ	.047	●	▲																									
	643HZ	190612-HZ	.047	●	▲	★																								
Heavy Cutting	**644HZ**	190616-HZ	.063	●	▲	★																								
HX	**SNMM643HX**	SNMM190612-HX	.047	●	▲	★																								
	644HX	190616-HX	.063	●	▲	★																								C014 –017 E025
	646HX	190624-HX	.094	●	▲	★																								
	856HX	250724-HX	.094	●	▲	★																								
Heavy Cutting	**866HX**	250924-HX	.094	●	▲	★																								
HV	**SNMM644HV**	SNMM190616-HV	.063	●	▲	★																								
	646HV	190624-HV	.094	●	▲	★																								C014 –017 E025
	856HV	250724-HV	.094	●	▲	★																								
Heavy Cutting	**866HV**	250924-HV	.094	●	▲	★																								
Flat Top	**SNMA321**	SNMA090304	.016																									★		
	322	090308	.031													●	●											●		
	432	120408	.031													●	●										●	★	★			
	433	120412	.047													●	●												★			C014 –017 E022 E025
	434	120416	.063													●	●														
	543	150612	.047														●														
	643	190612	.047													●	●														
	644	190616	.063													●	●														
Flat Top	**SNGA321**	SNGA090304	.016																			★									
	431	120404	.016																										★		C014 –017 E022 E025
	432	120408	.031																			★						★	★		

CHIP BREAKER ➤ A044
IDENTIFICATION ➤ A002

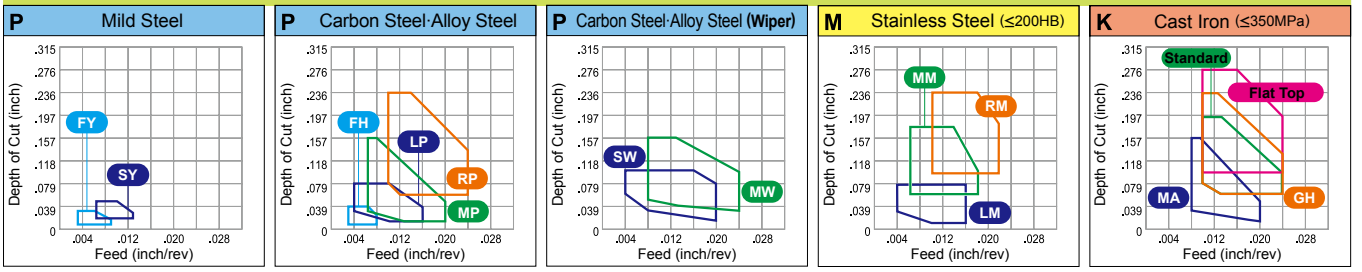
TURNING INSERTS [NEGATIVE]

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: UE6105	UE6110	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
FH	**TNMG221FH**	TNMG110304-FH	.016																			★										
	330.5FH	160402-FH	.008	●		▲								▲								●	●	●								C018 −023 E022 E025
	331FH	160404-FH	.016	●										▲								★	●	●	●							
	332FH	160408-FH	.031	●		▲																★	●	●	●							
Finish Cutting																																
FS	**TNMG331FS**	TNMG160404-FS	.016			▲																★										
	332FS	160408-FS	.031			▲																★										C018 −023 E022 E025
Finish Cutting																																
FY	**TNMG331FY**	TNMG160404-FY	.016			▲																	●	●	★							
	332FY	160408-FY	.031			▲																		●	★							C018 −023 E022 E025
Finish Cutting																																
PK	**TNGG331PK**	TNGG160404-PK	.016																			★										
	332PK	160408-PK	.031																			★										C018 −023 E022 E025
Finish Cutting																																
R/L FS	**TNGG330.5RFS**	TNGG160402R-FS	.008																			★										
	330.5LFS	160402L-FS	.008																			★										C018 −023 E022 E025
	331RFS	160404R-FS	.016																			★										
	331LFS	160404L-FS	.016																			★										
Finish Cutting																																
R/L F	**TNGG330.5RF**	TNGG160402R-F	.008																	●		★	★	●								
	330.5LF	160402L-F	.008																	●		★	★	●								C018 −023 E022 E025
	331RF	160404R-F	.016																	●		★	★	●								
	331LF	160404L-F	.016																	●		★	★	●								
	332RF	160408R-F	.031																	●		★	★	●								
Finish Cutting	**332LF**	160408L-F	.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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
NEW LP	**TNMG331LP**	TNMG160404-LP	.016	●	●	●																		●								
	332LP	160408-LP	.031	●	●	●																		●								C018 −023 E022 E025
Light Cutting	**333LP**	160412-LP	.047	●	●	●																		●								
	432LP	220408-LP	.031	●	●	●																		●								
	433LP	220412-LP	.047	●	●	●																										
NEW LM	**TNMG331LM**	TNMG160404-LM	.016							●	●	●																				
	332LM	160408-LM	.031							●	●	●																				C018 −023 E022 E025
Light Cutting	**333LM**	160412-LM	.047							●	●	●																				
SH	**TNMG331SH**	TNMG160404-SH	.016	●	●		▲							●			●					★	●		★							
	332SH	160408-SH	.031	●	●		▲							●			●					★	●		★							C018 −023 E022 E025
Light Cutting	**432SH**	220408-SH	.031	●	●									●																		
SA	**TNMG331SA**	TNMG160404-SA	.016	●	●		▲																●									
	332SA	160408-SA	.031	●	●		▲																●									C018 −023 E022 E025
Light Cutting	**333SA**	160412-SA	.047	●	●		▲																●									
	432SA	220408-SA	.031	●	●		▲																									
	433SA	220412-SA	.047		●																											
SW (With Wiper)	* **TNMX331SW**	TNMX160404-SW	.016	●	●								▲									★	●	●		▲						
	* **332SW**	160408-SW	.031	●	●								▲									★	●	●		▲						C018
Light Cutting																																
SY	**TNMG331SY**	TNMG160404-SY	.016				▲																●	●		★						
	332SY	160408-SY	.031				▲																	●		★						C018 −023 E022 E025
Light Cutting																																
C	**TNMG331C**	TNMG160404-C	.016																			★	●									
	332C	160408-C	.031																			★	●									C018 −023 E022 E025
Light Cutting	**431C**	220404-C	.016																			★	●		●							
	432C	220408-C	.031																				●									
R/L 1G	**TNMG331R1G**	TNMG160404R-1G	.016																			★										
	331L1G	160404L-1G	.016																			★										C018 −023 E022 E025
Light Cutting	**431R1G**	220404R-1G	.016																			★										
	431L1G	220404L-1G	.016																			★										

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

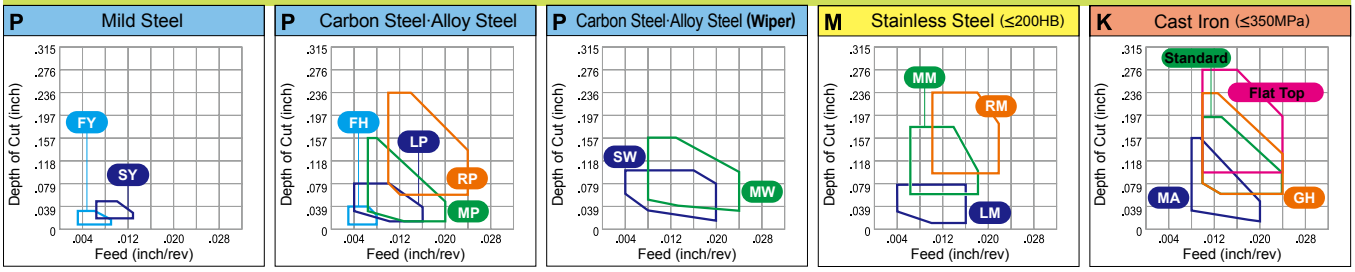
CHIP BREAKER ➤ A044
IDENTIFICATION ➤ A002

60° TN TYPE INSERTS WITH HOLE

TNGG 3 3 0.5 RK
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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
R/L K	TNGG330.5RK	TNGG160402R-K	.008																			★	★	●								
	330.5LK	160402L-K	.008																			★	★	●								C018 −023 E022 E025
	331RK	160404R-K	.016																			★	★	●								
	331LK	160404L-K	.016																				★	●								
	332LK	160408L-K	.031																					●								
Light Cutting	332RK	160408R-K	.031																					●								
MJ	TNMG331MJ	TNMG160404-MJ	.016												★			●	●												●	
	332MJ	160408-MJ	.031												★			●	●												●	C018 −023 E022 E025
	333MJ	160412-MJ	.047												★			★	★													
Light Cutting																																
MP	TNMG331MP	TNMG160404-MP	.016	●	●	●	▲										●							●								
	332MP	160408-MP	.031	●	●	●	▲										●							●								C018 −023 E022 E025
	333MP	160412-MP	.047	●	●	●	▲										●							●								
	432MP	220408-MP	.031	●	●	●	▲										●															
Medium Cutting	433MP	220412-MP	.047	●	●	●	▲										●															
NEW MM	TNMG332MM	TNMG160408-MM	.031							●	●	●																				
	333MM	160412-MM	.047							●	●	●																				C018 −023 E022 E025
	432MM	220408-MM	.031							●	●	●																				
	433MM	220412-MM	.047							●	●	●																				
Medium Cutting	434MM	220416-MM	.063							●	●	●																				
NEW GM	TNMG331GM	TNMG160404-GM	.016							●	●	●																				
	332GM	160408-GM	.031							●	●	●																				C018 −023 E022 E025
	333GM	160412-GM	.047							●	●	●																				
	432GM	220408-GM	.031							●	●	●																				
Medium Cutting	433GM	220412-GM	.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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
MA	**TNMG321MA**	TNMG160304-MA	.016				▲																								C018 −023 E022 E025
	322MA	160308-MA	.031				▲																								
	331MA	160404-MA	.016	●	●	●	▲			●	●	▲	●			●	●			●		●									
	332MA	160408-MA	.031	●	●	●	▲	●		●	●	▲	●			●	●			●		●									
	333MA	160412-MA	.047	●	●	●	▲			●	●	▲	●				●			●		●									
	334MA	160416-MA	.063														●														
	432MA	220408-MA	.031	●	●	●	▲	●		●	●	▲	●			●	●			●											
	433MA	220412-MA	.047	●	●	●	▲	●		●	●	▲	●				●			●											
	434MA	220416-MA	.063														●														
Medium Cutting	**542MA**	270608-MA	.031	●	●		▲	●																							
	543MA	270612-MA	.047	●	●		▲							●																	
MH	**TNMG331MH**	TNMG160404-MH	.016	●	●		▲						▲				●														C018 −023 E022 E025
	332MH	160408-MH	.031	●	●		▲	★					▲				●														
	333MH	160412-MH	.047	●	●		▲	★									●														
	432MH	220408-MH	.031	●	●		▲	●					▲				●														
Medium Cutting	**433MH**	220412-MH	.047	●	●		▲	●									●														
Standard	**TNMG221**	TNMG110304	.016		●	●	▲																			★		★			C018 −023 E022 E025
	222	110308	.031		●	●	▲																								
	321	160304	.016		●																					●					
	322	160308	.031		●	●	▲																			●					
	331	160404	.016	●	●	●	▲									★	★			●		★	●	●		●	★	●			
	332	160408	.031	●	●	●	▲	●								★	★			●		★	●	●		●	★	●			
	333	160412	.047	★	●	●	▲									★	★					★									
	334	160416	.063		●												★					★									
	431	220404	.016	●	●	●	▲	●															●			●					
	432	220408	.031	●	●	●	▲	●									●					★	●			●					
	433	220412	.047	●	●	●	▲										★														
	434	220416	.063		●	●	▲																								
	542	270608	.031		●																					▲					
	543	270612	.047		●		▲																			●					
	544	270616	.063		●		▲																			▲					
Medium Cutting	**666**	330924	.094				▲																			●					
MW (With Wiper)	* **TNMX332MW**	TNMX160408-MW	.031	●	●								▲				★														C018
	* **333MW**	160412-MW	.047	●	●								▲			★	★														
Medium Cutting																															

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

CHIP BREAKER ➤ A044
IDENTIFICATION ➤ A002

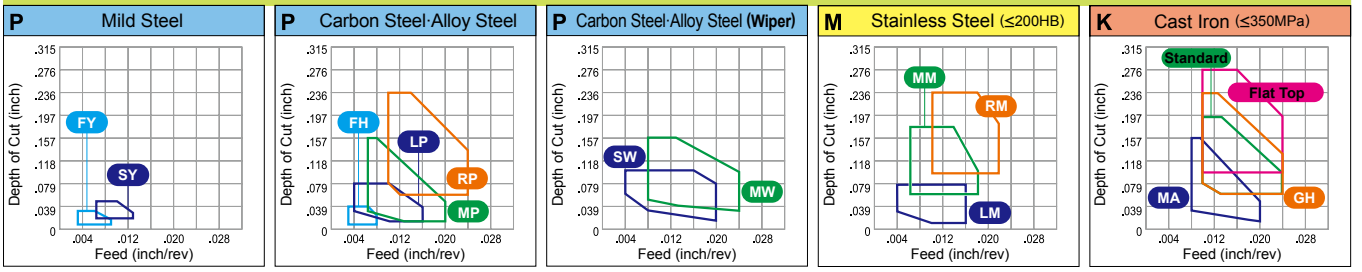
TURNING INSERTS [NEGATIVE]

60° TN TYPE INSERTS WITH HOLE

TNMG 3 3 1 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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
MS	**TNMG331MS**	TNMG160404-MS	.016	●									▲	●	●			●	●	★							★					
	332MS	160408-MS	.031	●		▲							▲	●	●			●	●	★	●		●									●	C018 −023 E022 E025
	333MS	160412-MS	.047	★										★	★			★	●													
	432MS	220408-MS	.031	●									▲	●	●			●	●	★	●											
Medium Cutting	**433MS**	220412-MS	.047											★																		
R/L ES	**TNMG331RES**	TNMG160404R-ES	.016										▲	★																		
	331LES	160404L-ES	.016										▲	★																		
	332RES	160408R-ES	.031										▲	★																		C018 −023 E022 E025
	332LES	160408L-ES	.031										▲	★																		
	432RES	220408R-ES	.031											★																		
Medium Cutting	**432LES**	220408L-ES	.031											★																		
R/L 2G	**TNMG331R2G**	TNMG160404R-2G	.016																			★										
	331L2G	160404L-2G	.016																			★										C018 −023 E022 E025
	332R2G	160408R-2G	.031																			★										
Medium Cutting	**332L2G**	160408L-2G	.031																			★										
R/L	**TNGG220.5R**	TNGG110302R	.008																				★									
	220.5L	110302L	.008																			★	★									
	221R	110304R	.016																			★	★									
	221L	110304L	.016																			★	★									
	222R	110308R	.031																				★									
	222L	110308L	.031																			★	★									C018 −023 E022 E025
	321R	160304R	.016																			★	★				★					
	321L	160304L	.016																			★	★									
	330.5R	160402R	.008																			★	★	●			★		★			
	330.5L	160402L	.008																			★	★	●								
	331R	160404R	.016																			★	●	●			★	★	★			
	331L	160404L	.016																			★	●	●			★		★			
Medium Cutting	**332R**	160408R	.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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
R/L	**TNGG332L**	TNGG160408L	.031																			★	●	●			★	★	★			
	**431R**	220404R	.016																			★	●				★					C018 −023 E022 E025
	431L	220404L	.016																			★	●				★					
	432R	220408R	.031																			★	●				★					
Medium Cutting	**432L**	220408L	.031																			★	●				★					
NEW **RP**	**TNMG332RP**	TNMG160408-RP	.031	●	●	●																										
	333RP	160412-RP	.047	●	●	●																										
	**432RP**	220408-RP	.031	●	●	●																										C018 −023 E022 E025
	433RP	220412-RP	.047	●	●	●																										
	434RP	220416-RP	.063	●	●	●																										
	543RP	270612-RP	.047	●	●	●																										
Rough Cutting	**544RP**	270616-RP	.063	●	●	●																										
NEW **RM**	**TNMG332RM**	TNMG160408-RM	.031							●	●	●																				
	333RM	160412-RM	.047							●	●	●																				
	**432RM**	220408-RM	.031							●	●	●																				C018 −023 E022 E025
	433RM	220412-RM	.047							●	●	●																				
Rough Cutting	**434RM**	220416-RM	.063							●	●	●																				
GH	**TNMG332GH**	TNMG160408-GH	.031	●	●	▲							▲	●		●	●															
	333GH	160412-GH	.047	★	★											●																
	432GH	220408-GH	.031	●	●	▲								●		●																C018 −023 E022 E025
	**433GH**	220412-GH	.047	●	●	▲								●		●	●															
	434GH	220416-GH	.063	●	●																											
	543GH	270612-GH	.047	●	●	▲	●							●																		
	544GH	270616-GH	.063	●	●																											
Rough Cutting	**666GH**	330924-GH	.094				●							●																		
HZ	**TNMM332HZ**	TNMM160408-HZ	.031		★	▲																										
	432HZ	220408-HZ	.031		●	▲																										C018 −023 E022 E025
	**433HZ**	220412-HZ	.047		●	▲																										
	434HZ	220416-HZ	.063		●	▲																										
Heavy Cutting																																
Flat Top	**TNMA331**	TNMA160404	.016													●	●											★	★			
	332	160408	.031													●	●										★	★	●			
	333	160412	.047													●	●															
	**334**	160416	.063														★															C018 −023 E022 E025
	431	220404	.016																										★			
	432	220408	.031													●	●					★					★		●			
	433	220412	.047													●	●															
	434	220416	.063													●	●										●					

CHIP BREAKER ➤ A044
IDENTIFICATION ➤ A002

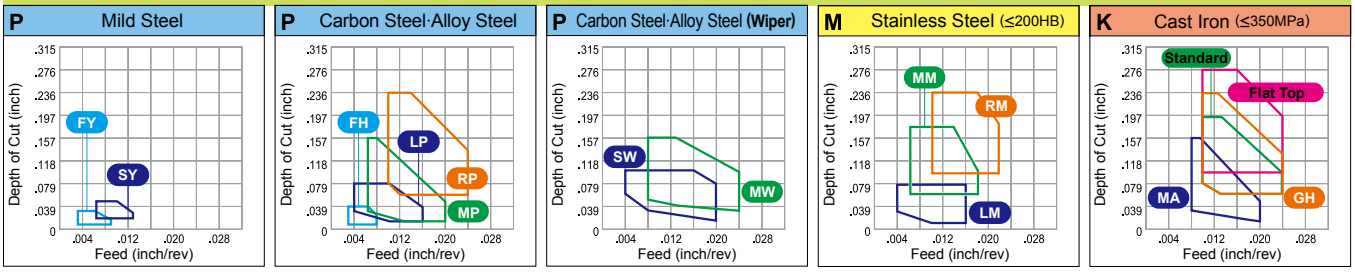
TURNING INSERTS [NEGATIVE]

60° TN TYPE INSERTS WITH HOLE

TNGA 2 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														Cermet		Coated Cermet			Carbide				Applicable Holder Page
				UE6105	UE6110	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
Flat Top	**TNGA221**	TNGA110304	.016																								★			
	222	110308	.031																		★						★			
	330.5	160402	.008																		★						★			C018
	331	160404	.016																							★	★	★			—023
	332	160408	.031																								★	★			E022
	431	220404	.016																							★					E025
	432	220408	.031																									★			

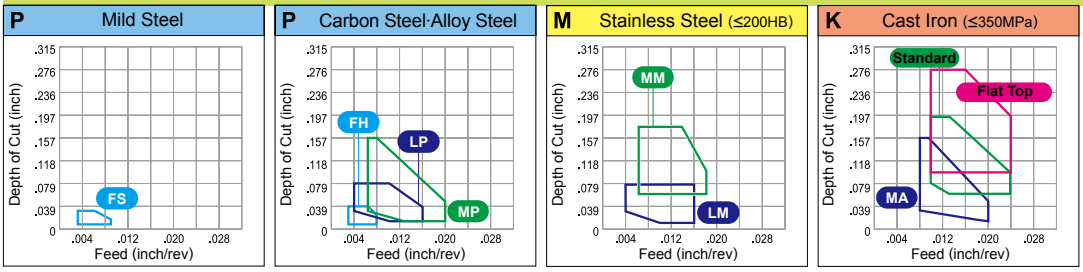
● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<10 inserts in one case>

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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
FH	**VNMG330.5FH**	VNMG160402-FH	.008	●		▲																●	●	●								
	331FH	160404-FH	.016	★		▲																★		●	★							C024 C025 E023 E026
	332FH	160408-FH	.031	★		▲																★	●	●	★							
Finish Cutting																																
FS	**VNMG331FS**	VNMG160404-FS	.016			▲																★		●								
	332FS	160408-FS	.031			▲																★		●								C024 C025 E023 E026
Finish Cutting																																
FJ	**VNGG33V5FJ**	VNGG1604V5-FJ	.002																●												●	
	330.2FJ	160401-FJ	.004																●												●	C024 C025 E023 E026
	330.5FJ	160402-FJ	.008																●												●	
Finish Cutting																																
R/L F	**VNGG330.5RF**	VNGG160402R-F	.008																	●		●	●	●								
	330.5LF	160402L-F	.008																	●		●	●	●								C024 C025 E023 E026
	331RF	160404R-F	.016																	●		●	●	●								
	331LF	160404L-F	.016																	●		●	●	●								
Finish Cutting																																
NEW **LP**	**VNMG331LP**	VNMG160404-LP	.016	●	●	●																		●								
	332LP	160408-LP	.031	●	●	●																		●								C024 C025 E023 E026
Light Cutting																																
NEW **LM**	**VNMG331LM**	VNMG160404-LM	.016							●	●	●																				
	332LM	160408-LM	.031							●	●	●																				C024 C025 E023 E026
Light Cutting																																

CHIP BREAKER ➤ A044
IDENTIFICATION ➤ A002

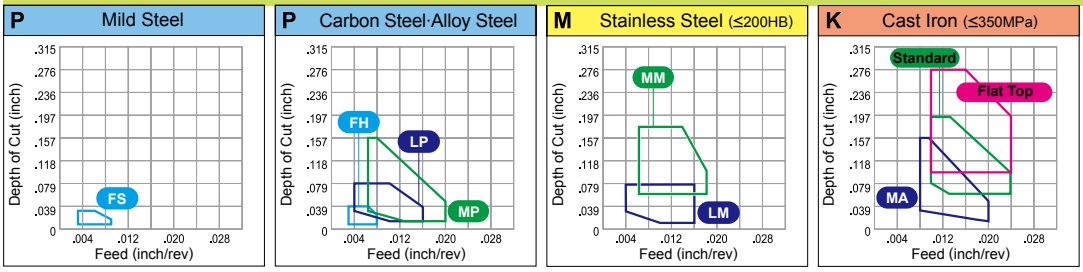
TURNING INSERTS [NEGATIVE]

35° VN TYPE INSERTS WITH HOLE

VNMG 3 3 1 SH
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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
SH	**VNMG331SH**	VNMG160404-SH	.016	●	★		▲															★	●		★							
	332SH	160408-SH	.031	●	★		▲															★	●		★							C024 C025 E023 E026
Light Cutting																																
MJ	**VNMG331MJ**	VNMG160404-MJ	.016												★				●	●											●	
	332MJ	160408-MJ	.031												★				●	●											●	C024 C025 E023 E026
	333MJ	160412-MJ	.047												★				★	★												
Light Cutting																																
MJ	**VNGM331MJ**	VNGM160404-MJ	.016																●												●	
	332MJ	160408-MJ	.031																●												●	C024 —026 E023 E026
	431MJ	220404-MJ	.016																●												●	
	432MJ	220408-MJ	.031																●												●	
Light Cutting																																
MP	**VNMG331MP**	VNMG160404-MP	.016	●	●	●	▲										●							●								
	332MP	160408-MP	.031	●	●	●	▲										●							●								C024 C025 E023 E026
	333MP	160412-MP	.047	●	●	●	▲										●															
Medium Cutting																																
NEW **MM**	**VNMG332MM**	VNMG160408-MM	.031							●	●	●																				
																																C024 C025 E023 E026
Medium Cutting																																
NEW **GM**	**VNMG331GM**	VNMG160404-GM	.016							●	●	●																				
	332GM	160408-GM	.031							●	●	●																				C024 C025 E023 E026
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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
MA	**VNMG331MA**	VNMG160404-MA	.016	●	●	●	▲			●	●	▲	●			●	●			●												
	332MA	160408-MA	.031	●	●	●	▲	●		●	●	▲	●			●	●			●												C024 C025 E023 E026
Medium Cutting																																
MH	**VNMG331MH**	VNMG160404-MH	.016	●	●		▲										●															
	332MH	160408-MH	.031	●	●		▲						▲				●															C024 C025 E023 E026
Medium Cutting																																
Standard	**VNMG331**	VNMG160404	.016	●	●	●	▲									★	★			●		★	●	●		●		●				
	332	160408	.031	●	●	●	▲									★	●			●		★	●	●	●	●		●				C024 C025 E023 E026
	333	160412	.047	★	●											★	★					★										
Medium Cutting																																
MS	**VNMG331MS**	VNMG160404-MS	.016		●								▲	●	●			●	●		★											
	332MS	160408-MS	.031		●								▲	●	●			★	●				●									●	C024 C025 E023 E026
Medium Cutting																																
R/L	**VNGG331R**	VNGG160404R	.016																			★	●				★		★			
	331L	160404L	.016																			★	●				★					C024 C025 E023 E026
Medium Cutting																																
Flat Top	**VNGA331**	VNGA160404	.016																									★	●			
	332	160408	.031																									★	●			C024 C025 E023 E026

CHIP BREAKER ➤ A044
IDENTIFICATION ➤ A002

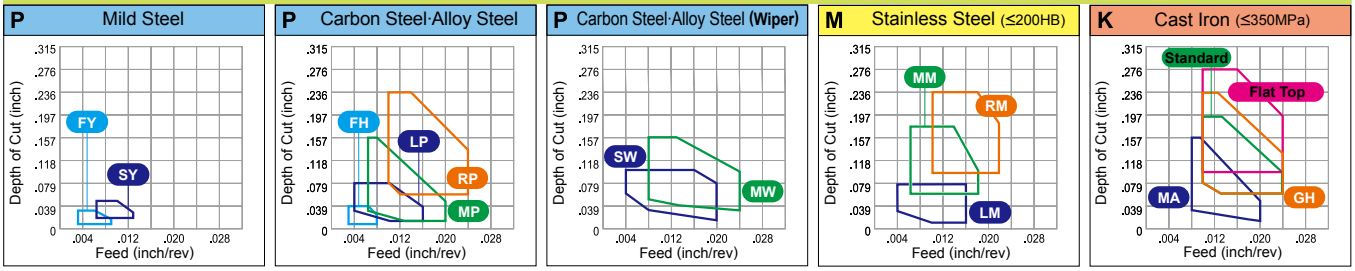
TURNING INSERTS [NEGATIVE]

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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
FH	WNMG431FH	WNMG080404-FH	.016		●																	★		●							
	432FH	080408-FH	.031		●									▲								★		●	●						C027 E023 E026 E027
Finish Cutting																															
FS	WNMG431FS	WNMG080404-FS	.016				▲															★									
	432FS	080408-FS	.031				▲															★									C027 E023 E026 E027
Finish Cutting																															
FY	WNMG431FY	WNMG080404-FY	.016																					●							
	432FY	080408-FY	.031				▲																	●		★					C027 E023 E026 E027
Finish Cutting																															
NEW LP	WNMG331LP	WNMG060404-LP	.016	●	●	●																		●							
	332LP	060408-LP	.031	●	●	●																		●							
	32.51LP	06T304-LP	.016	●	●	●																		●							C027 E023 E026 E027
	32.52LP	06T308-LP	.031	●	●	●																		●							
	431LP	080404-LP	.016	●	●	●																		●							
	432LP	080408-LP	.031	●	●	●																		●							
Light Cutting	433LP	080412-LP	.047	●	●	●																									
NEW LM	WNMG331LM	WNMG060404-LM	.016							●	●	●																			
	332LM	060408-LM	.031							●	●	●																			C027 E023 E026 E027
	431LM	080404-LM	.016							●	●	●																			
	432LM	080408-LM	.031							●	●	●																			
Light 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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
SH	**WNMG32.51SH**	WNMG06T304-SH	.016	●	●									●																		C027 E023 E026 E027
	32.52SH	06T308-SH	.031	●	●									●																		
	331SH	060404-SH	.016	●	●									●																		
	332SH	060408-SH	.031	●	●									●																		
	431SH	080404-SH	.016	●	●									●			●					★										
	432SH	080408-SH	.031	●	●		▲							●			●					★										
Light Cutting	**433SH**	080412-SH	.047	●	●		▲							●			★															
SA	**WNMG431SA**	WNMG080404-SA	.016	●	●		▲							●									●									C027 E023 E026 E027
	432SA	080408-SA	.031	●	●		▲							●									●									
Light Cutting	**433SA**	080412-SA	.047	●	●		▲																●									
SW (With Wiper)	* **WNMG331SW**	WNMG060404-SW	.016	●	●								▲									★		●								C027 E023 E026 E027
	* **332SW**	060408-SW	.031	●	●								▲									★		●								
	* **431SW**	080404-SW	.016	●	●								▲				●					★	●	●								
	* **432SW**	080408-SW	.031	●	●								▲				●					★	●	●	▲							
Light Cutting	* **433SW**	080412-SW	.047	●	●								▲									●	●	●								
SY	**WNMG431SY**	WNMG080404-SY	.016																					●								C027 E023 E026 E027
	432SY	080408-SY	.031				▲																●	●		★						
Light Cutting																																
C	**WNMG431C**	WNMG080404-C	.016																			★	●									C027 E023 E026 E027
	432C	080408-C	.031																				●									
Light Cutting																																
MJ	**WNMG432MJ**	WNMG080408-MJ	.031											★				★	★														C027 E023 E026 E027
	433MJ	080412-MJ	.047											★				★	★													
Light Cutting	**434MJ**	080416-MJ	.063											★				★	★													
MP	**WNMG32.51MP**	WNMG06T304-MP	.016	●	●	●	▲										●															C027 E023 E026 E027
	32.52MP	06T308-MP	.031	●	●	●	▲										●															
	32.53MP	06T312-MP	.047	●	●	●	▲										●															
	331MP	060404-MP	.016	●	●	●	▲										●															
	332MP	060408-MP	.031	●	●	●	▲										●															
	333MP	060412-MP	.047	●	●	●	▲										●															
	431MP	080404-MP	.016	●	●	●	▲										●							●								
	432MP	080408-MP	.031	●	●	●	▲										●							●								
	433MP	080412-MP	.047	●	●	●	▲										●							●								
Medium Cutting	**434MP**	080416-MP	.063	●	●	●	▲										●															

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

CHIP BREAKER ➤ A044
IDENTIFICATION ➤ A002

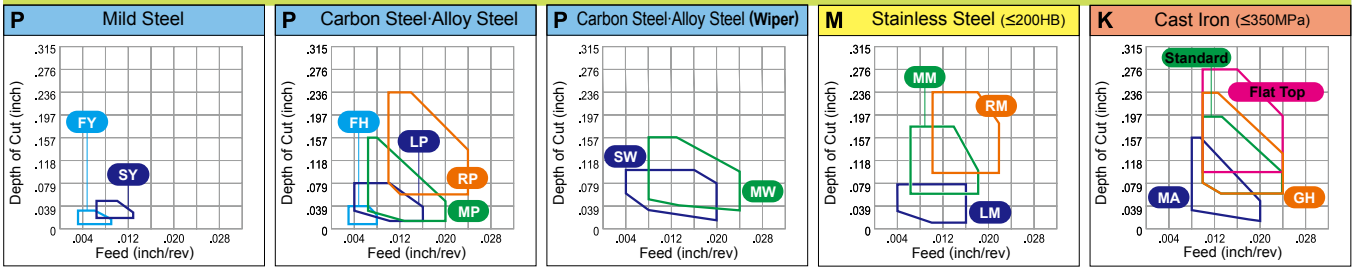
TURNING INSERTS [NEGATIVE]

80° WN TYPE INSERTS WITH HOLE

WNMG 3 3 2 MM
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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	Coated Cermet: MP3025	AP25N	VP25N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
NEW MM	WNMG332MM	WNMG060408-MM	.031							●	●	●																				
	333MM	060412-MM	.047							●	●	●																				C027 E023 E026 E027
	432MM	080408-MM	.031							●	●	●																				
	433MM	080412-MM	.047							●	●	●																				
Medium Cutting																																
NEW GM	WNMG331GM	WNMG060404-GM	.016							●	●	●																				
	332GM	060408-GM	.031							●	●	●																				C027 E023 E026 E027
	431GM	080404-GM	.016							●	●	●																				
	432GM	080408-GM	.031							●	●	●																				
Medium Cutting	433GM	080412-GM	.047							●	●	●																				
MA	WNMG32.51MA	WNMG06T304-MA	.016	●	●								★																			
	32.52MA	06T308-MA	.031	●	●								★																			
	32.53MA	06T312-MA	.047	★	●								★																			
	331MA	060404-MA	.016	●	★								●																			
	332MA	060408-MA	.031	●	★	●	▲				●	●	●							●												C027 E023 E026 E027
	333MA	060412-MA	.047	●	●	●					●	●	★							●												
	431MA	080404-MA	.016	●	●	●	▲				●	●	▲	●			●			●			●									
	432MA	080408-MA	.031	●	●	●	▲	●			●	●	▲	●		●	●			●			●									
	433MA	080412-MA	.047	●	●	●	▲	●			●	●	▲	●		●	●			●			●									
	434MA	080416-MA	.063	★	★												●															
Medium Cutting	543MA	100612-MA	.047				▲	●																								
MH	WNMG431MH	WNMG080404-MH	.016	●	●		▲																									
	432MH	080408-MH	.031	●	●		▲	●					▲				●															C027 E023 E026 E027
	433MH	080412-MH	.047	●	●		▲	●									●															
Medium Cutting																																
Standard	WNMG431	WNMG080404	.016	●	●	●	▲									●	●					★		●								
	432	080408	.031	●	●	●	▲									●	●			●		★		●			★					C027 E023 E026 E027
	433	080412	.047	●	●	●	▲									●	●			●							★					
	434	080416	.063														★															
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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
MW (With Wiper)	* **WNMG332MW**	WNMG060408-MW	.031	●	●	●	▲									●	●														
	* **333MW**	060412-MW	.047	●	★											●	●														C027 E023 E026 E027
	* **432MW**	080408-MW	.031	●	●	●	▲						▲			●	●														
	* **433MW**	080412-MW	.047	●	●								▲			●	●														
Medium Cutting																															
MS	**WNMG322MS**	WNMG060308-MS	.031											●																	
	32.51MS	06T304-MS	.016		●								▲	●																	
	32.52MS	06T308-MS	.031		●								▲	●																	
	331MS	060404-MS	.016		●								▲	●																	C027 E023 E026 E027
	332MS	060408-MS	.031		●								▲	●																	
	431MS	080404-MS	.016		●		▲						▲	●				●	●	●											
	432MS	080408-MS	.031		●		▲						▲	●	●			●	●	●										●	
Medium Cutting	**433MS**	080412-MS	.047		★									●	●			★	●												
NEW **RP**	**WNMG432RP**	WNMG080408-RP	.031	●	●	●																									
	433RP	080412-RP	.047	●	●	●																									C027 E023 E026 E027
Rough Cutting																															
NEW **RM**	**WNMG332RM**	WNMG060408-RM	.031							●	●	●																			
	333RM	060412-RM	.047							●	●	●																			C027 E023 E026 E027
	432RM	080408-RM	.031							●	●	●																			
	433RM	080412-RM	.047							●	●	●																			
Rough Cutting																															
GH	**WNMG432GH**	WNMG080408-GH	.031	●	●		▲	●					▲	●		●	●														
	433GH	080412-GH	.047	●	●		▲							●		●	●														C027 E023 E026 E027
Rough Cutting																															
GJ	**WNMG432GJ**	WNMG080408-GJ	.031											●					●											●	
	433GJ	080412-GJ	.047											●					●											●	C027 E023 E026 E027
	434GJ	080416-GJ	.063											●					●											●	
	543GJ	100612-GJ	.047																●											●	
Rough Cutting																															
Flat Top	**WNMA431**	WNMA080404	.016													●	●											★			
	432	080408	.031													●	●											★			C027 E023 E026 E027
	433	080412	.047													●	●														
	434	080416	.063														★														

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

CHIP BREAKER ➤ A044
IDENTIFICATION ➤ A002

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	● ● ◕ ◕ ◕

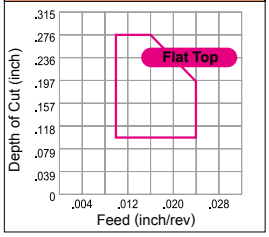
90° SN TYPE INSERTS WITHOUT HOLE

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														Cermet		Coated Cermet			Carbide				Applicable Holder Page
				UE6105	UE6110	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
Flat Top	**SNMN432**	SNMN120408	.031													★	★					★				★		★			–
	433	120412	.047													●	●					★					★					
	434	120416	.063													●	●															
	633	190412	.047																								★					
Flat Top	**SNG322**	SNGN090308	.031																										★			–
	431	120404	.016																								★		★			
	432	120408	.031																								★					

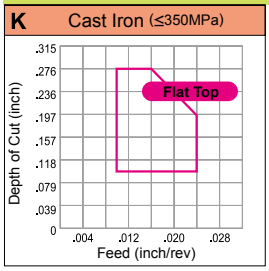
CHIP BREAKER ➤ A044
IDENTIFICATION ➤ A002

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



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	MC6025	UE6020	UE6035	UH6400	MC7015	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	MP3025	AP25N	VP25N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
Flat Top	TNMN322	TNMN160308	.031																			★									
	332	160404	.031													★	★					★									
	333	160412	.047													★	★														
	334	160416	.063													★	★														–
	335	160420	.079														★														
	432	220408	.031																			★									
	433	220412	.047																								★				
Flat Top	TNG221	TNGN110304	.016																									★			
	222	110308	.031																									★			
	331	160404	.016																									★			–
	332	160408	.031																									★			

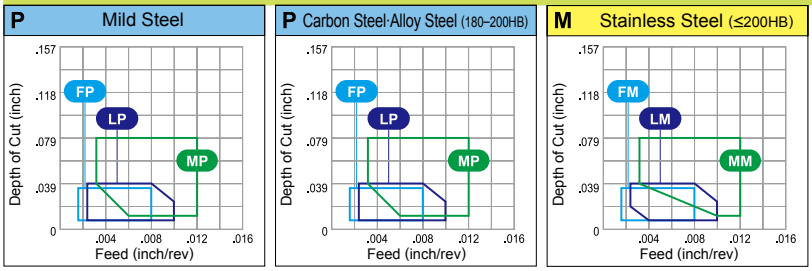
● : Inventory maintained. ○ : Inventory maintained. (Available Spring 2013)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet NX2525	NX3035	NX55	Coated Cermet MP3025	AP25N	VP25N	VP45N	Carbide UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
NEW FP	CCMT21.50.5FP	CCMT060202-FP	.008	●	●															○			○									C030 D008 D012 E012 E013
	21.51FP	060204-FP	.016	●	●															○			○									
	32.50.5FP	09T302-FP	.008	●	●															○			○									
	32.51FP	09T304-FP	.016	●	●															○			○									
Finish Cutting	32.52FP	09T308-FP	.031	●	●															○			○									
NEW FM	CCMT21.50.5FM	CCMT060202-FM	.008														●															C030 D008 D012 E012 E013
	21.51FM	060204-FM	.016														●															
	32.50.5FM	09T302-FM	.008														●															
	32.51FM	09T304-FM	.016														●															
Finish Cutting	32.52FM	09T308-FM	.031														●															
FV	CCMT21.50.5FV	CCMT060202-FV	.008			▲											●			★	●		●		★							C030 D008 D012 E012 E013
	21.51FV	060204-FV	.016			▲											●			★	●		●		★							
	32.50.5FV	09T302-FV	.008			▲														●	●				●							
	32.51FV	09T304-FV	.016			▲														★	●		●		★							
Finish Cutting	32.52FV	09T308-FV	.031			▲														★	●		●		★							
FJ	CCGT21.5V5FJ	CCGT0602V5-FJ	.002														●															C030 D008 D012 E012 E013
	21.50.2FJ	060201-FJ	.004														●															
	21.50.5FJ	060202-FJ	.008														●															
	32.5V5FJ	09T3V5-FJ	.002														●															
	32.50.2FJ	09T301-FJ	.004														●														★	
	32.50.5FJ	09T302-FJ	.008														●														★	
Finish Cutting	32.51FJ	09T304-FJ	.016														●														★	
FJ-P	CCGT21.5V5FJ-P	CCGT0602V5-FJ-P	.002																												●	C030 D008 D012 E012 E013
	21.50.2FJ-P	060201-FJ-P	.004																												●	
	21.50.5FJ-P	060202-FJ-P	.008																												●	
	32.5V5FJ-P	09T3V5-FJ-P	.002																												●	
	32.50.2FJ-P	09T301-FJ-P	.004																												●	
	32.50.5FJ-P	09T302-FJ-P	.008																												●	
Finish Cutting	32.51FJ-P	09T304-FJ-P	.016																												●	

CHIP BREAKER ➤ A058
IDENTIFICATION ➤ A002

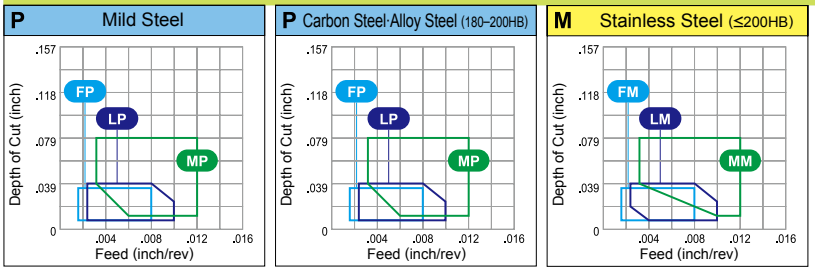
TURNING INSERTS [POSITIVE]

80° CC TYPE INSERTS WITH HOLE

CCGT 2 1.5 0.5 AZ
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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	NX55	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
AZ	CCGT21.50.5AZ	CCGT060202-AZ	.008																										●			
	21.51AZ	060204-AZ	.016																										●			
	32.50.5AZ	09T302-AZ	.008																										●			C030 D008 D012 E012 E013
	32.51AZ	09T304-AZ	.016																										●			
	32.52AZ	09T308-AZ	.031																										●			
	430.5AZ	120402-AZ	.008																										●			
	431AZ	120404-AZ	.016																										●			
Finish Cutting	432AZ	120408-AZ	.031																										●			
L-F	CCGT03S1V3L-F	CCGT03S1V3L-F	.0012															●		●												
	03S101L-F	03S101L-F	.004															●		●												
	03S102L-F	03S102L-F	.008															●		●			●									
	03S104L-F	03S104L-F	.016															●		★			●									E029
	04T0V3L-F	04T0V3L-F	.0012															●		●												
	04T001L-F	04T001L-F	.004															●		●												
	04T002L-F	04T002L-F	.008															●		●			●									
Finish Cutting	04T004L-F	04T004L-F	.016															●		★			●									
R/L F	CCGH21.50.5RF	CCGH060202R-F	.008															●		★				★					●			
	21.50.5LF	060202L-F	.008															●		★				★					●			C030 E006 E012 E013
	21.51RF	060204R-F	.016															●		★				★					●			
	21.51LF	060204L-F	.016															●		★				★					●			
Finish Cutting																																
NEW LP	CCMT21.51LP	CCMT060204-LP	.016	●	●															○			○									
	21.52LP	060208-LP	.031	●	●															○			○									C030 D008 D012 E012 E013
	32.51LP	09T304-LP	.016	●	●															○			○									
	32.52LP	09T308-LP	.031	●	●															○			○									
Light Cutting																																
NEW LM	CCMT21.51LM	CCMT060204-LM	.016						●	○								●														
	21.52LM	060208-LM	.031						●	○								●														C030 D008 D012 E012 E013
	32.51LM	09T304-LM	.016						●	○								●														
	32.52LM	09T308-LM	.031						●	○								●														
Light Cutting																																

● : Inventory maintained. ○ : Inventory maintained. (Available Spring 2013)
★ : 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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
SV	**CCMH21.50.5SV**	CCMH060202-SV	.008				▲				▲	●					★		★	●		●			★					C030 E012 E013
	**21.51SV**	060204-SV	.016				▲				▲	●					★		★	●		●			★					
Light Cutting																														
SW (With Wiper)	* **CCMT21.50.5SW**	CCMT060202-SW	.008	●		▲					▲									●			●	●							C030 D008 D012 E012 E013
	* **21.51SW**	060204-SW	.016	●		▲					▲			●						●			●	●						
	* **32.50.5SW**	09T302-SW	.008	●		▲					▲			●						●			●	●						
	* **32.51SW**	09T304-SW	.016	●		▲					▲			●						●			●	●						
Light Cutting																														
R/L SS	**CCGT21.5V3RSS**	CCGT0602V3R-SS	.0012														●													C030 D008 D012 E012 E013
	21.5V3LSS	0602V3L-SS	.0012														●													
	21.50.2RSS	060201R-SS	.004														●													
	21.50.2LSS	060201L-SS	.004														●													
	**21.50.5RSS**	060202R-SS	.008														●													
	21.50.5LSS	060202L-SS	.008														●													
	32.5V3RSS	09T3V3R-SS	.0012														●													
	32.5V3LSS	09T3V3L-SS	.0012														●													
	32.50.2RSS	09T301R-SS	.004														●													
	32.50.2LSS	09T301L-SS	.004														●													
	32.50.5RSS	09T302R-SS	.008														●													
Light Cutting	**32.50.5LSS**	09T302L-SS	.008														●													
MJ	**CCGT21.51MJ**	CCGT060204-MJ	.016													●														C030 D008 D012 E012 E013
	**32.52MJ**	09T308-MJ	.031													●														
Light Cutting																														
MJ-P	**CCGT21.51MJ-P**	CCGT060204-MJ-P	.016																										●	C030 D008 D012 E012 E013
	**32.52MJ-P**	09T308-MJ-P	.031																										●	
Light Cutting																														
NEW **MP**	**CCMT21.51MP**	CCMT060204-MP	.016	●	●															○			○								C030 D008 D012 E012 E013
	**21.52MP**	060208-MP	.031	●	●															○			○								
	32.51MP	09T304-MP	.016	●	●															○			○								
	32.52MP	09T308-MP	.031	●	●															○			○								
	431MP	120404-MP	.016	●	●															○			○								
	432MP	120408-MP	.031	●	●															○			○								
Medium Cutting	**433MP**	120412-MP	.047	●	●															○			○								

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

CHIP BREAKER ➤ A058
IDENTIFICATION ➤ A002

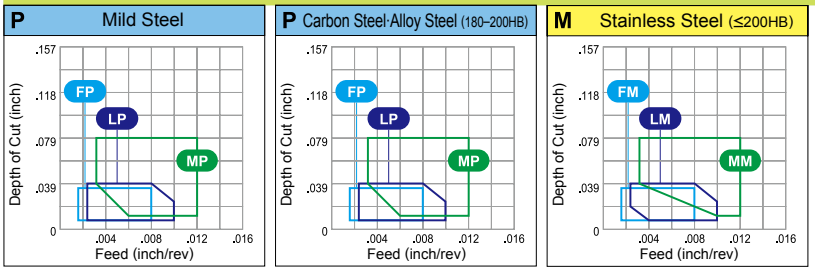
TURNING INSERTS [POSITIVE]

80° CC TYPE INSERTS WITH HOLE

CCMT 2 1.5 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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	NX55	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
NEW MM	CCMT21.51MM	CCMT060204-MM	.016						●	○								●														
	21.52MM	060208-MM	.031						●	○								●														
	32.51MM	09T304-MM	.016						●	○								●														
	32.52MM	09T308-MM	.031						●	○								●														
	431MM	120404-MM	.016						●	○								●														
	432MM	120408-MM	.031						●	○								●														
Medium Cutting	433MM	120412-MM	.047						●	○								●														
Standard	CCMT21.50.5	CCMT060202	.008		●		▲				●									★	●		●	●			●		●			
	21.51	060204	.016	●	●		▲				●			●				●		★	●		●	●			●		●			
	21.52	060208	.031		●		▲				●			●				●		★							●		●			
	2.520.5	080302	.008		★																											
	2.521	080304	.016		★						●									★	●		●	●			●					
	2.522	080308	.031		★						●																●					
	32.50.5	09T302	.008		●		▲				●									★	●		●	●					●			
	32.51	09T304	.016	●	●		▲				●			●				●		★	●		●	●			●		●			
	32.52	09T308	.031	●	●		▲				●			●				●		★	●		●	●			●		●			
	431	120404	.016	●	●		▲				●			●				●		★	●		●	●			★		●			
	432	120408	.031	●	●		▲				●			●				●		★	●		●				●		●			
Medium Cutting	433	120412	.047		●		▲				●			★							●											
MV	CCMH21.50.5MV	CCMH060202-MV	.008			●	▲				▲	●						★		★	●		●	●		●						
	21.51MV	060204-MV	.016			●	▲				▲	●						●		★	●		●	●		●						
Medium Cutting																																
MW (With Wiper)	* CCMT21.51MW	CCMT060204-MW	.016				▲				▲									●			●		●							
	* 21.52MW	060208-MW	.031		●		▲				▲									●			●		●							
	* 32.51MW	09T304-MW	.016		●		▲				▲									★			●		●							
	* 32.52MW	09T308-MW	.031		●		▲				▲									●			●		●							
	* 431MW	120404-MW	.016		●		▲				▲				●					●					●							
Medium Cutting	* 432MW	120408-MW	.031		●		▲				▲				●					●					●							

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

● : Inventory maintained. ○ : Inventory maintained. (Available Spring 2013)
★ : 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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
R/L SR	**CCET21.5V3RSR**	CCET0602V3R-SR	.0012														●		★								●			
	21.5V3LSR	0602V3L-SR	.0012														●		★								●			
	21.50.2RSR	060201R-SR	.004														●		★								●			
	21.50.2LSR	060201L-SR	.004														●		★								●			
	21.50.5RSR	060202R-SR	.008														●		★								●			
	21.50.5LSR	060202L-SR	.008														●		★								●			
	21.51RSR	060204R-SR	.016														●		★								●			C030 D008 D012 E012 E013
	21.51LSR	060204L-SR	.016														●		★								●			
	32.5V3RSR	09T3V3R-SR	.0012														●		★								●			
	32.5V3LSR	09T3V3L-SR	.0012														●		★								●			
	32.50.2RSR	09T301R-SR	.004														●		★								●			
	32.50.2LSR	09T301L-SR	.004														●		★								●			
	32.50.5RSR	09T302R-SR	.008														●		★								●			
	32.50.5LSR	09T302L-SR	.008														●		★								●			
	32.51RSR	09T304R-SR	.016														●		★								●			
Medium Cutting	**32.51LSR**	09T304L-SR	.016														●		★								●			
R/L SN	**CCET21.5V0RSN**	CCET060200R-SN	0														●		★								●			
	21.5V0LSN	060200L-SN	0														●		★								●			
	21.5V3RSN	0602V3R-SN	.0012														●		★								●			
	21.5V3LSN	0602V3L-SN	.0012														●		★								●			
	21.50.2RSN	060201R-SN	.004														●		★								●			
	21.50.2LSN	060201L-SN	.004														●		★								●			
	21.50.5RSN	060202R-SN	.008														●		★								●			
	21.50.5LSN	060202L-SN	.008														●		★								●			
	21.51RSN	060204R-SN	.016														●		★								●			C030 D008 D012 E012 E013
	21.51LSN	060204L-SN	.016														●		★								●			
	32.5V0RSN	09T300R-SN	0														●		★								●			
	32.5V0LSN	09T300L-SN	0														●		★								●			
	32.5V3RSN	09T3V3R-SN	.0012														●		★								●			
	32.5V3LSN	09T3V3L-SN	.0012														●		★								●			
	32.50.2RSN	09T301R-SN	.004														●		★								●			
	32.50.2LSN	09T301L-SN	.004														●		★								●			
	32.50.5RSN	09T302R-SN	.008														●		★								●			
	32.50.5LSN	09T302L-SN	.008														●		★								●			
	32.51RSN	09T304R-SN	.016														●		★								●			
Medium Cutting	**32.51LSN**	09T304L-SN	.016														●		★								●			

CHIP BREAKER ➤ A058
IDENTIFICATION ➤ A002

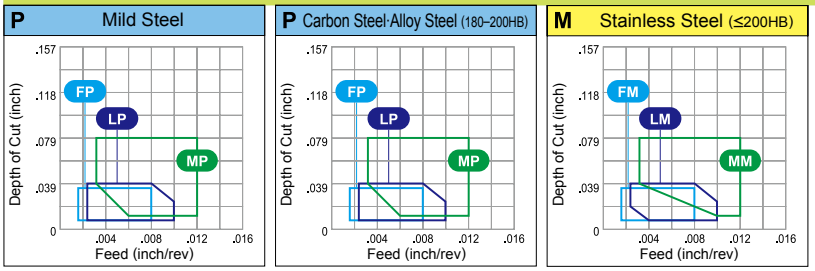
TURNING INSERTS [POSITIVE]

80° CC TYPE INSERTS WITH HOLE

CCGT 2 1.5 V3 RSN
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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
R/L SN	**CCGT21.5V3RSN**	CCGT0602V3R-SN	.0012															●												
	21.50.2RSN	060201R-SN	.004															●												
	21.50.2LSN	060201L-SN	.004															●												
	21.50.5RSN	060202R-SN	.008															●												
	21.50.5LSN	060202L-SN	.008															●												
	32.5V3RSN	09T3V3R-SN	.0012															●												C030 D008 D012 E012 E013
	32.5V3LSN	09T3V3L-SN	.0012															●												
	32.50.2RSN	09T301R-SN	.004															●												
	32.50.2LSN	09T301L-SN	.004															●												
	32.50.5RSN	09T302R-SN	.008															●												
	32.50.5LSN	09T302L-SN	.008															●												
	32.51RSN	09T304R-SN	.016															●												
Medium Cutting	**32.51LSN**	09T304L-SN	.016															●												
R/LW SN (With Wiper)	* **CCET21.5V3RWSN**	CCET0602V3RW-SN	.0012															●												C030 D008 D012 E012 E013
	* **21.5V3LWSN**	0602V3LW-SN	.0012															●												
	* **32.5V3RWSN**	09T3V3RW-SN	.0012															●												
Medium Cutting	* **32.5V3LWSN**	09T3V3LW-SN	.0012															●												
SMG	**CCGT21.50.5MSMG**	CCGT060202M-SMG	.008															●												C030 D008 D012 E012 E013
	21.51MSMG	060204M-SMG	.016															●												
Medium Cutting																														
Flat Top	**CCMW21.50.5**	CCMW060202	.008																									★		
	21.51	060204	.016											●	●											★		★		
	32.51	09T304	.016											●	●													★		C030 D008 D012 E012 E013
	32.52	09T308	.031											●	●											★		★		
	431	120404	.016											●	●													★		
	432	120408	.031											●	●													★		
	433	120412	.047											★																

*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			Coated														Cermet			Coated Cermet				Carbide					Applicable Holder Page
			UE6105	UE6110	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
	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)																											
Flat Top	**CCGW21.5V0**	CCGW060200	0																●											C030
	21.5V5	0602V5	.002																●											D008
	32.5V0	09T300	0																●											D012
	32.5V5	09T3V5	.002																●											E012
																														E013

POSI 7°
WITH HOLE
C
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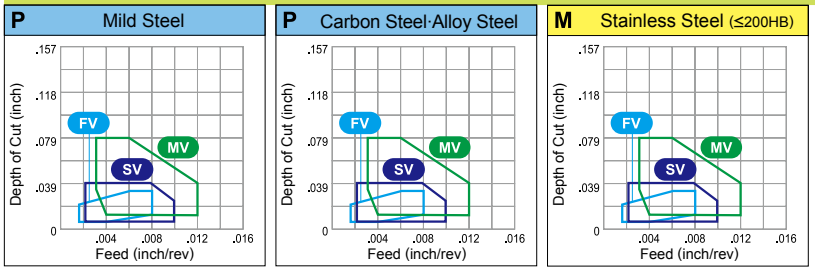
CHIP BREAKER ➤ A058
IDENTIFICATION ➤ A002

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 UE6105	UE6110	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet NX2525	NX3035	NX55	Coated Cermet MP3025	AP25N	VP25N	VP45N	Carbide UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
FV	**CPMH2.51.50.5FV**	CPMH080202-FV	.008			▲												●		●★			●									
	2.51.51FV	080204-FV	.016			▲												●		●★			●									
	320.5FV	090302-FV	.008			▲												●		●★			●									E006
	321FV	090304-FV	.016			▲												●		●★			●									
Finish Cutting	**322FV**	090308-FV	.031			▲												●		●★			●									
R/L F	**CPMH2.51.51RF**	CPMH080204R-F	.016															●		★									●			
	2.51.51LF	080204L-F	.016															●		★									●			
	321RF	090304R-F	.016															●		★									●			E006
Finish Cutting	**321LF**	090304L-F	.016															●		★				★					●			
R/L F	**CPGT2.51.51RF**	CPGT080204R-F	.016																	★												
	2.51.51LF	080204L-F	.016																	★												
	320.5RF	090302R-F	.008																	★												–
	320.5LF	090302L-F	.008																	★												
	321RF	090304R-F	.016																	★												
Finish Cutting	**321LF**	090304L-F	.016																	★												
SQ	**CPMT21.50.5SQ**	CPMT060202-SQ	.008								●																					
	21.51SQ	060204-SQ	.016	●							●																					
	21.52SQ	060208-SQ	.031								●																					
	32.50.5SQ	09T302-SQ	.008								●																					–
	32.51SQ	09T304-SQ	.016	●							●																					
Finish Cutting	**32.52SQ**	09T308-SQ	.031	●							●																					
Standard	**CPGT2.51.50.5**	CPGT080202	.008																										●			
	2.51.51	080204	.016																										●			
	320.5	090302	.008																										●			–
	321	090304	.016																										●			
Finish Cutting																																
SV	**CPMH2.51.50.5SV**	CPMH080202-SV	.008		●▲					▲●							★			★●			●		●							
	2.51.51SV	080204-SV	.016		●▲					▲●							★			★●			●		●							
	320.5SV	090302-SV	.008		●▲					▲●							★			★●			●		●							E006
	321SV	090304-SV	.016		●▲					▲●							★			★●			●		●							
Light Cutting	**322SV**	090308-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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
Standard	**CPMX2.51.51**	CPMX080204	.016	●														★												–
	**2.51.52**	080208	.031	●														★												
	321	090304	.016	●														★	★							★				
	322	090308	.031	●		▲												★								★				
Medium Cutting																														
MV	**CPMH2.51.51MV**	CPMH080204-MV	.016		●	▲				▲	●						●		★	●		●	●		●						
	**2.51.52MV**	080208-MV	.031		●	▲				▲	●						●		★	●		●	●		●						
	321MV	090304-MV	.016		●	▲				▲	●						●		★	●		●	●		●						E006
	322MV	090308-MV	.031		●	▲				▲	●						●		★	●		●	●		●						
Medium Cutting																														
MQ	**CPMT21.51MQ**	CPMT060204-MQ	.016	●							●											●									–
	**21.52MQ**	060208-MQ	.031	●							●											●									
	32.51MQ	09T304-MQ	.016	●							●											●									
	32.52MQ	09T308-MQ	.031	●							●											●									
Medium Cutting																														

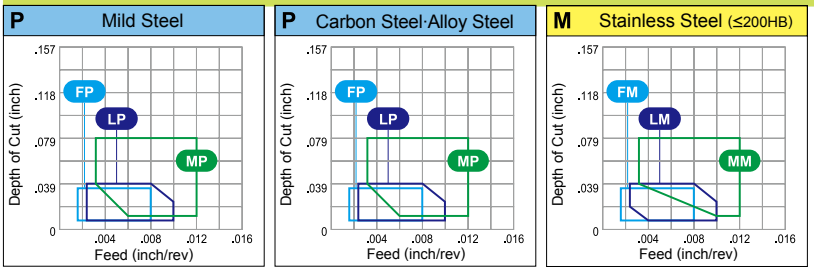
CHIP BREAKER ➤ A064
IDENTIFICATION ➤ A002

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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
NEW FP	DCMT21.50.5FP	DCMT070202-FP	.008	●	●															○			○								C031 C032 D009 D013 D040 E008 E013 E014
	21.51FP	070204-FP	.016	●	●															○			○								
	32.50.5FP	11T302-FP	.008	●	●															○			○								
	32.51FP	11T304-FP	.016	●	●															○			○								
Finish Cutting	32.52FP	11T308-FP	.031	●	●															○			○								
NEW FM	DCMT21.50.5FM	DCMT070202-FM	.008														●														C031 C032 D009 D013 D040 E008 E013 E014
	21.51FM	070204-FM	.016														●														
	32.50.5FM	11T302-FM	.008														●														
	32.51FM	11T304-FM	.016														●														
Finish Cutting	32.52FM	11T308-FM	.031														●														
FV	DCMT21.50.5FV	DCMT070202-FV	.008	★		▲											●			★	●		●								C031 C032 D009 D013 D040 E008 E013 E014
	21.51FV	070204-FV	.016	★		▲											●			★	●		●								
	32.52FV	070208-FV	.031			▲											●			●	★										
	32.50.5FV	11T302-FV	.008			▲											●			●	★										
	32.51FV	11T304-FV	.016	★		▲											●			★	●		●								
Finish Cutting	32.52FV	11T308-FV	.031	★		▲											●			★	●		●								
FJ	DCGT21.50.2FJ	DCGT070201-FJ	.004													●															C031 C032 D009 D013 D040 E008 E013 E014
	21.50.5FJ	070202-FJ	.008													●															
	21.5V5FJ	0702V5-FJ	.002													●															
	32.50.2FJ	11T301-FJ	.004													●															
	32.50.5FJ	11T302-FJ	.008													●															
Finish Cutting	32.5V5FJ	11T3V5-FJ	.002													●															
FJ-P	DCGT21.50.2FJ-P	DCGT070201-FJ-P	.004																											●	C031 C032 D009 D013 D040 E008 E013 E014
	21.50.5FJ-P	070202-FJ-P	.008																											●	
	21.5V5FJ-P	0702V5-FJ-P	.002																											●	
	32.50.2FJ-P	11T301-FJ-P	.004																											●	
	32.50.5FJ-P	11T302-FJ-P	.008																											●	
Finish Cutting	32.5V5FJ-P	11T3V5-FJ-P	.002																											●	

● : Inventory maintained. ○ : Inventory maintained. (Available Spring 2013)
★ : 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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
AZ	**DCGT21.50.5AZ**	DCGT070202-AZ	.008														●										●			C031
	21.51AZ	070204-AZ	.016														●										●			C032 D009
	32.50.5AZ	11T302-AZ	.008														●										●			D013 D040
	32.51AZ	11T304-AZ	.016														●										●			E008 E013
Finish Cutting	**32.52AZ**	11T308-AZ	.031														●										●			E014
R/L F	**DCGT21.50.5RF**	DCGT070202R-F	.008														●		★								●			
	21.50.5LF	070202L-F	.008														●		★				●				●			C031
	21.51RF	070204R-F	.016														●		★								●			C032 D009
	21.51LF	070204L-F	.016														●		★				●				●			D013
	32.50.5RF	11T302R-F	.008														●		★								●			D040
	32.50.5LF	11T302L-F	.008														●		★				●				●			E008
	32.51RF	11T304R-F	.016														●		★								●			E013
Finish Cutting	**32.51LF**	11T304L-F	.016														●		★				●				●			E014
NEW **LP**	**DCMT21.51LP**	DCMT070204-LP	.016	●	●														○			○								C031
	21.52LP	070208-LP	.031	●	●														○			○								C032 D009
	32.51LP	11T304-LP	.016	●	●														○			○								D013 D040
	32.52LP	11T308-LP	.031	●	●														○			○								E008
Light Cutting																														E013 E014
NEW **LM**	**DCMT21.51LM**	DCMT070204-LM	.016						●	○							●													C031
	21.52LM	070208-LM	.031						●	○							●													C032 D009
	32.51LM	11T304-LM	.016						●	○							●													D013 D040
	32.52LM	11T308-LM	.031						●	○							●													E008
Light Cutting																														E013 E014
SV	**DCMT21.50.5SV**	DCMT070202-SV	.008			▲				▲	●						●		★	●					●					C031
	21.51SV	070204-SV	.016	★		▲				▲	●						●		★	●					●					C032 D009
	21.52SV	070208-SV	.031	★		▲				▲	●						●		★	●					●					D013
	32.50.5SV	11T302-SV	.008	★		▲				▲	●						●		★	●					●					D040 E008
	32.51SV	11T304-SV	.016	★		▲				▲	●						●		★	●					●					E013
Light Cutting	**32.52SV**	11T308-SV	.031	★		▲				▲	●						●		★	●					★					E014
R/L SS	**DCGT21.5V3RSS**	DCGT0702V3R-SS	.0012														●													
	21.5V3LSS	0702V3L-SS	.0012														●													
	21.50.2RSS	070201R-SS	.004														●													C031
	21.50.2LSS	070201L-SS	.004														●													C032 D009
	21.50.5RSS	070202R-SS	.008														●													D013 D040
	21.50.5LSS	070202L-SS	.008														●													E008
	32.5V3RSS	11T3V3R-SS	.0012														●													E013
	32.50.2RSS	11T301R-SS	.004														●													E014
Light Cutting	**32.50.5RSS**	11T302R-SS	.008														●													

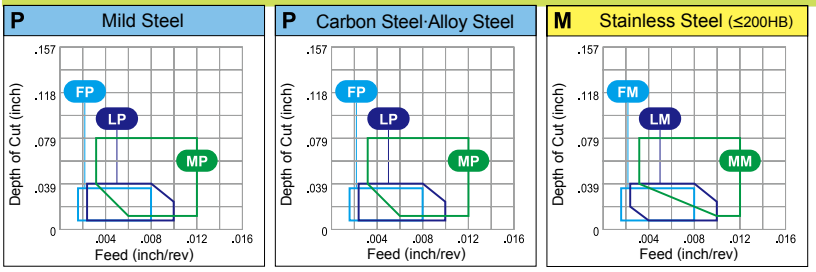
CHIP BREAKER ➤ A058
IDENTIFICATION ➤ A002

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												Cermet			Coated Cermet				Carbide					Applicable Holder Page
				UE6105	UE6110	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
MJ	**DCGT21.51MJ**	DCGT070204-MJ	.016														●													C031 C032 D009 D013 D040 E008 E013 E014
	32.51MJ	11T304-MJ	.016														●													
	32.52MJ	11T308-MJ	.031														●													
Light Cutting																														
MJ-P	**DCGT21.51MJ-P**	DCGT070204-MJ-P	.016																										●	C031 C032 D009 D013 D040 E008 E013 E014
	32.51MJ-P	11T304-MJ-P	.016																										●	
	32.52MJ-P	11T308-MJ-P	.031																										●	
Light Cutting																														
NEW **MP**	**DCMT21.51MP**	DCMT070204-MP	.016		●	●													○			○								C031 C032 D009 D013 D040 E008 E013 E014
	21.52MP	070208-MP	.031		●	●													○			○								
	32.51MP	11T304-MP	.016		●	●													○			○								
	32.52MP	11T308-MP	.031		●	●													○			○								
	431MP	150404-MP	.016		●	●													○			○								
	432MP	150408-MP	.031		●	●													○			○								
Medium Cutting																														
NEW **MM**	**DCMT21.51MM**	DCMT070204-MM	.016						●	○							●													C031 C032 D009 D013 D040 E008 E013 E014
	21.52MM	070208-MM	.031						●	○							●													
	32.51MM	11T304-MM	.016						●	○							●													
	32.52MM	11T308-MM	.031						●	○							●													
	431MM	150404-MM	.016						●	○							●													
	432MM	150408-MM	.031						●	○							●													
Medium Cutting																														
Standard	**DCMT21.50.5**	DCMT070202	.008		●		▲					●							★	●		●	●			★		▲			C031 C032 D009 D013 D040 E008 E013 E014
	21.51	070204	.016	●	●		▲					●		★			●		★	●		●	●			★		▲			
	21.52	070208	.031		★							★		●					★	●		●	●								
	32.50.5	11T302	.008		●		▲					●							★	●		●	●			★		▲			
	32.51	11T304	.016	●	●		▲					●		●			●		★	●		●	●			★		●			
	32.52	11T308	.031	●	●		▲					●		●			●		★	●		●	●			★					
	32.53	11T312	.047		★																									
	431	150404	.016		●		▲					●		★					★	●		●	★			★					
	432	150408	.031		●		▲					●		★					★	●		●				★					
	433	150412	.047		★																									
Medium Cutting																														

● : Inventory maintained. ○ : Inventory maintained. (Available Spring 2013)
★ : 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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
MV	**DCMT21.50.5MV**	DCMT070202-MV	.008	★	●	▲				▲	●						●			★	●		●	●		●					C031
	21.51MV	070204-MV	.016	★	●	▲				▲	●						●			★	●		●	●		★					C032
	21.52MV	070208-MV	.031	★	●	▲				▲	●						●			★	●		●	●		★					D009
	32.50.5MV	11T302-MV	.008	★	●	▲				▲	●						●			★	●		●	●		●					D013
	32.51MV	11T304-MV	.016	★	●	▲				▲	●						●			★	●		●	●		●					D040
	32.52MV	11T308-MV	.031	★	●	▲				▲	●						●			★	●		●	●		★					E008
Medium Cutting																															E013
																															E014
R/L SR	**DCET21.5V3RSR**	DCET0702V3R-SR	.0012														●			★								●			
	21.5V3LSR	0702V3L-SR	.0012														●			★								●			
	21.50.2RSR	070201R-SR	.004														●			★								●			
	21.50.2LSR	070201L-SR	.004														●			★								●			
	21.50.5RSR	070202R-SR	.008														●			★								●			
	21.50.5LSR	070202L-SR	.008														●			★								●			
	21.51RSR	070204R-SR	.016														●			★								●			
	21.51LSR	070204L-SR	.016														●			★								●			
	32.5V3RSR	11T3V3R-SR	.0012														●			★								●			
	32.5V3LSR	11T3V3L-SR	.0012														●			★								●			
	32.50.2RSR	11T301R-SR	.004														●			★								●			
	32.50.2LSR	11T301L-SR	.004														●			★								●			
	32.50.5RSR	11T302R-SR	.008														●			★								●			
	32.50.5LSR	11T302L-SR	.008														●			★								●			
	32.51RSR	11T304R-SR	.016														●			★								●			
Medium Cutting	**32.51LSR**	11T304L-SR	.016														●			★								●			
R/L SN	**DCET21.5V0RSN**	DCET070200R-SN	0														●			★								●			
	21.5V0LSN	070200L-SN	0														●			★								●			
	21.5V3RSN	0702V3R-SN	.0012														●			★								●			
	21.5V3LSN	0702V3L-SN	.0012														●			★								●			
	21.50.2RSN	070201R-SN	.004														●			★								●			
	21.50.2LSN	070201L-SN	.004														●			★								●			
	21.50.5RSN	070202R-SN	.008														●			★								●			
	21.50.5LSN	070202L-SN	.008														●			★								●			
	21.51RSN	070204R-SN	.016														●			★								●			
	21.51LSN	070204L-SN	.016														●			★								●			
	32.5V0RSN	11T300R-SN	0														●			★								●			
	32.5V0LSN	11T300L-SN	0														●			★								●			
	32.5V3RSN	11T3V3R-SN	.0012														●			★								●			
	32.5V3LSN	11T3V3L-SN	.0012														●			★								●			
	32.50.2RSN	11T301R-SN	.004														●			★								●			
	32.50.2LSN	11T301L-SN	.004														●			★								●			
	32.50.5RSN	11T302R-SN	.008														●			★								●			
	32.50.5LSN	11T302L-SN	.008														●			★								●			
	32.51RSN	11T304R-SN	.016														●			★								●			
Medium Cutting	**32.51LSN**	11T304L-SN	.016														●			★								●			

CHIP BREAKER ➤ A058
IDENTIFICATION ➤ A002

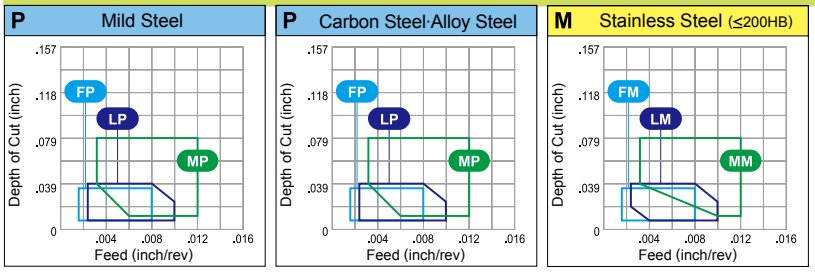
TURNING INSERTS [POSITIVE]

55° DC TYPE INSERTS WITH HOLE

DCGT 2 1.5 V3 RSN
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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	NX55	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
R/L SN	**DCGT21.5V3RSN**	DCGT0702V3R-SN	.0012															●														
	21.50.2RSN	070201R-SN	.004															●														
	21.50.5RSN	070202R-SN	.008															●														
	21.50.5LSN	070202L-SN	.008															●														
	32.5V3RSN	11T3V3R-SN	.0012															●														
	32.5V3LSN	11T3V3L-SN	.0012															●														
	32.50.2RSN	11T301R-SN	.004															●														
	32.50.2LSN	11T301L-SN	.004															●														
	32.50.5RSN	11T302R-SN	.008															●														
	32.50.5LSN	11T302L-SN	.008															●														
	32.51RSN	11T304R-SN	.016															●														
Medium Cutting	**32.51LSN**	11T304L-SN	.016															●														
R/LW SN (With Wiper)	* **DCET21.5V3RWSN**	DCET0702V3RW-SN	.0012															●														
	* **21.5V3LWSN**	0702V3LW-SN	.0012															●														
	* **32.5V3RWSN**	11T3V3RW-SN	.0012															●														
Medium Cutting	* **32.5V3LWSN**	11T3V3LW-SN	.0012															●														
SMG	**DCGT21.50.5MSMG**	DCGT070202M-SMG	.008															●														
	21.51MSMG	070204M-SMG	.016															●														
	32.50.5MSMG	11T302M-SMG	.008															●														
Medium Cutting	**32.51MSMG**	11T304M-SMG	.016															●														
Flat Top	**DCMW21.51**	DCMW070204	.016											★	★														★			
	32.51	11T304	.016											★	★												●		★			
	32.52	11T308	.031											★	★														★			
	431	150404	.016																										★			
	432	150408	.031																										★			
Flat Top	**DCGW21.5V0**	DCGW070200	0																	★												
	21.5V5	0702V5	.002																	★												
	32.5V0	11T300	0																	★												
	32.5V5	11T3V5	.002																	★												

Applicable Holder Page: C031 C032 D009 D013 D040 E008 E013 E014

*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>

CHIP BREAKER ➤ A058

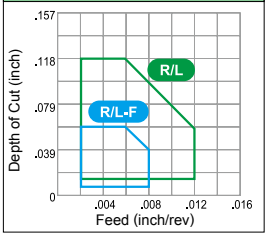
55° DE TYPE INSERTS WITH HOLE

DEGX 4 3 0.5 RF
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

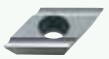
Finish Cutting Medium Cutting

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													Cermet			Coated Cermet				Carbide					Applicable Holder Page
				UE6105	UE6110	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
R/L F	**DEGX430.5RF**	DEGX150402R-F	.008																								★			
	**430.5LF**	150402L-F	.008																								★			
	431RF	150404R-F	.016																								★			C041
	431LF	150404L-F	.016																								★			
Finish Cutting																														
R/L	**DEGX430.5R**	DEGX150402R	.008																								●			
	**430.5L**	150402L	.008																								●			
	431R	150404R	.016																								●			C041
	431L	150404L	.016																								●			
Medium Cutting	**432R**	150408R	.031																								●			

CHIP BREAKER ➤ A068
IDENTIFICATION ➤ A002

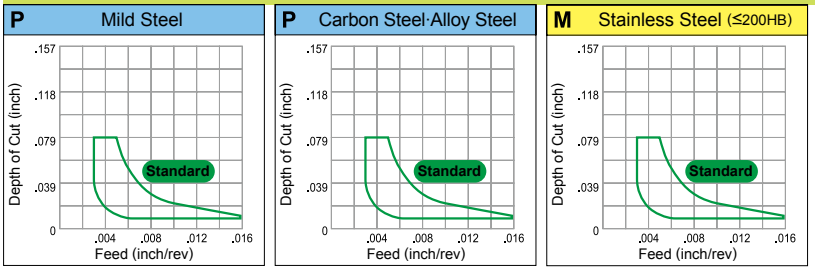
TURNING INSERTS [POSITIVE]

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



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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet NX2525	NX3035	NX55	Coated Cermet MP3025	AP25N	VP25N	VP45N	Carbide UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
AZ	**RCGT0803M0-AZ**	RCGT0803M0-AZ	–																										●			
	10T3M0-AZ	10T3M0-AZ	–																										●			C033
Finish Cutting																																
Standard	**RCMT0602M0**	RCMT0602M0	–		●															★	●		●				★					
	0803M0	0803M0	–		●							★								★	●		●				★					C033
Medium Cutting																																
Standard	**RCMX1003M0**	RCMX1003M0	–		●		▲					★				★				★	★		●									
	1204M0	1204M0	–	●	●		▲					●	★		★	★	★			★	●		●									
	1606M0	1606M0	–	★	●		▲	★				★	★			★	★															
	2006M0	2006M0	–	★	●		▲	★				★																				H012
	2507M0	2507M0	–	★	★		▲																									
Medium Cutting	**3209M0**	3209M0	–	★	★		▲																									
RR	**RCMX1606M0-RR**	RCMX1606M0-RR	–		★		▲	★				★																				
	2006M0-RR	2006M0-RR	–		★		▲	★				★																				
	2507M0-RR	2507M0-RR	–		★		▲	★				★																				–
Heavy Cutting	**3209M0-RR**	3209M0-RR	–		★		▲																									

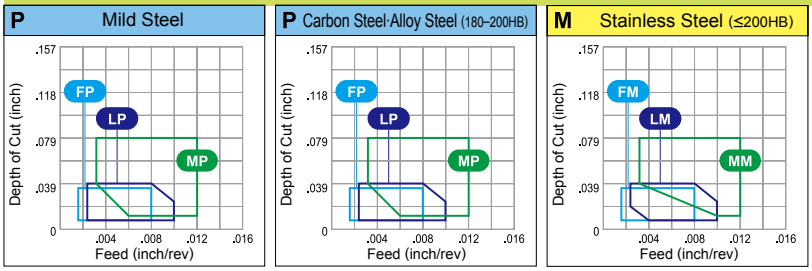
● : Inventory maintained. ○ : Inventory maintained. (Available Spring 2013)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
NEW FP	**SCMT32.51FP**	SCMT09T304-FP	.016	●	●															○			○								
	32.52FP	09T308-FP	.031	●	●															○			○								
Finish Cutting																															C034 E015
NEW FM	**SCMT32.51FM**	SCMT09T304-FM	.016														●														
	32.52FM	09T308-FM	.031														●														
Finish Cutting																															C034 E015
FV	**SCMT32.51FV**	SCMT09T304-FV	.016			▲														★	●			●		★						
Finish Cutting																															C034 E015
NEW LP	**SCMT32.51LP**	SCMT09T304-LP	.016	●	●															○			○								
	32.52LP	09T308-LP	.031	●	●															○			○								
Light Cutting																															C034 E015
NEW LM	**SCMT32.51LM**	SCMT09T304-LM	.016						●	○							●														
	32.52LM	09T308-LM	.031						●	○							●														
Light Cutting																															C034 E015
NEW MP	**SCMT32.51MP**	SCMT09T304-MP	.016	●	●															○			○								
	32.52MP	09T308-MP	.031	●	●															○			○								
	431MP	120404-MP	.016	●	●															○			○								
	432MP	120408-MP	.031	●	●															○			○								
Medium Cutting																															C034 E015

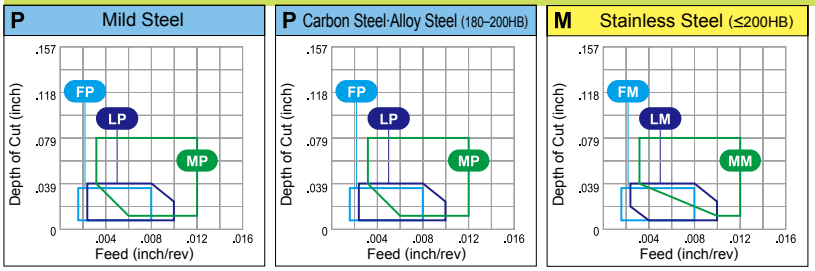
CHIP BREAKER ➤ A058
IDENTIFICATION ➤ A002

90° SC TYPE INSERTS WITH HOLE

SCMT 3 2.5 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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	NX55	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
NEW MM	SCMT32.51MM	SCMT09T304-MM	.016						●	○								●														
	32.52MM	09T308-MM	.031						●	○								●														
	431MM	120404-MM	.016						●	○								●														
	432MM	120408-MM	.031						●	○								●														
Medium Cutting																																C034 E015
Standard	SCMT32.51	SCMT09T304	.016	★	●		▲					●		●						★	●		●	●			●					
	32.52	09T308	.031	●	●		▲					●		●						★	●		●	●			★					
	431	120404	.016	★	●		▲					●		★						★	●		●									
	432	120408	.031	●	●		▲					●		★						★	●		●	●			★					
	433	120412	.047		★																											
Medium Cutting																																C034 E015
Flat Top	SCMW32.51	SCMW09T304	.016											★													★		★			
	32.52	09T308	.031											★	★																	
	432	120408	.031											★	★																	
																																C034 E015

● : Inventory maintained. ○ : Inventory maintained. (Available Spring 2013)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

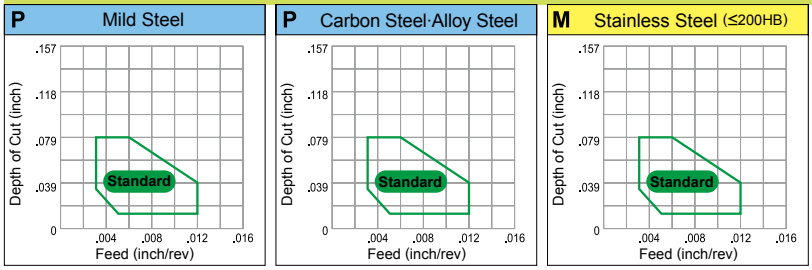
CHIP BREAKER ➤ A058

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												Cermet		Coated Cermet			Carbide					Applicable Holder Page
				UE6105	UE6110	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
Standard	**SPMT321**	SPMT090304	.016																	★										
	322	090304	.031																	★										
	**422**	120308	.031																	★							★				–
Medium Cutting																															
Flat Top	**SPMW321**	SPMW090304	.016														●	★		★							★		★			
	322	090308	.031														★	★		★							★		★			
	**421**	120304	.016														●	●		★							●		●			–
	422	120308	.031														●	●		★							●		●			
Flat Top	**SPGX321**	SPGX090304	.016																	★									★			
	322	090308	.031																										★			
	**421**	120304	.016																										★			–
	422	120308	.031																										★			

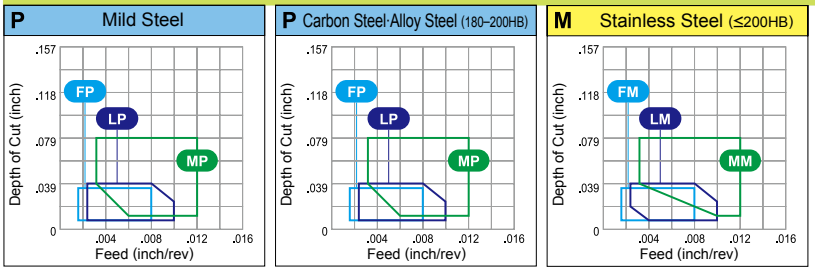
CHIP BREAKER ➤ A064
IDENTIFICATION ➤ A002

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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
NEW FP	TCMT1.81.50.5FP	TCMT090202-FP	.008	●	●															○			○								
	1.81.51FP	090204-FP	.016	●	●															○			○								C035 E015 E016
	21.50.5FP	110202-FP	.008	●	●															○			○								
	21.51FP	110204-FP	.016	●	●															○			○								
Finish Cutting	32.51FP	16T304-FP	.016	●	●															○			○								
NEW FM	TCMT1.81.50.5FM	TCMT090202-FM	.008														●														
	1.81.51FM	090204-FM	.016														●														C035 E015 E016
	21.50.5FM	110202-FM	.008														●														
	21.51FM	110204-FM	.016														●														
Finish Cutting	32.51FM	16T304-FM	.016														●														
FV	TCMT21.51FV	TCMT110204-FV	.016				▲													★	●			●		★						
	32.51FV	16T304-FV	.016				▲													★	●			●								C035 E015 E016
Finish Cutting																																
FJ	TCGT21.50.2FJ	TCGT110201-FJ	.004														●														
	21.50.5FJ	110202-FJ	.008														●														
	21.5V5FJ	1102V5-FJ	.002														●														C035 E015 E016
	32.50.2FJ	16T301-FJ	.004														●														
	32.50.5FJ	16T302-FJ	.008														●														
Finish Cutting	32.5V5FJ	16T3V5-FJ	.002														●														
FJ-P	TCGT21.5V5FJ-P	TCGT1102V5-FJ-P	.002																											●	
	21.50.2FJ-P	110201-FJ-P	.004																											●	
	21.50.5FJ-P	110202-FJ-P	.008																											●	C035 E015 E016
	32.5V5FJ-P	16T3V5-FJ-P	.002																											●	
	32.50.2FJ-P	16T301-FJ-P	.004																											●	
Finish Cutting	32.50.5FJ-P	16T302-FJ-P	.008																											●	

● : Inventory maintained. ○ : Inventory maintained. (Available Spring 2013)
★ : 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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
AZ	**TCGT21.50.5AZ**	TCGT110202-AZ	.008																								●			
	21.51AZ	110204-AZ	.016																								●			
	**21.52AZ**	110208-AZ	.031																								●			C035 E015 E016
	32.50.5AZ	16T302-AZ	.008																								●			
	32.51AZ	16T304-AZ	.016																								●			
Finish Cutting	**32.52AZ**	16T308-AZ	.031																								●			
R/L F	**TCGT1.21V3LF**	TCGT0601V3L-F	.0012																★											
	1.210.2LF	060101L-F	.004														●		★											
	**1.210.5RF**	060102R-F	.008														★		★									★			–
	1.210.5LF	060102L-F	.008														●		★									●			
	1.211RF	060104R-F	.016																★									★			
Finish Cutting	**1.211LF**	060104L-F	.016														●		★									●			
NEW **LP**	**TCMT1.81.51LP**	TCMT090204-LP	.016	●	●														○		○										
	1.81.52LP	090208-LP	.031	●	●														○		○										
	**21.51LP**	110204-LP	.016	●	●														○		○										C035 E015 E016
	21.52LP	110208-LP	.031	●	●														○		○										
	32.51LP	16T304-LP	.016	●	●														○		○										
Light Cutting	**32.52LP**	16T308-LP	.031	●	●														○		○										
NEW **LM**	**TCMT1.81.51LM**	TCMT090204-LM	.016						●	○							●														
	1.81.52LM	090208-LM	.031						●	○							●														
	**21.51LM**	110204-LM	.016						●	○							●														C035 E015 E016
	21.52LM	110208-LM	.031						●	○							●														
	32.51LM	16T304-LM	.016						●	○							●														
Light Cutting	**32.52LM**	16T308-LM	.031						●	○							●														
MJ	**TCGT21.51MJ**	TCGT110204-MJ	.016													●														
	32.51MJ	16T304-MJ	.016													●														
	**32.52MJ**	16T308-MJ	.031													●														C035 E015 E016
Light Cutting																															
MJ-P	**TCGT21.51MJ-P**	TCGT110204-MJ-P	.016																										●		
	32.51MJ-P	16T304-MJ-P	.016																										●		
	**32.52MJ-P**	16T308-MJ-P	.031																										●		C035 E015 E016
Light Cutting																															
NEW **MP**	**TCMT1.81.51MP**	TCMT090204-MP	.016	●	●														○		○										
	1.81.52MP	090208-MP	.031	●	●														○		○										
	21.51MP	110204-MP	.016	●	●														○		○										
	**21.52MP**	110208-MP	.031	●	●														○		○										C035 E015 E016
	2.521MP	130304-MP	.016	●	●														○		○										
	32.51MP	16T304-MP	.016	●	●														○		○										
	32.52MP	16T308-MP	.031	●	●														○		○										
Medium Cutting	**32.53MP**	16T312-MP	.047	●	●														○		○										

CHIP BREAKER ➤ A058
IDENTIFICATION ➤ A002

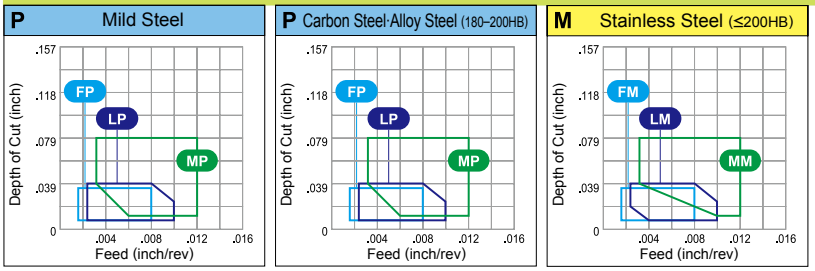
TURNING INSERTS [POSITIVE]

60° TC TYPE INSERTS WITH HOLE

TCMT 1.8 1.5 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												Cermet			Coated Cermet				Carbide					Applicable Holder Page
				UE6105	UE6110	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
NEW MM	TCMT1.81.51MM	TCMT090204-MM	.016						●	○								●												
	1.81.52MM	090208-MM	.031						●	○								●												
	21.51MM	110204-MM	.016						●	○								●												
	21.52MM	110208-MM	.031						●	○								●												C035 E015 E016
	2.521MM	130304-MM	.016						●	○								●												
	32.51MM	16T304-MM	.016						●	○								●												
	32.52MM	16T308-MM	.031						●	○								●												
Medium Cutting	32.53MM	16T312-MM	.047						●	○								●												
Standard	TCMT1.51.51	TCMT080204	.016																	●		●				★				
	1.81.51	090204	.016		●		▲					★								★	●		●	●		★		●		
	21.50.5	110202	.008		●		▲					●						●		★	●		●	●		★				
	21.51	110204	.016	●	●		▲					●			★			●		★	●		●	●		●		●		
	21.52	110208	.031	●	●													●					●							C035 E015 E016
	2.520.5	130302	.008																				●	●						
	2.521	130304	.016		●							●									●		●							
	32.51	16T304	.016	●	●		▲					●			●			●		★	●		●	●		●		●		
	32.52	16T308	.031	●	●		▲					●			●			●		★	●		●	●		●		●		
Medium Cutting	32.53	16T312	.047		★																									
Flat Top	TCMW21.51	TCMW110204	.016												★	★												★		
	2.521	130304	.016																									★		C035 E015 E016
	32.51	16T304	.016												●	●												★		
	32.52	16T308	.031												●	●												★		

● : Inventory maintained. ○ : Inventory maintained. (Available Spring 2013)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

CHIP BREAKER ➤ A058

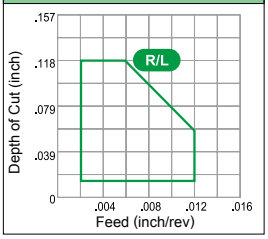
60° TE TYPE INSERTS WITH HOLE

TEGX 3 2 0.5 R
Size Thickness Corner Radius Chip Breaker
*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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet NX2525	NX3035	NX55	Coated Cermet MP3025	AP25N	VP25N	VP45N	Carbide UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
R/L	**TEGX320.5R**	TEGX160302R	.008																										●			
	**320.5L**	160302L	.008																										●			C042 E028
	321R	160304R	.016																										●			
Medium Cutting	**321L**	160304L	.016																										●			

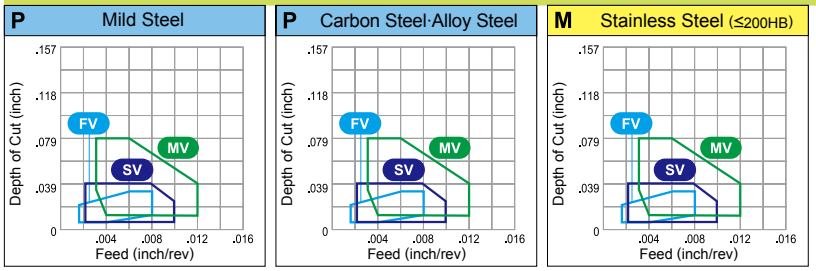
CHIP BREAKER ➤ A068
IDENTIFICATION ➤ A002

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: UE6105	UE6110	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	NX55	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
FV	TPMH1.51.50.5FV	TPMH080202-FV	.008				▲											●		●	★		●									E007
	1.51.51FV	080204-FV	.016				▲											●		●	★		●									
	1.81.50.5FV	090202-FV	.008				▲											●		●	★		●									
	1.81.51FV	090204-FV	.016				▲											●		●	★		●									
	220.5FV	110302-FV	.008				▲											●		●	★		●									
	221FV	110304-FV	.016				▲											●		●	★		●									
	222FV	110308-FV	.031				▲											●		●	★		●									
	320.5FV	160302-FV	.008				▲											●		●	★		●									
	321FV	160304-FV	.016				▲											●		●	★		●									
Finish Cutting	322FV	160308-FV	.031				▲											●		●	★		●									
R/L FS	TPGH1.51.50.5RFS	TPGH080202R-FS	.008															●			★								●			E007
	1.51.50.5LFS	080202L-FS	.008															●			★		●	★					●			
	1.51.51RFS	080204R-FS	.016															●			★								●			
	1.51.51LFS	080204L-FS	.016															●			★		●	★					●			
	1.81.50.5RFS	090202R-FS	.008															●			★								●			
	1.81.50.5LFS	090202L-FS	.008															●			★		●	★					●			
	1.81.51RFS	090204R-FS	.016															●			★								●			
	1.81.51LFS	090204L-FS	.016															●			★		●	★					●			
	220.5RFS	110302R-FS	.008															●			★								●			
	220.5LFS	110302L-FS	.008															●			★		●	★					●			
	221RFS	110304R-FS	.016															●			★								●			
	221LFS	110304L-FS	.016															●			★		●	★					●			
	321RFS	160304R-FS	.016															●			★								●			
	321LFS	160304L-FS	.016															●			★		●						●			
	322RFS	160308R-FS	.031															●			★								●			
Finish Cutting	322LFS	160308L-FS	.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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
SQ	**TPMT1.81.51SQ**	TPMT090204-SQ	.016								●																			
	21.50.5SQ	110202-SQ	.008	●							●																			
	21.51SQ	110204-SQ	.016	●							●																			
	21.52SQ	110208-SQ	.031	●							●																			
	32.51SQ	16T304-SQ	.016								●																			
	32.52SQ	16T308-SQ	.031								●																			
Finish Cutting																														–
R/L	**TPGX1.51.50.5R**	TPGX080202R	.008																★											
	1.51.50.5L	080202L	.008																★							★		●		
	1.51.51R	080204R	.016																★									★		
	1.51.51L	080204L	.016															★	★							★		●		
	1.81.50.5R	090202R	.008																★											
	1.81.50.5L	090202L	.008																★							★		●		
	1.81.51R	090204R	.016																★									●		
	1.81.51L	090204L	.016															★	★							★		●		E007
	1.81.52R	090208R	.031																									★		
	1.81.52L	090208L	.031																★									★		
	220.5L	110302L	.008																★							★		★		
	221R	110304R	.016															★	★									★		
	221L	110304L	.016															★	★							★		★		
	222R	110308R	.031																★									★		
Finish Cutting	**222L**	110308L	.031															★	★							★	★	●		
L	**TPMX1.81.51L**	TPMX090204L	.016																★											
	221L	110304L	.016																★											
Finish Cutting																														E007
SV	**TPMH1.51.50.5SV**	TPMH080202-SV	.008		●▲					▲●							★		★●			●								
	1.51.51SV	080204-SV	.016		●▲					▲●							★		★●			●			●					
	1.81.50.5SV	090202-SV	.008		●▲					▲●							★		★●			●								
	1.81.51SV	090204-SV	.016		●▲					▲●							★		★●			●			●					
	220.5SV	110302-SV	.008		●▲					▲●							★		★●			●			●					
	221SV	110304-SV	.016		●▲					▲●							★		★●			●			●					
	222SV	110308-SV	.031		●▲					▲●							★		★●			●			●					
	320.5SV	160302-SV	.008		●▲					▲●							★		★★			●			★					
	321SV	160304-SV	.016		●▲					▲●							★		★★			●			★					
Light Cutting	**322SV**	160308-SV	.031		●▲					▲●							★		★★			●			●					E007
Standard	**TPMX221**	TPMX110304	.016																★●			●								
	222	110308	.031																★●			●								
Medium Cutting																														E007

CHIP BREAKER ➤ A064
IDENTIFICATION ➤ A002

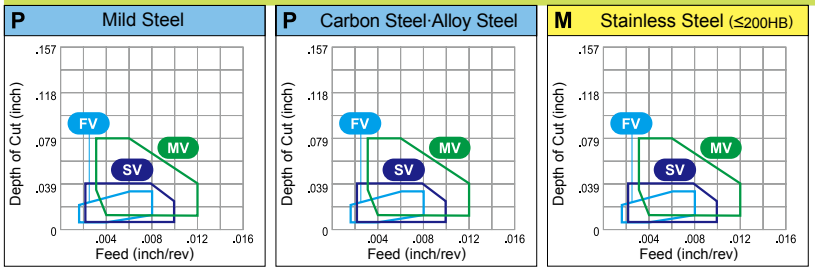
TURNING INSERTS [POSITIVE]

60° TP TYPE INSERTS WITH HOLE

TPMH 1.5 1.5 0.5 MV
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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	NX55	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
MV	TPMH1.51.50.5MV	TPMH080202-MV	.008			●	▲				▲	●						●		★	●		●									
	1.51.51MV	080204-MV	.016			●	▲				▲	●						●		★	●		●	●		●						
	1.81.50.5MV	090202-MV	.008			●	▲				▲	●						●		★	●		●									
	1.81.51MV	090204-MV	.016			●	▲				▲	●						●		★	●		●	●		●						
	1.81.52MV	090208-MV	.031			●	▲											●			●		●									
	220.5MV	110302-MV	.008			●	▲				▲	●						★		★	●		●	●		★						E007
	221MV	110304-MV	.016			●	▲				▲	●						●		★	●		●	●		●						
	222MV	110308-MV	.031			●	▲				▲	●						●		★	●		●	●		●						
	321MV	160304-MV	.016			●	▲				▲	●						●		★	★		●	●		★						
Medium Cutting	322MV	160308-MV	.031			●	▲				▲	●						●		★	★		●	●		●						
MQ	TPMT21.51MQ	TPMT110204-MQ	.016	●							●																					
	21.52MQ	110208-MQ	.031	●							●												●									
	32.51MQ	16T304-MQ	.016	●							●																					–
	32.52MQ	16T308-MQ	.031	●							●																					
Medium Cutting																																
Flat Top	TPGX1.51.50.5	TPGX080202	.008																								●		●			
	1.51.51	080204	.016															★	★	★							●		●			
	1.51.52	080208	.031																	★							●		★			
	1.81.50.5	090202	.008																										●			
	1.81.51	090204	.016																★	★							●		●			
	1.81.52	090208	.031																★	★							●		●			E007
	220.5	110302	.008																										●			
	221	110304	.016															★	★	★							●	★	●			
	222	110308	.031																★	★							●	★	●			
	321	160304	.016																	★							★		●			
	322	160308	.031																								★		●			

● : Inventory maintained. ○ : Inventory maintained. (Available Spring 2013)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

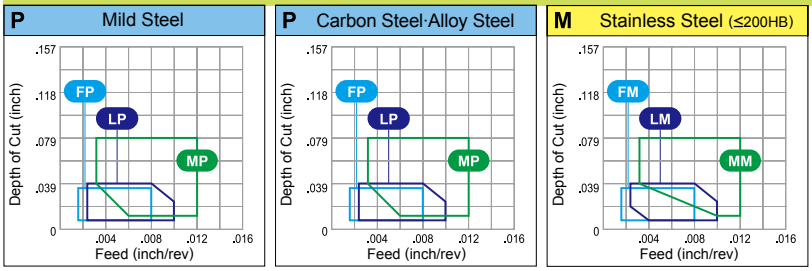
CHIP BREAKER ➤ A064

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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
NEW FP	**VBMT220.5FP**	VBMT110302-FP	.008	●	●															○			○								C028 C029 D010 D011 D014 D015 E009 E010 H013
	**221FP**	110304-FP	.016	●	●															○			○								
	222FP	110308-FP	.031	●	●															○			○								
	331FP	160404-FP	.016	●	●															○			○								
Finish Cutting	**332FP**	160408-FP	.031	●	●															○			○								
NEW FM	**VBMT220.5FM**	VBMT110302-FM	.008														●														C028 C029 D010 D011 D014 D015 E009 E010 H013
	**221FM**	110304-FM	.016														●														
	222FM	110308-FM	.031														●														
	331FM	160404-FM	.016														●														
Finish Cutting	**332FM**	160408-FM	.031														●														
FV	**VBMT221FV**	VBMT110304-FV	.016			▲											●			● ★											C028 C029 D010 D011 D014 D015 E009 E010 H013
	**222FV**	110308-FV	.031			▲											●			● ★											
	331FV	160404-FV	.016			▲											●			● ★											
Finish Cutting	**332FV**	160408-FV	.031			▲											●			● ★											
FJ	**VBGT33V5FJ**	VBGT1604V5-FJ	.002														●														
	**330.2FJ**	160401-FJ	.004														●														C028 C029 H013
	330.5FJ	160402-FJ	.008														●														
Finish Cutting																															
FJ-P	**VBGT33V5FJ-P**	VBGT1604V5-FJ-P	.002																											●	
	**330.2FJ-P**	160401-FJ-P	.004																											●	C028 C029 H013
	330.5FJ-P	160402-FJ-P	.008																											●	
Finish Cutting																															

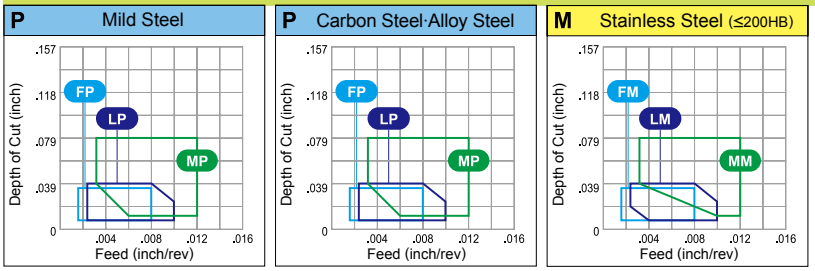
CHIP BREAKER ➤ A052
IDENTIFICATION ➤ A002

35° VB TYPE INSERTS WITH HOLE

VBGT 2 2 0.5 RF
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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	Cermet: NX2525	NX3035	NX55	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	Applicable Holder Page
R/L F	VBGT220.5RF	VBGT110302R-F	.008															●		★			●	★					●			
	220.5LF	110302L-F	.008															●		★			●	★					●			C028
	221RF	110304R-F	.016															●		★				★					●			C029 D010
	221LF	110304L-F	.016															●		★				★					●			D011
	330.5RF	160402R-F	.008															★		★				★					★			D014
	330.5LF	160402L-F	.008															★		★				★					★			D015 E009
	331RF	160404R-F	.016															★		★				★					★			E010
Finish Cutting	331LF	160404L-F	.016															★		★				★					★			
NEW LP	VBMT221LP	VBMT110304-LP	.016	●	●															○			○									C028 C029 D010
	222LP	110308-LP	.031	●	●															○			○									D011 D014 D015
	331LP	160404-LP	.016	●	●															○			○									E009 E010 H013
Light Cutting	332LP	160408-LP	.031	●	●															○			○									
NEW LM	VBMT221LM	VBMT110304-LM	.016						●	○								●														C028 C029 D010
	222LM	110308-LM	.031						●	○								●														D011 D014 D015
	331LM	160404-LM	.016						●	○								●														E009 E010 H013
Light Cutting	332LM	160408-LM	.031						●	○								●														
SV	VBMT221SV	VBMT110304-SV	.016			▲												●		●												C028 C029 D010
	222SV	110308-SV	.031			▲												●		●												D011 D014 D015
	331SV	160404-SV	.016			▲												●		●												E009 E010 H013
Light Cutting	332SV	160408-SV	.031			▲												●		●												
MJ	VBGT331MJ	VBGT160404-MJ	.016														●															
	332MJ	160408-MJ	.031														●															C028 C029 H013
Light Cutting																																

● : Inventory maintained. ○ : Inventory maintained. (Available Spring 2013)
★ : 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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
MJ-P	**VBGT331MJ-P**	VBGT160404-MJ-P	.016																									●		
	332MJ-P	160408-MJ-P	.031																									●		C028 C029 H013
Light Cutting																														
NEW **MP**	**VBMT331MP**	VBMT160404-MP	.016		●	●													○			○								C028 C029 D010 D011 D014 D015 E009 E010 H013
	332MP	160408-MP	.031		●	●													○			○								
Medium Cutting																														
NEW **MM**	**VBMT331MM**	VBMT160404-MM	.016						●	○							●													C028 C029 D010 D011 D014 D015 E009 E010 H013
	332MM	160408-MM	.031						●	○							●													
Medium Cutting																														
Standard	**VBMT331**	VBMT160404	.016		●																									
	332	160408	.031		●							●																		C028 C029 H013
Medium Cutting																														
MV	**VBMT221MV**	VBMT110304-MV	.016			●	▲				▲	●					●			★	●		●	●		★				C028 C029 D010 D011 D014 D015 E009 E010 H013
	222MV	110308-MV	.031			●	▲				▲	●					●			★	●		●	●		★				
	331MV	160404-MV	.016			●	▲				▲	●					●			★	●		●	●		★				
	332MV	160408-MV	.031			●	▲				▲	●					●			★	●		●	●		★				
Medium Cutting																														
R/L SR	**VBET22V3RSR**	VBET1103V3R-SR	.0012														●			★								●		C028 C029 D010 D011 D014 D015 E009 E010
	22V3LSR	1103V3L-SR	.0012														●			★								●		
	220.2RSR	110301R-SR	.004														●			★								●		
	220.2LSR	110301L-SR	.004														●			★								●		
	220.5RSR	110302R-SR	.008														●			★								●		
	220.5LSR	110302L-SR	.008														●			★								●		
	221RSR	110304R-SR	.016														●			★								●		
Medium Cutting	**221LSR**	110304L-SR	.016														●			★								●		

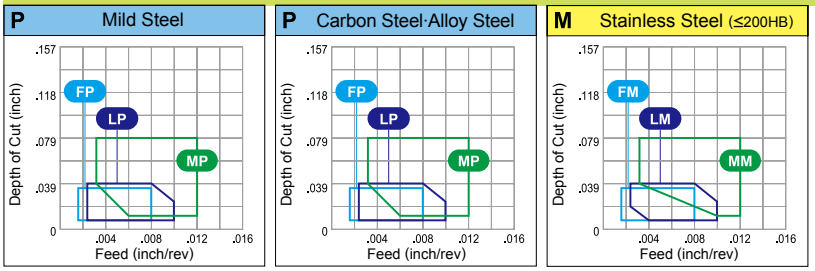
CHIP BREAKER ➤ A052
IDENTIFICATION ➤ A002

35° VB TYPE INSERTS WITH HOLE

VBET 2 2 V0 RSN
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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
R/L SN	VBET22V0RSN	VBET110300R-SN	0															●		★								●			
	22V0LSN	110300L-SN	0															●		★								●			
	22V3RSN	1103V3R-SN	.0012															●		★								●			C028 C029 D010 D011 D014 D015 E009 E010
	22V3LSN	1103V3L-SN	.0012															●		★								●			
	220.2RSN	110301R-SN	.004															●		★								●			
	220.2LSN	110301L-SN	.004															●		★								●			
	220.5RSN	110302R-SN	.008															●		★								●			
	220.5LSN	110302L-SN	.008															●		★								●			
	221RSN	110304R-SN	.016															●		★								●			
Medium Cutting	221LSN	110304L-SN	.016															●		★								●			
R/LW SN (With Wiper)	* VBET22V3RWSN	VBET1103V3RW-SN	.0012															●													C028 C029 D010 D011 D014 D015 E009 E010
	* 22V3LWSN	1103V3LW-SN	.0012															●													
Medium Cutting																															

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

● : Inventory maintained. ○ : Inventory maintained. (Available Spring 2013)
★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

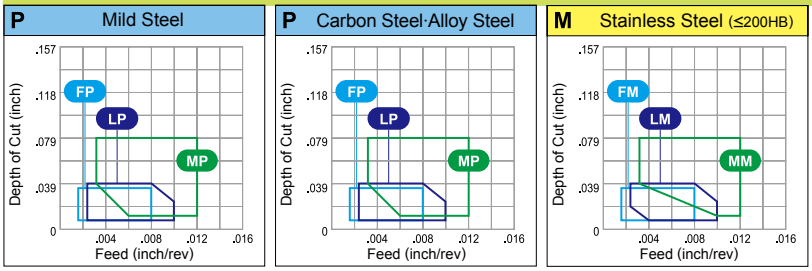
CHIP BREAKER ➤ A052

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													Cermet		Coated Cermet			Carbide					Applicable Holder Page
				UE6105	UE6110	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
NEW FP	VCMT220.5FP	VCMT110302-FP	.008	●	●														○		○									
	221FP	110304-FP	.016	●	●														○		○									C036 E009 E010 E016 E017
	331FP	160404-FP	.016	●	●														○		○									
	332FP	160408-FP	.031	●	●														○		○									
Finish Cutting																														
NEW FM	VCMT220.5FM	VCMT110302-FM	.008														●													
	221FM	110304-FM	.016														●													C036 E009 E010 E016 E017
	331FM	160404-FM	.016														●													
	332FM	160408-FM	.031														●													
Finish Cutting																														
FV	VCMT1.51.50.5FV	VCMT080202-FV	.008			▲											●		● ★		●									
	1.51.51FV	080204-FV	.016			▲											●		● ★		●									C036 E009 E010 E016 E017
	331FV	160404-FV	.016	★		▲													★ ●			●								
	332FV	160408-FV	.031	★		▲													★ ●			●								
Finish Cutting																														
AZ	VCGT331AZ	VCGT160404-AZ	.016																									●		
	332AZ	160408-AZ	.031																									●		C036 E016 E017
	333AZ	160412-AZ	.047																									●		
Finish Cutting																														
R/L F	VCGT1.51.50.5RF	VCGT080202R-F	.008														●		★			●						●		
	1.51.50.5LF	080202L-F	.008														●		★			●						●		E009 E010
	1.51.51RF	080204R-F	.016														●		★			●						●		
	1.51.51LF	080204L-F	.016														●		★			●						●		
Finish Cutting																														
NEW LP	VCMT221LP	VCMT110304-LP	.016	●	●														○		○									
	222LP	110308-LP	.031	●	●														○		○									C036 E009 E010 E016 E017
	331LP	160404-LP	.016	●	●														○		○									
	332LP	160408-LP	.031	●	●														○		○									
Light Cutting																														

CHIP BREAKER ➤ A058
IDENTIFICATION ➤ A002

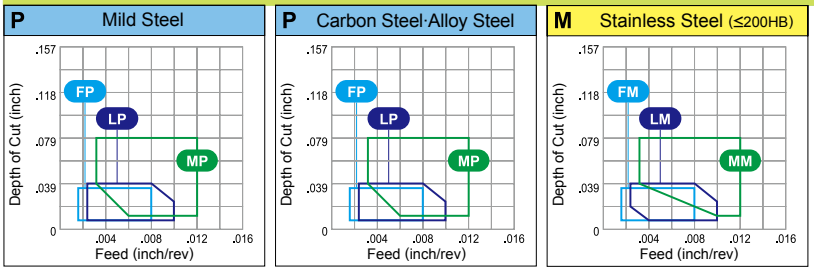
TURNING INSERTS [POSITIVE]

35° VC TYPE INSERTS WITH HOLE

VCMT 2 2 1 LM
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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
NEW LM	**VCMT221LM**	VCMT110304-LM	.016						●	○								●												
	222LM	110308-LM	.031						●	○								●												C036 E009 E010 E016 E017
	331LM	160404-LM	.016						●	○								●												
	332LM	160408-LM	.031						●	○								●												
Light Cutting																														
SV	**VCMT1.51.50.5SV**	VCMT080202-SV	.008				▲											●		●			●							
	1.51.51SV	080204-SV	.016				▲											●		●			●							E009 E010
Light Cutting																														
NEW MP	**VCMT331MP**	VCMT160404-MP	.016		●	●														○			○							
	332MP	160408-MP	.031		●	●														○			○							
	333MP	160412-MP	.047		●	●														○			○							E009 E010
Medium Cutting																														
NEW MM	**VCMT331MM**	VCMT160404-MM	.016						●	○								●												
	332MM	160408-MM	.031						●	○								●												
	333MM	160412-MM	.047						●	○								●												E009 E010
Medium Cutting																														
Standard	**VCMT221**	VCMT110304	.016		●		▲					●						●		★	●		●	●			★		★		
	331	160404	.016	●	●		▲					●			★			●		★	●		●	●			●		●		C036 E016 E017
	332	160408	.031	●	●		▲					●			●			●		★	●		●	●			●				
	333	160412	.047		●		▲					●								★	●										
Medium Cutting																														
MV	**VCMT1.51.50.5MV**	VCMT080202-MV	.008			●	▲				▲	●						●		★	●		●	●		★					
	1.51.51MV	080204-MV	.016			●	▲				▲	●						●		★	●		●	●		★					E009 E010
Medium Cutting																														

● : Inventory maintained. ○ : Inventory maintained. (Available Spring 2013)
★ : 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			Coated														Cermet			Coated Cermet				Carbide					Applicable Holder Page
			UE6105	UE6110	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
	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)																												
Flat Top	**VCMW221**	VCMW110304	.016																									★			C036 E016 E017
	331	160404	.016										★	★														★			
	332	160408	.031										★	★														★			

POSI 7°
WITH HOLE
C
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CHIP BREAKER ➤ A058
IDENTIFICATION ➤ A002

TURNING INSERTS [POSITIVE]

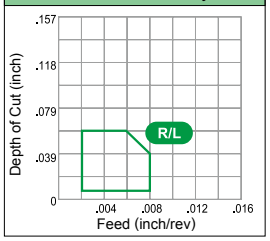
35° VD TYPE INSERTS WITH HOLE

VDGX 3 2 0.5 R
Size Thickness Corner Radius Chip Breaker
*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														Cermet			Coated Cermet			Carbide					Applicable Holder Page
				UE6105	UE6110	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
R/L	**VDGX320.5R**	VDGX160302R	.008																								●			
	320.5L	160302L	.008																								●			
	321R	160304R	.016																								●			C043
	321L	160304L	.016																								●			
Medium Cutting																														

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

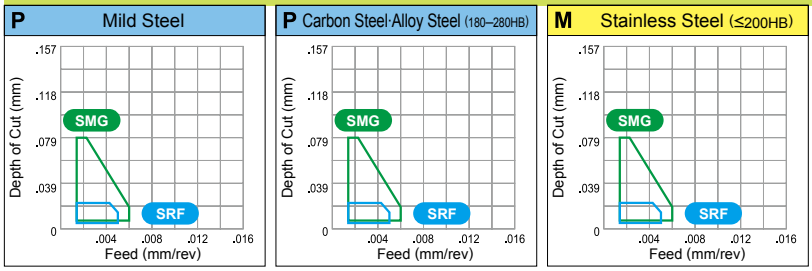
CHIP BREAKER ➤ A068

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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
L/R SRF	**VPET1.51.50.2RSRF**	VPET080201R-SRF	.004															●												
	1.51.50.2LSRF	080201L-SRF	.004															●												
	1.51.50.5RSRF	080202R-SRF	.008															●												
	1.51.50.5LSRF	080202L-SRF	.008															●												
	**22V3RSRF**	1103V3R-SRF	.0012															●												D010 D014 D015
	22V3LSRF	1103V3L-SRF	.0012															●												
	220.2RSRF	110301R-SRF	.004															●												
	220.2LSRF	110301L-SRF	.004															●												
	220.5RSRF	110302R-SRF	.008															●												
Finish Cutting	**220.5LSRF**	110302L-SRF	.008															●												
SMG	**VPGT1.51.50.2MSMG**	VPGT080201M-SMG	.004															●												
	1.51.50.5MSMG	080202M-SMG	.008															●												
	**220.2MSMG**	110301M-SMG	.004															●												D010 D014 D015
	220.5MSMG	110302M-SMG	.008															●												
Finish Cutting																														

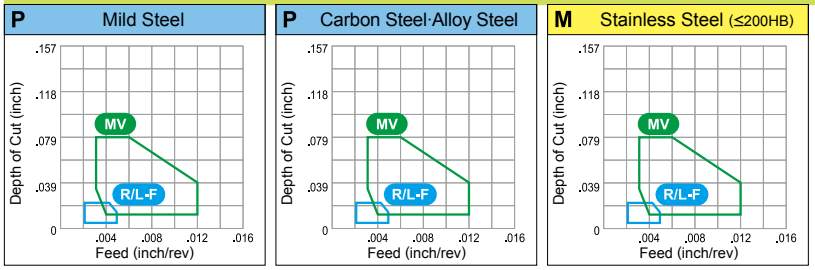
CHIP BREAKER ➤ A064
IDENTIFICATION ➤ A002

80° WB TYPE INSERTS WITH HOLE

WBGT 1.2 1 V3 LF
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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
R/L F	**WBGT1.21V3LF**	WBGT0201V3L-F	.0012															●		★										
	1.210.2LF	020101L-F	.004															●		★										
	1.210.5LF	020102L-F	.008															●		★			●							
	1.211LF	020104L-F	.016															●		★			●							
	1.51.5V3LF	L302V3L-F	.0012															●		★										E009 E029
	1.51.50.2LF	L30201L-F	.004															●		★										
	1.51.50.5RF	L30202R-F	.008															●		★										
	1.51.50.5LF	L30202L-F	.008															●		★			●							
	1.51.51RF	L30204R-F	.016															●		★										
Finish Cutting	**1.51.51LF**	L30204L-F	.016															●		★			●							
R/L MV	**WBMT1.51.50.5RMV**	WBMTL30202R-MV	.008			●▲				▲								★		★●			●			★					
	1.51.50.5LMV	L30202L-MV	.008			●▲				▲								★		★●			●			★					E009 E029
	1.51.51RMV	L30204R-MV	.016			●▲				▲								★		★●			●			★					
Medium Cutting	**1.51.51LMV**	L30204L-MV	.016			●▲				▲								★		★●			●			★					

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

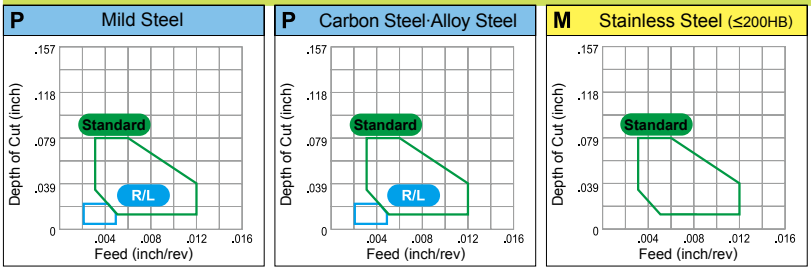
CHIP BREAKER ➤ A052

80° WC TYPE INSERTS WITH HOLE

WCGT 2 1.5 0.2 FJ
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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
FJ	**WCGT21.50.2FJ**	WCGT040201-FJ	.004														●													
	21.50.5FJ	040202-FJ	.008														●													
	21.5V5FJ	0402V5-FJ	.002														●													C037 E017 −020
	32.50.2FJ	06T301-FJ	.004														●													
	32.50.5FJ	06T302-FJ	.008														●													
Finish Cutting	**32.5V5FJ**	06T3V5-FJ	.002														●													
FJ-P	**WCGT21.5V5FJ-P**	WCGT0402V5-FJ-P	.002																										●	
	21.50.2FJ-P	040201-FJ-P	.004																										●	
	21.50.5FJ-P	040202-FJ-P	.008																										●	C037 E017 −020
	32.5V5FJ-P	06T3V5-FJ-P	.002																										●	
	32.50.2FJ-P	06T301-FJ-P	.004																										●	
Finish Cutting	**32.50.5FJ-P**	06T302-FJ-P	.008																										●	
R/L	**WCGT1.210.5R**	WCGT020102R	.008																	★										
	1.210.5L	020102L	.008																	★								●		
	1.211R	020104R	.016																	★										E017 −020
	1.211L	020104L	.016																	★								●		
	1.51.50.5L	L30202L	.008																	★										
Finish Cutting	**1.51.51L**	L30204L	.016																	★										
MJ	**WCGT21.51MJ**	WCGT040204-MJ	.016														●													
	32.51MJ	06T304-MJ	.016														●													C037 E017 −020
	32.52MJ	06T308-MJ	.031														●													
Light Cutting																														
MJ-P	**WCGT21.51MJ-P**	WCGT040204-MJ-P	.016																										●	
	32.51MJ-P	06T304-MJ-P	.016																										●	C037 E017 −020
	32.52MJ-P	06T308-MJ-P	.031																										●	
Light Cutting																														

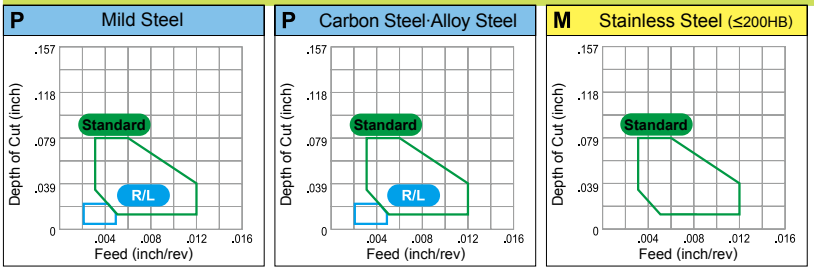
CHIP BREAKER ➤ A058
IDENTIFICATION ➤ A002

80° WC TYPE INSERTS WITH HOLE

WCMT 1.2 1 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												Cermet		Coated Cermet			Carbide				Applicable Holder Page
				UE6105	UE6110	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
Standard	**WCMT1.210.5**	WCMT020102	.008	●		▲					●								★	●		●	●			●				●	C037 E017 −020
	1.211	020104	.016	●		▲					●								★	●		●	●			●				●	
	1.51.50.5	L30202	.008	●							●								★	●		●	●			●				●	
	1.51.51	L30204	.016	●							●								★	●		●	●			●				●	
	21.50.5	040202	.008	●		▲					●								★	●		●	●			●					
	21.51	040204	.016	●		▲					●								★	●		●	●			●				●	
	21.52	040208	.031			▲																									
Medium Cutting	**32.51**	06T304	.016	●		▲					●								★	●		●	●			●					
	32.52	06T308	.031	●		▲					●								★	●		●	●			●					

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

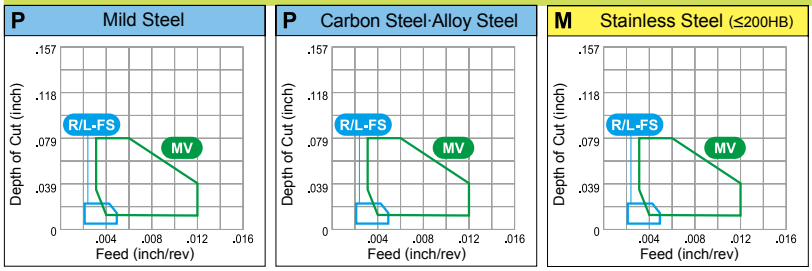
CHIP BREAKER ➤ A058

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												Cermet			Coated Cermet				Carbide					Applicable Holder Page
				UE6105	UE6110	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
R/L FS	**WPGT21.51RFS**	WPGT040204R-FS	.016															★		★										
	**21.51LFS**	040204L-FS	.016															★		★										
	321RFS	060304R-FS	.016															★		★										–
	321LFS	060304L-FS	.016															★		★										
Finish Cutting																														
MV	**WPMT21.50.5MV**	WPMT040202-MV	.008			● ▲					▲ ●							★		★ ●		●								
	**21.51MV**	040204-MV	.016			● ▲					▲ ●							★		★ ●		●			★					
	321MV	060304-MV	.016			● ▲					▲ ●							●		★ ●		●								E009
	322MV	060308-MV	.031			● ▲					▲ ●							●		★ ●		●			★					
Medium Cutting																														

CHIP BREAKER ➤ A064
IDENTIFICATION ➤ A002

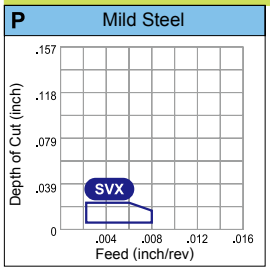
TURNING INSERTS [POSITIVE]

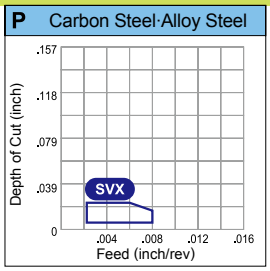
25° XC TYPE INSERTS WITH HOLE

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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
SVX	**XCMT220.5SVX**	XCMT150302-SVX	.008															●												
	221SVX	150304-SVX	.016				▲											●												
	**222SVX**	150308-SVX	.031				▲											●												C038
Light Cutting																														

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

CHIP BREAKER ➤ A058

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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
	**RTG05A**	RTG05A	–																						●		●			–
	06A	06A	–																						●		●			
	07A	07A	–																						●					
	08A	08A	–																						●		●			
	10A	10A	–																						●		●			

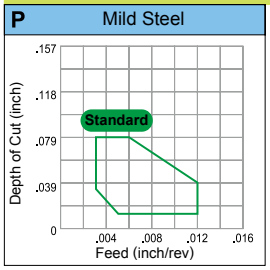
CHIP BREAKER ➤ A071
IDENTIFICATION ➤ A002

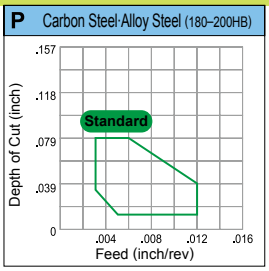
90° SP TYPE INSERTS WITHOUT HOLE

SPGR 3 2 1 R
Size Thickness Corner Radius Chip Breaker
*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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
R	**SPGR321R**	SPGR090304R	.016																						★					
Finish Cutting																														–
Standard	**SPMR321**	SPMR090304	.016	●		▲													★	●		●								
	322	090308	.031	●		▲													★	●		●								
	421	120304	.016	●		▲													★	★		●								–
	422	120304	.031	●		▲													●	★		●								
Light to Medium Cutting																														
Flat Top	**SPMN321**	SPMN090304	.016																★							★		★			
	322	090308	.031	●															★							★		●			
	421	120304	.016	★													★									★		★			
	422	120308	.031	●													●	★								●		●			
	423	120312	.047	★		▲											★									★		★			
	432	120408	.031																							★		★			–
	433	120412	.047																							●					
	532	150408	.031																							★					
	533	150412	.047																							●					
	631	190404	.016																							●					
	632	190408	.031																							★					
	633	190412	.047																							●					
Flat Top	**SPG321**	SPGN090304	.016																★							●		★			
	322	090308	.031																									★			
	421	120304	.016																	●	▲					●		●			
	422	120308	.031															●		●	▲					●		●			
	423	120312	.047																									★			–
	431	120404	.016																									●			
	432	120408	.031																							●		★			
	531	150404	.016																							★					
	532	150408	.031																									★			

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

60° TC TYPE INSERTS WITHOUT HOLE

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

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

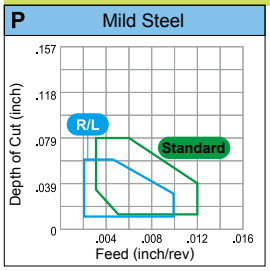
Work Material		
P	Steel	● ◕ ✠ ✠ ✠

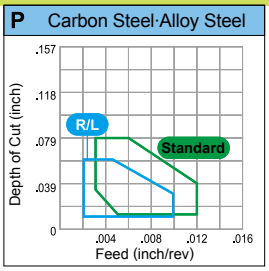
60° TP TYPE INSERTS WITHOUT HOLE

TPGR 2 2 1 R
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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
R/L	**TPGR221R**	TPGR110304R	.016																★								★			–
	221L	110304L	.016																★							★	★			
	321R	160304R	.016																★							★	★			
	321L	160304L	.016																★							★	★			
	322R	160308R	.031																★											
Finish Cutting	**322L**	160308L	.031																★							★	★			
Standard	**TPMR1.81.50.5**	TPMR090202	.008																	●		●								–
	1.81.51	090204	.016																★	●		●								
	1.81.52	090208	.031																			●								
	220.5	110302	.008																★	●		●								
	221	110304	.016		●		▲												★	●		●								
	222	110308	.031		●		▲												★	●		●								
	321	160304	.016		●		▲												★	●		●								
	322	160308	.031		●		▲												★	●		●								
Light to Medium Cutting	**323**	160312	.047		●															●		●								
Flat Top	**TPMN221**	TPMN110304	.016		●									★	★			★	★							●		★		–
	222	110308	.031		●									★	★				★							●		★		
	321	160304	.016		●									★	★			●	★	★						●		●		
	322	160308	.031		●									★	★			●	★	★						●	★	●		
	323	160312	.047		★									★	★				★									●		
	325	160320	.079																							★				
	431	220404	.016		●																					●				
	432	220408	.031		●		▲											●	★							●		★		
	433	220412	.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	MC6025	UE6020	UH6400	MC7025	MP7035	US7020	US735	US905	UC5105	UC5115	VP05RT	VP10RT	VP15TF	UP20M	NX2525	NX3035	NX55	MP3025	AP25N	VP25N	VP45N	UTi20T	HTi05T	HTi10	RT9005	RT9010	
Flat Top	**TPG220.5**	TPGN110302	.008																								●			
	221	110304	.016																★							★	★	●			
	222	110308	.031															●										●			
	320.5	160302	.008																									★			
	321	160304	.016															●	★							★	★	●			
	322	160308	.031															●	★							●	★	●			–
	323	160312	.047																									●			
	324	160316	.063																									●			
	332	160408	.031																							★					
	431	220404	.016															●										●			
	432	220408	.031															●										●			
	433	220412	.047															▲													

CHIP BREAKER ➤ A070
IDENTIFICATION ➤ A002

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

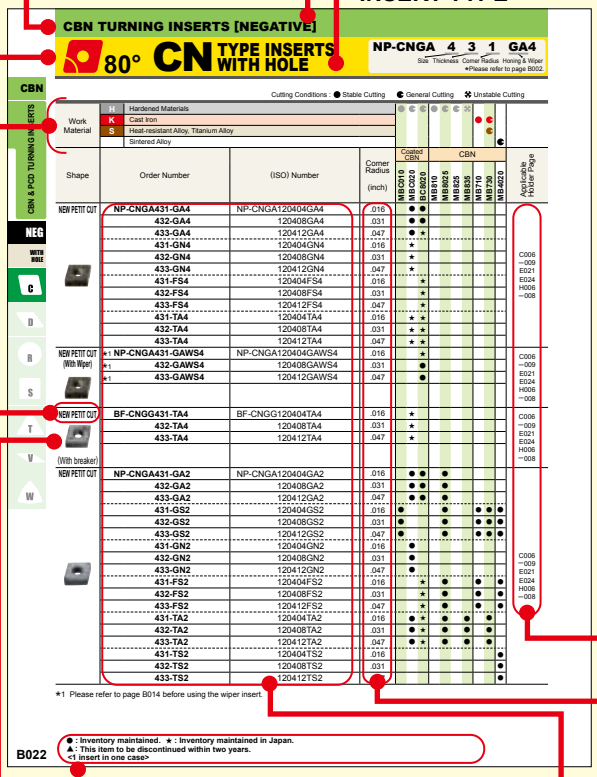
TITLE OF PRODUCT ACCORDING TO THE INSERT TYPE

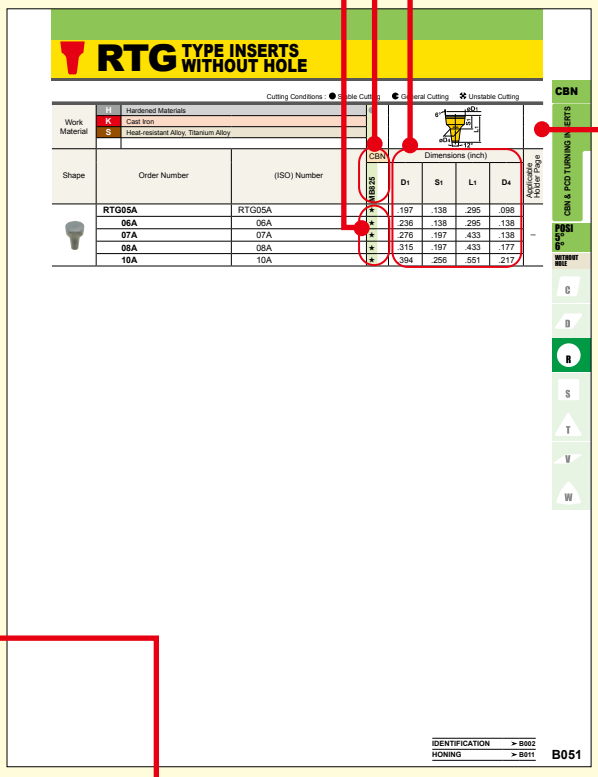
FIGURE SHOWING INSERT GEOMETRY
Dimensions are detailed in the "Dimensions" column.

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 (inch) | Coated CBN | CBN | Applicable Holder Page
MBCH10 MBC020 BC8020 MB810 MB815 MB825 MB835 MD710 MD720 MD4020
NEW PETIT CUT
NP-CNGA431-GA4 NP-CNGA120404GA4 .016
432-GA4 120408GA4 .031
433-GA4 120412GA4 .047
431-GN4 120404GN4 .016
432-GN4 120408GN4 .031
433-GN4 120412GN4 .047
431-FS4 120404FS4 .016
432-FS4 120408FS4 .031
433-FS4 120412FS4 .047
431-TA4 120404TA4 .016
432-TA4 120408TA4 .031
433-TA4 120412TA4 .047
NEW PETIT CUT (With Wiper)
*1 NP-CNGA431-GAWS4 NP-CNGA120404GAWS4 .016
*1 432-GAWS4 120408GAWS4 .031
*1 433-GAWS4 120412GAWS4 .047
NEW PETIT CUT
BF-CNGG431-TA4 BF-CNGG120404TA4 .016
432-TA4 120408TA4 .031
433-TA4 120412TA4 .047
(With breaker)
NEW PETIT CUT
NP-CNGA431-GA2 NP-CNGA120404GA2 .016
432-GA2 120408GA2 .031
433-GA2 120412GA2 .047
431-GS2 120404GS2 .016
432-GS2 120408GS2 .031
433-GS2 120412GS2 .047
431-GN2 120404GN2 .016
432-GN2 120408GN2 .031
433-GN2 120412GN2 .047
431-FS2 120404FS2 .016
432-FS2 120408FS2 .031
433-FS2 120412FS2 .047
431-TA2 120404TA2 .016
432-TA2 120408TA2 .031
433-TA2 120412TA2 .047
431-TS2 120404TS2 .016
432-TS2 120408TS2 .031
433-TS2 120412TS2 .031
Applicable Holder Page: C006 –009 E021 E024 H006 –008
*1 Please refer to page B014 before using the wiper insert.
● : Inventory maintained. ★ : 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 MB835 | Dimensions (inch) D1 S1 L1 D4 | Applicable Holder Page
RTG05A RTG05A ★ .197 .138 .295 .098
06A 06A ★ .236 .138 .295 .138
07A 07A ★ .276 .197 .433 .138
08A 08A ★ .315 .197 .433 .177
10A 10A ★ .394 .256 .551 .217
IDENTIFICATION ➤ B002
HONING ➤ B011
B051

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

INSERT CORNER RADIUS

PRODUCT NAME

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° ····· B025
SN○○TYPE ··· SQUARE 90° ····· B028
TN○○TYPE ··· TRIANGULAR 60° ····· B030
VN○○TYPE ··· RHOMBIC 35° ····· B032
WN○○TYPE ··· TRIGON 80° ····· B034
● NEGATIVE INSERTS WITHOUT HOLE
CN○○TYPE ··· RHOMBIC 80° ····· B035
DN○○TYPE ··· RHOMBIC 55° ····· B035
RN○○TYPE ··· ROUND ····· B036
SN○○TYPE ··· SQUARE 90° ····· B036
TN○○TYPE ··· TRIANGULAR 60° ····· B037
● POSITIVE INSERTS WITH HOLE
CC○○TYPE ··· RHOMBIC 80° ····· B038
CP○○TYPE ··· RHOMBIC 80° ····· B041
DC○○TYPE ··· RHOMBIC 55° ····· B042
TC○○TYPE ··· TRIANGULAR 60° ····· B045
TP○○TYPE ··· TRIANGULAR 60° ····· B046
VB○○TYPE ··· RHOMBIC 35° ····· B048
VC○○TYPE ··· RHOMBIC 35° ····· B049
WC○○TYPE ··· TRIGON 80° ····· B050
● POSITIVE INSERTS WITHOUT HOLE
SP○○TYPE ··· SQUARE 90° ····· B052
TB○○TYPE ··· TRIANGULAR 60° ····· B053
TP○○TYPE ··· TRIANGULAR 60° ····· B054
RTG○○TYPE ····· B051

STANDARD OF PCD TURNING INSERTS
● NEGATIVE INSERTS WITH HOLE
CN○○TYPE ··· RHOMBIC 80° ····· B055
DN○○TYPE ··· RHOMBIC 55° ····· B055
SN○○TYPE ··· SQUARE 90° ····· B056
TN○○TYPE ··· TRIANGULAR 60° ····· B056
VN○○TYPE ··· RHOMBIC 35° ····· B057
● NEGATIVE INSERTS WITHOUT HOLE
SN○○TYPE ··· SQUARE 90° ····· B058
● POSITIVE INSERTS WITH HOLE
CC○○TYPE ··· RHOMBIC 80° ····· B059
CP○○TYPE ··· RHOMBIC 80° ····· B059
DC○○TYPE ··· RHOMBIC 55° ····· B060
SP○○TYPE ··· SQUARE 90° ····· B060
TC○○TYPE ··· TRIANGULAR 60° ····· B061
TP○○TYPE ··· TRIANGULAR 60° ····· B062
VB○○TYPE ··· RHOMBIC 35° ····· B064
VC○○TYPE ··· RHOMBIC 35° ····· B064
WC○○TYPE ··· TRIGON 80° ····· B065
WP○○TYPE ··· TRIGON 80° ····· B065
DE○○TYPE ··· RHOMBIC 55° ····· B066
TE○○TYPE ··· TRIANGULAR 60° ····· B066
VD○○TYPE ··· RHOMBIC 35° ····· B067
● POSITIVE INSERTS WITHOUT HOLE
SP○○TYPE ··· SQUARE 90° ····· B068
TP○○TYPE ··· TRIANGULAR 60° ····· B068

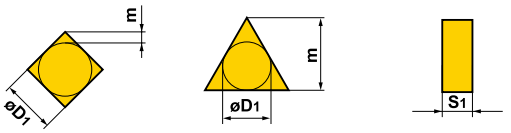
IDENTIFICATION

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	New Petit Cut
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 **ϕD1** (inch)	Tolerance of Thickness **S1** (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 **ϕD1** (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

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**	**GA**	**WS**	**2**
		⑧	⑨	⑩	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 FP	Continuous Cutting
G GA GN GS	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 Teeth

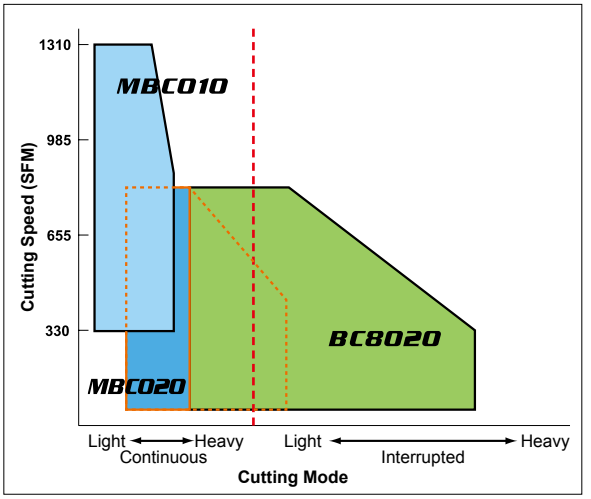
2	2
3	3
⋮	⋮
No mark	1

COATED CBN SERIES
BC8020 / MBC010 / MBC020

FEATURES

With the expansion of BC8020, Mitsubishi can offer 3 coated CBN grades for machining of hardened steels. These 3 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.

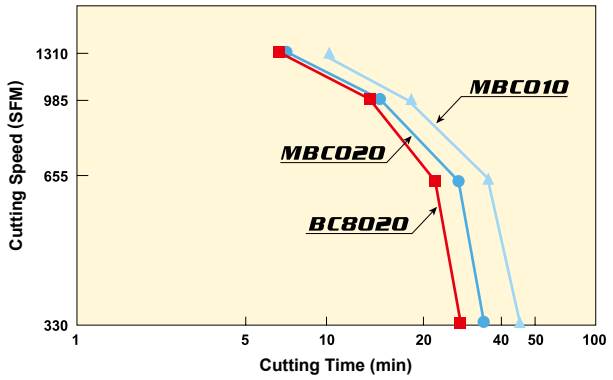


Grade	Grade Features and Application	Main Component	Coating Layer
BC8020	High efficiency coated CBN Incleased cutting edge strength and high crater wear resistant CBN grade in combination with a highly wear resistant TiAlN coating, results in longer tool life and improved machining efficiency under heavy 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

CUTTING PERFORMANCE

■ Continuous Cutting

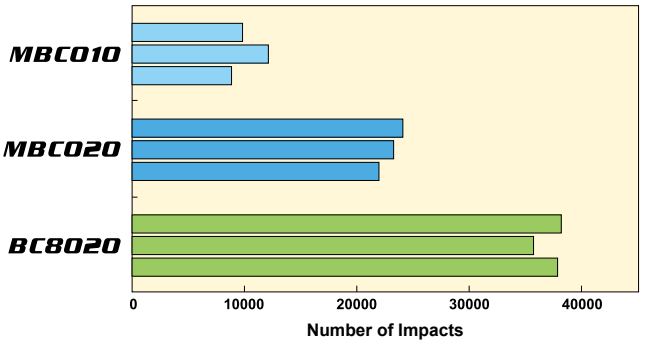
V-T Diagram (VB=.0039inch)



<Cutting Condition>
Workpiece : Hardened Steel (60HRC)
External Continuous Cutting
Insert : NP-CNGA432-GA2
Feed : .004IPR
Depth of Cut : .0039inch
Wet Cutting

■ Interrupted Cutting

Impact frequency before fracturing

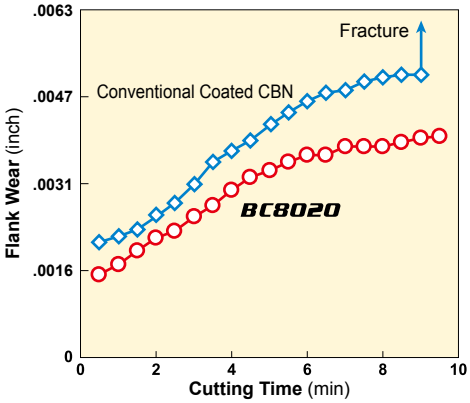


<Cutting Condition>
Workpiece : Hardened Steel (60HRC)
External Interrupted Cutting. 8 Grooves
Insert : NP-CNGA432-GA2
Cutting Speed : 490SFM
Feed : .008IPR
Depth of Cut : .0079inch
Dry Cutting

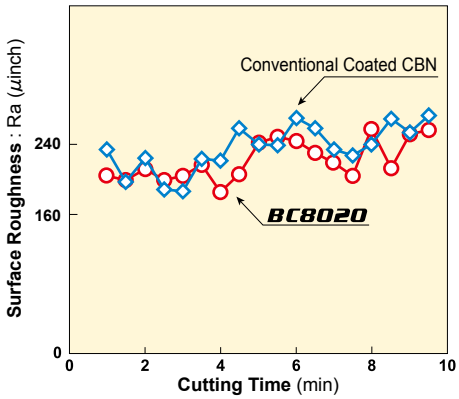
BC8020

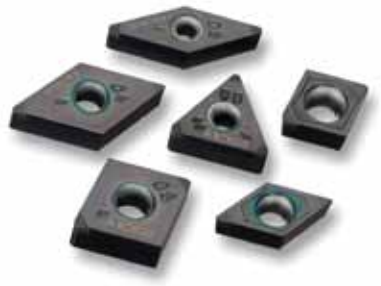
Continuous Cutting

WEAR RESISTANCE



SURFACE ROUGHNESS

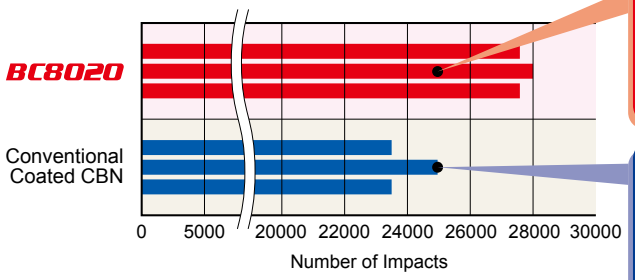




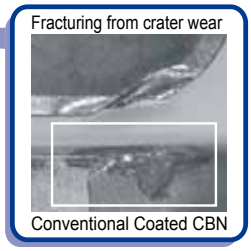
<Cutting Condition>
Workpiece : Hardened Steel (60HRC) Insert : NP-CNGA432-GA2
Cutting Speed : 490SFM Feed : .006IPR Depth of Cut : .020inch
Dry Continuous Cutting

Interrupted Cutting (Crater wear)

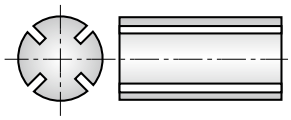
FRACTURE RESISTANCE





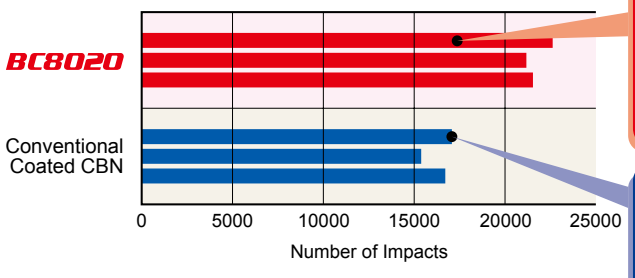


<Cutting Conditions>
Workpiece : Hardened Steel (60HRC)
Medium Interrupted Cutting
Insert : NP-CNGA432-GA2
Cutting speed : 490SFM
Feed : .006IPR
Depth of Cut : .006inch
Dry Interrupted Cutting

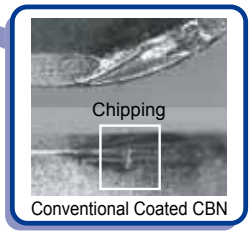


Interrupted Cutting (Chipping)

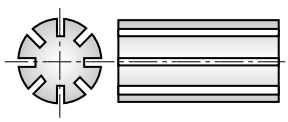
FRACTURE RESISTANCE





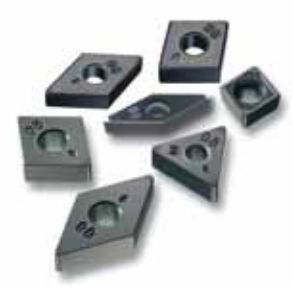


<Cutting Conditions>
Workpiece : Hardened Steel (60HRC)
Heavy Interrupted Cutting
Insert : NP-CNGA432-GA2
Cutting speed : 490SFM
Feed : .008IPR
Depth of Cut : .0079inch
Dry Interrupted Cutting

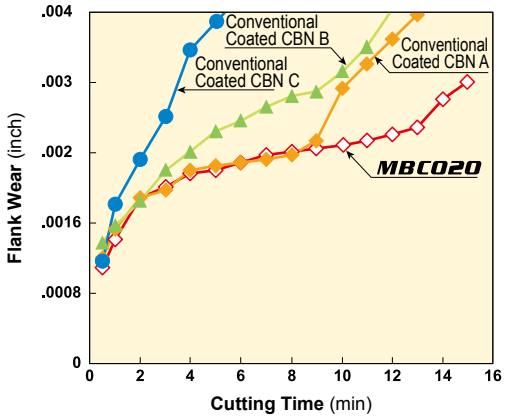


BC8020 exhibits excellent cutting performance for severe or interrupted machining.

MBC020

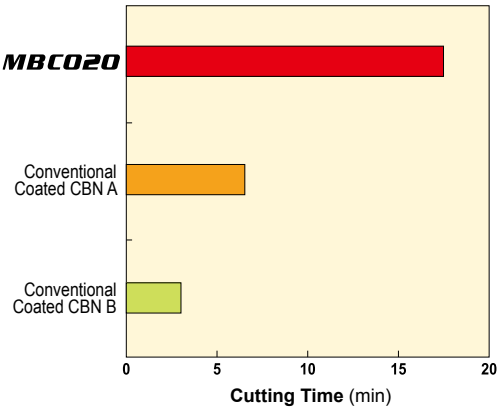


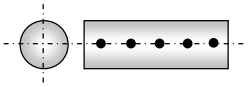
WEAR RESISTANCE



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

TOUGHNESS





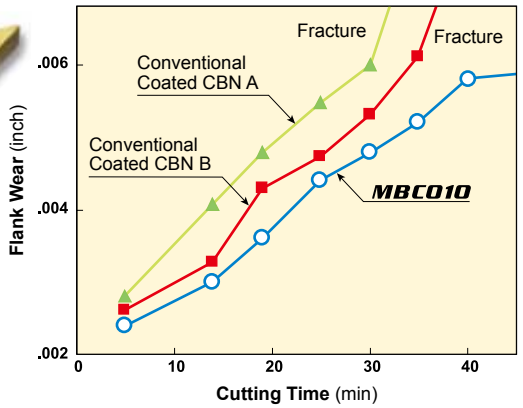
<Cutting Conditions>
Workpiece : Hardened Steel (60HRC)
Insert : NP-CNGA432-GA2
Cutting speed : 390SFM
Feed : .006IPR
Depth of Cut : .006inch
Dry Interrupted Cutting

MBC020 exhibits excellent cutting performance for a wide range of applications from continuous through interrupted machining.

MBC010

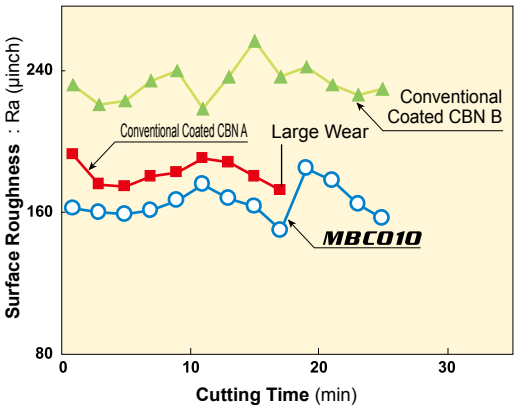


WEAR RESISTANCE



<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

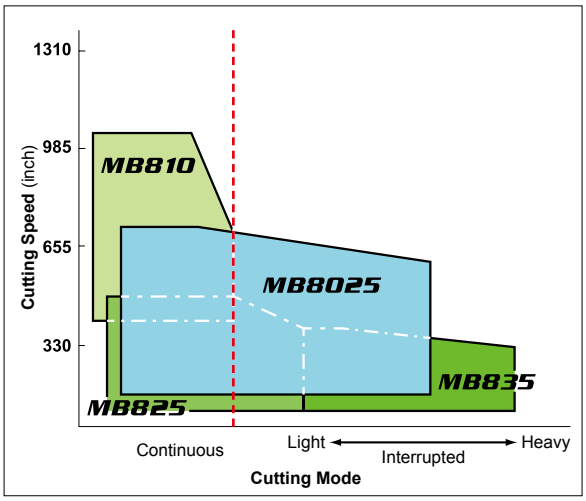
MBC010 employs TiN based coating for superior, consistent surface finishes.

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.



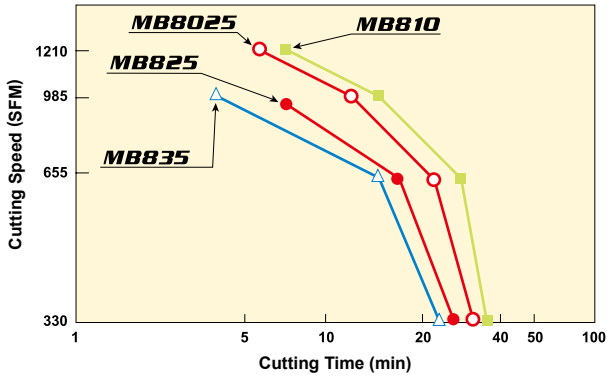
HARDENED STEEL MACHINING

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 (Micro Grain) TiN Al_2O_3
MB810	For High Speed Continuous Cutting It features improved wear resistance due to impregnation with larger CBN particles.	CBN 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) TiC 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

CUTTING PERFORMANCE

■Continuous Cutting

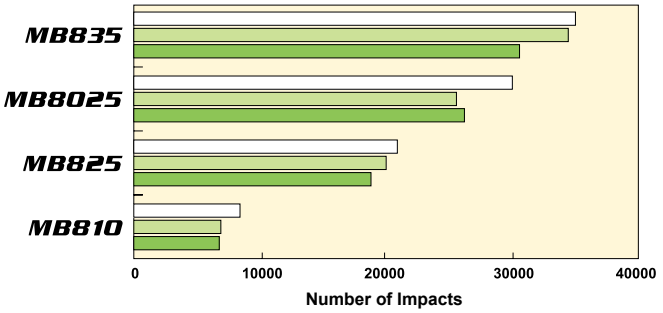
V-T Diagram (VB=.0039inch)



<Cutting Condition>
Workpiece: Hardened steel (60HRC)
Feed : .004IPR
Depth of Cut : .0039inch
Wet Cutting

■Interrupted Cutting

Impact frequency before fracturing



<Cutting Condition>
Workpiece : Hardened steel (60HRC)
External Interrupted Cutting 8 Groove
Cutting Speed : 490SFM
Feed : .004IPR
Depth of Cut : .0078inch
Dry Cutting

MB5015 For Cylinder liners

※Produced to order only

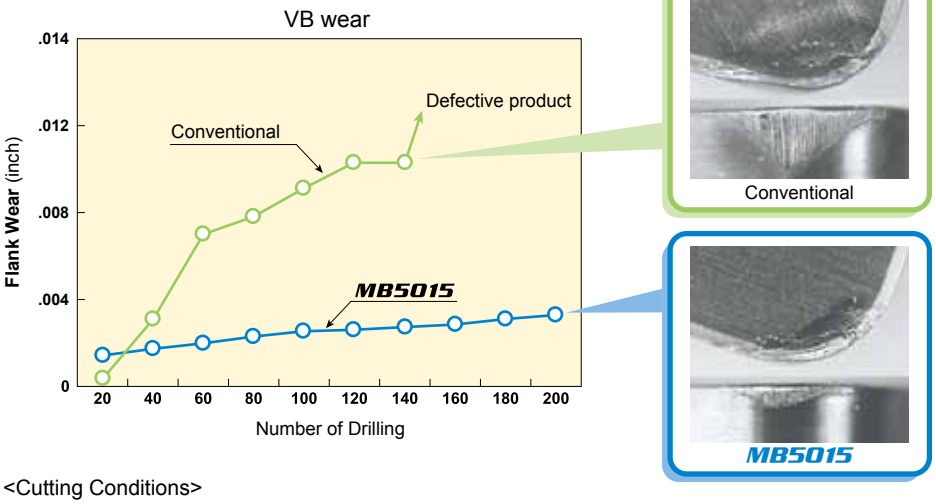
FEATURES

●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		—.012(Finishing) —.031(Semi-finishing)	—.002(Finishing) —.008(Semi-finishing)	Wet

CUTTING PERFORMANCE



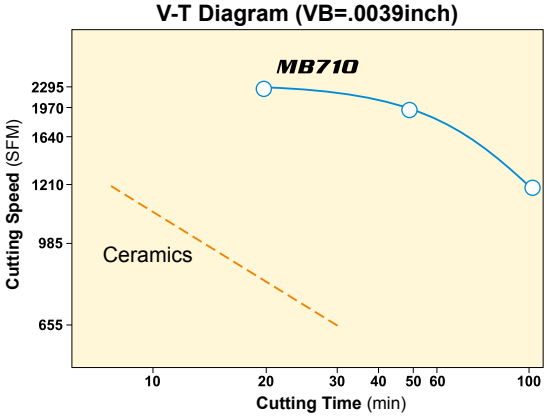
<Cutting Conditions>
Workpiece : FC200(Centrifugal casting)ϕ63.0
Cutting Speed : 2625SFM Feed : .014IPR Depth of Cut : .0012inch
Work : Centrifugal casting Cylinder liner Hole Depth : 4inch

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 AlN (Solid)

CUTTING PERFORMANCE

Continuous Cutting



<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 AND RECOMMENDED CUTTING CONDITIONS

For General Cutting

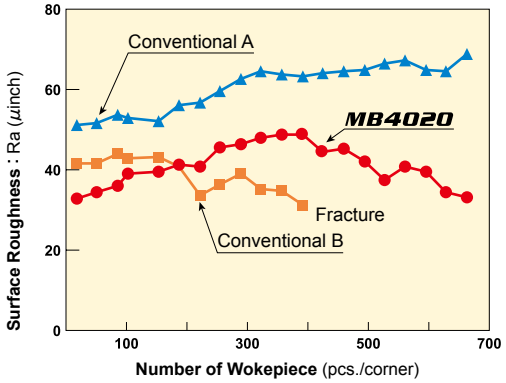
By increasing CBN content and employing the special binder that conjoins CBN particles more tightly, the long tool life is achieved in machining of sintered alloy. Excellent general-purpose grade that can cover machining and forms of various sintered alloy materials with different hardness and structure. Can be also used for cast iron machining.

Work Material	Cutting Speed (SFM)	Feed (inch/rev)	Depth of Cut (inch)
General Sintered Alloy	260 – 985	–.008	–.012
High Strength Sintered Alloy	260 – 820	–.008	–.012
Continuous Cutting of High Density Sintered Alloy	260 – 490	–.008	–.012



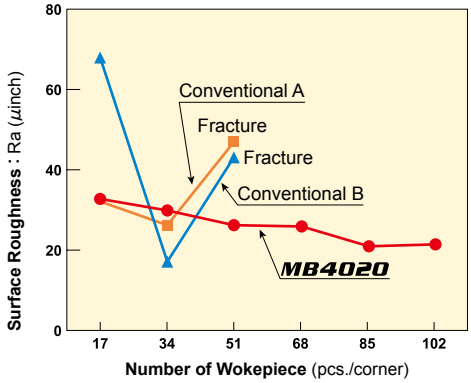
CUTTING PERFORMANCE

Continuous Cutting of High Density Sintered Alloy



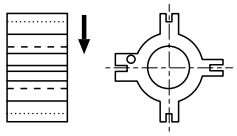
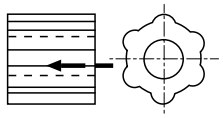
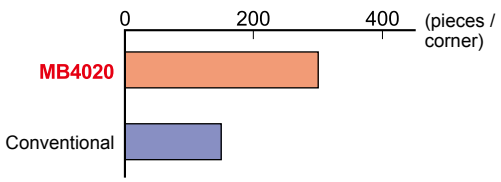
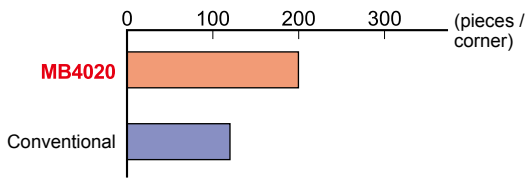
<Cutting Conditions>
Workpiece : High Strength Sintered Alloy Insert : NP-CNGA432-FS2
Cutting Speed : 620SFM Feed : .006IPR
Depth of Cut : .004inch
Wet Cutting

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
Workpiece		 Carburized and quenched alloy	 Carburized and quenched alloy
Component		Variable valve parts	Oil pump parts
Cutting Condition	Cutting Speed (SFM)	820	330
	Feed (IPR)	.004	.0012
	Depth of Cut (inch)	.008	.002
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)	—.008	—.008
			Continuous cutting for general purpose	**MBC020**	655 (260—820)	—.008	—.012
			Heavy interrupted cutting for general purpose	**BC8020**	655 (260—820)	—.012	—.030
			Interrupted cutting for general purpose		490 (195—655)	—.008	—.012
		Non-coated	Continuous cutting	**MB8025**	590 (260—820)	—.012	—.020
			Light interrupted cutting		390 (195—490)	—.008	—.012
			High speed finish cutting	**MB810**	655 (490—985)	—.006	—.006
			Continuous to medium interrupted cutting	**MB825**	390 (230—490)	—.012	—.020
			Interrupted cutting	**MB835**	330 (165—390)	—.012	—.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	—.020	—.039 MBS140 —.197	Dry,Wet
Alloy Cast Iron		Pearlitic	MB730, MB4020	—.016	—.020	Dry,Wet
Ductile Cast Iron	60-40-18	Ferritic	MB710, MB730	—.016	—.020	Dry,Wet
	100-70-03	Ferritic + Pearlitic Pearlitic				

● 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)	—.008	—.012
High Density Sintered Alloy	**MB4020**	490 (260—820)	—.008	—.012
Sintered Alloy	**MB4020, MB835**	330 (260—490)	—.008	—.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)	—.020	—.008

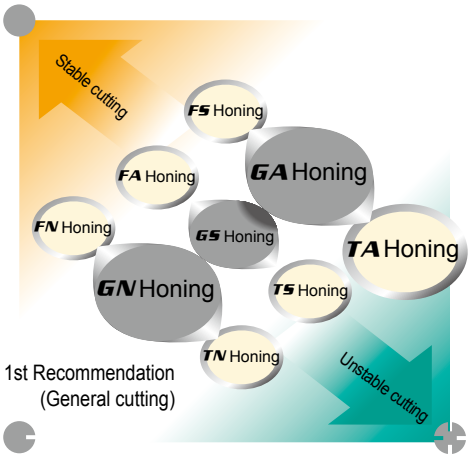
● Heat Resistant Alloy

Work Material	Grade	Recommended Cutting Condition		
		Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
Ni Base Alloy	**MB730**	390 (330—490)	—.008	—.020
Co Base Alloy	**MB730**	230 (165—330)	—.008	—.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

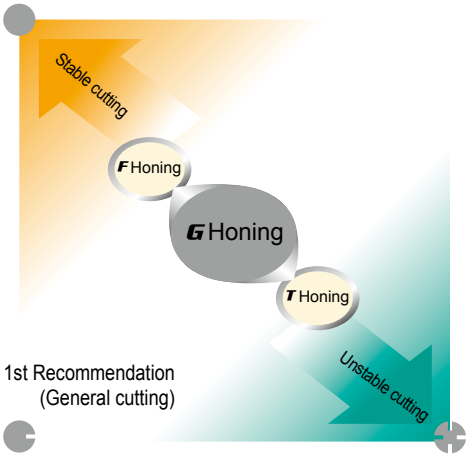
Main Application — Edge Honing Type

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*)

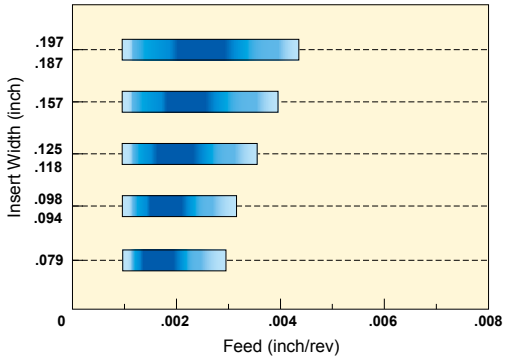


FEATURES

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.

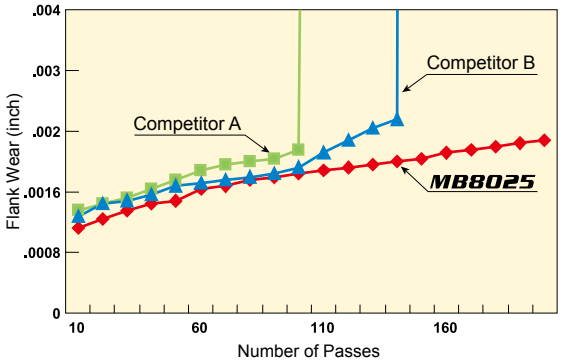
RECOMMENDED CUTTING CONDITIONS



Work Material		Hardness	Grade	Cutting Speed (SFM)	Coolant
H	Hardened Steel	35—65HRC	**MB8025**	330 (195—390)	Dry,Wet

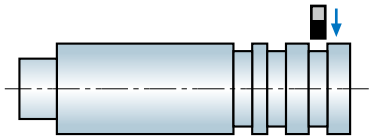
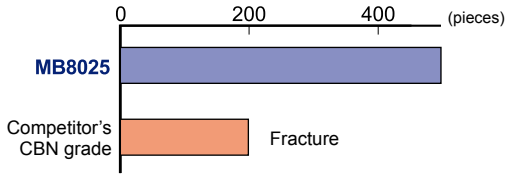
CUTTING PERFORMANCE

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

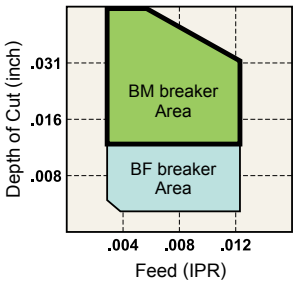
Chip breaker geometry designed for excellent chip control

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

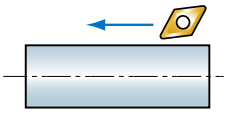


Good for deep depth cutting of carburized layer.

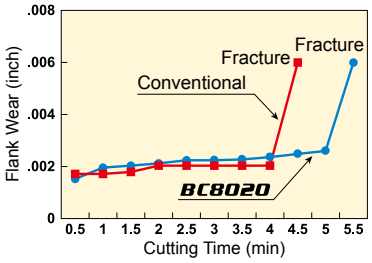
Recommend and under ap=.024 inch

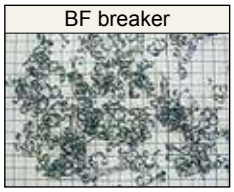
※Available in BC8020 grade.

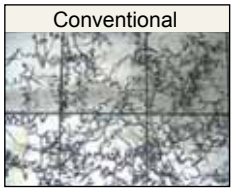
Cutting Performance



<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

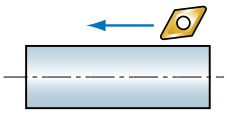


Good for chip removal under light depth and feed cutting.

Recommend and under ap=.012 inch

※Available in MBC020 grade.

Cutting Performance

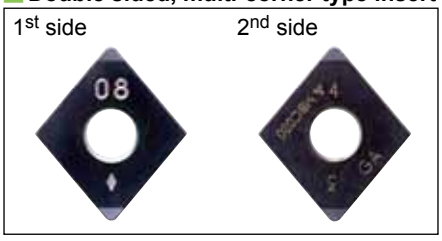


<Cutting Conditions>
Workpiece : Hardened Steel(55HRC)
Insert : BF-CNGG432-TA4
Cutting Speed : 330SFM
Feed : .008IPR
Depth of Cut : .004inch
Dry Cutting

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



Double Sided, multi-corner type insert, ex.

NP-CNGA432-GA4

No. of Cutting Edges

Single Sided, multi-corner type insert, ex.

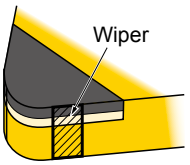
NP-CNGA432-GA2

No. of Cutting Edges

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.



NP-CNGA432-GAWS2

Wiper Symbol

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

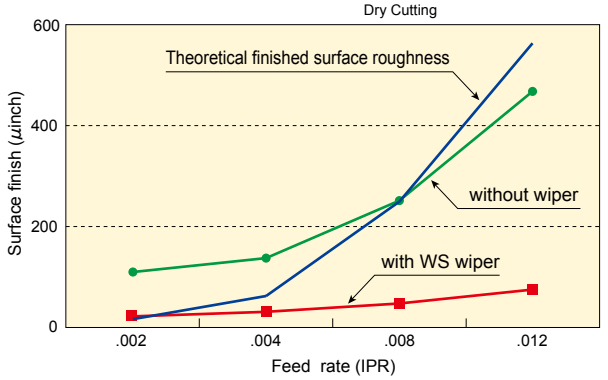
High feed rates not only shorten machining times but also make it possible to combine roughing and finishing operations.

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.)

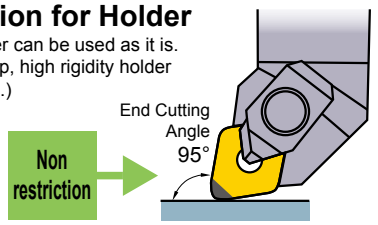
- Reducing cost
- Increased productivity
- Reduced machine down time

<Real cost reduction!!>

Special attention is not necessary when using C-style and W-style inserts

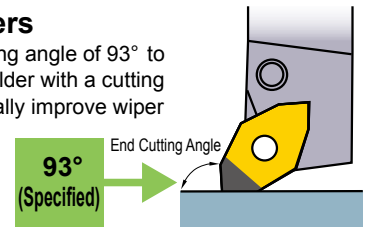
No Restriction for Holder

The standard holder can be used as it is.
(*The double clamp, high rigidity holder is recommended.)

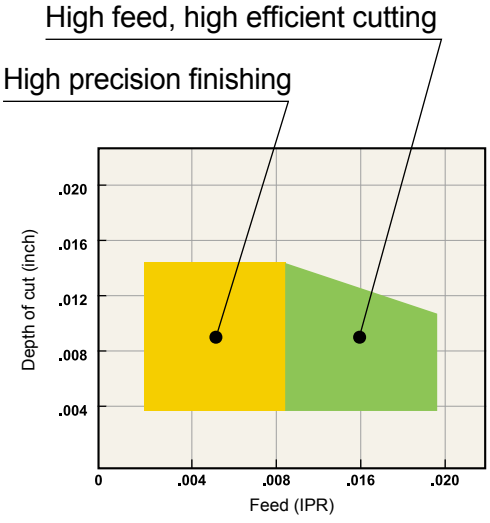


Restriction for Holders

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.).

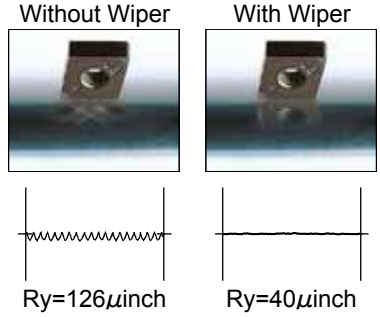


Cutting Conditions and Performance



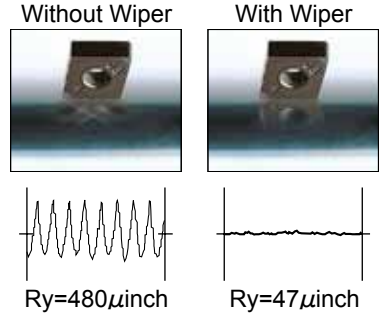
High precision finishing

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



SINTERED DIAMOND
PCD GRADE MD220

- Suitable for materials such as aluminum alloy, non-ferrous metals, and fiber reinforced plastics.
- Suitable for extremely high speed finishing.



Micro-Structure of **MD220**

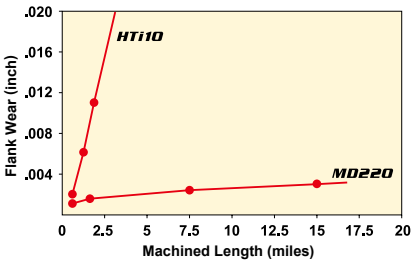
RECOMMENDED CUTTING CONDITIONS

TURNING

Work Material	Recommended Cutting Condition		
	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	50 (16—65)	—.008	—.020

(Note) Not suitable for steel.

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

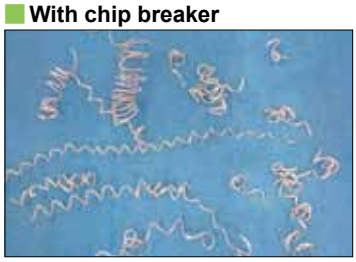
NEW PETIT CUT PCD INSERTS

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.

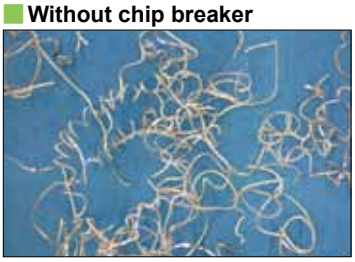
CUTTING PERFORMANCE

With chip breaker

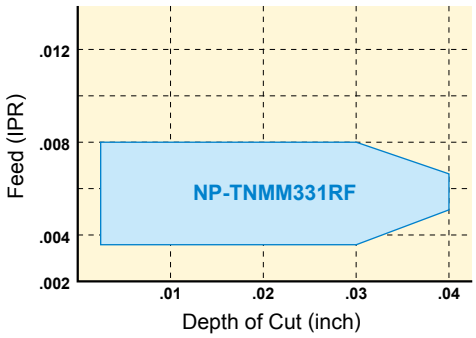


<Cutting Conditions>
Workpiece : A5052
Cutting Speed : 1115SFM
Feed : .004IPR

Without chip breaker



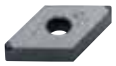
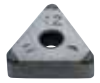
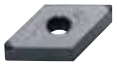
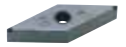
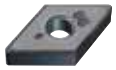
Depth of Cut : .004IPR
Dry Cutting



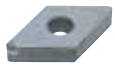
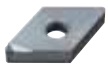
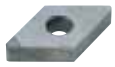
<Cutting Conditions>
Workpiece : Aluminum Alloy
Cutting Speed : 1310SFM
Wet Cutting

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  B025	NP-SNGA_○4  B028	NP-TNGA_○6  B030	NP-VNGA_○4  B032	NP-WNGA_○6  B034
	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  B025				
	Multi-corner Type Single Sided		Flat Top	NP-CNGA_○2  B022, B023	NP-DNGA_○2  B025, B026	NP-SNGA_○2  B028	NP-TNGA_○3  B030	NP-VNGA_○2  B032	NP-WNGA_○3  B034
	Multi-corner Type Single Sided	M Class	Flat Top	NP-CNMA_○2  B023	NP-DNMA_○2  B026	NP-SNMA_○2  B028		NP-VNMA_○2  B032	
	Multi-corner Type Single Sided With Wiper	G Class	Flat Top	NP-CNGA_○WS2  B023	NP-DNGA_○WS2JR/L  B026				NP-WNGA_○WS3  B034
	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  B031		
	One-corner Type Single Sided		Flat Top	NP-CNGA_○  B024	NP-DNGA_○  B027	NP-SNGA_○  B028	NP-TNGA_○  B031	NP-VNGA_○  B033	NP-WNGA_○  B034

NEGATIVE INSERTS WITH HOLE

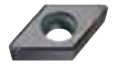
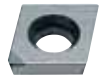
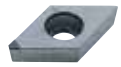
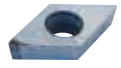
Product Name	Type	Tolerance	Breaker and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	One-corner Type Single Sided	M Class	Flat Top	NP-CNMA_○  B024	NP-DNMA_○  B027	NP-SNMA_○  B028	NP-TNMA_○  B031	NP-VNMA_○  B033	
	One-corner Type Single Sided With Breaker		R/L F	NP-CNMM_R/LF  B055	NP-DNMM_R/LF  B055	NP-SNMM_R/LF  B056	NP-TNMM_R/LF  B056	NP-VNMM_R/LF  B057	
STANDARD	One-corner Type Single Sided	G Class	Flat Top	CNGA  B024	DNGA  B027, B055	SNGA  B028, B056	TNGA  B031, B056	VNGA  B033, B057	
	One-corner Type Single Sided	M Class	Flat Top	CNMA  B024, B055					

5° POSITIVE INSERTS WITH HOLE

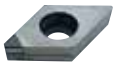
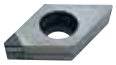
Product Name	Type	Tolerance	Breaker and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-corner Type	G Class	Flat Top					NP-VBGW_○2  B048	
	One-corner Type		Flat Top					NP-VBGW_○  B048	
	One-corner Type With Breaker		RF					NP-VBGT_RF  B064	

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 *  B038	NP-DCGW_○2 *  B042		NP-TCGW_○3  B045	NP-VCGW_○2  B049	NP-WCGW_○3  B050
	Multi-corner Type With Wiper		Flat Top	NP-CCGW_○WS2  B039					
	Multi-corner Type With Breaker		BF	BF-CCGT_○2  B039	BF-DCGT_○2  B043				
	One-corner Type		Flat Top	NP-CCGW/B_○  B039, B040	NP-DCGW_○  B044		NP-TCGW_○  B045	NP-VCGW_○  B049	
	One-corner Type	M Class	Flat Top	NP-CCMB_○  B039					
	One-corner Type		Flat Top	NP-CCMW_○  B040	NP-DCMW_○  B043				NP-WCMW_○  B050
	One-corner Type		Flat Top	NP-CCMW  B059					
	One-corner Type With Breaker		Breaker	NP-CCMH  B059					
	One-corner Type With Breaker	G Class	RF					NP-VCGT_RF  B064	
	One-corner Type With Breaker	M Class	R/L F		NP-DCMT_R/LF  B060				
STANDARD	One-corner Type	G Class	Flat Top				TCGW  B061		

7° POSITIVE INSERTS WITH HOLE

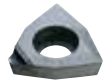
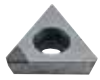
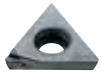
Product Name	Type	Tolerance	Breaker and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
STANDARD	One-corner Type	G Class	Flat Top	CCGW  B040	DCGW  B042				
STANDARD	One-corner Type	M Class	Flat Top	CCMW  B040, B059	DCMW  B043, B060		TCMW  B044, B061		WCMW  B065

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  B041			NP-TPGB_○3  B046		
NEW PETIT CUT	Multi-corner Type	G Class	Flat Top				NP-TPGX_○3  B046		
NEW PETIT CUT	One-corner Type	M Class	Flat Top	NP-CPMB_○  B041			NP-TPMB_○  B046		
NEW PETIT CUT	One-corner Type	G Class	Flat Top				NP-TPGX_○  B046		
NEW PETIT CUT	One-corner Type With Breaker	M Class	Breaker	NP-CPMH  B059					
NEW PETIT CUT	One-corner Type With Breaker	M Class	R/L F				NP-TPMH_R/LF  B062		
NEW PETIT CUT	One-corner Type With Breaker	M Class	R/L F				NP-TPMX_R/LF  B062		

CLASSIFICATION

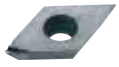
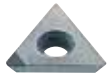
11° POSITIVE INSERTS WITH HOLE

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  B059					WPGT  B065
	One-corner Type		Flat Top			SPGX  B060	TPGX  B047, B063		
	One-corner Type With Breaker		R/L F				TPGT/V_R/LF  B062, B063		

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  B067

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  B066
	One-corner Type With Breaker		R/L F	DEGX_R/LF  B066	
	One-corner Type		Flat Top		TEGX  B066

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	CNG  B035	DNG  B035	SNG  B036	TNG  B037	RNG  B036

5° POSITIVE INSERTS WITHOUT HOLE

Product Name	Tolerance	Breaker and Cross Section	Triangular 60°	
STANDARD	G Class	Flat Top	TBG  B053	

11° POSITIVE INSERTS WITHOUT HOLE

Product Name	Tolerance	Breaker and Cross Section	Square 90°	Triangular 60°
STANDARD	G Class	Flat Top	SPG  B052, B068	TPG  B054, B068

SPECIAL PURPOSE INSERTS

Tool Holder Type	Tolerance	Inserts
TL Type	G Class	RTG_A  B051

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 (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
NEW PETIT CUT	**NP-CNGA431-GA4**	NP-CNGA120404GA4	.016		●	●								C006 −009 E021 E024 H006 −008
	432-GA4	120408GA4	.031		●	●								
	433-GA4	120412GA4	.047		●	★								
	431-GN4	120404GN4	.016		★									
	432-GN4	120408GN4	.031		★									
	433-GN4	120412GN4	.047		★									
	431-FS4	120404FS4	.016			★								
	432-FS4	120408FS4	.031			★								
	433-FS4	120412FS4	.047			★								
	431-TA4	120404TA4	.016		★	★								
	432-TA4	120408TA4	.031		★	★								
	433-TA4	120412TA4	.047		★	★								
NEW PETIT CUT (With Wiper)	∗1 **NP-CNGA431-GAWS4**	NP-CNGA120404GAWS4	.016			★								C006 −009 E021 E024 H006 −008
	∗1 **432-GAWS4**	120408GAWS4	.031			●								
	∗1 **433-GAWS4**	120412GAWS4	.047			●								
NEW PETIT CUT	**BF-CNGG431-TA4**	BF-CNGG120404TA4	.016		★									C006 −009 E021 E024 H006 −008
	432-TA4	120408TA4	.031		★									
	433-TA4	120412TA4	.047		★									
(With breaker)														
NEW PETIT CUT	**NP-CNGA431-GA2**	NP-CNGA120404GA2	.016		●	●		●						C006 −009 E021 E024 H006 −008
	432-GA2	120408GA2	.031		●	●		●						
	433-GA2	120412GA2	.047		●	●		●						
	431-GS2	120404GS2	.016	●				●			●	●	●	
	432-GS2	120408GS2	.031	●				●			●	●	●	
	433-GS2	120412GS2	.047	●				●			●	●	●	
	431-GN2	120404GN2	.016		●									
	432-GN2	120408GN2	.031		●									
	433-GN2	120412GN2	.047		●									
	431-FS2	120404FS2	.016			★		●			●		●	
	432-FS2	120408FS2	.031			★		●			●		●	
	433-FS2	120412FS2	.047			★		●			●		●	
	431-TA2	120404TA2	.016		●	★		●		●		●		
	432-TA2	120408TA2	.031		●	★		●		●		●		
	433-TA2	120412TA2	.047		●	★		●		●		●		
	431-TS2	120404TS2	.016										●	
	432-TS2	120408TS2	.031										●	
	433-TS2	120412TS2	.047										●	

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

● : Inventory maintained. ★ : 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 (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Applicable Holder Page
NEW PETIT CUT	**NP-CNGA431-G2**	NP-CNGA120404G2	.016					▲						C006 −009 E021 E024 H006 −008
	**432-G2**	120408G2	.031					★						
	433-G2	120412G2	.047					★						
	431-T2	120404T2	.016					▲						
	432-T2	120408T2	.031					★						
	433-T2	120412T2	.047					▲						
NEW PETIT CUT	∗1 **TNP-CNGA432-GS2**	TNP-CNGA120408GS2	.031	▲										C006 −009 E021 E024 H006 −008
	∗1 **433-GS2**	120412GS2	.047	▲										
	∗1 **431-G2**	120404G2	.016					★						
	∗1 **432-G2**	120408G2	.031					★						
	∗1 **433-G2**	120412G2	.047					★						
	∗1 **431-T2**	120404T2	.016					★						
	∗1 **432-T2**	120408T2	.031					★						
	∗1 **433-T2**	120412T2	.047					★						
NEW PETIT CUT	**NP-CNMA431-G2**	NP-CNMA120404G2	.016					▲	▲		▲			C006 −009 E021 E024 H006 −008
	**432-G2**	120408G2	.031					▲	▲		▲			
	433-G2	120412G2	.047					▲	▲					
	432-T2	120408T2	.031							▲				
	433-T2	120412T2	.047							▲				
NEW PETIT CUT	**TNP-CNMA431-G2**	TNP-CNMA120404G2	.016					▲	▲		▲			C006 −009 E021 E024 H006 −008
	∗1 **432-G2**	120408G2	.031					▲	▲		▲			
	∗1 **433-G2**	120412G2	.047					▲						
	∗1 **432-T2**	120408T2	.031							▲				
	∗1 **433-T2**	120412T2	.047							▲				
NEW PETIT CUT (With Wiper)	∗1 **NP-CNGA431-GAWS2**	NP-CNGA120404GAWS2	.016		●			▲						C006 −009 E021 E024 H006 −008
	∗2 **432-GAWS2**	120408GAWS2	.031		●	●		▲						
	∗2 **433-GAWS2**	120412GAWS2	.047		●	●		▲						
	∗2 **431-GSWS2**	120404GSWS2	.016	★										
	∗2 **432-GSWS2**	120408GSWS2	.031	●										
	∗2 **433-GSWS2**	120412GSWS2	.047	★										
NEW PETIT CUT	**BF-CNGM431-TA2**	BF-CNGM120404TA2	.016		●									C006 −009 E021 E024 H006 −008
	**432-TA2**	120408TA2	.031		●									
(With breaker)	**433-TA2**	120412TA2	.047		●									
NEW PETIT CUT	**BM-CNGM432-TA2**	BM-CNGM120408TA2	.031			★								C006 −009 E021 E024 H006 −008
	**433-TA2**	120412TA2	.047			★								
(With breaker)														

∗1 This order number is for "10 inserts in one case" package.
∗2 Please refer to page B014 before using the wiper insert.

IDENTIFICATION ➤ B002
HONING ➤ B011

CBN TURNING INSERTS [NEGATIVE]

80° CN TYPE INSERTS WITH HOLE

NP-CNGA 4 3 1 GA
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 (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
NEW PETIT CUT	**NP-CNGA431GA**	NP-CNGA120404GA	.016		▲									C006 −009 E021 E024 H006 −008
	432GA	120408GA	.031		▲									
	433GA	120412GA	.047		▲									
	431GN	120404GN	.016		▲									
	432GN	120408GN	.031		▲									
	433GN	120412GN	.047		▲									
	431TA	120404TA	.016		▲									
	432TA	120408TA	.031		▲									
	433TA	120412TA	.047		▲									
NEW PETIT CUT	**NP-CNMA431GS**	NP-CNMA120404GS	.016								▲	▲		C006 −009 E021 E024 H006 −008
	432GS	120408GS	.031						▲		▲	▲		
	433GS	120412GS	.047								▲	▲		
	431G	120404G	.016					▲	▲		▲			
	432G	120408G	.031					▲	▲		▲	▲		
	433G	120412G	.047					▲	▲		▲	▲		
	431F	120404F	.016				▲				▲			
	432F	120408F	.031				▲				▲			
	433F	120412F	.047				▲				▲			
	431T	120404T	.016						★	▲		▲		
	432T	120408T	.031						★	▲		▲		
	433T	120412T	.047						★	▲		▲		
NEW	**CNGA432**	CNGA120408	.031					●			●	●		C006 −009 E021 E024 H006 −008
	433	120412	.047					●			●	●		
	CNMA431	CNMA120404	.016				★				▲	▲		C006 −009 E021 E024 H006 −008
	432	120408	.031				★	▲			▲	▲		
	433	120412	.047								▲	▲		

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<1 insert in one case>

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 (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
NEW PETIT CUT	**NP-DNGA431-GA4**	NP-DNGA150404GA4	.016		●	★								C010 −012 E021 E024 H009 −011
	432-GA4	150408GA4	.031		●	★								
	433-GA4	150412GA4	.047		●	★								
	431-GN4	150404GN4	.016		★									
	432-GN4	150408GN4	.031		★									
	433-GN4	150412GN4	.047		★									
	431-FS4	150404FS4	.016			★								
	432-FS4	150408FS4	.031			★								
	433-FS4	150412FS4	.047			★								
	431-TA4	150404TA4	.016		★	★								
	432-TA4	150408TA4	.031		★	★								
	433-TA4	150412TA4	.047		★	★								
NEW PETIT CUT	**BF-DNGG431-TA4**	BF-DNGG150404TA4	.016		★									C010 −012 E021 E024 H009 −011
	432-TA4	150408TA4	.031		★									
	433-TA4	150412TA4	.047		★									
(With breaker)														
NEW PETIT CUT	**NP-DNGA332-GA2**	NP-DNGA110408GA2	.031		●	●								C010 −012 E021 E024 H009 −011
	431-GA2	150404GA2	.016		●	●		●						
	432-GA2	150408GA2	.031		●	●		●						
	433-GA2	150412GA2	.047		●	●		●						
	332-GS2	110408GS2	.031	●										
	431-GS2	150404GS2	.016	●							●	●		
	432-GS2	150408GS2	.031	●							●	●		
	433-GS2	150412GS2	.047	●							●	●		
	332-GN2	110408GN2	.031		●									
	431-GN2	150404GN2	.016		●									
	432-GN2	150408GN2	.031		●									
	433-GN2	150412GN2	.047		●									
	431-FS2	150404FS2	.016			★		●					●	
	432-FS2	150408FS2	.031			★		●					●	
	433-FS2	150412FS2	.047			★		●					●	
	332-TA2	110408TA2	.031		●									
	431-TA2	150404TA2	.016		●	★		●		●				
	432-TA2	150408TA2	.031		●	★		●		●				
	433-TA2	150412TA2	.047		●	★		●		●				
	431-TS2	150404TS2	.016										●	
	432-TS2	150408TS2	.031										●	
	433-TS2	150412TS2	.047										●	

IDENTIFICATION ➤ B002
HONING ➤ B011

CBN TURNING INSERTS [NEGATIVE]

55° DN TYPE INSERTS WITH HOLE

NP-DNGA 4 3 1 G2
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

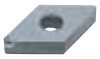
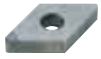
Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Applicable Holder Page
NEW PETIT CUT	**NP-DNGA431-G2**	NP-DNGA150404G2	.016					▲						C010 −012 E021 E024 H009 −011
	432-G2	150408G2	.031					▲						
	433-G2	150412G2	.047					▲						
	431-T2	150404T2	.016					▲						
	432-T2	150408T2	.031					▲						
	433-T2	150412T2	.047					▲						
NEW PETIT CUT	*1 **TNP-DNGA431-GS2**	TNP-DNGA150404GS2	.016	▲										C010 −012 E021 E024 H009 −011
	*1 **432-GS2**	150408GS2	.031	▲										
	*1 **433-GS2**	150412GS2	.047	▲										
	*1 **431-G2**	150404G2	.016					★						
	*1 **432-G2**	150408G2	.031					★						
	*1 **433-G2**	150412G2	.047					★						
	*1 **431-T2**	150404T2	.016					★						
	*1 **432-T2**	150408T2	.031					★						
	*1 **433-T2**	150412T2	.047					★						
NEW PETIT CUT	**NP-DNMA431-G2**	NP-DNMA150404G2	.016					▲	▲		▲			C010 −012 E021 E024 H009 −011
	432-G2	150408G2	.031					▲	▲		▲			
	433-G2	150412G2	.047					▲	▲		▲			
NEW PETIT CUT	*1 **TNP-DNMA431-G2**	TNP-DNMA150404G2	.016					▲	▲		▲			C010 −012 E021 E024 H009 −011
	*1 **432-G2**	150408G2	.031					▲	▲		▲			
	*1 **433-G2**	150412G2	.047					▲	▲		▲			
NEW PETIT CUT (With Wiper)	*2 **NP-DNGA431-GAWS2JR**	NP-DNGA150404GAWS2JR	.016		●			★						C010 −012 E021 E024 H009 −011
	*2 **431-GAWS2JL**	150404GAWS2JL	.016		●			★						
	*2 **432-GAWS2JR**	150408GAWS2JR	.031		●			★						
	*2 **432-GAWS2JL**	150408GAWS2JL	.031		●			★						
	*2 **431-GSWS2JR**	150404GSWS2JR	.016	★										
	*2 **431-GSWS2JL**	150404GSWS2JL	.016	★										
	*2 **432-GSWS2JR**	150408GSWS2JR	.031	★										
	*2 **432-GSWS2JL**	150408GSWS2JL	.031	★										
NEW PETIT CUT (With breaker)	**BF-DNGM431-TA2**	BF-DNGM150404TA2	.016		●									C010 −012 E021 E024 H009 −011
	432-TA2	150408TA2	.031		●									
	433-TA2	150412TA2	.047		●									
NEW PETIT CUT (With breaker)	**BM-DNGM432-TA2**	BM-DNGM150408TA2	.031			★								C010 −012 E021 E024 H009 −011
	433-TA2	150412TA2	.047			★								

*1 This order number is for "10 inserts in one case" package.
*2 Please refer to page B014 before using the wiper insert.

● : Inventory maintained. ★ : 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 (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
NEW PETIT CUT	**NP-DNGA431GA**	NP-DNGA150404GA	.016		▲									C010 −012 E021 E024 H009 −011
	432GA	150408GA	.031		▲									
	433GA	150412GA	.047		▲									
	431GN	150404GN	.016		▲									
	**432GN**	150408GN	.031		▲									
	433GN	150412GN	.047		▲									
	431TA	150404TA	.016		▲									
	432TA	150408TA	.031		▲									
	433TA	150412TA	.047		▲									
NEW PETIT CUT	**NP-DNMA431GS**	NP-DNMA150404GS	.016								▲	▲		C010 −012 E021 E024 H009 −011
	432GS	150408GS	.031						▲		▲	▲		
	332G	110408G	.031					▲	▲					
	431G	150404G	.016					▲	▲		▲			
	432G	150408G	.031					▲	▲		▲	▲		
	**433G**	150412G	.047					▲	▲		▲			
	431F	150404F	.016				▲				▲			
	432F	150408F	.031				▲				▲			
	433F	150412F	.047				▲							
	431T	150404T	.016						★	▲		▲		
	432T	150408T	.031						★	▲		▲		
	433T	150412T	.047							▲				
	**DNGA432**	DNGA150408	.031					●						C010 −012 E021 E024 H009 −011

IDENTIFICATION ➤ B002
HONING ➤ B011

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 (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Applicable Holder Page
NEW PETIT CUT 	**NP-SNGA431-GA4**	NP-SNGA120404GA4	.016		★									C014 −017 E022 E025
	432-GA4	120408GA4	.031		●									
	433-GA4	120412GA4	.047		★									
NEW PETIT CUT 	**NP-SNGA431-GA2**	NP-SNGA120404GA2	.016		●									C014 −017 E022 E025
	432-GA2	120408GA2	.031		●									
	433-GA2	120412GA2	.047		●									
	431-GS2	120404GS2	.016	●										
	432-GS2	120408GS2	.031	●							●	●		
	433-GS2	120412GS2	.047	●							●	●		
	431-FS2	120404FS2	.016										●	
	432-FS2	120408FS2	.031										●	
	433-FS2	120412FS2	.047										●	
	431-TS2	120404TS2	.016										●	
	432-TS2	120408TS2	.031										●	
	433-TS2	120412TS2	.047										●	
	431-G2	120404G2	.016					★						
	432-G2	120408G2	.031					★						
	433-G2	120412G2	.047					★						
	431-T2	120404T2	.016					★						
	432-T2	120408T2	.031					★						
	433-T2	120412T2	.047					★						
NEW PETIT CUT 	*1 **TNP-SNGA431-G2**	TNP-SNGA120404G2	.016					★						C014 −017 E022 E025
	*1 **432-G2**	120408G2	.031					★						
	*1 **433-G2**	120412G2	.047					★						
	*1 **431-T2**	120404T2	.016					★						
	*1 **432-T2**	120408T2	.031					★						
	*1 **433-T2**	120412T2	.047					★						
NEW PETIT CUT 	**NP-SNMA433-G2**	NP-SNMA120412G2	.047								▲			C014 −017 E022 E025
NEW PETIT CUT 	**NP-SNGA431GA**	NP-SNGA120404GA	.016		▲									C014 −017 E022 E025
	432GA	120408GA	.031		▲									
	433GA	120412GA	.047		▲									

*1 This order number is for "10 inserts in one case" package.

● : Inventory maintained. ★ : 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 (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
NEW PETIT CUT	**NP-SNMA431GS**	NP-SNMA120404GS	.016								▲	▲		C014 –017 E022 E025
	432GS	120408GS	.031								▲	▲		
	431G	120404G	.016					★	★					
	432G	120408G	.031					▲	★					
	433G	120412G	.047					★						
	**431F**	120404F	.016				▲				▲			
	432F	120408F	.031				▲				▲			
	433F	120412F	.047				★				▲			
	431T	120404T	.016						★	▲		▲		
	432T	120408T	.031						★	▲		▲		
	433T	120412T	.047						★	★		▲		
	SNGA432	SNGA120408	.031								●	●		C014 –017 E022 E025
	**433**	120412	.047								●	●		

IDENTIFICATION ➤ B002
HONING ➤ B011

CBN TURNING INSERTS [NEGATIVE]

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 (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
NEW PETIT CUT	**NP-TNGA331-GA6**	NP-TNGA160404GA6	.016		●	★								C018 −023 E022 E025
	332-GA6	160408GA6	.031		●	★								
	333-GA6	160412GA6	.047		●	★								
	331-GN6	160404GN6	.016		★									
	332-GN6	160408GN6	.031		★									
	333-GN6	160412GN6	.047		★									
	331-FS6	160404FS6	.016			★								
	332-FS6	160408FS6	.031			★								
	333-FS6	160412FS6	.047			★								
	331-TA6	160404TA6	.016		★	★								
	332-TA6	160408TA6	.031		★	★								
	333-TA6	160412TA6	.047		★	★								
NEW PETIT CUT	**NP-TNGA330.5-GA3**	NP-TNGA160402GA3	.008		●									C018 −023 E022 E025
	331-GA3	160404GA3	.016		●	●		●						
	332-GA3	160408GA3	.031		●	●		●						
	333-GA3	160412GA3	.047		●	●		●						
	331-GS3	160404GS3	.016	●							●	●		
	332-GS3	160408GS3	.031	●							●	●		
	333-GS3	160412GS3	.047	●							●	●		
	330.5-GN3	160402GN3	.008		●									
	331-GN3	160404GN3	.016		●									
	332-GN3	160408GN3	.031		●									
	333-GN3	160412GN3	.047		●									
	331-FS3	160404FS3	.016			★							●	
	332-FS3	160408FS3	.031			★							●	
	333-FS3	160412FS3	.047			★							●	
	331-TA3	160404TA3	.016		●	★								
	332-TA3	160408TA3	.031		●	★		●		●				
	333-TA3	160412TA3	.047		●	★		●		●				
	331-TS3	160404TS3	.016										●	
	332-TS3	160408TS3	.031										●	
	333-TS3	160412TS3	.047										●	
	331-G3	160404G3	.016					★						
	332-G3	160408G3	.031					★						
	333-G3	160412G3	.047					★						
	331-T3	160404T3	.016					★						
	332-T3	160408T3	.031					★						
	333-T3	160412T3	.047					★						

● : Inventory maintained. ★ : 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 (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
NEW PETIT CUT	∗1 **TNP-TNGA331-G3**	TNP-TNGA160404G3	.016					★						C018 −023 E022 E025
	∗1 **332-G3**	160408G3	.031					★						
	∗1 **333-G3**	160412G3	.047					★						
	∗1 **331-T3**	160404T3	.016					★						
	∗1 **332-T3**	160408T3	.031					★						
	∗1 **333-T3**	160412T3	.047					★						
NEW PETIT CUT	**BM-TNGM332-TA3**	BM-TNGM160408TA3	.031			★								C018 −023 E022 E025
	333-TA3	160412TA3	.047			★								
(With breaker)														
NEW PETIT CUT	**NP-TNGA331GA**	NP-TNGA160404GA	.016		▲									C018 −023 E022 E025
	332GA	160408GA	.031		▲									
	333GA	160412GA	.047		▲									
	331GN	160404GN	.016		▲									
	332GN	160408GN	.031		▲									
	333GN	160412GN	.047		▲									
	331TA	160404TA	.016		▲									
	332TA	160408TA	.031		▲									
	333TA	160412TA	.047		▲									
NEW PETIT CUT	**NP-TNMA331GS**	NP-TNMA160404GS	.016								▲	▲		C018 −023 E022 E025
	332GS	160408GS	.031								▲	▲		
	333GS	160412GS	.047								▲	▲		
	331G	160404G	.016					▲	★					
	332G	160408G	.031					▲	★					
	333G	160412G	.047					▲	★					
	331F	160404F	.016				▲				▲			
	332F	160408F	.031				▲				▲			
	333F	160412F	.047				▲				▲			
	331T	160404T	.016						▲	▲		▲		
	332T	160408T	.031						▲	▲		▲		
	333T	160412T	.047						▲	▲				
	TNGA331	TNGA160404	.016				★				●	●		C018 −023 E022 E025
	332	160408	.031				★				●	●		
	431	220404	.016								●			
	432	220408	.031								●			
	433	220412	.047								●			

∗1 This order number is for "10 inserts in one case" package.

IDENTIFICATION ➤ B002
HONING ➤ B011

CBN TURNING INSERTS [NEGATIVE]

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 (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Applicable Holder Page
NEW PETIT CUT	**NP-VNGA331-GA4**	NP-VNGA160404GA4	.016		●	★								
	332-GA4	160408GA4	.031		●	★								
	333-GA4	160412GA4	.047			★								
	331-FS4	160404FS4	.016			★								C024 C025 E023 E026
	332-FS4	160408FS4	.031			★								
	333-FS4	160412FS4	.047			★								
	331-TA4	160404TA4	.016			★								
	332-TA4	160408TA4	.031			★								
	333-TA4	160412TA4	.047			★								
NEW PETIT CUT	**NP-VNGA330.5-GA2**	NP-VNGA160402GA2	.008		●			●						
	331-GA2	160404GA2	.016		●	●		●		●				
	332-GA2	160408GA2	.031		●	●		●		●				
	331-GS2	160404GS2	.016	●									●	
	332-GS2	160408GS2	.031	●									●	
	330.5-GN2	160402GN2	.008		●									
	331-FS2	160404FS2	.016			★							●	
	332-FS2	160408FS2	.031			★							●	C024 C025 E023 E026
	331-TA2	160404TA2	.016			★		●		●				
	332-TA2	160408TA2	.031			★		●		●				
	331-TS2	160404TS2	.016										●	
	332-TS2	160408TS2	.031										●	
	331-G2	160404G2	.016					▲						
	332-G2	160408G2	.031					▲						
	331-T2	160404T2	.016					▲						
	332-T2	160408T2	.031					▲						
NEW PETIT CUT	*1 **TNP-VNGA331-GS2**	TNP-VNGA160404GS2	.016	▲										
	*1 **332-GS2**	160408GS2	.031	▲										
	*1 **331-G2**	160404G2	.016					★						C024 C025 E023 E026
	*1 **332-G2**	160408G2	.031					★						
	*1 **331-T2**	160404T2	.016					★						
	*1 **332-T2**	160408T2	.031					★						
NEW PETIT CUT	**NP-VNMA331-G2**	NP-VNMA160404G2	.016					▲	▲		▲			
	332-G2	160408G2	.031					▲	▲		▲			C024 C025 E023 E026
	331-F2	160404F2	.016				▲							
	332-F2	160408F2	.031				▲							
NEW PETIT CUT	*1 **TNP-VNMA331-F2**	TNP-VNMA160404F2	.016				▲							
	*1 **332-F2**	160408F2	.031				▲							C024 C025 E023 E026
	*1 **331-G2**	160404G2	.016					▲	▲		▲			
	*1 **332-G2**	160408G2	.031					▲	▲		▲			

*1 This order number is for "10 inserts in one case" package.

● : Inventory maintained. ★ : 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			Coated CBN			CBN								Applicable Holder Page
			MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020		
	H	Hardened Materials	●	◐	◐	●	◐	◐	✣	●	◐			
	K	Cast Iron								●	◐			
	S	Heat-resistant Alloy, Titanium Alloy									◐			
		Sintered Alloy										◐		
Shape	Order Number	(ISO) Number	Corner Radius (inch)											
NEW PETIT CUT	**NP-VNGA331GA**	NP-VNGA160404GA	.016		▲									–
	**332GA**	160408GA	.031		▲									
NEW PETIT CUT	**NP-VNMA331GS**	NP-VNMA160404GS	.016							▲	▲			C024 C025 E023 E026
	332GS	160408GS	.031							▲	▲			
	331G	160404G	.016				▲	▲						
	332G	160408G	.031				▲	▲		▲	▲			
	**331F**	160404F	.016			▲				▲				
	332F	160408F	.031			▲				▲				
	331T	160404T	.016					★	▲		▲			
	332T	160408T	.031					★	▲		▲			
	VNGA332	VNGA160408	.031				●							C024 C025 E023 E026
														

IDENTIFICATION ➤ B002
HONING ➤ B011

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 (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
NEW PETIT CUT	**NP-WNGA432-GA6**	NP-WNGA080408GA6	.031		★									C027 E023 E026 E027
NEW PETIT CUT	**NP-WNGA432-GA3**	NP-WNGA080408GA3	.031		●	●								C027 E023 E026 E027
	432-FS3	080408FS3	.031										●	
	432-TS3	080408TS3	.031										●	
NEW PETIT CUT (With Wiper)	*1 **NP-WNGA432-GAWS3**	NP-WNGA080408GAWS3	.031		●			★						C027 E023 E026 E027
	*1 **432-GSWS3**	080408GSWS3	.031	★										
NEW PETIT CUT	**NP-WNGA432GA**	NP-WNGA080408GA	.031		▲									C027 E023 E026 E027

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

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<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 (inch)	Coated CBN			CBN						Solid CBN	Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	MBS140	
	**CNG431**	CNGN120404	.016											★	–
	432	120408	.031											●	
	433	120412	.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 (inch)	Coated CBN			CBN						Solid CBN	Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	MBS140	
	**DNG322**	DNGN110308	.031											★	–
	323	110312	.047											★	

IDENTIFICATION ➤ B002
HONING ➤ B011

CBN TURNING INSERTS [NEGATIVE]

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 (inch)	Coated CBN			CBN						Solid CBN	Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	MBS140	
	**RNG32**	RNGN090300	0											●	–
	42	120300	0											●	
	43	120400	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 (inch)	Coated CBN			CBN						Solid CBN	Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	MBS140	
	**SNG322**	SNGN090308	.031											●	–
	323	090312	.047											●	
	324	090316	.063											●	
	432	120408	.031											●	
	433	120412	.047											★	
	434	120416	.063											●	
	**SNG432**	SNGN120408	.031								●				–
	433	120412	.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 (inch)	Coated CBN			CBN						Solid CBN	Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	MBS140	
	**TNG332**	TNGN160408	.031											●	–
	333	160412	.047											●	
	334	160416	.063											●	
	**TNG331**	TNGN160404	.016								●				–
	332	160408	.031								●				

CBN TURNING INSERTS [POSITIVE]

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 (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
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
	21.51-GA2	060204GA2	.016		●	●		●						
	21.52-GA2	060208GA2	.031		●	●		●						
	32.50.5-GA2	09T302GA2	.008		●	●		●						
	32.51-GA2	09T304GA2	.016		●	●		●						
	32.52-GA2	09T308GA2	.031		●	●		●						
	21.50.5-GS2	060202GS2	.008								●	●		
	21.51-GS2	060204GS2	.016	●							●	●		
	21.52-GS2	060208GS2	.031								●	●		
NEW	**32.50.5-GS2**	09T302GS2	.008								●	●		
	32.51-GS2	09T304GS2	.016	●							●	●		
	32.52-GS2	09T308GS2	.031	●							●	●		
	32.50.5-GN2	09T302GN2	.008		●									
	32.51-GN2	09T304GN2	.016		●									
	32.52-GN2	09T308GN2	.031		●									
	21.50.5-FA2	060202FA2	.008								●	●		
	21.51-FA2	060204FA2	.016								●	●		
	21.52-FA2	060208FA2	.031								●	●		
	32.51-FA2	09T304FA2	.016								●	●		
	32.52-FA2	09T308FA2	.031								●	●		
	21.50.5-FS2	060202FS2	.008			★							●	
	21.51-FS2	060204FS2	.016			★							●	
	21.52-FS2	060208FS2	.031										●	
	32.50.5-FS2	09T302FS2	.008			★							●	
	32.51-FS2	09T304FS2	.016			★							●	
	32.52-FS2	09T308FS2	.031			★							●	
NEW	**21.50.5-TA2**	060202TA2	.008							●				
NEW	**21.51-TA2**	060204TA2	.016							●				
NEW	**21.52-TA2**	060208TA2	.031							●				
NEW	**32.50.5-TA2**	09T302TA2	.008							●				
NEW	**32.51-TA2**	09T304TA2	.016							●				
NEW	**32.52-TA2**	09T308TA2	.031							●				

● : Inventory maintained. ★ : 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 (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	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
	21.51-TS2	060204TS2	.016										●	
	21.52-TS2	060208TS2	.031										●	
	32.50.5-TS2	09T302TS2	.008										●	
	32.51-TS2	09T304TS2	.016										●	
	32.52-TS2	09T308TS2	.031										●	
	32.51-G2	09T304G2	.016					▲						
	32.52-G2	09T308G2	.031					▲	▲					
NEW PETIT CUT 	∗1 **TNP-CCGW32.52-GS2**	TNP-CCGW09T308GS2	.031	▲										C030 D008 D012 E012 E013
	∗1 **32.51-G2**	09T304G2	.016					▲						
	∗1 **32.52-G2**	09T308G2	.031					▲	▲					
NEW PETIT CUT (With Wiper) 	NEW **NP-CCGW32.51-GAWS2**	NP-CCGW09T304GAWS2	.016					●						C030 D008 D012 E012 E013
	∗2 **32.52-GAWS2**	09T308GAWS2	.031		●			★						
	32.52-GSWS2	09T308GSWS2	.031	●										
NEW PETIT CUT 	**BF-CCGT32.51-TA2**	BF-CCGT09T304TA2	.016		●									C030 D008 D012 E012 E013
	32.52-TA2	09T308TA2	.031		●									
NEW PETIT CUT 	**NP-CCMB21.51G**	NP-CCMB060204G	.016						▲					C030 E006 E012 E013
NEW PETIT CUT 	**NP-CCGW21.50.5GA**	NP-CCGW060202GA	.008		▲									C030 D008 D012 E012 E013
	21.51GA	060204GA	.016		▲									
	21.52GA	060208GA	.031		▲									
	32.50.5GA	09T302GA	.008		▲									
	32.51GA	09T304GA	.016		▲									
	32.52GA	09T308GA	.031		▲									
	32.50.5GS	09T302GS	.008								▲	▲		
	32.51GS	09T304GS	.016								▲	▲		
	32.50.5GN	09T302GN	.008		▲									
	32.51GN	09T304GN	.016		▲									
	32.52GN	09T308GN	.031		▲									

∗1 This order number is for "10 inserts in one case" package.
∗2 Please refer to page B014 before using the wiper insert.

IDENTIFICATION ➤ B002
HONING ➤ B011

CBN TURNING INSERTS [POSITIVE]

80° CC TYPE INSERTS WITH HOLE

NP-CCGW 2 1.5 0.5 T
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 (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
NEW PETIT CUT 	NEW **NP-CCGW03S102FA**	NP-CCGW03S102FA	.008					●						C030 D008 D012 E012 E013
	NEW **04T002FA**	04T002FA	.008					●						
	NEW **03S104FS**	03S104FS	.016					●						
	NEW **04T004FS**	04T004FS	.016					●						
	21.50.5G	060202G	.008					▲	▲					
	21.51G	060204G	.016					▲	▲					
	21.52G	060208G	.031					▲						
	32.50.5G	09T302G	.008					▲	▲					
	32.51G	09T304G	.016					▲	▲		▲			
	32.52G	09T308G	.031					▲	▲		▲			
	21.50.5F	060202F	.008				▲							
	21.51F	060204F	.016				▲							
	32.50.5F	09T302F	.008				▲							
	32.51F	09T304F	.016				▲							
	21.50.5T	060202T	.008							▲				
	21.51T	060204T	.016							▲				
	32.50.5T	09T302T	.008							▲				
	32.51T	09T304T	.016							▲				
NEW PETIT CUT 	**NP-CCMW03S102F**	NP-CCMW03S102F	.008				▲							E029
	03S104F	03S104F	.016				▲							
	04T002F	04T004F	.008				▲							
	04T004F	04T004F	.016				▲							
NEW 	**CCGW32.51**	CCGW09T304	.016					●						C030 D008 D012 E012 E013
	32.52	09T308	.031					●						
	432	120408	.031					●						
	**CCMW32.51**	CCMW09T304	.016					▲						C030 D008 D012 E012 E013
	32.52	09T308	.031					▲						

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<1 insert in one case>

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 (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
NEW PETIT CUT	**NP-CPGB2.51.51-GA2**	NP-CPGB080204GA2	.016		★	★								E006
	2.51.52-GA2	080208GA2	.031		★	★								
	321-GA2	090304GA2	.016		★			●						
	322-GA2	090308GA2	.031		★									
	2.51.50.5-FS2	080202FS2	.008										★	
	2.51.51-FS2	080204FS2	.016			★							★	
	2.51.52-FS2	080208FS2	.031			★								
	320.5-FS2	090302FS2	.008										●	
	321-FS2	090304FS2	.016										●	
	322-FS2	090308FS2	.031										●	
NEW PETIT CUT	**NP-CPMB2.51.51G**	NP-CPMB080204G	.016						●					E006
	321G	090304G	.016						●					

IDENTIFICATION ➤ B002
HONING ➤ B011

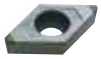
CBN TURNING INSERTS [POSITIVE]

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

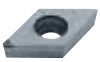
Work Material		
H	Hardened Materials	
K	Cast Iron	
S	Heat-resistant Alloy, Titanium Alloy	
	Sintered Alloy	

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
NEW PETIT CUT	NP-DCGW21.50.5-GA2	NP-DCGW070202GA2	.008		●	★		●						
	21.51-GA2	070204GA2	.016		●	●		●						
	21.52-GA2	070208GA2	.031		●	●		●						
	32.50.5-GA2	11T302GA2	.008		●	★		●						
	32.51-GA2	11T304GA2	.016		●	●		●						
	32.52-GA2	11T308GA2	.031		●	●		●						
	21.51-GS2	070204GS2	.016	●										
	32.50.5-GS2	11T302GS2	.008	★								●		
	32.51-GS2	11T304GS2	.016	●				●			●	●		
	32.52-GS2	11T308GS2	.031	●				●			●	●		
	21.50.5-GN2	070202GN2	.008		●									
	21.51-GN2	070204GN2	.016		●									
	21.52-GN2	070208GN2	.031		●									
	32.50.5-GN2	11T302GN2	.008		●									
	32.51-GN2	11T304GN2	.016		●									
	32.52-GN2	11T308GN2	.031		●									
	32.51-FA2	11T304FA2	.016								●	●		C031 C032 D009 D013 D040 E008 E013 E014
	32.52-FA2	11T308FA2	.031								●	●		
	21.50.5-FS2	070202FS2	.008			★								
	21.51-FS2	070204FS2	.016			★							●	
	21.52-FS2	070208FS2	.031										●	
	32.50.5-FS2	11T302FS2	.008			★							●	
	32.51-FS2	11T304FS2	.016			★							●	
	32.52-FS2	11T308FS2	.031			★							●	
	NEW 21.50.5-TA2	070202TA2	.008							●				
	NEW 21.51-TA2	070204TA2	.016							●				
	NEW 32.50.5-TA2	11T302TA2	.008							●				
	NEW 32.51-TA2	11T304TA2	.016							●				
	NEW 32.52-TA2	11T308TA2	.031							●				
	21.51-TS2	070204TS2	.016										●	
	21.52-TS2	070208TS2	.031										●	
	32.50.5-TS2	11T302TS2	.008										●	
	32.51-TS2	11T304TS2	.016										●	
	32.52-TS2	11T308TS2	.031										●	
	32.51-G2	11T304G2	.016					●						
	32.52-G2	11T308G2	.031					●						
	32.52-F2	11T308F2	.031								▲			
NEW PETIT CUT	*1 TNP-DCGW32.51-G2	TNP-DCGW11T304G2	.016					▲						C031 C032 D009 D013 D040 E008 E013 E014
	*1 32.52-G2	11T308G2	.031					▲						

*1 This order number is for "10 inserts in one case" package.
● : Inventory maintained. ★ : 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 (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
NEW PETIT CUT	**BF-DCGT32.51-TA2**	BF-DCGT11T304TA2	.016		●									C031 C032 D009 D013 D040 E008 E013 E014
 (With Breaker)	**32.52-TA2**	11T308TA2	.031		●									
NEW PETIT CUT	**NP-DCGW21.50.5GA**	NP-DCGW070202GA	.008		▲									C031 C032 D009 D013 D040 E008 E013 E014
	21.51GA	070204GA	.016		▲									
	21.52GA	070208GA	.031		▲									
	32.50.5GA	11T302GA	.008		▲									
	32.51GA	11T304GA	.016		▲									
	32.52GA	11T308GA	.031		▲									
	32.50.5GS	11T302GS	.008								▲	▲		
	32.51GS	11T304GS	.016								▲	▲		
	21.50.5GN	070202GN	.008		▲									
	21.51GN	070204GN	.016		▲									
	21.52GN	070208GN	.031		▲									
	32.50.5GN	11T302GN	.008		▲									
	32.51GN	11T304GN	.016		▲									
	32.52GN	11T308GN	.031		▲									
	**21.50.5G**	070202G	.008					▲						
	21.51G	070204G	.016					▲						
	21.52G	070208G	.031					▲						
	32.50.5G	11T302G	.008					▲	▲					
	32.51G	11T304G	.016					▲	▲					
	32.52G	11T308G	.031					▲	▲					
	21.50.5F	070202F	.008				●							
	21.51F	070204F	.016				●							
	32.50.5F	11T302F	.008				●							
	32.51F	11T304F	.016				●							
	21.50.5T	070202T	.008							▲				
	21.51T	070204T	.016							▲				
	32.50.5T	11T302T	.008							▲				
	32.51T	11T304T	.016							▲				
	32.52T	11T308T	.031							▲				
NEW PETIT CUT	**NP-DCMW21.51G**	NP-DCMW070204G	.016						▲					C031 C032 D009 D013 D040 E008 E013 E014
	**32.51G**	11T304G	.016						▲					

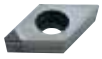
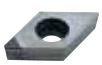
IDENTIFICATION ➤ B002
HONING ➤ B011

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 (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
NEW 	**DCGW32.51**	DCGW11T304	.016					●						C031 C032 D009 D013 D040 E008 E013 E014
	**DCMW32.51**	DCMW11T304	.016					▲						C031 C032 D009 D013 D040 E008 E013 E014

● : 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 (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
NEW PETIT CUT	**NP-TCGW1.81.50.5-GA3**	NP-TCGW090202GA3	.008		●									C035 E015 E016
	1.81.51-GA3	090204GA3	.016		●									
	1.81.52-GA3	090208GA3	.031		●									
	21.50.5-GA3	110202GA3	.008		●									
	21.51-GA3	110204GA3	.016		●	●								
	21.52-GA3	110208GA3	.031		●	●								
	2.521-GA3	130304GA3	.016		★									
	2.522-GA3	130308GA3	.031		★									
	32.51-GA3	16T304GA3	.016		●	●								
	32.52-GA3	16T308GA3	.031		●									
	21.51-FA3	110204FA3	.016								●	●		
	21.52-FA3	110208FA3	.031								●	●		
	21.51-FS3	110204FS3	.016										●	
	21.52-FS3	110208FS3	.031										●	
	NEW **32.51-FS3**	16T304FS3	.016										●	
	NEW **32.52-FS3**	16T308FS3	.031										●	
	21.51-TS3	110204TS3	.016										●	
	21.52-TS3	110208TS3	.031										●	
NEW PETIT CUT	**NP-TCGW21.51GA**	NP-TCGW110204GA	.016		▲									C035 E015 E016
	21.52GA	110208GA	.031		▲									
	32.51GA	16T304GA	.016		▲									
	32.52GA	16T308GA	.031		▲									

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 (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	CBN MB810	CBN MB8025	CBN MB825	CBN MB835	CBN MB710	CBN MB730	CBN MB4020	Applicable Holder Page
NEW PETIT CUT	NP-TPGB1.51.51-GA3	NP-TPGB080204GA3	.016		●			●						
	1.51.52-GA3	080208GA3	.031		●									
	1.81.51-GA3	090204GA3	.016		●			●						
	1.81.52-GA3	090208GA3	.031		●									
	221-GA3	110304GA3	.016		★	★								
	222-GA3	110308GA3	.031		★	★								
	321-GA3	160304GA3	.016		★	★		●						
	322-GA3	160308GA3	.031		★	●								E007
	1.81.50.5-FS3	090202FS3	.008										●	
	1.81.51-FS3	090204FS3	.016										●	
	220.5-FS3	110302FS3	.008										●	
	221-FS3	110304FS3	.016			★							●	
	222-FS3	110308FS3	.031			★							●	
	321-FS3	160304FS3	.016			★								
	322-FS3	160308FS3	.031			★								
NEW PETIT CUT	NP-TPGX1.51.50.5-GS3	NP-TPGX080202GS3	.008	★										
	1.51.51-GS3	080204GS3	.016	★										
	1.81.50.5-GS3	090202GS3	.008	★										
	1.81.51-GS3	090204GS3	.016	★										E007
	221-GS3	110304GS3	.016	★										
	222-GS3	110308GS3	.031	★										
	NEW 222-TA3	110308TA3	.031							●				
NEW PETIT CUT	NP-TPMB1.51.51G	NP-TPMB080204G	.016						▲					
	1.81.51G	090204G	.016						▲					
	221G	110304G	.016						★					E007
	321G	160304G	.016						▲					
NEW PETIT CUT	NP-TPGX1.81.51G	NP-TPGX090204G	.016					●						
	1.81.52G	090208G	.031					●						
	221G	110304G	.016					●	●		●			
	222G	110308G	.031					●	●		●			
	1.51.50.5F	080202F	.008				★							
	1.51.51F	080204F	.016				★							
	1.81.50.5F	090202F	.008				★							
	1.81.51F	090204F	.016				★							E007
	221F	110304F	.016				●				●			
	222F	110308F	.031				●				●			
	1.51.50.5T	080202T	.008							★				
	1.51.51T	080204T	.016							★				
	1.81.50.5T	090202T	.008							★				
	1.81.51T	090204T	.016							★				
	221T	110304T	.016						●	●		●		
	222T	110308T	.031						●	●		●		

● : Inventory maintained. ★ : 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			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 (inch)	MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
	**TPGX1.51.50.5**	TPGX080202	.008								★	★		E007
	1.51.51	080204	.016				★				★	★		
	1.81.50.5	090202	.008								★	★		
	1.81.51	090204	.016				★				★	★		
	221	110304	.016				●				●	●		
	222	110308	.031				●				●	●		
	321	160304	.016								●			
	322	160308	.031								●			

IDENTIFICATION ➤ B002
HONING ➤ B011

CBN TURNING INSERTS [POSITIVE]

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 (inch)	Coated CBN MBC010	Coated CBN MBC020	Coated CBN BC8020	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		●	●		●						C028 C029 D010 D011 D014 D015 E009 E010 H013
	332-GA2	160408GA2	.031		●	●		●						
	221-GS2	110304GS2	.016									●		
	222-GS2	110308GS2	.031									●		
	331-GS2	160404GS2	.016								●	●		
	332-GS2	160408GS2	.031								●	●		
	221-FS2	110304FS2	.016										●	
	222-FS2	110308FS2	.031										●	
	331-FS2	160404FS2	.016			★							●	
	332-FS2	160408FS2	.031			★							●	
	221-TS2	110304TS2	.016										●	
	222-TS2	110308TS2	.031										●	
	331-TS2	160404TS2	.016										●	
	332-TS2	160408TS2	.031										●	
NEW PETIT CUT	**NP-VBGW331GA**	NP-VBGW160404GA	.016		▲									C028 C029 H013
	332GA	160408GA	.031		▲									
	331G	160404G	.016					▲						
	332G	160408G	.031					▲						

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<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 (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
NEW PETIT CUT	**NP-VCGW331-GA2**	NP-VCGW160404GA2	.016		●	★		●						C036 E016 E017
	332-GA2	160408GA2	.031		●	★		●						
	331-FS2	160404FS2	.016			★								
	332-FS2	160408FS2	.031			★								
NEW PETIT CUT	**NP-VCGW331GA**	NP-VCGW160404GA	.016		▲									C036 E016 E017
	332GA	160408GA	.031		▲									

IDENTIFICATION ➤ B002
HONING ➤ B011

CBN TURNING INSERTS [POSITIVE]

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

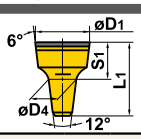
Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
NEW PETIT CUT	**NP-WCGW1.51.50.5-GA3**	NP-WCGWL30202GA3	.008		●									C037 E017 —020
	1.51.51-GA3	L30204GA3	.016		●									
	21.50.5-GA3	040202GA3	.008		●									
	21.51-GA3	040204GA3	.016		●									
	32.51-GA3	06T304GA3	.016		●									
	32.52-GA3	06T308GA3	.031		●									
	1.51.50.5-GS3	L30202GS3	.008	●										
	1.51.51-GS3	L30204GS3	.016	●										
	21.50.5-GS3	040202GS3	.008	●										
	21.51-GS3	040204GS3	.016	●										
	32.51-GS3	06T304GS3	.016	●										
	32.52-GS3	06T308GS3	.031	●										
NEW PETIT CUT	**NP-WCMW1.51.51FA**	NP-WCMWL30204FA	.016									●		C037 E017 —020
	1.51.52FA	L30208FA	.031									●		
	1.51.50.5G	L30202G	.008					●	●					
	1.51.51G	L30204G	.016					●	●					
	21.50.5G	040202G	.008					●	●					
	21.51G	040204G	.016					●	●					
	32.51G	06T304G	.016					●	●					
	32.52G	06T308G	.031					●	●					

● : Inventory maintained. ★ : 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	D1	S1	L1	D4	
	**RTG05A**	RTG05A	★	.197	.138	.295	.098	–
	06A	06A	★	.236	.138	.295	.138	
	07A	07A	★	.276	.197	.433	.138	
	08A	08A	★	.315	.197	.433	.177	
	10A	10A	★	.394	.256	.551	.217	

IDENTIFICATION ➤ B002
HONING ➤ B011

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		
	H	Hardened Materials
	K	Cast Iron
	S	Heat-resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
	**SPG321**	SPGN090304	.016								●			–
	322	090308	.031								●			
	421	120304	.016								●	★		
	422	120308	.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 (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
	**TBG1.211**	TBGN060104	.016				★				★			–
	1.212	060108	.031				★				★			

60° TP TYPE INSERTS WITHOUT HOLE

TPG 1.8 1.5 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 (inch)	Coated CBN			CBN							Applicable Holder Page
				MBC010	MBC020	BC8020	MB810	MB8025	MB825	MB835	MB710	MB730	MB4020	
	**TPG221**	TPGN110304	.016								●	●		–
	321	160304	.016								●	●		
	322	160308	.031					●			●	●		

● : Inventory maintained.
★ : Inventory maintained in Japan. □ : Non stock, produced to order only
<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 (inch)	PCD MD220	Applicable Holder Page
NEW PETIT CUT 	**NP-CNMM430.5RF**	NP-CNMM120402R-F	.008	★	C006 −009 E021 E024 H006 −008
	430.5LF	120402L-F	.008	□	
	431RF	120404R-F	.016	★	
	431LF	120404L-F	.016	□	
	432RF	120408R-F	.031	★	
	432LF	120408L-F	.031	□	
	**CNMA431**	CNMA120404	.016	★	C006 −009 E021 E024 H006 −008
	432	120408	.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 (inch)	PCD MD220	Applicable Holder Page
NEW PETIT CUT 	**NP-DNMM430.5RF**	NP-DNMM150402R-F	.008	★	C010 −012 E021 E024 H009 −011
	430.5LF	150402L-F	.008	□	
	431RF	150404R-F	.016	★	
	431LF	150404L-F	.016	□	
	432RF	150408R-F	.031	★	
	432LF	150408L-F	.031	□	
	**DNGA431**	DNGA150404	.016	★	C010 −012 E021 E024 H009 −011
	432	150408	.031	★	

PCD TURNING INSERTS [NEGATIVE]

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 (inch)	PCD MD220	Applicable Holder Page
NEW PETIT CUT 	**NP-SNMM431RF**	NP-SNMM120404R-F	.016	★	C014 –017 E022 E025
	431LF	120404L-F	.016	□	
	432RF	120408R-F	.031	★	
	432LF	120408L-F	.031	□	
	**SNGA431**	SNGA120404	.016	□	C014 –017 E022 E025
	432	120408	.031	★	

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 (inch)	PCD MD220	Applicable Holder Page
NEW PETIT CUT 	**NP-TNMM330.5RF**	NP-TNMM160402R-F	.008	★	C018 –023 E022 E025
	330.5LF	160402L-F	.008	□	
	331RF	160404R-F	.016	★	
	331LF	160404L-F	.016	□	
	332RF	160408R-F	.031	★	
	332LF	160408L-F	.031	□	
	**TNGA330.5**	TNGA160402	.008	★	C018 –023 E022 E025
	331	160404	.016	★	
	332	160408	.031	★	

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.
<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 (inch)	PCD MD220	Applicable Holder Page
NEW PETIT CUT 	**NP-VNMM330.5RF**	NP-VNMM160402R-F	.008	★	C024 C025 E023 E026
	330.5LF	160402L-F	.008	□	
	331RF	160404R-F	.016	★	
	331LF	160404L-F	.016	□	
	332RF	160408R-F	.031	★	
	332LF	160408L-F	.031	□	
	**VNGA331**	VNGA160404	.016	★	C024 C025 E023 E026
	332	160408	.031	★	

PCD TURNING INSERTS [NEGATIVE]

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 (inch)	PCD MD220	Applicable Holder Page
	**SNG431**	SNGN120404	.016	□	C014 –017 E025
	432	120408	.031	★	

● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.
<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 (inch)	PCD MD220	Applicable Holder Page
NEW PETIT CUT 	**NP-CCMH21.50.5**	NP-CCMH060202	.008	●	C030 E006 E012 E013
	21.51	060204	.016	●	
	**NP-CCMW03S102**	NP-CCMW03S102	.008	●	–
	03S104	03S104	.016	●	
	04T002	04T002	.008	●	
	04T004	04T004	.016	●	
	**CCMW21.50.5**	CCMW060202	.008	●	C030 D008 D012 E012 E013
	21.51	060204	.016	●	
	32.50.5	09T302	.008	●	
	32.51	09T304	.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

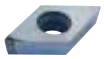
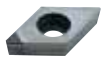
Work Material	N	Non-Ferrous Metal		●	
Shape	Order Number	(ISO) Number	Corner Radius (inch)	PCD MD220	Applicable Holder Page
NEW PETIT CUT 	**NP-CPMH2.51.50.5**	NP-CPMH080202	.008	●	E006
	2.51.51	080204	.016	●	
	320.5	090302	.008	●	
	321	090304	.016	●	
	**CPGT2.51.50.5**	CPGT080202	.008	●	–
	2.51.51	080204	.016	●	
	320.5	090302	.008	●	
	321	090304	.016	●	

PCD TURNING INSERTS [POSITIVE]

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 (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
	21.50.5LF	070202L-F	.008	●	
	21.51RF	070204R-F	.016	●	
	21.51LF	070204L-F	.016	●	
	32.50.5RF	11T302R-F	.008	●	
	32.50.5LF	11T302L-F	.008	●	
	32.51RF	11T304R-F	.016	●	
	32.51LF	11T304L-F	.016	●	
	**DCMW21.50.5**	DCMW070202	.008	★	C031 C032 D009 D013 D040 E008 E013 E014
	21.51	070204	.016	●	
	32.50.5	11T302	.008	●	
	32.51	11T304	.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 (inch)	PCD MD220	Applicable Holder Page
	**SPGX321**	SPGX090304	.016	★	–
	322	090308	.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 (inch)	PCD MD220	Applicable Holder Page
	**TCMW21.50.5**	TCMW110202	.008	●	C035 E015 E016
	21.51	110204	.016	★	
	**TCGW1.210.5**	TCGW060102	.008	★	–
	1.211	060104	.016	★	
	1.212	060108	.031	★	

PCD TURNING INSERTS [POSITIVE]

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 (inch)	PCD MD220	Applicable Holder Page
NEW PETIT CUT	**NP-TPMX1.81.50.5RF**	NP-TPMX090202R-F	.008	★	E007
	1.81.50.5LF	090202L-F	.008	★	
	1.81.51RF	090204R-F	.016	□	
	1.81.51LF	090204L-F	.016	★	
	1.81.52RF	090208R-F	.031	□	
	1.81.52LF	090208L-F	.031	★	
	220.5RF	110302R-F	.008	□	
	220.5LF	110302L-F	.008	★	
	**221RF**	110304R-F	.016	□	
	221LF	110304L-F	.016	★	
	222RF	110308R-F	.031	□	
	222LF	110308L-F	.031	★	
	320.5RF	160302R-F	.008	□	
	320.5LF	160302L-F	.008	★	
	321RF	160304R-F	.016	□	
	321LF	160304L-F	.016	★	
	322RF	160308R-F	.031	□	
	322LF	160308L-F	.031	★	
NEW PETIT CUT	**NP-TPMH1.51.50.5RF**	NP-TPMH080202R-F	.008	●	E007
	1.51.50.5LF	080202L-F	.008	●	
	1.51.51RF	080204R-F	.016	●	
	1.51.51LF	080204L-F	.016	●	
	1.81.50.5RF	090202R-F	.008	●	
	1.81.50.5LF	090202L-F	.008	●	
	1.81.51RF	090204R-F	.016	●	
	1.81.51LF	090204L-F	.016	●	
	**220.5RF**	110302R-F	.008	●	
	220.5LF	110302L-F	.008	●	
	221RF	110304R-F	.016	●	
	221LF	110304L-F	.016	●	
	320.5RF	160302R-F	.008	★	
	320.5LF	160302L-F	.008	★	
	321RF	160304R-F	.016	★	
	321LF	160304L-F	.016	★	
	TPGT320.5RF	TPGT160302R-F	.008	★	–
	320.5LF	160302L-F	.008	★	
	**321RF**	160304R-F	.016	★	
	321LF	160304L-F	.016	★	

● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.
<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 (inch)	PCD MD220	Applicable Holder Page
	**TPGV1.81.50.5RF**	TPGV090202R-F	.008	★	–
	1.81.50.5LF	090202L-F	.008	★	
	1.81.51RF	090204R-F	.016	★	
	1.81.51LF	090204L-F	.016	★	
	220.5RF	110302R-F	.008	★	
	220.5LF	110302L-F	.008	★	
	221RF	110304R-F	.016	★	
	221LF	110304L-F	.016	★	
	**TPGX1.51.50.5**	TPGX080202	.008	★	E007
	1.51.51	080204	.016	★	
	1.51.52	080208	.031	★	
	1.81.50.5	090202	.008	★	
	1.81.51	090204	.016	★	
	1.81.52	090208	.031	★	
	220.5	110302	.008	★	
	221	110304	.016	★	
	222	110308	.031	★	
	321	160304	.016	★	
	322	160308	.031	★	

PCD TURNING INSERTS [POSITIVE]

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 (inch)	PCD MD220	Applicable Holder Page
	**NP-VBGT22V5RF**	NP-VBGT1103V5R-F	.002	★	C028 C029 D010 D011 D014 D015 E009 E010
	220.2RF	110301R-F	.004	★	
	220.5RF	110302R-F	.008	★	
	221RF	110304R-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 (inch)	PCD MD220	Applicable Holder Page
	**NP-VCGT1.51.5V5RF**	NP-VCGT0802V5R-F	.002	★	C036 E009 E010 E016 E017
	1.51.50.2RF	080201R-F	.004	★	
	1.51.50.5RF	080202R-F	.008	★	
	1.51.51RF	080204R-F	.016	★	
	22V5RF	1103V5R-F	.002	★	
	220.2RF	110301R-F	.004	★	
	220.5RF	110302R-F	.008	★	
	221RF	110304R-F	.016	★	

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.
<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 (inch)	PCD MD220	Applicable Holder Page
	**WCMW1.51.50.5**	WCMWL30202	.008	★	–
	1.51.51	L30204	.016	□	
	21.50.5	040202	.008	★	
	21.51	040204	.016	□	
	32.51	06T304	.016	★	
	32.52	06T308	.031	□	

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 (inch)	PCD MD220	Applicable Holder Page
	**WPGT21.50.5**	WPGT040202	.008	★	–
	21.51	040204	.016	★	
	320.5	060302	.008	★	
	321	060304	.016	★	

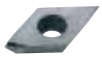
PCD TURNING INSERTS [POSITIVE]

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 (inch)	PCD MD220	Applicable Holder Page
	**DEGX430.5RF**	DEGX150402R-F	.008	★	C041
	430.5LF	150402L-F	.008	★	
	431RF	150404R-F	.016	★	
	431LF	150404L-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 (inch)	PCD MD220	Applicable Holder Page
	**TEGX320.5R**	TEGX160302R	.008	★	C042 E028
	320.5L	160302L	.008	★	
	321R	160304R	.016	★	
	321L	160304L	.016	★	
	**TEGX320.5**	TEGX160302	.008	★	C042 E028
	321	160304	.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 (inch)	PCD MD220	Applicable Holder Page
	**VDGX320.5RF**	VDGX160302R-F	.008	★	–
	320.5LF	160302L-F	.008	★	
	321RF	160304R-F	.016	★	
	321LF	160304L-F	.016	★	

PCD TURNING INSERTS [POSITIVE]

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 (inch)	PCD MD220	Applicable Holder Page
	**SPG320.5**	SPGN090302	.008	★	–
	321	090304	.016	★	
	322	090308	.031	★	
	323	090312	.047	□	
	421	120304	.016	★	
	422	120308	.031	★	
	423	120312	.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 (inch)	PCD MD220	Applicable Holder Page
	**TPG220.5**	TPGN110302	.008	★	–
	221	110304	.016	★	
	222	110308	.031	★	
	320.5	160302	.008	★	
	321	160304	.016	★	
	322	160308	.031	★	
	323	160312	.047	□	

★ : Inventory maintained in Japan. □ : Non stock, produced to order only.
<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.

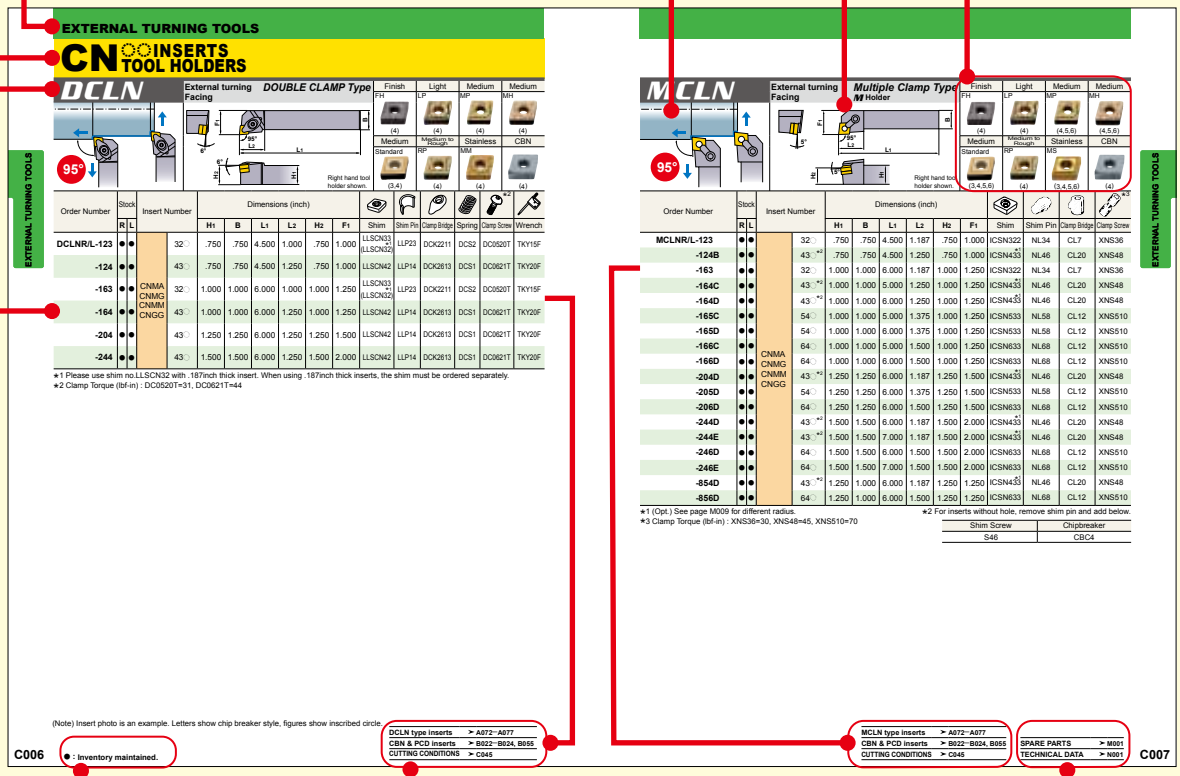
TITLE OF PRODUCT BY INSERT TYPE

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

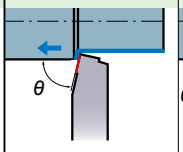
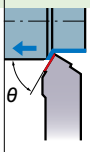
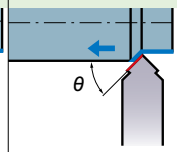
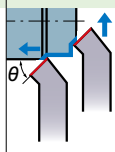
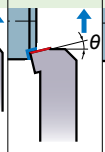
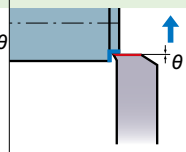
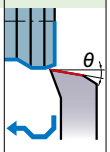
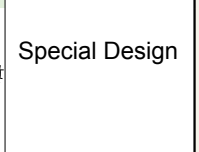
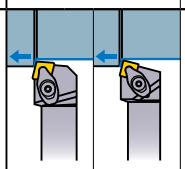
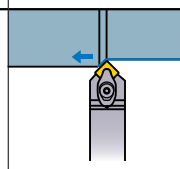
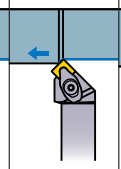
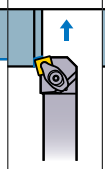
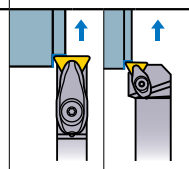
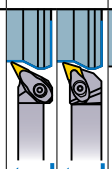
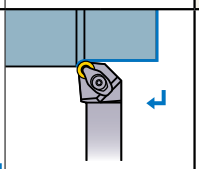
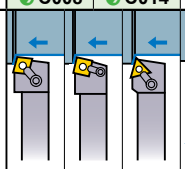
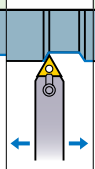
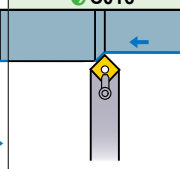
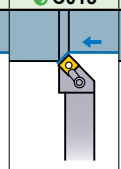
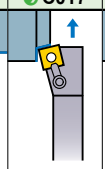
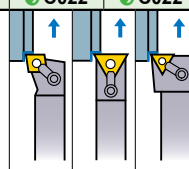
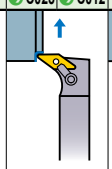
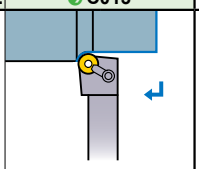
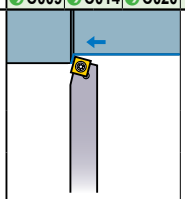
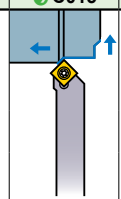
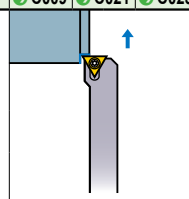
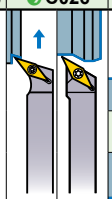
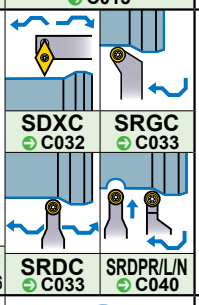
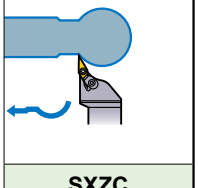
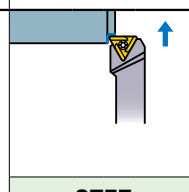
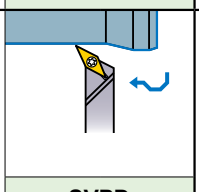
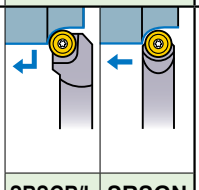
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DN○○ INSERTS TOOL HOLDERS C010
RN○○ INSERTS TOOL HOLDERS C013
SN○○ INSERTS TOOL HOLDERS C014
TN○○ INSERTS TOOL HOLDERS C018
VN○○ INSERTS TOOL HOLDERS C024
WN○○ INSERTS TOOL HOLDERS C027
VB○○ INSERTS TOOL HOLDERS C028
CC○○ INSERTS TOOL HOLDERS C030
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	
		$\theta = 95°$	$\theta = 93°$	$\theta = 62° 30'$ $72° 30'$	$\theta = 90° - 91°$	
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				
θ = 75°		θ = 60°	θ = 45°	θ = 45°	θ = 15°	θ = 0°—-1°	θ = 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, TL 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

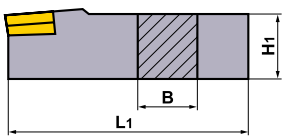
B	C	D	E	N	P
5°	7°	15°	20°	0°	11°

⑤ Hand of Tool

R	L	N

⑥ Tool Size [Height (H_1) and Width (B)] (inch)

	06	08	10	12	16	20	24	85
H_1	.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_1, the number will represent the number of sixteeths of B and H_1.
In case of B≠H_1, the first digit represents the number of eighths of B, and the second digit represents the number of quarters of H_1.

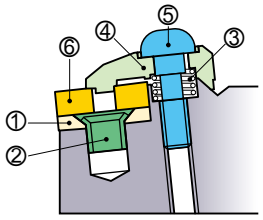
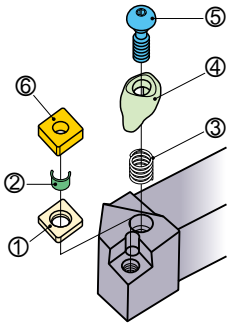
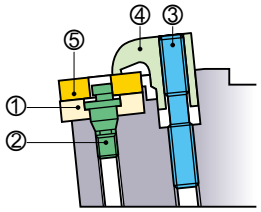
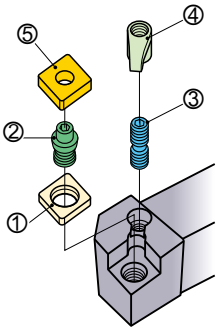
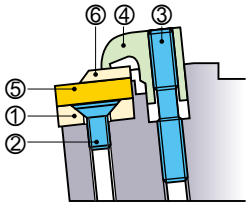
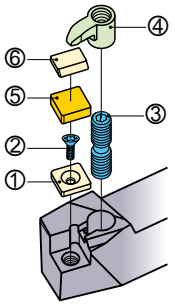
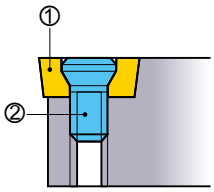
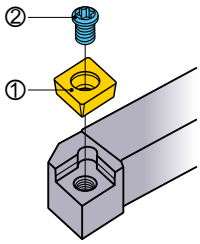
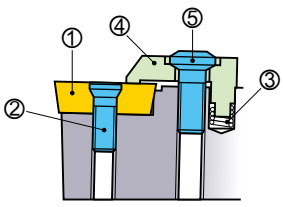
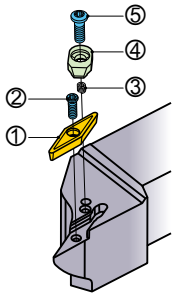
⑦ Insert Size

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 (L_1) (inch)

B	C	D	E
4.500	5.000	6.000	7.000

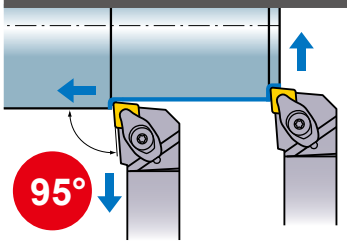
METHOD OF HOLDING

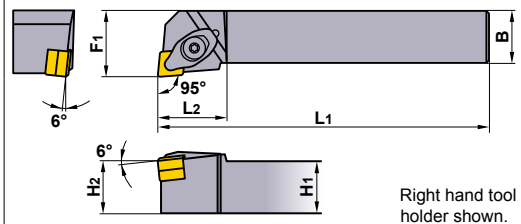
Type	Structure
Double Clamp **(DOUBLE CLAMP Holder)**	 ①Shim ②Shim Pin ③Spring ④Clamp Bridge ⑤Clamp Screw ⑥Insert 
Multiple Clamp **For insert with hole** **(M Holder)**	 ①Shim ②Shim Pin ③Clamp Screw ④Clamp Bridge ⑤Insert 
Multiple Clamp **For insert without hole** (Opt.) **(M Holder)**	 ①Shim ②Shim 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	MH
			
(4)	(4)	(4)	(4)
Medium	**Medium to Rough**	**Stainless**	**CBN**
Standard	RP	MM	
			
(3,4)	(4)	(4)	(4)

Order Number	Stock R	Stock L	Insert Number		H_1	B	L_1	L_2	H_2	F_1	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *2	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
-124	●	●		43◌	.750	.750	4.500	1.250	.750	1.000	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-163	●	●		32◌	1.000	1.000	6.000	1.000	1.000	1.250	LLSCN33 *1 (LLSCN32)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
-164	●	●		43◌	1.000	1.000	6.000	1.250	1.000	1.250	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-204	●	●		43◌	1.250	1.250	6.000	1.250	1.250	1.500	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-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.

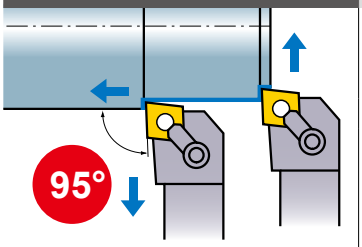
DCLN type inserts	**➤ A072–A077**
CBN & PCD inserts	**➤ B022–B024, B055**
CUTTING CONDITIONS	**➤ C045**

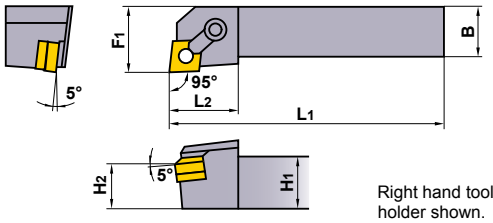
● : Inventory maintained.

MCLN

External turning
Facing

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	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_1	B	L_1	L_2	H_2	F_1				
MCLNR/L-123	●	●	CNMA CNMG CNMM CNGG	32◌	.750	.750	4.500	1.187	.750	1.000	ICSN322	NL34	CL7	XNS36
-124B	●	●		43◌ *2	.750	.750	4.500	1.250	.750	1.000	ICSN433 *1	NL46	CL20	XNS48
-163	●	●		32◌	1.000	1.000	6.000	1.187	1.000	1.250	ICSN322	NL34	CL7	XNS36
-164C	●	●		43◌ *2	1.000	1.000	5.000	1.250	1.000	1.250	ICSN433 *1	NL46	CL20	XNS48
-164D	●	●		43◌ *2	1.000	1.000	6.000	1.250	1.000	1.250	ICSN433 *1	NL46	CL20	XNS48
-165C	●	●		54◌	1.000	1.000	5.000	1.375	1.000	1.250	ICSN533	NL58	CL12	XNS510
-165D	●	●		54◌	1.000	1.000	6.000	1.375	1.000	1.250	ICSN533	NL58	CL12	XNS510
-166C	●	●		64◌	1.000	1.000	5.000	1.500	1.000	1.250	ICSN633	NL68	CL12	XNS510
-166D	●	●		64◌	1.000	1.000	6.000	1.500	1.000	1.250	ICSN633	NL68	CL12	XNS510
-204D	●	●		43◌ *2	1.250	1.250	6.000	1.187	1.250	1.500	ICSN433 *1	NL46	CL20	XNS48
-205D	●	●		54◌	1.250	1.250	6.000	1.375	1.250	1.500	ICSN533	NL58	CL12	XNS510
-206D	●	●		64◌	1.250	1.250	6.000	1.500	1.250	1.500	ICSN633	NL68	CL12	XNS510
-244D	●	●		43◌ *2	1.500	1.500	6.000	1.187	1.500	2.000	ICSN433 *1	NL46	CL20	XNS48
-244E	●	●		43◌ *2	1.500	1.500	7.000	1.187	1.500	2.000	ICSN433 *1	NL46	CL20	XNS48
-246D	●	●		64◌	1.500	1.500	6.000	1.500	1.500	2.000	ICSN633	NL68	CL12	XNS510
-246E	●	●		64◌	1.500	1.500	7.000	1.500	1.500	2.000	ICSN633	NL68	CL12	XNS510
-854D	●	●		43◌ *2	1.250	1.000	6.000	1.187	1.250	1.250	ICSN433 *1	NL46	CL20	XNS48
-856D	●	●		64◌	1.250	1.000	6.000	1.500	1.250	1.250	ICSN633	NL68	CL12	XNS510

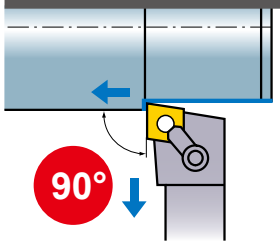
*1 (Opt.) See page M009 for different radius.
*2 For inserts without hole, remove shim pin and add below.
*3 Clamp Torque (lbf-in) : XNS36=30, XNS48=45, XNS510=70

Shim Screw	Chipbreaker
S46	CBC4

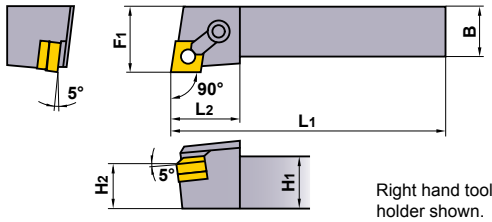
MCLN type inserts	➤ A072–A077	SPARE PARTS	➤ M001
CBN & PCD inserts	➤ B022–B024, B055	TECHNICAL DATA	➤ N001
CUTTING CONDITIONS	➤ C045		

CN INSERTS TOOL HOLDERS

MCGN



External turning — ***Multiple Clamp Type*** — ***M*** **Holder**



Right hand tool holder shown.

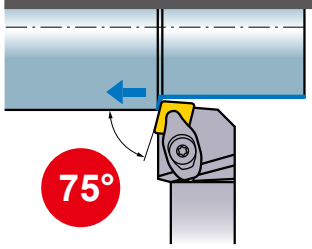
Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(4)	(4)	(4,5)	(4,5,6)
Medium	**Medium to Rough**	**Stainless**	**CBN**
Standard	RP	MM	
			
(4,5,6)	(4,5,6)	(4,5,6)	(4)

Order Number	Stock		Insert Number		Dimensions (inch)									 *3
	R	L			H1	B	L1	L2	H2	F1	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
-164C	□	□		43◌ *2	1.000	1.000	5.000	1.250	1.000	1.250	ICSN433 *1	NL46	CL20	XNS48
-164D	●	●		43◌ *2	1.000	1.000	6.000	1.250	1.000	1.250	ICSN433 *1	NL46	CL20	XNS48
-165D	●	●		54◌	1.000	1.000	6.000	1.313	1.000	1.250	ICSN533	NL58	CL12	XNS510
-166D	□	□		64◌	1.000	1.000	6.000	1.625	1.000	1.250	ICSN633	NL68	CL9	XNS510

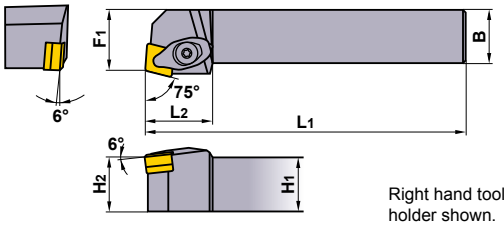
*1 (Opt.) See page M009 for different radius.
*2 For inserts without hole, remove shim pin and add below.
*3 Clamp Torque (lbf-in) : XNS48=45, XNS510=70

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)	(4,5)	(4)
Medium	**Medium to Rough**	**Stainless**	
Standard	RP	MM	
			
(4)	(4)	(4)	

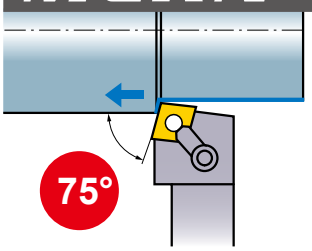
Order Number	Stock		Insert Number		Dimensions (inch)										 *	
	R	L			H1	B	L1	L2	H2	F1	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench
DCRNR/L-124	●	●	CNMA CNMG CNMM CNGG	43◌	.750	.750	4.500	1.250	.750	.888	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-164	●	●		43◌	1.000	1.000	6.000	1.250	1.000	1.128	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

* Clamp Torque (lbf-in) : DC0621T=44

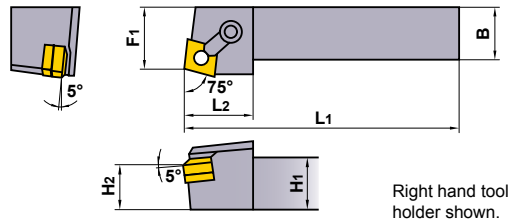
MCGN type inserts	**➤ A072–A077**
DCRN type inserts	**➤ A072–A077**
CBN & PCD inserts	**➤ B022–B024, B055**
CUTTING CONDITIONS	**➤ C045**

● : Inventory maintained.
□ : Non stock, produced to order only.

MCRN



External turning — ***Multiple Clamp Type*** — ***M* Holder**



Right hand tool holder shown.

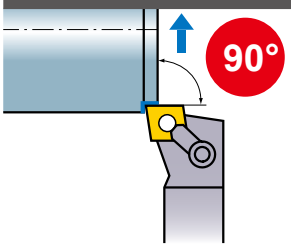
Finish	Light	Medium	Medium
FH	LP	MP	MH
(4)	(4)	(4,5)	(4,5,6)
Medium	**Medium to Rough**	**Stainless**	
Standard	RP	MM	
(4,5,6)	(4)	(4,5,6)	

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
	R	L			H_1	B	L_1	L_2	H_2	F_1				
MCRNR/L-124B	●	□	CNMA CNMG CNMM CNGG	43◌ *2	.750	.750	4.500	1.250	.750	.750	ICSN433 *1	NL46	CL20	XNS48
-164C	●	●		43◌ *2	1.000	1.000	5.000	1.250	1.000	1.250	ICSN433 *1	NL46	CL20	XNS48
-164D	●	●		43◌ *2	1.000	1.000	6.000	1.250	1.000	1.250	ICSN433 *1	NL46	CL20	XNS48
-165D	●	□		54◌	1.000	1.000	6.000	1.343	1.000	1.250	ICSN533	NL58	CL9	XNS510
-166D	□	□		64◌	1.000	1.000	6.000	1.343	1.000	1.250	ICSN633	NL68	CL12	XNS510

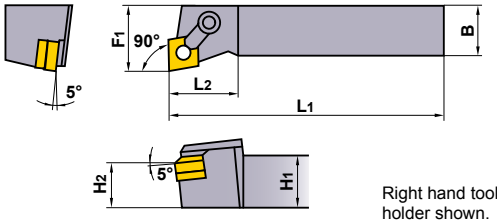
*1 (Opt.) See page M009 for different radius.
*2 For inserts without hole, remove shim pin and add below.
*3 Clamp Torque (lbf-in) : XNS48=45, XNS510=70

Shim Screw	Chipbreaker
S46	CBC4

MCFN



Facing — ***Multiple Clamp Type*** — ***M* Holder**



Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MH
(4)	(4)	(4,5)	(4,5,6)
Medium	**Medium to Rough**	**Stainless**	**CBN**
Standard	RP	MM	
(4,5,6)	(4)	(4,5,6)	(4)

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
	R	L			H_1	B	L_1	L_2	H_2	F_1				
MCFNR/L-124	□	□	CNMA CNMG CNMM CNGG	43◌ *2	.750	.750	4.500	1.250	.750	1.000	ICSN433 *1	NL46	CL20	XNS48
-164C	●	●		43◌ *2	1.000	1.000	5.000	1.250	1.000	1.250	ICSN433 *1	NL46	CL20	XNS48
-164D	□	□		43◌ *2	1.000	1.000	6.000	1.250	1.000	1.250	ICSN433 *1	NL46	CL20	XNS48
-165D	●	●		54◌	1.000	1.000	6.000	1.380	1.000	1.250	ICSN533	NL58	CL12	XNS510
-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

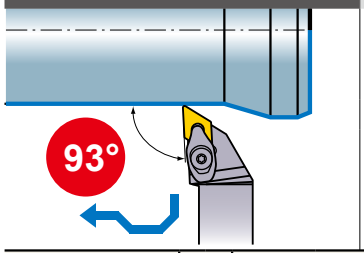
Shim Screw	Chipbreaker
S46	CBC4

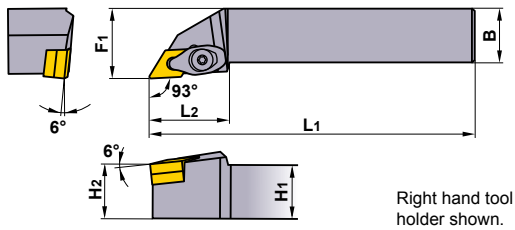
MCRN type inserts	**➤ A072–A077**	**CUTTING CONDITIONS**	**➤ C045**
MCFN type inserts	**➤ A072–A077**	**SPARE PARTS**	**➤ M001**
CBN & PCD inserts	**➤ B022–B024, B055**	**TECHNICAL DATA**	**➤ N001**

DN□□ INSERTS TOOL HOLDERS

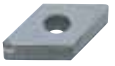
DDJN

External turning Copying ***DOUBLE CLAMP Type***





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	G Class	CBN
RP	MM	MJ	
			
(4)	(4)	(4)	(4)

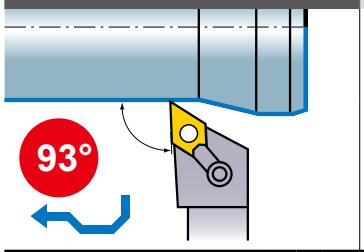
Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *2	Wrench
	R	L			H1	B	L1	L2	H2	F1						
DDJNR/L-123	●	●	DNMA DNMG DNMM DNGA DNGG DNGM DNMX	33○	.750	.750	4.500	1.188	.750	1.000	LLSDN32	LLP23	DCK2211	DCS2	DC0520T	TKY15F
-124	●	●		43○	.750	.750	4.500	1.375	.750	1.000	LLSDN43 *1 (LLSDN42)	LLP24 *1 (LLP14)	DCK2613	DCS1	DC0621T	TKY20F
-163	●	●		33○	1.000	1.000	6.000	1.188	1.000	1.250	LLSDN32	LLP23	DCK2211	DCS2	DC0520T	TKY15F
-164	●	●		43○	1.000	1.000	6.000	1.375	1.000	1.250	LLSDN43 *1 (LLSDN42)	LLP24 *1 (LLP14)	DCK2613	DCS1	DC0621T	TKY20F
-204	●	●		43○	1.250	1.250	6.000	1.375	1.250	1.500	LLSDN43 *1 (LLSDN42)	LLP24 *1 (LLP14)	DCK2613	DCS1	DC0621T	TKY20F
-244	●	●		43○	1.500	1.500	6.000	1.500	1.500	2.000	LLSDN43 *1 (LLSDN42)	LLP24 *1 (LLP14)	DCK2613	DCS1	DC0621T	TKY20F

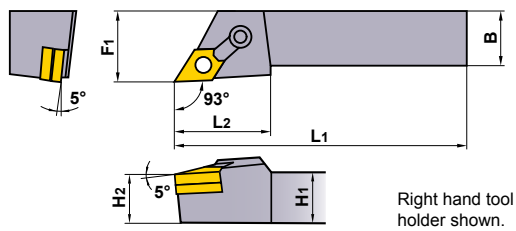
*1 Please use shim no.LLSDN42 and shim pin LLP14 with .25inch thick insert. When using .25inch thick inserts, the shim and shim pin must be ordered separately.

*2 Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

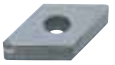
MDJN

External turning Copying ***Multiple Clamp Type*** ***M* Holder**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	G Class	CBN
RP	MM	MJ	
			
(4)	(4)	(4)	(4)

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *2
	R	L			H1	B	L1	L2	H2	F1				
MDJNR/L-123	●	●	DNMA DNMG DNMM DNGA DNGG DNGM DNMX	33○	.750	.750	4.500	1.250	.750	1.000	IDSN322	NL33L	CL7	XNS36
-124B	●	●		43○	.750	.750	4.500	1.250	.750	1.000	IDSN433	NL46	CL7	XNS36
-163	●	●		33○	1.000	1.000	5.000	1.250	1.000	1.250	IDSN322	NL33L	CL7	XNS36
-164C	●	●		43○	1.000	1.000	5.000	1.250	1.000	1.250	IDSN433	NL46	CL20	XNS48
-164D	●	●		43○	1.000	1.000	6.000	1.250	1.000	1.250	IDSN433	NL46	CL20	XNS48
-165D	●	●		54○ *1	1.000	1.000	6.000	1.469	1.000	1.250	IDSN533 *1	NL58	CL12	XNS510
-204D	●	●		43○	1.250	1.250	6.000	1.250	1.250	1.500	IDSN433	NL46	CL20	XNS48
-205D	●	●		54○ *1	1.250	1.250	6.000	1.469	1.250	1.500	IDSN533 *1	NL58	CL12	XNS510
-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

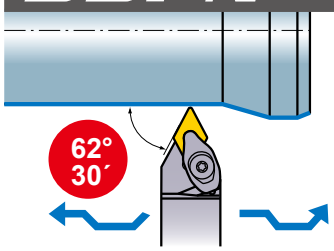
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

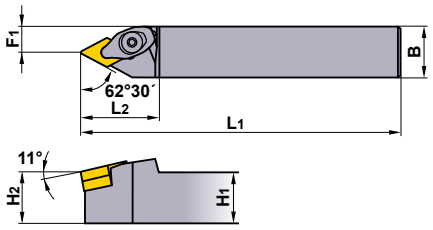
DDJN type inserts	➤ A078—A083	CUTTING CONDITIONS	➤ C045
MDJN type inserts	➤ A078—A083	CBN & PCD inserts	➤ B025—B027, B055

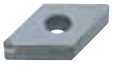
● : Inventory maintained.

DDPN

External turning ***DOUBLE CLAMP Type***
Copying





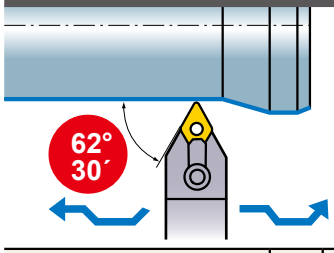
Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	G Class	CBN
RP	MM	MJ	
			
(4)	(4)	(4)	(4)

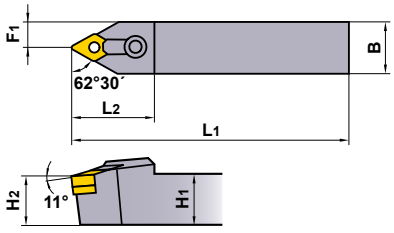
Order Number	Stock	Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *2	Wrench
				H1	B	L1	L2	H2	F1						
DDPNN-164	●	DNMA DNMG DNMM DNGA DNGG DNGM	43○	1.000	1.000	6.000	1.500	1.000	.500	LLSDN43 *1 (LLSDN42)	LLP24 *1 (LLP14)	DCK2613	DCS1	DC0621T	TKY20F

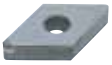
*1 Please use shim no.LLSDN42 and shim pin LLP14 with .25inch thick insert. When using .25inch thick inserts, the shim and shim pin must be ordered separately.
*2 Clamp Torque (lbf-in) : DC0621T=44

MDPN

External turning ***Multiple Clamp Type***
Copying ***M*** **Holder**





Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	G Class	CBN
RP	MM	MJ	
			
(4)	(4)	(4)	(4)

Order Number	Stock	Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *2
				H1	B	L1	L2	H2	F1				
MDPNN-164D	●	DNMA DNMG DNMM DNGA DNGG DNGM	43○	1.000	1.000	6.000	1.750	1.000	.500	IDSN433	NL46	CL12	XNS510
-165D	●		54○ *1	1.000	1.000	6.000	1.922	1.000	.500	IDSN533 *1	NL58	CL12	XNS510

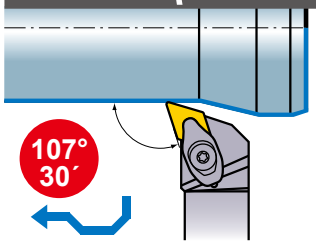
*1 (Opt.) See page M009 for different thickness.
*2 Clamp Torque (lbf-in) : XNS510=70

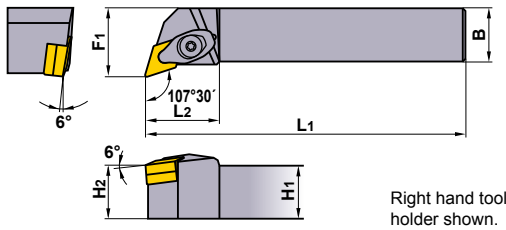
DDPN type inserts	➤ A078–A083	CUTTING CONDITIONS	➤ C045
MDPN type inserts	➤ A078–A083	SPARE PARTS	➤ M001
CBN & PCD inserts	➤ B025–B027, B055	TECHNICAL DATA	➤ N001

DN□□ INSERTS TOOL HOLDERS

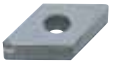
DDQN

External turning ***DOUBLE CLAMP Type***
Copying





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	G Class	CBN
RP	MM	MJ	
			
(4)	(4)	(4)	(4)

Order Number	Stock R	Stock L	Insert Number	H1	B	L1	L2	H2	F1	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *2	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.

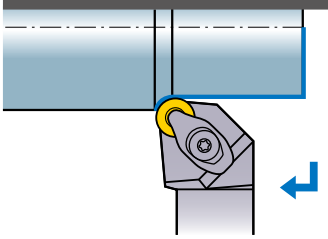
● : Inventory maintained.
□ : Non stock, produced to order only.

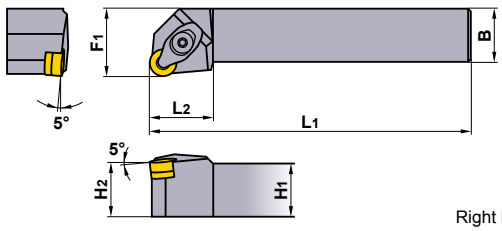
DDQN type inserts	➤ A078–A083
CBN & PCD inserts	➤ B025–B027, B055
CUTTING CONDITIONS	➤ C045

DRGN

External turning
Copying

DOUBLE CLAMP Type





Right hand tool holder shown.

Medium
Standard
(4)

Medium
Flat top
(4)

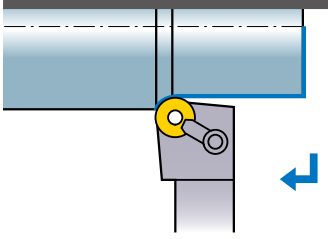
Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
	R	L			H_1	B	L_1	L_2	H_2	F_1						
DRGNR/L-124	●	●	RNMG	43○	.750	.750	4.500	1.188	.750	1.000	LLSRN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-164	●	●		43○	1.000	1.000	6.000	1.188	1.000	1.250	LLSRN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-204	●	●		43○	1.250	1.250	6.000	1.188	1.250	1.500	LLSRN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

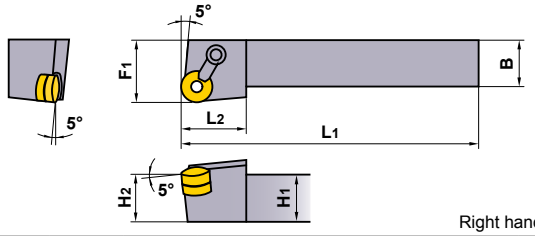
* Clamp Torque (lbf-in) : DC0621T=44

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_1	B	L_1	L_2	H_2	F_1				
MRGNR/L-123B	□	●	RNMG	32	.750	.750	4.500	.937	.750	1.000	IRSN32	NL33	CL6	XNS36
-124B	●	□		43 *1 *2	.750	.750	4.500	1.187	.750	1.000	IRSN43 *1	NL46	CL9	XNS59
-163	□	□		32	1.000	1.000	6.000	.937	1.000	1.250	IRSN32	NL34	CL6	XNS36
-164C	●	●		43 *1 *2	1.000	1.000	5.000	1.187	1.000	1.250	IRSN43 *1	NL46	CL9	XNS59
-164D	●	●		43 *1 *2	1.000	1.000	6.000	1.187	1.000	1.250	IRSN43 *1	NL46	CL9	XNS59
-204D	●	□		43 *1 *2	1.250	1.250	6.000	1.187	1.250	1.500	IRSN43 *1	NL46	CL9	XNS59
-206D	□	□		64	1.250	1.250	6.000	1.125	1.250	1.500	IRSN63	NL68	CL12	XNS58
-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	➤ A084
MRGN type inserts	➤ A084

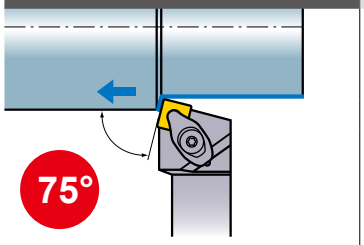
CUTTING CONDITIONS	➤ C045
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

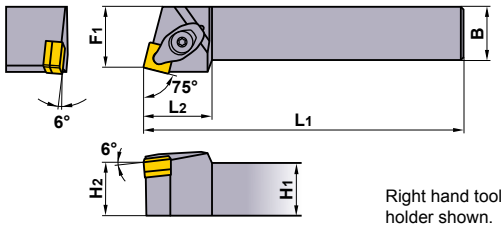
SN○○ INSERTS TOOL HOLDERS

DSRN

DOUBLE CLAMP Type

External turning





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	CBN	
RP	MM		
			
(4)	(4)	(4)	

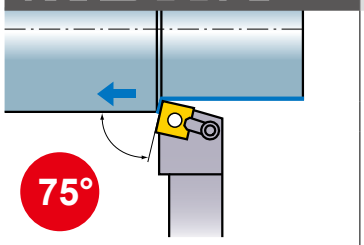
Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
	R	L			H1	B	L1	L2	H2	F1						
DSRNR/L-124	●	●	SNMA SNMG SNMM SNGA SNGG	43○	.750	.750	4.500	1.250	.750	.878	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-164	●	●		43○	1.000	1.000	6.000	1.250	1.000	1.128	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

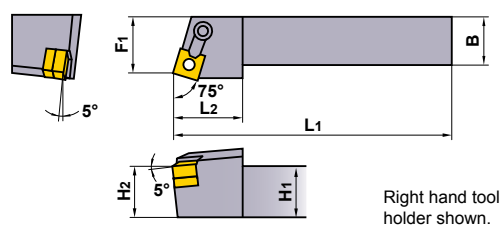
* Clamp Torque (lbf-in) : DC0621T=44

MSRN

Multiple Clamp Type

External turning — *M* Holder





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(3,4)	(4)	(4)	(4,6)
Medium to Rough	Stainless	CBN	
RP	MM		
			
(4)	(4,5,6)	(4)	

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
	R	L			H1	B	L1	L2	H2	F1				
MSRNR/L-83	□	□	SNMA SNMG SNMM SNGA SNGG	32○ *1 *2	.500	.500	4.500	1.062	.500	.658	ISSN322 *1	NL34	CL6	XNS36
-103	□	□		32○ *1 *2	.625	.625	4.500	1.062	.625	.783	ISSN322 *1	NL34	CL6	XNS36
-123	●	●		32○ *1 *2	.750	.750	4.500	1.062	.750	.908	ISSN322 *1	NL34	CL6	XNS36
-124B	●	●		43○ *1 *2	.750	.750	4.500	1.234	.750	.878	ISSN433 *1	NL46	CL9	XNS59
-164C	●	●		43○ *1 *2	1.000	1.000	5.000	1.234	1.000	1.128	ISSN433 *1	NL46	CL9	XNS59
-164D	●	●		43○ *1 *2	1.000	1.000	6.000	1.234	1.000	1.128	ISSN433 *1	NL46	CL9	XNS59
-165	●	●		54○	1.000	1.000	6.000	1.343	1.000	1.100	ISSN533	NL58	CL12	XNS510
-165C	●	●		54○	1.000	1.000	5.000	1.343	1.000	1.100	ISSN533	NL58	CL12	XNS510
-166	●	●		64○ *1	1.000	1.000	6.000	1.500	1.000	1.068	ISSN633 *1	NL68	CL12	XNS510
-205D	●	●		54○	1.250	1.250	6.000	1.343	1.250	1.350	ISSN533	NL58	CL12	XNS510
-206D	●	●		64○ *1	1.250	1.250	6.000	1.500	1.250	1.312	ISSN633 *1	NL68	CL12	XNS510
-246D	●	●		64○ *1	1.500	1.500	6.000	1.500	1.500	1.818	ISSN633 *1	NL68	CL12	XNS510
-246E	●	●		64○ *1	1.500	1.500	7.000	1.500	1.500	1.818	ISSN633 *1	NL68	CL12	XNS510
-248	●	●		86○	1.500	1.500	7.000	1.625	1.500	1.768	ISSN846	NL810	CL24	XNS610

*1 (Opt.) See page M009 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, XNS610=135

Insert	Shim Screw	Chipbreaker
SN○N3○○	S34	CBS3
SN○N4○○	S46	CBS4

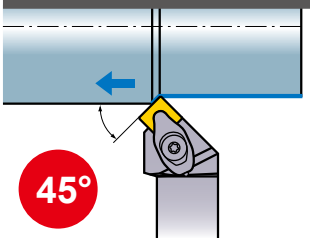
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

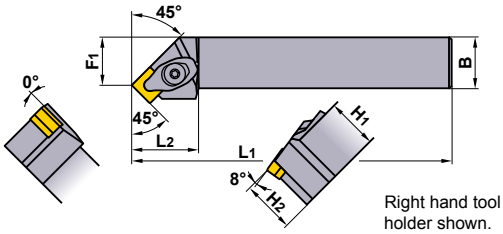
● : Inventory maintained.
□ : Non stock, produced to order only.

DSRN type inserts ➤ A085—A089
MSRN type inserts ➤ A085—A089
CBN & PCD inserts ➤ B028, B029, B056
CUTTING CONDITIONS ➤ C045

DSSN

External turning Chamfering ***DOUBLE CLAMP Type***





Right hand tool holder shown.

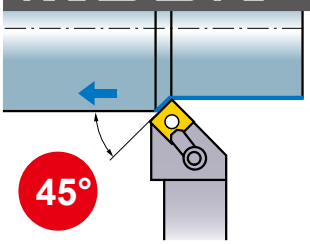
Finish	Light	Medium	Medium
FH	LP	MP	MH
 (4)	 (4)	 (4)	 (4)
Medium to Rough	Stainless	CBN	
RP	MM		
 (4)	 (4)	 (4)	

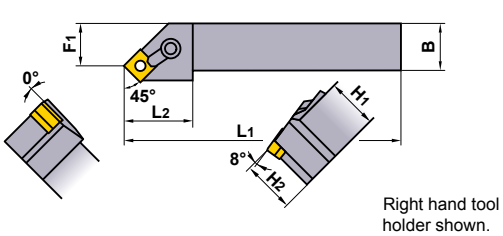
Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
	R	L			H1	B	L1	L2	H2	F1						
DSSNR/L-124	●	●	SNMA SNMG SNMM SNGA SNGG	43◌	.750	.750	4.500	1.250	.750	.659	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-164	●	●		43◌	1.000	1.000	6.000	1.250	1.000	.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	MM		
 (4)	 (4,5,6)	 (4)	

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
	R	L			H1	B	L1	L2	H2	F1				
MSSNR/L-83	□	□	SNMA SNMG SNMM SNGA SNGG	32◌ *1 *2	.500	.500	4.500	1.062	.500	.391	ISSN322 *1	NL34	CL6	XNS36
-124B	●	□		43◌ *1 *2	.750	.750	4.500	1.234	.750	.662	ISSN433 *1	NL46	CL9	XNS59
-164C	□	□		43◌ *1 *2	1.000	1.000	5.000	1.234	1.000	.912	ISSN433 *1	NL46	CL9	XNS59
-164D	●	●		43◌ *1 *2	1.000	1.000	6.000	1.234	1.000	.912	ISSN433 *1	NL46	CL9	XNS59
-205D	□	□		54◌	1.250	1.250	6.000	1.375	1.250	1.078	ISSN533	NL58	CL9	XNS510
-206D	□	□		64◌ *1	1.250	1.250	6.000	1.484	1.250	.992	ISSN633 *1	NL68	CL9	XNS510

*1 (Opt.) See page M009 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

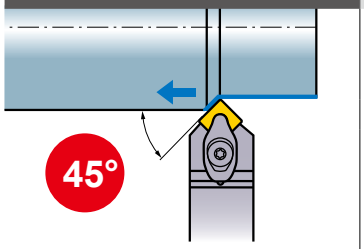
*3 Clamp Torque (lbf-in) : XNS36=30, XNS59=70, XNS510=70

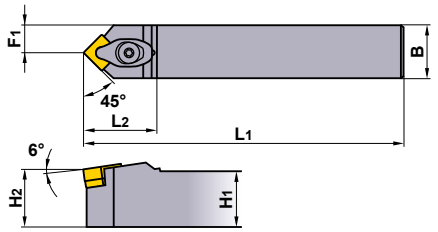
DSSN type inserts	**➤ A085–A089**
MSSN type inserts	**➤ A085–A089**
CBN & PCD inserts	**➤ B028, B029, B056**
CUTTING CONDITIONS	**➤ C045**
SPARE PARTS	**➤ M001**
TECHNICAL DATA	**➤ N001**

SN○○ INSERTS TOOL HOLDERS

DSDN

External turning Chamfering ***DOUBLE CLAMP Type***





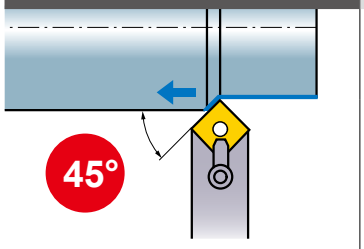
Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	CBN	
RP	MM		
			
(4)	(4)	(4)	

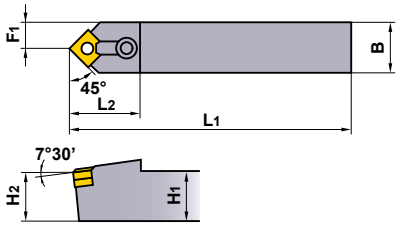
Order Number	Stock	Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
				H1	B	L1	L2	H2	F1						
DSDNN-124	●	SNMA SNMG SNMM SNGA SNGG	43○	.750	.750	4.500	1.375	.750	.375	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-164	●		43○	1.000	1.000	6.000	1.375	1.000	.500	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	MH
			
(3,4)	(4)	(4)	(4,6)
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
				H1	B	L1	L2	H2	F1				
MSDNN-83	●	SNMA SNMG SNMM SNGA SNGG	32○ *1 *2	.500	.500	4.500	1.000	.500	.250	ISSN322 *1	NL34	CL6	XNS36
-103	□		32○ *1 *2	.625	.625	4.500	1.000	.625	.313	ISSN322 *1	NL34	CL6	XNS36
-123	●		32○ *1 *2	.750	.750	4.500	1.000	.750	.375	ISSN322 *1	NL34	CL6	XNS36
-124	●		43○ *1 *2	.750	.750	4.500	1.375	.750	.375	ISSN433 *1	NL46	CL9	XNS59
-164	●		43○ *1 *2	1.000	1.000	6.000	1.375	1.000	.500	ISSN433 *1	NL46	CL9	XNS59
-165	●		54○	1.000	1.000	6.000	1.625	1.000	.500	ISSN533	NL58	CL12	XNS510
-166	●		64○ *1	1.000	1.000	6.000	1.625	1.000	.500	ISSN633 *1	NL68	CL12	XNS510
-206	●		64○ *1	1.250	1.250	7.000	1.625	1.250	.625	ISSN633 *1	NL68	CL12	XNS510

*1 (Opt.) See page M009 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.

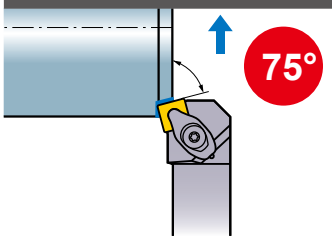
● : Inventory maintained.
□ : Non stock, produced to order only.

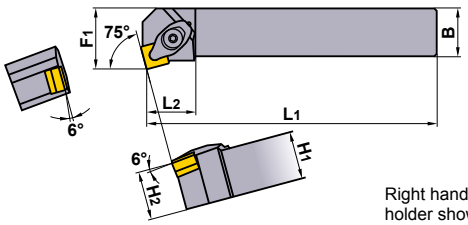
DSDN type inserts ➤ A085–A089
MSDN type inserts ➤ A085–A089
CBN & PCD inserts ➤ B028, B029, B056
CUTTING CONDITIONS ➤ C045

DSKN

DOUBLE CLAMP Type

Facing





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	CBN	
RP	MM		
			
(4)	(4)	(4)	

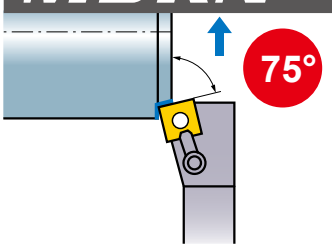
Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
	R	L			H1	B	L1	L2	H2	F1						
DSKNR/L-124	●	●	SNMA SNMG SNMM SNGA SNGG	43○	.750	.750	4.500	1.000	.750	1.000	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-164	●	●		43○	1.000	1.000	6.000	1.000	1.000	1.250	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

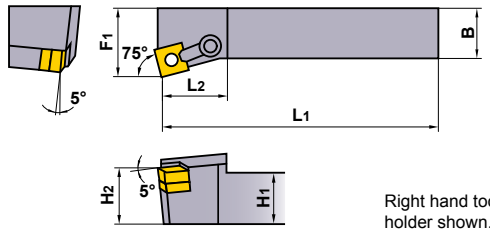
∗ Clamp Torque (lbf-in) : DC0621T=44

MSKN

Multiple Clamp Type

Facing ***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)	(3,4,5,6)	(4)	

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
	R	L			H1	B	L1	L2	H2	F1				
MSKNR/L-83	□	□	SNMA SNMG SNMM SNGA SNGG	32○ *1 *2	.500	.500	4.500	1.000	.500	.625	ISSN322 *1	NL34	CL6	XNS36
-103	□	□		32○ *1 *2	.625	.625	4.500	1.000	.625	.750	ISSN322 *1	NL34	CL6	XNS36
-123	□	□		32○ *1 *2	.750	.750	4.500	1.000	.750	.875	ISSN322 *1	NL34	CL6	XNS36
-124B	●	●		43○ *1 *2	.750	.750	4.500	1.219	.750	1.000	ISSN433 *1	NL46	CL9	XNS59
-164D	●	●		43○ *1 *2	1.000	1.000	6.000	1.219	1.000	1.250	ISSN433 *1	NL46	CL9	XNS59
-165D	●	●		54○	1.000	1.000	6.000	1.344	1.000	1.250	ISSN533	NL58	CL12	XNS510
-205D	●	●		54○	1.250	1.250	6.000	1.344	1.250	1.500	ISSN533	NL58	CL12	XNS510
-206D	□	□		64○ *1	1.250	1.250	6.000	1.500	1.250	1.500	ISSN633	NL68	CL12	XNS510

∗1 (Opt.) See page M009 for different thickness or radius.

∗2 For inserts without hole, remove shim pin and add below.

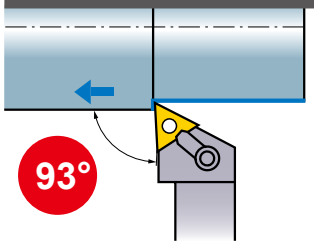
Insert	Shim Screw	Chipbreaker
SN○N3○○	S34	CBS3
SN○N4○○	S46	CBS4

∗3 Clamp Torque (lbf-in) : XNS36=30, XNS59=70, XNS510=70

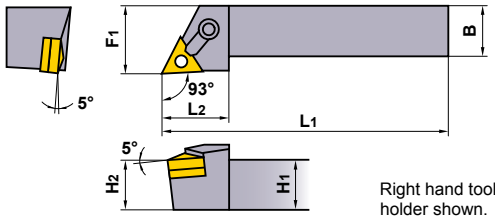
DSKN type inserts	**➤ A085–A089**
MSKN type inserts	**➤ A085–A089**
CBN & PCD inserts	**➤ B028, B029, B056**
CUTTING CONDITIONS	**➤ C045**
SPARE PARTS	**➤ M001**
TECHNICAL DATA	**➤ N001**

TN□□ INSERTS TOOL HOLDERS

MTJN



External turning — ***Multiple Clamp Type*** — ***M*** **Holder**



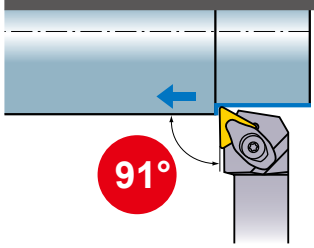
Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	Medium to Rough	Stainless	CBN
GH	RP	MM	
			
(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_1	B	L_1	L_2	H_2	F_1				
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
-163X	●	●		33○ *1	1.000	1.000	6.000	1.000	1.000	1.250	ITSN323 *1	NL34L	CL6	XNS36
-164	●	●		43○ *1	1.000	1.000	6.000	1.200	1.000	1.250	ITSN432 *1	NL46	CL9	XNS510
-165	□	●		54○ *1	1.000	1.000	6.000	1.375	1.000	1.250	ITSN533 *1	NL58	CL9	XNS510
-204	●	●		43○ *1	1.250	1.250	6.000	1.200	1.250	1.500	ITSN432 *1	NL46	CL9	XNS510
-205	●	●		54○ *1	1.250	1.250	6.000	1.375	1.250	1.500	ITSN533 *1	NL58	CL9	XNS510
-245	●	●		54○ *1	1.500	1.500	7.000	1.375	1.500	2.000	ITSN533 *1	NL58	CL9	XNS510
-246	●	□		66○ *1	1.500	1.500	7.000	1.375	1.500	2.000	ITSN636 *1	NL68L	CL12	XNS510
-854	●	□		43○ *1	1.250	1.000	6.000	1.200	1.250	1.250	ITSN432 *1	NL46	CL9	XNS510

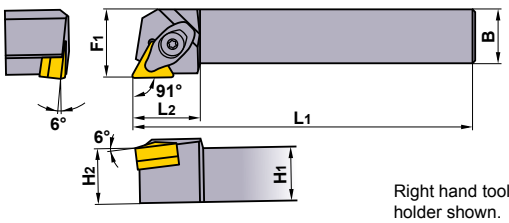
*1 (Opt.) See page M009 for different thickness or radius.
*2 Clamp Torque (lbf-in) : XNS36=30, XNS510=70

DTGN



DOUBLE CLAMP Type

External turning



Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(3)	(3)	(3,4)	(3)
Medium to Rough	Stainless	CBN	
RP	MM		
			
(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_1	B	L_1	L_2	H_2	F_1						
DTGNR/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
-163	●	●		33○	1.000	1.000	6.000	1.000	1.000	1.250	LLSTN32 *1 (LLSTN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
-164	●	●		43○	1.000	1.000	6.000	1.250	1.000	1.250	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-204	●	●		43○	1.250	1.250	6.000	1.250	1.250	1.500	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-244	●	●		43○	1.500	1.500	6.000	1.250	1.500	2.000	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

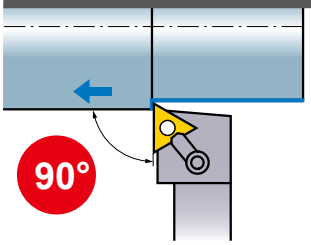
*1 Please use shim no.LLSTN33 with .125inch thick insert. When using .125inch thick inserts, the shim must be ordered separately.
*2 Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

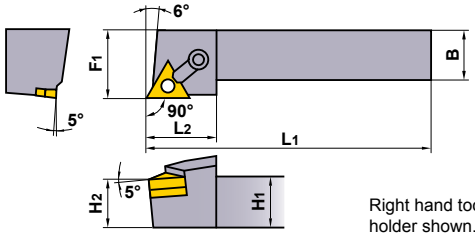
● : Inventory maintained.
□ : Non stock, produced to order only.

MTJN type inserts ➤ A090–A096
DTGN type inserts ➤ A090–A096
CBN & PCD inserts ➤ B030, B031, B056
CUTTING CONDITIONS ➤ C045

MTGN



External turning — ***Multiple Clamp Type*** ***M*** **Holder**



Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	Medium to Rough	Stainless	CBN
GH	RP	MM	
			
(3,4,5,6)	(3)	(3,4)	(3)

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H1	B	L1	L2	H2	F1	Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
MTGNR/L-123BX	●	●	TNMA TNMG TNMM TNGA TNGG	33○ *1 *2	.750	.750	4.500	.937	.750	1.000	ITSN323 *1	NL34L	CL6	XNS36
-163CX	●	●		33○ *1 *2	1.000	1.000	5.000	.937	1.000	1.250	ITSN323 *1	NL34L	CL6	XNS36
-163DX	□	●		33○ *1 *2	1.000	1.000	6.000	.937	1.000	1.250	ITSN323 *1	NL34L	CL9	XNS36
-164C	●	●		43○ *1	1.000	1.000	5.000	1.200	1.000	1.250	ITSN432 *1	NL46	CL9	XNS510
-164D	●	●		43○ *1	1.000	1.000	6.000	1.200	1.000	1.250	ITSN432 *1	NL46	CL9	XNS510
-165C	□	□		54○ *1	1.000	1.000	5.000	1.375	1.000	1.250	ITSN533 *1	NL58	CL9	XNS510
-165D	□	□		54○ *1	1.000	1.000	6.000	1.375	1.000	1.250	ITSN533 *1	NL58	CL9	XNS510
-204D	□	●		43○ *1	1.250	1.250	6.000	1.187	1.250	1.500	ITSN432 *1	NL46	CL9	XNS510
-205D	●	□		54○ *1	1.250	1.250	6.000	1.375	1.250	1.500	ITSN533 *1	NL58	CL9	XNS510
-244D	□	□		43○ *1	1.500	1.500	6.000	1.375	1.500	2.000	ITSN432 *1	NL46	CL9	XNS510
-244E	□	□		43○ *1	1.500	1.500	7.000	1.375	1.500	2.000	ITSN432 *1	NL46	CL9	XNS510
-245D	□	□		54○ *1	1.500	1.500	6.000	1.375	1.500	2.000	ITSN533 *1	NL58	CL9	XNS510
-245E	□	□		54○ *1	1.500	1.500	7.000	1.375	1.500	2.000	ITSN533 *1	NL58	CL9	XNS510
-246D	□	□		66○ *1	1.500	1.500	6.000	1.500	1.500	2.000	ITSN636 *1	NL68L	CL12	XNS510
-246E	□	□		66○ *1	1.500	1.500	7.000	1.500	1.500	2.000	ITSN636 *1	NL68L	CL12	XNS510
-854D	□	□		43○ *1	1.250	1.000	6.000	1.200	1.250	1.250	ITSN432 *1	NL46	CL9	XNS510
-855D	●			54○ *1	1.250	1.000	6.000	1.375	1.250	1.250	ITSN533 *1	NL58	CL9	XNS510

*1 (Opt.) See page M009 for different thickness or radius.

*2 For inserts without hole, remove shim pin and add below.

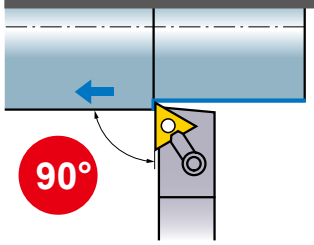
Shim Screw	Chipbreaker
S34	CBT3

*3 Clamp Torque (lbf-in) : XNS36=30, XNS510=70

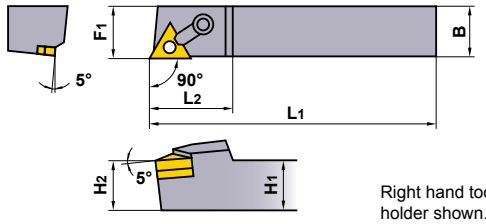
MTGN type inserts	➤ A090–A096
CBN & PCD inserts	➤ B030, B031, B056
CUTTING CONDITIONS	➤ C045
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

TN□□ INSERTS TOOL HOLDERS

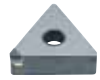
MTAN



External turning — ***Multiple Clamp Type*** ***M*** **Holder**



Right hand tool holder shown.

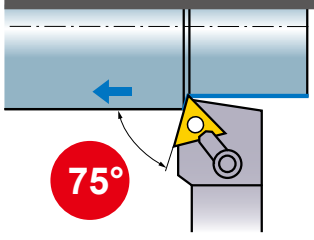
Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	Medium to Rough	Stainless	CBN
GH	RP	MM	
			
(3,4,5,6)	(3)	(3,4)	(3)

Order Number	Stock		Insert Number		Dimensions (inch)						 Shim	 Shim Pin	 Clamp Bridge	 *3 Clamp Screw
	R	L			H_1	B	L_1	L_2	H_2	F_1				
MTANR/L-102	□		TNMA TNMG TNMM TNGA TNGG	22○	.625	.625	4.500	.875	.625	.625	—	NL23	CL19	XNS36
-103X	●	□		33○ *1 *2	.625	.625	4.500	1.000	.625	.625	ITSN323 *1	NL34L	CL6	XNS36
-123X	●	□		33○ *1 *2	.750	.750	4.500	1.000	.750	.750	ITSN323 *1	NL34L	CL6	XNS36
-163X	●	●		33○ *1 *2	1.000	1.000	6.000	1.000	1.000	1.000	ITSN323 *1	NL34L	CL6	XNS36
-164	●	●		43○ *1	1.000	1.000	6.000	1.218	1.000	1.000	ITSN432 *1	NL46	CL9	XNS59
-165	●			54○ *1	1.000	1.000	6.000	1.375	1.000	1.000	ITSN533 *1	NL58	CL9	XNS510
-204	●	●		43○ *1	1.250	1.250	7.000	1.218	1.250	1.250	ITSN432 *1	NL46	CL9	XNS59
-205	●			54○ *1	1.250	1.250	7.000	1.375	1.250	1.250	ITSN533 *1	NL58	CL9	XNS510
-246	□			66○ *1	1.500	1.500	7.000	1.484	1.500	1.500	ITSN636 *1	NL68L	CL12	XNS510
-864	□			43○ *1	1.500	1.000	7.000	1.218	1.500	1.000	ITSN432 *1	NL46	CL9	XNS59

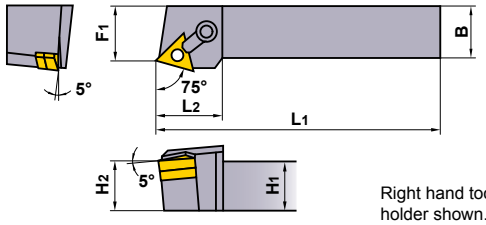
*1 (Opt.) See page M009 for different thickness or radius.
*2 For inserts without hole, remove shim pin and add below.
*3 Clamp Torque (lbf-in) : XNS36=30, XNS59=70, XNS510=70

Shim Screw	Chipbreaker
S34	CBT3

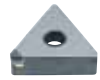
MTRN



External turning — ***Multiple Clamp Type*** ***M*** **Holder**



Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	Stainless	CBN	
RP	MM		
			
(3)	(3,4)	(3)	

Order Number	Stock		Insert Number		Dimensions (inch)						 Shim	 Shim Pin	 Clamp Bridge	 *3 Clamp Screw
	R	L			H_1	B	L_1	L_2	H_2	F_1				
MTRNR/L-123X	□	□	TNMA TNMG TNMM TNGA TNGG	33○ *1 *2	.750	.750	4.500	1.203	.750	.897	ITSN323 *1	NL34L	CL20	XNS46
-164	□	□		43○ *1	1.000	1.000	6.000	1.250	1.000	1.040	ITSN432 *1	NL46	CL9	XNS510

*1 (Opt.) See page M009 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

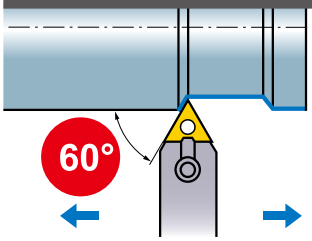
Shim Screw	Chipbreaker
S34	CBT3

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

● : Inventory maintained.
□ : Non stock, produced to order only.

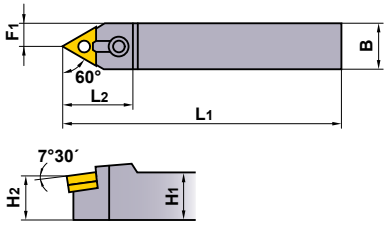
MTAN type inserts	➤ A090–A096
MTRN type inserts	➤ A090–A096
CBN & PCD inserts	➤ B030, B031, B056
CUTTING CONDITIONS	➤ C045

MTEN



External turning
Chamfering

Multiple Clamp Type
***M* Holder**

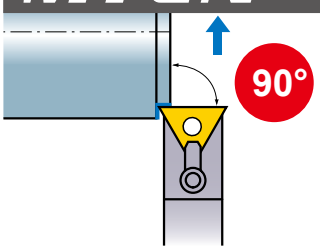


Finish	Light	Medium	Medium
FH	LP	MP	MH
(3)	(3)	(3,4)	(3,4)
Medium to Rough	Stainless	CBN	
RP	MM		
(3)	(3,4)	(3)	

Order Number	Stock	Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *2
				H1	B	L1	L2	H2	F1				
MTENN-82	●	TNMA TNMG TNMM TNGA TNGG	22◌	.500	.500	4.500	1.000	.500	.250	—	NL23	CL6	XNS36
-103X	●		33◌ *1	.625	.625	4.500	1.156	.625	.313	ITSN323 *1	NL34L	CL6	XNS36
-123X	●		33◌ *1	.750	.750	4.500	1.156	.750	.375	ITSN323 *1	NL34L	CL6	XNS36
-164	●		43◌ *1	1.000	1.000	6.000	1.500	1.000	.500	ITSN432 *1	NL46	CL9	XNS59
-205	●		54◌ *1	1.250	1.250	7.000	1.620	1.250	.625	ITSN533 *1	NL58	CL9	XNS510
-854	□		43◌ *1	1.250	1.000	6.000	1.500	1.250	.500	ITSN432 *1	NL46	CL9	XNS59
-864	●		43◌ *1	1.500	1.000	7.000	1.500	1.500	.500	ITSN432 *1	NL46	CL9	XNS59
-865	●		54◌ *1	1.500	1.000	7.000	1.620	1.500	.500	ITSN533 *1	NL58	CL9	XNS510

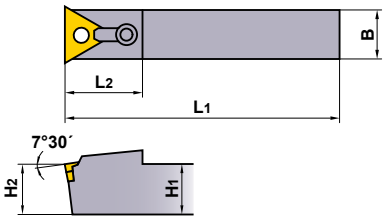
*1 (Opt.) See page M009 for different thickness or radius.
*2 Clamp Torque (lbf-in) : XNS36=30, XNS59=70, XNS510=70

MTCN



Facing

Multiple Clamp Type
***M* Holder**



Finish	Light	Medium	Medium
FH	LP	MP	MH
(3)	(3)	(3,4)	(3,4)
Medium to Rough	Stainless	CBN	
RP	MM		
(3)	(3,4)	(3)	

Order Number	Stock	Insert Number		Dimensions (inch)					Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
				H1	B	L1	L2	H2				
MTCNN-83X	□	TNMA TNMG TNMM TNGA TNGG	33◌ *1 *2	.500	.500	4.500	1.125	.500	ITSN323 *1	NL34L	CL7	XNS36
-124	□		43◌ *1	.750	.750	4.500	1.375	.750	ITSN432 *1	NL46	CL12	XNS59
-443X	□		33◌ *1 *2	1.000	.500	8.000	1.125	1.000	ITSN323 *1	NL34L	CL7	XNS36
-644	□		43◌ *1	1.000	.750	8.000	1.375	1.000	ITSN432 *1	NL46	CL12	XNS59
-664	□		43◌ *1	1.500	.750	8.000	1.375	1.500	ITSN432 *1	NL46	CL12	XNS59

*1 (Opt.) See page M009 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	➤ A090–A096
MTCN type inserts	➤ A090–A096
CBN & PCD inserts	➤ B030, B031, B056
CUTTING CONDITIONS	➤ C045

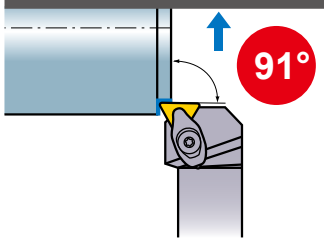
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

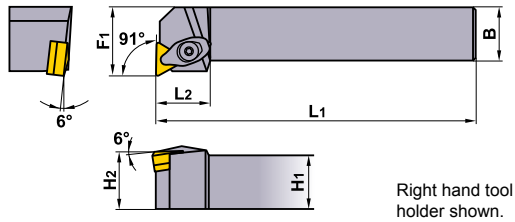
TN□□ INSERTS TOOL HOLDERS

DTFN

DOUBLE CLAMP Type

Facing





Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(3)	(3)	(3,4)	(3)
Medium to Rough	Stainless	CBN	
RP	MM		
			
(3)	(3,4)	(3)	

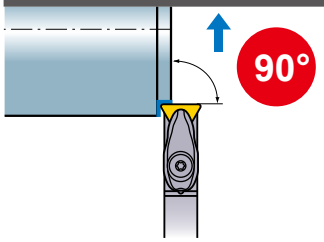
Order Number	Stock R	Stock L	Insert Number		H1	B	L1	L2	H2	F1	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *2	Wrench
DTFNR/L-123	●	●	TNMA TNMG TNMM TNGA TNGG	33○	.750	.750	4.500	1.000	.750	1.000	LLSTN32 *1 (LLSTN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
-163	●	●		33○	1.000	1.000	6.000	1.000	1.000	1.250	LLSTN32 *1 (LLSTN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
-164	●	●		43○	1.000	1.000	6.000	1.219	1.000	1.250	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-204	●	●		43○	1.250	1.250	6.000	1.219	1.250	1.500	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

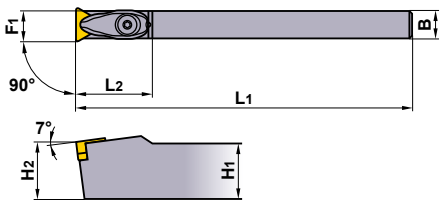
*1 Please use shim no.LLSTN33 with .125inch thick insert. When using .125inch thick inserts, the shim must be ordered separately.
*2 Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

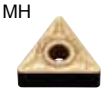
DTCN

DOUBLE CLAMP Type

Facing





Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(3)	(3)	(3)	(3)
Medium to Rough	Stainless	CBN	
RP	MM		
			
(3)	(3)	(3)	

Order Number	Stock	Insert Number		H1	B	L1	L2	H2	F1	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *2	Wrench
DTCNN-433	●	TNMA TNMG TNMM TNGA TNGG	33○	.750	.500	4.500	1.375	.750	.539	LLSTN32 *1 (LLSTN33)	LLP23	DCK3113	DCS2	DC0520T	TKY15F
-443	●		33○	1.000	.500	6.000	1.375	1.000	.539	LLSTN32 *1 (LLSTN33)	LLP23	DCK3113	DCS2	DC0520T	TKY15F

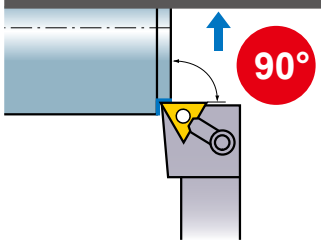
*1 Please use shim no.LLSTN33 with .125inch thick insert. When using .125inch thick inserts, the shim must be ordered separately.
*2 Clamp Torque (lbf-in) : DC0520T=31

(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

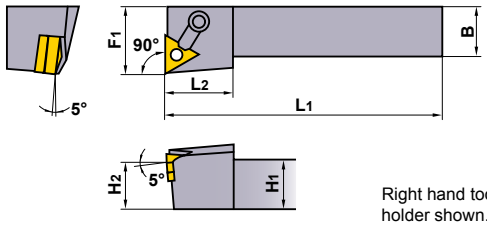
● : Inventory maintained.
□ : Non stock, produced to order only.

DTFN type inserts ➤ A090–A096
DTCN type inserts ➤ A090–A096
CBN & PCD inserts ➤ B030, B031, B056
CUTTING CONDITIONS ➤ C045

MTFN



Facing — ***Multiple Clamp Type*** — ***M*** **Holder**



Right hand tool holder shown.

Finish	Light	Medium	Medium
FH	LP	MP	MH
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	Stainless	CBN	
RP	MM		
			
(3)	(3,4)	(3)	

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
	R	L			H_1	B	L_1	L_2	H_2	F_1				
MTFNR/L-82	□	□	TNMA TNMG TNMM TNGA TNGG	22◌	.500	.500	4.500	.813	.500	.750	—	NL23	CL19	XNS36
-103X	□	□		33◌ *1 *2	.625	.625	4.500	.875	.625	.875	ITSN323 *1	NL34L	CL6	XNS36
-123BX	●	●		33◌ *1 *2	.750	.750	4.500	.875	.750	1.000	ITSN323 *1	NL34L	CL6	XNS36
-163CX	●	●		33◌ *1 *2	1.000	1.000	5.000	.875	1.000	1.250	ITSN323 *1	NL34L	CL6	XNS36
-163DX	□	□		33◌ *1 *2	1.000	1.000	6.000	.875	1.000	1.250	ITSN323 *1	NL34L	CL6	XNS36
-164C	□	□		43◌ *1	1.000	1.000	5.000	1.218	1.000	1.250	ITSN432 *1	NL46	CL9	XNS510
-164D	●	●		43◌ *1	1.000	1.000	6.000	1.218	1.000	1.250	ITSN432 *1	NL46	CL9	XNS510
-165C		□		54◌ *1	1.000	1.000	5.000	1.375	1.000	1.250	ITSN533 *1	NL58	CL12	XNS510
-165D	□	□		54◌ *1	1.000	1.000	6.000	1.375	1.000	1.250	ITSN533 *1	NL58	CL12	XNS510
-204D	□	□		43◌ *1	1.250	1.250	6.000	1.218	1.250	1.500	ITSN432 *1	NL46	CL9	XNS510
-205D	●	□		54◌ *1	1.250	1.250	6.000	1.375	1.250	1.500	ITSN533 *1	NL58	CL12	XNS510
-246D	□	□		66◌ *1	1.500	1.500	6.000	1.500	1.500	2.000	ITSN636 *1	NL68	CL12	XNS510
-246E	□	□		66◌ *1	1.500	1.500	7.000	1.500	1.500	2.000	ITSN636 *1	NL68	CL12	XNS510
-855D	□	□		54◌ *1	1.250	1.000	6.000	1.375	1.250	1.250	ITSN533 *1	NL58	CL12	XNS510

*1 (Opt.) See page M009 for different thickness or radius.

*2 For inserts without hole, remove shim pin and add below.

Shim Screw	Chipbreaker
S34	CBT3

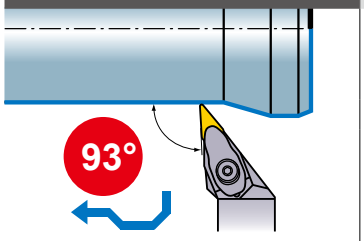
*3 Clamp Torque (lbf-in) : XNS36=30, XNS510=70

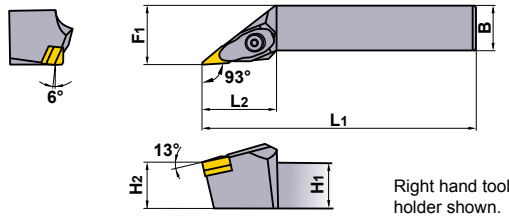
MTFN type inserts	➤ A090–A096
CBN & PCD inserts	➤ B030, B031, B056
CUTTING CONDITIONS	➤ C045
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

VN□□ INSERTS TOOL HOLDERS

DVJN

External turning Copying ***DOUBLE CLAMP Type***





Right hand tool holder shown.

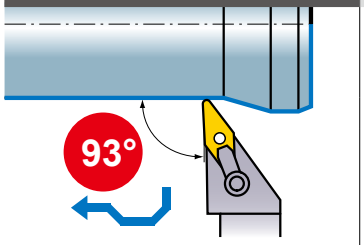
Finish	Light	Medium	Medium
FH	LP	MA	MH
			
(3)	(3)	(3)	(3)
Medium	**Stainless**	**G Class**	**CBN**
MP	MM	MJ	
			
(3)	(3)	(3)	(3)

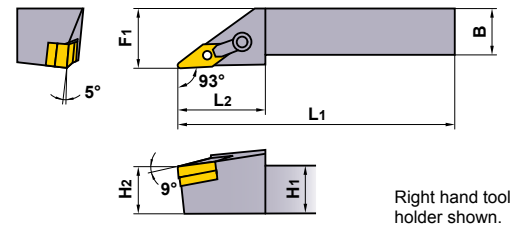
Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
	R	L			H1	B	L1	L2	H2	F1						
DVJNR/L-123	●	●	VNGA VNMG	33○	.750	.750	4.500	1.625	.750	1.000	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
-163	●	●	VNGM VNGG	33○	1.000	1.000	6.000	1.625	1.000	1.250	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
-203	●	●	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	MH
			
(3)	(3)	(3)	(3)
Medium	**Stainless**	**G Class**	**CBN**
MP	MM	MJ	
			
(3)	(3)	(3)	(3)

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *2
	R	L			H1	B	L1	L2	H2	F1				
MVJNR/L-123B	●	●	VNGA VNMG VNGM VNGG VNMM	33○	.750	.750	4.500	1.687	.750	1.000	IVSN322	NL34L	CL30	XNS510
-163C	●	●		33○	1.000	1.000	5.000	1.687	1.000	1.250	IVSN322	NL34L	CL30	XNS510
-163D	●	●		33○	1.000	1.000	6.000	1.687	1.000	1.250	IVSN322	NL34L	CL30	XNS510
-164C	□	□		43○	1.000	1.000	5.000	2.000	1.000	1.250	IVSN432 *1	NL46	CL30	XNS510
-164D	●	●		43○	1.000	1.000	6.000	2.000	1.000	1.250	IVSN432 *1	NL46	CL30	XNS510
-203D	□	□		33○	1.250	1.250	6.000	1.687	1.250	1.500	IVSN322	NL34L	CL30	XNS510
-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

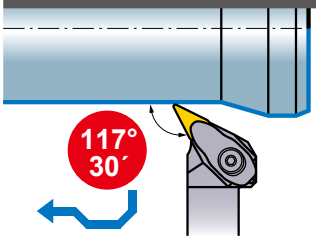
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

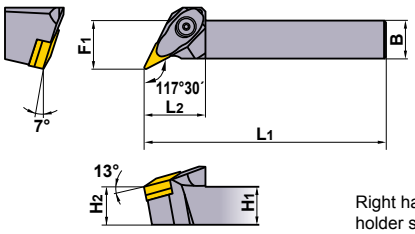
● : Inventory maintained.
□ : Non stock, produced to order only.

DVJN type inserts	➤ A097–A099	CBN & PCD inserts	➤ B032, B033, B057
MVJN type inserts	➤ A097–A099	CUTTING CONDITIONS	➤ C045

DVPN

Facing Copying — ***DOUBLE CLAMP Type***





Right hand tool holder shown.

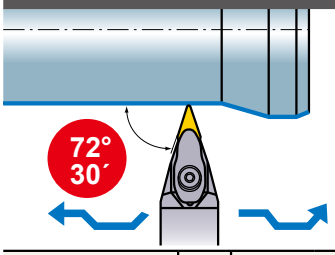
Finish	Light	Medium	Medium
FH	LP	MA	MH
			
(3)	(3)	(3)	(3)
Medium	**Stainless**	**G Class**	**CBN**
MP	MM	MJ	
			
(3)	(3)	(3)	(3)

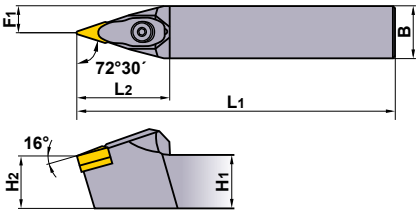
Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
	R	L			H_1	B	L_1	L_2	H_2	F_1						
DVPNR/L-123	●	●	VNGA VNMG VNGM VNGG VNMM	33◌	.750	.750	4.500	1.250	.750	1.000	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
-163	●	●		33◌	1.000	1.000	6.000	1.250	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	MH
			
(3)	(3)	(3)	(3)
Medium	**Stainless**	**G Class**	**CBN**
MP	MM	MJ	
			
(3)	(3)	(3)	(3)

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
					H_1	B	L_1	L_2	H_2	F_1						
DVVNN-123	●		VNGA VNMG VNGM VNGG VNMM	33◌	.750	.750	4.500	1.750	.750	.375	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
-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	➤ A097–A099	CUTTING CONDITIONS	➤ C045
DVVN type inserts	➤ A097–A099	SPARE PARTS	➤ M001
CBN & PCD inserts	➤ B032, B033, B057	TECHNICAL DATA	➤ N001

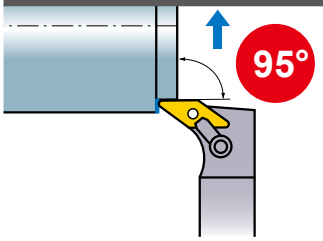
VN INSERTS TOOL HOLDERS

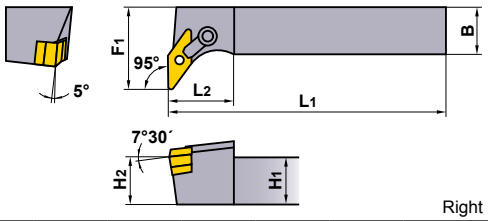
MVLN

Facing

Multiple Clamp Type
***M* Holder**

Medium
MJ





Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H1	B	L1	L2	H2	F1	Shim *1	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	NL46	CL12	XNS510
-164D	●	●		43◌	1.000	1.000	6.000	1.500	1.000	1.750	IVSN432	NL46	CL12	XNS510
-204D	●	●		43◌	1.250	1.250	6.000	1.500	1.250	2.000	IVSN432	NL46	CL12	XNS510
-244D	□			43◌	1.500	1.500	6.000	1.500	1.500	2.250	IVSN432	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.

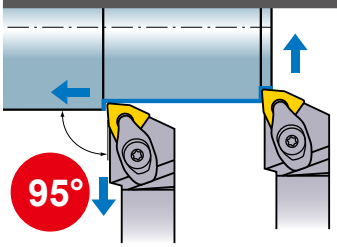
● : Inventory maintained. □ : Non stock, produced to order only.

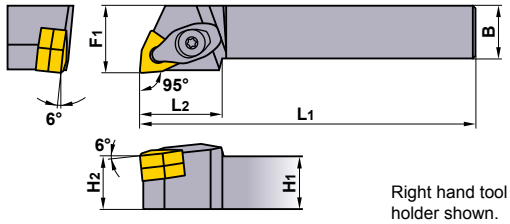
MVLN type inserts ➤ A098
CUTTING CONDITIONS ➤ C045

WN INSERTS TOOL HOLDERS

DWLN

External turning Facing ***DOUBLE CLAMP Type***





Right hand tool holder shown.

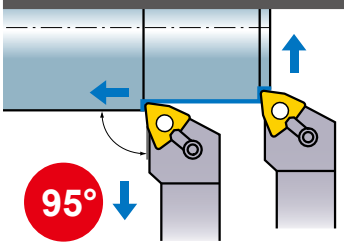
Finish	Light	Medium	Medium
FH	LP	MP	MH
(4)	(4)	(3,4)	(4)
Medium	**Medium to Rough**	**Stainless**	
Standard	RP	MM	
(4)	(4)	(3,4)	

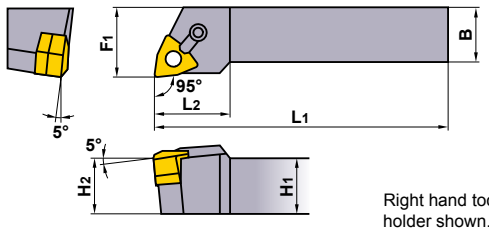
Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *2	Wrench
	R	L			H_1	B	L_1	L_2	H_2	F_1						
DWLNR/L-123	●	●	WNMA WNMG	33◌	.750	.750	4.500	1.000	.750	1.000	LLSWN32 *1 (LLSWN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
-124	●	●		43◌	.750	.750	4.500	1.250	.750	1.000	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-163	●	●		33◌	1.000	1.000	6.000	1.000	1.000	1.250	LLSWN32 *1 (LLSWN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
-164	●	●		43◌	1.000	1.000	6.000	1.250	1.000	1.250	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-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	MH
(4)	(4)	(3,4)	(4)
Medium	**Medium to Rough**	**Stainless**	
Standard	RP	MM	
(4)	(4)	(3,4)	

Order Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *
	R	L			H_1	B	L_1	L_2	H_2	F_1				
MWLNR/L-1232	●	●	WNMA WNMG	32◌	.750	.750	4.500	1.000	.750	1.000	IWSN322	NL34L	CL7	XNS36
-1233	●	●		33◌	.750	.750	4.500	1.000	.750	1.000	IWSN322	NL34L	CL7	XNS36
-124B	●	●		43◌	.750	.750	4.500	1.000	.750	1.000	IWSN432	NL46	CL20	XNS48
-1632	●	●		32◌	1.000	1.000	6.000	1.188	1.000	1.250	IWSN322	NL34	CL7	XNS36
-1633	●	●		33◌	1.000	1.000	6.000	1.188	1.000	1.250	IWSN322	NL34L	CL7	XNS36
-164D	●	●		43◌	1.000	1.000	6.000	1.188	1.000	1.250	IWSN432	NL46	CL20	XNS48
-854D	●	●		43◌	1.250	1.000	6.000	1.188	1.250	1.250	IWSN432	NL46	CL20	XNS48
-204D	●	●		43◌	1.250	1.250	6.000	1.188	1.250	1.500	IWSN432	NL46	CL20	XNS48
-165D	●	●		54◌	1.000	1.000	6.000	1.188	1.000	1.250	IWSN533	NL34L	CL9	XNS59
-205D	●	●		54◌	1.250	1.250	6.000	1.125	1.250	1.500	IWSN533	NL34L	CL9	XNS59
-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

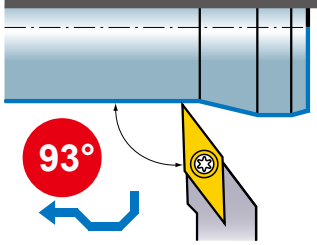
DWLN type inserts	**➤ A100–A103**	**CUTTING CONDITIONS**	**➤ C045**
MWLN type inserts	**➤ A100–A103**	**SPARE PARTS**	**➤ M001**
CBN inserts	**➤ B034**	**TECHNICAL DATA**	**➤ N001**

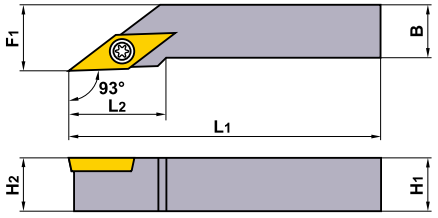
VB INSERTS TOOL HOLDERS

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)

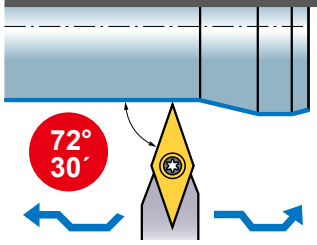
Order Number	Stock		Insert Number		Dimensions (inch)						*	
	R	L			H_1	B	L_1	L_2	H_2	F_1	Clamp Screw	Wrench
SVJBR/L-062	●	●	VBGT VBMT VBET	22◌	.375	.375	2.500	.875	.375	.500	TS25	TKY08F
-082	●	●		22◌	.500	.500	3.500	.875	.500	.625	TS25	TKY08F
-102	●	●		22◌	.625	.625	4.000	.875	.625	.750	TS25	TKY08F
-123	●	●		33◌	.750	.750	4.500	1.250	.750	1.000	TS4	TKY15F
-163	●	●		33◌	1.000	1.000	6.000	1.250	1.000	1.250	TS4	TKY15F

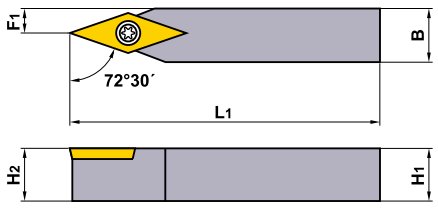
* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

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_1	B	L_1	H_2	F_1	Clamp Screw	Wrench
SVVBN-062	●	VBGT VBMT VBET	22◌	.375	.375	2.500	.375	.188	TS25	TKY08F
-082	●		22◌	.500	.500	3.000	.500	.250	TS25	TKY08F
-102	●		22◌	.625	.625	4.000	.625	.313	TS25	TKY08F
-122	●		22◌	.750	.750	4.500	.750	.375	TS25	TKY08F
-123	●		33◌	.750	.750	4.500	.750	.375	TS4	TKY15F
-163	●		33◌	1.000	1.000	6.000	1.000	.500	TS4	TKY15F

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

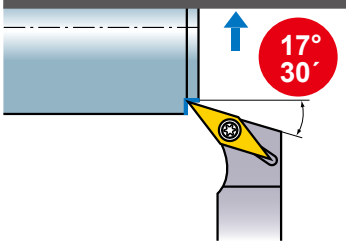
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

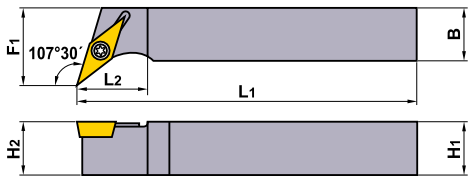
SVJB type inserts	➤ A133–A136	CBN & PCD inserts	➤ B048, B064
SVVB type inserts	➤ A133–A136	CUTTING CONDITIONS	➤ C045

● : 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_1	B	L_1	L_2	H_2	F_1	Clamp Screw	Wrench
SVHBR/L-062	●	●	VBGT VBMT VBET	22◌	.375	.375	2.500	.600	.375	.500	TS25	TKY08F
-082	●	●		22◌	.500	.500	3.500	.600	.500	.625	TS25	TKY08F
-102	●	●		22◌	.625	.625	4.000	.600	.625	.750	TS25	TKY08F
-123	●	●		33◌	.750	.750	4.500	1.000	.750	1.000	TS4	TKY15F
-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

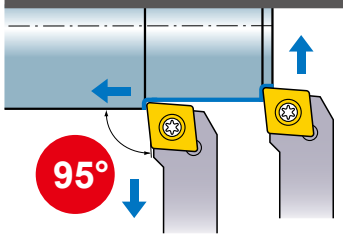
SVHB type inserts	➤ A133–A136
CBN & PCD inserts	➤ B048, B064
CUTTING CONDITIONS	➤ C045
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

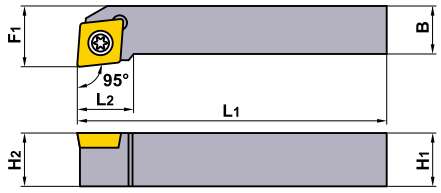
CC INSERTS TOOL HOLDERS

SCLC

External turning
Facing

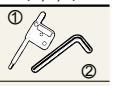
Screw Clamp Type
***SP* Holder**





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_1	B	L_1	L_2	H_2	F_1	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
-083	●	●		32.5○	.500	.500	3.500	.540	.500	.625	—	—	TS43	①TKY15F
-104	●	●		43○	.625	.625	4.000	.660	.625	.750	—	—	TS5	①TKY25F
-124	●	●		43○	.750	.750	4.500	.660	.750	.875	SPSCN42	JSS7	TS53	②TKY25R
-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.

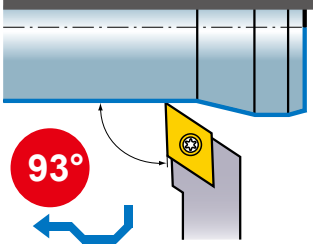
SCLC type inserts	**➤ A107–A113**
CBN & PCD inserts	**➤ B038–B040, B059**
CUTTING CONDITIONS	**➤ C045**

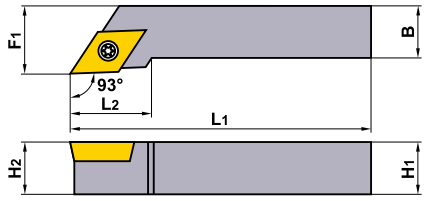
● : Inventory maintained.

SDJC

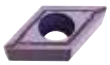
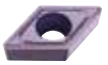
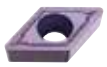
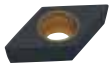
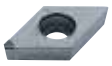
External turning
Copying

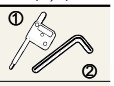
Screw Clamp Type
***SP* Holder**





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)

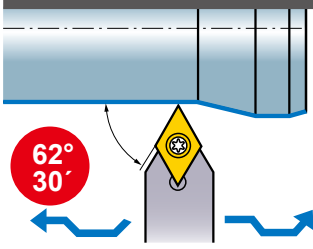
Order Number	Stock		Insert Number		Dimensions (inch)						 Shim	 Shim Screw	 * Clamp Screw	 Wrench
	R	L			H_1	B	L_1	L_2	H_2	F_1				
SDJCR/L-062	●	●	DCET DCGT DCMT DCMW	21.5°	.375	.375	2.500	.500	.375	.500	—	—	TS25	①TKY08F
-083	●	●		32.5°	.500	.500	3.500	.700	.500	.625	—	—	TS43	①TKY15F
-103	●	●		32.5°	.625	.625	4.000	.700	.625	.750	—	—	TS43	①TKY15F
-123	●	●		32.5°	.750	.750	4.500	.700	.750	.875	SPSDN32	JSS6	TS406	②TKY15R
-163	●	●		32.5°	1.000	1.000	6.000	1.000	1.000	1.250	SPSDN32	JSS6	TS406	②TKY15R

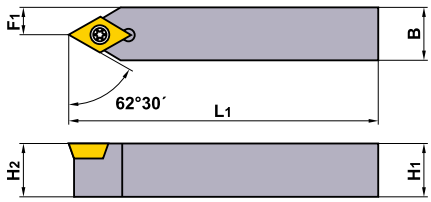
* Clamp Torque (lbf-in) : TS25=8.9, TS43=31, TS406=31

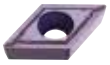
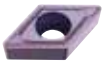
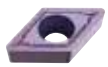
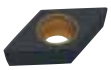
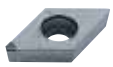
SDNC

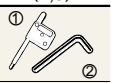
External turning
Copying

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)					 Shim	 Shim Screw	 * Clamp Screw	 Wrench
				H_1	B	L_1	H_2	F_1				
SDNCN-062	●	DCET DCGT DCMT DCMW	21.5°	.375	.375	2.500	.375	.188	—	—	TS25	①TKY08F
-083	●		32.5°	.500	.500	3.500	.500	.250	—	—	TS43	①TKY15F
-103	●		32.5°	.625	.625	4.000	.625	.313	—	—	TS43	①TKY15F
-123	●		32.5°	.750	.750	4.500	.750	.375	SPSDN32	JSS6	TS406	②TKY15R
-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

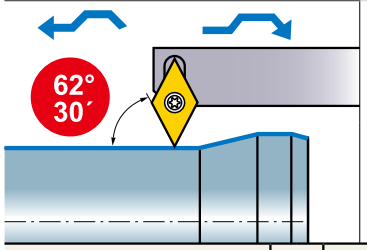
SDJC type inserts	➤ A116–A120	CUTTING CONDITIONS	➤ C045
SDNC type inserts	➤ A116–A120	SPARE PARTS	➤ M001
CBN & PCD inserts	➤ B042–B044, B060	TECHNICAL DATA	➤ N001

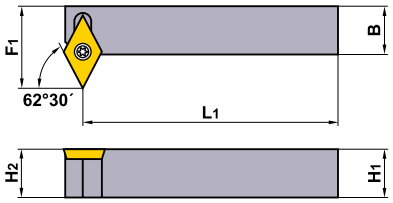
DC INSERTS TOOL HOLDERS

SDXC

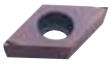
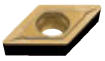
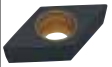
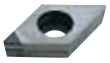
External turning
Copying

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_1	B	L_1	H_2	F_1	Clamp Screw	Wrench
SDXCR/L-062	●	●	DCET DCGT DCMT	21.5○	.375	.375	2.500	.375	.625	TS25	TKY08F
-082	●	●		21.5○	.500	.500	3.500	.500	.750	TS25	TKY08F
-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	**➤ A116–A120**
CBN & PCD inserts	**➤ B042–B044, B060**
CUTTING CONDITIONS	**➤ C045**

● : **Inventory maintained.**

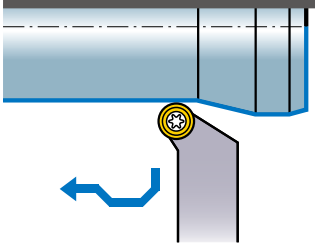
SRGC

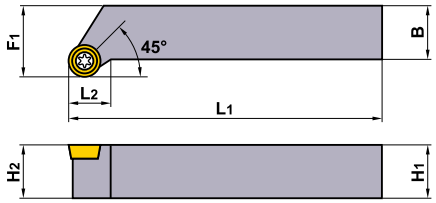
External turning
Copying

Screw Clamp Type
SP Holder

Medium
Standard


(08)





Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)						*	
	R	L			H1	B	L1	L2	H2	F1	Clamp Screw	Wrench
SRGCR/L-0608M	●	●	RCMT	0803M0	.375	.375	2.500	.610	.375	.625	TS3	TKY08F
-0808M	●	●		0803M0	.500	.500	3.500	.610	.500	.750	TS3	TKY08F
-1008M	●	●		0803M0	.625	.625	4.000	.610	.625	.875	TS3	TKY08F

* Clamp Torque (lbf-in) : TS3=8.9

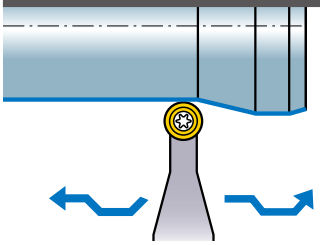
SRDC

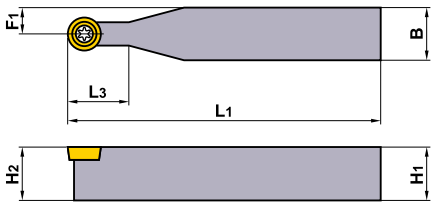
External turning
Copying

Screw Clamp Type
SP Holder

Medium
Standard


(08)





Order Number	Stock	Insert Number		Dimensions (inch)						*	
				H1	B	L1	L3	H2	F1	Clamp Screw	Wrench
SRDCN-0608M	●	RCMT	0803M0	.375	.375	2.500	.375	.375	.188	TS3	TKY08F
-0808M	●		0803M0	.500	.500	3.500	.500	.500	.250	TS3	TKY08F
-1008M	●		0803M0	.625	.625	4.000	.500	.625	.313	TS3	TKY08F

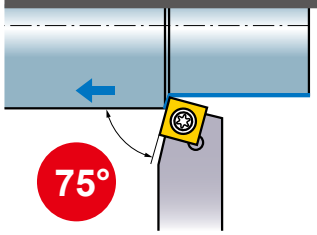
* Clamp Torque (lbf-in) : TS3=8.9

EXTERNAL TURNING TOOLS

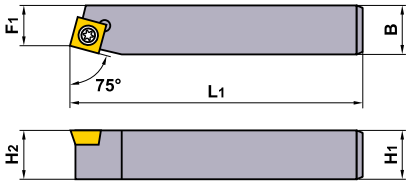
SRGC type inserts ➤ A122
SRDC type inserts ➤ A122
CUTTING CONDITIONS ➤ C045
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

SC INSERTS TOOL HOLDERS

SSBC

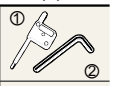


External turning — ***Screw Clamp Type*** ***SP*** **Holder**



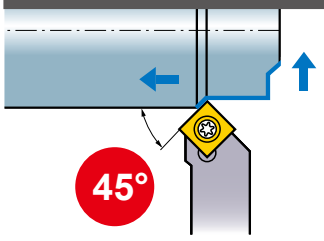
Right hand tool holder shown.

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)

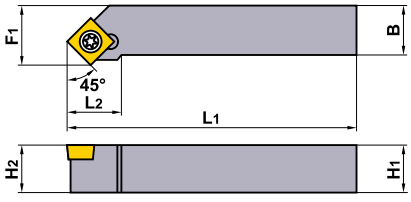
Order Number	Stock		Insert Number		Dimensions (inch)							 *	
	R	L			H_1	B	L_1	H_2	F_1	Shim	Shim Screw	Clamp Screw	Wrench
SSBCR/L-103	●	●	SCMT SCMW	32.5○	.625	.625	4.000	.625	.500	—	—	TS43	①TKY15F
-124	●	●		43○	.750	.750	4.500	.750	.625	SPSSN42	JSS7	TS53	②TKY25R
-164	●	●		43○	1.000	1.000	6.000	1.000	.875	SPSSN42	JSS7	TS53	②TKY25R

* Clamp Torque (lbf-in) : TS43=31, TS53=66

SSSC

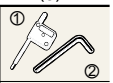


External turning
Facing, Chamfering — ***Screw Clamp Type*** ***SP*** **Holder**



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)								 *	
	R	L			H_1	B	L_1	L_2	H_2	F_1	Shim	Shim Screw	Clamp Screw	Wrench
SSSCR/L-083	●	●	SCMT SCMW	32.5○	.500	.500	3.500	.625	.500	.550	—	—	TS43	①TKY15F
-103	●	●		32.5○	.625	.625	4.000	.625	.625	.680	—	—	TS43	①TKY15F
-124	●	●		43○	.750	.750	4.500	1.000	.750	.850	SPSSN42	JSS7	TS53	②TKY25R
-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

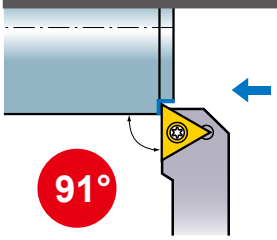
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

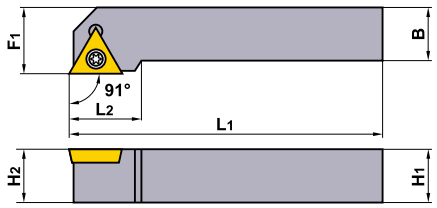
SSBC type inserts	**➤ A123, A124**
SSSC type inserts	**➤ A123, A124**
CUTTING CONDITIONS	**➤ C045**

● : **Inventory maintained.**

STGC

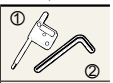
External turning — ***Screw Clamp Type*** **SP Holder**





Right hand tool holder shown.

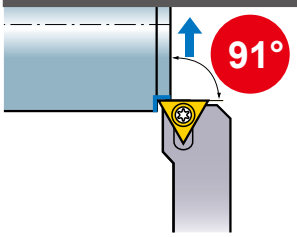
Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Flat Top**	**PCD/CBN**
MP	MM		
			
(2,3)	(2,3)	(2,3)	(2,3)

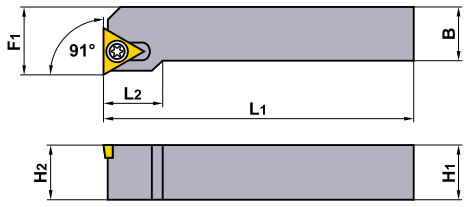
Order Number	Stock		Insert Number		Dimensions (inch)								 *	
	R	L			H_1	B	L_1	L_2	H_2	F_1	Shim	Shim Screw	Clamp Screw	Wrench
STGCR/L-062	●	●	TCGT TCMT TCMW	21.5°	.375	.375	2.500	.550	.375	.500	—	—	TS25	①TKY08F
-082.5	●	●		2.52°	.500	.500	3.500	.700	.500	.625	—	—	TS3	①TKY08F
-103	●	●		32.5°	.625	.625	4.000	.800	.625	.750	—	—	TS43	①TKY15F
-123	●	●		32.5°	.750	.750	4.500	.800	.750	.875	SPSTN32	JSS6	TS406	②TKY15R
-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

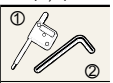
Facing — ***Screw Clamp Type*** **SP Holder**





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)								 *	
	R	L			H_1	B	L_1	L_2	H_2	F_1	Shim	Shim Screw	Clamp Screw	Wrench
STFCR/L-062	●	●	TCGT TCMT TCMW	21.5°	.375	.375	2.500	.500	.375	.500	—	—	TS25	①TKY08F
-082.5	●	●		2.52°	.500	.500	3.500	.571	.500	.625	—	—	TS3	①TKY08F
-102.5	●	●		2.52°	.625	.625	4.000	.571	.625	.750	—	—	TS3	①TKY08F
-123	●	●		32.5°	.750	.750	4.500	.866	.750	.875	SPSTN32	JSS6	TS406	②TKY15R
-163	●	●		32.5°	1.000	1.000	6.000	.866	1.000	1.250	SPSTN32	JSS6	TS406	②TKY15R

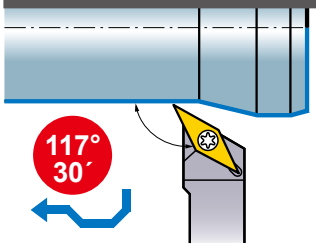
* Clamp Torque (lbf-in) : TS25=8.9, TS3=8.9, TS406=31

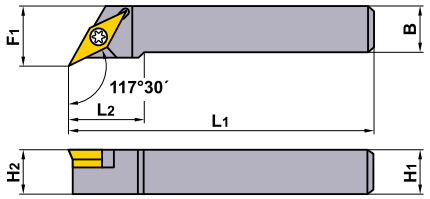
STGC type inserts	➤ A126–A128	CUTTING CONDITIONS	➤ C045
STFC type inserts	➤ A126–A128	SPARE PARTS	➤ M001
CBN & PCD inserts	➤ B045, B061	TECHNICAL DATA	➤ N001

VC INSERTS TOOL HOLDERS

SVPC

External turning Copying — ***Screw Clamp Type*** **SP Holder**





Right hand tool holder shown.

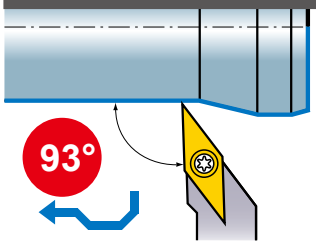
Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	Medium	Medium	Flat Top
MP	MM	Standard	
			
(2,3)	(2,3)	(2,3)	(2,3)

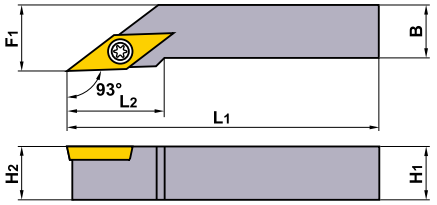
Order Number	Stock		Insert Number		Dimensions (inch)						 Shim	 Shim Pin	 * Clamp Screw	 Wrench
	R	L			H_1	B	L_1	L_2	H_2	F_1				
SVPCR/L-082	●	●	VCMT VCGT VCMW NP-VCGW	22◌	.500	.500	3.500	1.000	.500	.750	—	—	TS25	①TKY08F
-102	●	●		22◌	.625	.625	4.000	1.000	.625	.875	—	—	TS25	①TKY08F
-123	●	●		33◌	.750	.750	4.500	1.206	.750	1.000	SPSVN32	BCP141	TS44	②TKY15R
-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_1	B	L_1	L_2	H_2	F_1				
SVJCR/L-062	●	●	VCMT VCGT VCMW NP-VCGW	22◌	.375	.375	2.500	.750	.375	.500	—	—	TS25	①TKY08F
-083	●	●		33◌	.500	.500	3.500	1.000	.500	.625	—	—	TS43	①TKY15F
-103	●	●		33◌	.625	.625	4.000	1.000	.625	.750	—	—	TS43	①TKY15F
-123	●	●		33◌	.750	.750	4.500	1.000	.750	.875	SPSVN32	BCP141	TS44	②TKY15R
-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.

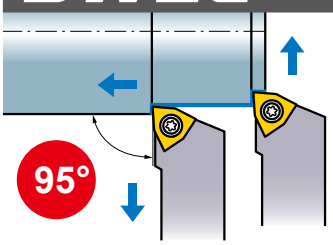
SVPC type inserts	**➤ A137–A139**
SVJC type inserts	**➤ A137–A139**
CBN & PCD inserts	**➤ B049, B064**
CUTTING CONDITIONS	**➤ C045**

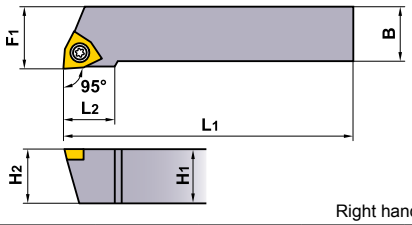
● : Inventory maintained.

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_1	B	L_1	L_2	H_2	F_1	Clamp Screw	Wrench
SWLCR/L-052	●	●	WCGT WCMT	21.5○	.313	.313	2.500	.500	.313	.375	TS25	TKY08F
-062	●	●		21.5○	.375	.375	2.500	.500	.375	.500	TS25	TKY08F
-082	●	●		21.5○	.500	.500	3.500	.500	.500	.625	TS25	TKY08F
-103	●	●		32.5○	.625	.625	4.000	.625	.625	.750	TS4	TKY15F
-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	➤ A143, A144
CBN inserts	➤ B050
CUTTING CONDITIONS	➤ C045

SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

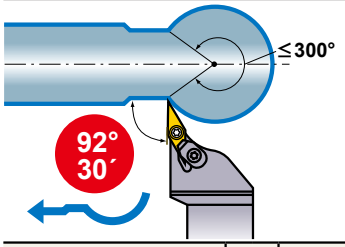
XC INSERTS TOOL HOLDERS

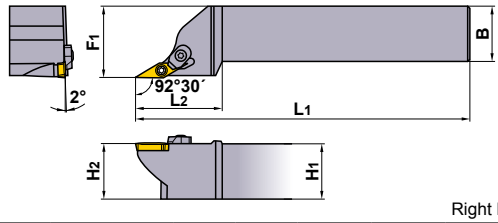
SXZC

External turning
Copying

DOUBLE CLAMP Type

Finish: SVX







(2)

Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H1	B	L1	L2	H2	F1	* 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
-122	●	●	XCMT	22□SVX	.750	.750	4.500	1.378	.750	1.000	TS255	AMS3	AJS3010T10	ASS2	TKY08F	TKY10F
-162	●	●	XCMT	22□SVX	1.000	1.000	6.000	1.575	1.000	1.250	TS255	AMS3	AJS3010T10	ASS2	TKY08F	TKY10F

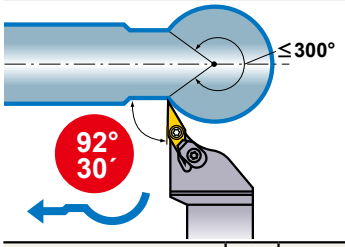
* Clamp Torque (lbf-in) : TS255=8.9, AJS3010T10=22

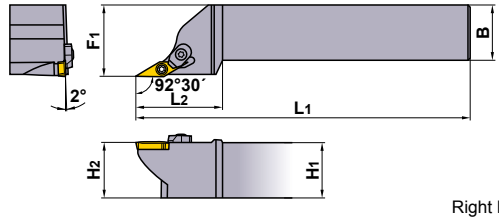
SXZC

External turning
Copying

DOUBLE CLAMP Type

Finish: SVX







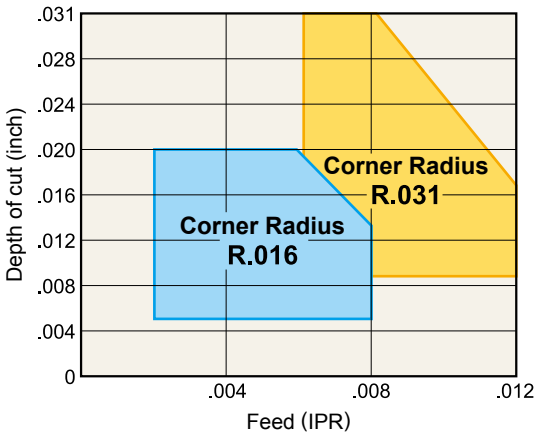
(2)

Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H1	B	L1	L2	H2	F1	* 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
2020K15	●	●	XCMT	22□SVX	20	20	125	35	20	25	TS255	AMS3	AJS3010T10	ASS2	TKY08F	TKY10F
2525M15	●	●	XCMT	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.

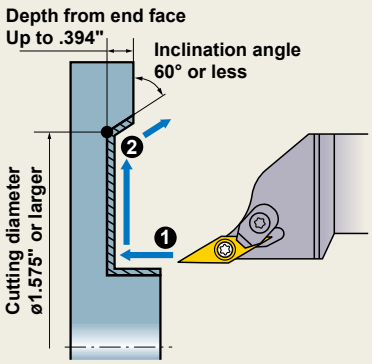
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

● : Inventory maintained.

SXZC type inserts ➤ A146

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)

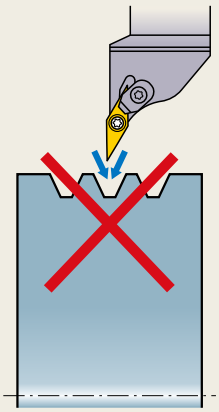
- To reduce the contact length of chips, the depth of cut should be less than half the corner radius.
- To prevent interference between the tool and the workpiece, the cutting diameter should be 1.575" or larger, inclination angle 60° or less and depth from the end face up to .394".

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

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

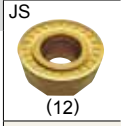
RP INSERTS TOOL HOLDERS

SRDPR/L

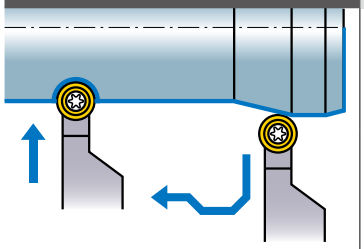
External turning
Copying

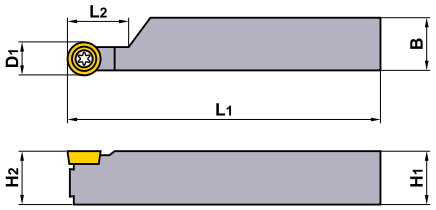
Screw Clamp Type
***SP* Holder**

Medium
JS



(12)





Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (inch)						*	
	R	L		D1	H1	B	L1	L2	H2	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

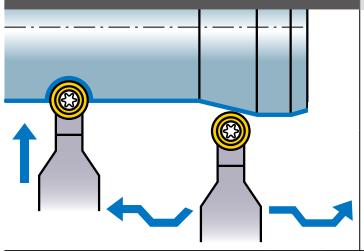
External turning
Copying

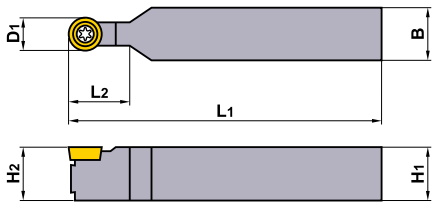
Screw Clamp Type
***SP* Holder**

Medium
JS



(12)





Order Number	Stock	Insert Number	Dimensions (inch)						*	
			D1	H1	B	L1	L2	H2	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.

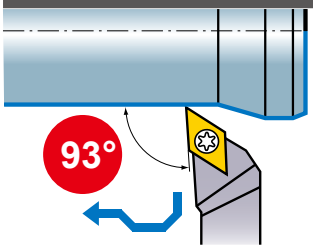
SRDPR/L type inserts ➤ J019
SRDPN type inserts ➤ J019

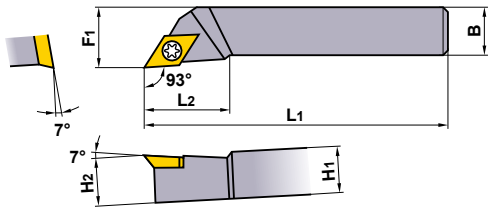
● : Inventory maintained.

SDJE

External turning
Copying

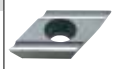
Screw Clamp Type for Aluminum
***AL* Holder**





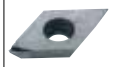
Right hand tool holder shown.

Medium
R/L



(4)

PCD
R/L-F



(4)

Order Number	Stock		Insert Number		Dimensions (inch)						*	
	R	L			H_1	B	L_1	L_2	H_2	F_1	Clamp Screw	Wrench
SDJER/L-104	●	●	DEGX	43□R/L	.625	.625	4.000	1.000	.625	.750	CS451190T	TKY20F
-124	●	●		43□R/L	.750	.750	4.500	1.000	.750	.875	CS451190T	TKY20F
-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

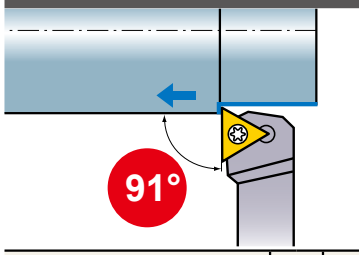
SDJE type inserts ➤ **A121**
PCD inserts ➤ **B066**
SPARE PARTS ➤ **M001**
TECHNICAL DATA ➤ **N001**

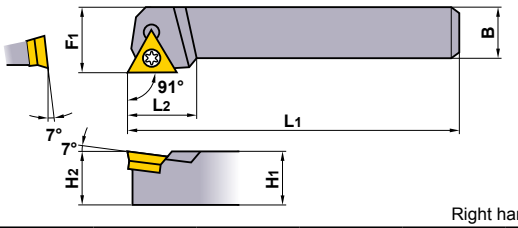
TE ○○ INSERTS TOOL HOLDERS

STGE

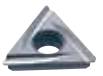
External turning

Screw Clamp Type for Aluminum
AL Holder





Right hand tool holder shown.

Medium
R/L

(3)
PCD
R/L

(3)

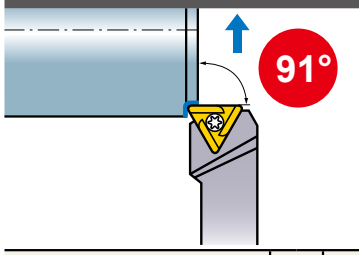
Order Number	Stock		Insert Number		Dimensions (inch)						*	
	R	L			H_1	B	L_1	L_2	H_2	F_1	Clamp Screw	Wrench
STGER/L-103	●	●	TEGX	32○R/L	.625	.625	4.000	.800	.625	.750	FC400890T	TKY10F
-123	●	●		32○R/L	.750	.750	4.500	.800	.750	.875	FC400890T	TKY10F
-163	●	●		32○R/L	1.000	1.000	6.000	.900	1.000	1.250	FC400890T	TKY10F

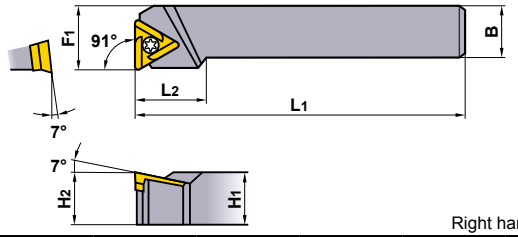
(Note) Right hand toolholder uses right hand insert. Left hand toolholder uses left hand insert.
* Clamp Torque (lbf-in) : FC400890T=22

STFE

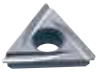
Facing

Screw Clamp Type for Aluminum
AL Holder





Right hand tool holder shown.

Medium
R/L

(3)
PCD
R/L

(3)

Order Number	Stock		Insert Number		Dimensions (inch)						*	
	R	L			H_1	B	L_1	L_2	H_2	F_1	Clamp Screw	Wrench
STFER/L-103	●	●	TEGX	32○R/L	.625	.625	4.000	.866	.625	.750	FC400890T	TKY10F
-123	●	●		32○R/L	.750	.750	4.500	.866	.750	1.000	FC400890T	TKY10F
-163	●	●		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.

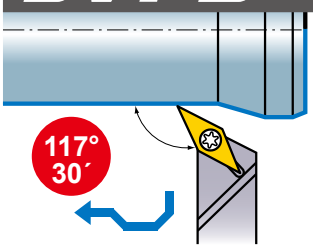
STGE type inserts ➤ A129
STFE type inserts ➤ A129
PCD inserts ➤ B066

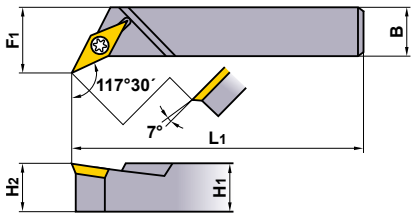
● : Inventory maintained.

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)

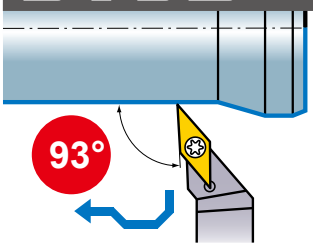
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H1	B	L1	H2	F1	* Clamp Screw	Wrench
SVPDR/L-123	●	●	VDGX	32□R/L	.750	.750	4.500	.750	1.000	FC400890T	TKY10F
-163	●	●	VDGX	32□R/L	1.000	1.000	6.000	1.000	1.250	FC400890T	TKY10F

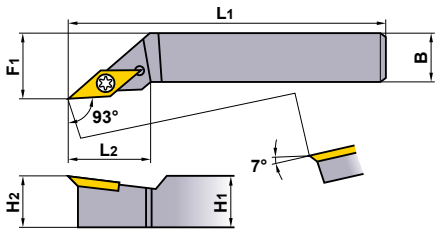
(Note) Right hand toolholder uses right hand insert. Left hand toolholder uses left hand insert.
* Clamp Torque (lbf-in) : FC400890T=22

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 R	Stock L	Insert Number		Dimensions (inch) H1	B	L1	L2	H2	F1	* Clamp Screw	Wrench
SVJDR/L-103	●	●	VDGX	32□R/L	.625	.625	4.000	1.100	.625	.750	FC400890T	TKY10F
-123	●	●	VDGX	32□R/L	.750	.750	4.500	1.100	.750	.875	FC400890T	TKY10F
-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 ➤ **A140**
SVJD type inserts ➤ **A140**
PCD inserts ➤ **B067**
SPARE PARTS ➤ **M001**
TECHNICAL DATA ➤ **N001**

RG INSERTS TOOL HOLDERS

SRSGR/L

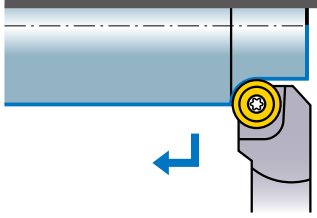
External turning
Copying

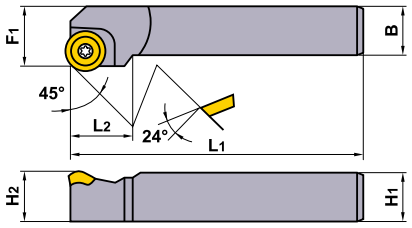
Screw Clamp Type
***SR* Holder**

Medium
Standard



(20)





Right hand tool holder shown.

Order Number	Stock		Insert Number	Dimensions (inch)						*	
	R	L		H1	B	L1	L2	H2	F1	Clamp Screw	Wrench
SRSGR/L-1620M	●	●	RGGM2004M0	1.000	1.000	6.000	1.181	1.000	1.250	TS5	TKY25F
-8520M	●			1.250	1.000	7.000	1.181	1.250	1.250	TS5	TKY25F

* Clamp Torque (lbf-in) : TS5=66

SRSGN

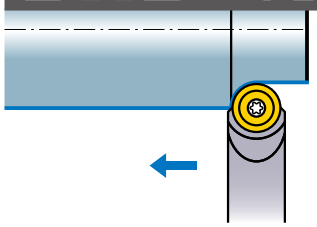
External turning

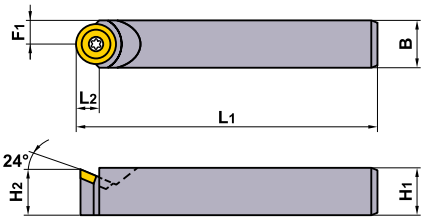
Screw Clamp Type
***SR* Holder**

Medium
Standard



(20)





Order Number	Stock	Insert Number	Dimensions (inch)						*	
			H1	B	L1	L2	H2	F1	Clamp Screw	Wrench
SRSGN-1620M	●	RGGM2004M0	1.000	1.000	6.000	.310	1.000	.500	TS5	TKY25F
-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)

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	UE6110	690—1165	.004—.016	.012—.079
		◐	L 2	SH	UE6110	690—1165	.004—.016	.012—.079
		◐	L 3	SA	UE6110	690—1165	.004—.016	.012—.079
		◐	L 4	LP	MP3025	640—970	.004—.016	.012—.079
		◐	L 5	SH	NX3035	605—850	.004—.016	.012—.079
		◐	L 6	SA	NX3035	605—850	.004—.016	.012—.079
		◐	L 7	SW	UE6110	690—1165	.004—.020	.012—.099
		◐	L 8	SW	NX3035	605—850	.004—.020	.012—.099
		◐	M 1	MP	UE6110	620—1065	.007—.020	.012—.158
		◐	M 2	MA	UE6110	620—1065	.008—.020	.012—.158
		◐	M 3	MA	NX3035	540—770	.008—.020	.012—.158
		◐	M 4	MH	UE6110	620—1065	.008—.022	.040—.158
		◐	M 5	Std	UE6110	620—1065	.010—.024	.060—.197
		◐	M 6	Std	NX3035	540—770	.010—.024	.060—.197
		◐	M 7	MW	UE6110	620—1065	.008—.024	.036—.158
		◐	R 1	RP	UE6110	590—1015	.010—.024	.060—.237
		◐	R 2	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
		◐	H 4	HAS	UE6020	510—820	.016—.044	.079—.355
		✣	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
		✣	H 5	HAS	UH6400	440—640	.016—.044	.079—.355
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

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

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	◐	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
		◐	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
	<200HB	◐	M 3	MA	MC7025	410—540	.008—.020	.012—.158
	>200HB	◐	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

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 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
		✣	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 2	MS	US735	280—540	.007—.020	.020—.158
		◐	M 4	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

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 410, AISI 430)	<200HB		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
			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
	<200HB		M	3	MA	MC7025	410—540	.008—.020	.012—.158
	>200HB		M	3	MS	US735	245—460	.007—.020	.020—.158
			M	4	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

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
M									
Hardened Stainless Steel	<450HB		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	3	MS	US735	165—310	.007—.020	.020—.158
			M	4	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
K									
Gray Cast Iron (AISI No 45 B)	<350MPa		L	1	MA	UC5105	560—1030	.008—.020	.012—.158
			M	1	Std	UC5105	560—1030	.010—.024	.060—.197
			M	2	Std	NX2525	510—690	.010—.024	.060—.197
			M	3	MW	UC5105	560—1030	.008—.024	.036—.158
			R	1	GH	UC5105	540—985	.010—.024	.060—.237
			R	2	Flat	UC5105	540—985	.008—.024	.099—.237
			R	3	Flat	HTi10	330—475	.008—.024	.099—.237
			R	4	Flat	HTi05T	360—605	.008—.024	.099—.237
			H	1	Flat	UC5105	540—985	.008—.024	.099—.237
			L	1	MA	UC5115	540—1000	.008—.020	.012—.158
			L	2	MP	UC5115	540—1000	.007—.020	.012—.158
			L	3	SW	UC5115	605—1100	.004—.020	.012—.099
			M	1	Std	UC5115	540—1000	.010—.024	.060—.197
			M	2	Std	HTi10	345—490	.010—.024	.060—.197
			M	3	MH	UC5115	540—1000	.008—.022	.040—.158
			M	4	MW	UC5115	540—1000	.008—.024	.036—.158
			R	1	GH	UC5115	525—950	.010—.024	.060—.237
			R	2	Flat	UC5115	525—950	.008—.024	.099—.237
			H	1	Flat	UC5115	525—950	.008—.024	.099—.237
			L	1	MA	UC5115	540—1000	.008—.020	.012—.158
			M	1	Std	UC5115	540—1000	.010—.024	.060—.197
			M	2	Std	UTi20T	280—395	.010—.024	.060—.197
			R	1	GH	UC5115	525—950	.010—.024	.060—.237
			R	2	Flat	UC5115	525—950	.008—.024	.099—.237
			R	3	Flat	UTi20T	260—375	.008—.024	.099—.237
			H	1	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	MA	UC5105	525—970	.008—.020	.012—.158
		●	M	1	Std	UC5105	525—970	.010—.024	.060—.197
		●	M	2	Std	NX2525	475—655	.010—.024	.060—.197
		●	R	1	GH	UC5105	510—920	.010—.024	.060—.237
		●	R	2	Flat	UC5105	510—920	.008—.024	.099—.237
		●	R	3	Flat	HTi10	310—440	.008—.024	.099—.237
		●	R	4	Flat	HTi05T	345—575	.008—.024	.099—.237
		●	H	1	Flat	UC5105	510—920	.008—.024	.099—.237
		◐	L	1	MA	UC5115	510—935	.008—.020	.012—.158
		◐	L	2	MP	UC5115	510—935	.007—.020	.012—.158
		◐	L	3	SW	UC5115	575—1030	.004—.020	.012—.099
		◐	M	1	Std	UC5115	510—935	.010—.024	.060—.197
		◐	M	2	Std	HTi10	330—460	.010—.024	.060—.197
		◐	R	1	GH	UC5115	490—900	.010—.024	.060—.237
		◐	R	2	Flat	UC5115	490—900	.008—.024	.099—.237
		◐	H	1	Flat	UC5115	490—900	.008—.024	.099—.237
		✱	L	1	MA	UC5115	510—935	.008—.020	.012—.158
		✱	M	1	Std	UC5115	510—935	.010—.024	.060—.197
		✱	M	2	Std	UTi20T	260—375	.010—.024	.060—.197
		✱	R	1	GH	UC5115	490—900	.010—.024	.060—.237
		✱	R	2	Flat	UC5115	490—900	.008—.024	.099—.237
		✱	R	3	Flat	UTi20T	245—360	.008—.024	.099—.237
		✱	H	1	Flat	UC5115	490—900	.008—.024	.099—.237
	<800MPa	●	L	1	MA	UC5105	475—870	.008—.020	.012—.158
		●	M	1	Std	UC5105	475—870	.010—.024	.060—.197
		●	M	2	Std	NX2525	425—575	.010—.024	.060—.197
		●	R	1	GH	UC5105	440—820	.010—.024	.060—.237
		●	R	2	Flat	UC5105	440—820	.008—.024	.099—.237
		●	R	3	Flat	HTi10	280—395	.008—.024	.099—.237
		●	R	4	Flat	HTi05T	295—510	.008—.024	.099—.237
		●	H	1	Flat	UC5105	440—820	.008—.024	.099—.237
		◐	L	1	MA	UC5115	460—835	.008—.020	.012—.158
		◐	L	2	MP	UC5115	460—835	.007—.020	.012—.158
		◐	L	3	SW	UC5115	510—920	.004—.020	.012—.099
		◐	M	1	Std	UC5115	460—835	.010—.024	.060—.197
		◐	M	2	Std	HTi10	280—410	.010—.024	.060—.197
		◐	R	1	GH	UC5115	425—785	.010—.024	.060—.237
		◐	R	2	Flat	UC5115	425—785	.008—.024	.099—.237
		◐	H	1	Flat	UC5115	425—785	.008—.024	.099—.237
		✱	L	1	MA	UC5115	460—835	.008—.020	.012—.158
		✱	M	1	Std	UC5115	460—835	.010—.024	.060—.197
		✱	M	2	Std	UTi20T	230—330	.010—.024	.060—.197
		✱	R	1	GH	UC5115	425—785	.010—.024	.060—.237
		✱	R	2	Flat	UC5115	425—785	.008—.024	.099—.237
		✱	R	3	Flat	UTi20T	210—310	.008—.024	.099—.237
		✱	H	1	Flat	UC5115	425—785	.008—.024	.099—.237

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	MJ(M)	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
		◐	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
		✱	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	MJ(M)	VP05RT	100—195	.003—.010	.016—.060
		●	L	2	MJ(M)	US905	165—330	.003—.010	.016—.060
		●	L	3	MJ(G)	VP10RT	80—165	.003—.010	.016—.060
		●	M	1	MS	VP05RT	100—195	.004—.010	.020—.158
		●	M	2	MS	US905	165—330	.004—.010	.020—.158
		●	R	1	GJ	VP10RT	65—150	.007—.014	.040—.119
		●	R	2	GJ	US905	150—310	.007—.014	.040—.119
		◐	F	1	FJ	VP10RT	100—195	.003—.008	.004—.040
		◐	L	1	MJ(M)	VP10RT	80—165	.003—.010	.016—.060
		◐	M	1	MS	VP10RT	80—165	.004—.010	.020—.158
		◐	R	1	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	UE6110	820—1395	.002—.008	.008—.036
		◐	F	2	FP	MP3025	755—1150	.002—.008	.008—.036
		◐	F	3	FV	MP3025	755—1150	.002—.008	.008—.036
		◐	F	4	FV	NX3035	705—1000	.002—.008	.008—.036
		◐	L	1	LP	UE6110	820—1395	.003—.010	.008—.040
		◐	L	2	LP	MP3025	755—1150	.003—.010	.008—.040
		◐	L	3	Std	UE6110	670—1150	.004—.012	.012—.079
		◐	M	1	MP	UE6110	670—1150	.004—.012	.012—.079
		◐	M	2	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	UE6110	605—1015	.002—.008	.008—.036
		◐	F	2	FP	MP3025	560—850	.002—.008	.008—.036
		◐	F	3	FV	MP3025	560—850	.002—.008	.008—.036
		◐	F	4	FV	NX3035	525—740	.002—.008	.008—.036
		◐	F	5	SW	MP3025	560—850	.003—.010	.008—.060
		◐	L	1	LP	UE6110	605—1015	.003—.010	.008—.040
		◐	L	2	LP	MP3025	560—850	.003—.010	.008—.040
		◐	L	3	Std	UE6110	490—850	.004—.012	.012—.079
		◐	M	1	MP	UE6110	490—850	.004—.012	.012—.079
		◐	M	2	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	UE6110	360—605	.004—.012	.012—.079
		◐	M	2	MP	MP3025	330—510	.004—.012	.012—.079
		✣	M	1	MP	MC6025	360—575	.004—.012	.012—.079

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
		●	S	1	LM	MC7025	460—620	.003—.010	.008—.040
		●	S	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
		◐	S	1	LM	MC7025	460—620	.003—.010	.008—.040
		◐	S	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
		✣	S	1	LM	MP7035	280—440	.003—.010	.008—.040
		✣	S	2	LM	VP15TF	245—410	.003—.010	.008—.040
		✣	S	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
		●	S	1	LM	MC7025	395—525	.003—.010	.008—.040
		●	S	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
		◐	S	1	LM	MC7025	395—525	.003—.010	.008—.040
		◐	S	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
		✣	S	1	LM	MP7035	230—375	.003—.010	.008—.040
		✣	S	2	LM	VP15TF	195—345	.003—.010	.008—.040
		✣	S	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
		●	S	1	LM	MC7025	310—425	.003—.010	.008—.040
		●	S	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
		◐	S	1	LM	MC7025	310—425	.003—.010	.008—.040
		◐	S	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
		✣	S	1	LM	MP7035	180—310	.003—.010	.008—.040
		✣	S	2	LM	VP15TF	165—280	.003—.010	.008—.040
		✣	S	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

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									
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
		●	S	1	LM	MC7025	460—620	.003—.010	.008—.040
		●	S	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
		◐	S	1	LM	MC7025	460—620	.003—.010	.008—.040
		◐	S	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
		✣	S	1	LM	MP7035	280—440	.003—.010	.008—.040
		✣	S	2	LM	VP15TF	245—410	.003—.010	.008—.040
		✣	S	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
		●	S	1	LM	MC7025	395—525	.003—.010	.008—.040
		●	S	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
		◐	S	1	LM	MC7025	395—525	.003—.010	.008—.040
		◐	S	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
		✣	S	1	LM	MP7035	230—375	.003—.010	.008—.040
		✣	S	2	LM	VP15TF	195—345	.003—.010	.008—.040
		✣	S	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
		●	S	1	LM	MC7025	260—345	.003—.010	.008—.040
		●	S	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
		◐	S	1	LM	MC7025	260—345	.003—.010	.008—.040
		◐	S	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
		✣	S	1	LM	MP7035	150—245	.003—.010	.008—.040
		✣	S	2	LM	VP15TF	130—230	.003—.010	.008—.040
		✣	S	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

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
K									
Gray Cast Iron	<350MPa	●	F	1	Std	UC5115	425—805	.004—.012	.012—.079
		●	S	1	Std	UC5115	425—805	.004—.012	.012—.079
		●	M	1	Flat	UC5115	425—805	.004—.012	.012—.079
		◐	F	1	Std	UC5115	425—805	.004—.012	.012—.079
		◐	S	1	Std	UC5115	425—805	.004—.012	.012—.079
		◐	M	1	Flat	UC5115	425—805	.004—.012	.012—.079
		✣	F	1	Std	UC5115	425—805	.004—.012	.012—.079
		✣	S	1	Std	UC5115	425—805	.004—.012	.012—.079
		✣	M	1	Flat	UC5115	425—805	.004—.012	.012—.079
Ductile Cast Iron	<450MPa	●	F	1	Std	UC5115	410—755	.004—.012	.012—.079
		●	S	1	Std	UC5115	410—755	.004—.012	.012—.079
		●	M	1	Flat	UC5115	410—755	.004—.012	.012—.079
		◐	F	1	Std	UC5115	410—755	.004—.012	.012—.079
		◐	S	1	Std	UC5115	410—755	.004—.012	.012—.079
		◐	M	1	Flat	UC5115	410—755	.004—.012	.012—.079
		✣	F	1	Std	UC5115	410—755	.004—.012	.012—.079
		✣	S	1	Std	UC5115	410—755	.004—.012	.012—.079
		✣	M	1	Flat	UC5115	410—755	.004—.012	.012—.079
	<800MPa	●	F	1	Std	UC5115	360—670	.004—.012	.012—.079
		●	S	1	Std	UC5115	360—670	.004—.012	.012—.079
		●	M	1	Flat	UC5115	360—670	.004—.012	.012—.079
		◐	F	1	Std	UC5115	360—670	.004—.012	.012—.079
		◐	S	1	Std	UC5115	360—670	.004—.012	.012—.079
		◐	M	1	Flat	UC5115	360—670	.004—.012	.012—.079
		✣	F	1	Std	UC5115	360—670	.004—.012	.012—.079
		✣	S	1	Std	UC5115	360—670	.004—.012	.012—.079
		✣	M	1	Flat	UC5115	360—670	.004—.012	.012—.079
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
S									
Titanium Alloy (Ti-6Al-4V)	Si>10%	●	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)	Si>10%	●	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

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

11° 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	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
K									
Gray Cast Iron	<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

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
K									
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

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.

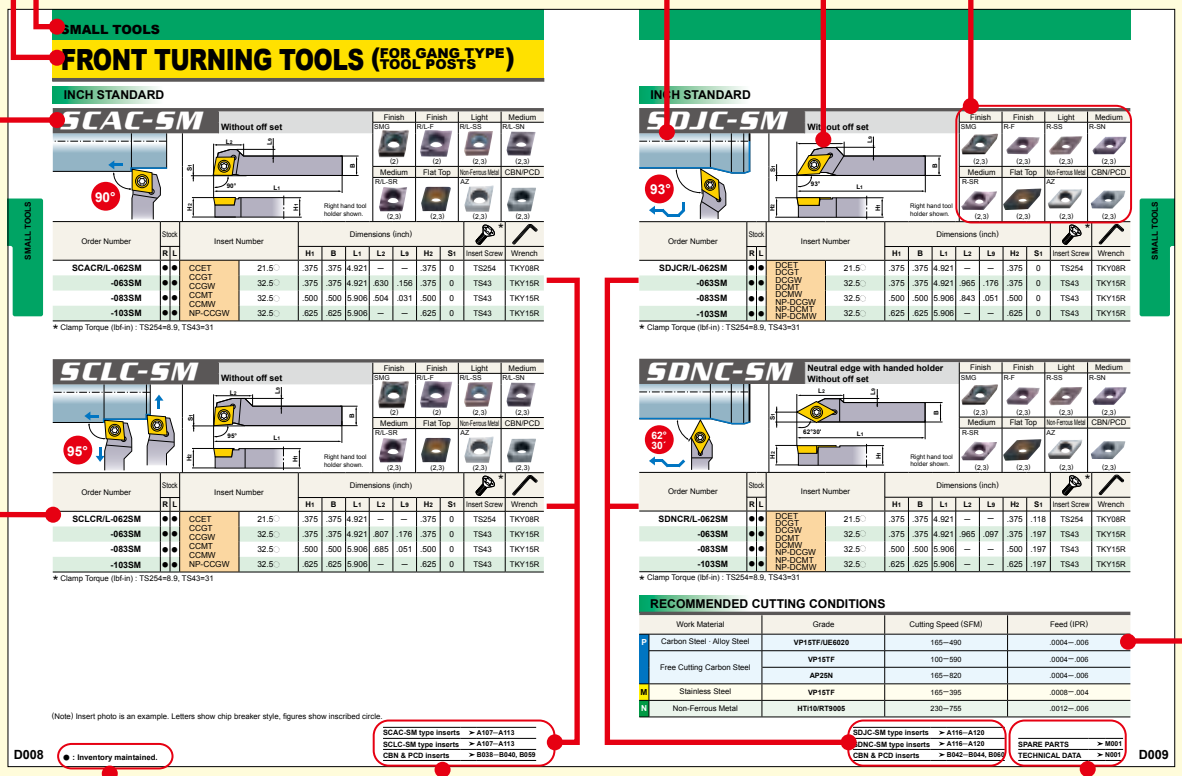
APPLICATION

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
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

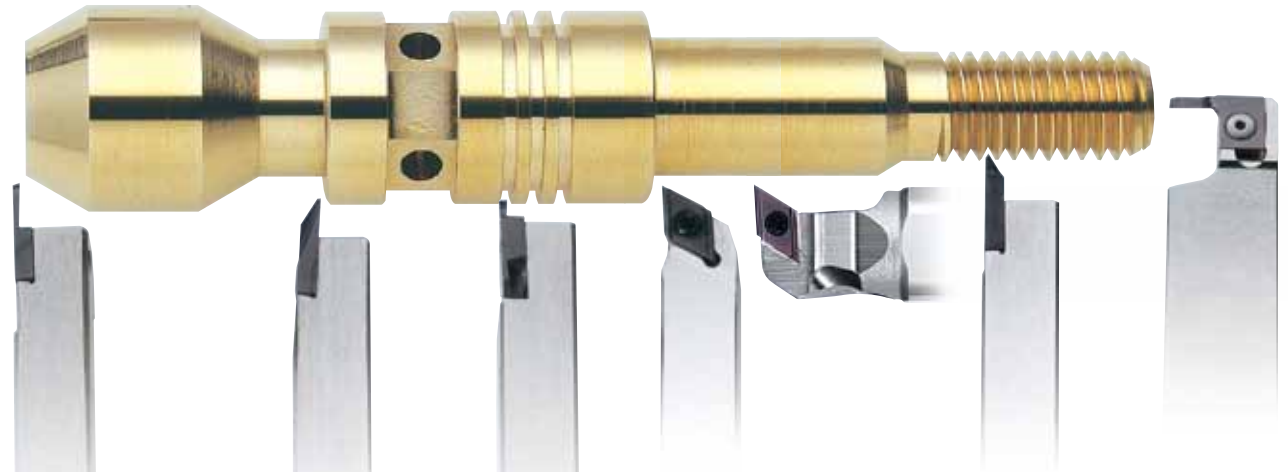
DIMPLE SLEEVE HOLDER		
SH	D039	D040

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

OUTLINE OF SMALL TOOLS

TOOLS FOR GANG TYPE TOOL POSTS



Cutting Off | Back Turning | Grooving | Front Turning | Threading | Internal Turning

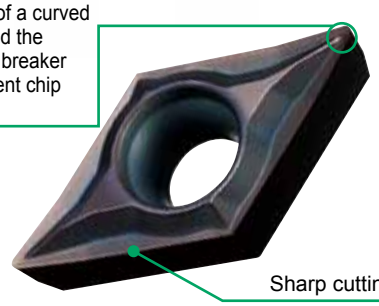


SMG Breaker Insert

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.

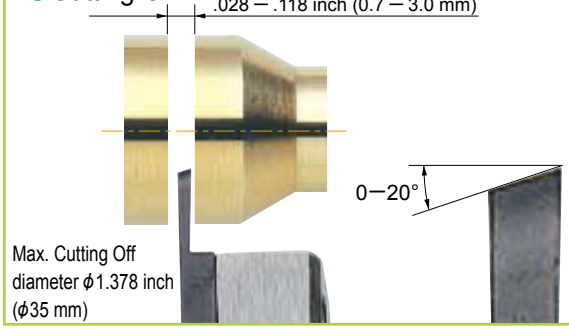


Tolerance Corner R

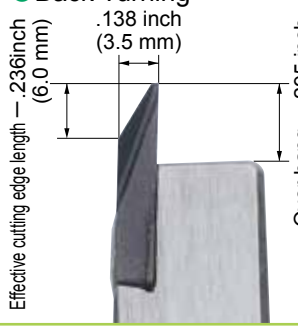


SMG breaker insert	E class
Re $^{0}_{-.002}$ inch	Re $^{0}_{-.0008}$ inch
(Conventional G class Re ± .004 inch)	

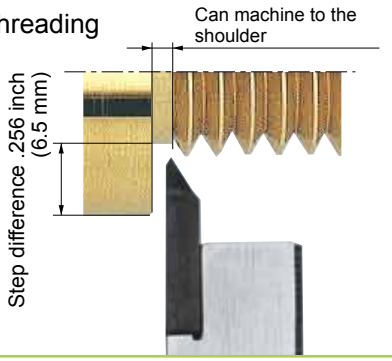
Cutting Off



Back Turning



Threading



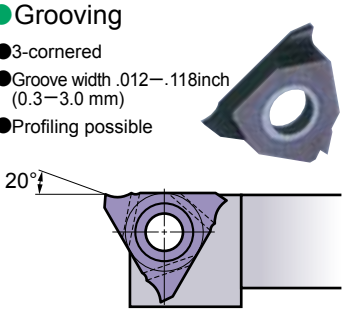
Back Clamping Mechanism



The screw designed for common use of front and back enables back clamping.

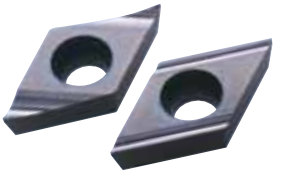
Grooving

- 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 employ-ment 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

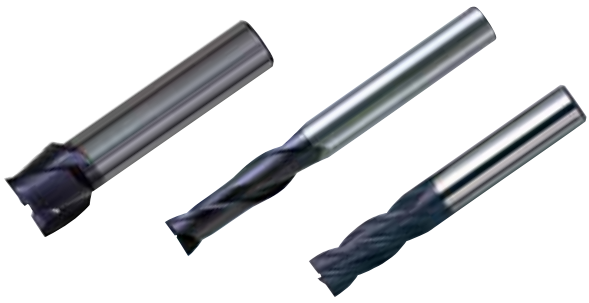
- Solid Carbide Drills



TAF Drill
Min. cutting diameter
ϕ .468 inch —

END MILLING TOOLS

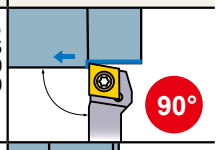
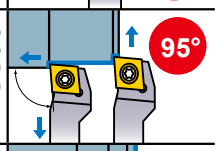
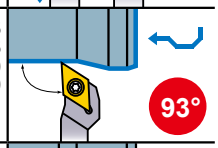
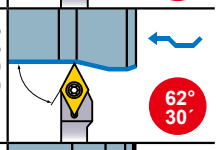
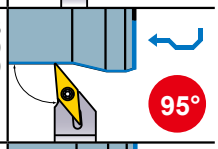
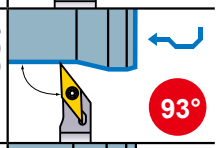
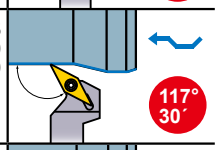
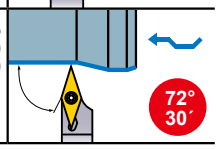
- Solid Carbide End Mills



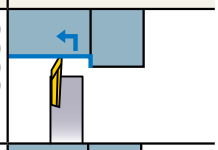
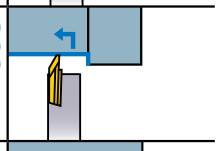
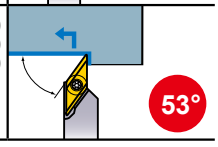
CLASSIFICATION (EXTERNAL TURNING)

GANG TYPE TOOL POSTS

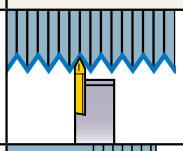
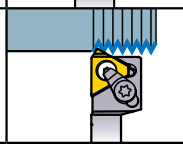
FRONT TURNING

Name of Tool Holder	Tool Size (H x W x L) Inch	Tool Size (H x W x L) 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	

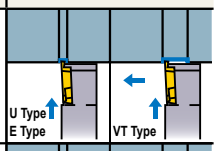
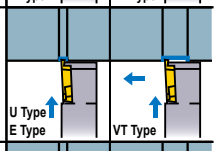
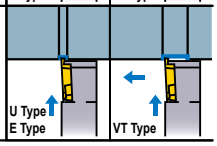
BACK TURNING

Name of Tool Holder	Tool Size (H x W x L) Inch	Tool Size (H x W x L) 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	

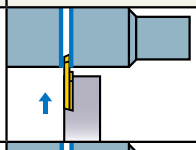
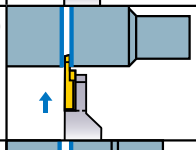
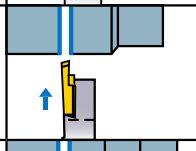
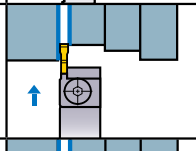
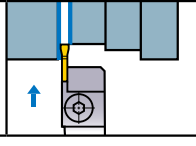
THREADING

Name of Tool Holder	Tool Size (H x W x L) Inch	Tool Size (H x W x L) 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

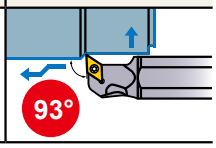
Name of Tool Holder	Tool Size (H x W x L) Inch	Tool Size (H x W x L) Metric	Geometry
GTAH (Grooving Width) .012-.055 inch 0.3-3.0 mm Inch ➲ D022 Metric ➲ D024	.375 x .375 x 3.150 .500 x .500 x 3.150 .500 x .500 x 4.724 .625 x .625 x 4.724	8 x 8 x 80 8 x 8 x 120 10 x 10 x 80 10 x 10 x 120 12 x 12 x 80 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	

CUTTING OFF

Name of Tool Holder	Tool Size (H x W x L) Inch	Tool Size (H x W x L) 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	

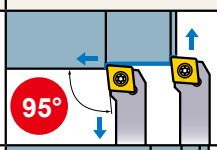
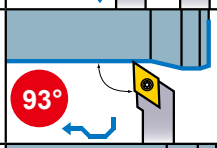
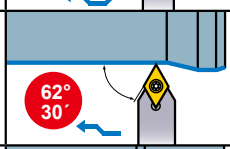
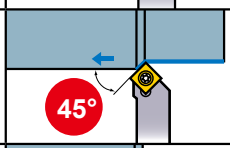
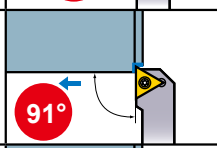
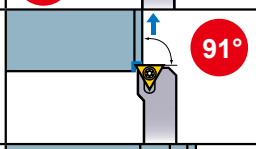
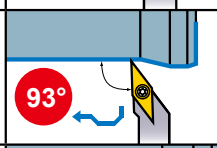
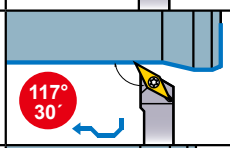
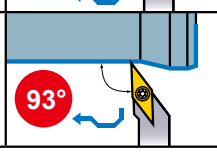
OPPOSITE TOOL POSTS

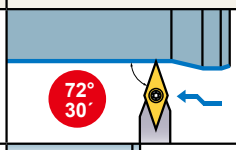
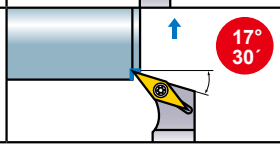
DIMPLE SLEEVE HOLDER

Name of Tool Holder	Shank Size (D x L) Inch	Shank Size (D x L) 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	

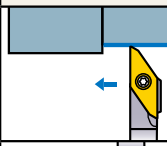
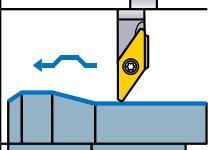
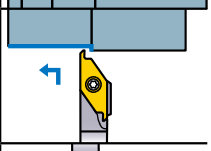
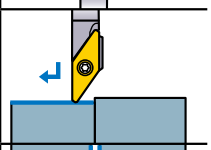
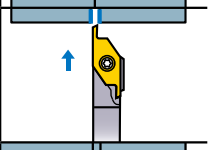
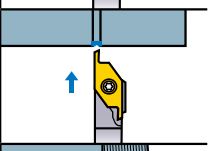
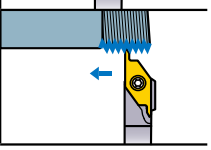
TURRET TYPE TOOL POSTS

FRONT TURNING

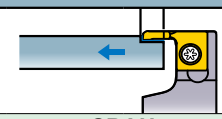
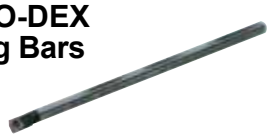
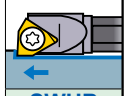
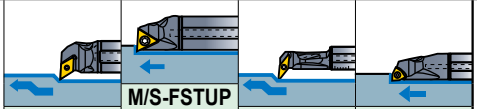
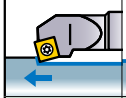
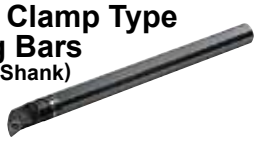
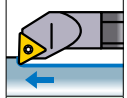
Name of Tool Holder	Shank Size (inch) (H x W x L)	Geometry
SCLC Inch ➔ **C030**	.375x .375x 2.500 .500x .500x 3.500 .625x .625x 4.000	
SDJC Inch ➔ **C031**	.375x .375x 2.500 .500x .500x 3.500 .625x .625x 4.000	
SDNC Inch ➔ **C031**	.375x .375x 2.500 .500x .500x 3.500 .625x .625x 4.000	
SSSC Inch ➔ **C034**	.500x .500x 3.500 .625x .625x 4.000	
STGC Inch ➔ **C035**	.375x .375x 2.500 .500x .500x 3.500 .625x .625x 4.000	
STFC Inch ➔ **C035**	.375x .375x 2.500 .500x .500x 3.500 .625x .625x 4.000	
SVJC Inch ➔ **C036**	.375x .375x 2.500 .500x .500x 3.500 .625x .625x 4.000	
SVPC Inch ➔ **C036**	.500x .500x 3.500 .625x .625x 4.000	
SVJB Inch ➔ **C028**	.375x .375x 2.500 .500x .500x 3.500 .625x .625x 4.000	

Name of Tool Holder	Shank Size (inch) (H x W x L)	Geometry
SVVB Inch ➔ **C028**	.375x .375x 2.500 .500x .500x 3.500 .625x .625x 4.000	
SVHB Inch ➔ **C029**	.375x .375x 2.500 .500x .500x 3.500 .625x .625x 4.000	

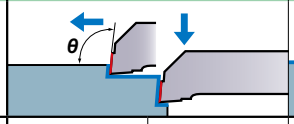
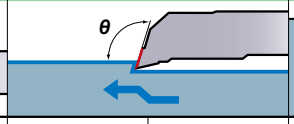
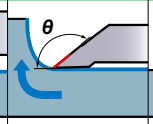
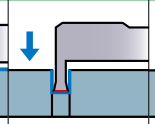
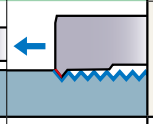
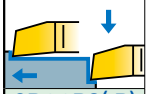
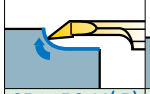
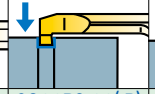
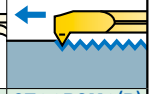
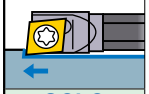
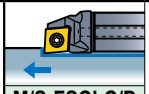
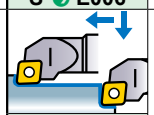
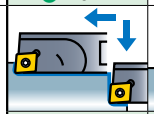
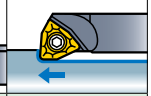
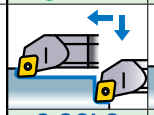
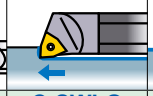
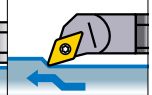
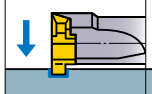
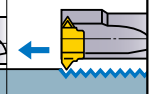
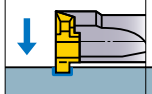
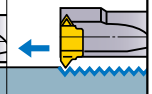
RADIAL TYPE TOOL POSTS

Name of Tool Holder	Tool Size (H x W x L) Inch	Tool Size (H x W x L) 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	θ = 75°	θ = 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.

	θ = 95°		θ = 107°30´–117°30´		θ = 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) ➲ F211	 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 ➲ F209	 S-SL5N ➲ G037		○	○			○
						 FSL51, FSL52 ➲ F208	 FSL51, FSL52 ➲ G036		○	○			○

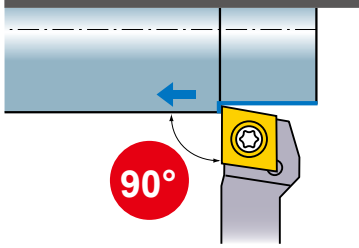
(Note 2) ◎: 1st recommendation. ○: 2nd recommendation.

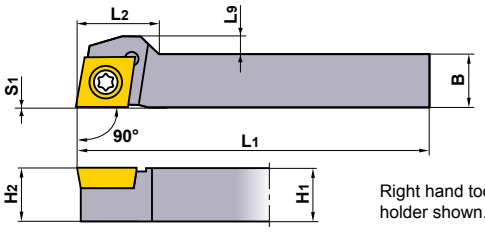
FRONT TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

SCAC-SM

Without off set





Right hand tool holder shown.

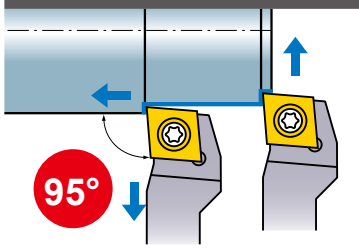
Finish	Finish	Light	Medium
SMG	R/L-F	R/L-SS	R/L-SN
			
(2)	(2)	(2,3)	(2,3)
Medium	**Flat Top**	**Non-Ferrous Metal**	**CBN/PCD**
R/L-SR		AZ	
			
(2,3)	(2,3)	(2,3)	(2,3)

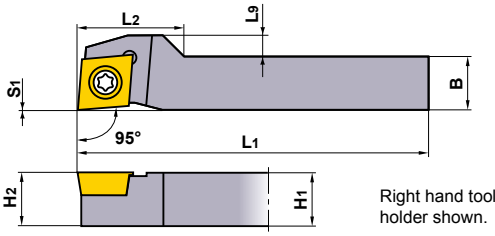
Order Number	Stock		Insert Number		Dimensions (inch)							*	
	R	L			H1	B	L1	L2	L9	H2	S1	Insert Screw	Wrench
SCACR/L-062SM	●	●	CCET CCGT CCGW CCMT CCMW NP-CCGW	21.5°	.375	.375	4.921	—	—	.375	0	TS254	TKY08R
-063SM	●	●		32.5°	.375	.375	4.921	.630	.156	.375	0	TS43	TKY15R
-083SM	●	●		32.5°	.500	.500	5.906	.504	.031	.500	0	TS43	TKY15R
-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			H1	B	L1	L2	L9	H2	S1	Insert Screw	Wrench
SCLCR/L-062SM	●	●	CCET CCGT CCGW CCMT CCMW NP-CCGW	21.5°	.375	.375	4.921	—	—	.375	0	TS254	TKY08R
-063SM	●	●		32.5°	.375	.375	4.921	.807	.176	.375	0	TS43	TKY15R
-083SM	●	●		32.5°	.500	.500	5.906	.685	.051	.500	0	TS43	TKY15R
-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.

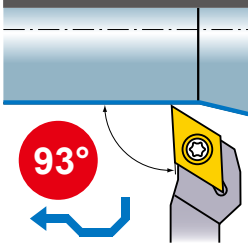
SCAC-SM type inserts	➤ A107—A113
SCLC-SM type inserts	➤ A107—A113
CBN & PCD inserts	➤ B038—B040, B059

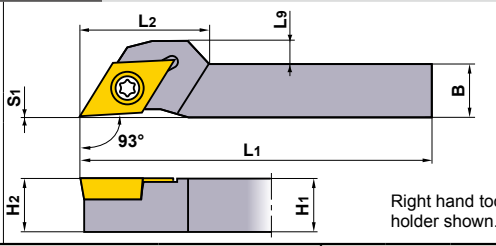
● : Inventory maintained.

INCH STANDARD

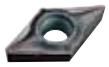
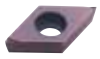
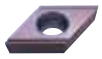
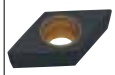
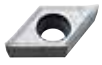
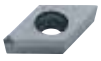
SDJC-SM

Without off set





Right hand tool holder shown.

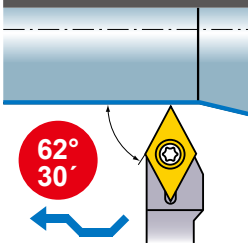
Finish	Finish	Light	Medium
SMG	R-F	R-SS	R-SN
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Flat Top**	**Non-Ferrous Metal**	**CBN/PCD**
R-SR		AZ	
			
(2,3)	(2,3)	(2,3)	(2,3)

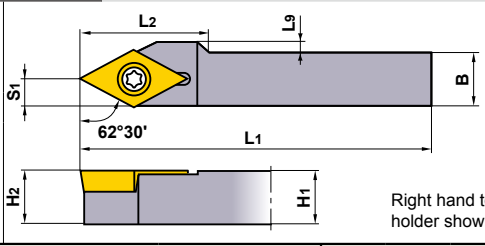
Order Number	Stock		Insert Number		Dimensions (inch)							*	
	R	L			H_1	B	L_1	L_2	L_9	H_2	S_1	Insert Screw	Wrench
SDJCR/L-062SM	●	●	DCET DCGT DCGW DCMT DCMW NP-DCGW NP-DCMT NP-DCMW	21.5°	.375	.375	4.921	—	—	.375	0	TS254	TKY08R
-063SM	●	●		32.5°	.375	.375	4.921	.965	.176	.375	0	TS43	TKY15R
-083SM	●	●		32.5°	.500	.500	5.906	.843	.051	.500	0	TS43	TKY15R
-103SM	●	●		32.5°	.625	.625	5.906	—	—	.625	0	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

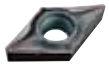
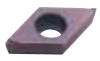
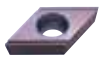
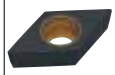
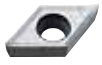
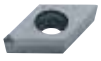
SDNC-SM

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_1	B	L_1	L_2	L_9	H_2	S_1	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
-063SM	●	●		32.5°	.375	.375	4.921	.965	.097	.375	.197	TS43	TKY15R
-083SM	●	●		32.5°	.500	.500	5.906	—	—	.500	.197	TS43	TKY15R
-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 ➤ **A116—A120**
SDNC-SM type inserts ➤ **A116—A120**
CBN & PCD inserts ➤ **B042—B044, B060**

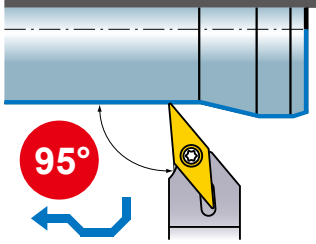
SPARE PARTS ➤ **M001**
TECHNICAL DATA ➤ **N001**

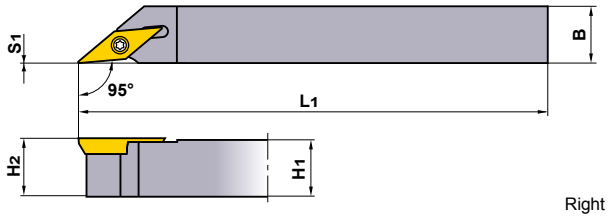
FRONT TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

SVLP-SM

Without off set





Right hand tool holder shown.

Finish: R/L-SRF



(1.5, 2)

Finish: SMG



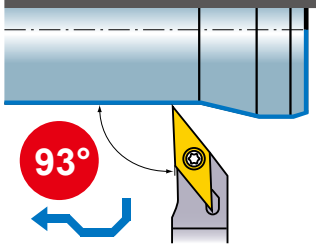
(1.5, 2)

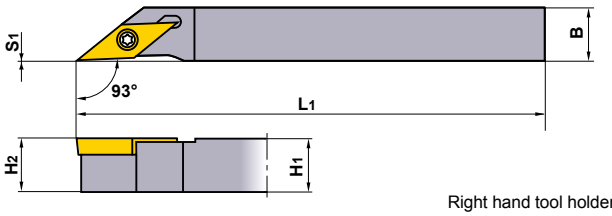
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H1	B	L1	H2	S1	* Insert Screw	Wrench
SVLPR-061.5SM	●		VPET VPGT	1.51.5○	.375	.375	5.000	.375	0	TS202	TKY06R
-081.5SM	●			1.51.5○	.500	.500	6.000	.500	0	TS202	TKY06R
SVLPR/L-062SM	●	●		22○	.375	.375	5.000	.375	0	TS255	TKY08R
-082SM	●	●		22○	.500	.500	6.000	.500	0	TS255	TKY08R
-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) H1	B	L1	H2	S1	* Insert Screw	Wrench
SVJBR/L-062SM	●	●	VBET VBGT VBMT	22○	.375	.375	4.921	.375	0	TS255	TKY08R
-082SM	●	●		22○	.500	.500	5.906	.500	0	TS255	TKY08R
-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.

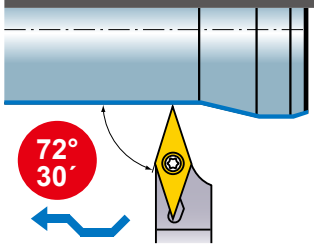
SVLP-SM type inserts	➤ A141
SVJB-SM type inserts	➤ A133–A136
CBN & PCD inserts	➤ B048, B064

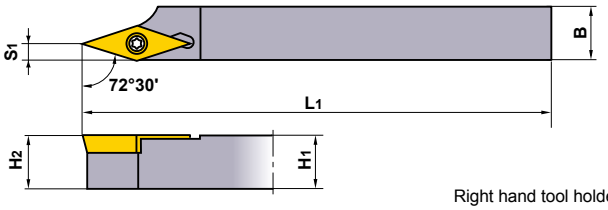
● : Inventory maintained.

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 R	Stock L	Insert Number		Dimensions (inch) H1	B	L1	H2	S1	* Insert Screw	Wrench
SVVBR/L-062SM	●	●	VBET VBGT VBMT	22○	.375	.375	4.921	.375	.118	TS255	TKY08R
-082SM	●	●		22○	.500	.500	5.906	.500	.118	TS255	TKY08R
-102SM	●	●		22○	.625	.625	5.906	.625	.118	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

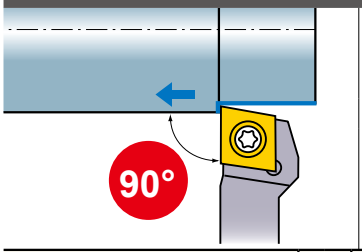
SVVB-SM type inserts ➤ A133—A136
CBN & PCD inserts ➤ B048, B064
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

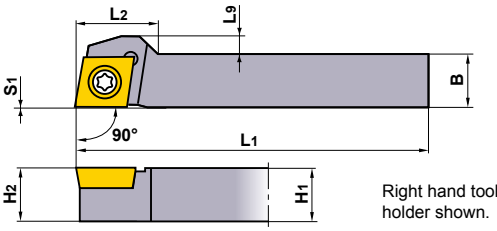
FRONT TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

SCAC-SM

Without off set





Right hand tool holder shown.

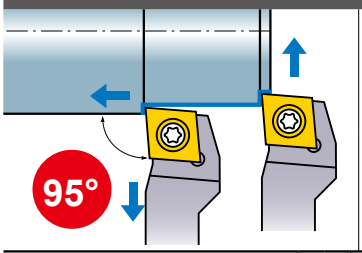
Finish	Finish	Light	Medium
SMG	R/L-F	R/L-SS	R/L-SN
			
(2)	(2)	(2,3)	(2,3)
Medium	**Flat Top**	**Non-Ferrous Metal**	**CBN/PCD**
R/L-SR		AZ	
			
(2,3)	(2,3)	(2,3)	(2,3)

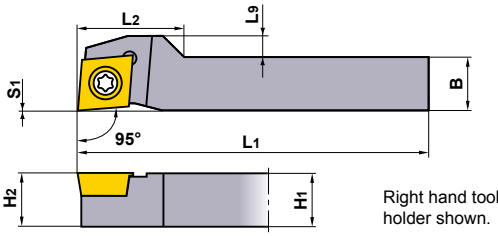
Order Number	Stock		Insert Number		Dimensions (mm)							*	
	R	L			H_1	B	L_1	L_2	L_9	H_2	S_1	Insert Screw	Wrench
SCACR/L0808K06-SM	●	●	CCET CCGT CCGW CCMT CCMW NP-CCGW	21.5°	8	8	125	11	1.6	8	0	TS254	TKY08R
1010K06-SM	●	●		21.5°	10	10	125	—	—	10	0	TS254	TKY08R
1010K09-SM	●	●		32.5°	10	10	125	16	3.5	10	0	TS43	TKY15R
1212M09-SM	●	●		32.5°	12	12	150	14	1.5	12	0	TS43	TKY15R
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_1	B	L_1	L_2	L_9	H_2	S_1	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
1010K06-SM	●	●		21.5°	10	10	125	—	—	10	0	TS254	TKY08R
1010K09-SM	●	●		32.5°	10	10	125	20	4	10	0	TS43	TKY15R
1212M09-SM	●	●		32.5°	12	12	150	18	2	12	0	TS43	TKY15R
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.

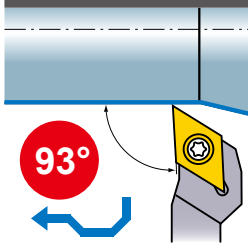
SCAC-SM type inserts	**➤ A107—A113**
SCLC-SM type inserts	**➤ A107—A113**
CBN & PCD inserts	**➤ B038—B040, B059**

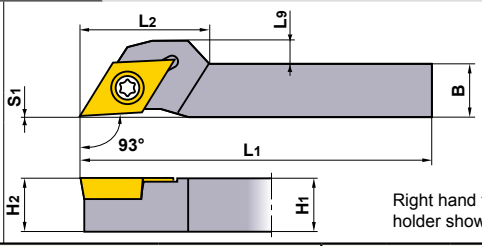
● : Inventory maintained.

METRIC STANDARD

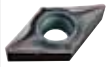
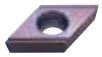
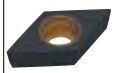
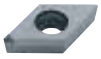
SDJC-SM

Without off set





Right hand tool holder shown.

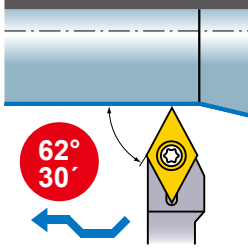
Finish	Finish	Light	Medium
SMG	R-F	R-SS	R-SN
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Flat Top**	**Non-Ferrous Metal**	**CBN/PCD**
R-SR		AZ	
			
(2,3)	(2,3)	(2,3)	(2,3)

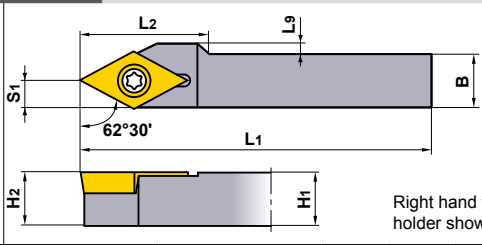
Order Number	Stock		Insert Number		Dimensions (mm)							*	
	R	L			H_1	B	L_1	L_2	L_9	H_2	S_1	Insert Screw	Wrench
SDJCR/L0808K07-SM	●	●	DCET DCGT DCGW DCMT DCMW NP-DCGW NP-DCMT NP-DCMW	21.5	8	8	125	15	2	8	0	TS254	TKY08R
1010K07-SM	●	●		21.5	10	10	125	—	—	10	0	TS254	TKY08R
1010K11-SM	●	●		32.5	10	10	125	24	4	10	0	TS43	TKY15R
1212M11-SM	●	●		32.5	12	12	150	22	2	12	0	TS43	TKY15R
1616M11-SM	●	●		32.5	16	16	150	—	—	16	0	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

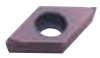
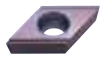
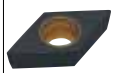
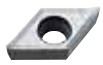
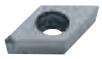
SDNC-SM

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_1	B	L_1	L_2	L_9	H_2	S_1	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
1010K07-SM	●	●		21.5	10	10	125	—	—	10	3	TS254	TKY08R
1010K11-SM	●	●		32.5	10	10	125	24	2	10	5	TS43	TKY15R
1212M11-SM	●	●		32.5	12	12	150	—	—	12	5	TS43	TKY15R
1616M11-SM	●	●		32.5	16	16	150	—	—	16	5	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

SDJC-SM type inserts	➤ A116–A120
SDNC-SM type inserts	➤ A116–A120
CBN & PCD inserts	➤ B042–B044, B060

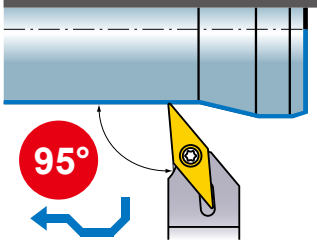
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

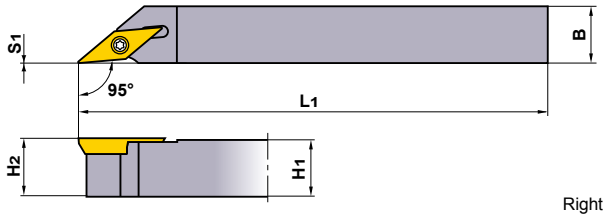
FRONT TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

SVLP-SM

Without off set





Right hand tool holder shown.

Finish
R/L-SRF

(1.5, 2)
Finish
SMG

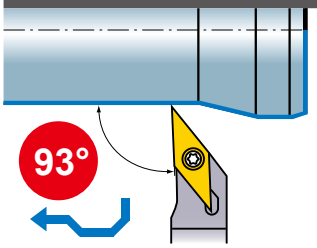
(1.5, 2)

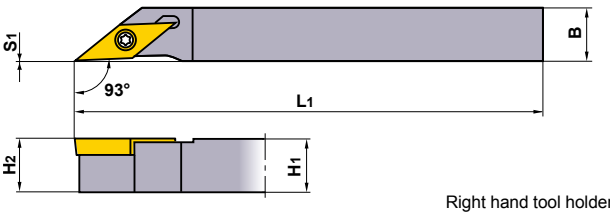
Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H1	B	L1	H2	S1	* Insert Screw	Wrench
SVLPR/L1010K08-SM	●	●	VPET VPGT	1.51.5○	10	10	125	10	0	TS202	TKY06R
1212M08-SM	●	●		1.51.5○	12	12	150	12	0	TS202	TKY06R
1010K11-SM	●	●		22○	10	10	125	10	0	TS255	TKY08R
1212M11-SM	●	●		22○	12	12	150	12	0	TS255	TKY08R
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) H1	B	L1	H2	S1	* Insert Screw	Wrench
SVJBR/L1010K11-SM	●	●	VBET VBGT VBMT	22○	10	10	125	10	0	TS255	TKY08R
1212M11-SM	●	●		22○	12	12	150	12	0	TS255	TKY08R
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.

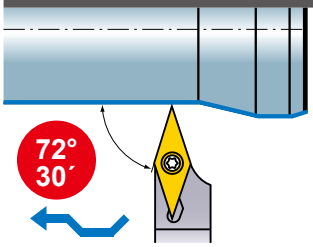
SVLP-SM type inserts	➤ A141
SVJB-SM type inserts	➤ A133–A136
CBN & PCD inserts	➤ B048, B064

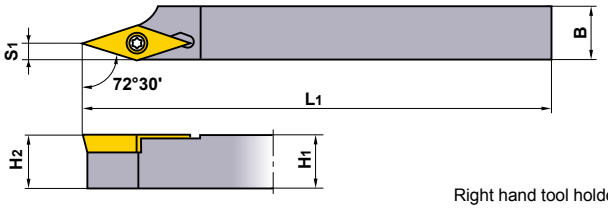
● : Inventory maintained.

METRIC STANDARD

SVVB-SM

Neutral edge with handed holder





Right hand tool holder shown.

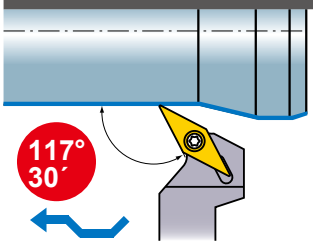
Finish	Medium
R/L-F	R/L-SN
 (2)	 (2)
Medium	**Medium**
MV	R/L-SR
 (2)	 (2)

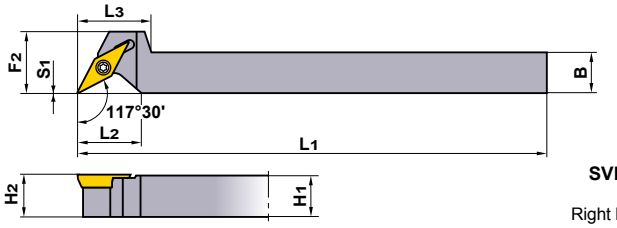
Order Number	Stock		Insert Number		Dimensions (mm)					*	
	R	L			H_1	B	L_1	H_2	S_1	Insert Screw	Wrench
SVVBR/L1010K11-SM	●	●	VBET VBGT VBMT	22◌	10	10	125	10	3	TS255	TKY08R
1212M11-SM	●	●		22◌	12	12	150	12	3	TS255	TKY08R
1616M11-SM	●	●		22◌	16	16	150	16	3	TS255	TKY08R

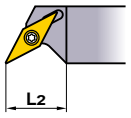
* Clamp Torque (lbf-in) : TS255=8.9

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_1	B	L_1	L_2	L_3	F_2	H_2	S_1	Insert Screw	Wrench
SVPPR/L1010K11-SM	●	●	VPET VPGT	22◌	10	10	125	17	20	18	10	0	TS255	TKY08R
1212M11-SM	●	●		22◌	12	12	150	17	20	18	12	0	TS255	TKY08R
1616M11-SM	●	●		22◌	16	16	150	17	–	16	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**	230—755	.0012—.006

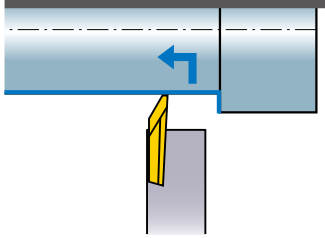
SVVB-SM type inserts	**➤ A133—A136**
SVPP-SM type inserts	**➤ A141**
CBN & PCD inserts	**➤ B048, B064**

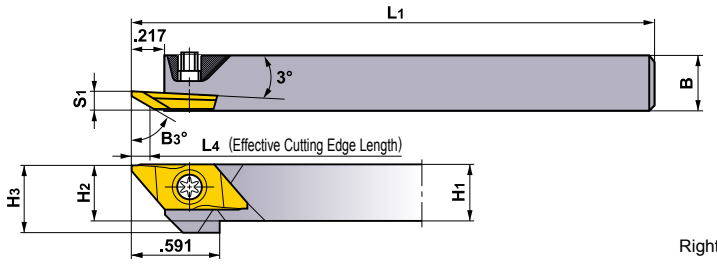
SPARE PARTS	**➤ M001**
TECHNICAL DATA	**➤ N001**

BACK TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

BTAH





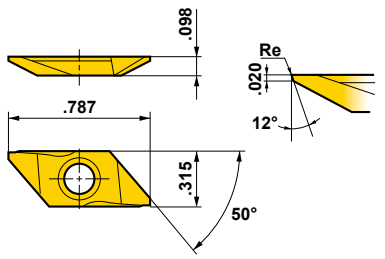
Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)						*	
	R	L			H1	B	L1	H2	H3	S1	Insert Screw	Wrench
BTAHR/L-062	●	●	BTAT	5528□□R/L-B 6035□□R/L-B 605000RX	.375	.375	4.724	.375	.500	.138	NS402W	NKY15R
-082	●	●			.500	.500	4.724	.500	—	.138	NS403W	NKY15R
-102	●				.625	.625	4.724	.625	—	.138	NS403W	NKY15R

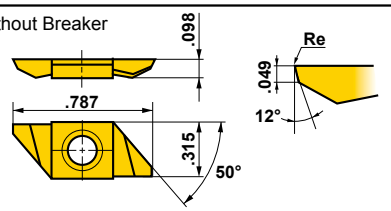
(Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.
(Note 2) Set the maximum depth of cut at under 60% of the effective cutting edge length.
* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

INSERTS

Order Number	Hand	Coated	Dimensions (inch)		Effective Cutting Edge Length L4 (inch) *	Geometry
		VP15TF	B3 *	Re		
BTAT552800R-B	R	●	55°	0	.110	With Breaker
552800L-B	L	●	55°	0	.110	
552801R-B	R	●	55°	.004	.110	
552801L-B	L	●	55°	.004	.110	
603500R-B	R	●	60°	0	.138	
603500L-B	L	●	60°	0	.138	
603501R-B	R	●	60°	.004	.138	
603501L-B	L	●	60°	.004	.138	
BTAT605000RX	R	●	60°	0	.197	Without Breaker



Right hand insert shown.

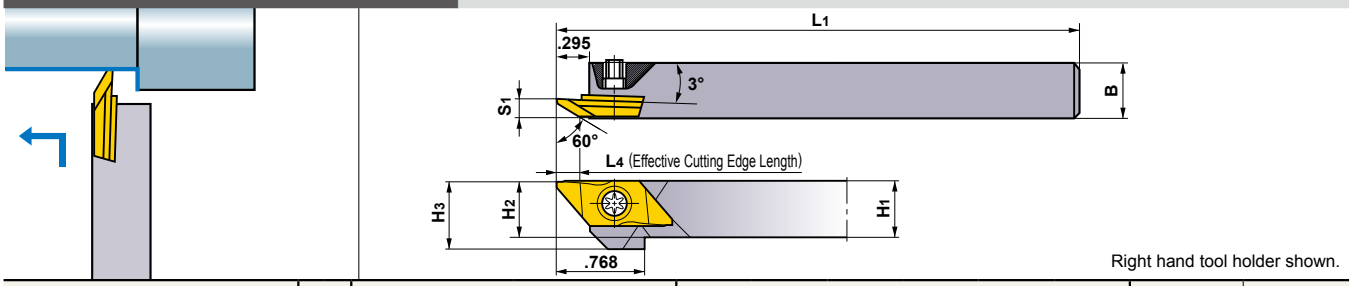


* Numeric value set insert on holder.

● : Inventory maintained. (5 inserts in one case)

INCH STANDARD

CTBH



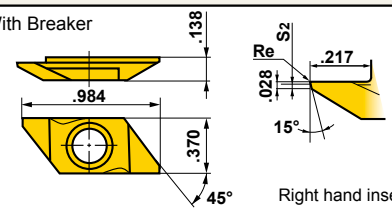
Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H1	B	L1	H2	H3	S1	* Insert Screw	Wrench
CTBHR/L-062	●	●	BTBT	60450□R/L-B 606000R/L	.375	.375	4.724	.375	.500	.133	NS402W	NKY15R
-082	●	●			.500	.500	4.724	.500	—	.133	NS403W	NKY15R
-102	●	●			.625	.625	4.724	.625	—	.133	NS403W	NKY15R

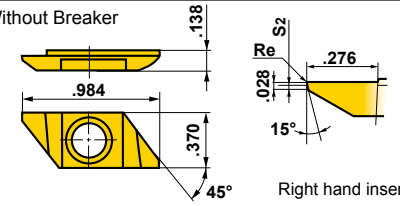
(Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.
(Note 2) Set the maximum depth of cut at under 60% of the effective cutting edge length.
* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

INSERTS

Order Number	Hand	Coated VP15TF	Dimensions (inch) Re *	S2	Effective Cutting Edge Length L4 (inch)*	Geometry
BTBT604500R-B	R	●	0	.008	.177	With Breaker
604500L-B	L	●	0	.008	.177	
604501R-B	R	●	.004	.012	.177	
604501L-B	L	●	.004	.012	.177	
BTBT606000R	R	●	0	.008	.236	Without Breaker
606000L	L	●	0	.008	.236	



Right hand insert shown.



Right hand insert shown.

* Numeric value set insert on holder.

RECOMMENDED CUTTING CONDITIONS

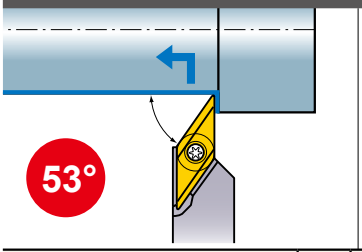
	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF**	165—490	.0004—.006
P	Free Cutting Carbon Steel	**VP15TF**	100—590	.0004—.006
M	Stainless Steel	**VP15TF**	165—395	.0008—.004
N	Non-Ferrous Metal	**VP15TF**	230—755	.0012—.006

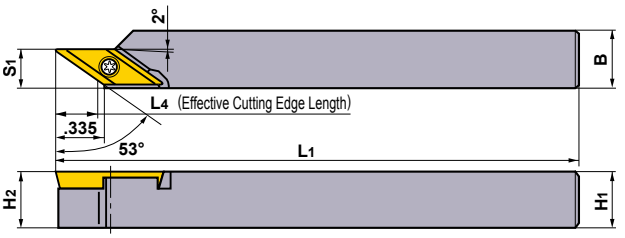
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

BACK TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

BTVH





Right hand tool holder only.

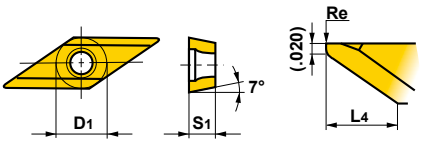
Order Number	Stock	Insert Number		Dimensions (inch)					*	
	R			H1	B	L1	H2	S1	Insert Screw	Wrench
BTVHR-062	●	BTVT	5375◌◌R-B	.375	.375	4.724	.375	.295	NS251	NKY15R
-082	●			.500	.500	4.724	.500	.295	NS251	NKY15R
-102	●			.625	.625	4.724	.625	.295	NS251	NKY15R

(Note) Set the maximum depth of cut at under 30% of the effective cutting edge length.

* Clamp Torque (lbf-in) : NS251=6.2

INSERTS

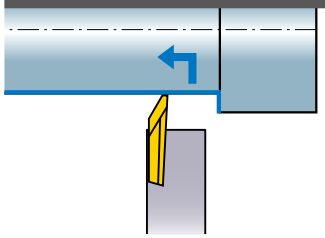
Order Number	Hand	Coated	Dimensions (inch)			Effective Cutting Edge Length L4 (inch)	Geometry
		VP15TF	D1	S1	Re		
BTVT5375V5R-B	R	●	.250	.125	.002	.295	With Breaker
537501R-B	R	●	.250	.125	.004	.295	

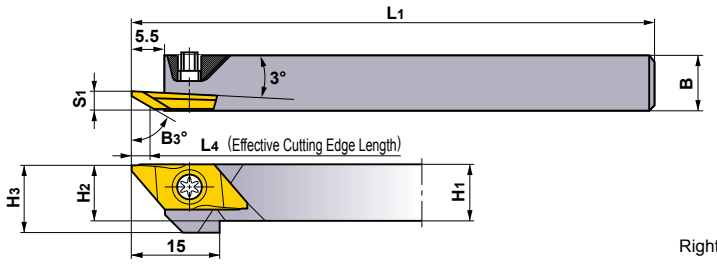


● : Inventory maintained. (5 inserts in one case)

METRIC STANDARD

BTAH





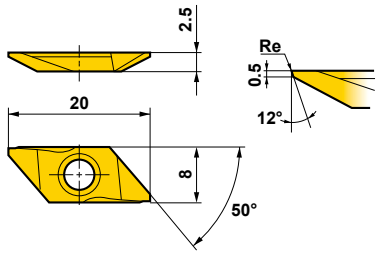
Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H1	B	L1	H2	H3	S1	* 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
1010-50	●	●			10	10	120	10	12	3.5	NS402W	NKY15R
1212-50	●	●			12	12	120	12	—	3.5	NS403W	NKY15R
1616-50	●				16	16	120	16	—	3.5	NS403W	NKY15R

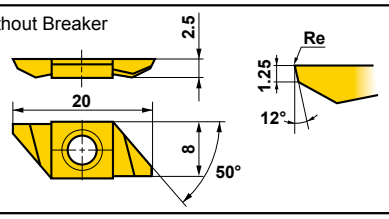
(Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.
(Note 2) Set the maximum depth of cut at under 60% of the effective cutting edge length.
* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

INSERTS

Order Number	Hand	Coated VP15TF	Dimensions (mm) B3*	Re	Effective Cutting Edge Length L4 (mm)*	Geometry
BTAT552800R-B	R	●	55°	0	2.8	With Breaker
552800L-B	L	●	55°	0	2.8	
552801R-B	R	●	55°	0.1	2.8	
552801L-B	L	●	55°	0.1	2.8	
603500R-B	R	●	60°	0	3.5	
603500L-B	L	●	60°	0	3.5	
603501R-B	R	●	60°	0.1	3.5	
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

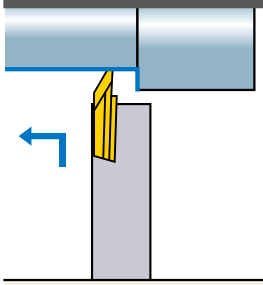
	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF**	165—490	.0004—.006
P	Free Cutting Carbon Steel	**VP15TF**	100—590	.0004—.006
M	Stainless Steel	**VP15TF**	165—395	.0008—.004
N	Non-Ferrous Metal	**VP15TF**	230—755	.0012—.006

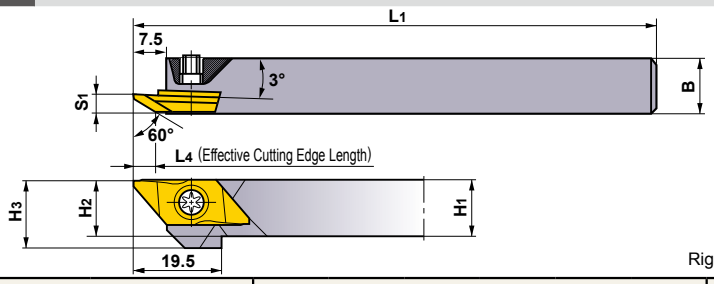
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

BACK TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

CTBH





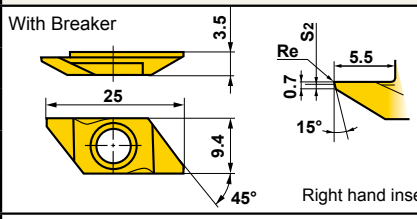
Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)						*	
	R	L			H1	B	L1	H2	H3	S1	Insert Screw	Wrench
CTBHR/L1010-160	●	●	BTBT	60450□R/L-B 606000R/L	10	10	120	10	12	3.4	NS402W	NKY15R
1212-160	●	●			12	12	120	12	—	3.4	NS403W	NKY15R
1616-160	●	●			16	16	120	16	—	3.4	NS403W	NKY15R

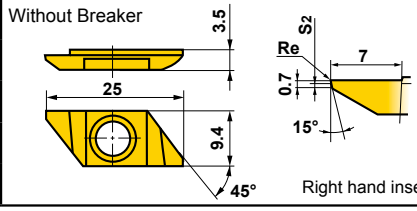
(Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.
(Note 2) Set the maximum depth of cut at under 60% of the effective cutting edge length.
* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

INSERTS

Order Number	Hand	Coated	Dimensions (mm)		Effective Cutting Edge Length L4 (mm)*	Geometry
		VP15TF	Re*	S2		
BTBT604500R-B	R	●	0	0.2	4.5	With Breaker
604500L-B	L	●	0	0.2	4.5	
604501R-B	R	●	0.1	0.3	4.5	
604501L-B	L	●	0.1	0.3	4.5	
BTBT606000R	R	●	0	0.2	6.0	Without Breaker
606000L	L	●	0	0.2	6.0	



Right hand insert shown.



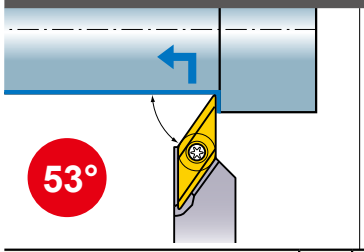
Right hand insert shown.

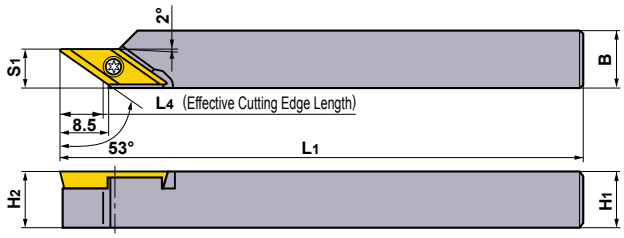
* Numeric value set insert on holder.

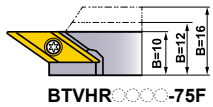
● : Inventory maintained. (5 inserts in one case)

METRIC STANDARD

BTVH







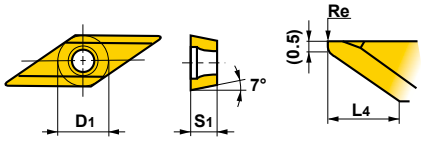
Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)					*	
	R			H_1	B	L_1	H_2	S_1	Insert Screw	Wrench
BTVHR1010-75	●	BTVT	5375□□R-B	10	10	120	10	7.5	NS251	NKY15R
1212-75	●			12	12	120	12	7.5	NS251	NKY15R
1616-75	●			16	16	120	16	7.5	NS251	NKY15R
1010-75F	●			10	10	120	10	10.0	NS251	NKY15R
1212-75F	●			12	12	120	12	10.0	NS251	NKY15R
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.
(Note 2) For high load machining, F type is recommended.
* Clamp Torque (lbf-in) : NS251=6.2

INSERTS

Order Number	Hand	Coated	Dimensions (mm)			Effective Cutting Edge Length L_4 (mm)	Geometry
		VP15TF	D_1	S_1	Re		
BTVT5375V5R-B	R	●	6.35	3.18	0.05	7.5	With Breaker
537501R-B	R	●	6.35	3.18	0.1	7.5	



RECOMMENDED CUTTING CONDITIONS

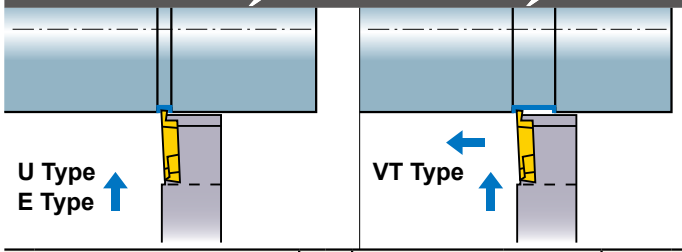
	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF**	165—490	.0004—.006
P	Free Cutting Carbon Steel	**VP15TF**	100—590	.0004—.006
M	Stainless Steel	**VP15TF**	165—395	.0008—.004
N	Non-Ferrous Metal	**VP15TF**	230—755	.0012—.006

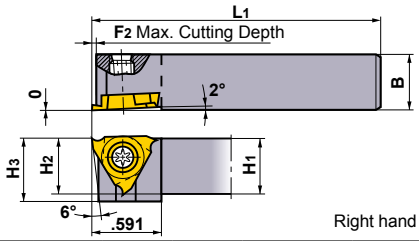
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

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) H1	B	H2	L1	F2*1	H3	Cutting Width (inch)	*2 Insert Screw	Wrench
Standard Shank	GTAHR/L-063S	□	□	GTAT GTBT*1 GTCT*1	○○○○	.375	.375	.375	3.150	.079	.531	.012–.118	NS404W	NKY15R
	-083S	□	□		○○○○	.500	.500	.500	3.150	.079	.520	.012–.118	NS404W	NKY15R
	GTBHR/L-063S	□	□	GTBT. GTCT	○○○○	.375	.375	.375	3.150	.118	.531	.057–.118	NS404W	NKY15R
	GTCHR/L-063S	□	□	GTCT	○○○○	.375	.375	.375	3.150	.118	.531	.098–.118	NS404W	NKY15R
Long Shank	GTAHR/L-063	□	□	GTAT GTBT*1 GTCT*1	○○○○	.375	.375	.375	4.724	.079	.531	.012–.118	NS404W	NKY15R
	-083	□	□		○○○○	.500	.500	.500	4.724	.079	.520	.012–.118	NS404W	NKY15R
	-103	□	□		○○○○	.625	.625	.625	4.724	.079	—	.012–.118	NS404W	NKY15R
	GTBHR/L-063	●	●	GTBT. GTCT	○○○○	.375	.375	.375	4.724	.118	.531	.057–.118	NS404W	NKY15R
	-083	●	●		○○○○	.500	.500	.500	4.724	.118	.520	.057–.118	NS404W	NKY15R
	-103	●	●		○○○○	.625	.625	.625	4.724	.118	—	.057–.118	NS404W	NKY15R
	GTCHR/L-063	□	□	GTCT	○○○○	.375	.375	.375	4.724	.118	.531	.098–.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 L_3 exceeds the holder dimension F_2, it is impossible to machine the depths over F_2.

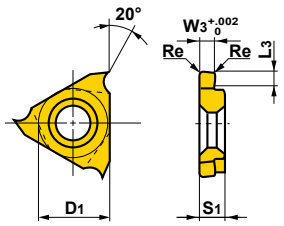
*2 Clamp Torque (lbf-in) : NS404W=6.2

INSERTS

Order Number	Hand	Coated VP15TF	Dimensions (inch) W3	L3 *1	Re	D1	S1
GTAT03006V3R-U	R	●	.012	.024	.001	.375	.125
03006V3L-U	L	●	.012	.024	.001	.375	.125
05012V5R-U	R	●	.020	.047	.002	.375	.125
05012V5L-U	L	●	.020	.047	.002	.375	.125
07520V5R-U	R	●	.030	.079	.002	.375	.125
07520V5L-U	L	●	.030	.079	.002	.375	.125
09520V5R-U	R	●	.037	.079	.002	.375	.125
09520V5L-U	L	●	.037	.079	.002	.375	.125
10020V5R-U	R	●	.039	.079	.002	.375	.125
10020V5L-U	L	●	.039	.079	.002	.375	.125
10320V5R-U	R	●	.041	.079	.002	.375	.125
12520V5R-U	R	●	.049	.079	.002	.375	.125
12520V5L-U	L	●	.049	.079	.002	.375	.125
GTBT14530V5R-U	R	●	.057	.118	.002	.375	.125
14530V5L-U	L	●	.057	.118	.002	.375	.125
15030V5R-U	R	●	.059	.118	.002	.375	.125
15030V5L-U	L	●	.059	.118	.002	.375	.125
17530V5R-U	R	●	.069	.118	.002	.375	.125
17530V5L-U	L	●	.069	.118	.002	.375	.125
20030V5R-U	R	●	.079	.118	.002	.375	.125
20030V5L-U	L	●	.079	.118	.002	.375	.125
GTCT25030V5R-U	R	●	.098	.118	.002	.375	.125
25030V5L-U	L	●	.098	.118	.002	.375	.125

Geometry (inch)

U Type Breaker (Grooving)
For general use

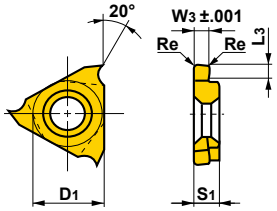


Right hand insert shown.

● : Inventory maintained. □ : Non stock, produced to order only.
(5 inserts in one case)

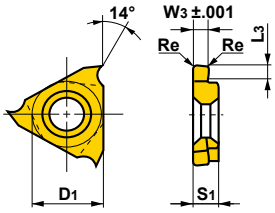
INSERTS

Order Number	Hand	Coated		Dimensions (inch)					Geometry
		VP15TF	VP15KZ	W3	L3	Re	D1	S1	
GTAT03306V3R-E	R	●		.013	.024	.001	.375	.125	**E** Type Breaker (Grooving) For precision cutting
03306V3L-E	L	●		.013	.024	.001	.375	.125	
04312V3R-E	R	●		.017	.047	.001	.375	.125	
04312V3L-E	L	●		.017	.047	.001	.375	.125	
05312V5R-E	R	●		.021	.047	.002	.375	.125	
05312V5L-E	L	●		.021	.047	.002	.375	.125	
07520V5R-E	R	●		.030	.079	.002	.375	.125	
07520V5L-E	L	●		.030	.079	.002	.375	.125	
09520V5R-E	R	●		.037	.079	.002	.375	.125	
09520V5L-E	L	●		.037	.079	.002	.375	.125	
10020V5R-E	R	●		.039	.079	.002	.375	.125	
10020V5L-E	L	●		.039	.079	.002	.375	.125	
1002001R-E	R	●		.039	.079	.004	.375	.125	
1002001L-E	L	●		.039	.079	.004	.375	.125	
12020V5R-E	R	●		.047	.079	.002	.375	.125	
12020V5L-E	L	●		.047	.079	.002	.375	.125	
1202001R-E	R	●		.047	.079	.004	.375	.125	
1202001L-E	L	●		.047	.079	.004	.375	.125	
14020V5R-E	R	●		.055	.079	.002	.375	.125	
14020V5L-E	L	●		.055	.079	.002	.375	.125	
GTBT15030V5R-E	R	●		.059	.118	.002	.375	.125	
15030V5L-E	L	●		.059	.118	.002	.375	.125	
1503001R-E	R	●		.059	.118	.004	.375	.125	
1503001L-E	L	●		.059	.118	.004	.375	.125	
18030V5R-E	R	●		.071	.118	.002	.375	.125	
18030V5L-E	L	●		.071	.118	.002	.375	.125	
20030V5R-E	R	●		.079	.118	.002	.375	.125	
20030V5L-E	L	●		.079	.118	.002	.375	.125	
2003001R-E	R	●		.079	.118	.004	.375	.125	
2003001L-E	L	●		.079	.118	.004	.375	.125	
22530V5R-E	R	●		.089	.118	.002	.375	.125	
22530V5L-E	L	●		.089	.118	.002	.375	.125	
GTCT25030V5R-E	R	●		.098	.118	.002	.375	.125	
25030V5L-E	L	●		.098	.118	.002	.375	.125	
27530V5R-E	R	●		.108	.118	.002	.375	.125	
27530V5L-E	L	●		.108	.118	.002	.375	.125	
30030V5R-E	R	●		.118	.118	.002	.375	.125	
30030V5L-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	W3	L3	Re	D1	S1		
GTAT0330600R-VT	R		●	.013	.024	0	.375	.125	.010	**VT** Type Breaker (Grooving, Profiling)
0431200R-VT	R		●	.017	.047	0	.375	.125	.035	
0532000R-VT	R		●	.021	.079	0	.375	.125	.063	
0652000R-VT	R		●	.026	.079	0	.375	.125	.063	
0752000R-VT	R		●	.030	.079	0	.375	.125	.063	
0802000R-VT	R		●	.031	.079	0	.375	.125	.063	
0852000R-VT	R		●	.033	.079	0	.375	.125	.063	
0952000R-VT	R		●	.037	.079	0	.375	.125	.063	
1002000R-VT	R		●	.039	.079	0	.375	.125	.063	
1102000R-VT	R		●	.043	.079	0	.375	.125	.063	
1202000R-VT	R		●	.047	.079	0	.375	.125	.063	
1302000R-VT	R		●	.051	.079	0	.375	.125	.063	
1402000R-VT	R		●	.055	.079	0	.375	.125	.063	
GTBT1503000R-VT	R		●	.059	.118	0	.375	.125	.106	
2003000R-VT	R		●	.079	.118	0	.375	.125	.106	



RECOMMENDED CUTTING CONDITIONS

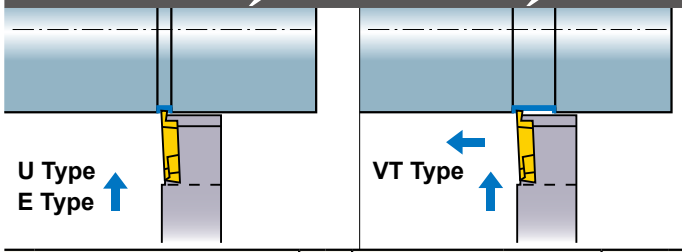
	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF/VP15KZ**	165—490	.0004—.0035
P	Free Cutting Carbon Steel	**VP15TF/VP15KZ**	100—590	.0004—.0035
M	Stainless Steel	**VP15TF/VP15KZ**	165—395	.0008—.002
N	Non-Ferrous Metal	**VP15TF/VP15KZ**	230—755	.0012—.004

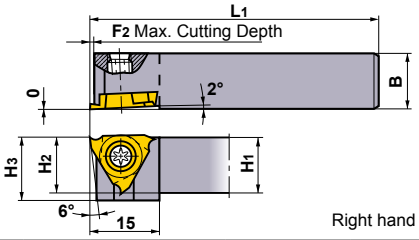
SPARE PARTS ➤ **M001**
TECHNICAL DATA ➤ **N001**

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) H1	B	H2	L1	F2*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
	1010-20S	★	★			10	10	10	80	2	13	0.3—3.0	NS404W	NKY15R
	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
	1010-20	★	★			10	10	10	120	2	13	0.3—3.0	NS404W	NKY15R
	1212-20	★	★			12	12	12	120	2	13	0.3—3.0	NS404W	NKY15R
	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
	1212-30	●	●			12	12	12	120	3	13	1.45—3.0	NS404W	NKY15R
	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 L3 exceeds the holder dimension F2, it is impossible to machine the depths over F2.

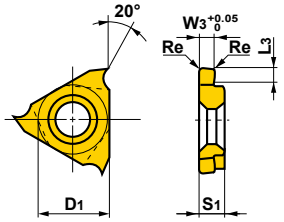
*2 Clamp Torque (lbf-in) : NS404W=6.2

INSERTS

Order Number	Hand	Coated VP15TF	Dimensions (mm) W3	L3 *1	Re	D1	S1
GTAT03006V3R-U	R	●	0.3	0.6	0.03	9.525	3.18
03006V3L-U	L	●	0.3	0.6	0.03	9.525	3.18
05012V5R-U	R	●	0.5	1.2	0.05	9.525	3.18
05012V5L-U	L	●	0.5	1.2	0.05	9.525	3.18
07520V5R-U	R	●	0.75	2.0	0.05	9.525	3.18
07520V5L-U	L	●	0.75	2.0	0.05	9.525	3.18
09520V5R-U	R	●	0.95	2.0	0.05	9.525	3.18
09520V5L-U	L	●	0.95	2.0	0.05	9.525	3.18
10020V5R-U	R	●	1.0	2.0	0.05	9.525	3.18
10020V5L-U	L	●	1.0	2.0	0.05	9.525	3.18
10320V5R-U	R	●	1.03	2.0	0.05	9.525	3.18
12520V5R-U	R	●	1.25	2.0	0.05	9.525	3.18
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
14530V5L-U	L	●	1.45	3.0	0.05	9.525	3.18
15030V5R-U	R	●	1.5	3.0	0.05	9.525	3.18
15030V5L-U	L	●	1.5	3.0	0.05	9.525	3.18
17530V5R-U	R	●	1.75	3.0	0.05	9.525	3.18
17530V5L-U	L	●	1.75	3.0	0.05	9.525	3.18
20030V5R-U	R	●	2.0	3.0	0.05	9.525	3.18
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
25030V5L-U	L	●	2.5	3.0	0.05	9.525	3.18

Geometry (mm)

U Type Breaker (Grooving)
For general use



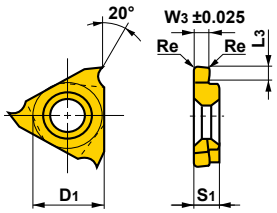
Right hand insert shown.

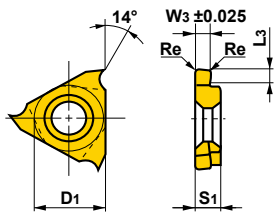
● : Inventory maintained. ★ : Inventory maintained in Japan.
(5 inserts in one case)

INSERTS

Order Number	Hand	Coated		Dimensions (mm)					Geometry
		VP15TF	VP15KZ	W3	L3	Re	D1	S1	
GTAT03306V3R-E	R	●		0.33	0.6	0.03	9.525	3.18	**E** Type Breaker (Grooving) For precision cutting
03306V3L-E	L	●		0.33	0.6	0.03	9.525	3.18	
04312V3R-E	R	●		0.43	1.2	0.03	9.525	3.18	
04312V3L-E	L	●		0.43	1.2	0.03	9.525	3.18	
05312V5R-E	R	●		0.53	1.2	0.05	9.525	3.18	
05312V5L-E	L	●		0.53	1.2	0.05	9.525	3.18	
07520V5R-E	R	●		0.75	2.0	0.05	9.525	3.18	
07520V5L-E	L	●		0.75	2.0	0.05	9.525	3.18	
09520V5R-E	R	●		0.95	2.0	0.05	9.525	3.18	
09520V5L-E	L	●		0.95	2.0	0.05	9.525	3.18	
10020V5R-E	R	●		1.0	2.0	0.05	9.525	3.18	
10020V5L-E	L	●		1.0	2.0	0.05	9.525	3.18	
1002001R-E	R	●		1.0	2.0	0.1	9.525	3.18	
1002001L-E	L	●		1.0	2.0	0.1	9.525	3.18	
12020V5R-E	R	●		1.2	2.0	0.05	9.525	3.18	
12020V5L-E	L	●		1.2	2.0	0.05	9.525	3.18	
1202001R-E	R	●		1.2	2.0	0.1	9.525	3.18	
1202001L-E	L	●		1.2	2.0	0.1	9.525	3.18	
14020V5R-E	R	●		1.4	2.0	0.05	9.525	3.18	
14020V5L-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	
15030V5L-E	L	●		1.5	3.0	0.05	9.525	3.18	
1503001R-E	R	●		1.5	3.0	0.1	9.525	3.18	
1503001L-E	L	●		1.5	3.0	0.1	9.525	3.18	
18030V5R-E	R	●		1.8	3.0	0.05	9.525	3.18	
18030V5L-E	L	●		1.8	3.0	0.05	9.525	3.18	
20030V5R-E	R	●		2.0	3.0	0.05	9.525	3.18	
20030V5L-E	L	●		2.0	3.0	0.05	9.525	3.18	
2003001R-E	R	●		2.0	3.0	0.1	9.525	3.18	
2003001L-E	L	●		2.0	3.0	0.1	9.525	3.18	
22530V5R-E	R	●		2.25	3.0	0.05	9.525	3.18	
22530V5L-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	
25030V5L-E	L	●		2.5	3.0	0.05	9.525	3.18	
27530V5R-E	R	●		2.75	3.0	0.05	9.525	3.18	
27530V5L-E	L	●		2.75	3.0	0.05	9.525	3.18	
30030V5R-E	R	●		3.0	3.0	0.05	9.525	3.18	
30030V5L-E	L	●		3.0	3.0	0.05	9.525	3.18	Right hand insert shown.
GTAT0330600R-VT	R		●	0.33	0.6	0	9.525	3.18	0.25	**VT** Type Breaker (Grooving, Profiling)
0431200R-VT	R		●	0.43	1.2	0	9.525	3.18	0.9	
0532000R-VT	R		●	0.53	2.0	0	9.525	3.18	1.6	
0652000R-VT	R		●	0.65	2.0	0	9.525	3.18	1.6	
0752000R-VT	R		●	0.75	2.0	0	9.525	3.18	1.6	
0802000R-VT	R		●	0.8	2.0	0	9.525	3.18	1.6	
0852000R-VT	R		●	0.85	2.0	0	9.525	3.18	1.6	
0952000R-VT	R		●	0.95	2.0	0	9.525	3.18	1.6	
1002000R-VT	R		●	1.0	2.0	0	9.525	3.18	1.6	
1102000R-VT	R		●	1.1	2.0	0	9.525	3.18	1.6	
1202000R-VT	R		●	1.2	2.0	0	9.525	3.18	1.6	
1302000R-VT	R		●	1.3	2.0	0	9.525	3.18	1.6	
1402000R-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	
2003000R-VT	R		●	2.0	3.0	0	9.525	3.18	2.7	

Max. Depth of Cut (mm)





RECOMMENDED CUTTING CONDITIONS

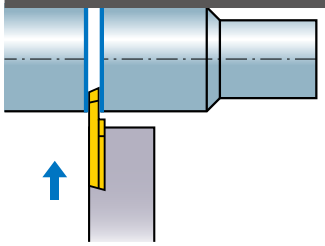
	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF/VP15KZ**	165—490	.0004—.0035
P	Free Cutting Carbon Steel	**VP15TF/VP15KZ**	100—590	.0004—.0035
M	Stainless Steel	**VP15TF/VP15KZ**	165—395	.0008—.002
N	Non-Ferrous Metal	**VP15TF/VP15KZ**	230—755	.0012—.004

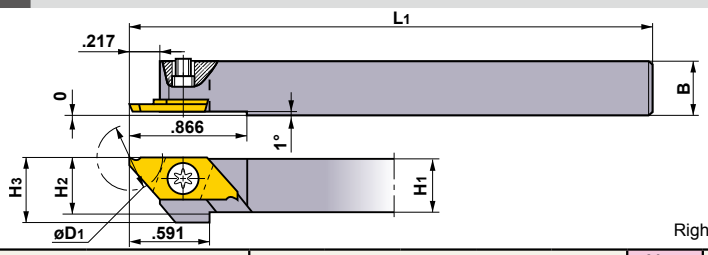
SPARE PARTS ➤ **M001**
TECHNICAL DATA ➤ **N001**

CUTTING OFF TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

CTAH



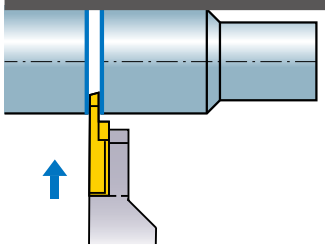


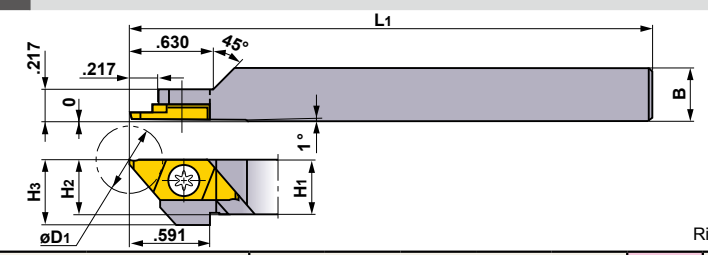
Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H1	B	H2	L1	H3	Max. Cut Off Diameter (inch) D1	*2 Insert Screw	Wrench
CTAHR/L-062	●	●	CTAT	○○○○	.375	.375	.375	4.724	.500	.472 (.315)*1	NS402W	NKY15R
-082	●	●		○○○○	.500	.500	.500	4.724	—		NS403W	NKY15R
-102	●	●		○○○○	.625	.625	.625	4.724	—		NS403W	NKY15R

*1 When the width of cutting off 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) H1	B	H2	L1	H3	Max. Cut Off Diameter (inch) D1	*2 Insert Screw	Wrench
CTAHR-062S	●	CTAT	○○○○	.375	.375	.375	3.150	.500	.472 (.315)*1	NS401	NKY25R
-082S	●		○○○○	.500	.500	.500	3.150	—		NS401	NKY25R

*1 When the width of cutting off 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
	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	Dimensions (inch)			Max. Cut Off Diameter (inch)
							VP15TF	W3	L3	Re	
Right Hand (R)	16°	With Breaker	.787, .315, 50°, .098	Re, L3, W3 ±.002, Re	CTAT07080V5RR-B	R	●	.028	.177	.002	.315
					10120V5RR-B	R	●	.039	.264	.002	.472
					15120V5RR-B	R	●	.059	.264	.002	.472
					20120V5RR-B	R	●	.079	.264	.002	.472
	16°			Re, L3, W3 ±.002, Re, Strong Edge Type	CTAT15120V5RR-BX	R	●	.059	.264	.002	.472
					20120V5RR-BX	R	●	.079	.264	.002	.472
	0°			Re, L3, W3 ±.002, Re	CTAT10120V5RN-B	N	●	.039	.264	.002	.472
					15120V5RN-B	N	●	.059	.264	.002	.472
					20120V5RN-B	N	●	.079	.264	.002	.472
	0°			Re, L3, W3 ±.002, Re, Strong Edge Type	CTAT15120V5RN-BX	N	●	.059	.264	.002	.472
					20120V5RN-BX	N	●	.079	.264	.002	.472
	16°			Re, L3, W3 ±.002, Re	CTAT10110V5RL-B	L	●	.039	.264	.002	.433
					15110V5RL-B	L	●	.059	.264	.002	.433
					20110V5RL-B	L	●	.079	.264	.002	.433
	20°	Without Breaker		Re, L3, W3 ±.002, Re, .138	CTAT1012000RR	R	●	.039	.264	0	.472
					1512000RR	R	●	.059	.264	0	.472
					2012000RR	R	●	.079	.264	0	.472
Left Hand (L)	16°	With Breaker		Re, W3 ±.002, Re, L3	CTAT07080V5LL-B	L	●	.028	.177	.002	.315
					10120V5LL-B	L	●	.039	.264	.002	.472
					15120V5LL-B	L	●	.059	.264	.002	.472
					20120V5LL-B	L	●	.079	.264	.002	.472
	0°			Re, W3 ±.002, Re, L3	CTAT10120V5LN-B	N	●	.039	.264	.002	.472
					15120V5LN-B	N	●	.059	.264	.002	.472
					20120V5LN-B	N	●	.079	.264	.002	.472
	16°			Re, W3 ±.002, Re, L3	CTAT10110V5LR-B	R	●	.039	.264	.002	.433
					15110V5LR-B	R	●	.059	.264	.002	.433
					20110V5LR-B	R	●	.079	.264	.002	.433
	20°	Without Breaker		Re, .138, W3 ±.002, Re, L3	CTAT1012000LL	L	●	.039	.264	0	.472
					1512000LL	L	●	.059	.264	0	.472
					2012000LL	L	●	.079	.264	0	.472

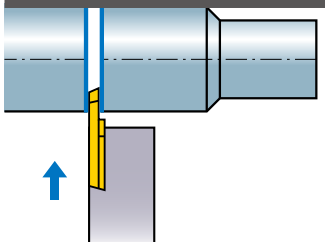
Right hand insert shown.

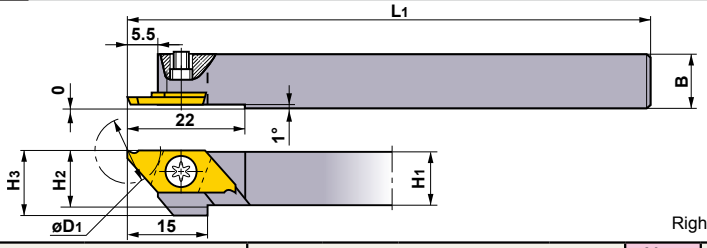
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

CUTTING OFF TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

CTAH



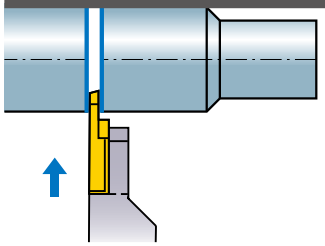


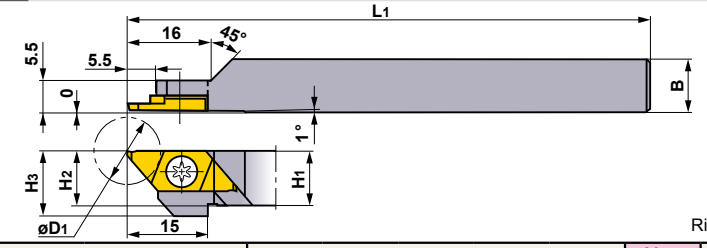
Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H1	B	H2	L1	H3	Max. Cut Off Diameter (mm) D1	*2 Insert Screw	Wrench
CTAHR/L0810-120	●	●	CTAT	○○○○	8	10	8	120	12	12 (8)*1	NS402W	NKY15R
1010-120	●	●		○○○○	10	10	10	120	12		NS402W	NKY15R
1212-120	●	●		○○○○	12	12	12	120	—		NS403W	NKY15R
1616-120	●	●		○○○○	16	16	16	120	—		NS403W	NKY15R

*1 When the width of cutting off 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) H1	B	H2	L1	H3	Max. Cut Off Diameter (mm) D1	*2 Insert Screw	Wrench
CTAHR1010-120S	★	CTAT	○○○○	10	10	10	80	12	12 (8)*1	NS401	NKY25R

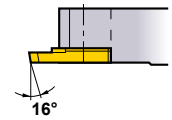
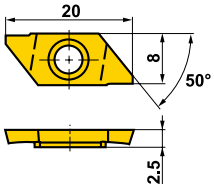
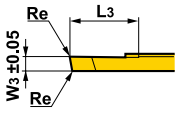
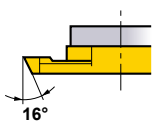
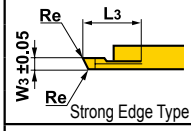
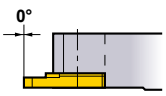
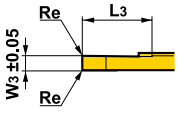
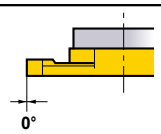
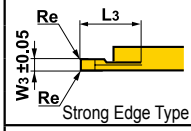
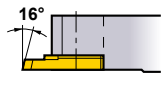
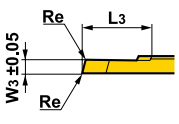
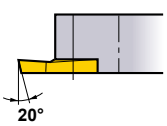
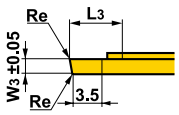
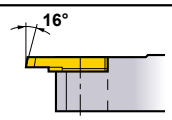
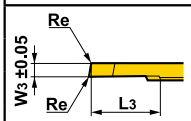
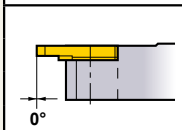
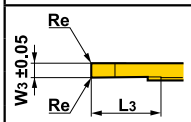
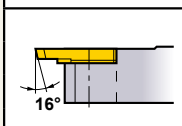
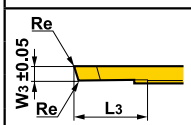
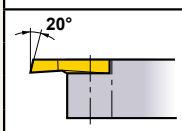
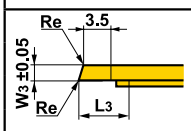
*1 When the width of cutting off is 0.7mm.
*2 Clamp Torque (lbf-in) : NS401=31

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

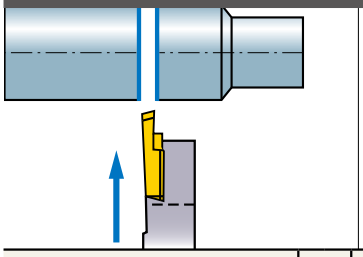
Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated	Dimensions (mm)			Max. Cut Off Diameter (mm)
							VP15TF	W_3	L_3	Re	
Right Hand (R)		With Breaker	 Right hand insert shown.		**CTAT07080V5RR-B**	R	●	0.7	4.5	0.05	8
					10120V5RR-B	R	●	1.0	6.7	0.05	12
					15120V5RR-B	R	●	1.5	6.7	0.05	12
					20120V5RR-B	R	●	2.0	6.7	0.05	12
					**CTAT15120V5RR-BX**	R	●	1.5	6.7	0.05	12
					20120V5RR-BX	R	●	2.0	6.7	0.05	12
					**CTAT10120V5RN-B**	N	●	1.0	6.7	0.05	12
					15120V5RN-B	N	●	1.5	6.7	0.05	12
					20120V5RN-B	N	●	2.0	6.7	0.05	12
					**CTAT15120V5RN-BX**	N	●	1.5	6.7	0.05	12
					20120V5RN-BX	N	●	2.0	6.7	0.05	12
					**CTAT10110V5RL-B**	L	●	1.0	6.7	0.05	11
					15110V5RL-B	L	●	1.5	6.7	0.05	11
					20110V5RL-B	L	●	2.0	6.7	0.05	11
		Without Breaker			**CTAT1012000RR**	R	●	1.0	6.7	0	12
					1512000RR	R	●	1.5	6.7	0	12
					2012000RR	R	●	2.0	6.7	0	12
Left Hand (L)		With Breaker			**CTAT07080V5LL-B**	L	●	0.7	4.5	0.05	8
					10120V5LL-B	L	●	1.0	6.7	0.05	12
					15120V5LL-B	L	●	1.5	6.7	0.05	12
					20120V5LL-B	L	●	2.0	6.7	0.05	12
					**CTAT10120V5LN-B**	N	●	1.0	6.7	0.05	12
					15120V5LN-B	N	●	1.5	6.7	0.05	12
					20120V5LN-B	N	●	2.0	6.7	0.05	12
					**CTAT10110V5LR-B**	R	●	1.0	6.7	0.05	11
					15110V5LR-B	R	●	1.5	6.7	0.05	11
					20110V5LR-B	R	●	2.0	6.7	0.05	11
		Without Breaker			**CTAT1012000LL**	L	●	1.0	6.7	0	12
					1512000LL	L	●	1.5	6.7	0	12
					2012000LL	L	●	2.0	6.7	0	12

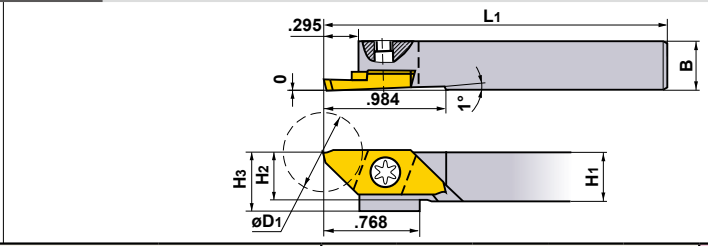
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

CUTTING OFF TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

CTBH



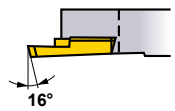
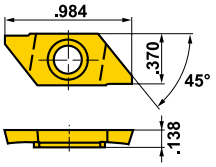
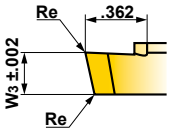
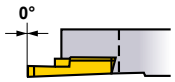
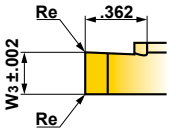
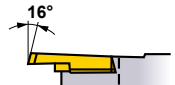
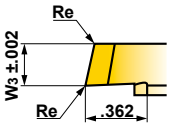
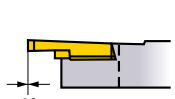
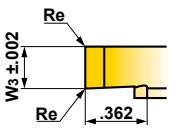
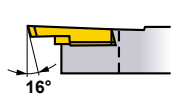
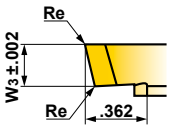


Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H1	B	H2	L1	H3	Max. Cut Off Diameter (inch) D1	* Insert Screw	Wrench
CTBHR/L-062	●	●	CTBT	○○○○	.375	.375	.375	4.724	.500	.630	NS402W	NKY15R
-082	●	●		○○○○	.500	.500	.500	4.724	—	.630	NS403W	NKY15R
-102	●	●		○○○○	.625	.625	.625	4.724	—	.630	NS403W	NKY15R

* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

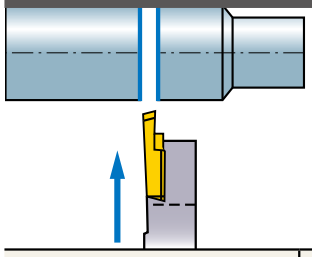
INSERTS

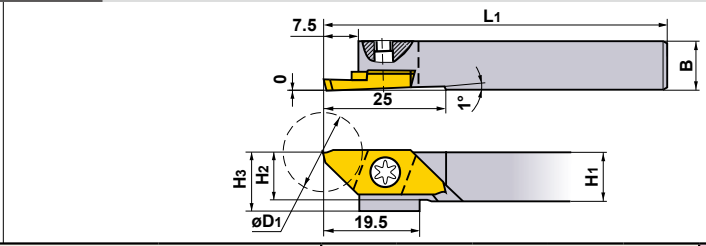
Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated VP15TF	Dimensions (inch) W3	Re	Max. Cut Off Diameter (inch)
Right Hand (R)		With Breaker	 Right hand insert shown.		**CTBT15160V5RR-B**	R	●	.059	.002	.630
					20160V5RR-B	R	●	.079	.002	.630
					**CTBT20160V5RN-B**	N	●	.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



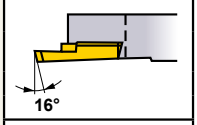
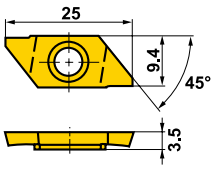
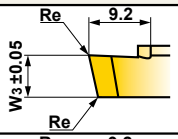
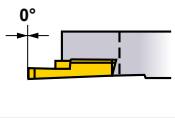
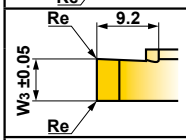
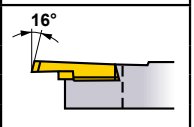
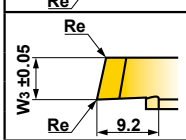
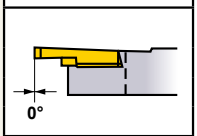
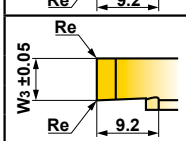
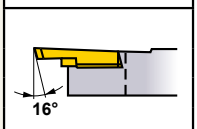
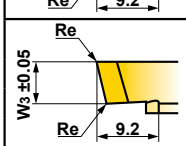


Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H1	B	H2	L1	H3	Max. Cut Off Diameter (mm) D1	* Insert Screw	Wrench
CTBHR/L1010-160	●	●	CTBT	○○○○	10	10	10	120	12	16	NS402W	NKY15R
1212-160	●	●		○○○○	12	12	12	120	—	16	NS403W	NKY15R
1616-160	●	●		○○○○	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) W3	Re	Max. Cut Off Diameter (mm)
Right Hand (R)		With Breaker			**CTBT15160V5RR-B**	R	●	1.5	0.05	16
					20160V5RR-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

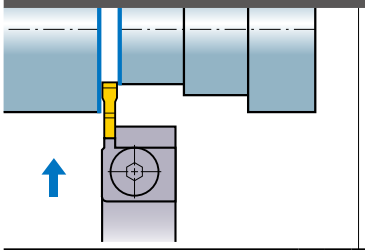
	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF**	165—490	.0008—.0035
P	Free Cutting Carbon Steel	**VP15TF**	100—590	.0004—.0035
M	Stainless Steel	**VP15TF**	165—395	.0008—.0019
N	Non-Ferrous Metal	**VP15TF**	230—755	.0012—.0043

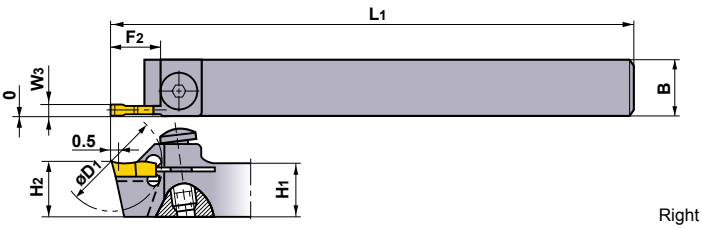
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

CUTTING OFF TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

CTCH





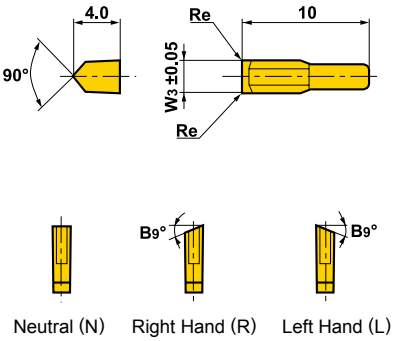
Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H1	B	H2	L1	F2	Max. Cut Off Diameter (mm) D1	Clamp Screw *	Wrench
CTCHR/L1010-200	●	●	CTCT	2○○○	10	10	10	120	11	20	NS501W	HKY25RS
1212-200	●	●		2○○○	12	12	12	120	11	20	NS501W	HKY25RS

* Clamp Torque (lbf-in) : NS501W=19

INSERTS

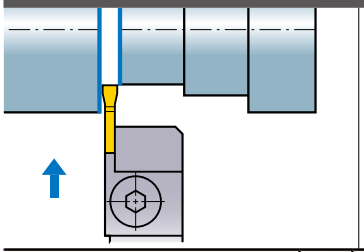
Breaker	Order Number	Hand	Coated VP15TF	Dimensions (mm) W3	B9	Re	Max.Cut Off Diameter (mm)	Geometry
With Breaker	**CTCT22200V5N-B**	N	●	2.2	0°	0.05	20	
	2220001N-B	N	●	2.2	0°	0.1	20	
	25200V5N-B	N	●	2.5	0°	0.05	20	
	2520001N-B	N	●	2.5	0°	0.1	20	
	22200V5R-B	R	●	2.2	17°	0.05	20	
	2220001R-B	R	●	2.2	17°	0.1	20	
	25200V5R-B	R	●	2.5	17°	0.05	20	
	2520001R-B	R	●	2.5	17°	0.1	20	
	22200V5L-B	L	●	2.2	17°	0.05	20	
	2220001L-B	L	●	2.2	17°	0.1	20	
	25200V5L-B	L	●	2.5	17°	0.05	20	
	2520001L-B	L	●	2.5	17°	0.1	20	

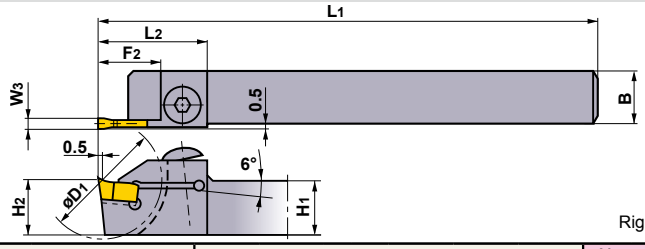


● : Inventory maintained. (10 inserts in one case)

METRIC STANDARD

CTDH





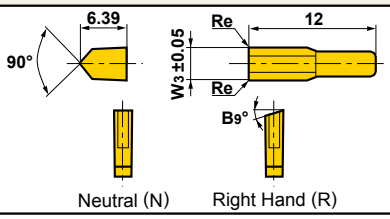
Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)						Max. Cut Off Diameter (mm) D1	* Clamp Screw	Wrench
	R	L			H1	B	H2	L1	L2	F2			
CTDHR/L1616-230	●		CTDT	2535○○	16	16	16	125	24	12.2	23	HBH06020	HKY40R
1616-280	●			2535○○	16	16	16	120	25	15	28	NS502W	HKY25R
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	Dimensions (mm)			Max. Cut Off Diameter (mm)	Geometry
			VP15TF	W3	B9	Re		
With Breaker	**CTDT2535002N-B**	N	●	2.5	0°	0.2	23—35	
	25350V5R-B	R	●	2.5	8°	≤ 0.05	23—35	
	25350V5R-BS	R	●	2.5	17°	≤ 0.05	23—35	
	2535002R-B	R	●	2.5	8°	0.2	23—35	



RECOMMENDED CUTTING CONDITIONS

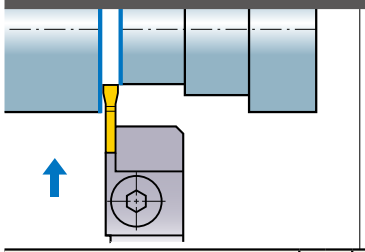
	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF**	165—490	.0008—.0035
P	Free Cutting Carbon Steel	**VP15TF**	100—590	.0004—.0035
M	Stainless Steel	**VP15TF**	165—395	.0008—.0019
N	Non-Ferrous Metal	**VP15TF**	230—755	.0012—.0043

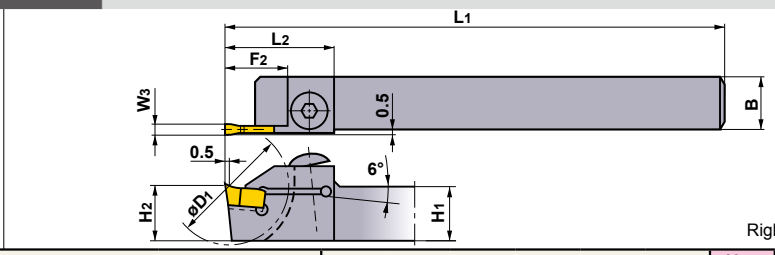
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

CUTTING OFF TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

CTEH





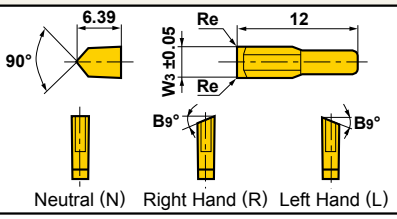
Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H1	B	H2	L1	L2	F2	Max. Cut Off Diameter (mm) D1	* Clamp Screw	Wrench
CTEHR/L1616-230	●		CTET	3035□□	16	16	16	125	24	12.2	23	HBH06020	HKY40R
1616-280	●			3035□□	16	16	16	120	25	15	28	NS502W	HKY25R
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) W3	B9	Re	Max. Cut Off Diameter (mm)	Geometry
With Breaker	**CTET30350V5R-B**	R	●	3	8°	≤ 0.05	23—35	
	30350V5R-BS	R	●	3	17°	≤ 0.05	23—35	
	3035002N-B	N	●	3	0°	0.2	23—35	
	3035002R-B	R	●	3	8°	0.2	23—35	
	3035002L-B	L	●	3	8°	0.2	23—35	



RECOMMENDED CUTTING CONDITIONS

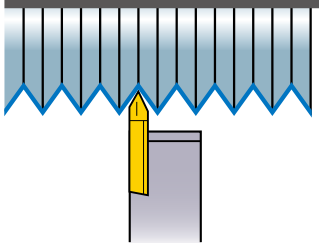
	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	**VP15TF**	165—490	.0008—.0035
P	Free Cutting Carbon Steel	**VP15TF**	100—590	.0004—.0035
M	Stainless Steel	**VP15TF**	165—395	.0008—.0019
N	Non-Ferrous Metal	**VP15TF**	230—755	.0012—.0043

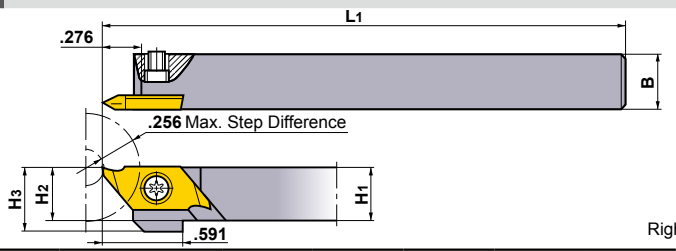
● : Inventory maintained. (10 inserts in one case)

THREADING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

TTAH



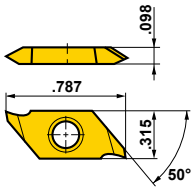
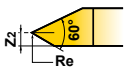
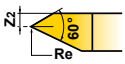
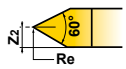
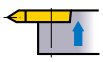
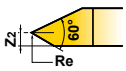
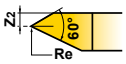
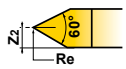
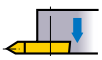
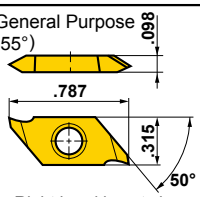
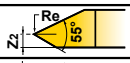
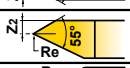
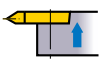
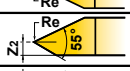
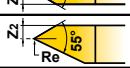


Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H1	B	H2	L1	H3	* Insert Screw	Wrench
TTAHR/L-062	●	●	TTAT	◇◇◇◇	.375	.375	.375	4.724	.500	NS402W	NKY15R
-082	●	●		◇◇◇◇	.500	.500	.500	4.724	—	NS402W	NKY15R
-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) Z2	Dimensions (inch) Re	Pitch of Thread (inch) (thread/inch)
Right Hand (R)		With Breaker	General Purpose (60°)  Right hand insert shown.		**TTAT60075F5RR-B**	R	●	.016	.002 Flat	.008—.030
					60125V5RR-B	R	●	.031	.002	.020—.049
					**60075F5RL-B**	L	●	.016	.002 Flat	.008—.030
					60125V5RL-B	L	●	.031	.002	.020—.049
					**6015001RN-B**	N	●	.049	.004	.039—.059
Left Hand (L)					**60075F5LR-B**	R	●	.016	.002 Flat	.008—.030
					60125V5LR-B	R	●	.031	.002	.020—.049
					**60075F5LL-B**	L	●	.016	.002 Flat	.008—.030
					60125V5LL-B	L	●	.031	.002	.020—.049
					**6015001LN-B**	N	●	.049	.004	.039—.059
Right Hand (R)			General Purpose (55°)  Right hand insert shown.		**55158V5RR-B**	R	●	.031	.002	(40—16)
					**55158V5RL-B**	L	●	.031	.002	(40—16)
Left Hand (L)					**55158V5LR-B**	R	●	.031	.002	(40—16)
					**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

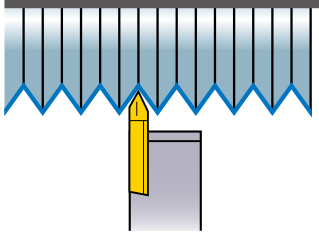
● : Inventory maintained. (5 inserts in one case)

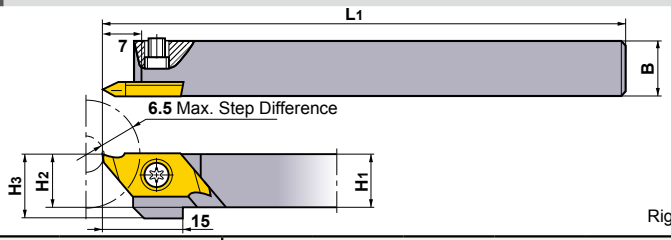
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

THREADING TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

TTAH





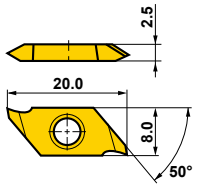
Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H1	B	H2	L1	H3	* Insert Screw	Wrench
TTAHR/L0810	●	●	TTAT	○○○○	8	10	8	120	12	NS402W	NKY15R
1010	●	●		○○○○	10	10	10	120	12	NS402W	NKY15R
1212	●	●		○○○○	12	12	12	120	—	NS403W	NKY15R
1616	●	●		○○○○	16	16	16	120	—	NS403W	NKY15R

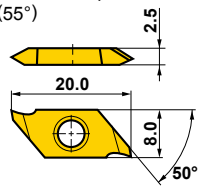
* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

INSERTS

Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated VP15TF	Dimensions (mm) Z2	Re	Pitch of Thread (mm) (thread/inch)
Right Hand (R)		With Breaker	General Purpose (60°)		**TTAT60075F5RR-B**	R	●	0.4	0.05 Flat	0.2—0.75 (80—36)
					60125V5RR-B	R	●	0.8	0.05	0.5—1.25 (40—16)
					60075F5RL-B	L	●	0.4	0.05 Flat	0.2—0.75 (80—36)
					60125V5RL-B	L	●	0.8	0.05	0.5—1.25 (40—16)
					6015001RN-B	N	●	1.25	0.1	1.0—1.5 (24—18)
Left Hand (L)					**60075F5LR-B**	R	●	0.4	0.05 Flat	0.2—0.75 (80—36)
					60125V5LR-B	R	●	0.8	0.05	0.5—1.25 (40—16)
					60075F5LL-B	L	●	0.4	0.05 Flat	0.2—0.75 (80—36)
					60125V5LL-B	L	●	0.8	0.05	0.5—1.25 (40—16)
					6015001LN-B	N	●	1.25	0.1	1.0—1.5 (24—18)
Right Hand (R)			General Purpose (55°)		**55158V5RR-B**	R	●	0.8	0.05	(40—16)
					55158V5RL-B	L	●	0.8	0.05	(40—16)
Left Hand (L)					**55158V5LR-B**	R	●	0.8	0.05	(40—16)
					55158V5LL-B	L	●	0.8	0.05	(40—16)



Right hand insert shown.

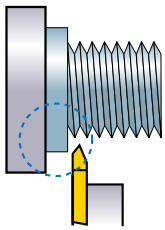
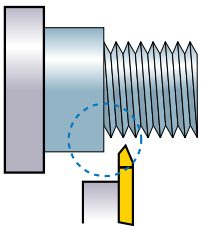
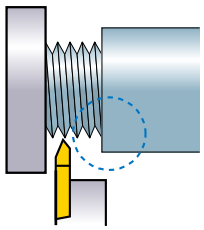
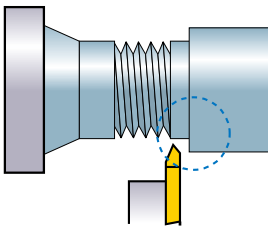


Right hand insert shown.

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											
0.75		Machining Impossible									
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										
26		Machining Impossible								
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

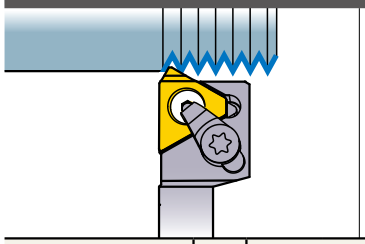
	Work Material	Cutting Speed (SFM)
M	Stainless Steel	165—395
N	Non-Ferrous Metal	230—755

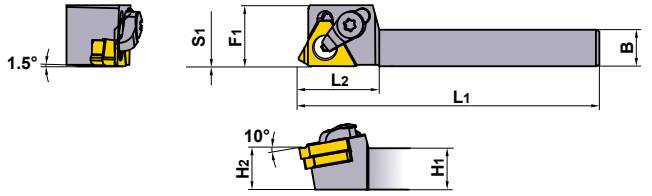
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

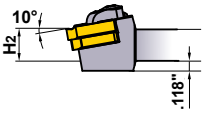
THREADING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

MMTE







MMTER-063SM

Order Number	Stock	Insert Number		Dimensions (inch)							Clamp Bridge	* Clamp Screw	Stop Ring	* Shim Screw	Shim	①② Wrench
	R			H1	B	L1	L2	H2	F1	S1						
MMTER-063SM	●	TTAT	MMT16ER	.375	.375	4.724	.875	.375	.625	0	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
-083SM	●			.500	.500	4.724	.875	.500	.625	0	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R

* Clamp Torque (lbf-in) : SETS51=31, HFC03008=18

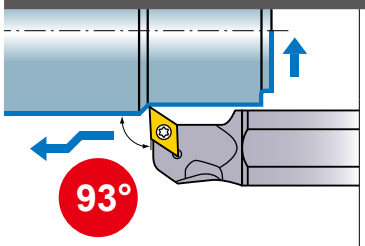
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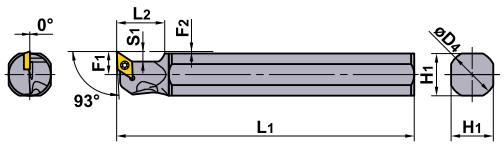
MMTE type inserts ➤ G014–G020
HOW TO SELECT A SHIM ➤ G025

DIMPLE SLEEVE HOLDER (FOR OPPOSITE TOOL POSTS)

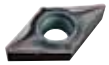
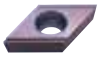
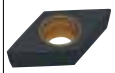
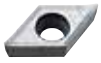
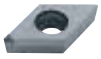
INCH STANDARD

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			D_4	L_1	L_2	H_1	F_1	S_1	F_2	Insert Screw	Wrench
SH16H-FSDUCL07	●	DCET DCGT DCGW DCMT DCMW NP-DCGW NP-DCMT NP-DCMW	21.5○○	.625	3.937	.787	.551	.305	.165	.030	TS254	TKY08R
19K-FSDUCL07	●			.750	4.921	.787	.669	.364	.165	.030	TS254	TKY08R
25M-FSDUCL07	●			1.000	5.906	.787	.906	.482	.165	.030	TS254	TKY08R
SH16H-FSDUCL11	●	DCET DCGT DCGW DCMT DCMW NP-DCGW NP-DCMT NP-DCMW	32.5○○	.625	3.937	.787	.551	.305	.252	.030	TS43	TKY15R
19K-FSDUCL11	●			.750	4.921	.787	.669	.364	.252	.030	TS43	TKY15R
25M-FSDUCL11	●			1.000	5.906	.787	.906	.482	.252	.030	TS43	TKY15R

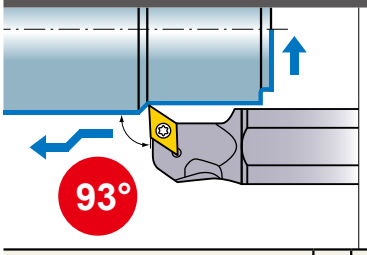
(Note 1) When using insert with right and left hand chip breaker, please use right hand insert.
(Note 2) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.
* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

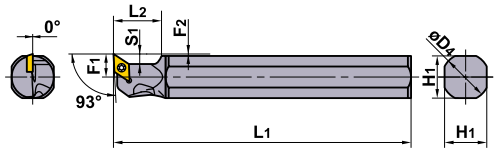
SH○○○ type inserts ➤ A116–A120
CBN & PCD inserts ➤ B042–B044, B060
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

DIMPLE SLEEVE HOLDER (FOR OPPOSITE TOOL POSTS)

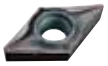
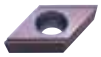
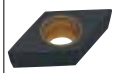
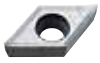
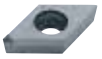
METRIC STANDARD

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			D_4	L_1	L_2	H_1	F_1	S_1	F_2	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
22K-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
22K-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

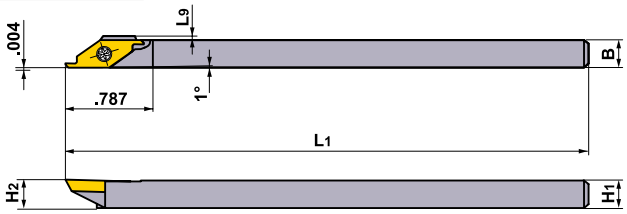
SH□□□ type inserts ➤ A116—A120
CBN & PCD inserts ➤ B042—B044, B060

● : Inventory maintained.

FOR RADIAL TYPE TOOL POSTS

INCH STANDARD

CSVH



Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)					Max. D.O.C (inch)	* Insert Screw	Wrench
	R	L			H1	B	H2	L1	L9			
CSVHR/L-062	●	●	CSVT	○○○○	.375	.375	.375	5.512	0	.118	NS251	NKY15R
-082	●			○○○○	.500	.500	.500	5.512	0	.118	NS251	NKY15R

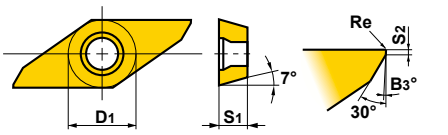
(Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.
(Note 2) Each insert has own depth of cut.
* Clamp Torque (lbf-in) : NS251=6.2

SMALL TOOLS

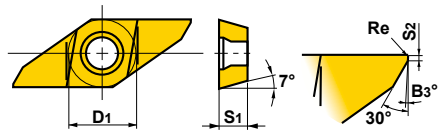
INSERTS

CSVTF (Front turning)

Order Number	Hand	Coated	Dimensions (inch)					Max. D.O.C (inch)	Geometry
		VP15KZ	D1	S1	Re	S2	B3		
CSVTF30AR	R	●	.250	.094	0	.012	5°	.118	Without Breaker
30AL	L	●	.250	.094	0	.012	5°	.118	
30BR	R	●	.250	.094	0	.012	2°	.118	
30CR	R	●	.250	.094	0	.006	2°	.118	
30DR	R	●	.250	.094	0	.006	5°	.118	
CSVTF30AR-B	R	●	.250	.094	0	.012	5°	.118	With Breaker
30AL-B	L	●	.250	.094	0	.012	5°	.118	
30BR-B	R	●	.250	.094	0	.012	2°	.118	
30CR-B	R	●	.250	.094	0	.006	2°	.118	
30DR-B	R	●	.250	.094	0	.006	5°	.118	



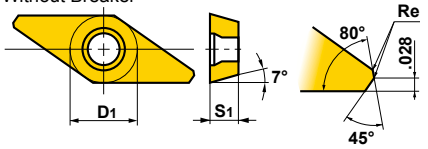
Right hand insert shown.



Right hand insert shown.

CSVTFXL (Front turning, Copying)

Order Number	Hand	Coated	Dimensions (inch)			Max. D.O.C (inch)	Geometry
		VP15KZ	D1	S1	Re		
CSVTFXL	L	●	.250	.094	0	.118	Without Breaker



● : Inventory maintained. (5 inserts in one case)

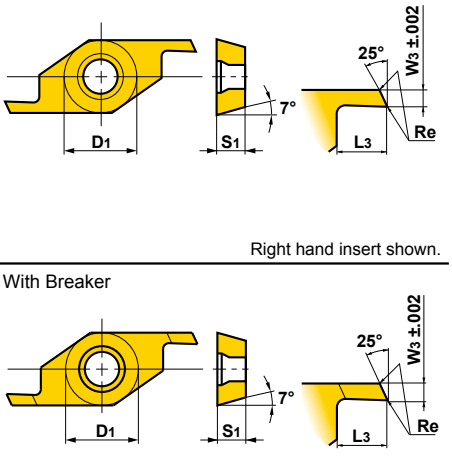
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

FOR RADIAL TYPE TOOL POSTS

INSERTS

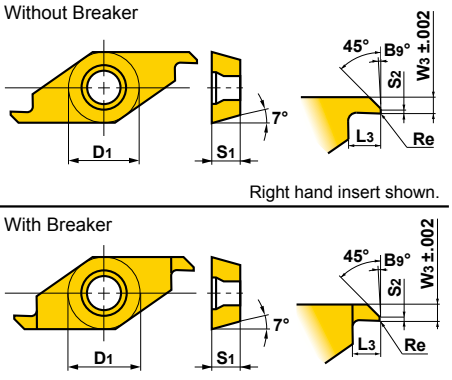
CSVTC (Cutting off)

Order Number	Hand	Coated	Dimensions (inch)					Max. D.O.C. (inch)	Geometry
		VP15KZ	D_1	S_1	Re	L_3	W_3		
CSVTC0640R	R	●	.250	.094	0	.079	.024	.059	Without Breaker
0750R	R	●	.250	.094	0	.098	.028	.079	
0750L	L	●	.250	.094	0	.098	.028	.079	
0850R	R	●	.250	.094	0	.098	.031	.079	
0850L	L	●	.250	.094	0	.098	.031	.079	
0950R	R	●	.250	.094	0	.098	.035	.079	
1060R	R	●	.250	.094	0	.118	.039	.098	
1060L	L	●	.250	.094	0	.118	.039	.098	
1360R	R	●	.250	.094	0	.118	.051	.098	
1360L	L	●	.250	.094	0	.118	.051	.098	
1560R	R	●	.250	.094	0	.118	.059	.098	
1560L	L	●	.250	.094	0	.118	.059	.098	Right hand insert shown.
CSVTC0640R-B	R	●	.250	.094	0	.079	.024	.059	With Breaker
0750R-B	R	●	.250	.094	0	.098	.028	.079	
0850R-B	R	●	.250	.094	0	.098	.031	.079	
0950R-B	R	●	.250	.094	0	.098	.035	.035	
1060R-B	R	●	.250	.094	0	.118	.039	.098	
1360R-B	R	●	.250	.094	0	.118	.051	.098	
1560R-B	R	●	.250	.094	0	.118	.059	.098	



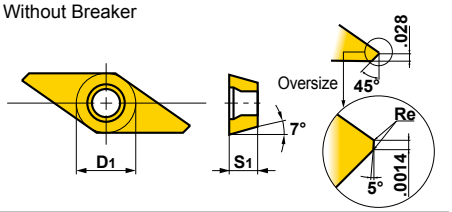
CSVTB (Back turning)

Order Number	Hand	Coated	Dimensions (inch)							Max. D.O.C. (inch)	Geometry
		VP15KZ	D_1	S_1	Re	L_3	W_3	S_2	B_9		
CSVTB10AR	R	●	.250	.094	0	.098	.039	.012	5°	.079	Without Breaker
10AL	L	●	.250	.094	0	.098	.039	.012	5°	.079	
10BR	R	●	.250	.094	0	.098	.039	.012	2°	.079	
10CR	R	●	.250	.094	0	.098	.039	.006	2°	.079	
10DR	R	●	.250	.094	0	.098	.039	.006	5°	.079	
12AR	R	●	.250	.094	0	.098	.047	.012	5°	.079	
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
10BR-B	R	●	.250	.094	0	.098	.039	.012	2°	.079	
10CR-B	R	●	.250	.094	0	.098	.039	.006	2°	.079	
10DR-B	R	●	.250	.094	0	.098	.039	.006	5°	.079	
12AR-B	R	●	.250	.094	0	.098	.047	.012	5°	.079	
14AR-B	R	●	.250	.094	0	.098	.055	.012	5°	.079	



CSVTBXL (Back turning, Copying)

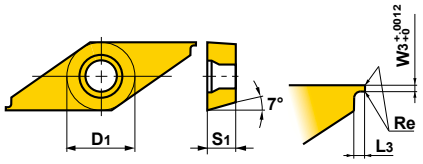
Order Number	Hand	Coated	Dimensions (inch)			Max. D.O.C (inch)	Geometry
		VP15KZ	D_1	S_1	Re		
CSVTBXL	L	●	.250	.094	0	.118	Without Breaker



● : Inventory maintained. (5 inserts in one case)

CSVTG (Grooving)

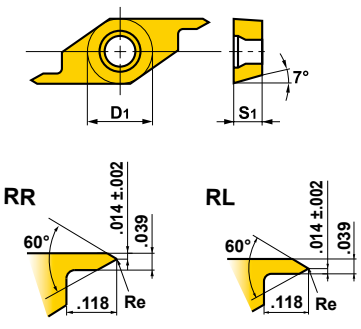
Order Number	Hand	Coated	Dimensions (inch)					Max. D.O.C. (inch)	Geometry
		VP15KZ	D_1	S_1	Re	L_3	W_3		
CSVTG02505R	R	●	.250	.094	0	.020	.010	.006	Without Breaker
03005R	R	●	.250	.094	0	.020	.012	.006	
03505R	R	●	.250	.094	0	.020	.014	.006	
04005R	R	●	.250	.094	0	.020	.016	.006	
04510R	R	●	.250	.094	0	.039	.018	.018	
05010R	R	●	.250	.094	0	.039	.020	.018	
05510R	R	●	.250	.094	0	.039	.022	.018	
06010R	R	●	.250	.094	0	.039	.024	.018	
06510R	R	●	.250	.094	0	.039	.026	.018	
07010R	R	●	.250	.094	0	.039	.028	.018	
07520R	R	●	.250	.094	0	.079	.030	.055	
07520L	L	●	.250	.094	0	.079	.030	.055	
08020R	R	●	.250	.094	0	.079	.031	.055	
08520R	R	●	.250	.094	0	.079	.033	.055	
09020R	R	●	.250	.094	0	.079	.035	.055	
09520R	R	●	.250	.094	0	.079	.037	.055	
09520L	L	●	.250	.094	0	.079	.037	.055	
10020R	R	●	.250	.094	0	.079	.039	.055	
11030R	R	●	.250	.094	0	.118	.043	.102	
12030R	R	●	.250	.094	0	.118	.047	.102	
12030L	L	●	.250	.094	0	.118	.047	.102	
13030R	R	●	.250	.094	0	.118	.051	.102	
14030R	R	●	.250	.094	0	.118	.055	.102	
15030R	R	●	.250	.094	0	.118	.059	.102	



Right hand insert shown.

CSVTT (Threading)

Order Number	Hand	Coated	Pitch (inch)	Dimensions (inch)			Geometry
		VP15KZ		D_1	S_1	Re	
CSVTT60050RR	R	●	.008–.020	.250	.094	.001	Without Breaker General Purpose (60°)
60050RL	L	●	.008–.020	.250	.094	.001	



Right hand insert shown.

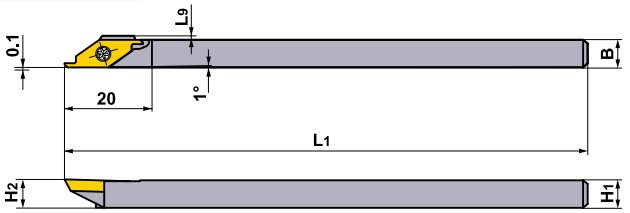
SMALL TOOLS

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)					Max. D.O.C (mm)	* Insert Screw	Wrench
	R	L			H1	B	H2	L1	L9			
CSVHR/L0707	●	●	CSVT	◇◇◇◇	7	7	7	140	0.5	3.0	NS251	NKY15R
0808	●	●		◇◇◇◇	8	8	8	140	0	3.0	NS251	NKY15R
0909	●			◇◇◇◇	9.5	9.5	9.5	140	0	3.0	NS251	NKY15R
1010	●	●		◇◇◇◇	10	10	10	140	0	3.0	NS251	NKY15R
1212	●			◇◇◇◇	12	12	12	140	0	3.0	NS251	NKY15R

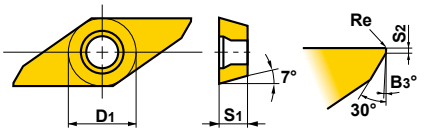
(Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.
(Note 2) Each insert has own depth of cut.
* Clamp Torque (lbf-in) : NS251=6.2

INSERTS

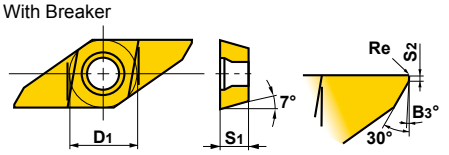
CSVTF

(Front turning)

Order Number	Hand	Coated	Dimensions (mm)					Max. D.O.C (mm)	Geometry
		VP15KZ	D1	S1	Re	S2	B3		
CSVTF30AR	R	●	6.35	2.38	0	0.3	5°	3.0	Without Breaker
30AL	L	●	6.35	2.38	0	0.3	5°	3.0	
30BR	R	●	6.35	2.38	0	0.3	2°	3.0	
30CR	R	●	6.35	2.38	0	0.15	2°	3.0	
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
30AL-B	L	●	6.35	2.38	0	0.3	5°	3.0	
30BR-B	R	●	6.35	2.38	0	0.3	2°	3.0	
30CR-B	R	●	6.35	2.38	0	0.15	2°	3.0	
30DR-B	R	●	6.35	2.38	0	0.15	5°	3.0	



Right hand insert shown.

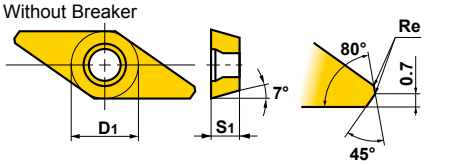


Right hand insert shown.

CSVTFXL

(Front turning, Copying)

Order Number	Hand	Coated	Dimensions (mm)			Max. D.O.C (mm)	Geometry
		VP15KZ	D1	S1	Re		
CSVTFXL	L	●	6.35	2.38	0	3.0	Without Breaker

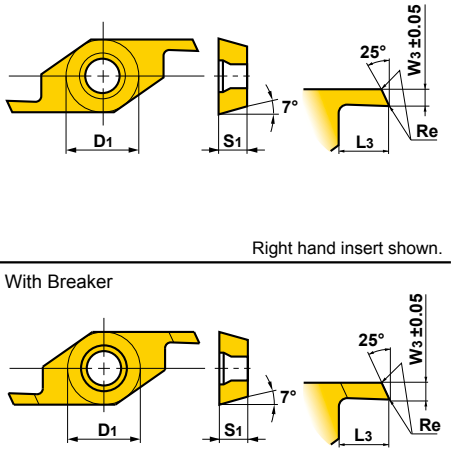


● : Inventory maintained. (5 inserts in one case)

INSERTS

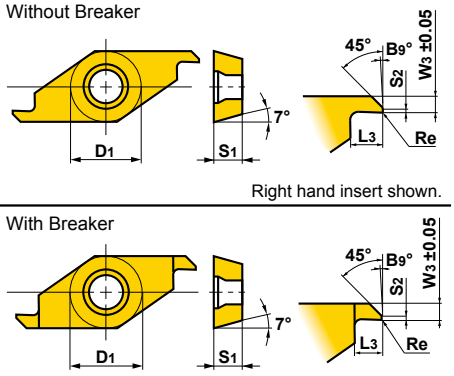
CSVTC (Cutting off)

Order Number	Hand	Coated	Dimensions (mm)					Max. D.O.C (mm)	Geometry
		VP15KZ	D_1	S_1	Re	L_3	W_3		
CSVTC0640R	R	●	6.35	2.38	0	2.0	0.6	1.5	Without Breaker
0750R	R	●	6.35	2.38	0	2.5	0.7	2.0	
0750L	L	●	6.35	2.38	0	2.5	0.7	2.0	
0850R	R	●	6.35	2.38	0	2.5	0.8	2.0	
0850L	L	●	6.35	2.38	0	2.5	0.8	2.0	
0950R	R	●	6.35	2.38	0	2.5	0.9	2.0	
1060R	R	●	6.35	2.38	0	3.0	1.0	2.5	
1060L	L	●	6.35	2.38	0	3.0	1.0	2.5	
1360R	R	●	6.35	2.38	0	3.0	1.3	2.5	
1360L	L	●	6.35	2.38	0	3.0	1.3	2.5	
1560R	R	●	6.35	2.38	0	3.0	1.5	2.5	
1560L	L	●	6.35	2.38	0	3.0	1.5	2.5	Right hand insert shown.
CSVTC0640R-B	R	●	6.35	2.38	0	2.0	0.6	1.5	With Breaker
0750R-B	R	●	6.35	2.38	0	2.5	0.7	2.0	
0850R-B	R	●	6.35	2.38	0	2.5	0.8	2.0	
0950R-B	R	●	6.35	2.38	0	2.5	0.9	0.9	
1060R-B	R	●	6.35	2.38	0	3.0	1.0	2.5	
1360R-B	R	●	6.35	2.38	0	3.0	1.3	2.5	
1560R-B	R	●	6.35	2.38	0	3.0	1.5	2.5	



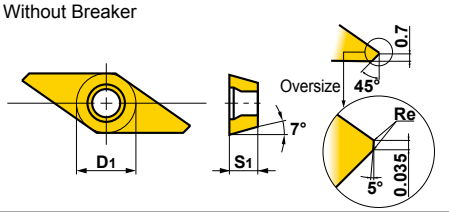
CSVTB (Back turning)

Order Number	Hand	Coated	Dimensions (mm)							Max. D.O.C (mm)	Geometry
		VP15KZ	D_1	S_1	Re	L_3	W_3	S_2	B_9		
CSVTB10AR	R	●	6.35	2.38	0	2.5	1	0.3	5°	2.0	Without Breaker
10AL	L	●	6.35	2.38	0	2.5	1	0.3	5°	2.0	
10BR	R	●	6.35	2.38	0	2.5	1	0.3	2°	2.0	
10CR	R	●	6.35	2.38	0	2.5	1	0.15	2°	2.0	
10DR	R	●	6.35	2.38	0	2.5	1	0.15	5°	2.0	
12AR	R	●	6.35	2.38	0	2.5	1.2	0.3	5°	2.0	
14AR	R	●	6.35	2.38	0	2.5	1.4	0.3	5°	2.0	Right hand insert shown.
CSVTB10AR-B	R	●	6.35	2.38	0	2.5	1	0.3	5°	2.0	With Breaker
10BR-B	R	●	6.35	2.38	0	2.5	1	0.3	2°	2.0	
10CR-B	R	●	6.35	2.38	0	2.5	1	0.15	2°	2.0	
10DR-B	R	●	6.35	2.38	0	2.5	1	0.15	5°	2.0	
12AR-B	R	●	6.35	2.38	0	2.5	1.2	0.3	5°	2.0	
14AR-B	R	●	6.35	2.38	0	2.5	1.4	0.3	5°	2.0	



CSVTBXL (Back turning, Copying)

Order Number	Hand	Coated	Dimensions (mm)			Max. D.O.C (mm)	Geometry
		VP15KZ	D_1	S_1	Re		
CSVTBXL	L	●	6.35	2.38	0	3.0	Without Breaker



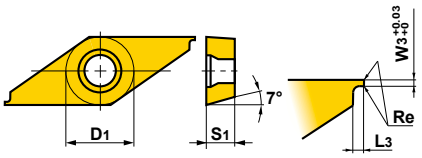
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

FOR RADIAL TYPE TOOL POSTS

INSERTS

CSVTG (Grooving)

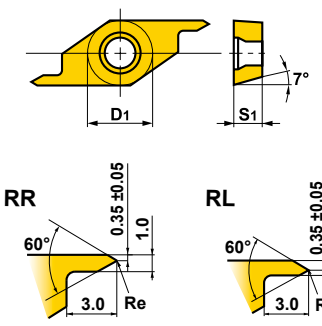
Order Number	Hand	Coated VP15KZ	Dimensions (mm) D1	S1	Re	L3	W3	Max. D.O.C (mm)	Geometry
CSVTG02505R	R	●	6.35	2.38	0	0.5	0.25	0.15	Without Breaker
03005R	R	●	6.35	2.38	0	0.5	0.3	0.15	
03505R	R	●	6.35	2.38	0	0.5	0.35	0.15	
04005R	R	●	6.35	2.38	0	0.5	0.4	0.15	
04510R	R	●	6.35	2.38	0	1.0	0.45	0.45	
05010R	R	●	6.35	2.38	0	1.0	0.5	0.45	
05510R	R	●	6.35	2.38	0	1.0	0.55	0.45	
06010R	R	●	6.35	2.38	0	1.0	0.6	0.45	
06510R	R	●	6.35	2.38	0	1.0	0.65	0.45	
07010R	R	●	6.35	2.38	0	1.0	0.7	0.45	
07520R	R	●	6.35	2.38	0	2.0	0.75	1.4	
07520L	L	●	6.35	2.38	0	2.0	0.75	1.4	
08020R	R	●	6.35	2.38	0	2.0	0.8	1.4	
08520R	R	●	6.35	2.38	0	2.0	0.85	1.4	
09020R	R	●	6.35	2.38	0	2.0	0.9	1.4	
09520R	R	●	6.35	2.38	0	2.0	0.95	1.4	
09520L	L	●	6.35	2.38	0	2.0	0.95	1.4	
10020R	R	●	6.35	2.38	0	2.0	1.0	1.4	
11030R	R	●	6.35	2.38	0	3.0	1.1	2.6	
12030R	R	●	6.35	2.38	0	3.0	1.2	2.6	
12030L	L	●	6.35	2.38	0	3.0	1.2	2.6	
13030R	R	●	6.35	2.38	0	3.0	1.3	2.6	
14030R	R	●	6.35	2.38	0	3.0	1.4	2.6	
15030R	R	●	6.35	2.38	0	3.0	1.5	2.6	



Right hand insert shown.

CSVTT (Threading)

Order Number	Hand	Coated VP15KZ	Pitch (mm)	Dimensions (mm) D1	S1	Re	Geometry
CSVTT60050RR	R	●	0.2—0.5	6.35	2.38	0.03	Without Breaker General Purpose (60°)
60050RL	L	●	0.2—0.5	6.35	2.38	0.03	



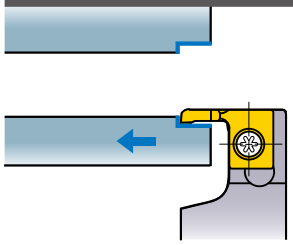
Right hand insert shown.

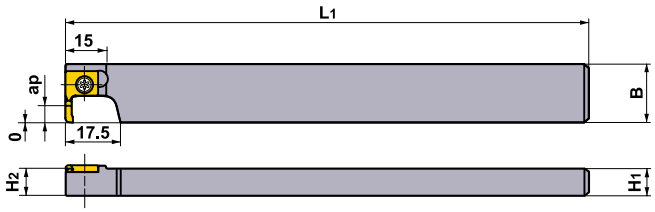
● : Inventory maintained. (5 inserts in one case)

BORING TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

SBAH — Without off set



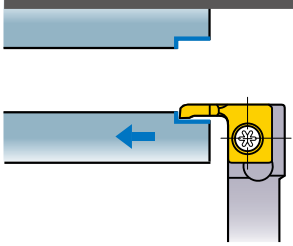


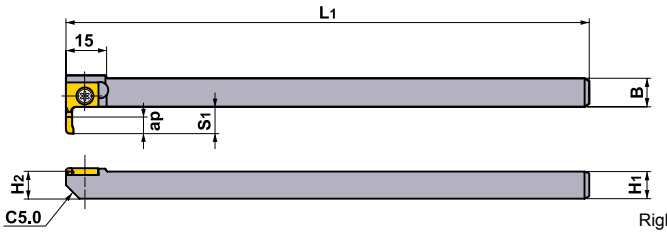
Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)				Max. Depth of Cut ap (mm)	Min. Cutting Diameter (mm)	*	
	R			H1	B	L1	H2			Insert Screw	Wrench
SBAHR1022	●	SBAT	3080□□L/L-B	10	21.5	120	10	8	3	NS402W	NKY15R
1222	●	SBAT	3080□□L/L-B	12	21.5	120	12	8	3	NS403W	NKY15R

* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

SBAH — With off set





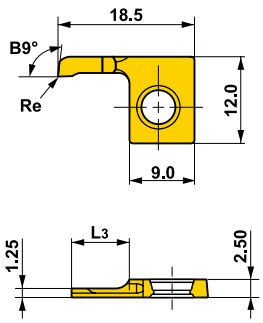
Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)					Max. Depth of Cut ap (mm)	Min. Cutting Diameter (mm)	*	
	R			H1	B	L1	H2	S1			Insert Screw	Wrench
SBAHR1010	●	SBAT	3080□□L/L-B	10	10	120	10	10	8	3	NS402W	NKY15R

* Clamp Torque (lbf-in) : NS402W=0.7

INSERTS

Breaker	Order Number	Coated	Dimensions (mm)			Min. Cutting Diameter (mm)	Geometry
		VP15KZ	B9°	Re	L3		
Without Breaker	**SBAT308000L**	●	95°	0	8.0	3	
	3080V5L	●	95°	0.05	8.0	3	
With Breaker	**SBAT308000L-B**	●	95°	0	8.0	3	
	3080V5L-B	●	95°	0.05	8.0	3	



SMALL TOOLS

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

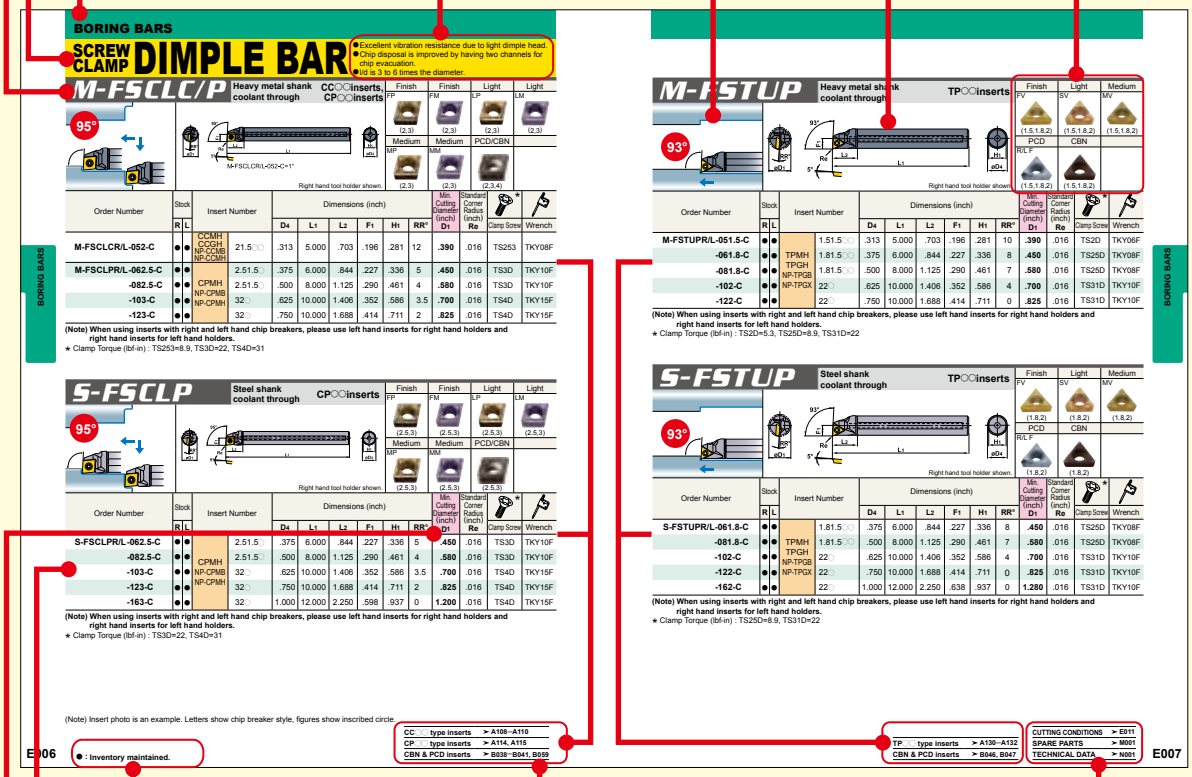
PRODUCT SECTION

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

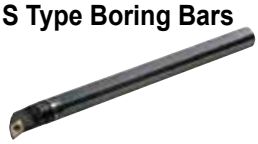
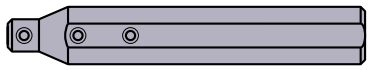
CLASSIFICATION E002
IDENTIFICATION E004

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

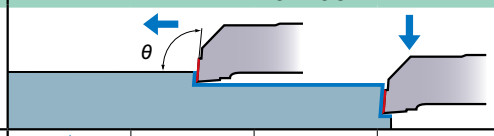
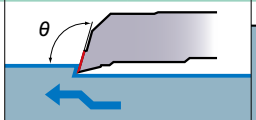
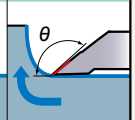
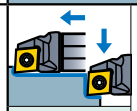
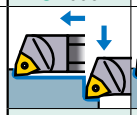
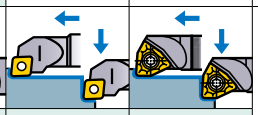
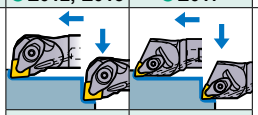
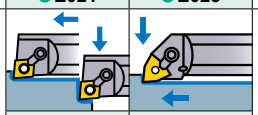
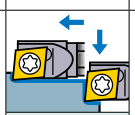
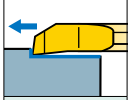
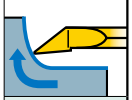
*Arranged by Alphabetical order

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	θ = 75°	θ = 90°, 91°	θ = 93°			
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. ● 7° 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.)

θ = 95°	θ = 107°30′ – 117°30′	θ = 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				◎		○	◎	◎		
 C-SWLO, M-SWLO ➲E019, E020	 S-SCLC, M-SCLC, C-SCLC ➲E012, E013 / C-SWL ➲E017			○		○*				
 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

C	Carbide Shank
M	Heavy Metal Shank
S	Steel Shank

① Shank Material

D	1 action
M	2 action
S	

② Method of Holding

C	80°	T	60°
D	55°	V	35°
S	90°	W	60°

③ Insert Shape

F	91°	Q	107°30′ 117°30′
K	75°	U	93°
L	95° 95°	Z	

④ Tool Style

S ① - S ② C ③ L ④ C ⑤ R ⑥ - 10 ⑦ 3 ⑧ - C 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

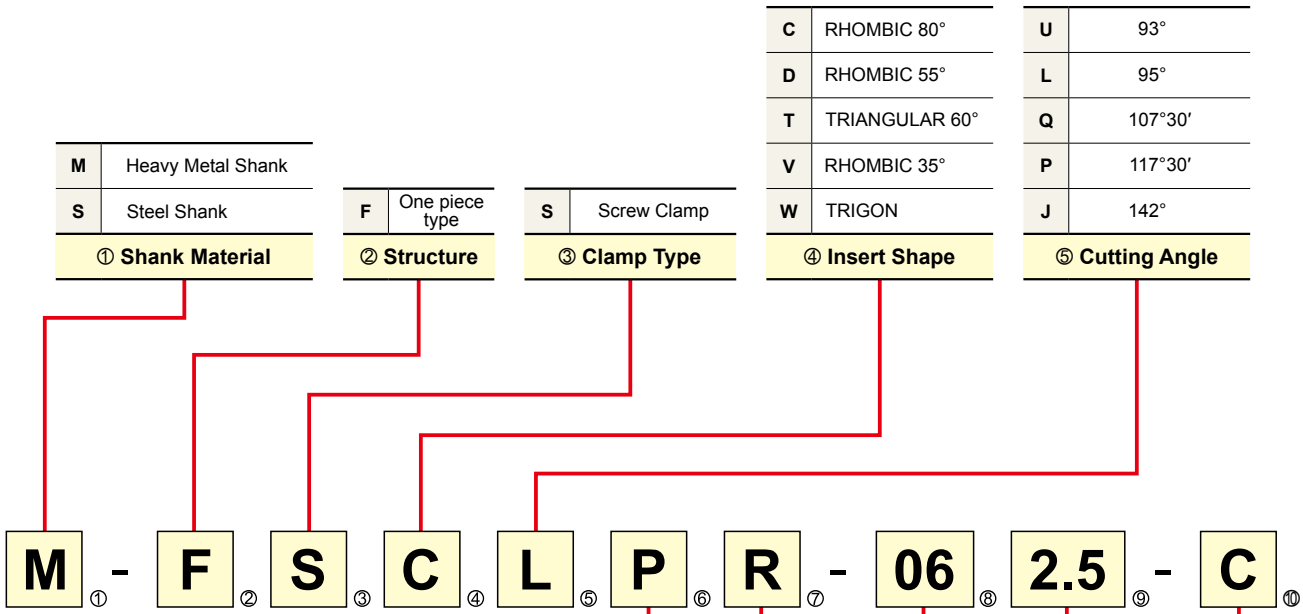
⑧ Insert Size

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**

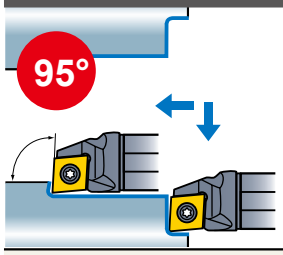
⑩ Oil hole	
C	Coolant Through

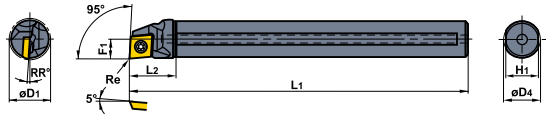
SCREW CLAMP DIMPLE BAR

- 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)	(2,3,4)	

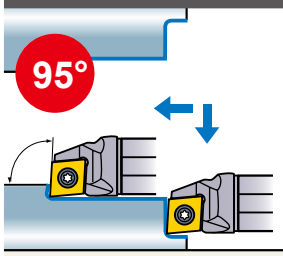
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) D4	L1	L2	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) Re	* Clamp Screw	Wrench
M-FSCLCR/L-052-C	●	●	CCMH CCGH NP-CCMB NP-CCMH	21.5○○	.313	5.000	.703	.196	.281	12	**.390**	.016	TS253	TKY08F
M-FSCLPR/L-062.5-C	●	●	CPMH NP-CPMB NP-CPMH	2.51.5○	.375	6.000	.844	.227	.336	5	**.450**	.016	TS3D	TKY10F
-082.5-C	●	●		2.51.5○	.500	8.000	1.125	.290	.461	4	**.580**	.016	TS3D	TKY10F
-103-C	●	●		32○	.625	10.000	1.406	.352	.586	3.5	**.700**	.016	TS4D	TKY15F
-123-C	●	●		32○	.750	10.000	1.688	.414	.711	2	**.825**	.016	TS4D	TKY15F

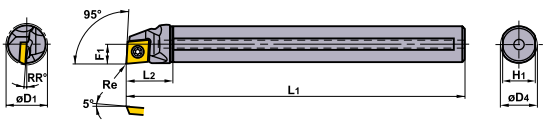
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* 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) D4	L1	L2	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) 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
-082.5-C	●	●		2.51.5○	.500	8.000	1.125	.290	.461	4	**.580**	.016	TS3D	TKY10F
-103-C	●	●		32○	.625	10.000	1.406	.352	.586	3.5	**.700**	.016	TS4D	TKY15F
-123-C	●	●		32○	.750	10.000	1.688	.414	.711	2	**.825**	.016	TS4D	TKY15F
-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

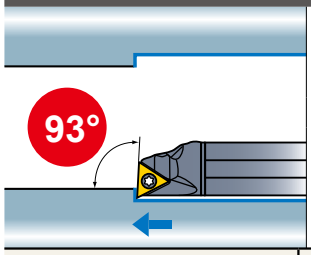
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

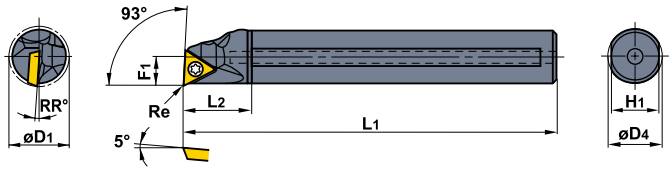
CC○○ type inserts	➤ A108–A110
CP○○ type inserts	➤ A114, A115
CBN & PCD inserts	➤ B038–B041, B059

● : 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)	

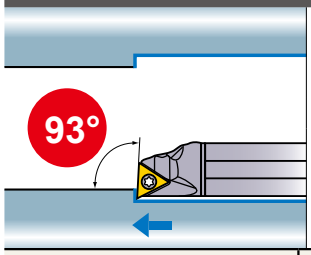
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) D4	L1	L2	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) Re	* Clamp Screw	Wrench
M-FSTUPR/L-051.5-C	●	●	TPMH TPGH NP-TPGB NP-TPGX	1.51.5○○	.313	5.000	.703	.196	.281	10	**.390**	.016	TS2D	TKY06F
-061.8-C	●	●		1.81.5○○	.375	6.000	.844	.227	.336	8	**.450**	.016	TS25D	TKY08F
-081.8-C	●	●		1.81.5○○	.500	8.000	1.125	.290	.461	7	**.580**	.016	TS25D	TKY08F
-102-C	●	●		22○	.625	10.000	1.406	.352	.586	4	**.700**	.016	TS31D	TKY10F
-122-C	●	●		22○	.750	10.000	1.688	.414	.711	0	**.825**	.016	TS31D	TKY10F

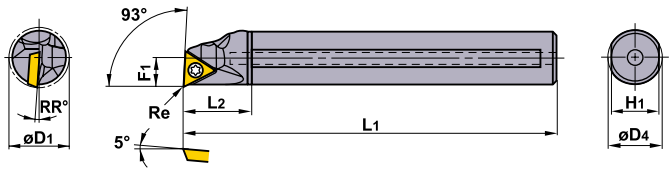
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* 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) D4	L1	L2	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) 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
-081.8-C	●	●		1.81.5○○	.500	8.000	1.125	.290	.461	7	**.580**	.016	TS25D	TKY08F
-102-C	●	●		22○	.625	10.000	1.406	.352	.586	4	**.700**	.016	TS31D	TKY10F
-122-C	●	●		22○	.750	10.000	1.688	.414	.711	0	**.825**	.016	TS31D	TKY10F
-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 ➤ A130–A132
CBN & PCD inserts ➤ B046, B047

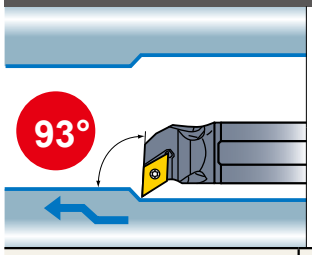
CUTTING CONDITIONS ➤ E011
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

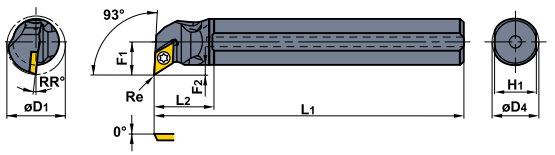
SCREW CLAMP DIMPLE BAR

- 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)

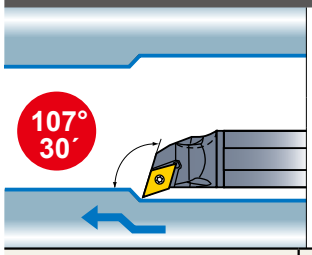
Order Number	Stock		Insert Number		Dimensions (inch)							Min. Cutting Diameter (inch)	Standard Corner Radius (inch)	*	
	R	L			D4	L1	L2	F1	F2	H1	RR°	D1	Re	Clamp Screw	Wrench
M-FSDUCR/L-062-C	●	●	DCMT DCET DCGT NP-DCMW NP-DCGW	21.5○	.375	6.000	.675	.317	.130	.336	7.5	**.525**	.016	TS25	TKY08F
-082-C	●	●		21.5○	.500	8.000	.833	.380	.130	.461	6	**.667**	.016	TS25	TKY08F
-102-C	●	●		21.5○	.625	10.000	.781	.442	.130	.586	5	**.781**	.016	TS25	TKY08F
-123-C	●	●		32.5○	.750	10.000	.844	.615	.240	.711	5	**1.200**	.031	TS43	TKY15F

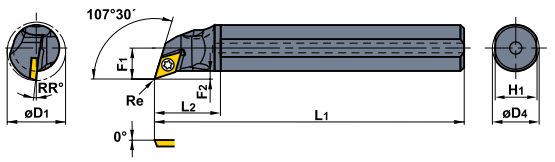
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* 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		Insert Number		Dimensions (inch)							Min. Cutting Diameter (inch)	Standard Corner Radius (inch)	*	
	R	L			D4	L1	L2	F1	F2	H1	RR°	D1	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
-082-C	●	●		21.5○	.500	8.000	.938	.352	.102	.461	6	**.667**	.016	TS25	TKY08F
-102-C	●	●		21.5○	.625	10.000	.879	.415	.102	.586	5	**.781**	.016	TS25	TKY08F
-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

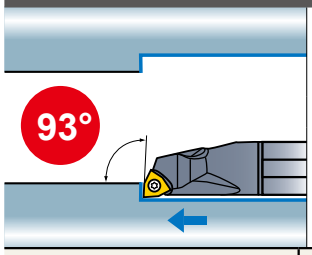
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

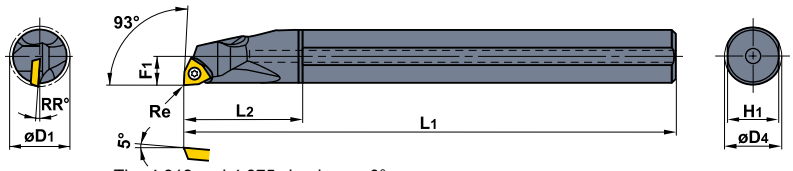
DC○○ type inserts ➤ A116–A120
CBN & PCD inserts ➤ B042–B044, B060

● : 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)

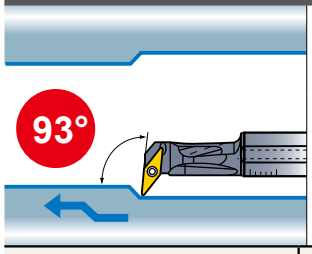
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) D4	L1	L2	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) Re	* Clamp Screw	Wrench
M-FSWUBR/L-051.5-C	●	●	WBMT WBGT	1.51.5○	.313	5.000	.703	.196	.281	14	**.391**	.008	TS2	TKY06F
-061.5-C	●	●	WBMT WBGT	1.51.5○	.375	6.000	.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
-102-C	●	●	WPMT	21.5○	.625	10.000	1.406	.352	.586	1	**.703**	.016	TS253	TKY08F
-123-C	●	●	WPMT	32○	.750	10.000	1.688	.414	.711	2	**.825**	.031	TS4	TKY15F

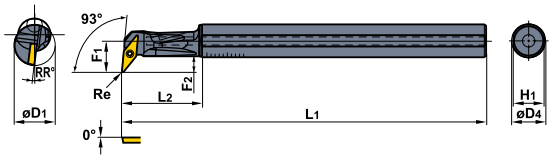
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* 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)
Finish
FM

(1.5,2)
Light
LP

(1.5,2)
Light
SV

(1.5,2)
Medium
MV

(1.5,2)
Medium
LM

(1.5,2)
CBN

(2)

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) D4	L1	L2	F1	F2	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) 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
-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 ➤ A142
WP○○ type inserts ➤ A145
VC○○ type inserts ➤ A137, A138
VB○○ type inserts ➤ A133–A136
CBN & PCD inserts ➤ B048, B064

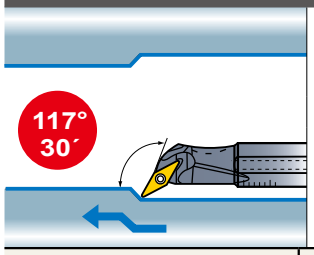
CUTTING CONDITIONS ➤ E011

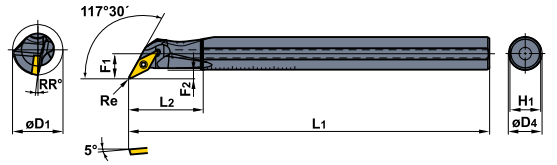
SCREW CLAMP DIMPLE BAR

- 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)

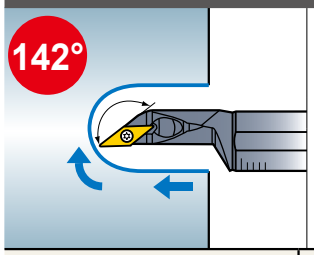
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) D4	L1	L2	F1	F2	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) Re	* Clamp Screw	Wrench
M-FSVPCR/L-061.5-C	●	●	VCGT VCMT	1.51.5○	.375	6.000	.938	.306	.118	.336	8	**.600**	.016	TS202	TKY06F
M-FSVPBR/L-082-C	●	●	VBGT VBMT NP-VBGW	22○	.500	8.000	1.167	.407	.157	.461	8	**.833**	.016	TS255	TKY08F
-102-C	●	●		22○	.625	10.000	1.367	.490	.177	.586	5	**.977**	.016	TS255	TKY08F
-122-C	●	●		22○	.750	10.000	1.500	.572	.197	.711	5	**1.125**	.016	TS255	TKY08F

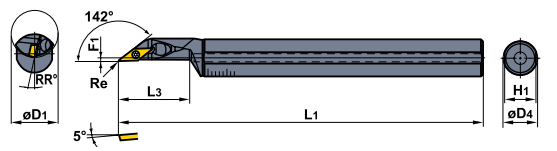
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* 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) D4	L1	L3	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) 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
-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	**➤ A137, A138**
VB○○ type inserts	**➤ A133–A136**
CBN & PCD inserts	**➤ B048, B064**

● : **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.**

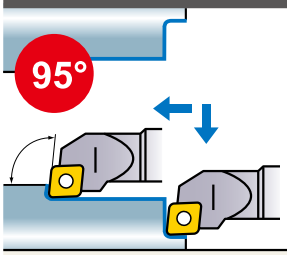
Order Number	Insert Screw	Remark
CCG/MT21.5○	Can be used as it is.	If the screw is too long then please grind away the unnecessary material.
CPGT2.51.5○	Change to TS3.	
CPGT32○	Change to TS4.	
CPMX2.51.5○	Can be used as it is.	
CPMX32○	Can be used as it is.	
TPGD/P1.51.5○	Change to CS200T.	
TPGD/P1.81.5○	Change to CS250T.	
TPGA/M22○	Change to CS300890T.	
TPMX1.51.5○	Change to CS200T.	
TPMX1.81.5○	Change to CS250T.	
TPMX22○	Change to CS300890T.	

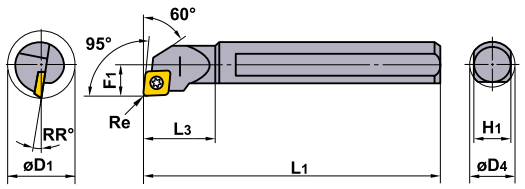
SCREW CLAMP TYPE

- Two wall pocket.
- 7° 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)

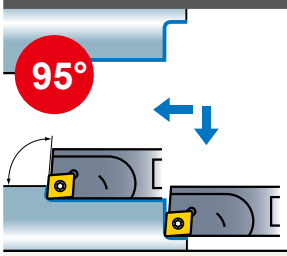
Order Number	Stock R	Stock L	Insert Number		D4	L1	L3	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) Re	* Clamp Screw	Wrench
S-SCLCR/L-062	●	●	CCMT CCMW CCGW CCGT CCET CCMH NP-CCGW	21.5○	.375	6.000	.625	.250	.340	15	**.477**	.016	TS25	TKY08F
-082	●	●		21.5○	.500	6.000	.750	.313	.460	13	**.602**	.016	TS25	TKY08F
-103	●	●		32.5○	.625	8.000	1.250	.406	.560	10	**.797**	.031	TS4	TKY15F
-123	●	●		32.5○	.750	10.000	1.875	.500	.700	8	**.954**	.031	TS4	TKY15F
-164	●	●		43○	1.000	12.000	2.500	.641	.910	7	**1.219**	.031	TS5	TKY25F
-204	●	●		43○	1.250	12.000	2.500	.875	1.160	5	**1.579**	.031	TS5	TKY25F

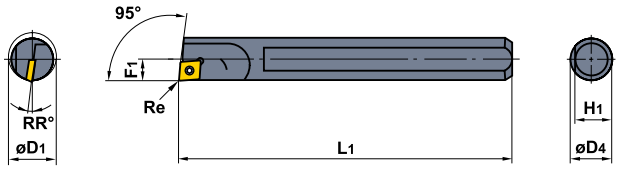
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* 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		D4	L1	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) Re	* Clamp Screw	Wrench
M-SCLCR-063	●	CCGT NP-CCMW	03S1○○L-F	.188	3.000	.100	.173	15	**.200**	.008	TS16	TKY06F
-073	●		03S1○○L-F	.219	3.500	.120	.199	14	**.240**	.008	TS16	TKY06F
-064	●		04T0○○L-F	.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

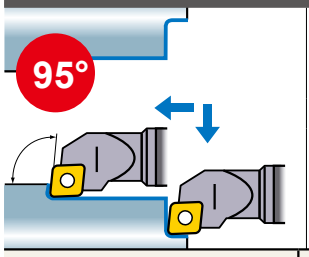
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

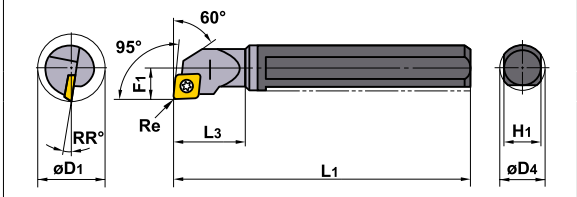
CC○○ type inserts ➤ A107–A113
CBN & PCD inserts ➤ B038–B040, B059

● : 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)

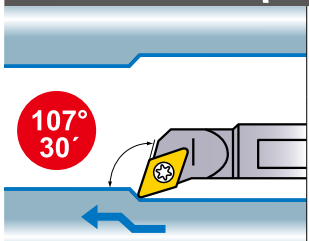
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) D4	L1	L3	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) Re	* Clamp Screw	Wrench
C-SCLCR/L-062	●	●	CCMT CCMW CCGW CCGT CCET NP-CCGW CCMH	21.5○	.375	6.000	.625	.250	.340	15	**.477**	.016	TS25	TKY08F
-082	●	●		21.5○	.500	6.000	.750	.313	.460	13	**.602**	.016	TS25	TKY08F
-103	●	●		32.5○	.625	8.000	1.250	.406	.560	10	**.797**	.031	TS4	TKY15F

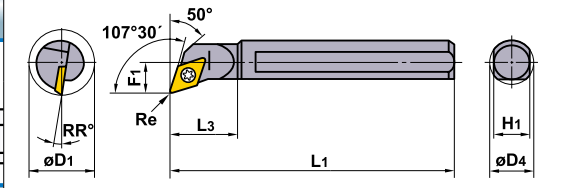
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

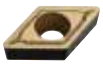
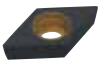
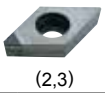
S-SDQC

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) D4	L1	L3	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) 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
-102	●	●		21.5○	.625	8.000	1.000	.406	.560	7	**.797**	.016	TS25	TKY08F
-123	●	●		32.5○	.750	10.000	1.250	.500	.700	7	**.954**	.031	TS4	TKY15F
-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 ➤ A107–A113
DC○○ type inserts ➤ A116–A120
CBN & PCD inserts ➤ B038–B040, B042, B043, B044, B059, B060

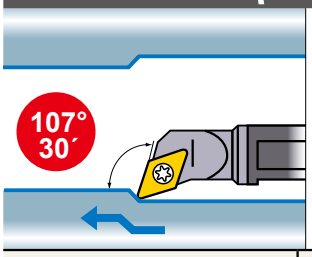
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

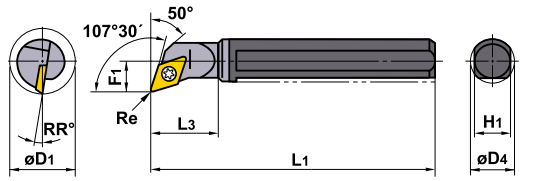
SCREW CLAMP TYPE

- Two wall pocket.
- 7° positive insert, low cutting force.
- Screw-on type.
- Steel and carbide shanks are stocked in various diameters.

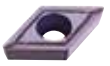
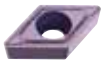
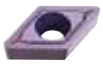
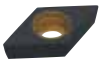
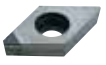
C-SDQC

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)

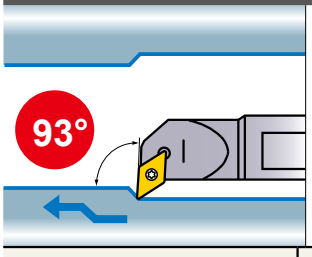
Order Number	Stock		Insert Number		Dimensions (inch)						Min. Cutting Diameter (inch)	Standard Corner Radius (inch)	*	
	R	L			D4	L1	L3	F1	H1	RR°	D1	Re	Clamp Screw	Wrench
C-SDQCR/L-082	●	●	DCMT DCMW DCGW DCGT DCET NP-DCMW NP-DCMT	21.5○	.500	6.000	.875	.375	.460	10	**.665**	.016	TS25	TKY08F
-102	●	●		21.5○	.625	8.000	1.000	.406	.560	7	**.797**	.016	TS25	TKY08F
-123	●	●		32.5○	.750	10.000	1.250	.500	.700	7	**.954**	.031	TS4	TKY15F

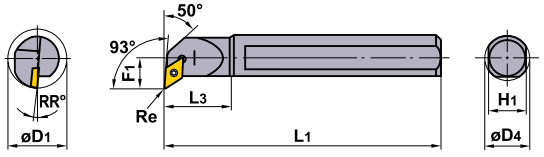
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

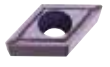
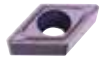
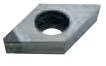
S-SDUC

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		Insert Number		Dimensions (inch)						Min. Cutting Diameter (inch)	Standard Corner Radius (inch)	*	
	R	L			D4	L1	L3	F1	H1	RR°	D1	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
-082	●	●		21.5○	.500	6.000	.750	.500	.460	7	**.789**	.016	TS25	TKY08F
-102	●	●		21.5○	.625	8.000	1.250	.563	.560	7	**.954**	.016	TS25	TKY08F
-123	●	●		32.5○	.750	10.000	1.875	.625	.700	7	**1.079**	.031	TS4	TKY15F
-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

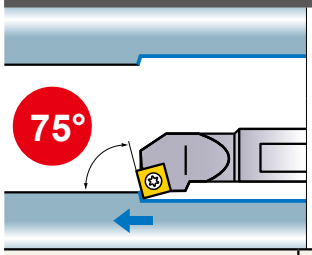
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

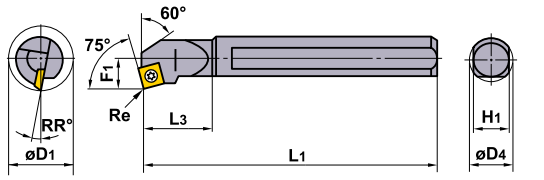
DC○○ type inserts	**➤ A116–A120**
CBN & PCD inserts	**➤ B042–B044, B060**

● : **Inventory maintained.**

S-SSKC

Steel shank — **SC○○inserts**





Right hand tool holder shown.

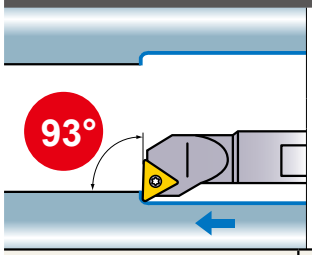
Finish	Finish	Light	Light
FP	FM	LP	LM
(3)	(3)	(3)	(3)
Medium	**Medium**	**Medium**	**Flat Top**
MP	MM	Standard	
(3,4)	(3,4)	(3,4)	(3,4)

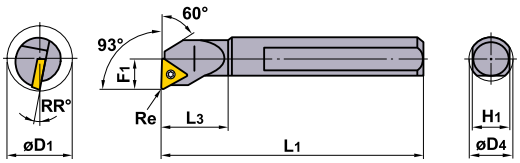
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) D4	L1	L3	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) Re	* Clamp Screw	Wrench
S-SSKCR/L-103	●	●	SCMT SCMW	32.5○	.625	8.000	1.250	.406	.560	10	**.797**	.031	TS4	TKY15F
-123	●	●		32.5○	.750	10.000	1.875	.500	.700	8	**.954**	.031	TS4	TKY15F
-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) D4	L1	L3	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) 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
-082	●	●		21.5○	.500	6.000	.750	.313	.460	13	**.602**	.016	TS25	TKY08F
-102	●	●		21.5○	.625	8.000	1.250	.406	.560	10	**.797**	.016	TS25	TKY08F
-123	●	●		32.5○	.750	10.000	1.875	.500	.700	8	**.954**	.031	TS4	TKY15F
-163	●	●		32.5○	1.000	12.000	2.500	.641	.910	7	**1.219**	.031	TS4	TKY15F
-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

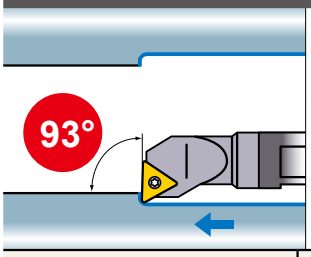
SC○○ type inserts ➤ A123, A124
TC○○ type inserts ➤ A126–A128
CBN & PCD inserts ➤ B045, B061
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

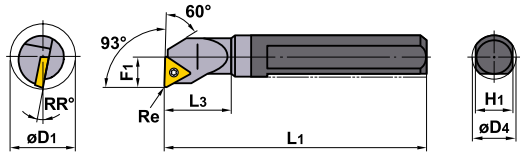
SCREW CLAMP TYPE

- Two wall pocket.
- 7° 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)

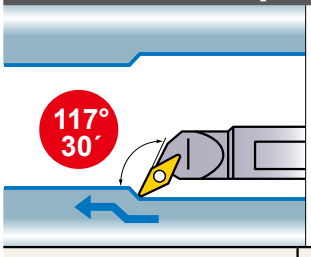
Order Number	Stock R	Stock L	Insert Number		D4	L1	L3	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) Re	* Clamp Screw	Wrench
C-STUCR/L-062	●	●	TCMT TCMW TCGT	21.5○	.375	6.000	.625	.250	.340	15	**.477**	.016	TS25	TKY08F
-082	●	●		21.5○	.500	6.000	.750	.313	.460	13	**.602**	.016	TS25	TKY08F
-102	●	●	NP-TCGW	21.5○	.625	8.000	1.250	.406	.560	10	**.797**	.016	TS25	TKY08F

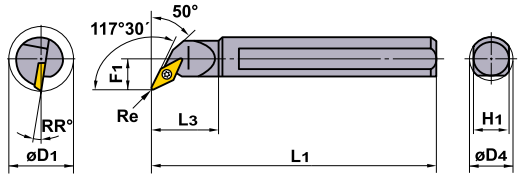
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* 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		D4	L1	L3	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) 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
-122	●	●		22○	.750	10.000	1.250	.500	.700	7	**.954**	.016	TS25	TKY08F
-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

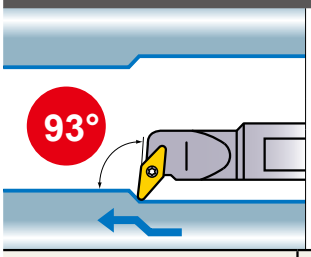
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

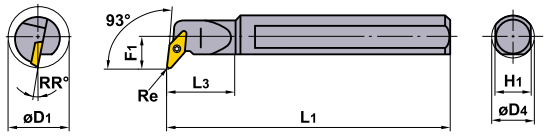
TC○○ type inserts	**➤ A126–A128**
VC○○ type inserts	**➤ A137–A139**
CBN & PCD inserts	**➤ B045, B049, B061, B064**

● : Inventory maintained.

S-SVUC

Steel shank — **VC○○inserts**





Right hand tool holder shown.

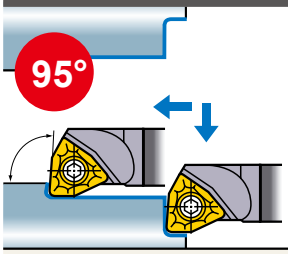
Finish	Finish	Light	Light
FP	FM	LP	LM
(2,3)	(2,3)	(2,3)	(2,3)
Medium	Medium	Medium	Flat Top
MP	MM	Standard	
(3)	(3)	(2,3)	(2,3)

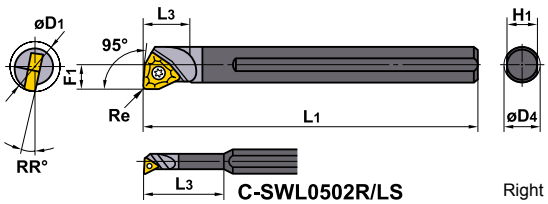
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) D4	L1	L3	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) Re	* Clamp Screw	Wrench
S-SVUCR/L-122	●	●	VCMT VCMW NP-VCGW	22○	.750	10.000	1.250	.500	.700	7	**1.000**	.016	TS25	TKY08F
-163	●	●		33○	1.000	12.000	1.500	.641	.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) D4	L1	L3	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) 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
05S3R/LM	●	●		1.51.5○	.313	5.000	1.370	.156	.282	15	**.312**	.016	TS2	TKY06F
0504R/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 ➤ A137–A139
WC○○ type inserts ➤ A143, A144
CBN & PCD inserts ➤ B049, B050, B064

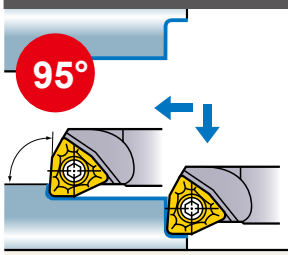
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

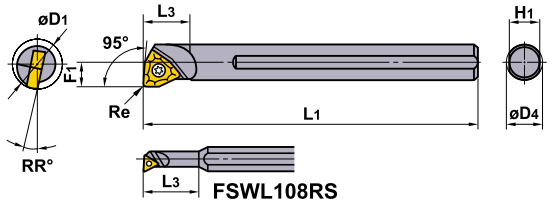
SCREW CLAMP TYPE

- Two wall pocket.
- 7° positive insert, low cutting force.
- Screw-on type.
- Steel and carbide shanks are stocked in various diameters.

FSWL1

Steel shank — **WC○○inserts**





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)	

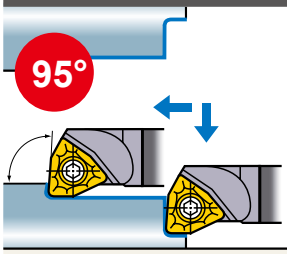
Order Number	Stock	Insert Number		Dimensions (mm)						Min. Cutting Diameter (mm)	Standard Corner Radius (inch)	*	
	R			D4	L1	L3	F1	H1	RR°	D1	Re	Clamp Screw	Wrench
FSWL108RS	★	WCMT WCGT	1.21○	8	100	19	2.9	7	17	**5.8**	.016	TS21	TKY06F
108R	★	WCMT	21.5○	8	125	10	5	7	15	**10**	.016	TS25	TKY08F
110R	★	NP-WCGW NP-WCMW	21.5○	10	150	12	6	9	13	**12**	.016	TS25	TKY08F
112R	★		32.5○	12	180	15	8	11	13	**16**	.031	TS4	TKY15F

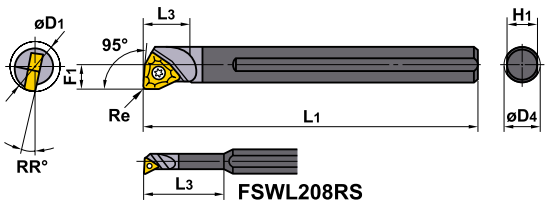
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : TS21=5.3, TS25=8.9, TS4=31

FSWL2

Carbide shank — **WC○○inserts**





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	Insert Number		Dimensions (mm)						Min. Cutting Diameter (mm)	Standard Corner Radius (inch)	*	
	R			D4	L1	L3	F1	H1	RR°	D1	Re	Clamp Screw	Wrench
FSWL208RS	★	WCMT WCGT	1.21○	8	122	25	2.9	7	17	**5.8**	.016	TS21	TKY06F
208RM	★		1.51.5○	8	125	33	4	7	15	**8**	.016	TS2	TKY06F
208R	★		21.5○	8	125	10	5	7	15	**10**	.016	TS25	TKY08F
212R	★	NP-WCGW 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, TS2=5.3, TS25=8.9, TS4=31

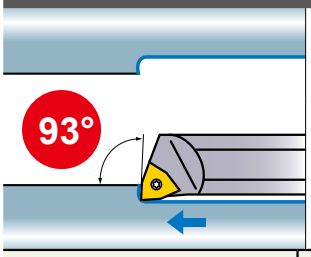
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

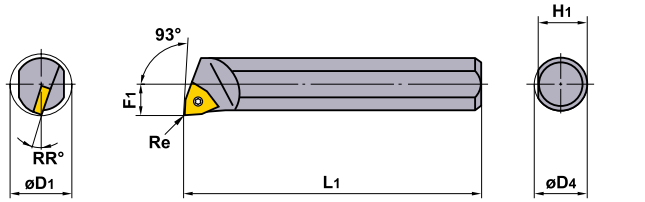
● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.

WC○○ type inserts ➤ A143, A144
CBN inserts ➤ B050

S-SWUC

Steel shank — **WC○○inserts**





Right hand tool holder shown.

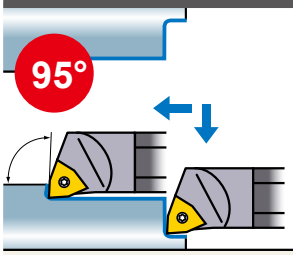
Finish	Finish	Light
FJ	R/L	Standard
		
(2,3)	(1.2,1.5)	(1.2,1.5,2,3)
Medium	**CBN**	
MJ		
		
(2,3)	(1.5,2,3)	

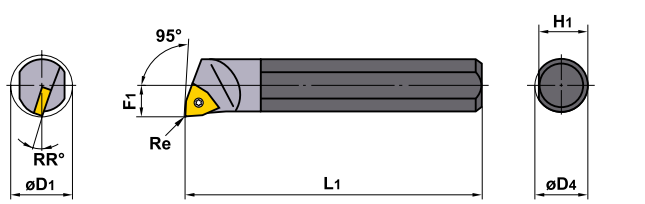
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) D4	L1	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) Re	* Clamp Screw	Wrench
S-SWUCR/L-055	●	●	WCMT WCGT NP-WCMW NP-WCGW	1.21○	.188	4.000	.114	.172	17	**.228**	.016	TS21	TKY06F
-065	●	●		1.21○	.250	4.000	.156	.235	17	**.312**	.016	TS2	TKY06F
-066	●	●		1.51.5○	.313	6.000	.188	.295	15	**.375**	.016	TS2	TKY06F
-062	●	●		21.5○	.375	6.000	.250	.358	15	**.500**	.016	TS25	TKY08F
-082	●	●		21.5○	.500	6.000	.312	.480	13	**.625**	.016	TS25	TKY08F
-103	●	●		32.5○	.625	8.000	.375	.593	10	**.750**	.031	TS4	TKY15F
-123	●	●		32.5○	.750	10.000	.500	.725	8	**1.000**	.031	TS4	TKY15F
-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) D4	L1	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) 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
-065	●	□		1.21○	.250	4.000	.156	.235	17	**.313**	.016	TS2	TKY06F
-066	●	□		1.51.5○	.313	6.000	.188	.295	15	**.375**	.016	TS2	TKY06F
-070	●	□		21.5○	.375	6.000	.218	.358	15	**.438**	.016	TS25	TKY08F
-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

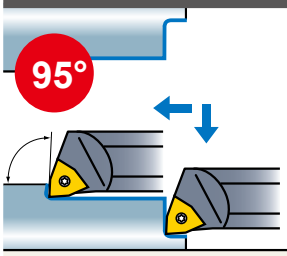
WC○○ type inserts	**➤ A143, A144**	**SPARE PARTS**	**➤ M001**
CBN inserts	**➤ B050**	**TECHNICAL DATA**	**➤ N001**

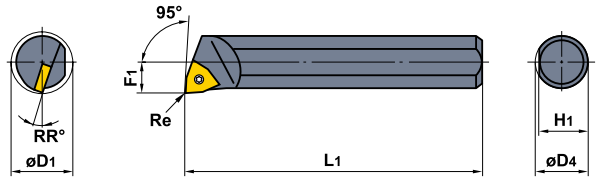
SCREW CLAMP TYPE

- Two wall pocket.
- 7° 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)	

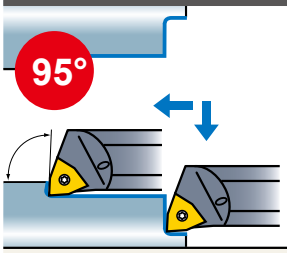
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) D4	L1	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) Re	* Clamp Screw	Wrench
M-SWLOR/L-055	●	●	WCMT WCGT NP-WCMW NP-WCGW	1.21○	.188	4.000	.114	.172	17	**.228**	.016	TS21	TKY06F
-065	●	●		1.21○	.250	4.000	.156	.235	17	**.313**	.016	TS2	TKY06F
-066	●	●		1.51.5○	.313	6.000	.188	.295	15	**.375**	.016	TS2	TKY06F
-070	●	●		21.5○	.375	6.000	.218	.358	15	**.438**	.016	TS25	TKY08F
-062	●	●		21.5○	.375	6.000	.250	.358	15	**.500**	.016	TS25	TKY08F
-082	●	●		21.5○	.500	6.000	.312	.480	13	**.625**	.016	TS25	TKY08F
-103	●	●		32.5○	.625	8.000	.375	.593	10	**.750**	.031	TS4	TKY15F
-123	●	●		32.5○	.750	10.000	.500	.725	8	**1.000**	.031	TS4	TKY15F
-163	●			32.5○	1.000	12.000	.640	.975	7	**1.250**	.031	TS4	TKY15F

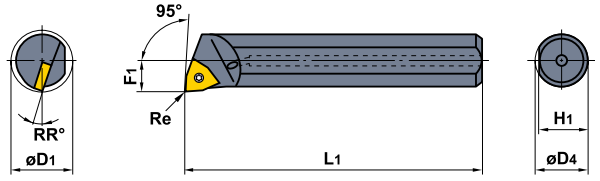
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* 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) D4	L1	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) 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
-070-C	●	●		21.5○	.375	6.000	.218	.358	15	**.438**	.016	TS25	TKY08F
-062-C	●	●		21.5○	.375	6.000	.250	.358	15	**.500**	.016	TS25	TKY08F
-082-C	●	●		21.5○	.500	6.000	.312	.480	13	**.625**	.016	TS25	TKY08F
-103-C	●	●		32.5○	.625	8.000	.375	.593	10	**.750**	.031	TS4	TKY15F
-123-C	●	●		32.5○	.750	10.000	.500	.725	8	**1.000**	.031	TS4	TKY15F
-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	**➤ A143, A144**
CBN inserts	**➤ B050**

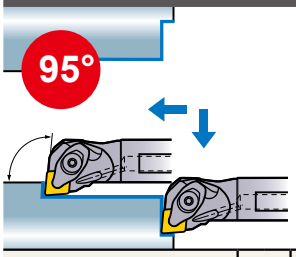
● : Inventory maintained.

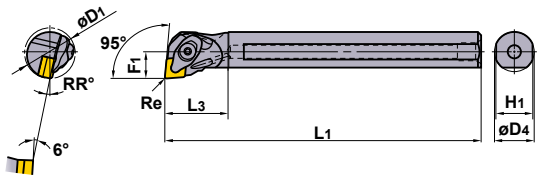
DOUBLE CLAMP DIMPLE BAR

- 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)

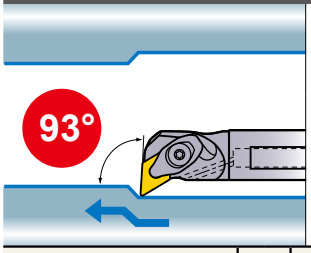
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) D4	L1	L3	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) Re	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
S-DCLNR/L-123-C	●	●	CNMA	32○	.750	10.000	1.219	.500	.711	12	1.000	.031	LLSCP32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
-163-C	●	●	CNMG	32○	1.000	12.000	1.625	.641	.922	11	1.281	.031	LLSCP32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
-164-C	●	●	CNMA	43○	1.000	12.000	1.625	.641	.922	11	1.281	.031	LLSCP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-204-C	●	●	CNMG	43○	1.250	14.000	2.000	.766	1.171	13	1.532	.031	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-244-C	●	●	CNMM CNGG	43○	1.500	14.000	2.000	.891	1.382	12	1.782	.031	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-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
-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

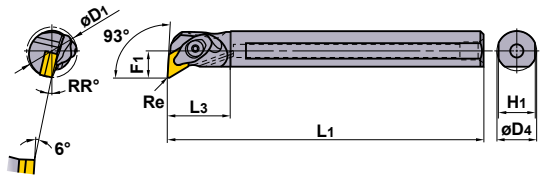
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

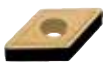
S-DDUN

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		Dimensions (inch) D4	L1	L3	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) 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
-204-C	●	●	DNMG DNMX	43○	1.250	14.000	2.000	1.000	1.171	11	2.000	.031	LLSDN43	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-244-C	●	●	DNGA DNGG	43○	1.500	14.000	2.000	1.125	1.382	10	2.250	.031	LLSDN43	LLP24	DCK2613	DCS1	DC0621T	TKY20F
-284-C	●	●	NP-DNMA	43○	1.750	14.000	2.500	1.250	1.632	9	2.500	.031	LLSDN43	LLP24	DCK2613	DCS1	DC0621T	TKY20F
-324-C	●	●	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

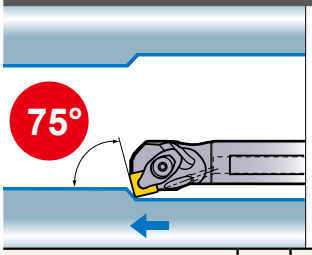
CN○○ type inserts ➤ A072—A077
DN○○ type inserts ➤ A078—A083
CBN & PCD inserts ➤ B022—B027, B055
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

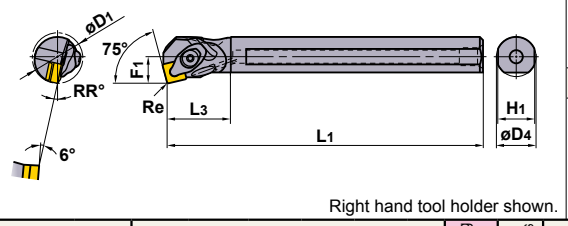
DOUBLE CLAMP DIMPLE BAR

- 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)

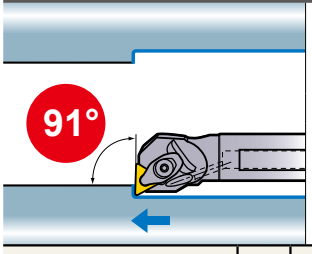
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) D4	L1	L3	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) Re	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
S-DSKNR/L-164-C	●	●	SNMA SNMG SNMM SNGA SNGG NP-SNMA NP-SNGA	43○	1.000	12.000	1.625	.641	.922	13	1.282	.031	LLSSP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-204-C	●	●		43○	1.250	14.000	2.000	.766	1.171	13	1.532	.031	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-244-C	●	●		43○	1.500	14.000	2.000	.891	1.382	11	1.782	.031	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-284-C	●	●		43○	1.750	14.000	2.500	1.016	1.632	10	2.032	.031	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-324-C	●	●		43○	2.000	14.000	2.500	1.281	1.882	9	2.562	.031	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

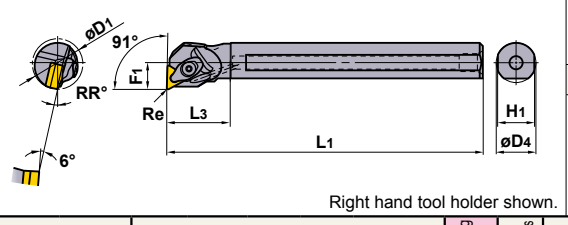
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* 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) D4	L1	L3	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) 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
-163-C	●	●		33○	1.000	12.000	1.625	.641	.922	13	1.282	.031	LLSTP32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
-203-C	●	●		33○	1.250	14.000	2.000	.766	1.171	13	1.532	.031	LLSTN32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
-243-C	●	●		33○	1.500	14.000	2.000	.891	1.382	12	1.782	.031	LLSTN32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
-244-C	●	●		43○	1.500	14.000	2.000	.891	1.382	12	1.782	.031	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-283-C	●	●		33○	1.750	14.000	2.500	1.016	1.632	11	2.032	.031	LLSTN32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
-284-C	●	●		43○	1.750	14.000	2.500	1.016	1.632	11	2.032	.031	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-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

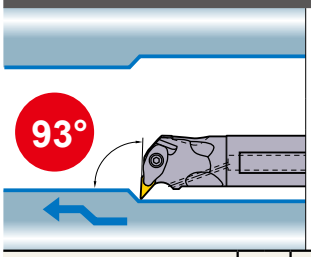
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

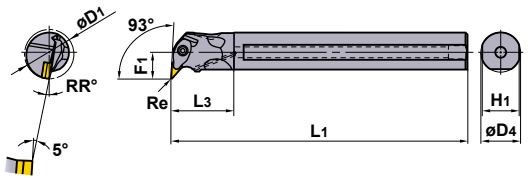
SN○○ type inserts	**➤ A085–A089**
TN○○ type inserts	**➤ A090–A096**
CBN & PCD inserts	**➤ B028–B031, B056**

● : **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)	

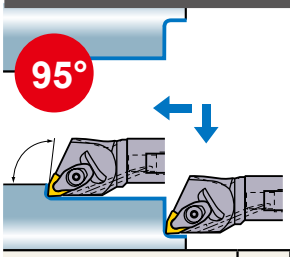
Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) D4	L1	L3	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) Re	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
S-DVUNR/L-203-C	●	●	VNMA VNMG VNGA VNGM NP-VNMA NP-VNGA	33○	1.250	14.000	2.000	1.000	1.171	10	2.000	.031	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
-243-C	●	●		33○	1.500	14.000	2.500	1.125	1.382	9	2.250	.031	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F

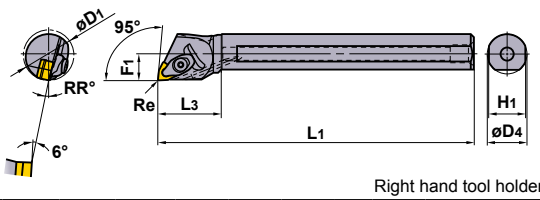
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

* 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) D4	L1	L3	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) 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
-163-C	●	●		33○	1.000	12.000	1.750	.641	.922	13	1.282	.031	LLSWP32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
-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
-204-C	●	●		43○	1.250	14.000	2.000	.766	1.171	13	1.532	.031	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-244-C	●	●		43○	1.500	14.000	2.500	.891	1.382	12	1.782	.031	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-284-C	●	●		43○	1.750	14.000	2.500	1.125	1.632	11	2.250	.031	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-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

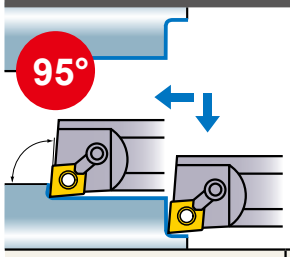
VN○○ type inserts ➤ A097—A099
WN○○ type inserts ➤ A100—A103
CBN & PCD inserts ➤ B032—B034, B057
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

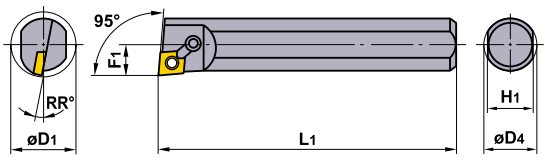
MULTIPLE CLAMP TYPE

- 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		Dimensions (inch) D4	L1	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Shim	Shim Pin *3	Clamp Bridge	Clamp Screw *3
S-MCLNR/L-123	●	●	CNMA CNMG CNMM CNGG NP-CNMA NP-CNGA	32○	.750	10.000	.500	.700	14	**1.000**	—	NL33	CL7	XNS36
-163	●	●		32○	1.000	12.000	.640	.910	14	**1.280**	—	NL33	CL7	XNS36
-164	●	●		43○ *2	1.000	12.000	.640	.910	14	**1.280**	—	NL44	CL20	XNS47
-204	●	●		43○ *2	1.250	12.000	.765	1.160	14	**1.530**	ICSN433 *1	NL46	CL20	XNS47
-244	●	●		43○ *2	1.500	14.000	.890	1.410	14	**1.780**	ICSN433 *1	NL46	CL20	XNS47
-284	●	●		43○ *2	1.750	14.000	1.015	1.660	12	**2.030**	ICSN433 *1	NL46	CL20	XNS47
-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.

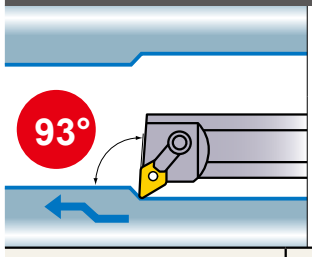
*2 For inserts without hole, remove shim pin and add below.

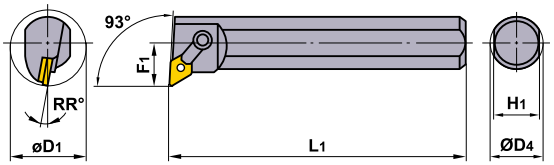
Shim Screw	S46	Chipbreaker	CBC4

*3 Clamp Torque (lbf-in) : NL33=13, NL44=19, NL46=19, NL68=43, XNS36=30, XNS47=45, XNS510=70

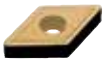
S-MDUN

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		Dimensions (inch) D4	L1	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Shim	Shim Pin *2	Clamp Bridge	Clamp Screw *2
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
-244	●	●		43○	1.500	14.000	1.125	1.410	10	**2.250**	IDSN433	NL46	CL12	XNS59
-284	●	●		43○	1.750	14.000	1.250	1.660	10	**2.500**	IDSN433	NL46	CL12	XNS59
-285	□			54○ *1	1.750	14.000	1.375	1.660	10	**2.750**	IDSN533 *1	NL58	CL30	XNS510
-324	●	●		43○	2.000	14.000	1.375	1.910	10	**2.750**	IDSN433	NL46	CL12	XNS59
-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.

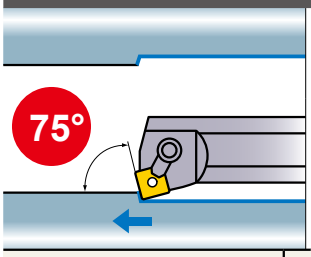
● : **Inventory maintained.**

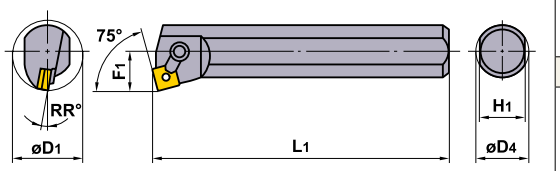
□ : **Non stock, produced to order only.**

CN○○ type inserts	**➤ A072–A077**
DN○○ type inserts	**➤ A078–A083**
CBN & PCD inserts	**➤ B022–B027, B055**

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		Insert Number		Dimensions (inch)					Min. Cutting Diameter (inch)	Shim *3	Shim Pin *3	Clamp Bridge	Clamp Screw *3
	R	L			D_4	L_1	F_1	H_1	RR°	D_1				
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
-244	●	●		43○ *1 *2	1.500	14.000	.890	1.410	14	**1.780**	ISSN433 *1	NL46	CL9	XNS59
-284	●	●		43○ *1 *2	1.750	14.000	1.015	1.660	12	**2.030**	ISSN433 *1	NL46	CL9	XNS59
-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 M009 for different thickness or radius.

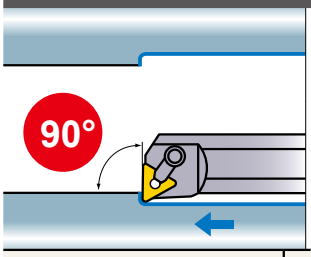
*2 For inserts without hole, remove shim pin and add below.

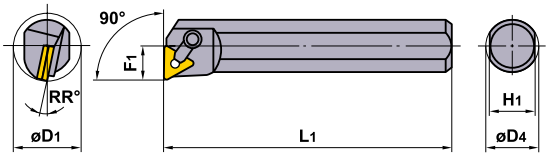
*3 Clamp Torque (lbf-in) : NL46=19, NL68=43, XNS58=70, XNS59=70

Shim Screw	S34	Chipbreaker	CBS4

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		Insert Number		Dimensions (inch)					Min. Cutting Diameter (inch)	Shim *3	Shim Pin *3	Clamp Bridge	Clamp Screw *3
	R	L			D_4	L_1	F_1	H_1	RR°	D_1				
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
-203X	●	●		33○ *1 *2	1.250	12.000	.765	1.160	12	**1.530**	ITSN323 *1	NL34L	CL7	XNS35
-243X	●	●		33○ *1 *2	1.500	14.000	.890	1.410	10	**1.780**	ITSN323 *1	NL34L	CL7	XNS35
-244	●	●		43○ *1	1.500	14.000	1.031	1.410	10	**2.062**	ITSN432 *1	NL46	CL9	XNS59
-283X	□			33○ *1 *2	1.750	14.000	1.015	1.660	10	**2.030**	ITSN323 *1	NL34L	CL7	XNS35
-284	●	●		43○ *1	1.750	14.000	1.156	1.660	8	**2.312**	ITSN432 *1	NL46	CL9	XNS59
-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 M009 for different thickness or radius.

*2 For inserts without hole, remove shim pin and add below.

*3 Clamp Torque (lbf-in) : NL34L=13, NL46=19, XNS35=30, XNS59=70

Shim Screw	S34	Chipbreaker	CBT3

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—.015	—.12
K	Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	200—330	.004—.016	—.20	200—330	.004—.012	—.16

SN○○ type inserts ➤ A085—A089

TN○○ type inserts ➤ A090—A096

CBN & PCD inserts ➤ B028—B031, B056

SPARE PARTS ➤ M001

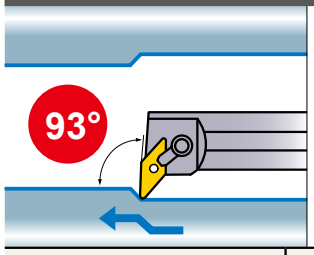
TECHNICAL DATA ➤ N001

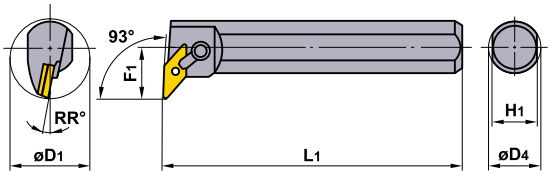
MULTIPLE CLAMP TYPE

- 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		Insert Number		Dimensions (inch)					Min. Cutting Diameter (inch)				
	R	L			D4	L1	F1	H1	RR°	D1	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
-243	●			33○	1.500	14.000	1.250	1.41	12	**2.500**	IVSN322	NL34L	CL12	XNS58
-284	●			43○ *1	1.750	14.000	1.500	1.66	12	**3.000**	IVSN432 *1	NL46	CL12	XNS59
-324	□			43○ *1	2.000	16.000	1.625	1.91	12	**3.250**	IVSN432 *1	NL46	CL12	XNS59

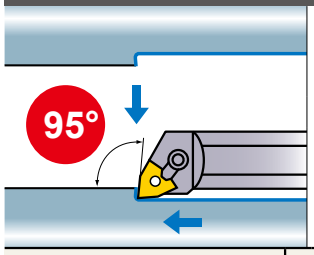
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

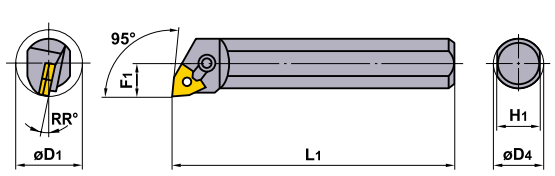
*1 (Opt.) See page M010 for different radius.

*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		Insert Number		Dimensions (inch)					Min. Cutting Diameter (inch)				
	R	L			D4	L1	F1	H1	RR°	D1	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
-163	●	●		32○	1.000	12.000	.640	.910	14	**1.280**	—	NL33	CL7	XNS36
-164	●	●		43○	1.000	12.000	.640	.910	14	**1.280**	—	NL44	CL20	XNS47
-204	●	●		43○	1.250	12.000	.765	1.160	14	**1.530**	IWSN432	NL46	CL20	XNS48
-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.**

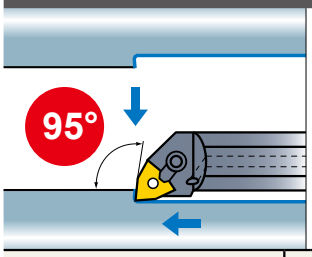
□ : **Non stock, produced to order only.**

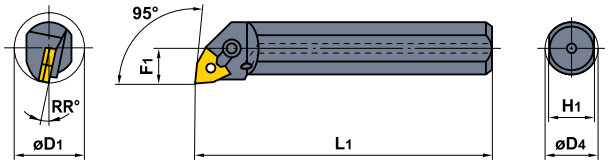
VN○○ type inserts	**➤ A097–A099**
WN○○ type inserts	**➤ A100–A103**
CBN & PCD inserts	**➤ B032–B034, B057**

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)					Min. Cutting Diameter (inch)		*		*
	R	L			D_4	L_1	F_1	H_1	RR°	D_1	Shim	Shim Pin	Clamp Bridge	Clamp Screw
M-MWLNR/L-164-C	●	●	WNMA WNMG NP-WNMA	43○	1.000	12.000	.640	.955	14	**1.280**	–	NL44	CL20	XNS47
-204-C	●	●		43○	1.250	12.000	.765	1.205	14	**1.530**	IWSN432	NL46	CL20	XNS48
-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 ➤ A100–A103
CBN inserts ➤ B034
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

AL TYPE BORING BARS

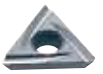
- Shank sizes ϕ.625inch thru ϕ1.000inch.
- Screw-on type.
- Recommended for aluminum, nonferrous metals and plastics.

S-STFE

Steel shank

TE○○inserts

Medium
R/L

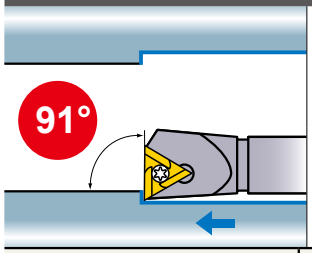


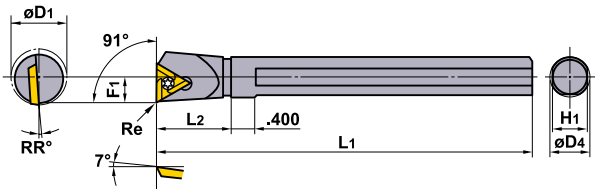
(3)

PCD
R/L



(3)





Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) D4	L1	L2	F1	H1	RR°	Min. Cutting Diameter (inch) D1	Standard Corner Radius (inch) Re	* Clamp Screw	Wrench
S-STFER/L-103	●	●	TEGX	32○	.625	8.000	1.250	.406	.560	3	**.813**	.016	FC400890T	TKY10F
-123	●	●		32○	.750	10.000	1.500	.500	.700	3	**1.000**	.016	FC400890T	TKY10F
-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 ➤ A129
PCD inserts ➤ B066

● : Inventory maintained.

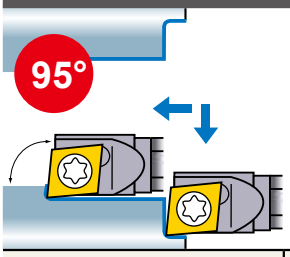
MICRO-DEX

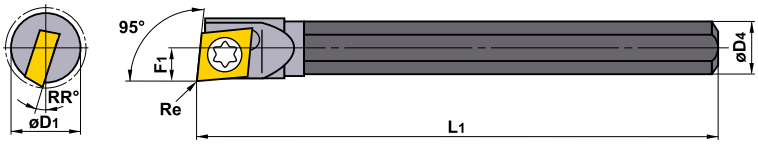
- The minimum cutting diameter is ϕ5mm (.197inch).
- 7°positive insert.
- Carbide shank type.
- Easy-to-use tool geometries.
- Suitable for small workpiece.
- l/d is 5 times the diameter.

SCLC

Carbide shank — **CC○○inserts**

Finish: L F





Right hand tool holder only.


(03,04)

CBN


(03,04)

Order Number	Stock	Insert Number		Dimensions (mm)					Min. Cutting Diameter (mm)	Standard Corner Radius (mm)	*	
	R			D4	L1	F1	H1	RR°	D1	Re	Clamp Screw	Wrench
C04GSCLCR03	●	CCGT NP-CCMW	03S1○○L-F	4	90	2.5	3.7	15	**5**	0.2	TS16	TKY06F
C05HSCLCR03	●		03S1○○L-F	5	100	3.0	4.7	13	**6**	0.2	TS16	TKY06F
C06JSCLCR04	●		04T0○○L-F	6	110	3.5	5.7	13	**7**	0.2	TS21	TKY06F
C07KSCLCR04	●		04T0○○L-F	7	125	4.0	6.7	11	**8**	0.2	TS21	TKY06F

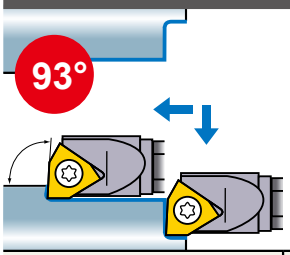
(Note) When using inserts with right and left hand chip breakers, please use left hand inserts for right hand holders and right hand inserts for left hand holders.

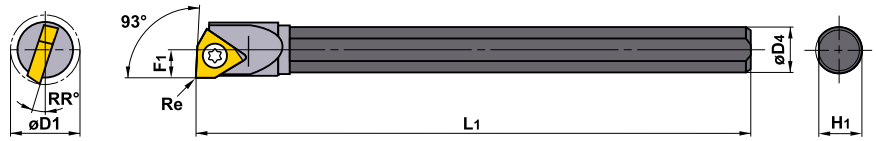
* Clamp Torque (lbf-in) : TS16=5.3, TS21=5.3

SWUB

Carbide shank — **WBGT inserts**

Finish: L F





Right hand tool holder only.


(1.2,1.5)

Order Number	Stock	Insert Number		Dimensions (mm)					Min. Cutting Diameter (mm)	Standard Corner Radius (mm)	*	
	R			D4	L1	F1	H1	RR°	D1	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 ➤ A108
WBGT type inserts ➤ A142
CBN inserts ➤ B040
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

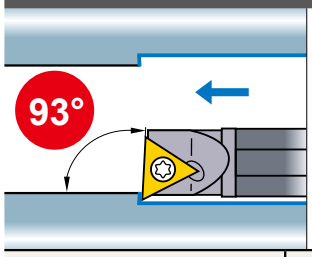
MICRO-DEX

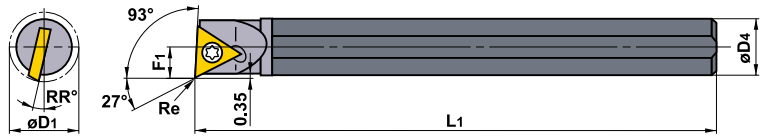
- The minimum cutting diameter is ϕ8mm (.315inch).
- 7°positive insert.
- Carbide shank type.
- Easy-to-use tool geometries.
- Suitable for small workpiece.
- l/d is 5 times the diameter.

STUC

Carbide shank — **TCGT inserts**

Finish: L F







Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)					Min. Cutting Diameter (mm)	Standard Corner Radius (mm)	*	
	R			D4	L1	F1	H1	RR°	D1	Re	Clamp Screw	Wrench
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

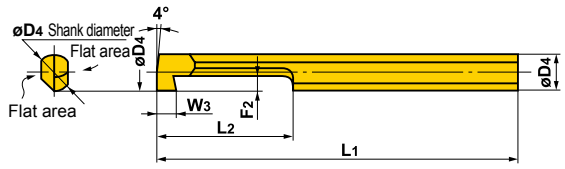
● : Inventory maintained. (1 MICRO-MINI in one case)

TCGT type inserts ➤ A127

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	Dimensions (mm)				Min. Cutting Diameter (mm)	Max. Depth of Groove (mm)
		TF15	W3	D4	L1	L2		F2
	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

Right hand tool only.

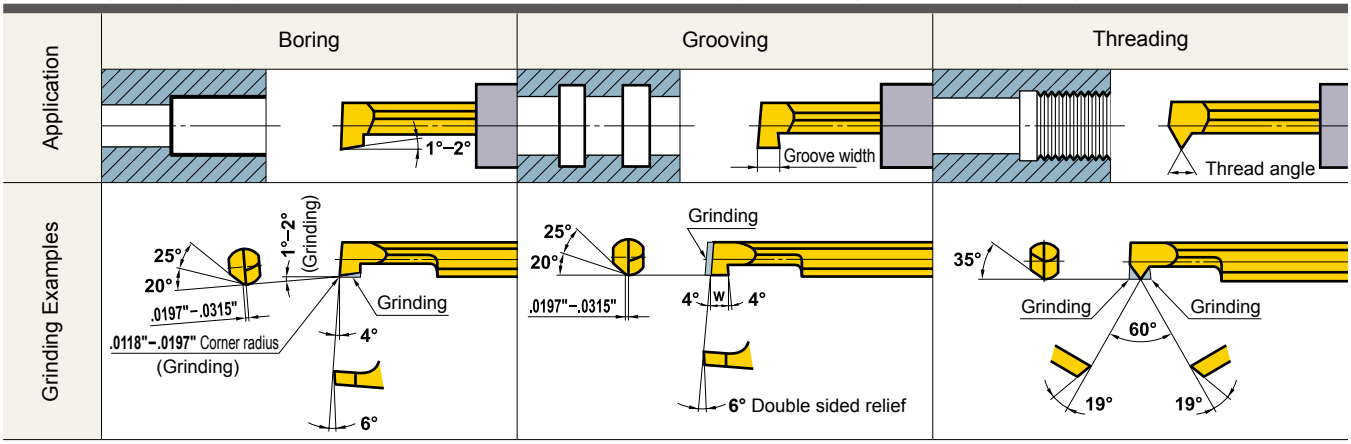
RECOMMENDED CUTTING CONDITIONS

	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.



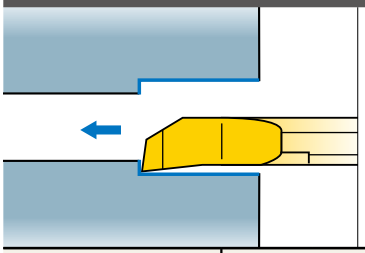
BORING BARS

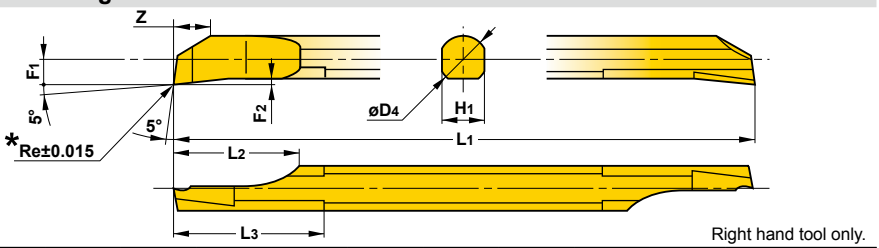
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

MICRO-MINI TWIN

CB

For boring





Right hand tool only.

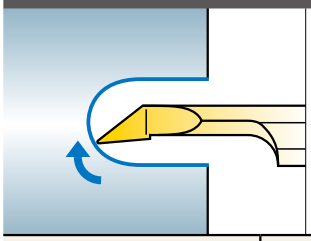
Order Number	Stock		Breaker	Min. Cutting Diameter (mm)		Dimensions (mm)								
	Micro Grain Carbide	Coated												
	TF15	VP15TF		l/d≤3	l/d>3	Re	D4	L1	L2	L3	F1	F2	H1	Z
CB02RS	●	●	Without	2.2	3.6	0.05	2	50	5	6	1	0.25	1.8	1.4
02RS-B	●	●	With	2.2	3.9	0.05	2	50	5	6	1	0.25	1.8	1.4
02RS-01	●	●	Without	2.2	3.6	0.1	2	50	5	6	1	0.25	1.8	1.4
02RS-01B	●	●	With	2.2	4.2	0.1	2	50	5	6	1	0.25	1.8	1.4
02RS-02	●	●	Without	2.2	3.6	0.2	2	50	5	6	1	0.25	1.8	1.4
02RS-02B	●	●	With	2.2	4.9	0.2	2	50	5	6	1	0.25	1.8	1.4
03RS	●	●	Without	3.2	4.2	0.05	3	50	7.5	9	1.5	0.35	2.7	2.3
03RS-B	●	●	With	3.2	4.4	0.05	3	50	7.5	9	1.5	0.35	2.7	2.3
03RS-01	●	●	Without	3.2	4.2	0.1	3	50	7.5	9	1.5	0.35	2.7	2.3
03RS-01B	●	●	With	3.2	4.5	0.1	3	50	7.5	9	1.5	0.35	2.7	2.3
03RS-02	●	●	Without	3.2	4.2	0.2	3	50	7.5	9	1.5	0.35	2.7	2.3
03RS-02B	●	●	With	3.2	4.8	0.2	3	50	7.5	9	1.5	0.35	2.7	2.3
04RS	●	●	Without	4.2	5.1	0.05	4	60	10	12	2	0.45	3.6	3.1
04RS-B	●	●	With	4.2	5.2	0.05	4	60	10	12	2	0.45	3.6	3.1
04RS-01	●	●	Without	4.2	5.1	0.1	4	60	10	12	2	0.45	3.6	3.1
04RS-01B	●	●	With	4.2	5.3	0.1	4	60	10	12	2	0.45	3.6	3.1
04RS-02	●	●	Without	4.2	5.1	0.2	4	60	10	12	2	0.45	3.6	3.1
04RS-02B	●	●	With	4.2	5.5	0.2	4	60	10	12	2	0.45	3.6	3.1
05RS	●	●	Without	5.2	6.0	0.05	5	70	12.5	15	2.5	0.55	4.5	3.9
05RS-B	●	●	With	5.2	6.1	0.05	5	70	12.5	15	2.5	0.55	4.5	3.9
05RS-02	●	●	Without	5.2	6.0	0.2	5	70	12.5	15	2.5	0.55	4.5	3.9
05RS-02B	●	●	With	5.2	6.4	0.2	5	70	12.5	15	2.5	0.55	4.5	3.9
06RS	●	●	Without	6.2	7.2	0.05	6	75	12.5	18	3	0.65	5.4	4.7
06RS-B	●	●	With	6.2	7.3	0.05	6	75	12.5	18	3	0.65	5.4	4.7
06RS-02	●	●	Without	6.2	7.2	0.2	6	75	12.5	18	3	0.65	5.4	4.7
06RS-02B	●	●	With	6.2	7.8	0.2	6	75	12.5	18	3	0.65	5.4	4.7
07RS	●	●	Without	7.2	8.6	0.05	7	85	12.5	21	3.5	0.75	6.3	5.5
07RS-B	●	●	With	7.2	8.8	0.05	7	85	12.5	21	3.5	0.75	6.3	5.5
07RS-02	●	●	Without	7.2	8.6	0.2	7	85	12.5	21	3.5	0.75	6.3	5.5
07RS-02B	●	●	With	7.2	9.2	0.2	7	85	12.5	21	3.5	0.75	6.3	5.5

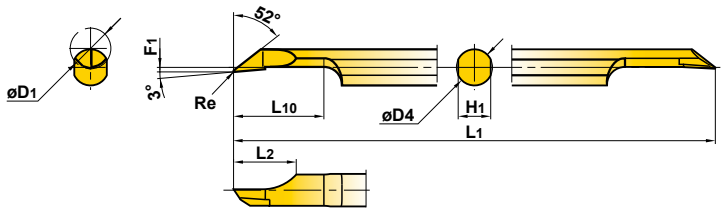
* The Re dimension represents the size before grinding a chip breaker.

● : Inventory maintained. (1 MICRO-MINI TWIN in one case)

CR

For copying

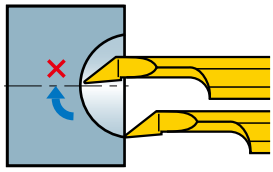
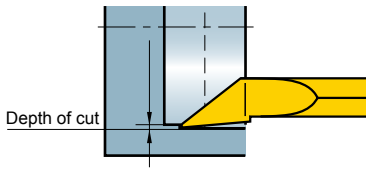




Right hand tool only.

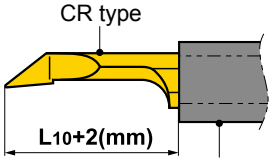
Order Number	Stock		Breaker	Min.Cutting Diameter (mm)	Dimensions (mm)						
	Micrograin Carbide	Coated									
	TF15	VP15TF		D1	Re	D4	L1	L10	L2	F1	H1
CR03RS-01	●	●	Without	**3.5**	0.1	3	50	8	6	0.15	2.7
03RS-01B	●	●	With	**3.5**	0.1	3	50	8	6	0.15	2.7
04RS-01	●	●	Without	**4.5**	0.1	4	60	10	7	0.15	3.6
04RS-01B	●	●	With	**4.5**	0.1	4	60	10	7	0.15	3.6
05RS-01	●	●	Without	**5.5**	0.1	5	70	12	8	0.15	4.5
05RS-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

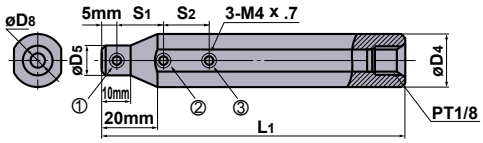
(Note) Recommend wet machining.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

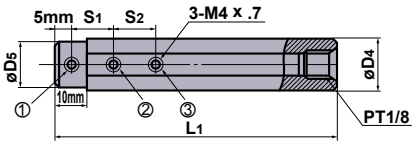
HOLDER (INCH SHANK STANDARD)

RBH

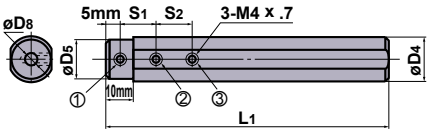
Round type holder



RBH16□□□A
(Coolant thru)



RBH10□□□A, RBH12□□□A
(Coolant thru)



RBH190□□N

ID (ϕD8) : INCH TYPE

Order Number	Stock	Dimensions						Clamp Screw *			Wrench	Torque (lbf-in)
		D4 (inch)	D8 (inch)	D5 (mm)	L1 (mm)	S1 (mm)	S2 (mm)	①	②	③		
RBH10300A	●	.625	.187	15	100	15	15	A	A	A	HKY20F	18 (2.0N·m)
10350A	●	.625	.219	15	100	15	15	A	A	A	HKY20F	18 (2.0N·m)
10400A	●	.625	.250	15	100	20	20	A	A	A	HKY20F	18 (2.0N·m)
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)
12350A	●	.750	.219	18	125	15	15	B	B	B	HKY20F	18 (2.0N·m)
12400A	●	.750	.250	18	125	20	20	B	B	B	HKY20F	18 (2.0N·m)
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)
16350A	●	1.000	.219	15	150	15	15	A	C	C	HKY20F	18 (2.0N·m)
16400A	●	1.000	.250	16	150	20	20	A	C	C	HKY20F	18 (2.0N·m)
16500A	●	1.000	.313	17	150	20	20	A	C	C	HKY20F	18 (2.0N·m)

ID (ϕD8) : METRIC TYPE

Order Number	Stock	Dimensions						Clamp Screw *			Wrench	Torque (lbf-in)
		D4 (inch)	D8 (mm)	D5 (mm)	L1 (mm)	S1 (mm)	S2 (mm)	①	②	③		
RBH10126A	●	.625	2	15	100	10	—	B	B	—	HKY20F	18 (2.0N·m)
10189A	●	.625	3	15	100	10	10	A	A	A	HKY20F	18 (2.0N·m)
10252A	●	.625	4	15	100	15	15	A	A	A	HKY20F	18 (2.0N·m)
10315A	●	.625	5	15	100	15	15	A	A	A	HKY20F	18 (2.0N·m)
10378A	●	.625	6	15	100	20	20	A	A	A	HKY20F	18 (2.0N·m)
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)
19030N	●	.750	3	18	125	10	10	B	B	B	HKY20F	18 (2.0N·m)
19040N	●	.750	4	18	125	15	15	B	B	B	HKY20F	18 (2.0N·m)
19050N	●	.750	5	18	125	15	15	B	B	B	HKY20F	18 (2.0N·m)
19060N	●	.750	6	18	125	15	15	B	B	B	HKY20F	18 (2.0N·m)
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)
16189A	●	1.000	3	12	150	10	10	A	B	C	HKY20F	18 (2.0N·m)
16252A	●	1.000	4	13	150	15	15	A	C	C	HKY20F	18 (2.0N·m)
16315A	●	1.000	5	14	150	15	15	A	C	C	HKY20F	18 (2.0N·m)
16378A	●	1.000	6	15	150	20	20	A	C	C	HKY20F	18 (2.0N·m)
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
		10189A	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
		10252A	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
		10315A	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
		10378A	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
		10441A	07RS(-B) 07RS-0□(B)	–	C07GS□□□R□□	–	
	ID : Inch Type	**RBH10300A**	For DIMPLE BAR and SCREW CLAMP TYPE				
		10350A					
		10400A					
		10500A					
Round Type Holder ϕ.750 inch	ID : Metric Type	**RBH19020N**	02RS(-B) 02RS-0□(B)	–	–	–	Citizen Precision Machinery Co., Ltd.
		19030N	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
		19040N	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
		19050N	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
		19060N	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
		19070N	07RS(-B) 07RS-0□(B)	–	C07GS□□□R□□	–	
	ID : Inch Type	**RBH12300A**	For DIMPLE BAR and SCREW CLAMP TYPE				
		12350A					
		12400A					
		12500A					
Round Type Holder ϕ1.000 inch	ID : Metric Type	**RBH16126A**	02RS(-B) 02RS-0□(B)	–	–	–	Citizen Precision Machinery Co., Ltd. NC lathes
		16189A	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
		16252A	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
		16315A	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
		16378A	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
		16441A	07RS(-B) 07RS-0□(B)	–	C07GS□□□R□□	–	
	ID : Inch Type	**RBH16300A**	For DIMPLE BAR and SCREW CLAMP TYPE				
		16350A					
		16400A					
		16500A					

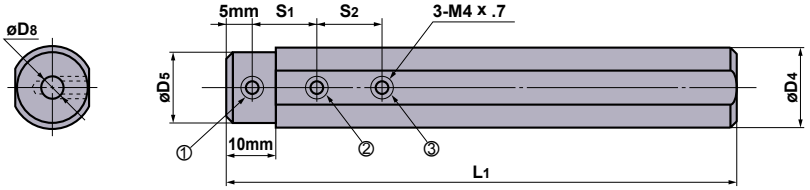
* Mitsubishi Materials obtained the makers' approval before entering their names in the list.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

HOLDER (METRIC SHANK STANDARD)

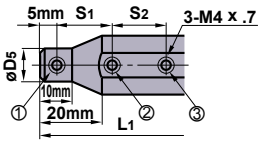
RBH

Round type holder

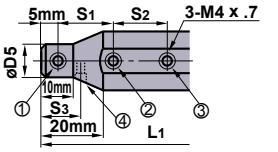


RBH16○○N

RBH20○○N
RBH25○○N



RBH22○○N



Order Number	Stock	Dimensions (mm)							Clamp Screw *				Wrench	Torque (lbf-in)
		D4	D8	D5	L1	S1	S2	S3	①	②	③	④		
RBH1620N	●	16	2	15	100	10	—	—	B	B	—	—	HKY20F	18 (2.0N·m)
1630N	●	16	3	15	100	10	10	—	A	A	A	—	HKY20F	18 (2.0N·m)
1640N	●	16	4	15	100	15	15	—	A	A	A	—	HKY20F	18 (2.0N·m)
1650N	●	16	5	15	100	15	15	—	A	A	A	—	HKY20F	18 (2.0N·m)
1660N	●	16	6	15	100	15	15	—	A	A	A	—	HKY20F	18 (2.0N·m)
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)
2030N	●	20	3	12	125	10	10	—	A	A	B	—	HKY20F	18 (2.0N·m)
2040N	●	20	4	13	125	15	15	—	A	B	B	—	HKY20F	18 (2.0N·m)
2050N	●	20	5	14	125	15	15	—	A	B	B	—	HKY20F	18 (2.0N·m)
2060N	●	20	6	15	125	15	15	—	A	B	B	—	HKY20F	18 (2.0N·m)
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)
2230N	●	22	3	12	125	10	10	10	A	B	C	A	HKY20F	18 (2.0N·m)
2240N	●	22	4	13	125	15	15	12.5	A	B	B	A	HKY20F	18 (2.0N·m)
2250N	●	22	5	14	125	15	15	12.5	A	B	B	A	HKY20F	18 (2.0N·m)
2260N	●	22	6	15	125	15	15	15	A	B	B	A	HKY20F	18 (2.0N·m)
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)
2530N	●	25	3	12	150	10	10	—	A	B	C	—	HKY20F	18 (2.0N·m)
2540N	●	25	4	13	150	15	15	—	A	C	C	—	HKY20F	18 (2.0N·m)
2550N	●	25	5	14	150	15	15	—	A	C	C	—	HKY20F	18 (2.0N·m)
2560N	●	25	6	15	150	15	15	—	A	C	C	—	HKY20F	18 (2.0N·m)
2570N	●	25	7	16	150	20	20	—	A	C	C	—	HKY20F	18 (2.0N·m)

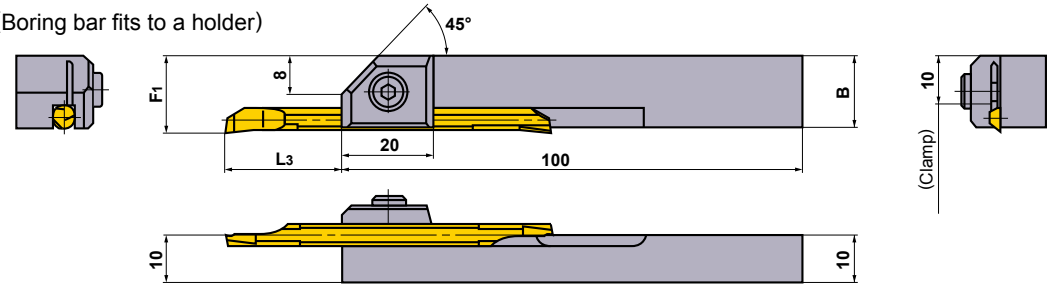
* Order number of clamp screw A=HSS04004, B=HSS04006, C=HSS04008

● : Inventory maintained. ★ : Inventory maintained in Japan.

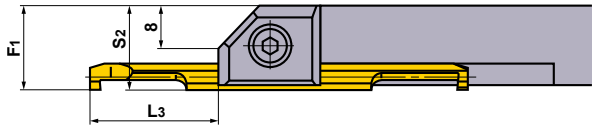
SBH

Square type holder

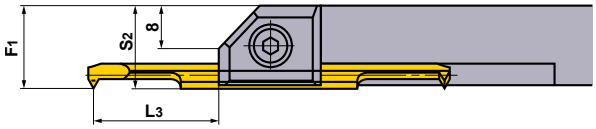
CB type (Boring bar fits to a holder)



CG type (Boring bar fits to a holder)



CT type (Boring bar fits to a holder)



Order Number	Stock	Dimensions (mm) F1 CB type	F1 CG type	F1 CT type	Maximum Tool Overhang L3 (Recommended tool overhang when machining general steels) CB type	CG..RS-10 CG..RS-10B	CG..RS-20 CG..RS-20B	CT type	CR type	S2 CG CT·CR type	B CB·CG CT·CR type	MICRO-MINI TWIN CB type	CG type	CT type	CR type	Clamp Screw	Wrench	Torque (lbf-in)
SBH1020R	★	13	—	—	6—24 (6—10)	—	—	—	—	—	12.9	02RS(-B) 02RS-0□(B)	—	—	—	HSC 04010	HKY30R	42 (4.8N·m)
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)
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)
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)
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)
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
	1630N	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
	1640N	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
	1650N	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
	1660N	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
	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
	2030N	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
	2040N	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
	2050N	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
	2060N	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
	2070N	07RS(-B) 07RS-0□(B)	–	C07GS□□□R□□	–	
Round Type Holder ϕ22mm	**RBH2220N**	02RS(-B) 02RS-0□(B)	–	–	–	STAR MICRONICS CO., LTD.
	2230N	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
	2240N	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
	2250N	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
	2260N	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
	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
	2530N	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
	2540N	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
	2550N	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
	2560N	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
	2570N	07RS(-B) 07RS-0□(B)	–	C07GS□□□R□□	–	
Square Type Holder □10mm	**SBH1020R**	02RS(-B) 02RS-0□(B)	–	–	–	NC lathes
	1030R	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	–	
	1040R	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	–	–	
	1050R	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	–	–	
	1060R	06RS(-B) 06RS-0□(B)	–	–	–	
	1070R	07RS(-B) 07RS-0□(B)	–	–	–	

* Mitsubishi Materials obtained the makers' approval before entering their names in the list.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

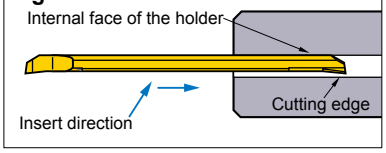
PRECAUTION IN USING THE MICRO-MINI TWIN

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.

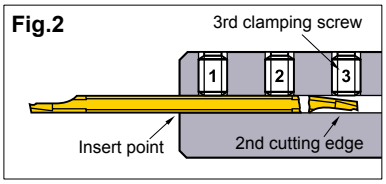
Fig.1



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



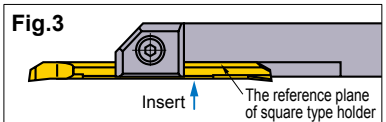
●When using a square type holder

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.

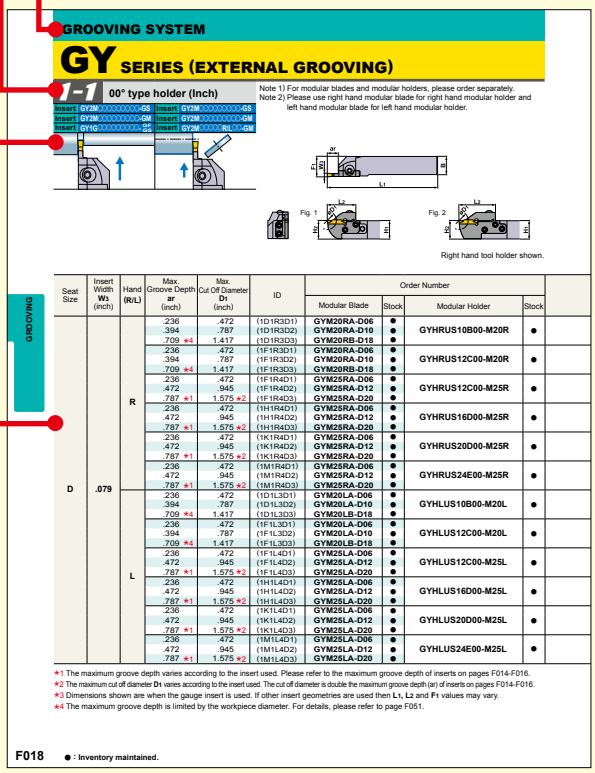
INDICATION OF HOLDER TYPE ACCORDING TO APPLICATION
indicates the holder types, such as 00º type or 90º type.

PRODUCT SECTION

TITLE OF PRODUCT

GEOMETRY

MIN. CUTTING DIAMETER
is color-coded to locate at a glance, the minimum cutting diameters for internal machining.



GROOVING SYSTEM

GY SERIES (EXTERNAL GROOVING)

1-1 00° type holder (Inch)

Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder and left hand modular blade for left hand modular holder.

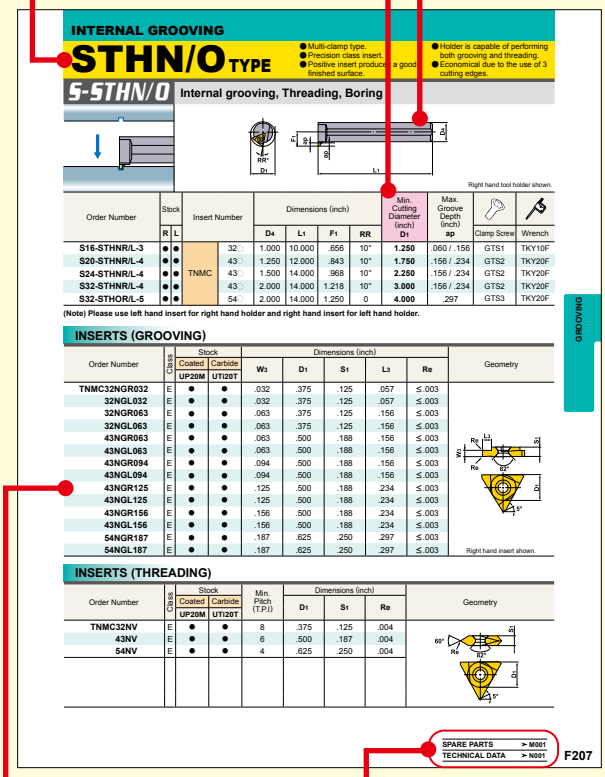
Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	Max. Groove Depth ar (inch)	Max. Cut Off Diameter D1 (inch)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
D	.079	R	.236	.472	(1D1R3D1)	GYM20RA-D06	●	GYHRUS10B00-M20R	●
			.394	.787	(1D1R3D2)	GYM20RA-D10	●		
			.709 ※4	1.417	(1D1R3D3)	GYM20RB-D18	●		
			.236	.472	(1F1R3D1)	GYM20RA-D06	●	GYHRUS12C00-M20R	●
			.394	.787	(1F1R3D2)	GYM20RA-D10	●		
			.709 ※4	1.417	(1F1R3D3)	GYM20RB-D18	●		
			.236	.472	(1F1R4D1)	GYM25RA-D06	●	GYHRUS12C00-M25R	●
			.472	.945	(1F1R4D2)	GYM25RA-D12	●		
			.787 ※1	1.575 ※2	(1F1R4D3)	GYM25RA-D20	●		
			.236	.472	(1H1R4D1)	GYM25RA-D06	●	GYHRUS16D00-M25R	●
			.472	.945	(1H1R4D2)	GYM25RA-D12	●		
			.787 ※1	1.575 ※2	(1H1R4D3)	GYM25RA-D20	●		
			.236	.472	(1K1R4D1)	GYM25RA-D06	●	GYHRUS20D00-M25R	●
			.472	.945	(1K1R4D2)	GYM25RA-D12	●		
			.787 ※1	1.575 ※2	(1K1R4D3)	GYM25RA-D20	●		
			.236	.472	(1M1R4D1)	GYM25RA-D06	●	GYHRUS24E00-M25R	●
			.472	.945	(1M1R4D2)	GYM25RA-D12	●		
			.787 ※1	1.575 ※2	(1M1R4D3)	GYM25RA-D20	●		
		L	.236	.472	(1D1L3D1)	GYM20LA-D06	●	GYHLUS10B00-M20L	●
			.394	.787	(1D1L3D2)	GYM20LA-D10	●		
			.709 ※4	1.417	(1D1L3D3)	GYM20LB-D18	●		
			.236	.472	(1F1L3D1)	GYM20LA-D06	●	GYHLUS12C00-M20L	●
			.394	.787	(1F1L3D2)	GYM20LA-D10	●		
			.709 ※4	1.417	(1F1L3D3)	GYM20LB-D18	●		
			.236	.472	(1F1L4D1)	GYM25LA-D06	●	GYHLUS12C00-M25L	●
			.472	.945	(1F1L4D2)	GYM25LA-D12	●		
			.787 ※1	1.575 ※2	(1F1L4D3)	GYM25LA-D20	●		
			.236	.472	(1H1L4D1)	GYM25LA-D06	●	GYHLUS16D00-M25L	●
			.472	.945	(1H1L4D2)	GYM25LA-D12	●		
			.787 ※1	1.575 ※2	(1H1L4D3)	GYM25LA-D20	●		
			.236	.472	(1K1L4D1)	GYM25LA-D06	●	GYHLUS20D00-M25L	●
			.472	.945	(1K1L4D2)	GYM25LA-D12	●		
			.787 ※1	1.575 ※2	(1K1L4D3)	GYM25LA-D20	●		
			.236	.472	(1M1L4D1)	GYM25LA-D06	●	GYHLUS24E00-M25L	●
			.472	.945	(1M1L4D2)	GYM25LA-D12	●		
			.787 ※1	1.575 ※2	(1M1L4D3)	GYM25LA-D20	●		

※1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
※2 The maximum cut off diameter **D1** varies according to the insert used. The cut off diameter is double the maximum groove depth (ar) of inserts on pages F014-F016.
※3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1**, **L2** and **F1** values may vary.
※4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F051.

F018 ● : Inventory maintained.

GROOVING



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) D4	L1	F1	RR	Min. Cutting Diameter (inch) D1	Max. Groove Depth (inch) ap	Clamp Screw	Wrench
S16-STHNR/L-3	●	●		1.000	10.000	.656	10°	1.250	.060 / .156	GTS1	TKY10F
S20-STHNR/L-4	●	●		1.250	12.000	.843	10°	1.750	.156 / .234	GTS2	TKY20F
S24-STHNR/L-4	●	●	TNMC	1.500	14.000	.968	10°	2.250	.156 / .234	GTS2	TKY20F
S32-STHNR/L-4	●	●		2.000	14.000	1.218	10°	3.000	.156 / .234	GTS2	TKY20F
S32-STHOR/L-5	●	●		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 (GROOVING)

Order Number	Class	Stock Coated UP20M	Stock Carbide UTi20T	Dimensions (inch) W3	D1	S1	L3	Re	Geometry
TNMC32NGR032	E	●	●	.032	.375	.125	.057	≤.003	
32NGL032	E	●	●	.032	.375	.125	.057	≤.003	
32NGR063	E	●	●	.063	.375	.125	.156	≤.003	
32NGL063	E	●	●	.063	.375	.125	.156	≤.003	
43NGR063	E	●	●	.063	.500	.188	.156	≤.003	
43NGL063	E	●	●	.063	.500	.188	.156	≤.003	
43NGR094	E	●	●	.094	.500	.188	.156	≤.003	
43NGL094	E	●	●	.094	.500	.188	.156	≤.003	
43NGR125	E	●	●	.125	.500	.188	.234	≤.003	
43NGL125	E	●	●	.125	.500	.188	.234	≤.003	
43NGR156	E	●	●	.156	.500	.188	.234	≤.003	
43NGL156	E	●	●	.156	.500	.188	.234	≤.003	
54NGR187	E	●	●	.187	.625	.250	.297	≤.003	
54NGL187	E	●	●	.187	.625	.250	.297	≤.003	

Right hand insert shown.

INSERTS (THREADING)

Order Number	Class	Stock Coated UP20M	Stock Carbide UTi20T	Min. Pitch (TPI)	Dimensions (inch) D1	S1	Re	Geometry
TNMC32NV	E	●	●	8	.375	.125	.004	
43NV	E	●	●	6	.500	.187	.004	
54NV	E	●	●	4	.625	.250	.004	

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

F207

GROOVING

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.

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.

●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 HOLDER F012

GY INSERTS F014
GY HOLDER (EXTERNAL) F018
GY HOLDER (FACE GROOVING) F058
GY HOLDER (INTERNAL) F178

UG HOLDER (EXTERNAL GROOVING) F204

MTVO HOLDER (EXTERNAL GROOVING) F206

S-STHN/O HOLDER (INTERNAL GROOVING) F207
FSL51/52 HOLDER (INTERNAL GROOVING) F208
S-SL5N HOLDER (INTERNAL GROOVING) F209

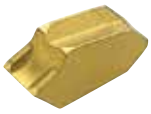
MICRO-MINI TWIN BORING BARS
CG TYPE (INTERNAL GROOVING) F211

Arranged by Alphabetical order.

F211 **CG**
F208 **FSL5**
F018 **GY (Holders)**
F014 **GY (Inserts)**
F204 **KGBN**
F205 **KGT (Inserts)**
F210 **MLG (Inserts)**
F210 **MLT (Inserts)**
F206 **MTVO**
F209 **S-SL5N**
F207 **S○○-STHN**
F207 **S○○-STHO**
F206 **TNMC (Inserts)**
F204 **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	Face Grooving	Copying	
GY Holder 		● Clamp-on type. ● High accuracy and rigidity due to the modular blade. (Tri-lock system) ● Various insert types.	.079 (2.0mm) .094 .098 (2.5mm) .118 (3.0mm) .125 .157 (4.0mm) .187 .197 (5.0mm) .236 (6.0mm) .250				.079 (2.0mm) .098 (2.5mm) .118 (3.0mm) .125 .157 (4.0mm) .187 .197 (5.0mm) .236 (6.0mm) .250	F018
UG Holder 		● Spring clamp type. ● Strengthened insert clamping. ● Block and blade type. ● Maximum cut off diameter 4.724inch.		.087 .122 .161 .201				F204
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					F206

INTERNAL CUTTING

Name of Tool Holder	Insert Shape	Features	Min. Cutting Diameter (inch)	Groove Width (inch)	Max. Groove Depth (inch)	Page
GY 		● Clamp-on type. ● High accuracy and rigidity due to the modular blade. (Tri-lock system) ● Various insert types.	.984 (25mm)	.079 (2.0mm) .094 .098 (2.5mm) .118 (3.0mm) .125 .157 (4.0mm) .187 .197 (5.0mm) .236 (6.0mm) .250	.157 I .512	F178
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 I .297	F207
FSLS S-SLS 		● 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 I .118	F208
MICRO-MINI TWIN Boring Bars 	–	● Solid carbide type. ● Economical due to single holder with two cutting edges.	.118	.04 I .08	.04 I .08	F211
MICRO-MINI Boring Bars 	–	● Solid carbide type. ● Insert can be ground to suit the application.	.126	.08 I .12	.04 I .08	E031

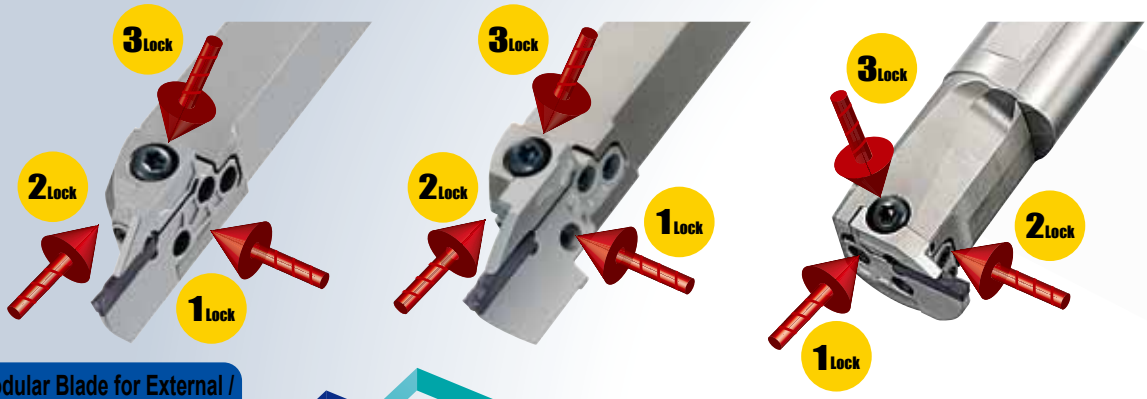
FEATURES OF THE GY SERIES

Tri Lock System for increased stability and performance!

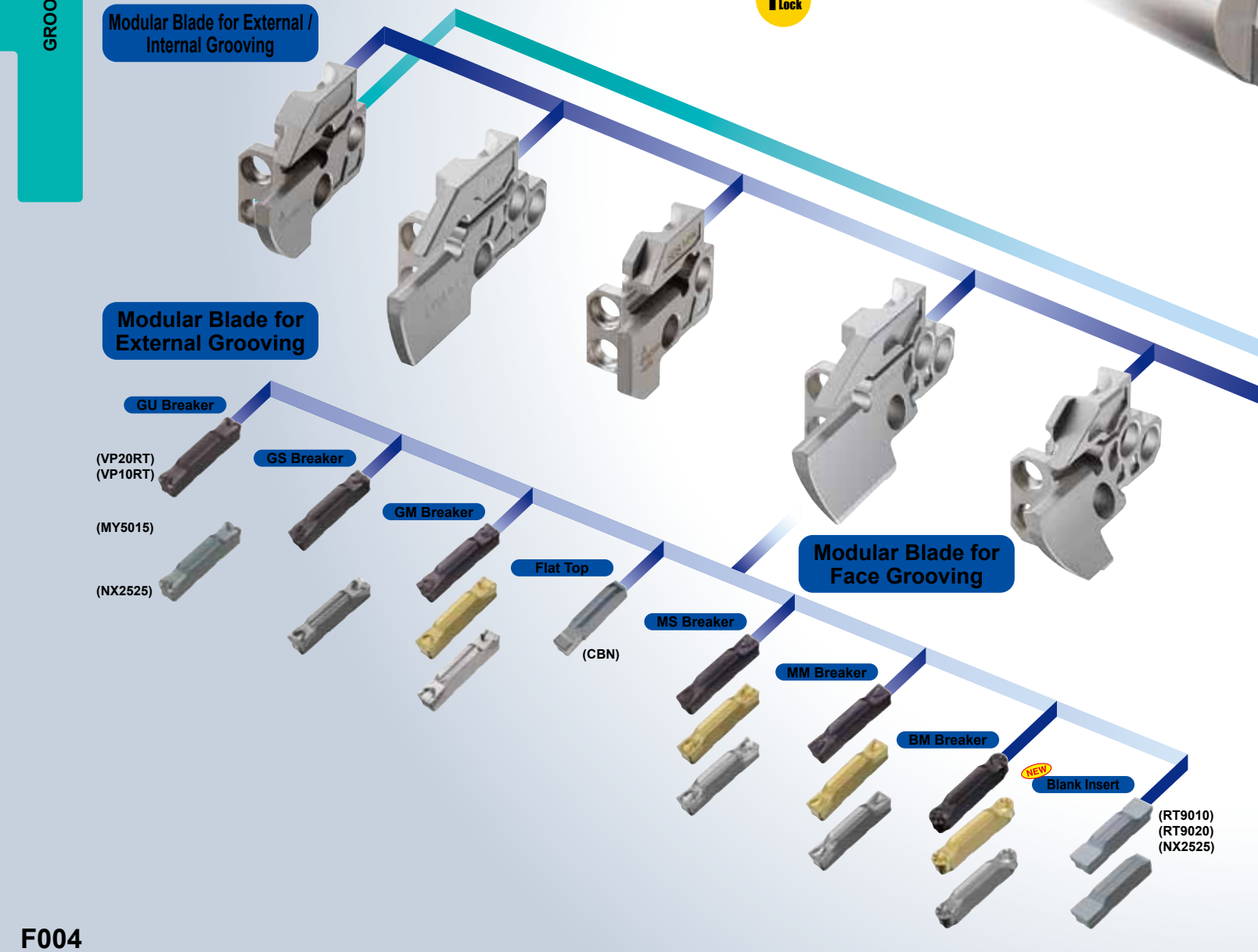
Innovative Tri Lock System

- 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.

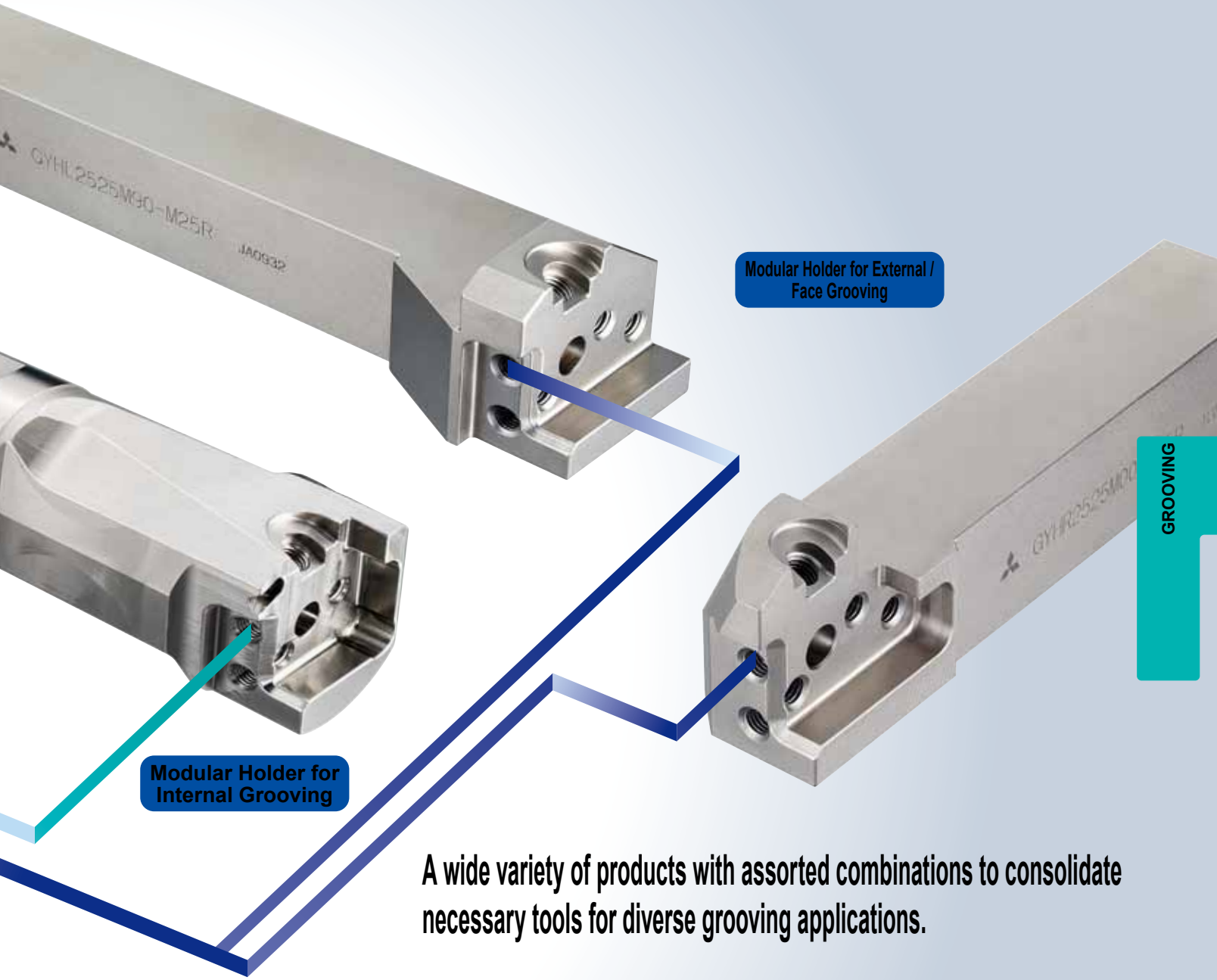
*Mitsubishi Materials study data







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.

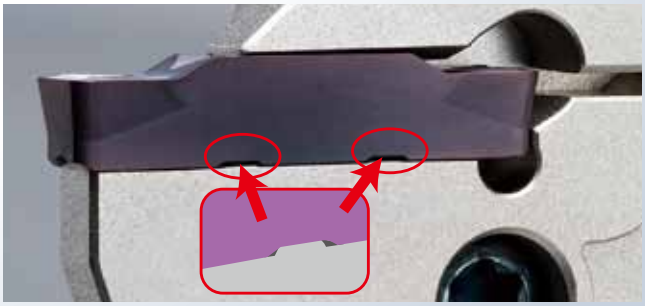


A wide variety of products with assorted combinations to consolidate necessary tools for diverse grooving applications.

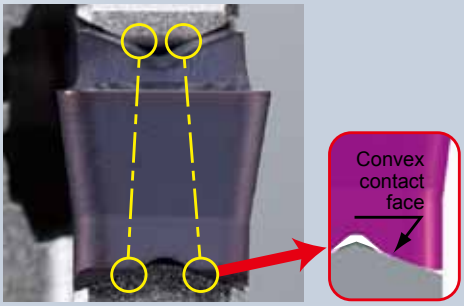
New insert design leading the way for new grooving applications !

● Highly reliable insert clamping

●Safety keys prevent insert movement.



●The convex geometry ensures high precision clamping.

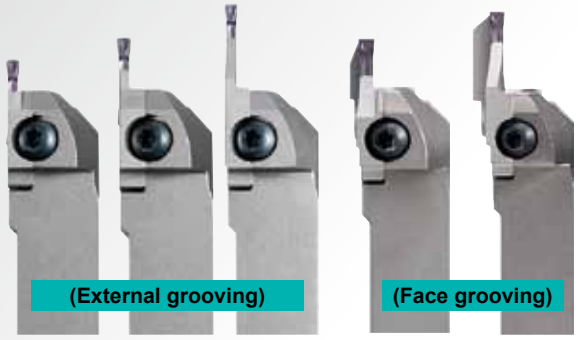


FEATURES OF THE GY SERIES

A wide selection of holders and inserts available for diverse grooving applications.

External • Face holders

- Applicable for various depths of grooves by the wide array of modular blades with different lengths.



- Applicable for various diameter of face grooves by the wide array of modular blades with different grooving diameters.



- Corresponding blades to a variety of modular holders with different shank sizes.



GYM25 Modular blade | **GYM20 Modular blade**

Internal holders

- A wide range of holders available from minimum diameter ø25mm.

Mono block type

(Inch)
ø1.000"
ø1.250"

(Metric)
ø25mm
ø32mm



Modular blade type

(Inch)
ø1.625"
ø2.000"
ø2.500"
ø2.750"

(Metric)
ø40mm
ø50mm
ø60mm
ø70mm

- Short shank types are standard stocked.

Mono block type

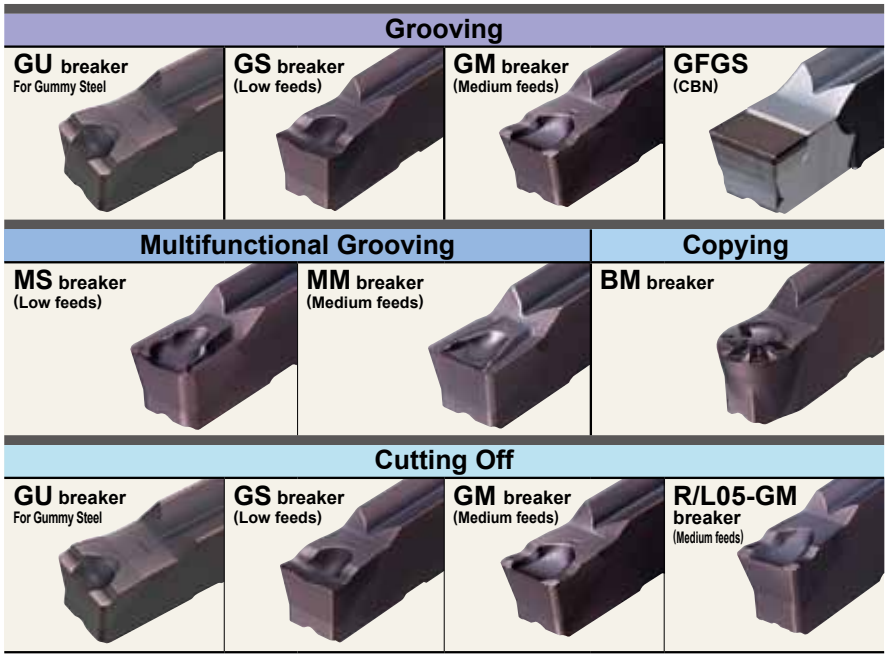


Modular blade type



A wide selection of inserts

•Breaker system



•Selection of groove widths



•Different corner radii available



NEW

•Innovative clamping system ensures reliable grooving.



*Blank inserts to be ground by customers.

Application of Insert Grades

Work Material / Machining Condition	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 VP20RT	MB8025

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.

VP20RT (First recommendetion)

•MIRACLE coated **VP20RT** for general turning operations. The combination of the tough special cemented carbide substrate and MIRACLE coating bring a good balance of wear resistance and fracture toughness at a high level. Corresponding to various work piece materials and diverse applications.

VP10RT

•MIRACLE coated **VP10RT** has high wear resistance.It adopts the special cemented carbide substrate that is harder than VP20RT. Use for hard-to-cut materials or to extend tool life.

MY5015

•CVD coated **MY5015** with excellent wear resistance at higher cutting temperatures. It demonstrates longer tool life when machining cast iron and ductile cast iron. Also use for high speed cutting of steel under stable conditions such as continuous cutting.

NEW RT9010

•Uncoated carbide grade for the blank insert. Use this when you want to obtain long tool life with stability. Substrate is harder than RT9020.
This is an uncoated carbide grade.

NEW RT9020

•A tougher carbide substrate. This grade applies to wide range of applications.
This is an uncoated carbide grade.

NX2525

•**NX2525** is a cermet grade for finishing.
Use for finish cutting of steel to obtain a glazed surface or low-cutting-speed applications that weld easily.

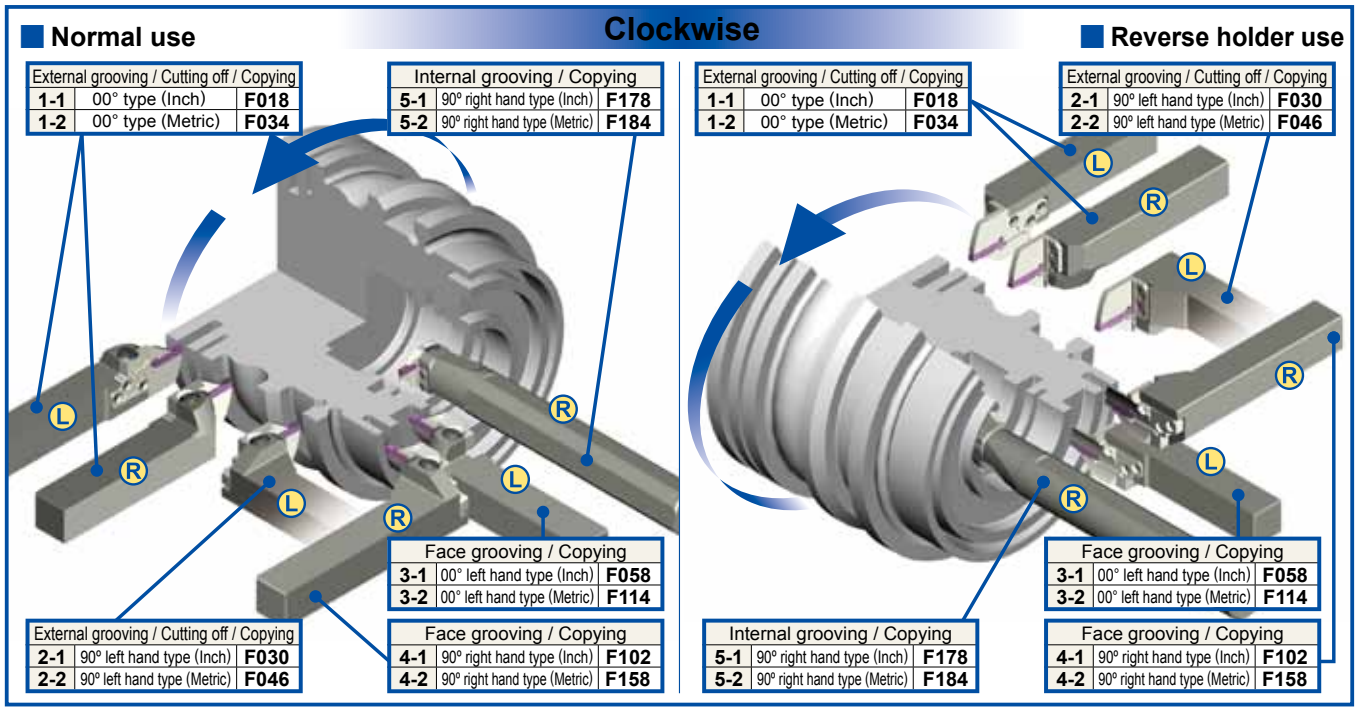
MB8025

•**MB8025** is a sintered cubic-boron-nitride grade for hardened steel.

SELECTION GUIDE (1)

STEP 1 SELECT APPLICATION

1 Select the application and the direction of the workpiece rotation.

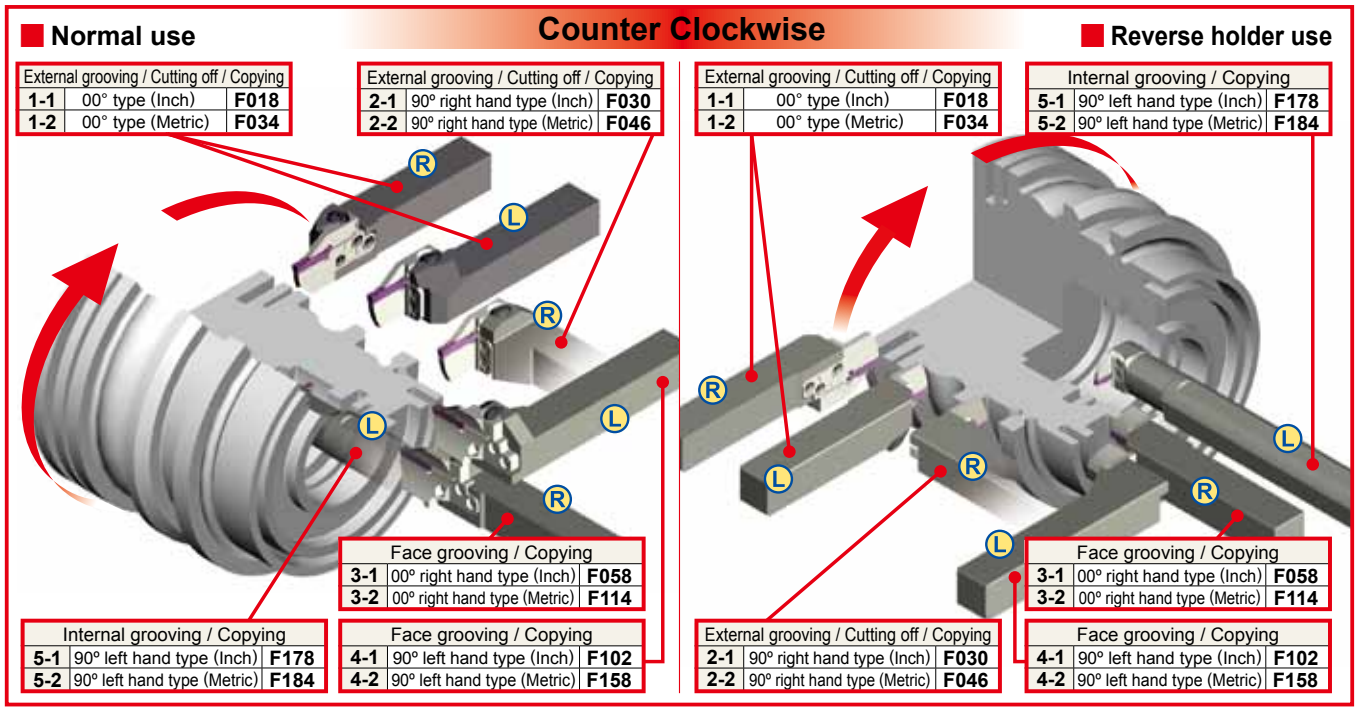


STEP 2 SELECT INSERT

1 Select an insert suitable for the application, then select the corresponding seat size.
* Seat size refers to the seat width of the modular blade.

Inserts

Applications	Geometry (inch)	Order Number	Stock: Coated VP10RT	Coated VP20RT	Cermet MY5015	Cermet NX2525	CBN MB8025	Seat Size	Dimensions (inch): W3 Grooving Width	W3 Tolerance	Re	ar (Max.)	L2
For Grooving / Cutting off	GU Breaker (For Gummy Steel)	NEW GY2M0200D020N-GU	●	●		●		D	.079	±.0012	.008	.776	.815
		NEW 0239E020N-GU	●	●		●		E	.094	±.0012	.008	.780	.815
		NEW 0250E020N-GU	●	●		●		E	.098	±.0012	.008	.768	.815
		NEW 0300F030N-GU	●	●		●		F	.118	±.0012	.012	.760	.815
		NEW 0318F030N-GU	●	●		●		F	.125	±.0012	.012	.760	.815
		0400G030N-GU	●	●		●		G	.157	±.0016	.012	.953	1.010
		0475H040N-GU	●	●		●		H	.187	±.0016	.016	.953	1.010
		0500H040N-GU	●	●		●		H	.197	±.0016	.016	.953	1.010
		0600J040N-GU	●	●		●		J	.236	±.0016	.016	.953	1.010
		0635J040N-GU	●	●		●		J	.250	±.0016	.016	.953	1.010
	GS Breaker (Low feeds)	GY2M0200D020N-GS	●	●		●		D	.079	±.0012	.008	.736	.815
		0239E020N-GS	●	●		●		E	.094	±.0012	.008	.728	.815
		0250E020N-GS	●	●		●		E	.098	±.0012	.008	.728	.815
		0300F020N-GS	●	●		●		F	.118	±.0012	.008	.728	.815
		0318F020N-GS	●	●		●		F	.125	±.0012	.008	.728	.815
		0400G020N-GS	●	●		●		G	.157	±.0016	.008	.941	1.010
		0475H030N-GS	●	●		●		H	.187	±.0016	.012	.941	1.010
		0500H030N-GS	●	●		●		H	.197	±.0016	.012	.945	1.010
		0600J030N-GS	●	●		●		J	.236	±.0016	.012	.949	1.010
		0635J030N-GS	●	●		●		J	.250	±.0016	.012	.949	1.010



STEP3 SELECT MODULAR HOLDER & BLADE

1. Proceed to the tool holder page in STEP1, then go to the column of the seat size selected in STEP 2.
2. Select the hand of the tool holder.
3. Select a modular holder suitable for the application.
4. Select the maximum groove depth.
5. Select a modular blade that corresponds to 4. When selecting a modular blade for face grooving note if the cutting diameter range is suitable.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	Max. Groove Depth ar (inch)	Max. Cut Off Diameter D1 (inch)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
D	.079	R	.236	.472	(1D1R3D1)	GYM20RA-D06	●	GYHRUS10B00-M20R	●
			.394	.787	(1D1R3D2)	GYM20RA-D10	●		
			.709 *4	1.417	(1D1R3D3)	GYM20RB-D18	●		
			.236	.472	(1F1R3D1)	GYM20RA-D06	●	GYHRUS12C00-M20R	●
			.394	.787	(1F1R3D2)	GYM20RA-D10	●		
			.709 *4	1.417	(1F1R3D3)	GYM20RB-D18	●		
			.236	.472	(1F1R4D1)	GYM25RA-D06	●	GYHRUS12C00-M25R	●
			.472	.945	(1F1R4D2)	GYM25RA-D12	●		
			.787 *1	1.575 *2	(1F1R4D3)	GYM25RA-D20	●		
			.236	.472	(1H1R4D1)	GYM25RA-D06	●	GYHRUS16D00-M25R	●
			.472	.945	(1H1R4D2)	GYM25RA-D12	●		
			.787 *1	1.575 *2	(1H1R4D3)	GYM25RA-D20	●		
			.236	.472	(1K1R4D1)	GYM25RA-D06	●	GYHRUS20D00-M25R	●
			.472	.945	(1K1R4D2)	GYM25RA-D12	●		
			.787 *1	1.575 *2	(1K1R4D3)	GYM25RA-D20	●		
			.236	.472	(1M1R4D1)	GYM25RA-D06	●	GYHRUS24E00-M25R	●
			.472	.945	(1M1R4D2)	GYM25RA-D12	●		
			.787 *1	1.575 *2	(1M1R4D3)	GYM25RA-D20	●		
			.236	.472	(1D1L3D1)	GYM20LA-D06	●	GYHLUS10B00-M20L	●
			.394	.787	(1D1L3D2)	GYM20LA-D10	●		
			.709 *4	1.417	(1D1L3D3)	GYM20LB-D18	●		
			.236	.472	(1F1L3D1)	GYM20LA-D06	●		

SELECTION GUIDE (2)

HOLDER SELECTION

External Grooving (➲ F018-F056)

1 00° type

● Modular blade type



Right hand tool holder shown.

2 90° type

● Modular blade type



Right hand tool holder shown.

Inserts ➲ F014		Insert Width					
	Inch	.079″	.094″ .098″	.118″ .125″	.157″	.187″ .197″	.236″ .250″
	Metric	2.00mm	2.39mm 2.50mm	3.00mm 3.18mm	4.00mm	4.75mm 5.00mm	6.00mm 6.35mm
Inch Holders	R	➲ F018	➲ F020	➲ F022	➲ F024	➲ F026	➲ F028
	L	➲ F018	➲ F020	➲ F022	➲ F024	➲ F026	➲ F028
Metric Holders	R	➲ F034	➲ F036	➲ F038	➲ F040	➲ F042	➲ F044
	L	➲ F034	➲ F036	➲ F038	➲ F040	➲ F042	➲ F044

Insert Width					
.079″	.094″ .098″	.118″ .125″	.157″	.187″ .197″	.236″ .250″
2.00mm	2.39mm 2.50mm	3.00mm 3.18mm	4.00mm	4.75mm 5.00mm	6.00mm 6.35mm
➲ F030	➲ F030	➲ F030	➲ F032	➲ F032	➲ F032
➲ F030	➲ F030	➲ F030	➲ F032	➲ F032	➲ F032
➲ F046	➲ F046	➲ F046	➲ F048	➲ F048	➲ F048
➲ F046	➲ F046	➲ F046	➲ F048	➲ F048	➲ F048

INSERT SELECTION

Grooving

GU Breaker — For Gummy Steel



GS Breaker — (Low feeds)



GM Breaker — (Medium feeds)



Flat Top — (CBN)



Multifunctional Grooving

MS Breaker — (Low feeds)



MM Breaker — (Medium feeds)

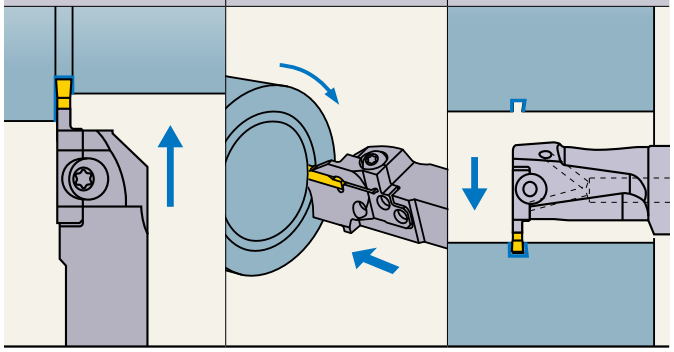


Blank



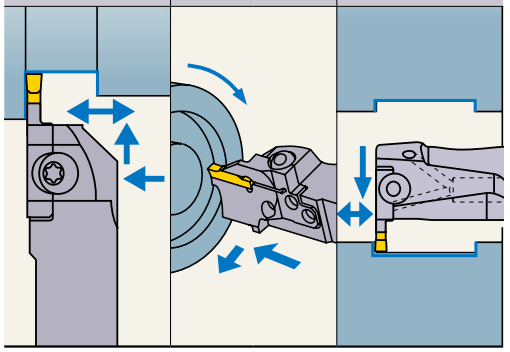
Cutting Mode

External	Face	Internal



Cutting Mode

External	Face	Internal



Face Grooving (➔ F058-F176)

3 00° type

● Modular blade type



Right hand tool holder shown.

Insert Width					
.079″	.094″ .098″	.118″ .125″	.157″	.187″ .197″	.236″ .250″
2.00mm	2.39mm 2.50mm	3.00mm 3.18mm	4.00mm	4.75mm 5.00mm	6.00mm 6.35mm
➔ F058	➔ F066	➔ F074	➔ F082	➔ F090	➔ F098
➔ F062	➔ F070	➔ F078	➔ F086	➔ F094	➔ F100
➔ F114	➔ F122	➔ F130	➔ F138	➔ F146	➔ F154
➔ F118	➔ F126	➔ F134	➔ F142	➔ F150	➔ F156

4 90° type

● Modular blade type



Right hand tool holder shown.

Insert Width					
.079″	.094″ .098″	.118″ .125″	.157″	.187″ .197″	.236″ .250″
2.00mm	2.39mm 2.50mm	3.00mm 3.18mm	4.00mm	4.75mm 5.00mm	6.00mm 6.35mm
➔ F102	➔ F104	➔ F106	➔ F108	➔ F110	➔ F112
➔ F102	➔ F104	➔ F106	➔ F108	➔ F110	➔ F112
➔ F158	➔ F160	➔ F162	➔ F164	➔ F166	➔ F168
➔ F158	➔ F160	➔ F162	➔ F164	➔ F166	➔ F168

Internal Grooving (➔ F178-F195)

5 90° type

● Mono block type (Through air / coolant)

● Modular blade type (Through air / coolant)



Right hand tool holder shown.

Insert Width					
.079″	.094″ .098″	.118″ .125″	.157″	.187″ .197″	.236″ .250″
2.00mm	2.39mm 2.50mm	3.00mm 3.18mm	4.00mm	4.75mm 5.00mm	6.00mm 6.35mm
➔ F178	➔ F178	➔ F180	➔ F180	➔ F182	➔ F182
➔ F178	➔ F178	➔ F180	➔ F180	➔ F182	➔ F182
➔ F184	➔ F184	➔ F186	➔ F186	➔ F188	➔ F188
➔ F184	➔ F184	➔ F186	➔ F186	➔ F188	➔ F188

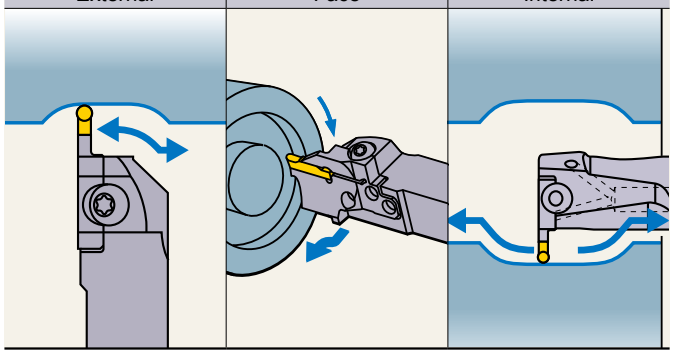
Copying

BM Breaker



Cutting Mode

External	Face	Internal



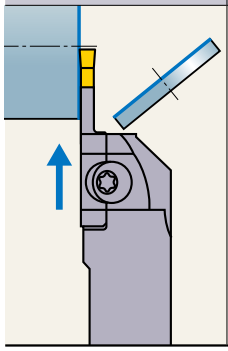
Cutting Off

GU Breaker For Gummy Steel	GS Breaker (Low feeds)	GM Breaker (Medium feeds)	R/L05-GM Breaker (Medium feeds)



Cutting Mode

External	Face	Internal



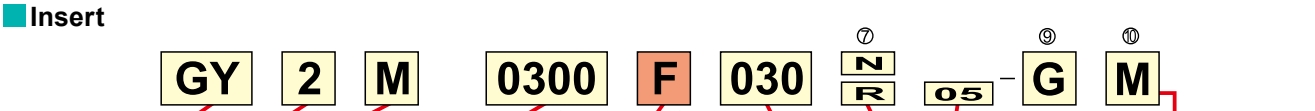
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GROOVING

IDENTIFICATION

Insert



①Series Description

②Number of Teeth

1	1 Edge Type
2	2 Edge Type

③Peripheral

G	Ground
M	Sintered
B	Blank

④Groove Width

	Inch	Metric
0200	.079"	2.00mm
0239	.094"	2.39mm
0250	.098"	2.50mm
0300	.118"	3.00mm
0318	.125"	3.18mm
0400	.157"	4.00mm
0475	.187"	4.75mm
0500	.197"	5.00mm
0600	.236"	6.00mm
0635	.250"	6.35mm

⑤Seat Size *1

	Inch	Metric
D	.079"	2.00mm
E	.094" .098"	2.39mm 2.50mm
F	.118" .125"	3.00mm 3.18mm
G	.157"	4.00mm
H	.187" .197"	4.75mm 5.00mm
J	.236" .250"	6.00mm 6.35mm

⑥Corner Radius

	Inch	Metric
020	.008"	0.20mm
030	.012"	0.30mm
040	.016"	0.40mm
080	.031"	0.80mm
150	.059"	1.50mm
159	.063"	1.59mm
200	.079"	2.00mm
238	.094"	2.38mm
250	.098"	2.50mm
300	.118"	3.00mm
318	.125"	3.18mm

⑦Hand

N	Neutral
R	Right
L	Left

⑧Lead angle (R/L type insert)

05	5°

⑨Application 1

G	Grooving/Cutting off
M	Multifunctional
B	Copying (Ball nose)

⑩Application 2

S	Low feed
M	Medium feed
U	Gummy steel

⑪Application 3

F	Flat Top

* Only for CBN inserts.

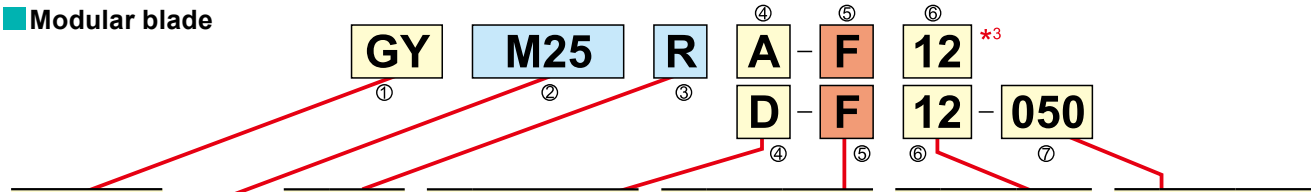
⑫Horning Type *

GS	General Purpose

* Only for CBN inserts.

*1 Select a seat size with the same symbol as that of modular blade and mono block holder.

Modular blade



①Series Description

②Modular Blade Size

M20
M25

③Hand

R	Right
L	Left

④Modular Blade Type

A	External / Internal Standard Type
B	External only Reinforced Type
D	Face grooving Type

⑤Seat Size *1

	Inch	Metric
D	.079"	2.00mm
E	.094" .098"	2.39mm 2.50mm
F	.118" .125"	3.00mm 3.18mm
G	.157"	4.00mm
H	.187" .197"	4.75mm 5.00mm
J	.236" .250"	6.00mm 6.35mm

⑥Max. Groove Depth *2

	Inch	Metric
06	.236"	6mm
08	.315"	8mm
10	.394"	10mm
12	.472"	12mm
14	.551"	14mm
18	.709"	18mm
20	.787"	20mm
25	.984"	25mm

⑦Min. Groove Diameter

	Inch	Metric
035	1.378"	35mm
040	1.575"	40mm
050	1.969"	50mm
060	2.362"	60mm
070	2.756"	70mm
075	2.953"	75mm
085	3.346"	85mm
100	3.937"	100mm
110	4.331"	110mm
125	4.921"	125mm
135	5.315"	135mm
170	6.693"	170mm
180	7.087"	180mm
250	9.843"	250mm

* Only for face grooving.

*1 Select a seat size with the same symbol as that of 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 F178-F189.

*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 HOLDER

(Inch) GY H R US16 D 00 – M25 R

(Metric) GY H R 2525 M 00 – M25 R

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

①Series Description

②Holder Type

H	External / Face Holder

③Hand of Holder

R	Right
L	Left

④Holder Size

Inch		Metric	
US10	.625"x.625"	1616	16mmx16mm
US12	.750"x.750"	2020	20mmx20mm
US16	1.000"x1.000"	2525	25mmx25mm
US20	1.250"x1.250"	3225	32mmx25mm
US24	1.500"x1.500"	3232	32mmx32mm

⑤Holder Length

Inch		Metric	
B	4.5"	J	110mm
C	5.0"	K	125mm
D	6.0"	M	150mm
E	7.0"	P	170mm

⑥Angle (degree)

00	0°
90	90°

⑦Modular Blade Size

M20
M25

⑧Hand of Modular Blade

R	Right
L	Left

INTERNAL HOLDER

●Mono Block Holder Type

(Inch) GY A R US16 K 90 A – F 06

(Metric) GY A R 20 K 90 A – F 06

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①Series Description

②Holder Type

A	Mono block type

③Hand of Holder

R	Right
L	Left

④Shank Size

Inch		Metric	
US12	.750"	20	20mm
US16	1.000"	25	25mm

⑤Holder Length

	Inch	Metric
K	5.0"	125mm
Q	7.0"	180mm
R	8.0"	200mm

⑥Angle (degree)

90	90°

⑦Neck Length

	Inch	Metric
A	1.250"	30mm
B	1.500"	40mm

⑧Seat Size*1

	Inch	Metric
D	.079"	2.00mm
E	.094" .098"	2.39mm 2.50mm
F	.118" .125"	3.00mm 3.18mm
G	.157"	4.00mm
H	.187" .197"	4.75mm 5.00mm
J	.236" .250"	6.00mm 6.35mm

⑨Max. Grooving Depth

	Inch	Metric
06	.236"	6mm
07	.276"	7mm

●Modular Holder Type

(Inch) GY D L US20 L 90 D – M25 R

(Metric) GY D L 40 L 90 D – M25 R

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

①Series Description

②Holder Type

D	Modular blade type

③Hand of Holder

R	Right
L	Left

④Shank Size

Inch		Metric	
US20	1.250"	32	32mm
US24	1.500"	40	40mm
US32	2.000"	50	50mm

⑤Holder Length

	Inch	Metric
L	5.5"	140mm
M	6.0"	150mm
P	6.75"	170mm
S	10.0"	250mm
T	12.0"	300mm

⑥Angle (degree)

90	90°

⑦Neck Length

	Inch	Metric
C	2.000"	50mm
D	2.500"	60mm
F	3.250"	80mm

⑧Modular Blade Size

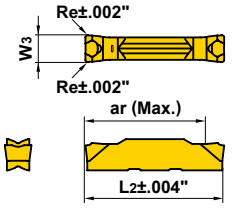
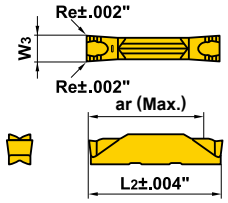
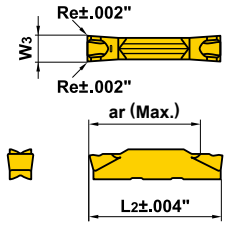
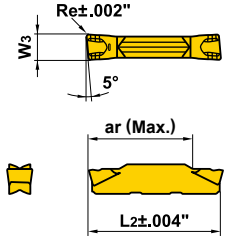
M20
M25

⑨Hand of Modular Blade

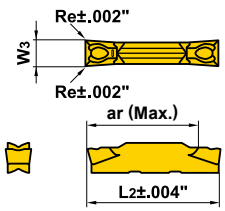
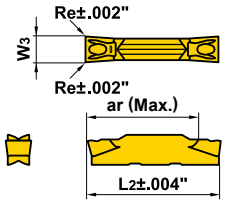
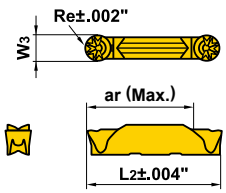
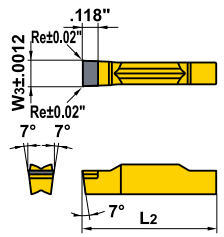
R	Right
L	Left

CLASSIFICATION OF GY INSERTS (EXTERNAL / FACE / INTERNAL)

Inserts

Applications	Geometry (inch)	Order Number	Stock: Coated VP10RT	Coated VP20RT	Coated MY5015	Cermet NX2525	CBN	CBN MB8025	Seat Size	Dimensions (inch): W3 Grooving Width	W3 Tolerance	Re	ar (Max.)	L2
For Grooving / Cutting off	**GU Breaker** (For Gummy Steel) 	NEW GY2M0200D020N-GU	●	●		●			D	.079	±.0012	.008	.776	.815
		NEW 0239E020N-GU	●	●		●			E	.094	±.0012	.008	.780	.815
		NEW 0250E020N-GU	●	●		●			E	.098	±.0012	.008	.768	.815
		NEW 0300F030N-GU	●	●		●			F	.118	±.0012	.012	.760	.815
		NEW 0318F030N-GU	●	●		●			F	.125	±.0012	.012	.760	.815
		0400G030N-GU	●	●		●			G	.157	±.0016	.012	.953	1.010
		0475H040N-GU	●	●		●			H	.187	±.0016	.016	.953	1.010
		0500H040N-GU	●	●		●			H	.197	±.0016	.016	.953	1.010
		0600J040N-GU	●	●		●			J	.236	±.0016	.016	.953	1.010
		0635J040N-GU	●	●		●			J	.250	±.0016	.016	.953	1.010
	GS Breaker (Low feeds) 	GY2M0200D020N-GS	●	●		●			D	.079	±.0012	.008	.736	.815
		0239E020N-GS	●	●		●			E	.094	±.0012	.008	.728	.815
		0250E020N-GS	●	●		●			E	.098	±.0012	.008	.728	.815
		0300F020N-GS	●	●		●			F	.118	±.0012	.008	.728	.815
		0318F020N-GS	●	●		●			F	.125	±.0012	.008	.728	.815
		0400G020N-GS	●	●		●			G	.157	±.0016	.008	.941	1.010
		0475H030N-GS	●	●		●			H	.187	±.0016	.012	.941	1.010
		0500H030N-GS	●	●		●			H	.197	±.0016	.012	.945	1.010
		0600J030N-GS	●	●		●			J	.236	±.0016	.012	.949	1.010
		0635J030N-GS	●	●		●			J	.250	±.0016	.012	.949	1.010
	GM Breaker (Medium feeds) 	GY2M0200D020N-GM	●	●	●	●			D	.079	±.0012	.008	.764	.815
		0239E020N-GM	●	●	●	●			E	.094	±.0012	.008	.764	.815
		0250E020N-GM	●	●	●	●			E	.098	±.0012	.008	.764	.815
		0300F030N-GM	●	●	●	●			F	.118	±.0012	.012	.764	.815
		0318F030N-GM	●	●	●	●			F	.125	±.0012	.012	.764	.815
		0400G030N-GM	●	●	●	●			G	.157	±.0016	.012	.961	1.010
		0475H040N-GM	●	●	●	●			H	.187	±.0016	.016	.957	1.010
		0500H040N-GM	●	●	●	●			H	.197	±.0016	.016	.957	1.010
		0600J040N-GM	●	●	●	●			J	.236	±.0016	.016	.957	1.010
		0635J040N-GM	●	●	●	●			J	.250	±.0016	.016	.957	1.010
For Cutting off	**R/L05-GM Breaker**  Right hand insert shown.	GY2M0200D020R05-GM	●	●					D	.079	±.0012	.008	.768	.819
		0200D020L05-GM	●	●					D	.079	±.0012	.008	.768	.819
		0250E020R05-GM	●	●					E	.098	±.0012	.008	.768	.820
		0250E020L05-GM	●	●					E	.098	±.0012	.008	.768	.820
		0300F030R05-GM	●	●					F	.118	±.0012	.012	.768	.821
		0300F030L05-GM	●	●					F	.118	±.0012	.012	.768	.821
		0400G030R05-GM	●	●					G	.157	±.0016	.012	.965	1.018
		0400G030L05-GM	●	●					G	.157	±.0016	.012	.965	1.018
		0500H040R05-GM	●	●					H	.197	±.0016	.016	.965	1.022
		0500H040L05-GM	●	●					H	.197	±.0016	.016	.965	1.022

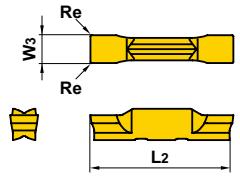
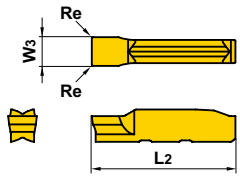
● : Inventory maintained.
<10 inserts in one case><CBN: 1 insert in one case>

Applications	Geometry (inch)	Order Number	Stock: Coated VP10RT	Coated VP20RT	Coated MY5015	Cermet NX2525	Carbide RT9010	Carbide RT9020	CBN MB8025	Seat Size	Dimensions (inch): W3 Grooving Width	W3 Tolerance	Re	ar (Max.)	L2
For Multifunctional Grooving	**MS Breaker** (Low feeds) 	NEW **GY2M0200D020N-MS**	●	●	●	●				D	.079	±.0012	.008	.752	.815
		NEW **0250E020N-MS**	●	●	●	●				E	.098	±.0012	.008	.752	.815
		0300F020N-MS	●	●	●	●				F	.118	±.0012	.008	.756	.815
		0300F040N-MS	●	●	●	●				F	.118	±.0012	.016	.744	.815
		0400G020N-MS	●	●	●	●				G	.157	±.0016	.008	.953	1.010
		0400G040N-MS	●	●	●	●				G	.157	±.0016	.016	.941	1.010
		0500H040N-MS	●	●	●	●				H	.197	±.0016	.016	.941	1.010
		0500H080N-MS	●	●	●	●				H	.197	±.0016	.031	.925	1.010
		0600J040N-MS	●	●	●	●				J	.236	±.0016	.016	.941	1.010
		0600J080N-MS	●	●	●	●				J	.236	±.0016	.031	.925	1.010
	MM Breaker (Medium feeds) 	**GY2M0200D020N-MM**	●	●	●	●				D	.079	±.0012	.008	.752	.815
		0250E020N-MM	●	●	●	●				E	.098	±.0012	.008	.752	.815
		0300F020N-MM	●	●	●	●				F	.118	±.0012	.008	.752	.815
		0300F040N-MM	●	●	●	●				F	.118	±.0012	.016	.744	.815
		0300F080N-MM	●	●	●	●				F	.118	±.0012	.031	.728	.815
		0400G020N-MM	●	●	●	●				G	.157	±.0016	.008	.949	1.010
		0400G040N-MM	●	●	●	●				G	.157	±.0016	.016	.941	1.010
		0400G080N-MM	●	●	●	●				G	.157	±.0016	.031	.925	1.010
		0500H040N-MM	●	●	●	●				H	.197	±.0016	.016	.941	1.010
		0500H080N-MM	●	●	●	●				H	.197	±.0016	.031	.925	1.010
		0600J040N-MM	●	●	●	●				J	.236	±.0016	.016	.941	1.010
		0600J080N-MM	●	●	●	●				J	.236	±.0016	.031	.925	1.010
For Copying	**BM Breaker** 	**GY2M0200D100N-BM**	●	●	●	●				D	.079	±.0012	.039	.768	.815
		0250E125N-BM	●	●	●	●				E	.098	±.0012	.049	.760	.815
		0300F150N-BM	●	●	●	●				F	.118	±.0012	.059	.748	.823
		0318F159N-BM	●	●	●	●				F	.125	±.0012	.063	.744	.823
		0400G200N-BM	●	●	●	●				G	.157	±.0016	.079	.921	1.016
		0475H238N-BM	●	●	●	●				H	.187	±.0016	.094	.902	1.016
		0500H250N-BM	●	●	●	●				H	.197	±.0016	.098	.898	1.016
		0600J300N-BM	●	●	●	●				J	.236	±.0016	.118	.886	1.020
		0635J318N-BM	●	●	●	●				J	.250	±.0016	.125	.878	1.020
For Grooving	**Flat Top** (CBN) 	**GY1G0200D020N-GFGS**							●	D	.079	±.0012	.008	–	.815
		0239E020N-GFGS							●	E	.094	±.0012	.008	–	.815
		0250E020N-GFGS							●	E	.098	±.0012	.008	–	.815
		0300F020N-GFGS							●	F	.118	±.0012	.008	–	.815
		0318F020N-GFGS							●	F	.125	±.0012	.008	–	.815
		0400G020N-GFGS							●	G	.157	±.0012	.008	–	1.010
		0475H020N-GFGS							●	H	.187	±.0012	.008	–	1.010
		0500H020N-GFGS							●	H	.197	±.0012	.008	–	1.010

GROOVING

CLASSIFICATION OF GY INSERTS (EXTERNAL / FACE / INTERNAL)

Inserts

Applications	Geometry (inch)	Order Number	Stock: Coated VP10RT	Coated VP20RT	Coated MY5015	Cermet NX2525		Carbide RT9010	Carbide RT9020	CBN MB8025	Seat Size	Dimensions (inch): W3 Grooving Width	W3 Tolerance	Re	ar (Max.)	L2
Blank	2 Edge Type 	* GY2B0220D020N				★		★	★		D	.087	±.0039	.008	–	.829
		* 0270E020N				★		★	★		E	.106	±.0039	.008	–	.829
		* 0340F020N				★		★	★		F	.134	±.0039	.008	–	.829
		* 0420G020N				★		★	★		G	.165	±.0039	.008	–	1.024
		* 0520H020N				★		★	★		H	.205	±.0039	.008	–	1.024
		* 0655J020N				★		★	★		J	.258	±.0039	.008	–	1.024
	1 Edge Type 	* GY1B0220D020N				★		★	★		D	.087	±.0039	.008	–	.827
		* 0270E020N				★		★	★		E	.106	±.0039	.008	–	.827
		* 0340F020N				★		★	★		F	.134	±.0039	.008	–	.827
		* 0420G020N				★		★	★		G	.165	±.0039	.008	–	1.020
		* 0520H020N				★		★	★		H	.205	±.0039	.008	–	1.020
		* 0655J020N				★		★	★		J	.258	±.0039	.008	–	1.020

* Blank inserts to be ground by customers.

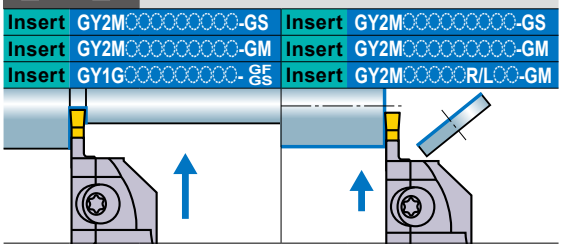
★ : Inventory maintained in Japan.
<10 inserts in one case><CBN: 1 insert in one case>

Application of Insert Grades ➤ F007

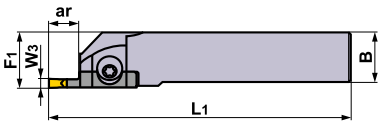
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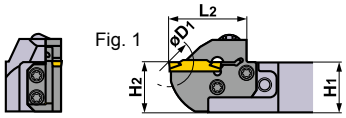
GY SERIES (EXTERNAL GROOVING)

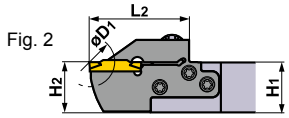
1-1 00° type holder (Inch)



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder and left hand modular blade for left hand modular holder.





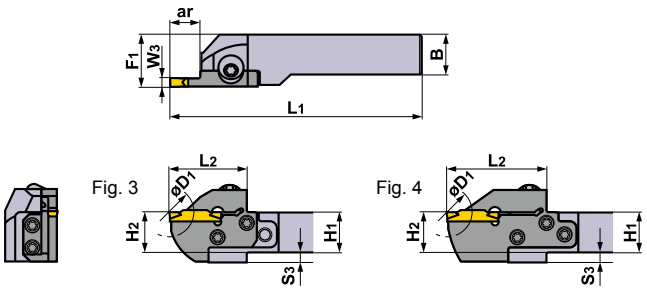


Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	Max. Groove Depth ar (inch)	Max. Cut Off Diameter D1 (inch)	ID	Order Number			
						Modular Blade	Stock	Modular Holder	Stock
D	.079	R	.236	.472	(1D1R3D1)	**GYM20RA-D06**	●	**GYHRUS10B00-M20R**	●
			.394	.787	(1D1R3D2)	**GYM20RA-D10**	●		
			.709 *4	1.417	(1D1R3D3)	**GYM20RB-D18**	●		
			.236	.472	(1F1R3D1)	**GYM20RA-D06**	●	**GYHRUS12C00-M20R**	●
			.394	.787	(1F1R3D2)	**GYM20RA-D10**	●		
			.709 *4	1.417	(1F1R3D3)	**GYM20RB-D18**	●		
			.236	.472	(1F1R4D1)	**GYM25RA-D06**	●	**GYHRUS12C00-M25R**	●
			.472	.945	(1F1R4D2)	**GYM25RA-D12**	●		
			.787 *1	1.575 *2	(1F1R4D3)	**GYM25RA-D20**	●		
			.236	.472	(1H1R4D1)	**GYM25RA-D06**	●	**GYHRUS16D00-M25R**	●
			.472	.945	(1H1R4D2)	**GYM25RA-D12**	●		
			.787 *1	1.575 *2	(1H1R4D3)	**GYM25RA-D20**	●		
			.236	.472	(1K1R4D1)	**GYM25RA-D06**	●	**GYHRUS20D00-M25R**	●
			.472	.945	(1K1R4D2)	**GYM25RA-D12**	●		
			.787 *1	1.575 *2	(1K1R4D3)	**GYM25RA-D20**	●		
			.236	.472	(1M1R4D1)	**GYM25RA-D06**	●	**GYHRUS24E00-M25R**	●
			.472	.945	(1M1R4D2)	**GYM25RA-D12**	●		
			.787 *1	1.575 *2	(1M1R4D3)	**GYM25RA-D20**	●		
		L	.236	.472	(1D1L3D1)	**GYM20LA-D06**	●	**GYHLUS10B00-M20L**	●
			.394	.787	(1D1L3D2)	**GYM20LA-D10**	●		
			.709 *4	1.417	(1D1L3D3)	**GYM20LB-D18**	●		
			.236	.472	(1F1L3D1)	**GYM20LA-D06**	●	**GYHLUS12C00-M20L**	●
			.394	.787	(1F1L3D2)	**GYM20LA-D10**	●		
			.709 *4	1.417	(1F1L3D3)	**GYM20LB-D18**	●		
			.236	.472	(1F1L4D1)	**GYM25LA-D06**	●	**GYHLUS12C00-M25L**	●
			.472	.945	(1F1L4D2)	**GYM25LA-D12**	●		
			.787 *1	1.575 *2	(1F1L4D3)	**GYM25LA-D20**	●		
			.236	.472	(1H1L4D1)	**GYM25LA-D06**	●	**GYHLUS16D00-M25L**	●
			.472	.945	(1H1L4D2)	**GYM25LA-D12**	●		
			.787 *1	1.575 *2	(1H1L4D3)	**GYM25LA-D20**	●		
			.236	.472	(1K1L4D1)	**GYM25LA-D06**	●	**GYHLUS20D00-M25L**	●
			.472	.945	(1K1L4D2)	**GYM25LA-D12**	●		
			.787 *1	1.575 *2	(1K1L4D3)	**GYM25LA-D20**	●		
			.236	.472	(1M1L4D1)	**GYM25LA-D06**	●	**GYHLUS24E00-M25L**	●
			.472	.945	(1M1L4D2)	**GYM25LA-D12**	●		
			.787 *1	1.575 *2	(1M1L4D3)	**GYM25LA-D20**	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 The maximum cut off diameter **D1** varies according to the insert used. The cut off diameter is double the maximum groove depth (ar) of inserts on pages F014-F016.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2** and **F1** values may vary.
*4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F051.

● : Inventory maintained.

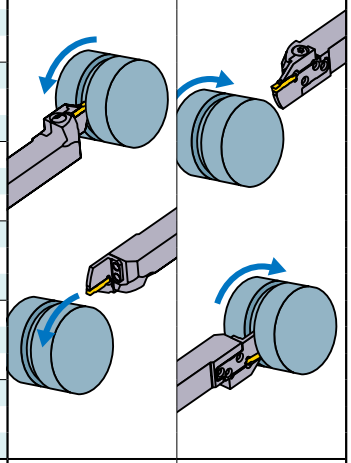
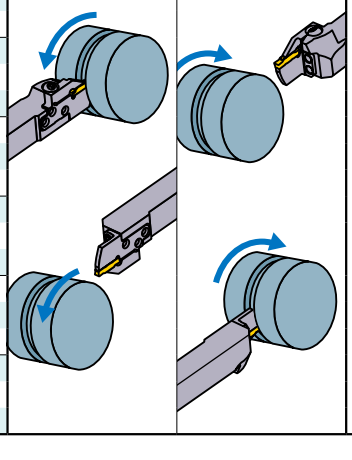


Right hand tool holder shown.

* Wrench : ①For Clamp Screw ②For Blade Screw.

SPARE PARTS

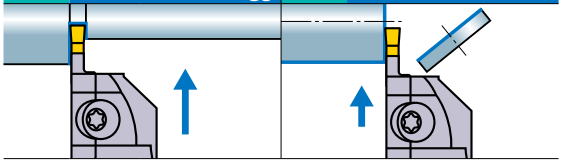
Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHR/LUS10B00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/LUS12C00-M20R/L			
GYHR/LUS12C00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

Dimensions (inch) *3							Fig.	Cutting Mode		Insert	
H1	B	L1	L2	H2	F1	S3		Clockwise	Counter Clockwise	Geometry / Insert Number	Page
.625	.625	4.264	1.102	.625	.812	.125	3			GY2M0200D020N-GS GY2M0200D020N-GM (Gauge insert) GY2M0200D020R05-GM GY2M0200D020L05-GM GY2M0200D020N-MM GY2M0200D100N-BM GY1G0200D020N-GFGS	F014 ı F016
.625	.625	4.500	1.339	.625	.812	.125	3				
.625	.625	4.736	1.575	.625	.812	.125	4				
.750	.750	4.764	1.102	.750	.875	—	1				
.750	.750	5.000	1.339	.750	.875	—	1				
.750	.750	5.236	1.575	.750	.875	—	2				
.750	.750	4.685	1.220	.750	1.000	.250	3				
.750	.750	5.000	1.535	.750	1.000	.250	3				
.750	.750	5.236	1.772	.750	1.000	.250	4				
1.000	1.000	5.685	1.220	1.000	1.125	—	1				
1.000	1.000	6.000	1.535	1.000	1.125	—	1				
1.000	1.000	6.236	1.772	1.000	1.125	—	2				
1.250	1.250	5.685	1.220	1.250	1.375	—	1				
1.250	1.250	6.000	1.535	1.250	1.375	—	1				
1.250	1.250	6.236	1.772	1.250	1.375	—	2				
1.500	1.500	6.685	1.220	1.500	1.625	—	1				
1.500	1.500	7.000	1.535	1.500	1.625	—	1				
1.500	1.500	7.236	1.772	1.500	1.625	—	2				
.625	.625	4.264	1.102	.625	.812	.125	3				
.625	.625	4.500	1.339	.625	.812	.125	3				
.625	.625	4.736	1.575	.625	.812	.125	4				
.750	.750	4.764	1.102	.750	.875	—	1				
.750	.750	5.000	1.339	.750	.875	—	1				
.750	.750	5.236	1.575	.750	.875	—	2				
.750	.750	4.685	1.220	.750	1.000	.250	3				
.750	.750	5.000	1.535	.750	1.000	.250	3				
.750	.750	5.236	1.772	.750	1.000	.250	4				
1.000	1.000	5.685	1.220	1.000	1.125	—	1				
1.000	1.000	6.000	1.535	1.000	1.125	—	1				
1.000	1.000	6.236	1.772	1.000	1.125	—	2				
1.250	1.250	5.685	1.220	1.250	1.375	—	1				
1.250	1.250	6.000	1.535	1.250	1.375	—	1				
1.250	1.250	6.236	1.772	1.250	1.375	—	2				
1.500	1.500	6.685	1.220	1.500	1.625	—	1				
1.500	1.500	7.000	1.535	1.500	1.625	—	1				
1.500	1.500	7.236	1.772	1.500	1.625	—	2				

GY SERIES (EXTERNAL GROOVING)

1-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS | Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM | Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS | Insert GY2M○○○○○R/L○○-GM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder and left hand modular blade for left hand modular holder.

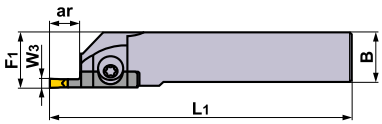




Fig. 1

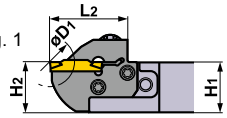
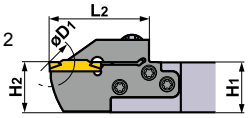


Fig. 2

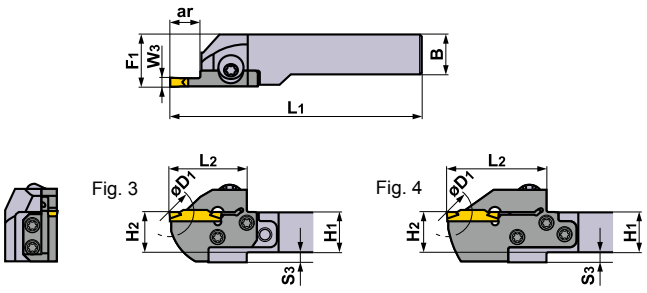


Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	Max. Groove Depth ar (inch)	Max. Cut Off Diameter D1 (inch)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
E	.094 .098	R	.236	.472	(1D1R3E1)	GYM20RA-E06	●	GYHRUS10B00-M20R	●
			.394	.787	(1D1R3E2)	GYM20RA-E10	●		
			.709 *4	1.417	(1D1R3E3)	GYM20RB-E18	●		
			.236	.472	(1F1R3E1)	GYM20RA-E06	●	GYHRUS12C00-M20R	●
			.394	.787	(1F1R3E2)	GYM20RA-E10	●		
			.709 *4	1.417	(1F1R3E3)	GYM20RB-E18	●		
			.236	.472	(1F1R4E1)	GYM25RA-E06	●	GYHRUS12C00-M25R	●
			.472	.945	(1F1R4E2)	GYM25RA-E12	●		
			.787 *1	1.575 *2	(1F1R4E3)	GYM25RA-E20	●		
			.236	.472	(1H1R4E1)	GYM25RA-E06	●	GYHRUS16D00-M25R	●
			.472	.945	(1H1R4E2)	GYM25RA-E12	●		
			.787 *1	1.575 *2	(1H1R4E3)	GYM25RA-E20	●		
			.236	.472	(1K1R4E1)	GYM25RA-E06	●	GYHRUS20D00-M25R	●
			.472	.945	(1K1R4E2)	GYM25RA-E12	●		
			.787 *1	1.575 *2	(1K1R4E3)	GYM25RA-E20	●		
			.236	.472	(1M1R4E1)	GYM25RA-E06	●	GYHRUS24E00-M25R	●
			.472	.945	(1M1R4E2)	GYM25RA-E12	●		
			.787 *1	1.575 *2	(1M1R4E3)	GYM25RA-E20	●		
		L	.236	.472	(1D1L3E1)	GYM20LA-E06	●	GYHLUS10B00-M20L	●
			.394	.787	(1D1L3E2)	GYM20LA-E10	●		
			.709 *4	1.417	(1D1L3E3)	GYM20LB-E18	●		
			.236	.472	(1F1L3E1)	GYM20LA-E06	●	GYHLUS12C00-M20L	●
			.394	.787	(1F1L3E2)	GYM20LA-E10	●		
			.709 *4	1.417	(1F1L3E3)	GYM20LB-E18	●		
			.236	.472	(1F1L4E1)	GYM25LA-E06	●	GYHLUS12C00-M25L	●
			.472	.945	(1F1L4E2)	GYM25LA-E12	●		
			.787 *1	1.575 *2	(1F1L4E3)	GYM25LA-E20	●		
			.236	.472	(1H1L4E1)	GYM25LA-E06	●	GYHLUS16D00-M25L	●
			.472	.945	(1H1L4E2)	GYM25LA-E12	●		
			.787 *1	1.575 *2	(1H1L4E3)	GYM25LA-E20	●		
			.236	.472	(1K1L4E1)	GYM25LA-E06	●	GYHLUS20D00-M25L	●
			.472	.945	(1K1L4E2)	GYM25LA-E12	●		
			.787 *1	1.575 *2	(1K1L4E3)	GYM25LA-E20	●		
			.236	.472	(1M1L4E1)	GYM25LA-E06	●	GYHLUS24E00-M25L	●
			.472	.945	(1M1L4E2)	GYM25LA-E12	●		
			.787 *1	1.575 *2	(1M1L4E3)	GYM25LA-E20	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 The maximum cut off diameter **D1** varies according to the insert used. The cut off diameter is double the maximum groove depth (ar) of inserts on pages F014-F016.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2** and **F1** values may vary.
*4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F051.

● : Inventory maintained.

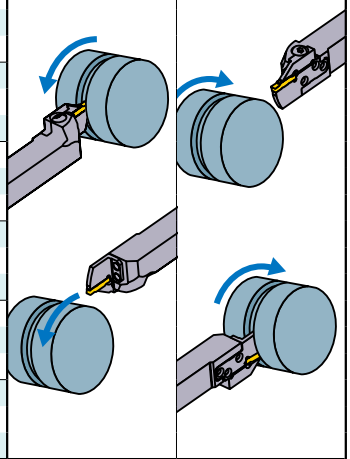
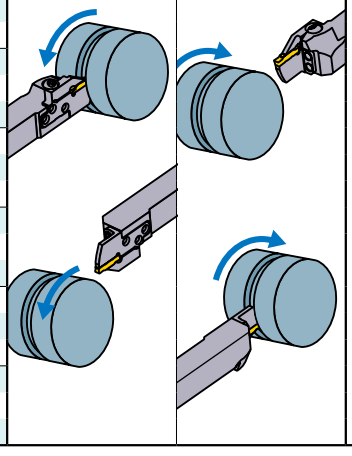


Right hand tool holder shown.

* Wrench : ①For Clamp Screw ②For Blade Screw.

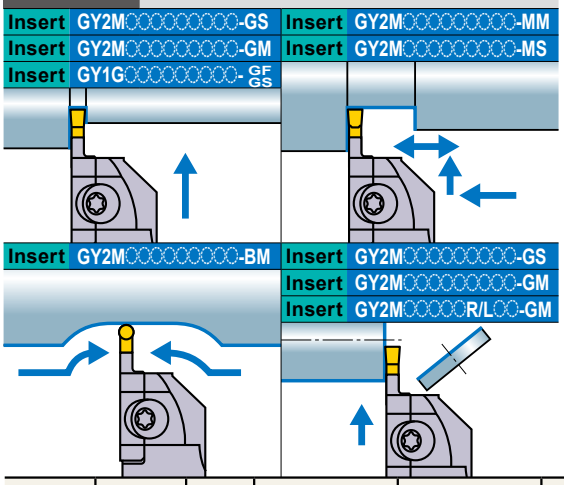
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHR/LUS10B00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/LUS12C00-M20R/L			
GYHR/LUS12C00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

Dimensions (inch) *3							Fig.	Cutting Mode		Insert	
H1	B	L1	L2	H2	F1	S3		Clockwise	Counter Clockwise	Geometry / Insert Number	Page
.625	.625	4.264	1.102	.625	.812	.125	3			GY2M0239E020N-GS GY2M0250E020N-GS	F014 I F016
.625	.625	4.500	1.339	.625	.812	.125	3				
.625	.625	4.736	1.575	.625	.812	.125	4				
.750	.750	4.764	1.102	.750	.875	—	1			GY2M0239E020N-GM GY2M0250E020N-GM (Gauge insert)	
.750	.750	5.000	1.339	.750	.875	—	1				
.750	.750	5.236	1.575	.750	.875	—	2				
.750	.750	4.685	1.220	.750	1.000	.250	3			GY2M0250E020R05-GM GY2M0250E020L05-GM	
.750	.750	5.000	1.535	.750	1.000	.250	3				
.750	.750	5.236	1.772	.750	1.000	.250	4				
1.000	1.000	5.685	1.220	1.000	1.125	—	1			GY2M0250E020N-MM	
1.000	1.000	6.000	1.535	1.000	1.125	—	1				
1.000	1.000	6.236	1.772	1.000	1.125	—	2			GY2M0250E125N-BM	
1.250	1.250	5.685	1.220	1.250	1.375	—	1			GY1G0239E020N-GFGS GY1G0250E020N-GFGS	
1.250	1.250	6.000	1.535	1.250	1.375	—	1				
1.250	1.250	6.236	1.772	1.250	1.375	—	2				
1.500	1.500	6.685	1.220	1.500	1.625	—	1				
1.500	1.500	7.000	1.535	1.500	1.625	—	1				
1.500	1.500	7.236	1.772	1.500	1.625	—	2				
.625	.625	4.264	1.102	.625	.812	.125	3				
.625	.625	4.500	1.339	.625	.812	.125	3				
.625	.625	4.736	1.575	.625	.812	.125	4				
.750	.750	4.764	1.102	.750	.875	—	1				
.750	.750	5.000	1.339	.750	.875	—	1				
.750	.750	5.236	1.575	.750	.875	—	2				
.750	.750	4.685	1.220	.750	1.000	.250	3				
.750	.750	5.000	1.535	.750	1.000	.250	3				
.750	.750	5.236	1.772	.750	1.000	.250	4				
1.000	1.000	5.685	1.220	1.000	1.125	—	1				
1.000	1.000	6.000	1.535	1.000	1.125	—	1				
1.000	1.000	6.236	1.772	1.000	1.125	—	2				
1.250	1.250	5.685	1.220	1.250	1.375	—	1				
1.250	1.250	6.000	1.535	1.250	1.375	—	1				
1.250	1.250	6.236	1.772	1.250	1.375	—	2				
1.500	1.500	6.685	1.220	1.500	1.625	—	1				
1.500	1.500	7.000	1.535	1.500	1.625	—	1				
1.500	1.500	7.236	1.772	1.500	1.625	—	2				

GY SERIES (EXTERNAL GROOVING)

1-1 00° type holder (Inch)



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder and left hand modular blade for left hand modular holder.

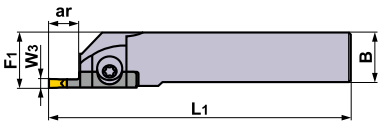




Fig. 1

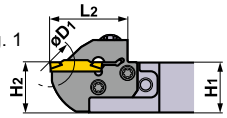
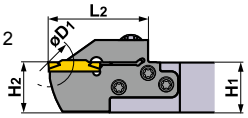


Fig. 2

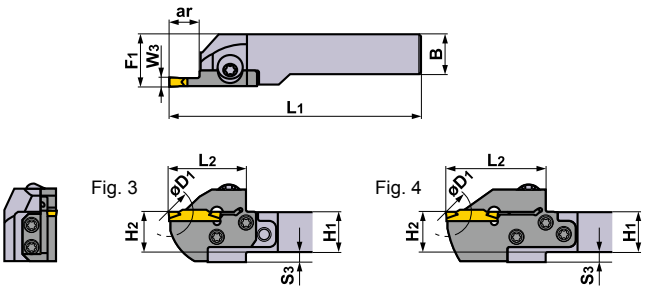


Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	Max. Groove Depth ar (inch)	Max. Cut Off Diameter D1 (inch)	ID	Order Number			
						Modular Blade	Stock	Modular Holder	Stock
F	.118 .125	R	.236	.472	(1D1R3F1)	GYM20RA-F06	●	GYHRUS10B00-M20R	●
			.394	.787	(1D1R3F2)	GYM20RA-F10	●		
			.709 *4	1.417	(1D1R3F3)	GYM20RB-F18	●		
			.236	.472	(1F1R3F1)	GYM20RA-F06	●	GYHRUS12C00-M20R	●
			.394	.787	(1F1R3F2)	GYM20RA-F10	●		
			.709 *4	1.417	(1F1R3F3)	GYM20RB-F18	●		
			.236	.472	(1F1R4F1)	GYM25RA-F06	●	GYHRUS12C00-M25R	●
			.472	.945	(1F1R4F2)	GYM25RA-F12	●		
			.787 *1	1.575 *2	(1F1R4F3)	GYM25RA-F20	●		
			.236	.472	(1H1R4F1)	GYM25RA-F06	●	GYHRUS16D00-M25R	●
			.472	.945	(1H1R4F2)	GYM25RA-F12	●		
			.787 *1	1.575 *2	(1H1R4F3)	GYM25RA-F20	●		
			.236	.472	(1K1R4F1)	GYM25RA-F06	●	GYHRUS20D00-M25R	●
			.472	.945	(1K1R4F2)	GYM25RA-F12	●		
			.787 *1	1.575 *2	(1K1R4F3)	GYM25RA-F20	●		
			.236	.472	(1M1R4F1)	GYM25RA-F06	●	GYHRUS24E00-M25R	●
			.472	.945	(1M1R4F2)	GYM25RA-F12	●		
			.787 *1	1.575 *2	(1M1R4F3)	GYM25RA-F20	●		
		L	.236	.472	(1D1L3F1)	GYM20LA-F06	●	GYHLUS10B00-M20L	●
			.394	.787	(1D1L3F2)	GYM20LA-F10	●		
			.709 *4	1.417	(1D1L3F3)	GYM20LB-F18	●		
			.236	.472	(1F1L3F1)	GYM20LA-F06	●	GYHLUS12C00-M20L	●
			.394	.787	(1F1L3F2)	GYM20LA-F10	●		
			.709 *4	1.417	(1F1L3F3)	GYM20LB-F18	●		
			.236	.472	(1F1L4F1)	GYM25LA-F06	●	GYHLUS12C00-M25L	●
			.472	.945	(1F1L4F2)	GYM25LA-F12	●		
			.787 *1	1.575 *2	(1F1L4F3)	GYM25LA-F20	●		
			.236	.472	(1H1L4F1)	GYM25LA-F06	●	GYHLUS16D00-M25L	●
			.472	.945	(1H1L4F2)	GYM25LA-F12	●		
			.787 *1	1.575 *2	(1H1L4F3)	GYM25LA-F20	●		
			.236	.472	(1K1L4F1)	GYM25LA-F06	●	GYHLUS20D00-M25L	●
			.472	.945	(1K1L4F2)	GYM25LA-F12	●		
			.787 *1	1.575 *2	(1K1L4F3)	GYM25LA-F20	●		
			.236	.472	(1M1L4F1)	GYM25LA-F06	●	GYHLUS24E00-M25L	●
			.472	.945	(1M1L4F2)	GYM25LA-F12	●		
			.787 *1	1.575 *2	(1M1L4F3)	GYM25LA-F20	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 The maximum cut off diameter **D1** varies according to the insert used. The cut off diameter is double the maximum groove depth (ar) of inserts on pages F014-F016.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2** and **F1** values may vary.
*4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F051.

● : Inventory maintained.

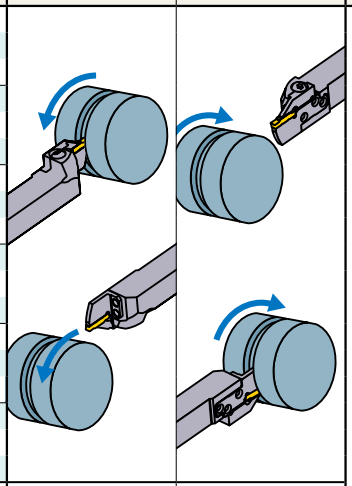
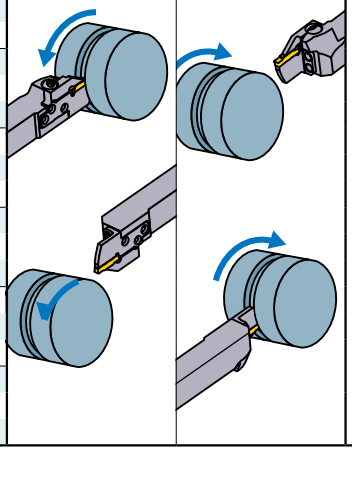


Right hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

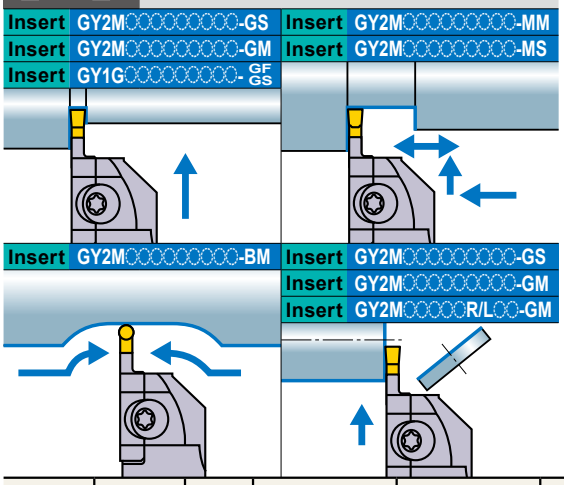
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗Wrench
GYHR/LUS10B00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/LUS12C00-M20R/L			
GYHR/LUS12C00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

Dimensions (inch) ∗3							Fig.	Cutting Mode		Insert	
H1	B	L1	L2	H2	F1	S3		Clockwise	Counter Clockwise	Geometry / Insert Number	Page
.625	.625	4.264	1.102	.625	.812	.125	3			GY2M0300F020N-GS GY2M0318F020N-GS GY2M0300F030N-GM (Gauge insert) GY2M0318F030N-GM GY2M0300F030R05-GM GY2M0300F030L05-GM GY2M0300F020N-MS GY2M0300F040N-MS GY2M0300F020N-MM GY2M0300F040N-MM GY2M0300F080N-MM GY2M0300F150N-BM GY2M0318F159N-BM GY1G0300F020N-GFGS GY1G0318F020N-GFGS	F014 – F016
.625	.625	4.500	1.339	.625	.812	.125	3				
.625	.625	4.736	1.575	.625	.812	.125	4				
.750	.750	4.764	1.102	.750	.875	—	1				
.750	.750	5.000	1.339	.750	.875	—	1				
.750	.750	5.236	1.575	.750	.875	—	2				
.750	.750	4.685	1.220	.750	1.000	.250	3				
.750	.750	5.000	1.535	.750	1.000	.250	3				
.750	.750	5.236	1.772	.750	1.000	.250	4				
1.000	1.000	5.685	1.220	1.000	1.125	—	1				
1.000	1.000	6.000	1.535	1.000	1.125	—	1				
1.000	1.000	6.236	1.772	1.000	1.125	—	2				
1.250	1.250	5.685	1.220	1.250	1.375	—	1				
1.250	1.250	6.000	1.535	1.250	1.375	—	1				
1.250	1.250	6.236	1.772	1.250	1.375	—	2				
1.500	1.500	6.685	1.220	1.500	1.625	—	1				
1.500	1.500	7.000	1.535	1.500	1.625	—	1				
1.500	1.500	7.236	1.772	1.500	1.625	—	2				
.625	.625	4.264	1.102	.625	.812	.125	3				
.625	.625	4.500	1.339	.625	.812	.125	3				
.625	.625	4.736	1.575	.625	.812	.125	4				
.750	.750	4.764	1.102	.750	.875	—	1				
.750	.750	5.000	1.339	.750	.875	—	1				
.750	.750	5.236	1.575	.750	.875	—	2				
.750	.750	4.685	1.220	.750	1.000	.250	3				
.750	.750	5.000	1.535	.750	1.000	.250	3				
.750	.750	5.236	1.772	.750	1.000	.250	4				
1.000	1.000	5.685	1.220	1.000	1.125	—	1				
1.000	1.000	6.000	1.535	1.000	1.125	—	1				
1.000	1.000	6.236	1.772	1.000	1.125	—	2				
1.250	1.250	5.685	1.220	1.250	1.375	—	1				
1.250	1.250	6.000	1.535	1.250	1.375	—	1				
1.250	1.250	6.236	1.772	1.250	1.375	—	2				
1.500	1.500	6.685	1.220	1.500	1.625	—	1				
1.500	1.500	7.000	1.535	1.500	1.625	—	1				
1.500	1.500	7.236	1.772	1.500	1.625	—	2				

GY SERIES (EXTERNAL GROOVING)

1-1 00° type holder (Inch)



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder and left hand modular blade for left hand modular holder.

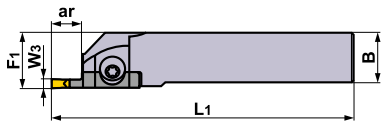




Fig. 1

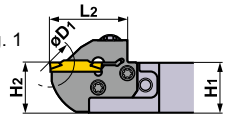
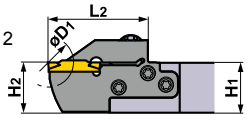


Fig. 2

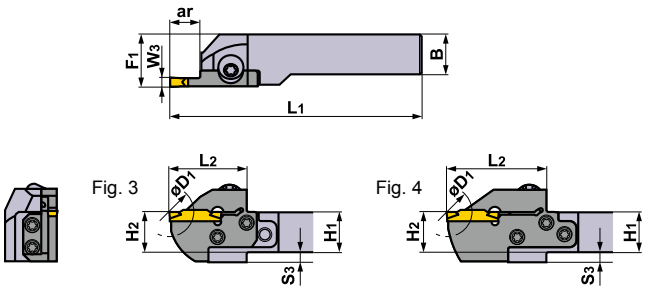


Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	Max. Groove Depth ar (inch)	Max. Cut Off Diameter D1 (inch)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
G	.157	R	.472	.945	(1D1R3G1)	GYM20RA-G12	●	GYHRUS10B00-M20R	●
			.472	.945	(1F1R3G1)	GYM20RA-G12	●	GYHRUS12C00-M20R	●
			.315	.630	(1F1R4G1)	GYM25RA-G08	●	GYHRUS12C00-M25R	●
			.551	1.102	(1F1R4G2)	GYM25RA-G14	●		
			.984 *1	1.969 *2	(1F1R4G3)	GYM25RA-G25	●		
			.315	.630	(1H1R4G1)	GYM25RA-G08	●	GYHRUS16D00-M25R	●
			.551	1.102	(1H1R4G2)	GYM25RA-G14	●		
			.984 *1	1.969 *2	(1H1R4G3)	GYM25RA-G25	●		
			.315	.630	(1K1R4G1)	GYM25RA-G08	●	GYHRUS20D00-M25R	●
			.551	1.102	(1K1R4G2)	GYM25RA-G14	●		
			.984 *1	1.969 *2	(1K1R4G3)	GYM25RA-G25	●		
			.315	.630	(1M1R4G1)	GYM25RA-G08	●	GYHRUS24E00-M25R	●
			.551	1.102	(1M1R4G2)	GYM25RA-G14	●		
			.984 *1	1.969 *2	(1M1R4G3)	GYM25RA-G25	●		
		L	.472	.945	(1D1L3G1)	GYM20LA-G12	●	GYHLUS10B00-M20L	●
			.472	.945	(1F1L3G1)	GYM20LA-G12	●	GYHLUS12C00-M20L	●
			.315	.630	(1F1L4G1)	GYM25LA-G08	●	GYHLUS12C00-M25L	●
			.551	1.102	(1F1L4G2)	GYM25LA-G14	●		
			.984 *1	1.969 *2	(1F1L4G3)	GYM25LA-G25	●		
			.315	.630	(1H1L4G1)	GYM25LA-G08	●	GYHLUS16D00-M25L	●
			.551	1.102	(1H1L4G2)	GYM25LA-G14	●		
			.984 *1	1.969 *2	(1H1L4G3)	GYM25LA-G25	●		
			.315	.630	(1K1L4G1)	GYM25LA-G08	●	GYHLUS20D00-M25L	●
			.551	1.102	(1K1L4G2)	GYM25LA-G14	●		
			.984 *1	1.969 *2	(1K1L4G3)	GYM25LA-G25	●		
			.315	.630	(1M1L4G1)	GYM25LA-G08	●	GYHLUS24E00-M25L	●
			.551	1.102	(1M1L4G2)	GYM25LA-G14	●		
			.984 *1	1.969 *2	(1M1L4G3)	GYM25LA-G25	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 The maximum cut off diameter **D1** varies according to the insert used. The cut off diameter is double the maximum groove depth (ar) of inserts on pages F014-F016.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2** and **F1** values may vary.

● : Inventory maintained.

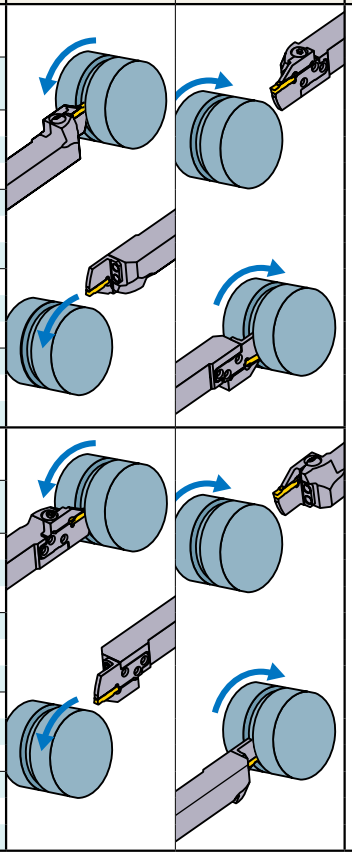
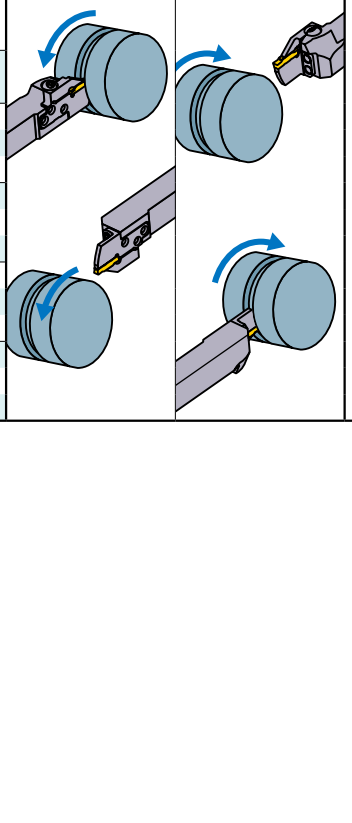


Right hand tool holder shown.

* Wrench : ①For Clamp Screw ②For Blade Screw.

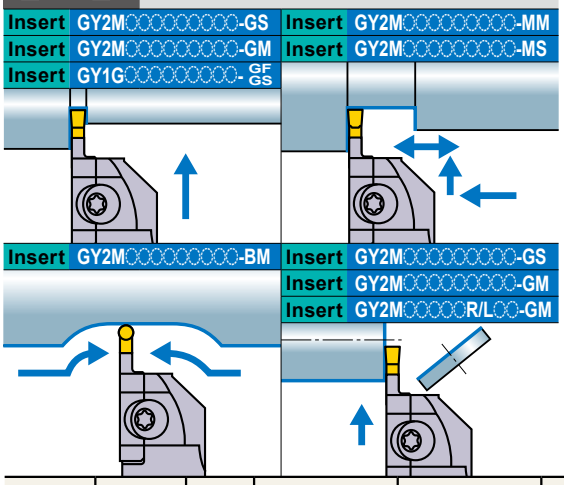
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHR/LUS10B00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/LUS12C00-M20R/L			
GYHR/LUS12C00-M25R/L			
GYHR/LUS16D00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

Dimensions (inch) *3							Fig.	Cutting Mode		Insert	
H1	B	L1	L2	H2	F1	S3		Clockwise	Counter Clockwise	Geometry / Insert Number	Page
.625	.625	4.500	1.339	.625	.812	.125	3			GY2M0400G030N-GU GY2M0400G020N-GS GY2M0400G030N-GM (Gauge insert) GY2M0400G030R05-GM GY2M0400G030L05-GM GY2M0400G020N-MS GY2M0400G040N-MS GY2M0400G020N-MM GY2M0400G040N-MM GY2M0400G080N-MM GY2M0400G200N-BM GY1G0400G020N-GFGS	F014 I F016
.750	.750	5.000	1.339	.750	.875	—	1				
.750	.750	4.764	1.299	.750	1.000	.250	3				
.750	.750	5.000	1.535	.750	1.000	.250	3				
.750	.750	5.433	1.969	.750	1.000	.250	4				
1.000	1.000	5.764	1.299	1.000	1.125	—	1				
1.000	1.000	6.000	1.535	1.000	1.125	—	1				
1.000	1.000	6.433	1.969	1.000	1.125	—	2				
1.250	1.250	5.764	1.299	1.250	1.375	—	1				
1.250	1.250	6.000	1.535	1.250	1.375	—	1				
1.250	1.250	6.433	1.969	1.250	1.375	—	2				
1.500	1.500	6.764	1.299	1.500	1.625	—	1				
1.500	1.500	7.000	1.535	1.500	1.625	—	1				
1.500	1.500	7.433	1.969	1.500	1.625	—	2				
.625	.625	4.500	1.339	.625	.812	.125	3				
.750	.750	5.000	1.339	.750	.875	—	1				
.750	.750	4.764	1.299	.750	1.000	.250	3				
.750	.750	5.000	1.535	.750	1.000	.250	3				
.750	.750	5.433	1.969	.750	1.000	.250	4				
1.000	1.000	5.764	1.299	1.000	1.125	—	1				
1.000	1.000	6.000	1.535	1.000	1.125	—	1				
1.000	1.000	6.433	1.969	1.000	1.125	—	2				
1.250	1.250	5.764	1.299	1.250	1.375	—	1				
1.250	1.250	6.000	1.535	1.250	1.375	—	1				
1.250	1.250	6.433	1.969	1.250	1.375	—	2				
1.500	1.500	6.764	1.299	1.500	1.625	—	1				
1.500	1.500	7.000	1.535	1.500	1.625	—	1				
1.500	1.500	7.433	1.969	1.500	1.625	—	2				

GY SERIES (EXTERNAL GROOVING)

1-1 00° type holder (Inch)



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder and left hand modular blade for left hand modular holder.

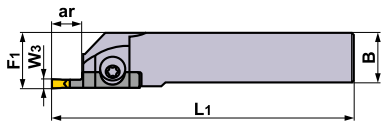




Fig. 1

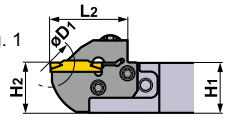
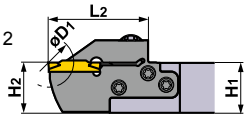


Fig. 2

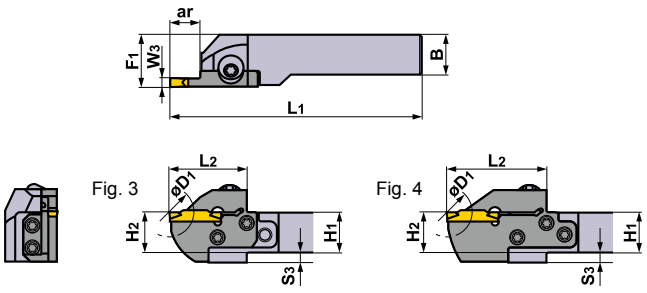


Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	Max. Groove Depth ar (inch)	Max. Cut Off Diameter D1 (inch)	ID	Order Number			
						Modular Blade	Stock	Modular Holder	Stock
H	.187 .197	R	.472	.945	(1D1R3H1)	**GYM20RA-H12**	●	**GYHRUS10B00-M20R**	●
			.472	.945	(1F1R3H1)	**GYM20RA-H12**	●	**GYHRUS12C00-M20R**	●
			.315	.630	(1F1R4H1)	**GYM25RA-H08**	●	**GYHRUS12C00-M25R**	●
			.551	1.102	(1F1R4H2)	**GYM25RA-H14**	●		
			.984 *1	1.969 *2	(1F1R4H3)	**GYM25RA-H25**	●		
			.315	.630	(1H1R4H1)	**GYM25RA-H08**	●	**GYHRUS16D00-M25R**	●
			.551	1.102	(1H1R4H2)	**GYM25RA-H14**	●		
			.984 *1	1.969 *2	(1H1R4H3)	**GYM25RA-H25**	●		
			.315	.630	(1K1R4H1)	**GYM25RA-H08**	●	**GYHRUS20D00-M25R**	●
			.551	1.102	(1K1R4H2)	**GYM25RA-H14**	●		
			.984 *1	1.969 *2	(1K1R4H3)	**GYM25RA-H25**	●		
			.315	.630	(1M1R4H1)	**GYM25RA-H08**	●	**GYHRUS24E00-M25R**	●
			.551	1.102	(1M1R4H2)	**GYM25RA-H14**	●		
			.984 *1	1.969 *2	(1M1R4H3)	**GYM25RA-H25**	●		
		L	.472	.945	(1D1L3H1)	**GYM20LA-H12**	●	**GYHLUS10B00-M20L**	●
			.472	.945	(1F1L3H1)	**GYM20LA-H12**	●	**GYHLUS12C00-M20L**	●
			.315	.630	(1F1L4H1)	**GYM25LA-H08**	●	**GYHLUS12C00-M25L**	●
			.551	1.102	(1F1L4H2)	**GYM25LA-H14**	●		
			.984 *1	1.969 *2	(1F1L4H3)	**GYM25LA-H25**	●		
			.315	.630	(1H1L4H1)	**GYM25LA-H08**	●	**GYHLUS16D00-M25L**	●
			.551	1.102	(1H1L4H2)	**GYM25LA-H14**	●		
			.984 *1	1.969 *2	(1H1L4H3)	**GYM25LA-H25**	●		
			.315	.630	(1K1L4H1)	**GYM25LA-H08**	●	**GYHLUS20D00-M25L**	●
			.551	1.102	(1K1L4H2)	**GYM25LA-H14**	●		
			.984 *1	1.969 *2	(1K1L4H3)	**GYM25LA-H25**	●		
			.315	.630	(1M1L4H1)	**GYM25LA-H08**	●	**GYHLUS24E00-M25L**	●
			.551	1.102	(1M1L4H2)	**GYM25LA-H14**	●		
			.984 *1	1.969 *2	(1M1L4H3)	**GYM25LA-H25**	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 The maximum cut off diameter **D1** varies according to the insert used. The cut off diameter is double the maximum groove depth (ar) of inserts on pages F014-F016.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2** and **F1** values may vary.

● : Inventory maintained.

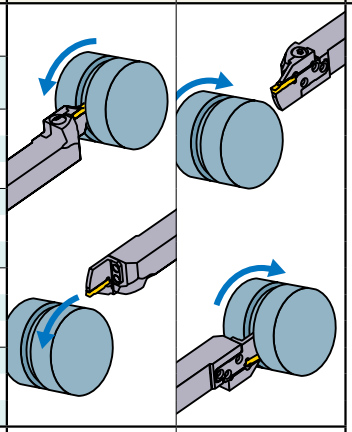
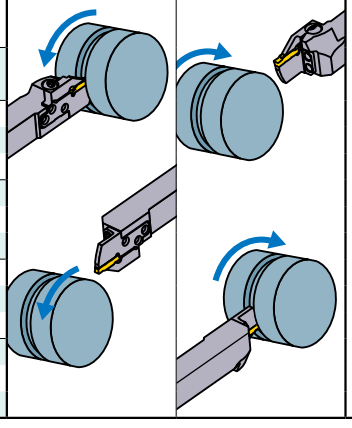


Right hand tool holder shown.

* Wrench : ①For Clamp Screw ②For Blade Screw.

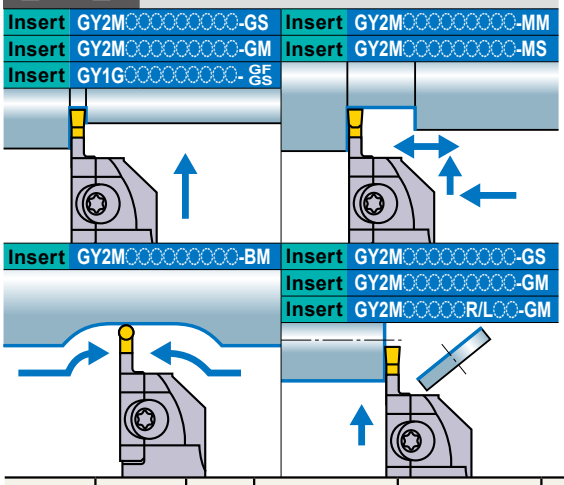
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHR/LUS10B00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/LUS12C00-M20R/L			
GYHR/LUS12C00-M25R/L			
GYHR/LUS16D00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

Dimensions (inch) *3							Fig.	Cutting Mode		Insert	
H1	**B**	**L1**	**L2**	**H2**	**F1**	**S3**		Clockwise	Counter Clockwise	Geometry / Insert Number	Page
.625	.625	4.500	1.339	.625	.812	.125	3			GY2M0475H040N-GU GY2M0500H040N-GU GY2M0475H030N-GS GY2M0500H030N-GS GY2M0475H040N-GM GY2M0500H040N-GM (Gauge insert) GY2M0500H040R05-GM GY2M0500H040L05-GM GY2M0500H040N-MS GY2M0500H080N-MS GY2M0500H040N-MM GY2M0500H080N-MM GY2M0475H238N-BM GY2M0500H250N-BM GY1G0475H020N-GFGS GY1G0500H020N-GFGS	F014 I F016
.750	.750	5.000	1.339	.750	.875	—	1				
.750	.750	4.764	1.299	.750	1.000	.250	3				
.750	.750	5.000	1.535	.750	1.000	.250	3				
.750	.750	5.433	1.969	.750	1.000	.250	4				
1.000	1.000	5.764	1.299	1.000	1.125	—	1				
1.000	1.000	6.000	1.535	1.000	1.125	—	1				
1.000	1.000	6.433	1.969	1.000	1.125	—	2				
1.250	1.250	5.764	1.299	1.250	1.375	—	1				
1.250	1.250	6.000	1.535	1.250	1.375	—	1				
1.250	1.250	6.433	1.969	1.250	1.375	—	2				
1.500	1.500	6.764	1.299	1.500	1.625	—	1				
1.500	1.500	7.000	1.535	1.500	1.625	—	1				
1.500	1.500	7.433	1.969	1.500	1.625	—	2				
.625	.625	4.500	1.339	.625	.812	.125	3				
.750	.750	5.000	1.339	.750	.875	—	1				
.750	.750	4.764	1.299	.750	1.000	.250	3				
.750	.750	5.000	1.535	.750	1.000	.250	3				
.750	.750	5.433	1.969	.750	1.000	.250	4				
1.000	1.000	5.764	1.299	1.000	1.125	—	1				
1.000	1.000	6.000	1.535	1.000	1.125	—	1				
1.000	1.000	6.433	1.969	1.000	1.125	—	2				
1.250	1.250	5.764	1.299	1.250	1.375	—	1				
1.250	1.250	6.000	1.535	1.250	1.375	—	1				
1.250	1.250	6.433	1.969	1.250	1.375	—	2				
1.500	1.500	6.764	1.299	1.500	1.625	—	1				
1.500	1.500	7.000	1.535	1.500	1.625	—	1				
1.500	1.500	7.433	1.969	1.500	1.625	—	2				

GY SERIES (EXTERNAL GROOVING)

1-1 00° type holder (Inch)



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder and left hand modular blade for left hand modular holder.

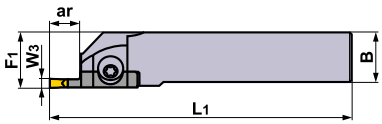




Fig. 1

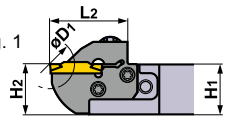
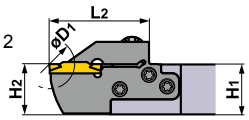


Fig. 2

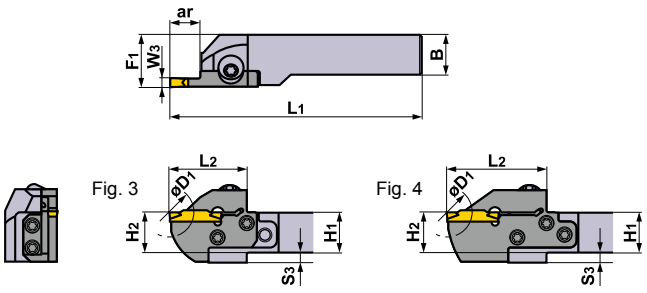


Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	Max. Groove Depth ar (inch)	Max. Cut Off Diameter D1 (inch)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
J	.236 .250	R	.315	.630	(1F1R4J1)	GYM25RA-J08	●	GYHRUS12C00-M25R	●
			.551	1.102	(1F1R4J2)	GYM25RA-J14	●		
			.984 *1	1.969 *2	(1F1R4J3)	GYM25RA-J25	●		
			.315	.630	(1H1R4J1)	GYM25RA-J08	●	GYHRUS16D00-M25R	●
			.551	1.102	(1H1R4J2)	GYM25RA-J14	●		
			.984 *1	1.969 *2	(1H1R4J3)	GYM25RA-J25	●		
			.315	.630	(1K1R4J1)	GYM25RA-J08	●	GYHRUS20D00-M25R	●
			.551	1.102	(1K1R4J2)	GYM25RA-J14	●		
			.984 *1	1.969 *2	(1K1R4J3)	GYM25RA-J25	●		
			.315	.630	(1M1R4J1)	GYM25RA-J08	●	GYHRUS24E00-M25R	●
			.551	1.102	(1M1R4J2)	GYM25RA-J14	●		
			.984 *1	1.969 *2	(1M1R4J3)	GYM25RA-J25	●		
		L	.315	.630	(1F1L4J1)	GYM25LA-J08	●	GYHLUS12C00-M25L	●
			.551	1.102	(1F1L4J2)	GYM25LA-J14	●		
			.984 *1	1.969 *2	(1F1L4J3)	GYM25LA-J25	●		
			.315	.630	(1H1L4J1)	GYM25LA-J08	●	GYHLUS16D00-M25L	●
			.551	1.102	(1H1L4J2)	GYM25LA-J14	●		
			.984 *1	1.969 *2	(1H1L4J3)	GYM25LA-J25	●		
			.315	.630	(1K1L4J1)	GYM25LA-J08	●	GYHLUS20D00-M25L	●
			.551	1.102	(1K1L4J2)	GYM25LA-J14	●		
			.984 *1	1.969 *2	(1K1L4J3)	GYM25LA-J25	●		
			.315	.630	(1M1L4J1)	GYM25LA-J08	●	GYHLUS24E00-M25L	●
			.551	1.102	(1M1L4J2)	GYM25LA-J14	●		
			.984 *1	1.969 *2	(1M1L4J3)	GYM25LA-J25	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 The maximum cut off diameter **D1** varies according to the insert used. The cut off diameter is double the maximum groove depth (ar) of inserts on pages F014-F016.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2** and **F1** values may vary.

● : Inventory maintained.

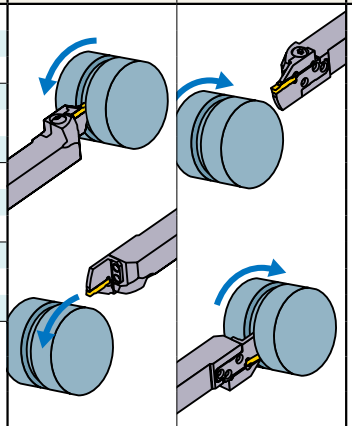
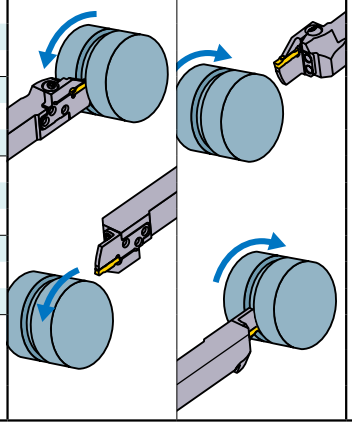


Right hand tool holder shown.

* Wrench : ①For Clamp Screw ②For Blade Screw.

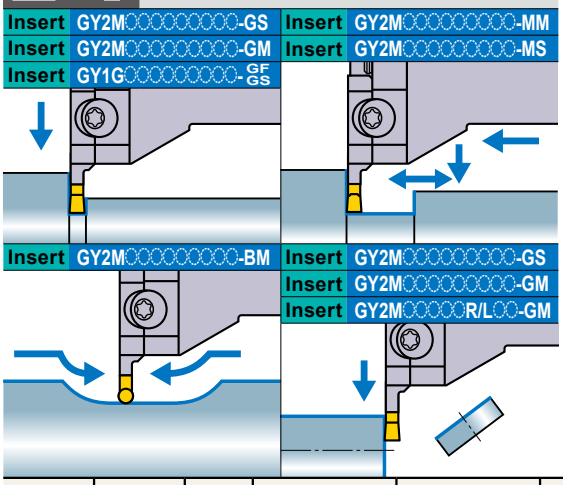
SPARE PARTS

Modular 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			

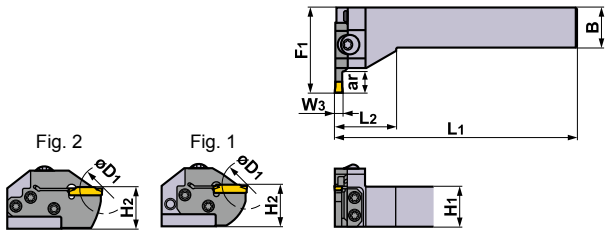
Dimensions (inch) *3							Fig.	Cutting Mode		Insert	
H1	B	L1	L2	H2	F1	S3		Clockwise	Counter Clockwise	Geometry / Insert Number	Page
.750	.750	4.764	1.299	.750	1.000	.250	3			GY2M0600J040N-GU GY2M0635J040N-GU GY2M0600J030N-GS GY2M0635J030N-GS GY2M0600J040N-GM (Gauge insert) GY2M0635J040N-GM	F014 I F016
.750	.750	5.000	1.535	.750	1.000	.250	3				
.750	.750	5.433	1.969	.750	1.000	.250	4				
1.000	1.000	5.764	1.299	1.000	1.125	—	1				
1.000	1.000	6.000	1.535	1.000	1.125	—	1				
1.000	1.000	6.433	1.969	1.000	1.125	—	2				
1.250	1.250	5.764	1.299	1.250	1.375	—	1				
1.250	1.250	6.000	1.535	1.250	1.375	—	1				
1.250	1.250	6.433	1.969	1.250	1.375	—	2				
1.500	1.500	6.764	1.299	1.500	1.625	—	1				
1.500	1.500	7.000	1.535	1.500	1.625	—	1				
1.500	1.500	7.433	1.969	1.500	1.625	—	2				
.750	.750	4.764	1.299	.750	1.000	.250	3			GY2M0600J040N-MS GY2M0600J080N-MS GY2M0600J040N-MM GY2M0600J080N-MM GY2M0600J300N-BM GY2M0635J318N-BM	
.750	.750	5.000	1.535	.750	1.000	.250	3				
.750	.750	5.433	1.969	.750	1.000	.250	4				
1.000	1.000	5.764	1.299	1.000	1.125	—	1				
1.000	1.000	6.000	1.535	1.000	1.125	—	1				
1.000	1.000	6.433	1.969	1.000	1.125	—	2				
1.250	1.250	5.764	1.299	1.250	1.375	—	1				
1.250	1.250	6.000	1.535	1.250	1.375	—	1				
1.250	1.250	6.433	1.969	1.250	1.375	—	2				
1.500	1.500	6.764	1.299	1.500	1.625	—	1				
1.500	1.500	7.000	1.535	1.500	1.625	—	1				
1.500	1.500	7.433	1.969	1.500	1.625	—	2				

GY SERIES (EXTERNAL GROOVING)

2-1 90° type holder (Inch)



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.



Right hand tool holder shown.

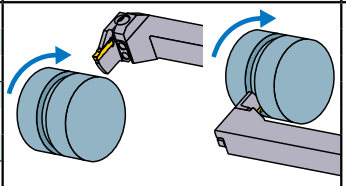
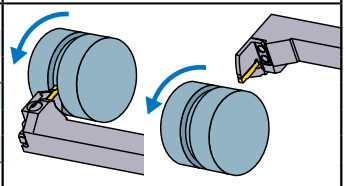
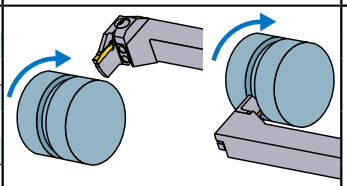
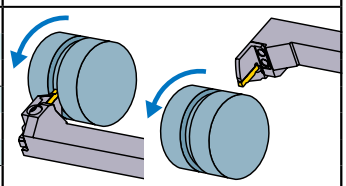
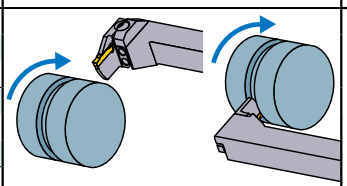
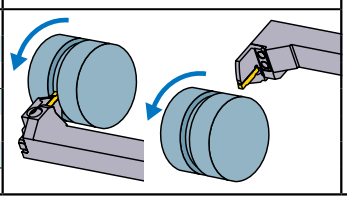
Seat Size	Insert Width W3 (inch)	Hand (R/L)	Max. Groove Depth ar (inch)	Max. Cut Off Diameter D1 (inch)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
D	.079	R	.236	.472	(2F1R3D1)	GYM20LA-D06	●	GYHRUS12C90-M20L	●
			.394	.787	(2F1R3D2)	GYM20LA-D10	●		
			.709 *4	1.417	(2F1R3D3)	GYM20LB-D18	●		
			.236	.472	(2H1R4D1)	GYM25LA-D06	●	GYHRUS16D90-M25L	●
			.472	.945	(2H1R4D2)	GYM25LA-D12	●		
			.787 *1	1.575 *2	(2H1R4D3)	GYM25LA-D20	●		
		L	.236	.472	(2F1L3D1)	GYM20RA-D06	●	GYHLUS12C90-M20R	●
			.394	.787	(2F1L3D2)	GYM20RA-D10	●		
			.709 *4	1.417	(2F1L3D3)	GYM20RB-D18	●		
			.236	.472	(2H1L4D1)	GYM25RA-D06	●	GYHLUS16D90-M25R	●
			.472	.945	(2H1L4D2)	GYM25RA-D12	●		
			.787 *1	1.575 *2	(2H1L4D3)	GYM25RA-D20	●		
E	.094 .098	R	.236	.472	(2F1R3E1)	GYM20LA-E06	●	GYHRUS12C90-M20L	●
			.394	.787	(2F1R3E2)	GYM20LA-E10	●		
			.709 *4	1.417	(2F1R3E3)	GYM20LB-E18	●		
			.236	.472	(2H1R4E1)	GYM25LA-E06	●	GYHRUS16D90-M25L	●
			.472	.945	(2H1R4E2)	GYM25LA-E12	●		
			.787 *1	1.575 *2	(2H1R4E3)	GYM25LA-E20	●		
		L	.236	.472	(2F1L3E1)	GYM20RA-E06	●	GYHLUS12C90-M20R	●
			.394	.787	(2F1L3E2)	GYM20RA-E10	●		
			.709 *4	1.417	(2F1L3E3)	GYM20RB-E18	●		
			.236	.472	(2H1L4E1)	GYM25RA-E06	●	GYHLUS16D90-M25R	●
			.472	.945	(2H1L4E2)	GYM25RA-E12	●		
			.787 *1	1.575 *2	(2H1L4E3)	GYM25RA-E20	●		
F	.118 .125	R	.236	.472	(2F1R3F1)	GYM20LA-F06	●	GYHRUS12C90-M20L	●
			.394	.787	(2F1R3F2)	GYM20LA-F10	●		
			.709 *4	1.417	(2F1R3F3)	GYM20LB-F18	●		
			.236	.472	(2H1R4F1)	GYM25LA-F06	●	GYHRUS16D90-M25L	●
			.472	.945	(2H1R4F2)	GYM25LA-F12	●		
			.787 *1	1.575 *2	(2H1R4F3)	GYM25LA-F20	●		
		L	.236	.472	(2F1L3F1)	GYM20RA-F06	●	GYHLUS12C90-M20R	●
			.394	.787	(2F1L3F2)	GYM20RA-F10	●		
			.709 *4	1.417	(2F1L3F3)	GYM20RB-F18	●		
			.236	.472	(2H1L4F1)	GYM25RA-F06	●	GYHLUS16D90-M25R	●
			.472	.945	(2H1L4F2)	GYM25RA-F12	●		
			.787 *1	1.575 *2	(2H1L4F3)	GYM25RA-F20	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 The maximum cut off diameter **D1** varies according to the insert used. The cut off diameter is double the maximum groove depth (ar) of inserts on pages F014-F016.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2** and **F1** values may vary.
*4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F051.
● : **Inventory maintained.**

* Wrench : ①For Clamp Screw ②For Blade Screw.

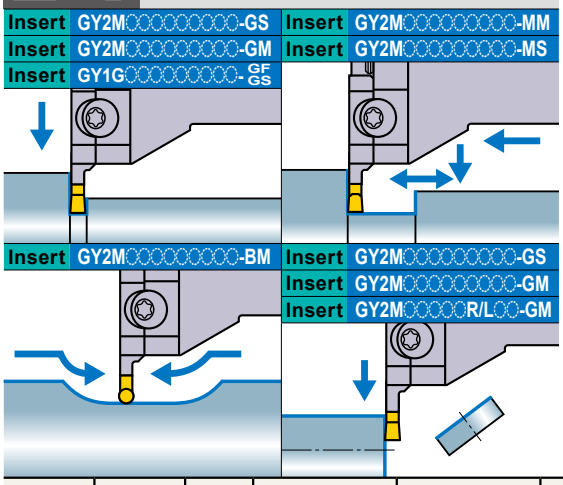
SPARE PARTS

Modular Holder Number	 Clamp Screw	 (5 pcs.) Blade Screw	 * 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			

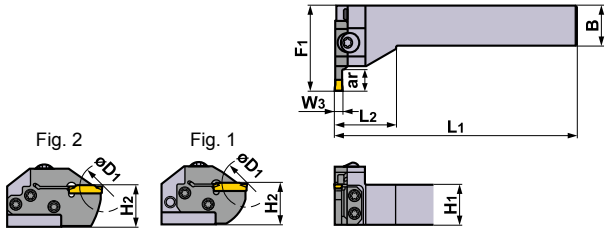
Dimensions (inch) *3						Fig.	Cutting Mode	Insert	
H1	**B**	**L1**	**L2**	**H2**	**F1**			Geometry / Insert Number	Page
.750	.750	5.000	1.375	.750	1.545	1		GY2M0200D020N-GS GY2M0200D020N-GM (Gauge insert) GY2M0200D020R05-GM GY2M0200D020L05-GM GY2M0200D020N-MM GY2M0200D100N-BM GY1G0200D020N-GFGS	F014 I F016
.750	.750	5.000	1.375	.750	1.781	1			
.750	.750	5.000	1.375	.750	2.017	2			
1.000	1.000	6.000	1.500	1.000	1.779	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.330	2			
.750	.750	5.000	1.375	.750	1.545	1			
.750	.750	5.000	1.375	.750	1.781	1			
.750	.750	5.000	1.375	.750	2.017	2			
1.000	1.000	6.000	1.500	1.000	1.779	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.330	2			
.750	.750	5.000	1.375	.750	1.545	1		GY2M0239E020N-GS GY2M0250E020N-GS GY2M0239E020N-GM GY2M0250E020N-GM (Gauge insert) GY2M0250E020R05-GM GY2M0250E020L05-GM GY2M0250E020N-MM GY2M0250E125N-BM GY1G0239E020N-GFGS GY1G0250E020N-GFGS	F014 I F016
.750	.750	5.000	1.375	.750	1.781	1			
.750	.750	5.000	1.375	.750	2.017	2			
1.000	1.000	6.000	1.500	1.000	1.779	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.330	2			
.750	.750	5.000	1.375	.750	1.545	1			
.750	.750	5.000	1.375	.750	1.781	1			
.750	.750	5.000	1.375	.750	2.017	2			
1.000	1.000	6.000	1.500	1.000	1.779	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.330	2			
.750	.750	5.000	1.375	.750	1.545	1		GY2M0300F020N-GS GY2M0318F020N-GS GY2M0300F030N-GM (Gauge insert) GY2M0318F030N-GM GY2M0300F030R05-GM GY2M0300F030L05-GM GY2M0300F020N-MS GY2M0300F040N-MS GY2M0300F020N-MM GY2M0300F040N-MM GY2M0300F080N-MM GY2M0300F150N-BM GY2M0318F159N-BM GY1G0300F020N-GFGS GY1G0318F020N-GFGS	F014 I F016
.750	.750	5.000	1.375	.750	1.781	1			
.750	.750	5.000	1.375	.750	2.017	2			
1.000	1.000	6.000	1.500	1.000	1.779	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.330	2			
.750	.750	5.000	1.375	.750	1.545	1			
.750	.750	5.000	1.375	.750	1.781	1			
.750	.750	5.000	1.375	.750	2.017	2			
1.000	1.000	6.000	1.500	1.000	1.779	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.330	2			

GY SERIES (EXTERNAL GROOVING)

2-1 90° type holder (Inch)



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.



Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	Max. Groove Depth ar (inch)	Max. Cut Off Diameter D1 (inch)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
G	.157	R	.472	.945	(2F1R3G1)	GYM20LA-G12	●	GYHRUS12C90-M20L	●
			.315	.630	(2H1R4G1)	GYM25LA-G08	●	GYHRUS16D90-M25L	●
			.551	1.102	(2H1R4G2)	GYM25LA-G14	●		
			.984 *1	1.969 *2	(2H1R4G3)	GYM25LA-G25	●		
		L	.472	.945	(2F1L3G1)	GYM20RA-G12	●	GYHLUS12C90-M20R	●
			.315	.630	(2H1L4G1)	GYM25RA-G08	●	GYHLUS16D90-M25R	●
			.551	1.102	(2H1L4G2)	GYM25RA-G14	●		
			.984 *1	1.969 *2	(2H1L4G3)	GYM25RA-G25	●		
H	.187 .197	R	.472	.945	(2F1R3H1)	GYM20LA-H12	●	GYHRUS12C90-M20L	●
			.315	.630	(2H1R4H1)	GYM25LA-H08	●	GYHRUS16D90-M25L	●
			.551	1.102	(2H1R4H2)	GYM25LA-H14	●		
			.984 *1	1.969 *2	(2H1R4H3)	GYM25LA-H25	●		
		L	.472	.945	(2F1L3H1)	GYM20RA-H12	●	GYHLUS12C90-M20R	●
			.315	.630	(2H1L4H1)	GYM25RA-H08	●	GYHLUS16D90-M25R	●
			.551	1.102	(2H1L4H2)	GYM25RA-H14	●		
			.984 *1	1.969 *2	(2H1L4H3)	GYM25RA-H25	●		
J	.236 .250	R	.315	.630	(2H1R4J1)	GYM25LA-J08	●	GYHRUS16D90-M25L	●
			.551	1.102	(2H1R4J2)	GYM25LA-J14	●		
			.984 *1	1.969 *2	(2H1R4J3)	GYM25LA-J25	●		
		L	.315	.630	(2H1L4J1)	GYM25RA-J08	●	GYHLUS16D90-M25R	●
			.551	1.102	(2H1L4J2)	GYM25RA-J14	●		
			.984 *1	1.969 *2	(2H1L4J3)	GYM25RA-J25	●		

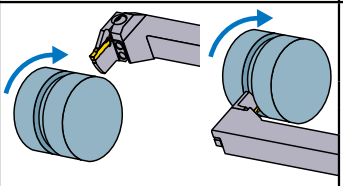
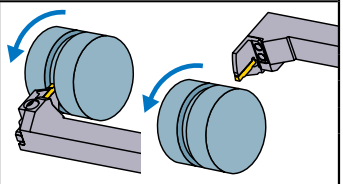
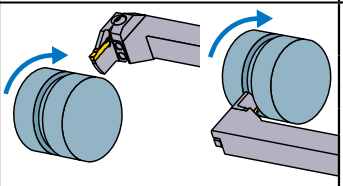
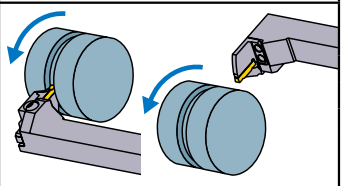
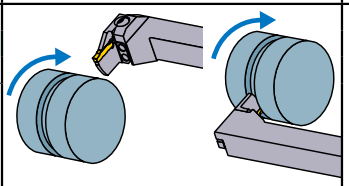
*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 The maximum cut off diameter **D1** varies according to the insert used. The cut off diameter is double the maximum groove depth (ar) of inserts on pages F014-F016.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1**, **L2** and **F1** values may vary.

● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

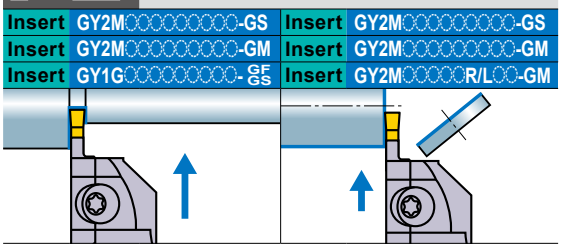
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench (①/②)
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						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
.750	.750	5.000	1.375	.750	1.781	1		GY2M0400G030N-GU GY2M0400G020N-GS GY2M0400G030N-GM (Gauge insert) GY2M0400G030R05-GM GY2M0400G030L05-GM GY2M0400G020N-MS GY2M0400G040N-MS GY2M0400G020N-MM GY2M0400G040N-MM GY2M0400G080N-MM GY2M0400G200N-BM GY1G0400G020N-GFGS	F014 ı F016
1.000	1.000	6.000	1.500	1.000	1.857	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			
.750	.750	5.000	1.375	.750	1.781	1			
1.000	1.000	6.000	1.500	1.000	1.857	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			
.750	.750	5.000	1.375	.750	1.781	1		GY2M0475H040N-GU GY2M0500H040N-GU GY2M0475H030N-GS GY2M0500H030N-GS GY2M0475H040N-GM GY2M0500H040N-GM (Gauge insert) GY2M0500H040R05-GM GY2M0500H040L05-GM GY2M0500H040N-MS GY2M0500H080N-MS GY2M0500H040N-MM GY2M0500H080N-MM GY2M0475H238N-BM GY2M0500H250N-BM GY1G0475H020N-GFGS GY1G0500H020N-GFGS	F014 ı F016
1.000	1.000	6.000	1.500	1.000	1.857	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			
.750	.750	5.000	1.375	.750	1.781	1			
1.000	1.000	6.000	1.500	1.000	1.857	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	1.857	1		GY2M0600J040N-GU GY2M0635J040N-GU GY2M0600J030N-GS GY2M0635J030N-GS GY2M0600J040N-GM (Gauge insert) GY2M0635J040N-GM GY2M0600J040N-MS GY2M0600J080N-MS GY2M0600J040N-MM GY2M0600J080N-MM GY2M0600J300N-BM GY2M0635J318N-BM	F014 ı F016
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			

GY SERIES (EXTERNAL GROOVING)

1-2 00° type holder (Metric)



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder and left hand modular blade for left hand modular holder.

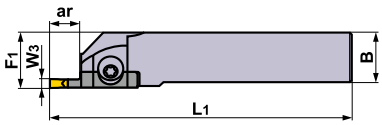




Fig. 1

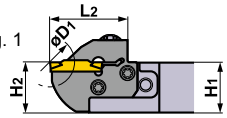
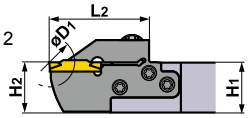


Fig. 2

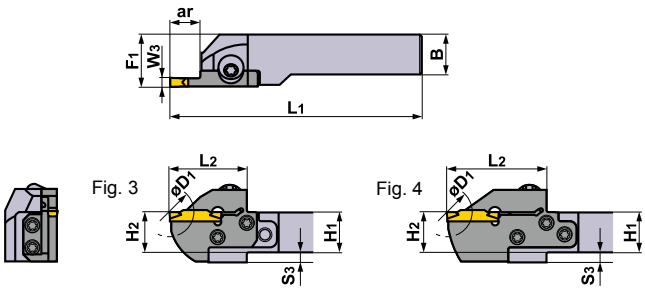


Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	Max. Groove Depth ar (mm)	Max. Cut Off Diameter D1 (mm)	ID	Order Number			
						Modular Blade	Stock	Modular Holder	Stock
D	2.00	R	6	12	(1C1R3D1)	GYM20RA-D06	●	GYHR1616J00-M20R	●
			10	20	(1C1R3D2)	GYM20RA-D10	●		
			18 *4	36	(1C1R3D3)	GYM20RB-D18	●		
			6	12	(1E1R3D1)	GYM20RA-D06	●	GYHR2020K00-M20R	●
			10	20	(1E1R3D2)	GYM20RA-D10	●		
			18 *4	36	(1E1R3D3)	GYM20RB-D18	●		
			6	12	(1E1R4D1)	GYM25RA-D06	●	GYHR2020K00-M25R	●
			12	24	(1E1R4D2)	GYM25RA-D12	●		
			20 *1	40 *2	(1E1R4D3)	GYM25RA-D20	●		
			6	12	(1G1R4D1)	GYM25RA-D06	●	GYHR2525M00-M25R	●
			12	24	(1G1R4D2)	GYM25RA-D12	●		
			20 *1	40 *2	(1G1R4D3)	GYM25RA-D20	●		
			6	12	(1Q1R4D1)	GYM25RA-D06	●	GYHR3225P00-M25R	★
			12	24	(1Q1R4D2)	GYM25RA-D12	●		
			20 *1	40 *2	(1Q1R4D3)	GYM25RA-D20	●		
			6	12	(1J1R4D1)	GYM25RA-D06	●	GYHR3232P00-M25R	★
			12	24	(1J1R4D2)	GYM25RA-D12	●		
			20 *1	40 *2	(1J1R4D3)	GYM25RA-D20	●		
		L	6	12	(1C1L3D1)	GYM20LA-D06	●	GYHL1616J00-M20L	●
			10	20	(1C1L3D2)	GYM20LA-D10	●		
			18 *4	36	(1C1L3D3)	GYM20LB-D18	●		
			6	12	(1E1L3D1)	GYM20LA-D06	●	GYHL2020K00-M20L	●
			10	20	(1E1L3D2)	GYM20LA-D10	●		
			18 *4	36	(1E1L3D3)	GYM20LB-D18	●		
			6	12	(1E1L4D1)	GYM25LA-D06	●	GYHL2020K00-M25L	●
			12	24	(1E1L4D2)	GYM25LA-D12	●		
			20 *1	40 *2	(1E1L4D3)	GYM25LA-D20	●		
			6	12	(1G1L4D1)	GYM25LA-D06	●	GYHL2525M00-M25L	●
			12	24	(1G1L4D2)	GYM25LA-D12	●		
			20 *1	40 *2	(1G1L4D3)	GYM25LA-D20	●		
			6	12	(1Q1L4D1)	GYM25LA-D06	●	GYHL3225P00-M25L	★
			12	24	(1Q1L4D2)	GYM25LA-D12	●		
			20 *1	40 *2	(1Q1L4D3)	GYM25LA-D20	●		
			6	12	(1J1L4D1)	GYM25LA-D06	●	GYHL3232P00-M25L	★
			12	24	(1J1L4D2)	GYM25LA-D12	●		
			20 *1	40 *2	(1J1L4D3)	GYM25LA-D20	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 The maximum cut off diameter **D1** varies according to the insert used. The cut off diameter is double the maximum groove depth (ar) of inserts on pages F014-F016.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2** and **F1** values may vary.
*4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F051.

● : Inventory maintained. ★ : Inventory maintained in Japan.

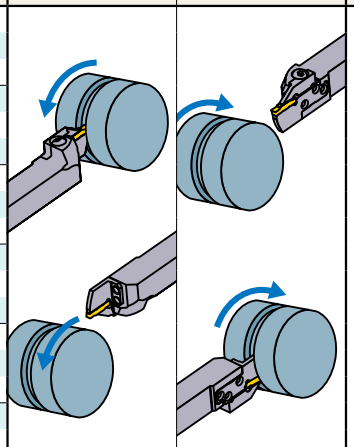
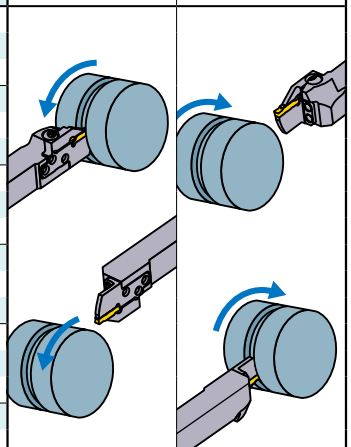


Right hand tool holder shown.

* Wrench : ①For Clamp Screw ②For Blade Screw.

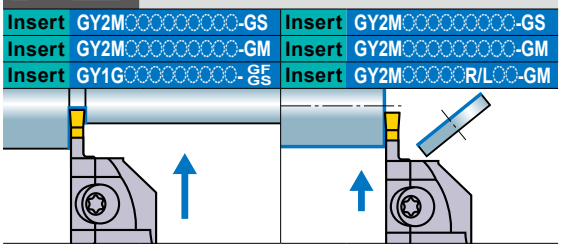
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHR/L1616J00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/L2020K00-M20R/L			
GYHR/L2020K00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

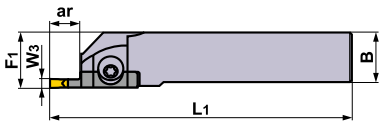
Dimensions (mm) *3							Fig.	Cutting Mode		Insert	
H1	B	L1	L2	H2	F1	S3		Clockwise	Counter Clockwise	Geometry / Insert Number	Page
16	16	104	28	16	20	4	3			GY2M0200D020N-GS GY2M0200D020N-GM (Gauge insert) GY2M0200D020R05-GM GY2M0200D020L05-GM GY2M0200D020N-MM GY2M0200D100N-BM GY1G0200D020N-GFGS	F014 – F016
16	16	110	34	16	20	4	3				
16	16	116	40	16	20	4	4				
20	20	119	28	20	23	—	1				
20	20	125	34	20	23	—	1				
20	20	131	40	20	23	—	2				
20	20	117	31	20	26	5	3				
20	20	125	39	20	26	5	3				
20	20	131	45	20	26	5	4				
25	25	142	31	25	28	—	1				
25	25	150	39	25	28	—	1				
25	25	156	45	25	28	—	2				
32	25	162	31	32	28	—	1				
32	25	170	39	32	28	—	1				
32	25	176	45	32	28	—	2				
32	32	162	31	32	35	—	1				
32	32	170	39	32	35	—	1				
32	32	176	45	32	35	—	2				
16	16	104	28	16	20	4	3				
16	16	110	34	16	20	4	3				
16	16	116	40	16	20	4	4				
20	20	119	28	20	23	—	1				
20	20	125	34	20	23	—	1				
20	20	131	40	20	23	—	2				
20	20	117	31	20	26	5	3				
20	20	125	39	20	26	5	3				
20	20	131	45	20	26	5	4				
25	25	142	31	25	28	—	1				
25	25	150	39	25	28	—	1				
25	25	156	45	25	28	—	2				
32	25	162	31	32	28	—	1				
32	25	170	39	32	28	—	1				
32	25	176	45	32	28	—	2				
32	32	162	31	32	35	—	1				
32	32	170	39	32	35	—	1				
32	32	176	45	32	35	—	2				

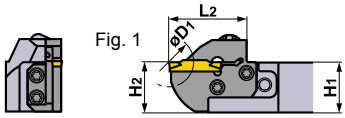
GY SERIES (EXTERNAL GROOVING)

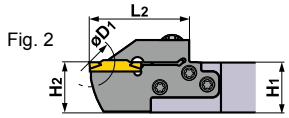
1-2 00° type holder (Metric)



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder and left hand modular blade for left hand modular holder.





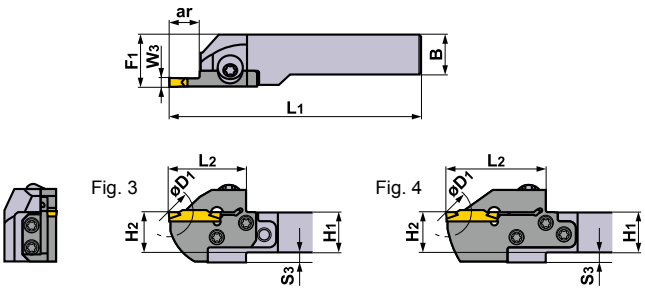


Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	Max. Groove Depth ar (mm)	Max. Cut Off Diameter D1 (mm)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
E	2.39 2.50	R	6	12	(1C1R3E1)	GYM20RA-E06	●	GYHR1616J00-M20R	●
			10	20	(1C1R3E2)	GYM20RA-E10	●		
			18 *4	36	(1C1R3E3)	GYM20RB-E18	●		
			6	12	(1E1R3E1)	GYM20RA-E06	●	GYHR2020K00-M20R	●
			10	20	(1E1R3E2)	GYM20RA-E10	●		
			18 *4	36	(1E1R3E3)	GYM20RB-E18	●		
			6	12	(1E1R4E1)	GYM25RA-E06	●	GYHR2020K00-M25R	●
			12	24	(1E1R4E2)	GYM25RA-E12	●		
			20 *1	40 *2	(1E1R4E3)	GYM25RA-E20	●		
			6	12	(1G1R4E1)	GYM25RA-E06	●	GYHR2525M00-M25R	●
			12	24	(1G1R4E2)	GYM25RA-E12	●		
			20 *1	40 *2	(1G1R4E3)	GYM25RA-E20	●		
			6	12	(1Q1R4E1)	GYM25RA-E06	●	GYHR3225P00-M25R	★
			12	24	(1Q1R4E2)	GYM25RA-E12	●		
			20 *1	40 *2	(1Q1R4E3)	GYM25RA-E20	●		
			6	12	(1J1R4E1)	GYM25RA-E06	●	GYHR3232P00-M25R	★
			12	24	(1J1R4E2)	GYM25RA-E12	●		
			20 *1	40 *2	(1J1R4E3)	GYM25RA-E20	●		
		L	6	12	(1C1L3E1)	GYM20LA-E06	●	GYHL1616J00-M20L	●
			10	20	(1C1L3E2)	GYM20LA-E10	●		
			18 *4	36	(1C1L3E3)	GYM20LB-E18	●		
			6	12	(1E1L3E1)	GYM20LA-E06	●	GYHL2020K00-M20L	●
			10	20	(1E1L3E2)	GYM20LA-E10	●		
			18 *4	36	(1E1L3E3)	GYM20LB-E18	●		
			6	12	(1E1L4E1)	GYM25LA-E06	●	GYHL2020K00-M25L	●
			12	24	(1E1L4E2)	GYM25LA-E12	●		
			20 *1	40 *2	(1E1L4E3)	GYM25LA-E20	●		
			6	12	(1G1L4E1)	GYM25LA-E06	●	GYHL2525M00-M25L	●
			12	24	(1G1L4E2)	GYM25LA-E12	●		
			20 *1	40 *2	(1G1L4E3)	GYM25LA-E20	●		
			6	12	(1Q1L4E1)	GYM25LA-E06	●	GYHL3225P00-M25L	★
			12	24	(1Q1L4E2)	GYM25LA-E12	●		
			20 *1	40 *2	(1Q1L4E3)	GYM25LA-E20	●		
			6	12	(1J1L4E1)	GYM25LA-E06	●	GYHL3232P00-M25L	★
			12	24	(1J1L4E2)	GYM25LA-E12	●		
			20 *1	40 *2	(1J1L4E3)	GYM25LA-E20	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 The maximum cut off diameter **D1** varies according to the insert used. The cut off diameter is double the maximum groove depth (ar) of inserts on pages F014-F016.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2** and **F1** values may vary.
*4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F051.

● : Inventory maintained. ★ : Inventory maintained in Japan.

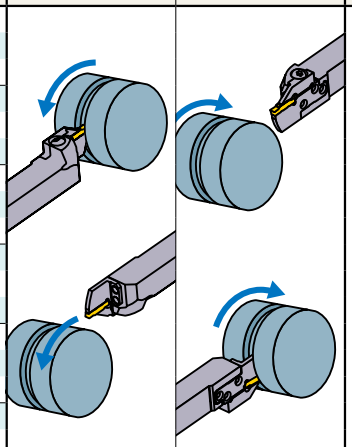
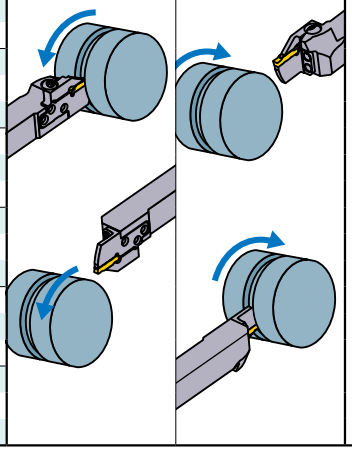


Right hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

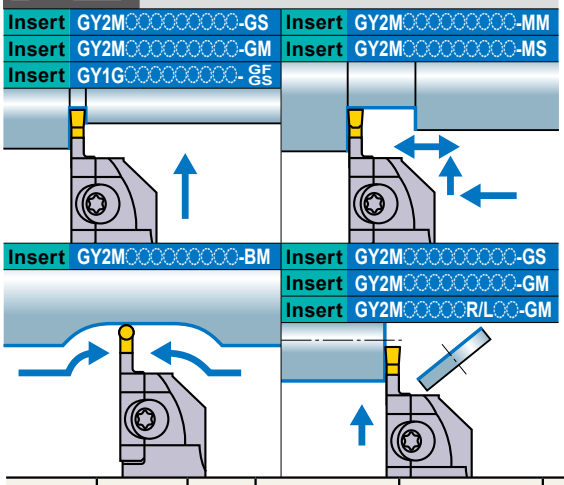
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗ Wrench ① ②
GYHR/L1616J00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/L2020K00-M20R/L			
GYHR/L2020K00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Dimensions (mm) ∗3							Fig.	Cutting Mode		Insert	
H1	B	L1	L2	H2	F1	S3		Clockwise	Counter Clockwise	Geometry / Insert Number	Page
16	16	104	28	16	20	4	3			GY2M0239E020N-GS GY2M0250E020N-GS GY2M0239E020N-GM GY2M0250E020N-GM (Gauge insert) GY2M0250E020R05-GM GY2M0250E020L05-GM GY2M0250E020N-MM GY2M0250E125N-BM GY1G0239E020N-GFGS GY1G0250E020N-GFGS	F014 ı F016
16	16	110	34	16	20	4	3				
16	16	116	40	16	20	4	4				
20	20	119	28	20	23	—	1				
20	20	125	34	20	23	—	1				
20	20	131	40	20	23	—	2				
20	20	117	31	20	26	5	3				
20	20	125	39	20	26	5	3				
20	20	131	45	20	26	5	4				
25	25	142	31	25	28	—	1				
25	25	150	39	25	28	—	1				
25	25	156	45	25	28	—	2				
32	25	162	31	32	28	—	1				
32	25	170	39	32	28	—	1				
32	25	176	45	32	28	—	2				
32	32	162	31	32	35	—	1				
32	32	170	39	32	35	—	1				
32	32	176	45	32	35	—	2				
16	16	104	28	16	20	4	3				
16	16	110	34	16	20	4	3				
16	16	116	40	16	20	4	4				
20	20	119	28	20	23	—	1				
20	20	125	34	20	23	—	1				
20	20	131	40	20	23	—	2				
20	20	117	31	20	26	5	3				
20	20	125	39	20	26	5	3				
20	20	131	45	20	26	5	4				
25	25	142	31	25	28	—	1				
25	25	150	39	25	28	—	1				
25	25	156	45	25	28	—	2				
32	25	162	31	32	28	—	1				
32	25	170	39	32	28	—	1				
32	25	176	45	32	28	—	2				
32	32	162	31	32	35	—	1				
32	32	170	39	32	35	—	1				
32	32	176	45	32	35	—	2				

GY SERIES (EXTERNAL GROOVING)

1-2 00° type holder (Metric)



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder and left hand modular blade for left hand modular holder.

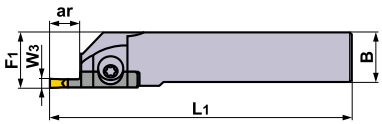




Fig. 1

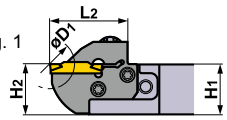
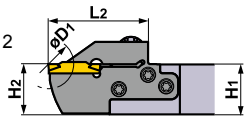


Fig. 2

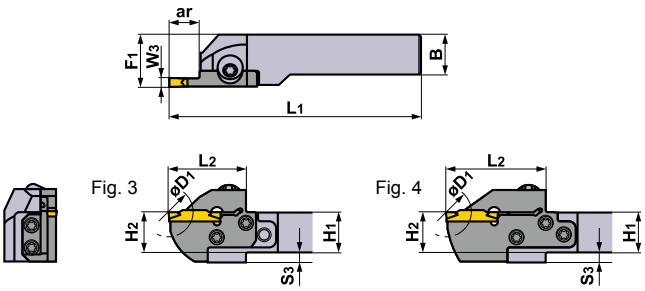


Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	Max. Groove Depth ar (mm)	Max. Cut Off Diameter D1 (mm)	ID	Order Number			
						Modular Blade	Stock	Modular Holder	Stock
F	3.00 3.18	R	6	12	(1C1R3F1)	GYM20RA-F06	●	GYHR1616J00-M20R	●
			10	20	(1C1R3F2)	GYM20RA-F10	●		
			18 *4	36	(1C1R3F3)	GYM20RB-F18	●		
			6	12	(1E1R3F1)	GYM20RA-F06	●	GYHR2020K00-M20R	●
			10	20	(1E1R3F2)	GYM20RA-F10	●		
			18 *4	36	(1E1R3F3)	GYM20RB-F18	●		
			6	12	(1E1R4F1)	GYM25RA-F06	●	GYHR2020K00-M25R	●
			12	24	(1E1R4F2)	GYM25RA-F12	●		
			20 *1	40 *2	(1E1R4F3)	GYM25RA-F20	●		
			6	12	(1G1R4F1)	GYM25RA-F06	●	GYHR2525M00-M25R	●
			12	24	(1G1R4F2)	GYM25RA-F12	●		
			20 *1	40 *2	(1G1R4F3)	GYM25RA-F20	●		
			6	12	(1Q1R4F1)	GYM25RA-F06	●	GYHR3225P00-M25R	★
			12	24	(1Q1R4F2)	GYM25RA-F12	●		
			20 *1	40 *2	(1Q1R4F3)	GYM25RA-F20	●		
			6	12	(1J1R4F1)	GYM25RA-F06	●	GYHR3232P00-M25R	★
			12	24	(1J1R4F2)	GYM25RA-F12	●		
			20 *1	40 *2	(1J1R4F3)	GYM25RA-F20	●		
		L	6	12	(1C1L3F1)	GYM20LA-F06	●	GYHL1616J00-M20L	●
			10	20	(1C1L3F2)	GYM20LA-F10	●		
			18 *4	36	(1C1L3F3)	GYM20LB-F18	●		
			6	12	(1E1L3F1)	GYM20LA-F06	●	GYHL2020K00-M20L	●
			10	20	(1E1L3F2)	GYM20LA-F10	●		
			18 *4	36	(1E1L3F3)	GYM20LB-F18	●		
			6	12	(1E1L4F1)	GYM25LA-F06	●	GYHL2020K00-M25L	●
			12	24	(1E1L4F2)	GYM25LA-F12	●		
			20 *1	40 *2	(1E1L4F3)	GYM25LA-F20	●		
			6	12	(1G1L4F1)	GYM25LA-F06	●	GYHL2525M00-M25L	●
			12	24	(1G1L4F2)	GYM25LA-F12	●		
			20 *1	40 *2	(1G1L4F3)	GYM25LA-F20	●		
			6	12	(1Q1L4F1)	GYM25LA-F06	●	GYHL3225P00-M25L	★
			12	24	(1Q1L4F2)	GYM25LA-F12	●		
			20 *1	40 *2	(1Q1L4F3)	GYM25LA-F20	●		
			6	12	(1J1L4F1)	GYM25LA-F06	●	GYHL3232P00-M25L	★
			12	24	(1J1L4F2)	GYM25LA-F12	●		
			20 *1	40 *2	(1J1L4F3)	GYM25LA-F20	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 The maximum cut off diameter **D1** varies according to the insert used. The cut off diameter is double the maximum groove depth (ar) of inserts on pages F014-F016.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2** and **F1** values may vary.
*4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F051.

● : Inventory maintained. ★ : Inventory maintained in Japan.

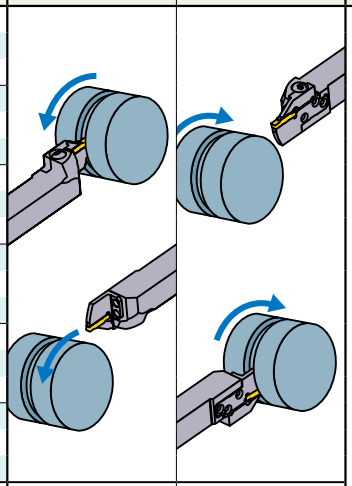
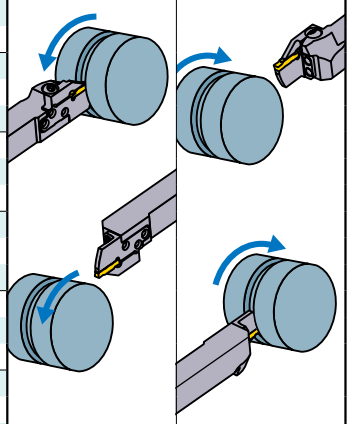


Right hand tool holder shown.

* Wrench : ①For Clamp Screw ②For Blade Screw.

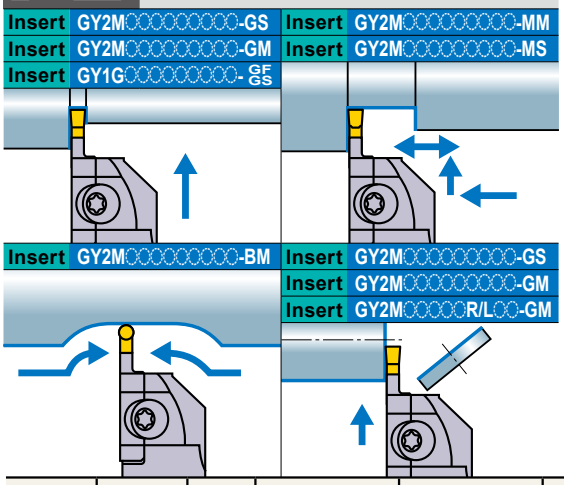
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench ①②
GYHR/L1616J00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/L2020K00-M20R/L			
GYHR/L2020K00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Dimensions (mm) *3							Fig.	Cutting Mode		Insert	
H1	B	L1	L2	H2	F1	S3		Clockwise	Counter Clockwise	Geometry / Insert Number	Page
16	16	104	28	16	20	4	3			GY2M0300F020N-GS GY2M0318F020N-GS GY2M0300F030N-GM (Gauge insert) GY2M0318F030N-GM GY2M0300F030R05-GM GY2M0300F030L05-GM GY2M0300F020N-MS GY2M0300F040N-MS GY2M0300F020N-MM GY2M0300F040N-MM GY2M0300F080N-MM GY2M0300F150N-BM GY2M0318F159N-BM GY1G0300F020N-GFGS GY1G0318F020N-GFGS	F014 I F016
16	16	110	34	16	20	4	3				
16	16	116	40	16	20	4	4				
20	20	119	28	20	23	—	1				
20	20	125	34	20	23	—	1				
20	20	131	40	20	23	—	2				
20	20	117	31	20	26	5	3				
20	20	125	39	20	26	5	3				
20	20	131	45	20	26	5	4				
25	25	142	31	25	28	—	1				
25	25	150	39	25	28	—	1				
25	25	156	45	25	28	—	2				
32	25	162	31	32	28	—	1				
32	25	170	39	32	28	—	1				
32	25	176	45	32	28	—	2				
32	32	162	31	32	35	—	1				
32	32	170	39	32	35	—	1				
32	32	176	45	32	35	—	2				
16	16	104	28	16	20	4	3				
16	16	110	34	16	20	4	3				
16	16	116	40	16	20	4	4				
20	20	119	28	20	23	—	1				
20	20	125	34	20	23	—	1				
20	20	131	40	20	23	—	2				
20	20	117	31	20	26	5	3				
20	20	125	39	20	26	5	3				
20	20	131	45	20	26	5	4				
25	25	142	31	25	28	—	1				
25	25	150	39	25	28	—	1				
25	25	156	45	25	28	—	2				
32	25	162	31	32	28	—	1				
32	25	170	39	32	28	—	1				
32	25	176	45	32	28	—	2				
32	32	162	31	32	35	—	1				
32	32	170	39	32	35	—	1				
32	32	176	45	32	35	—	2				

GY SERIES (EXTERNAL GROOVING)

1-2 00° type holder (Metric)



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder and left hand modular blade for left hand modular holder.

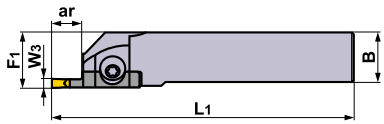




Fig. 1

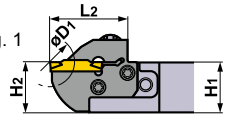
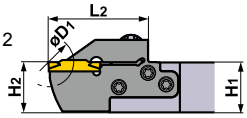


Fig. 2

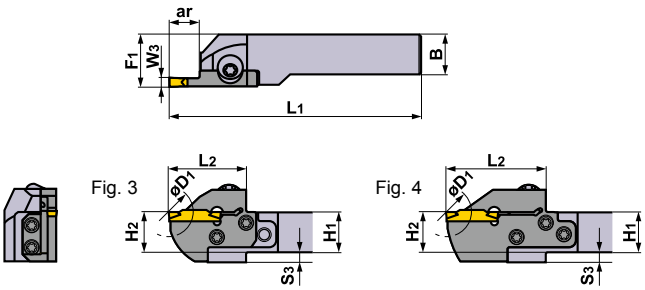


Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	Max. Groove Depth ar (mm)	Max. Cut Off Diameter D1 (mm)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
G	4.00	R	12	24	(1C1R3G1)	GYM20RA-G12	●	GYHR1616J00-M20R	●
			12	24	(1E1R3G1)	GYM20RA-G12	●	GYHR2020K00-M20R	●
			8	16	(1E1R4G1)	GYM25RA-G08	●	GYHR2020K00-M25R	●
			14	28	(1E1R4G2)	GYM25RA-G14	●		
			25 *1	50 *2	(1E1R4G3)	GYM25RA-G25	●		
			8	16	(1G1R4G1)	GYM25RA-G08	●	GYHR2525M00-M25R	●
			14	28	(1G1R4G2)	GYM25RA-G14	●		
			25 *1	50 *2	(1G1R4G3)	GYM25RA-G25	●		
			8	16	(1Q1R4G1)	GYM25RA-G08	●	GYHR3225P00-M25R	★
			14	28	(1Q1R4G2)	GYM25RA-G14	●		
			25 *1	50 *2	(1Q1R4G3)	GYM25RA-G25	●		
			8	16	(1J1R4G1)	GYM25RA-G08	●	GYHR3232P00-M25R	★
			14	28	(1J1R4G2)	GYM25RA-G14	●		
			25 *1	50 *2	(1J1R4G3)	GYM25RA-G25	●		
		L	12	24	(1C1L3G1)	GYM20LA-G12	●	GYHL1616J00-M20L	●
			12	24	(1E1L3G1)	GYM20LA-G12	●	GYHL2020K00-M20L	●
			8	16	(1E1L4G1)	GYM25LA-G08	●	GYHL2020K00-M25L	●
			14	28	(1E1L4G2)	GYM25LA-G14	●		
			25 *1	50 *2	(1E1L4G3)	GYM25LA-G25	●		
			8	16	(1G1L4G1)	GYM25LA-G08	●	GYHL2525M00-M25L	●
			14	28	(1G1L4G2)	GYM25LA-G14	●		
			25 *1	50 *2	(1G1L4G3)	GYM25LA-G25	●		
			8	16	(1Q1L4G1)	GYM25LA-G08	●	GYHL3225P00-M25L	★
			14	28	(1Q1L4G2)	GYM25LA-G14	●		
			25 *1	50 *2	(1Q1L4G3)	GYM25LA-G25	●		
			8	16	(1J1L4G1)	GYM25LA-G08	●	GYHL3232P00-M25L	★
			14	28	(1J1L4G2)	GYM25LA-G14	●		
			25 *1	50 *2	(1J1L4G3)	GYM25LA-G25	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 The maximum cut off diameter **D1** varies according to the insert used. The cut off diameter is double the maximum groove depth (ar) of inserts on pages F014-F016.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2** and **F1** values may vary.

● : Inventory maintained. ★ : Inventory maintained in Japan.

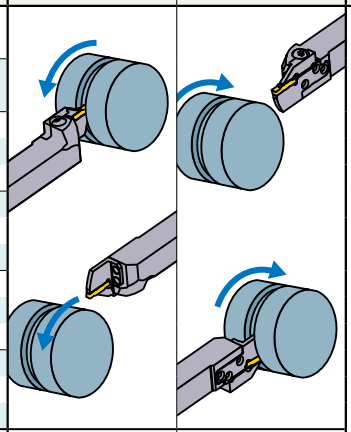
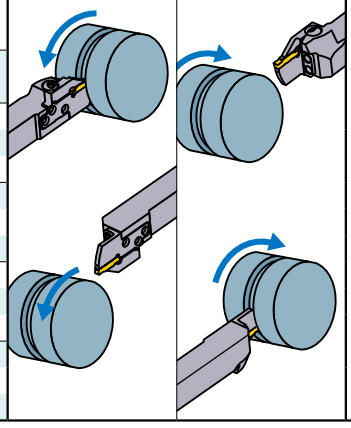


Right hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

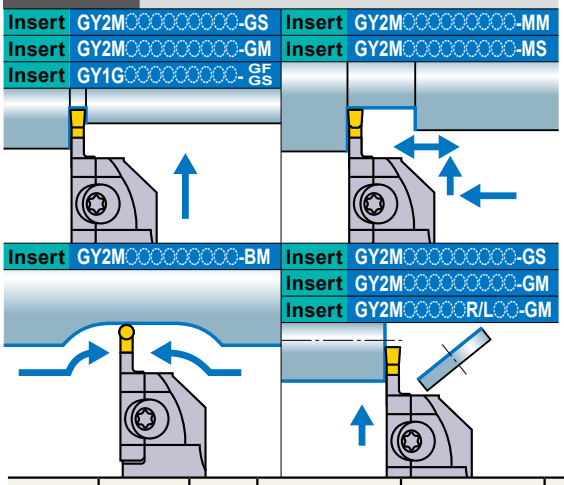
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗ Wrench (①/②)
GYHR/L1616J00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/L2020K00-M20R/L			
GYHR/L2020K00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Dimensions (mm) ∗3							Fig.	Cutting Mode		Insert	
H1	B	L1	L2	H2	F1	S3		Clockwise	Counter Clockwise	Geometry / Insert Number	Page
16	16	110	34	16	20	4	3			GY2M0400G030N-GU GY2M0400G020N-GS GY2M0400G030N-GM (Gauge insert) GY2M0400G030R05-GM GY2M0400G030L05-GM GY2M0400G020N-MS GY2M0400G040N-MS GY2M0400G020N-MM GY2M0400G040N-MM GY2M0400G080N-MM GY2M0400G200N-BM GY1G0400G020N-GFGS	F014 I F016
20	20	125	34	20	23	—	1				
20	20	119	33	20	26	5	3				
20	20	125	39	20	26	5	3				
20	20	136	50	20	26	5	4				
25	25	144	33	25	28	—	1				
25	25	150	39	25	28	—	1				
25	25	161	50	25	28	—	2				
32	25	164	33	32	28	—	1				
32	25	170	39	32	28	—	1				
32	25	181	50	32	28	—	2				
32	32	164	33	32	35	—	1				
32	32	170	39	32	35	—	1				
32	32	181	50	32	35	—	2				
16	16	110	34	16	20	4	3				
20	20	125	34	20	23	—	1				
20	20	119	33	20	26	5	3				
20	20	125	39	20	26	5	3				
20	20	136	50	20	26	5	4				
25	25	144	33	25	28	—	1				
25	25	150	39	25	28	—	1				
25	25	161	50	25	28	—	2				
32	25	164	33	32	28	—	1				
32	25	170	39	32	28	—	1				
32	25	181	50	32	28	—	2				
32	32	164	33	32	35	—	1				
32	32	170	39	32	35	—	1				
32	32	181	50	32	35	—	2				

GY SERIES (EXTERNAL GROOVING)

1-2 00° type holder (Metric)



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder and left hand modular blade for left hand modular holder.

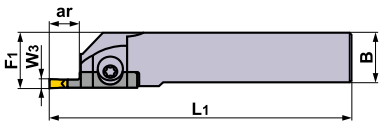




Fig. 1

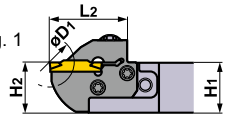
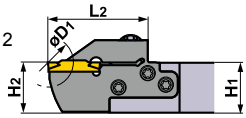


Fig. 2

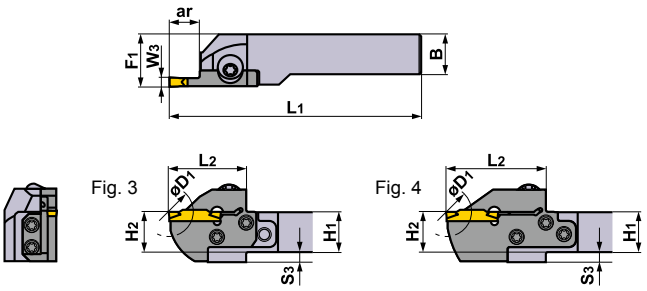


Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	Max. Groove Depth ar (mm)	Max. Cut Off Diameter D1 (mm)	ID	Order Number			
						Modular Blade	Stock	Modular Holder	Stock
H	4.75 5.00	R	12	24	(1C1R3H1)	**GYM20RA-H12**	●	**GYHR1616J00-M20R**	●
			12	24	(1E1R3H1)	**GYM20RA-H12**	●	**GYHR2020K00-M20R**	●
			8	16	(1E1R4H1)	**GYM25RA-H08**	●	**GYHR2020K00-M25R**	●
			14	28	(1E1R4H2)	**GYM25RA-H14**	●		
			25 *1	50 *2	(1E1R4H3)	**GYM25RA-H25**	●		
			8	16	(1G1R4H1)	**GYM25RA-H08**	●	**GYHR2525M00-M25R**	●
			14	28	(1G1R4H2)	**GYM25RA-H14**	●		
			25 *1	50 *2	(1G1R4H3)	**GYM25RA-H25**	●		
			8	16	(1Q1R4H1)	**GYM25RA-H08**	●	**GYHR3225P00-M25R**	★
			14	28	(1Q1R4H2)	**GYM25RA-H14**	●		
			25 *1	50 *2	(1Q1R4H3)	**GYM25RA-H25**	●		
			8	16	(1J1R4H1)	**GYM25RA-H08**	●	**GYHR3232P00-M25R**	★
			14	28	(1J1R4H2)	**GYM25RA-H14**	●		
			25 *1	50 *2	(1J1R4H3)	**GYM25RA-H25**	●		
		L	12	24	(1C1L3H1)	**GYM20LA-H12**	●	**GYHL1616J00-M20L**	●
			12	24	(1E1L3H1)	**GYM20LA-H12**	●	**GYHL2020K00-M20L**	●
			8	16	(1E1L4H1)	**GYM25LA-H08**	●	**GYHL2020K00-M25L**	●
			14	28	(1E1L4H2)	**GYM25LA-H14**	●		
			25 *1	50 *2	(1E1L4H3)	**GYM25LA-H25**	●		
			8	16	(1G1L4H1)	**GYM25LA-H08**	●	**GYHL2525M00-M25L**	●
			14	28	(1G1L4H2)	**GYM25LA-H14**	●		
			25 *1	50 *2	(1G1L4H3)	**GYM25LA-H25**	●		
			8	16	(1Q1L4H1)	**GYM25LA-H08**	●	**GYHL3225P00-M25L**	★
			14	28	(1Q1L4H2)	**GYM25LA-H14**	●		
			25 *1	50 *2	(1Q1L4H3)	**GYM25LA-H25**	●		
			8	16	(1J1L4H1)	**GYM25LA-H08**	●	**GYHL3232P00-M25L**	★
			14	28	(1J1L4H2)	**GYM25LA-H14**	●		
			25 *1	50 *2	(1J1L4H3)	**GYM25LA-H25**	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 The maximum cut off diameter **D1** varies according to the insert used. The cut off diameter is double the maximum groove depth (ar) of inserts on pages F014-F016.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2** and **F1** values may vary.

● : Inventory maintained. ★ : Inventory maintained in Japan.

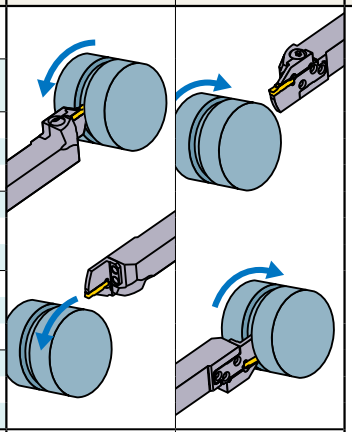
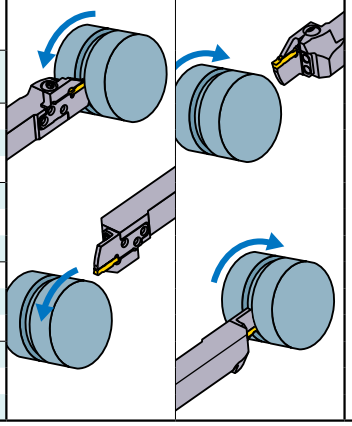


Right hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

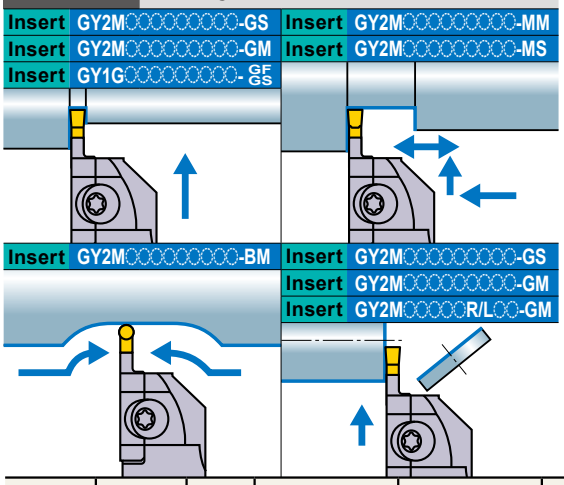
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗ Wrench ① ②
GYHR/L1616J00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/L2020K00-M20R/L			
GYHR/L2020K00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Dimensions (mm) ∗3							Fig.	Cutting Mode		Insert	
H1	B	L1	L2	H2	F1	S3		Clockwise	Counter Clockwise	Geometry / Insert Number	Page
16	16	110	34	16	20	4	3			GY2M0475H040N-GU GY2M0500H040N-GU	F014 I F016
20	20	125	34	20	23	—	1				
20	20	119	33	20	26	5	3			GY2M0475H030N-GS GY2M0500H030N-GS	
20	20	125	39	20	26	5	3				
20	20	136	50	20	26	5	4				
25	25	144	33	25	28	—	1			GY2M0475H040N-GM GY2M0500H040N-GM (Gauge insert)	
25	25	150	39	25	28	—	1				
25	25	161	50	25	28	—	2				
32	25	164	33	32	28	—	1				
32	25	170	39	32	28	—	1				
32	25	181	50	32	28	—	2				
32	32	164	33	32	35	—	1			GY2M0500H040R05-GM GY2M0500H040L05-GM	
32	32	170	39	32	35	—	1				
32	32	181	50	32	35	—	2				
16	16	110	34	16	20	4	3			GY2M0500H040N-MS GY2M0500H080N-MS	
20	20	125	34	20	23	—	1				
20	20	119	33	20	26	5	3			GY2M0500H040N-MM GY2M0500H080N-MM	
20	20	125	39	20	26	5	3				
20	20	136	50	20	26	5	4				
25	25	144	33	25	28	—	1			GY2M0475H238N-BM GY2M0500H250N-BM	
25	25	150	39	25	28	—	1				
25	25	161	50	25	28	—	2				
32	25	164	33	32	28	—	1				
32	25	170	39	32	28	—	1				
32	25	181	50	32	28	—	2				
32	32	164	33	32	35	—	1			GY1G0475H020N-GFGS GY1G0500H020N-GFGS	
32	32	170	39	32	35	—	1				
32	32	181	50	32	35	—	2				

GY SERIES (EXTERNAL GROOVING)

1-2 00° type holder (Metric)



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder and left hand modular blade for left hand modular holder.

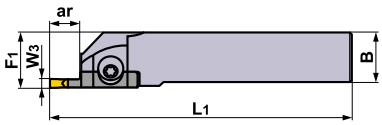




Fig. 1

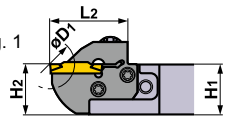
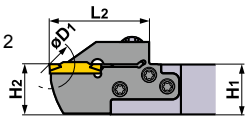


Fig. 2

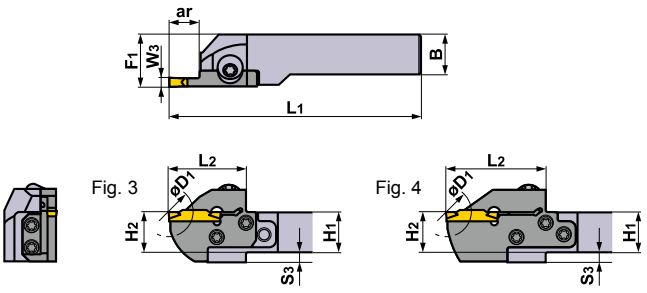


Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	Max. Groove Depth ar (mm)	Max. Cut Off Diameter D1 (mm)	ID	Order Number			
						Modular Blade	Stock	Modular Holder	Stock
J	6.00 6.35	R	8	16	(1E1R4J1)	GYM25RA-J08	●	GYHR2020K00-M25R	●
			14	28	(1E1R4J2)	GYM25RA-J14	●		
			25 *1	50 *2	(1E1R4J3)	GYM25RA-J25	●		
			8	16	(1G1R4J1)	GYM25RA-J08	●	GYHR2525M00-M25R	●
			14	28	(1G1R4J2)	GYM25RA-J14	●		
			25 *1	50 *2	(1G1R4J3)	GYM25RA-J25	●		
			8	16	(1Q1R4J1)	GYM25RA-J08	●	GYHR3225P00-M25R	★
			14	28	(1Q1R4J2)	GYM25RA-J14	●		
			25 *1	50 *2	(1Q1R4J3)	GYM25RA-J25	●		
			8	16	(1J1R4J1)	GYM25RA-J08	●	GYHR3232P00-M25R	★
			14	28	(1J1R4J2)	GYM25RA-J14	●		
			25 *1	50 *2	(1J1R4J3)	GYM25RA-J25	●		
		L	8	16	(1E1L4J1)	GYM25LA-J08	●	GYHL2020K00-M25L	●
			14	28	(1E1L4J2)	GYM25LA-J14	●		
			25 *1	50 *2	(1E1L4J3)	GYM25LA-J25	●		
			8	16	(1G1L4J1)	GYM25LA-J08	●	GYHL2525M00-M25L	●
			14	28	(1G1L4J2)	GYM25LA-J14	●		
			25 *1	50 *2	(1G1L4J3)	GYM25LA-J25	●		
			8	16	(1Q1L4J1)	GYM25LA-J08	●	GYHL3225P00-M25L	★
			14	28	(1Q1L4J2)	GYM25LA-J14	●		
			25 *1	50 *2	(1Q1L4J3)	GYM25LA-J25	●		
			8	16	(1J1L4J1)	GYM25LA-J08	●	GYHL3232P00-M25L	★
			14	28	(1J1L4J2)	GYM25LA-J14	●		
			25 *1	50 *2	(1J1L4J3)	GYM25LA-J25	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 The maximum cut off diameter **D1** varies according to the insert used. The cut off diameter is double the maximum groove depth (ar) of inserts on pages F014-F016.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2** and **F1** values may vary.

● : Inventory maintained. ★ : Inventory maintained in Japan.

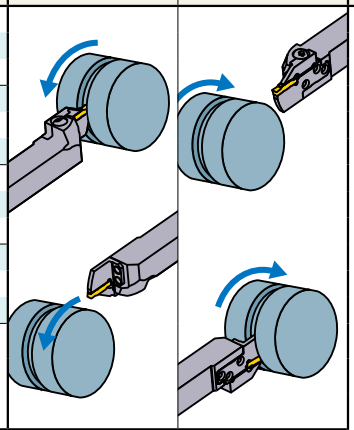
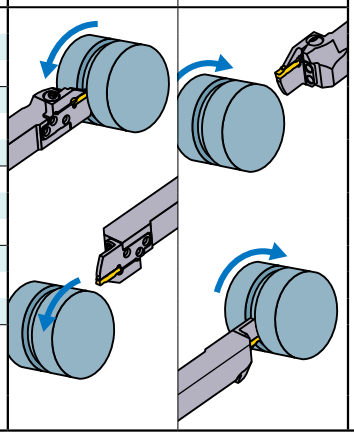


Right hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

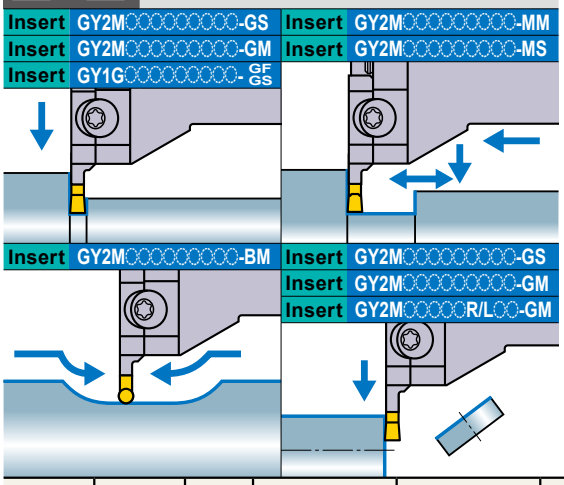
SPARE PARTS

Modular 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			

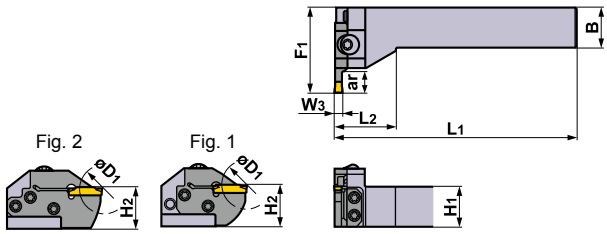
Dimensions (mm) ∗3							Fig.	Cutting Mode		Insert	
H1	B	L1	L2	H2	F1	S3		Clockwise	Counter Clockwise	Geometry / Insert Number	Page
20	20	119	33	20	26	5	3			GY2M0600J040N-GU GY2M0635J040N-GU GY2M0600J030N-GS GY2M0635J030N-GS GY2M0600J040N-GM (Gauge insert) GY2M0635J040N-GM GY2M0600J040N-MS GY2M0600J080N-MS GY2M0600J040N-MM GY2M0600J080N-MM GY2M0600J300N-BM GY2M0635J318N-BM	F014 I F016
20	20	125	39	20	26	5	3				
20	20	136	50	20	26	5	4				
25	25	144	33	25	28	—	1				
25	25	150	39	25	28	—	1				
25	25	161	50	25	28	—	2				
32	25	164	33	32	28	—	1				
32	25	170	39	32	28	—	1				
32	25	181	50	32	28	—	2				
32	32	164	33	32	35	—	1				
32	32	170	39	32	35	—	1				
32	32	181	50	32	35	—	2				
20	20	119	33	20	26	5	3				
20	20	125	39	20	26	5	3				
20	20	136	50	20	26	5	4				
25	25	144	33	25	28	—	1				
25	25	150	39	25	28	—	1				
25	25	161	50	25	28	—	2				
32	25	164	33	32	28	—	1				
32	25	170	39	32	28	—	1				
32	25	181	50	32	28	—	2				
32	32	164	33	32	35	—	1				
32	32	170	39	32	35	—	1				
32	32	181	50	32	35	—	2				

GY SERIES (EXTERNAL GROOVING)

2-2 90° type holder (Metric)



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.



Right hand tool holder shown.

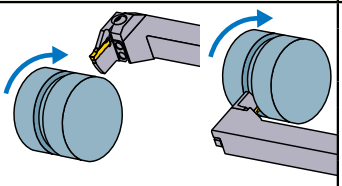
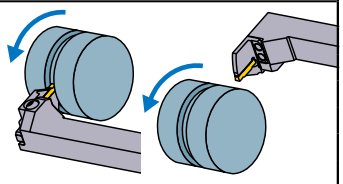
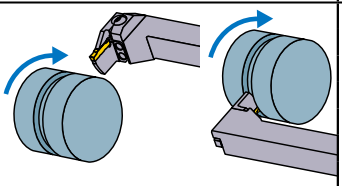
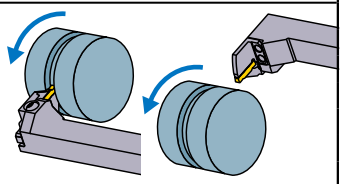
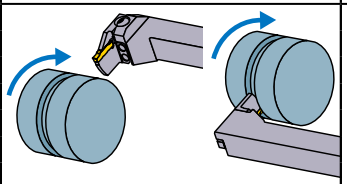
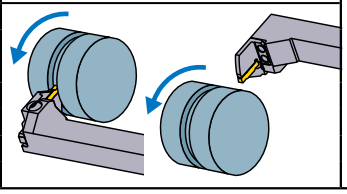
Seat Size	Insert Width W3 (mm)	Hand (R/L)	Max. Groove Depth ar (mm)	Max. Cut Off Diameter D1 (mm)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
D	2.00	R	6	12	(2E1R3D1)	GYM20LA-D06	●	GYHR2020K90-M20L	●
			10	20	(2E1R3D2)	GYM20LA-D10	●		
			18 *4	36	(2E1R3D3)	GYM20LB-D18	●		
			6	12	(2G1R4D1)	GYM25LA-D06	●	GYHR2525M90-M25L	●
			12	24	(2G1R4D2)	GYM25LA-D12	●		
			20 *1	40 *2	(2G1R4D3)	GYM25LA-D20	●		
		L	6	12	(2E1L3D1)	GYM20RA-D06	●	GYHL2020K90-M20R	●
			10	20	(2E1L3D2)	GYM20RA-D10	●		
			18 *4	36	(2E1L3D3)	GYM20RB-D18	●		
			6	12	(2G1L4D1)	GYM25RA-D06	●	GYHL2525M90-M25R	●
			12	24	(2G1L4D2)	GYM25RA-D12	●		
			20 *1	40 *2	(2G1L4D3)	GYM25RA-D20	●		
E	2.39 2.50	R	6	12	(2E1R3E1)	GYM20LA-E06	●	GYHR2020K90-M20L	●
			10	20	(2E1R3E2)	GYM20LA-E10	●		
			18 *4	36	(2E1R3E3)	GYM20LB-E18	●		
			6	12	(2G1R4E1)	GYM25LA-E06	●	GYHR2525M90-M25L	●
			12	24	(2G1R4E2)	GYM25LA-E12	●		
			20 *1	40 *2	(2G1R4E3)	GYM25LA-E20	●		
		L	6	12	(2E1L3E1)	GYM20RA-E06	●	GYHL2020K90-M20R	●
			10	20	(2E1L3E2)	GYM20RA-E10	●		
			18 *4	36	(2E1L3E3)	GYM20RB-E18	●		
			6	12	(2G1L4E1)	GYM25RA-E06	●	GYHL2525M90-M25R	●
			12	24	(2G1L4E2)	GYM25RA-E12	●		
			20 *1	40 *2	(2G1L4E3)	GYM25RA-E20	●		
F	3.00 3.18	R	6	12	(2E1R3F1)	GYM20LA-F06	●	GYHR2020K90-M20L	●
			10	20	(2E1R3F2)	GYM20LA-F10	●		
			18 *4	36	(2E1R3F3)	GYM20LB-F18	●		
			6	12	(2G1R4F1)	GYM25LA-F06	●	GYHR2525M90-M25L	●
			12	24	(2G1R4F2)	GYM25LA-F12	●		
			20 *1	40 *2	(2G1R4F3)	GYM25LA-F20	●		
		L	6	12	(2E1L3F1)	GYM20RA-F06	●	GYHL2020K90-M20R	●
			10	20	(2E1L3F2)	GYM20RA-F10	●		
			18 *4	36	(2E1L3F3)	GYM20RB-F18	●		
			6	12	(2G1L4F1)	GYM25RA-F06	●	GYHL2525M90-M25R	●
			12	24	(2G1L4F2)	GYM25RA-F12	●		
			20 *1	40 *2	(2G1L4F3)	GYM25RA-F20	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 The maximum cut off diameter **D1** varies according to the insert used. The cut off diameter is double the maximum groove depth (ar) of inserts on pages F014-F016.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2** and **F1** values may vary.
*4 The maximum groove depth is limited by the workpiece diameter. For details, please refer to page F051.
● : **Inventory maintained.**

* Wrench : ①For Clamp Screw ②For Blade Screw.

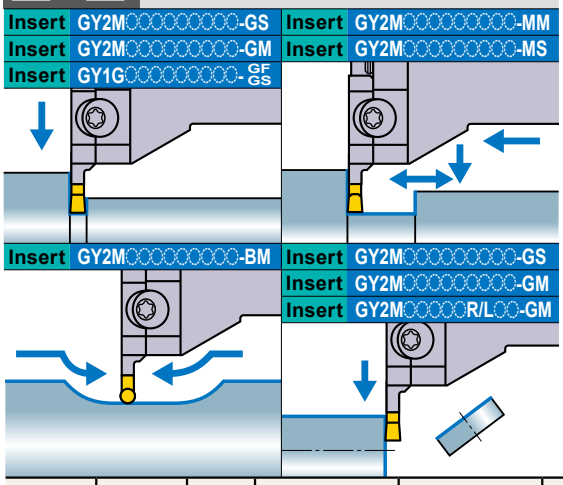
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench (①②)
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			

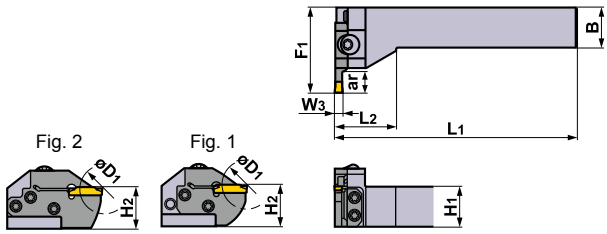
Dimensions (mm) *3						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
20	20	125	35	20	39	1		GY2M0200D020N-GS GY2M0200D020N-GM (Gauge insert) GY2M0200D020R05-GM GY2M0200D020L05-GM GY2M0200D020N-MM GY2M0200D100N-BM GY1G0200D020N-GFGS	F014 ı F016
20	20	125	35	20	45	1			
20	20	125	35	20	51	2			
25	25	150	38	25	45	1			
25	25	150	38	25	53	1			
25	25	150	38	25	59	2			
20	20	125	35	20	39	1			
20	20	125	35	20	45	1			
20	20	125	35	20	51	2			
25	25	150	38	25	45	1			
25	25	150	38	25	53	1			
25	25	150	38	25	59	2			
20	20	125	35	20	39	1		GY2M0239E020N-GS GY2M0250E020N-GS GY2M0239E020N-GM GY2M0250E020N-GM (Gauge insert) GY2M0250E020R05-GM GY2M0250E020L05-GM GY2M0250E020N-MM GY2M0250E125N-BM GY1G0239E020N-GFGS GY1G0250E020N-GFGS	F014 ı F016
20	20	125	35	20	45	1			
20	20	125	35	20	51	2			
25	25	150	38	25	45	1			
25	25	150	38	25	53	1			
25	25	150	38	25	59	2			
20	20	125	35	20	39	1			
20	20	125	35	20	45	1			
20	20	125	35	20	51	2			
25	25	150	38	25	45	1			
25	25	150	38	25	53	1			
25	25	150	38	25	59	2			
20	20	125	35	20	39	1		GY2M0300F020N-GS GY2M0318F020N-GS GY2M0300F030N-GM (Gauge insert) GY2M0318F030N-GM GY2M0300F030R05-GM GY2M0300F030L05-GM GY2M0300F020N-MS GY2M0300F040N-MS GY2M0300F020N-MM GY2M0300F040N-MM GY2M0300F080N-MM GY2M0300F150N-BM GY2M0318F159N-BM GY1G0300F020N-GFGS GY1G0318F020N-GFGS	F014 ı F016
20	20	125	35	20	45	1			
20	20	125	35	20	51	2			
25	25	150	38	25	45	1			
25	25	150	38	25	53	1			
25	25	150	38	25	59	2			
20	20	125	35	20	39	1			
20	20	125	35	20	45	1			
20	20	125	35	20	51	2			
25	25	150	38	25	45	1			
25	25	150	38	25	53	1			
25	25	150	38	25	59	2			

GY SERIES (EXTERNAL GROOVING)

2-2 90° type holder (Metric)



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.



Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	Max. Groove Depth ar (mm)	Max. Cut Off Diameter D1 (mm)	ID	Order Number			
						Modular Blade	Stock	Modular Holder	Stock
G	4.00	R	12	24	(2E1R3G1)	GYM20LA-G12	●	GYHR2020K90-M20L	●
			8	16	(2G1R4G1)	GYM25LA-G08	●	GYHR2525M90-M25L	●
			14	28	(2G1R4G2)	GYM25LA-G14	●		
			25 *1	50 *2	(2G1R4G3)	GYM25LA-G25	●		
		L	12	24	(2E1L3G1)	GYM20RA-G12	●	GYHL2020K90-M20R	●
			8	16	(2G1L4G1)	GYM25RA-G08	●	GYHL2525M90-M25R	●
			14	28	(2G1L4G2)	GYM25RA-G14	●		
			25 *1	50 *2	(2G1L4G3)	GYM25RA-G25	●		
H	4.75 5.00	R	12	24	(2E1R3H1)	GYM20LA-H12	●	GYHR2020K90-M20L	●
			8	16	(2G1R4H1)	GYM25LA-H08	●	GYHR2525M90-M25L	●
			14	28	(2G1R4H2)	GYM25LA-H14	●		
			25 *1	50 *2	(2G1R4H3)	GYM25LA-H25	●		
		L	12	24	(2E1L3H1)	GYM20RA-H12	●	GYHL2020K90-M20R	●
			8	16	(2G1L4H1)	GYM25RA-H08	●	GYHL2525M90-M25R	●
			14	28	(2G1L4H2)	GYM25RA-H14	●		
			25 *1	50 *2	(2G1L4H3)	GYM25RA-H25	●		
J	6.00 6.35	R	8	16	(2G1R4J1)	GYM25LA-J08	●	GYHR2525M90-M25L	●
			14	28	(2G1R4J2)	GYM25LA-J14	●		
			25 *1	50 *2	(2G1R4J3)	GYM25LA-J25	●		
		L	8	16	(2G1L4J1)	GYM25RA-J08	●	GYHL2525M90-M25R	●
			14	28	(2G1L4J2)	GYM25RA-J14	●		
			25 *1	50 *2	(2G1L4J3)	GYM25RA-J25	●		

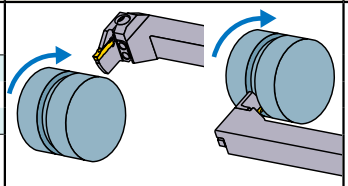
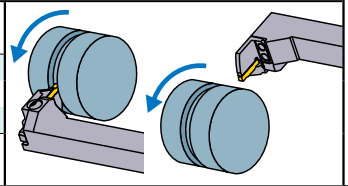
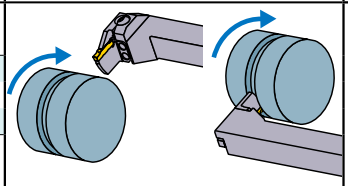
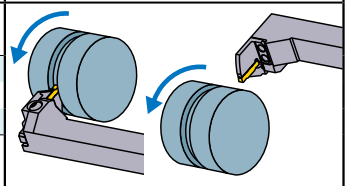
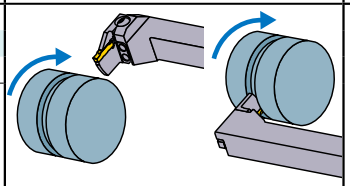
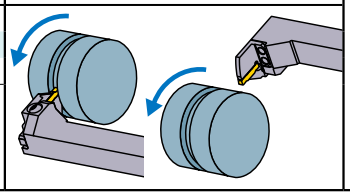
*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2. The maximum cut off diameter **D1** varies according to the insert used. The cut off diameter is double the maximum groove depth (ar) of inserts on pages F014-F016.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1**, **L2** and **F1** values may vary.

● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench (①, ②)
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			

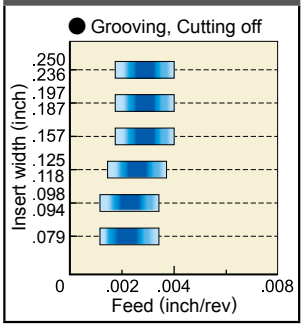
Dimensions (mm) *3						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
20	20	125	35	20	45	1		GY2M0400G030N-GU GY2M0400G020N-GS GY2M0400G030N-GM (Gauge insert) GY2M0400G030R05-GM GY2M0400G030L05-GM GY2M0400G020N-MS GY2M0400G040N-MS GY2M0400G020N-MM GY2M0400G040N-MM GY2M0400G080N-MM GY2M0400G200N-BM GY1G0400G020N-GFGS	F014 ı F016
25	25	150	38	25	47	1			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
20	20	125	35	20	45	1			
25	25	150	38	25	47	1			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
20	20	125	35	20	45	1		GY2M0475H040N-GU GY2M0500H040N-GU GY2M0475H030N-GS GY2M0500H030N-GS GY2M0475H040N-GM GY2M0500H040N-GM (Gauge insert) GY2M0500H040R05-GM GY2M0500H040L05-GM GY2M0500H040N-MS GY2M0500H080N-MS GY2M0500H040N-MM GY2M0500H080N-MM GY2M0475H238N-BM GY2M0500H250N-BM GY1G0475H020N-GFGS GY1G0500H020N-GFGS	F014 ı F016
25	25	150	38	25	47	1			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
20	20	125	35	20	45	1			
25	25	150	38	25	47	1			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	47	1		GY2M0600J040N-GU GY2M0635J040N-GU GY2M0600J030N-GS GY2M0635J030N-GS GY2M0600J040N-GM (Gauge insert) GY2M0635J040N-GM GY2M0600J040N-MS GY2M0600J080N-MS GY2M0600J040N-MM GY2M0600J080N-MM GY2M0600J300N-BM GY2M0635J318N-BM	F014 ı F016
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
									

Recommended Cutting Conditions [External Grooving]

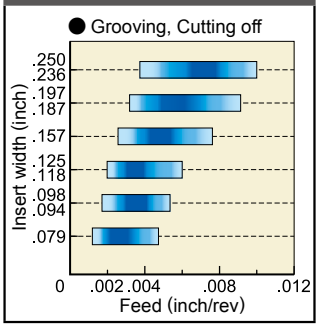
*Below are the recommended cutting conditions when using the modular holder GYHR/LUS16D00-M25R/L with the modular blade GYM25○A-○○.

Recommended feed rate and depth of cut : 1st recommended area

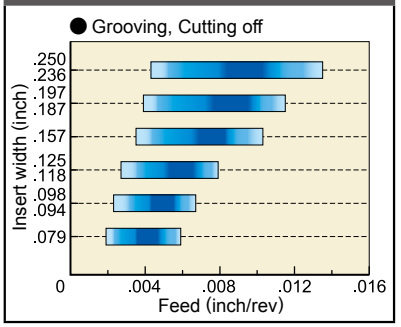
GU Breaker



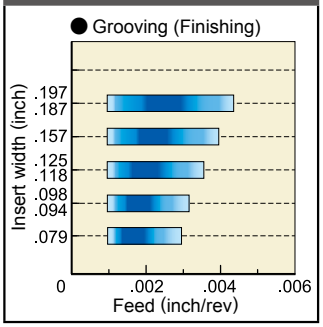
GS Breaker



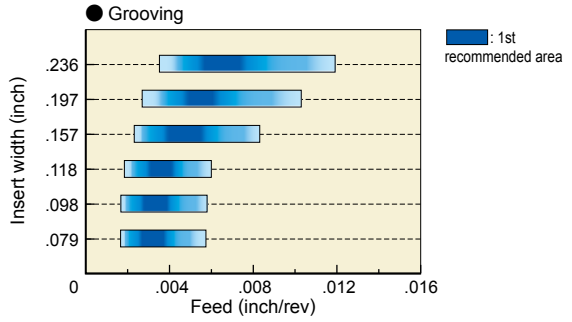
GM Breaker

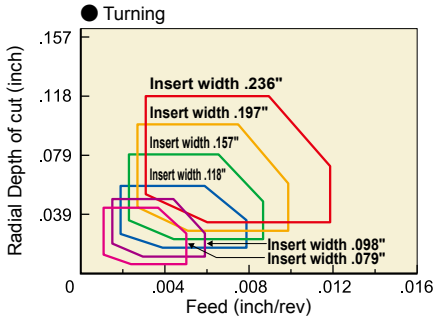


Flat Top GFGS (CBN)

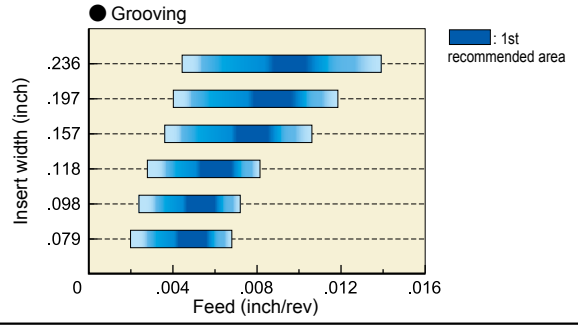


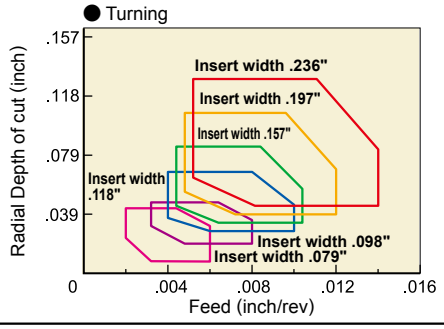
MS Breaker



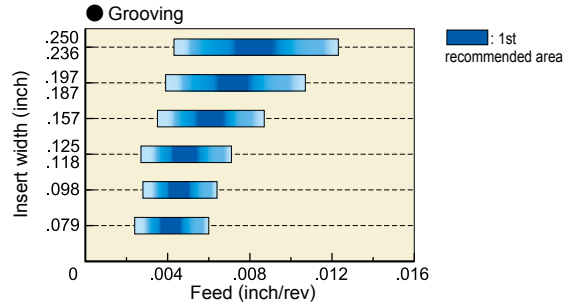


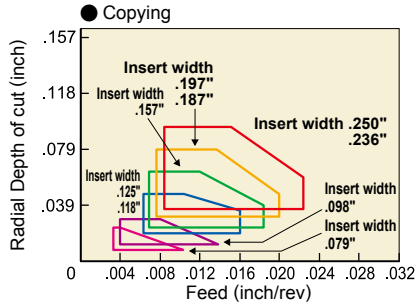
MM Breaker





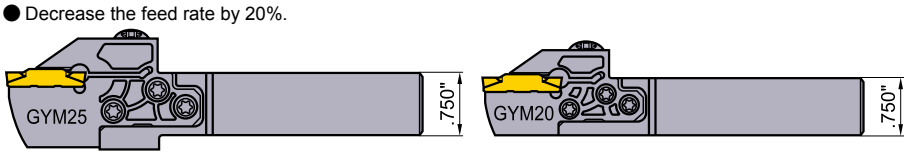
BM Breaker





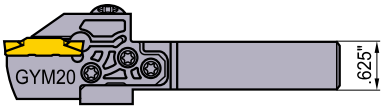
(Note) When using a combination as shown below, decrease the recommended feed rate by 20% and 40% respectively.

● Decrease the feed rate by 20%.



(.750"×.750" Square holder)

● Decrease the feed rate by 40%.

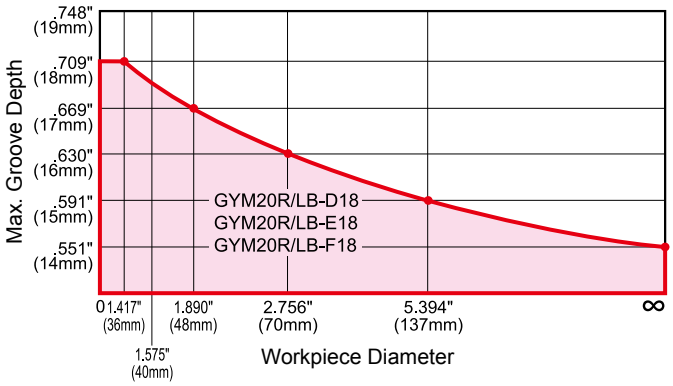


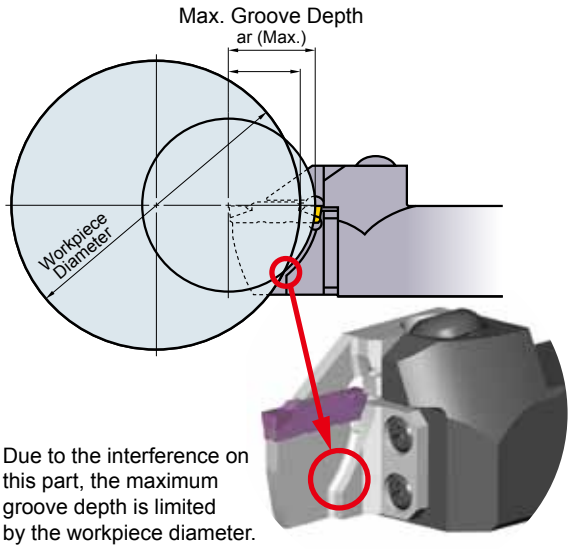
(.625"×.625" Square holder)

Limitation of the maximum groove depth

•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.





Due to the interference on this part, the maximum groove depth is limited by the workpiece diameter.

Recommended Cutting Speed (SFM)

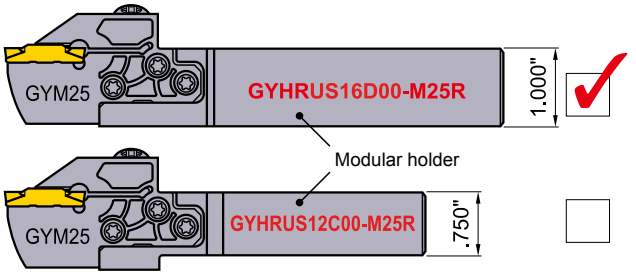
	Work Material	Hardness	Insert Grade	Cutting Speed (SFM) 165 330 495 660 825 990
P	Mild Steel	≤160HB	VP20RT	330 – 720
			VP10RT	360 – 755
			MY5015	460 – 990
			NX2525	295 – 690
	Carbon Steel Alloy Steel	160-280HB	VP20RT	260 – 590
			VP10RT	295 – 625
			MY5015	360 – 825
			NX2525	230 – 560
		≥280HB	VP20RT	195 – 460
			VP10RT	230 – 495
			MY5015	295 – 690
			NX2525	180 – 440
M	Stainless Steel	≤270HB	VP20RT	195 – 460
			VP10RT	230 – 495
K	Cast Iron	Tensile Strength ≤300MPa	VP20RT	260 – 590
			VP10RT	295 – 625
			MY5015	460 – 990
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP20RT	195 – 460
			VP10RT	230 – 495
			MY5015	295 – 690
S	Heat Resistant Alloy Titanium Alloy	–	VP20RT	100 – 195
			VP10RT	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.

Tool Selection

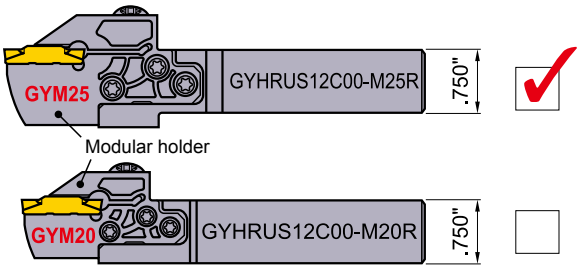
Notes when selecting the tool body

Modular holder



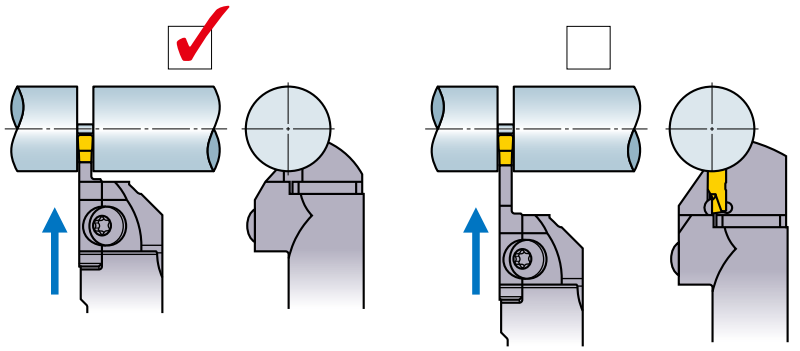
●To ensure sufficient clamping rigidity, select a modular holder with the largest possible shank size.

Modular blade (1)



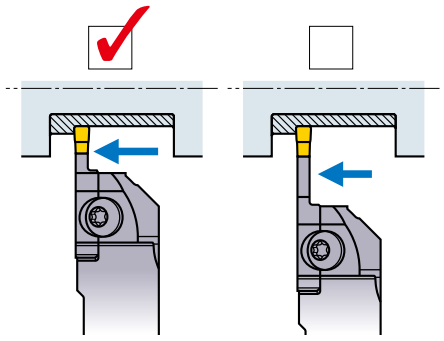
●If there is no restriction for use, select the largest modular blade for the same shank size.

Modular blade (2)



●Select the shortest possible blade suitable for the application.

Modular blade (3)

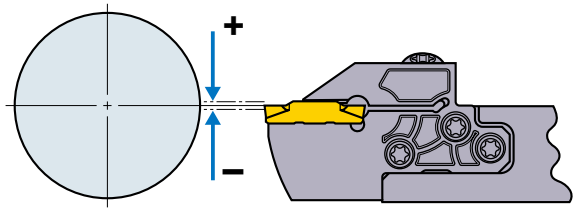


●Select the shortest possible blade suitable for the application.

✓: **Recommended.**

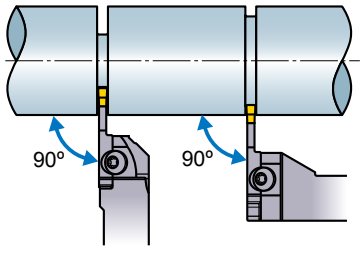
Notes when setting the tool

Setting of cutting edge height



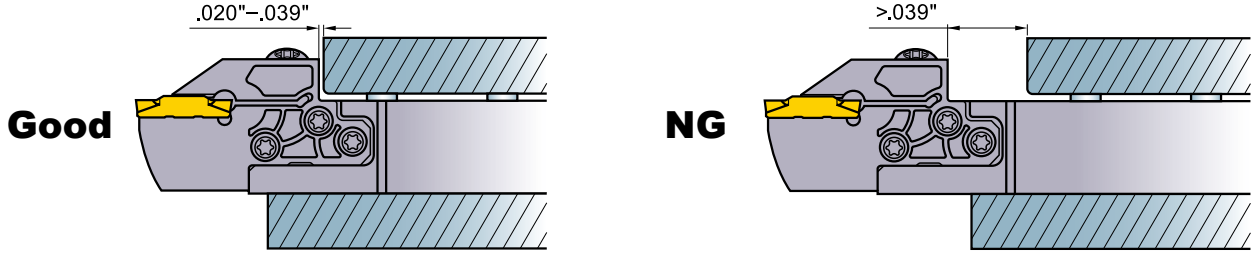
<Grooving/Cross-feed machining>
Set the cutting edge height to ±.004" parallel to the central axis.
<Cutting off>
Set the cutting edge height to 0–+.008" parallel to the central axis.

Tool body setting angle



●Set the insert perpendicular to the central axis.

Overhang

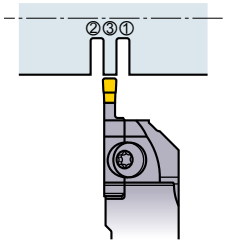


●When setting the tool, ensure that the overhang is as short as possible.

Machining Recommendations

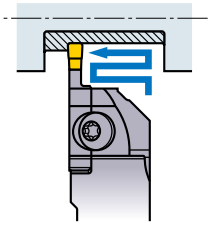
Notes on multi-functional machining (MS and MM breakers)

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.

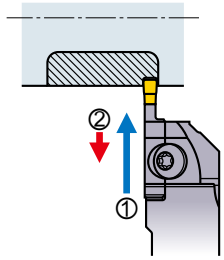
Machining wide grooves



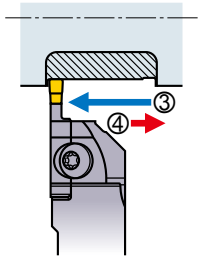
●It is recommended that cross-feed machining is used.

Machining wide grooves

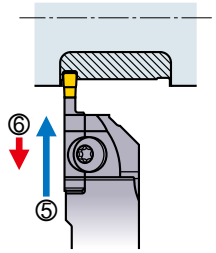
Roughing



①Carry out grooving.
②Retract the tool approx .004".

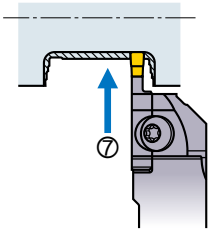


③Carry out cross feed machining.
④Retract the tool approx .004".

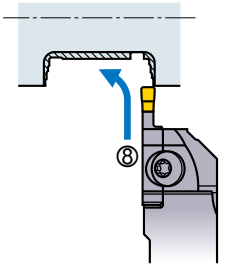


⑤Carry out grooving.
⑥Retract the tool approx .004".
* Repeat the steps ①–⑥.

Finishing

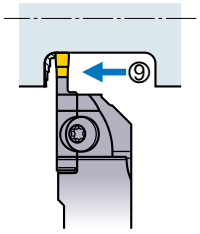


⑦Carry out grooving to the end point of the corner radius.

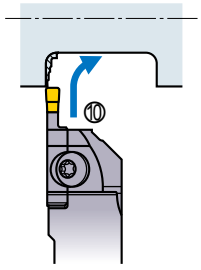


⑧Machining of the wall surface, corner radius and bottom face should be carried out in one process.

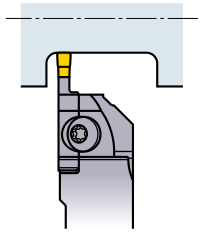
Finishing



⑨Stop at the bottom of the corner radius.

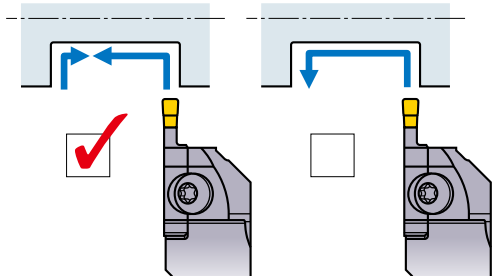


⑩Machine the counter wall to the corner radius in one process.



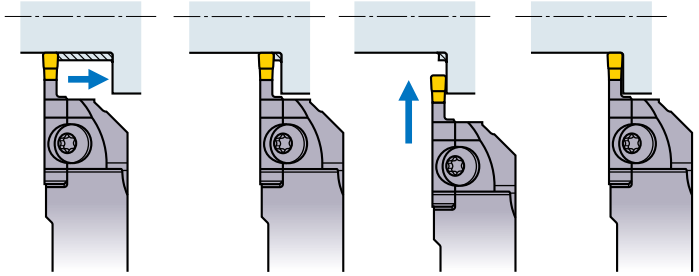
⑪Finish machining.

Precautions when finishing walls



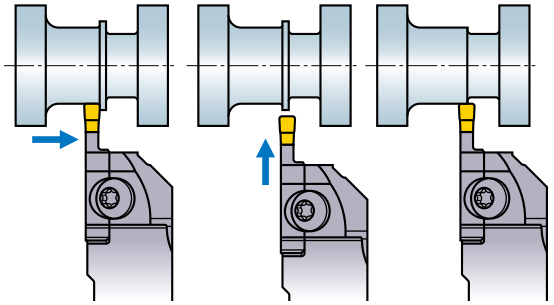
●To produce high accuracy walls using MS or MM breaker insert, do not carry out back turning. Plunging is recommended.

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.

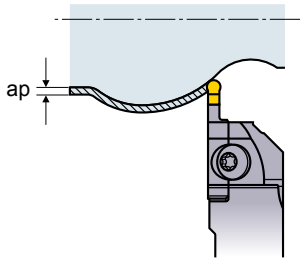
Machining of a ring section



●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.

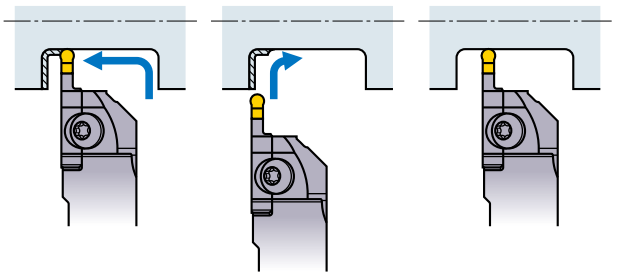
Machining Recommendations

Notes on multi-functional machining (BM breaker)



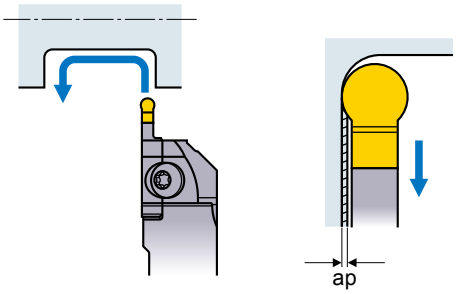
●With the BM breaker insert, 3 dimensional copying is possible.
Set the depth of cut (ap) to 40% less than the insert width.

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



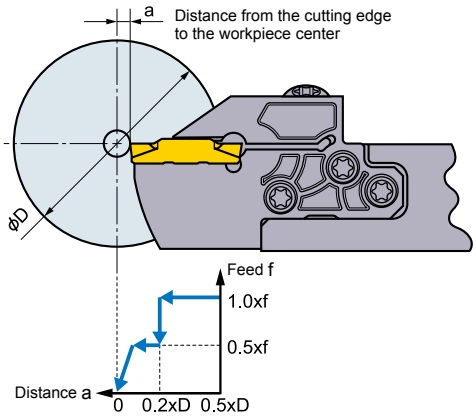
●Carry out finishing in one process.
For the depth of cut (ap) when back turning, refer to the table on the right.

Insert	ap (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	

Notes for cutting off

feed

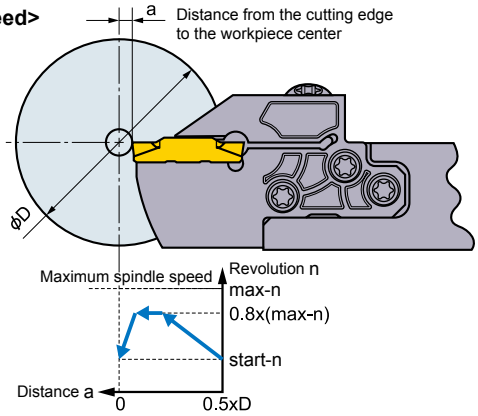
<Feed>



- 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.

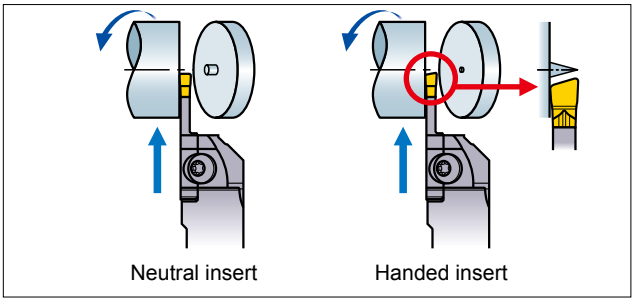
Revolution

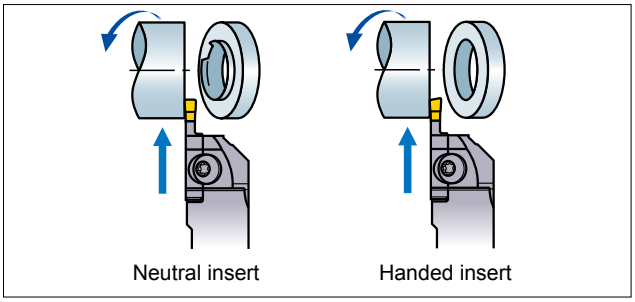
<Spindle speed>



- 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



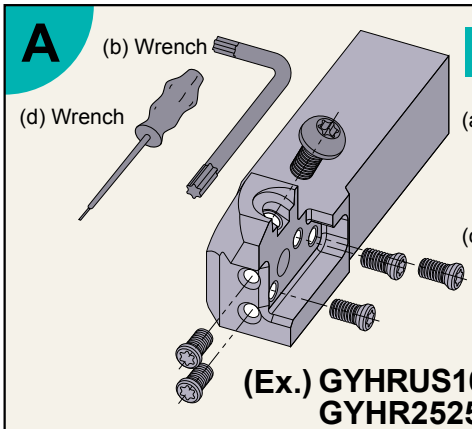


- When there is a center stub on solid bar work or burrs are formed on pipe material, it is possible to decrease them by using a handed insert. With a handed insert, machining tends to be less stable when compared to using a neutral insert. Pay special attention to avoid fracturing of the cutting edge and decrease the feed when necessary.

ASSEMBLY INSTRUCTION

Assembly Procedures

A



Holder

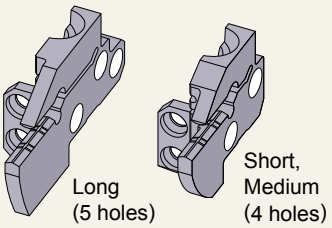
(a) Insert clamp screw x 1pc.

(c) Modular blade set screw x 5pcs.

(Ex.) GYHRUS16D00 - ① M25R
GYHR2525M00 - ① M25R

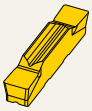
Modular Blade

(Ex.)
GY ② M25R A - ③ F 20
GY ② M25R A - ③ F 12



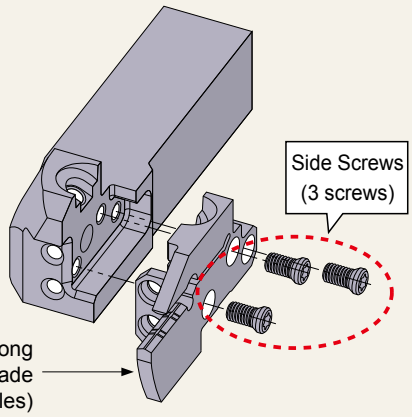
Insert

(Ex.)GY2M0300 ④ F 040N-MS
GY2M0318 ④ F 030N-GM

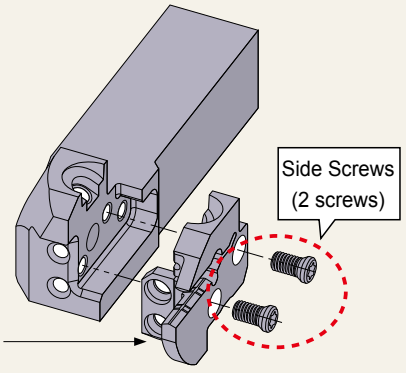


Note 1) ③ and ④ are changed by the insert size.

B

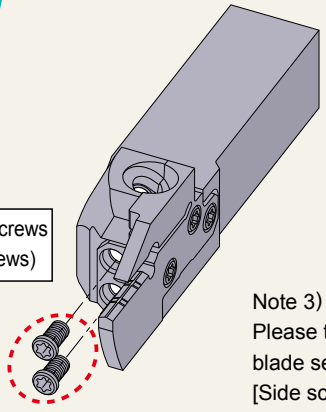


B'



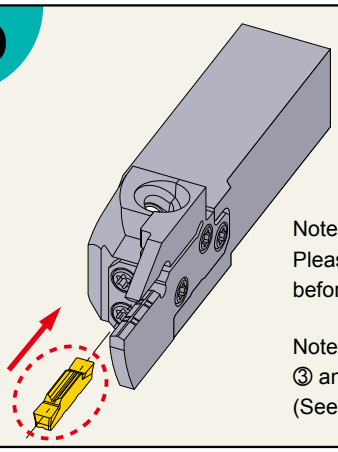
Note 2) ① and ② should be matched. (See caption A)

C



Note 3)
Please tighten the modular blade set screws in order of [Side screws] → [Front screws].

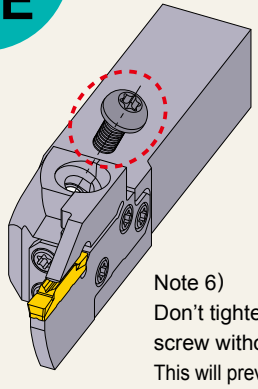
D



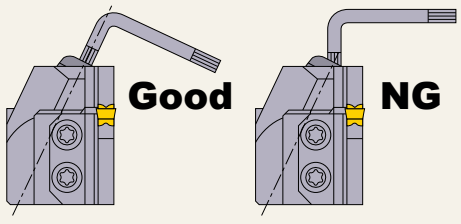
Note 4)
Please clean the insert-seat before installing the insert.

Note 5)
③ and ④ should be matched. (See caption A)

E

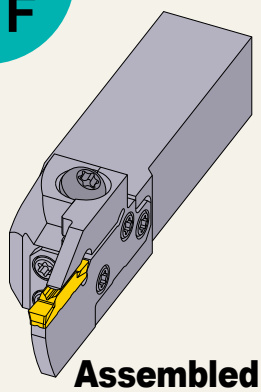


Note 6)
Don't tighten the insert clamp screw without installing the insert.
This will prevent modular blade damage.



Note 7)
The insert clamp screw is inclined.
Ensure that the wrench is perpendicular to the screw tightening.

F

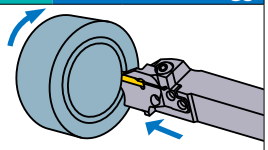


Memo

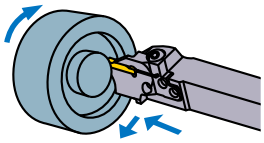
GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

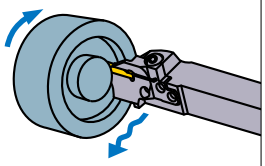
Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS



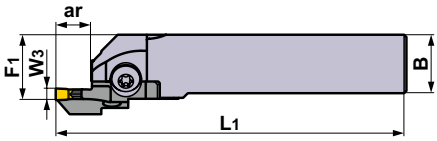
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS

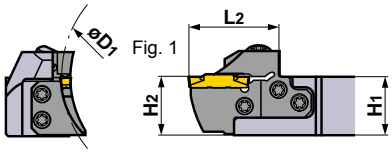


Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.





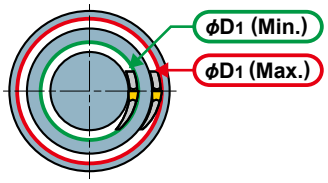
Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
NEW D	.079	*2 R	1.575	1.969	.472	(4E1R4D11)	GYM25RD-D12-040	●	GYHRUS12C00-M25R	●
			1.969	2.362	.472	(4E1R4D12)	GYM25RD-D12-050	●		
			2.362	2.953	.472	(4E1R4D13)	GYM25RD-D12-060	●		
			2.953	3.937	.472	(4E1R4D14)	GYM25RD-D12-075	●		
			3.937	5.906	.472	(4E1R4D15)	GYM25RD-D12-100	●		
			5.315	7.874	.472	(4E1R4D16)	GYM25RD-D12-135	●		
			7.087	9.843	.472	(4E1R4D17)	GYM25RD-D12-180	●		
			1.575	1.969	.472	(4G1R4D11)	GYM25RD-D12-040	●	GYHRUS16D00-M25R	●
			1.969	2.362	.472	(4G1R4D12)	GYM25RD-D12-050	●		
			2.362	2.953	.472	(4G1R4D13)	GYM25RD-D12-060	●		
			2.953	3.937	.472	(4G1R4D14)	GYM25RD-D12-075	●		
			3.937	5.906	.472	(4G1R4D15)	GYM25RD-D12-100	●		
			5.315	7.874	.472	(4G1R4D16)	GYM25RD-D12-135	●		
			7.087	9.843	.472	(4G1R4D17)	GYM25RD-D12-180	●		

*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*2 Refer to page F062 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained.

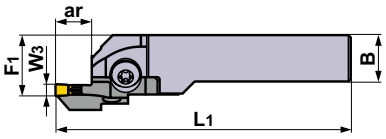
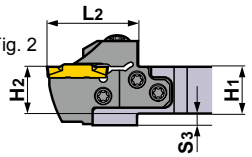




Fig. 2

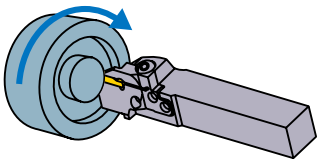
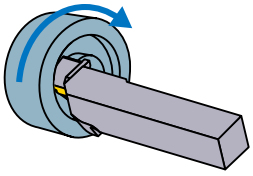


Right hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

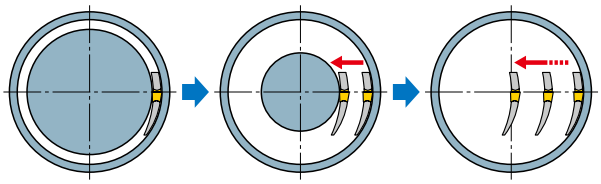
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗ Wrench
GYHRUS12C00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHRUS16D00-M25R			

Dimensions (inch) ∗1							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
.750	.750	5.000	1.535	.750	1.000	.250	2		GY2M0200D020N-GU GY2M0200D020N-GS GY2M0200D020N-GM GY2M0200D020R05-GM GY2M0200D020L05-GM GY2M0200D020N-MS (Gauge insert) GY2M0200D020N-MM GY2M0200D100N-BM GY1G0200D020N-GFGS	F014 I F016
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			

Notes when selecting a modular blade (2)

- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.

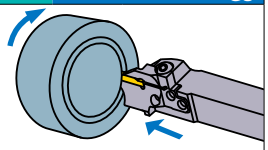


GROOVING

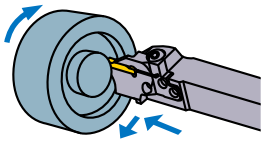
GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

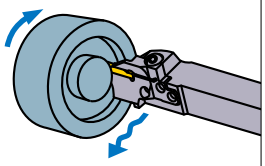
Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF/GS



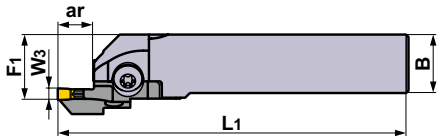
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS

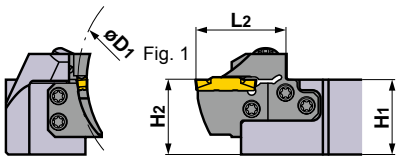


Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.





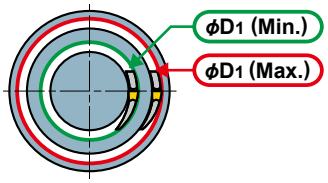
Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
NEW D	.079	*2 R	1.575	1.969	.472	(4Q1R4D11)	GYM25RD-D12-040	●	GYHRUS20D00-M25R	●
			1.969	2.362	.472	(4Q1R4D12)	GYM25RD-D12-050	●		
			2.362	2.953	.472	(4Q1R4D13)	GYM25RD-D12-060	●		
			2.953	3.937	.472	(4Q1R4D14)	GYM25RD-D12-075	●		
			3.937	5.906	.472	(4Q1R4D15)	GYM25RD-D12-100	●		
			5.315	7.874	.472	(4Q1R4D16)	GYM25RD-D12-135	●		
			7.087	9.843	.472	(4Q1R4D17)	GYM25RD-D12-180	●		
			1.575	1.969	.472	(4J1R4D11)	GYM25RD-D12-040	●	GYHRUS24E00-M25R	●
			1.969	2.362	.472	(4J1R4D12)	GYM25RD-D12-050	●		
			2.362	2.953	.472	(4J1R4D13)	GYM25RD-D12-060	●		
			2.953	3.937	.472	(4J1R4D14)	GYM25RD-D12-075	●		
			3.937	5.906	.472	(4J1R4D15)	GYM25RD-D12-100	●		
			5.315	7.874	.472	(4J1R4D16)	GYM25RD-D12-135	●		
			7.087	9.843	.472	(4J1R4D17)	GYM25RD-D12-180	●		

*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*2 Refer to page F064 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

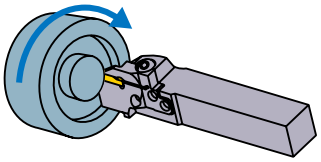
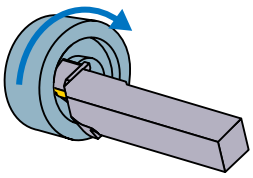


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

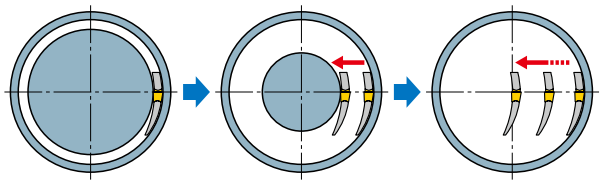
SPARE PARTS

Modular Holder Number	 Clamp Screw	 (5 pcs.) Blade Screw	 * Wrench
GYHRUS20D00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHRUS24E00-M25R			

Dimensions (inch) *1						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0200D020N-GU GY2M0200D020N-GS GY2M0200D020N-GM GY2M0200D020R05-GM GY2M0200D020L05-GM GY2M0200D020N-MS (Gauge insert) GY2M0200D020N-MM GY2M0200D100N-BM GY1G0200D020N-GFGS	F014 I F016
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			

Notes when selecting a modular blade (2)

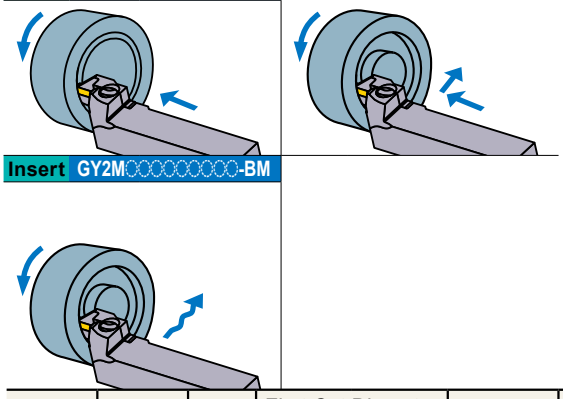
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

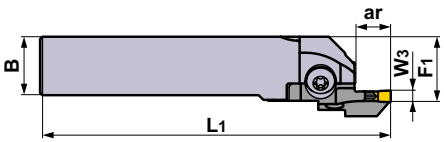
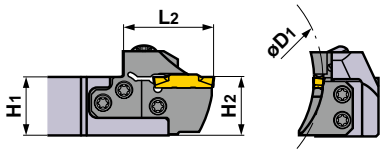


Fig. 1



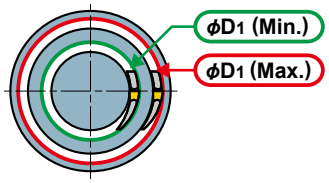
Left hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
NEW D	.079	*2 L	1.575	1.969	.472	(4E1R4D11)	GYM25LD-D12-040	●	GYHLUS12C00-M25L	●
			1.969	2.362	.472	(4E1R4D12)	GYM25LD-D12-050	●		
			2.362	2.953	.472	(4E1R4D13)	GYM25LD-D12-060	●		
			2.953	3.937	.472	(4E1R4D14)	GYM25LD-D12-075	●		
			3.937	5.906	.472	(4E1R4D15)	GYM25LD-D12-100	●		
			5.315	7.874	.472	(4E1R4D16)	GYM25LD-D12-135	●		
			7.087	9.843	.472	(4E1R4D17)	GYM25LD-D12-180	●		
			1.575	1.969	.472	(4G1R4D11)	GYM25LD-D12-040	●	GYHLUS16D00-M25L	●
			1.969	2.362	.472	(4G1R4D12)	GYM25LD-D12-050	●		
			2.362	2.953	.472	(4G1R4D13)	GYM25LD-D12-060	●		
			2.953	3.937	.472	(4G1R4D14)	GYM25LD-D12-075	●		
			3.937	5.906	.472	(4G1R4D15)	GYM25LD-D12-100	●		
			5.315	7.874	.472	(4G1R4D16)	GYM25LD-D12-135	●		
			7.087	9.843	.472	(4G1R4D17)	GYM25LD-D12-180	●		

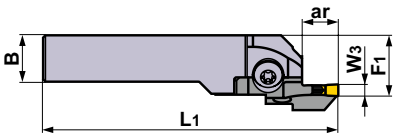
*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*2 Refer to page F058 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained.



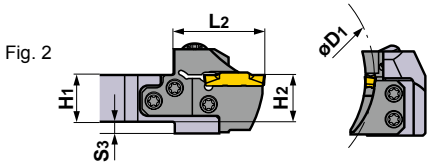


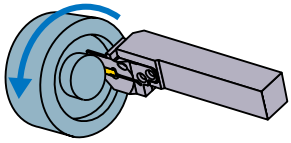
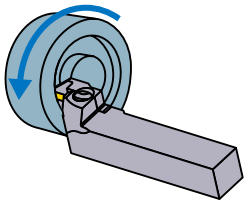
Fig. 2

Left hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

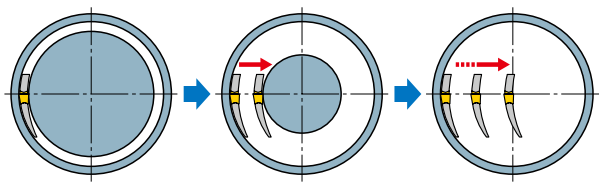
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗ Wrench
GYHLUS12C00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D00-M25L			

Dimensions (inch) ∗1							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
.750	.750	5.000	1.535	.750	1.000	.250	2		GY2M0200D020N-GU GY2M0200D020N-GS GY2M0200D020N-GM GY2M0200D020R05-GM GY2M0200D020L05-GM	F014 – F016
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1		GY2M0200D020N-MS (Gauge insert) GY2M0200D020N-MM GY2M0200D100N-BM GY1G0200D020N-GFGS	
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			

Notes when selecting a modular blade (2)

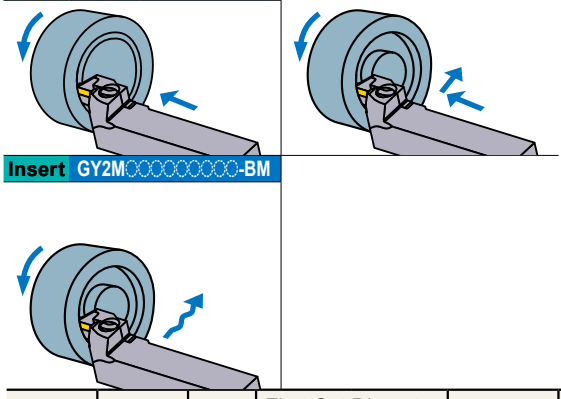
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

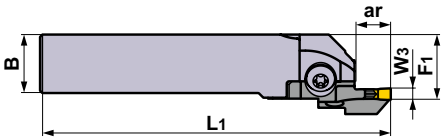
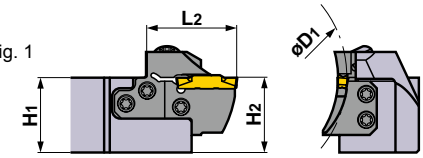


Fig. 1



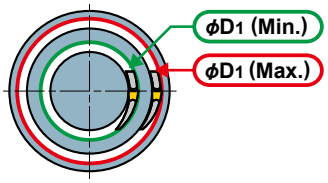
Left hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
NEW D	.079	*2 L	1.575	1.969	.472	(4Q1L4D11)	GYM25LD-D12-040	●	GYHLUS20D00-M25L	●
			1.969	2.362	.472	(4Q1L4D12)	GYM25LD-D12-050	●		
			2.362	2.953	.472	(4Q1L4D13)	GYM25LD-D12-060	●		
			2.953	3.937	.472	(4Q1L4D14)	GYM25LD-D12-075	●		
			3.937	5.906	.472	(4Q1L4D15)	GYM25LD-D12-100	●		
			5.315	7.874	.472	(4Q1L4D16)	GYM25LD-D12-135	●		
			7.087	9.843	.472	(4Q1L4D17)	GYM25LD-D12-180	●		
			1.575	1.969	.472	(4J1L4D11)	GYM25LD-D12-040	●	GYHLUS24E00-M25L	●
			1.969	2.362	.472	(4J1L4D12)	GYM25LD-D12-050	●		
			2.362	2.953	.472	(4J1L4D13)	GYM25LD-D12-060	●		
			2.953	3.937	.472	(4J1L4D14)	GYM25LD-D12-075	●		
			3.937	5.906	.472	(4J1L4D15)	GYM25LD-D12-100	●		
			5.315	7.874	.472	(4J1L4D16)	GYM25LD-D12-135	●		
			7.087	9.843	.472	(4J1L4D17)	GYM25LD-D12-180	●		

*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*2 Refer to page F060 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

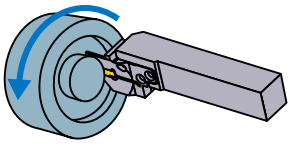
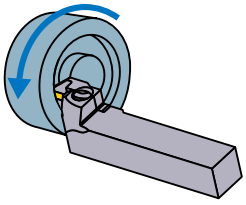


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

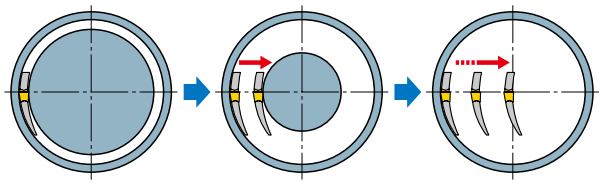
SPARE PARTS

Modular Holder Number	 Clamp Screw	 (5 pcs.) Blade Screw	 * Wrench
GYHLUS20D00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS24E00-M25L			

Dimensions (inch) *1						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0200D020N-GU GY2M0200D020N-GS GY2M0200D020N-GM GY2M0200D020R05-GM GY2M0200D020L05-GM GY2M0200D020N-MS (Gauge insert) GY2M0200D020N-MM GY2M0200D100N-BM GY1G0200D020N-GFGS	F014 I F016
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			

Notes when selecting a modular blade (2)

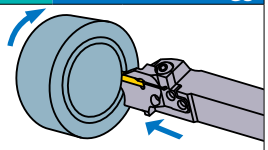
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



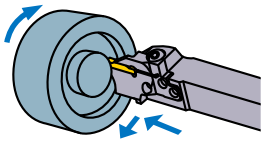
GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

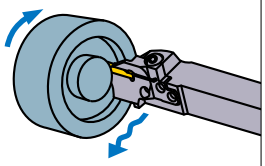
Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS



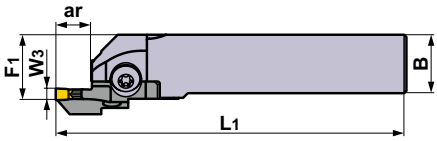
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS

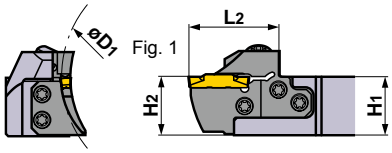


Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.





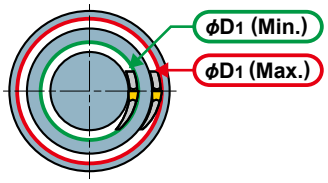
Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
NEW E	.094 .098	*2 R	1.575	1.969	.472	(4E1R4E11)	GYM25RD-E12-040	●	GYHRUS12C00-M25R	●
			1.969	2.362	.472	(4E1R4E12)	GYM25RD-E12-050	●		
			2.362	2.953	.472	(4E1R4E13)	GYM25RD-E12-060	●		
			2.953	3.937	.472	(4E1R4E14)	GYM25RD-E12-075	●		
			3.937	5.906	.472	(4E1R4E15)	GYM25RD-E12-100	●		
			5.315	7.874	.472	(4E1R4E16)	GYM25RD-E12-135	●		
			7.087	9.843	.472	(4E1R4E17)	GYM25RD-E12-180	●		
			1.575	1.969	.472	(4G1R4E11)	GYM25RD-E12-040	●	GYHRUS16D00-M25R	●
			1.969	2.362	.472	(4G1R4E12)	GYM25RD-E12-050	●		
			2.362	2.953	.472	(4G1R4E13)	GYM25RD-E12-060	●		
			2.953	3.937	.472	(4G1R4E14)	GYM25RD-E12-075	●		
			3.937	5.906	.472	(4G1R4E15)	GYM25RD-E12-100	●		
			5.315	7.874	.472	(4G1R4E16)	GYM25RD-E12-135	●		
			7.087	9.843	.472	(4G1R4E17)	GYM25RD-E12-180	●		

*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*2 Refer to page F070 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained.

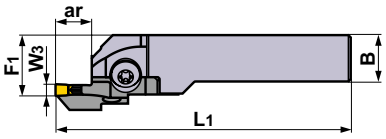
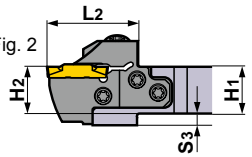




Fig. 2

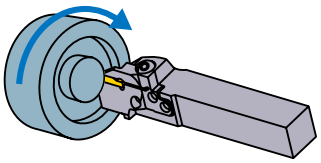
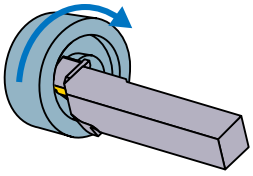


Right hand tool holder shown.

* Wrench : ①For Clamp Screw ②For Blade Screw.

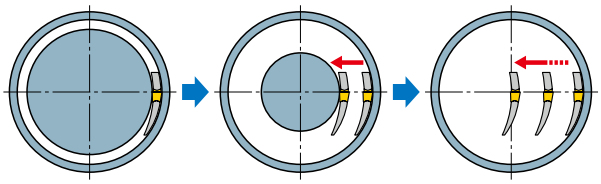
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHRUS12C00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHRUS16D00-M25R			

Dimensions (inch) *1							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
.750	.750	5.000	1.535	.750	1.000	.250	2		GY2M0239E020N-GU GY2M0250E020N-GU GY2M0239E020N-GS GY2M0250E020N-GS GY2M0239E020N-GM GY2M0250E020N-GM GY2M0250E020R05-GM GY2M0250E020L05-GM GY2M0250E020N-MS (Gauge insert) GY2M0250E020N-MM GY2M0250E125N-BM GY1G0239E020N-GFGS GY1G0250E020N-GFGS	F014 I F016
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			

Notes when selecting a modular blade (2)

- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.

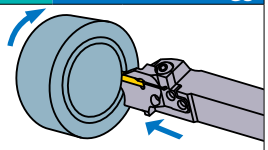


GROOVING

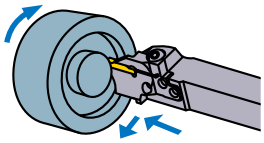
GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

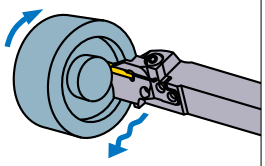
Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS



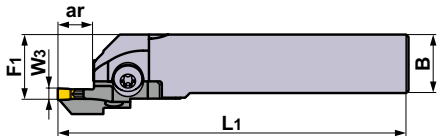
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS

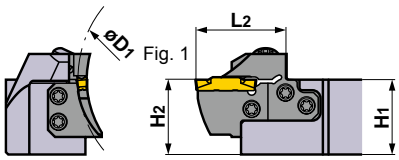


Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.





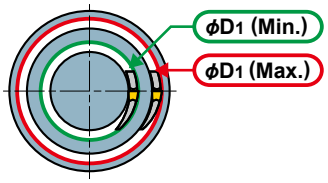
Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
NEW E	.094 .098	*2 R	1.575	1.969	.472	(4Q1R4E11)	GYM25RD-E12-040	●	GYHRUS20D00-M25R	●
			1.969	2.362	.472	(4Q1R4E12)	GYM25RD-E12-050	●		
			2.362	2.953	.472	(4Q1R4E13)	GYM25RD-E12-060	●		
			2.953	3.937	.472	(4Q1R4E14)	GYM25RD-E12-075	●		
			3.937	5.906	.472	(4Q1R4E15)	GYM25RD-E12-100	●		
			5.315	7.874	.472	(4Q1R4E16)	GYM25RD-E12-135	●		
			7.087	9.843	.472	(4Q1R4E17)	GYM25RD-E12-180	●		
			1.575	1.969	.472	(4J1R4E11)	GYM25RD-E12-040	●	GYHRUS24E00-M25R	●
			1.969	2.362	.472	(4J1R4E12)	GYM25RD-E12-050	●		
			2.362	2.953	.472	(4J1R4E13)	GYM25RD-E12-060	●		
			2.953	3.937	.472	(4J1R4E14)	GYM25RD-E12-075	●		
			3.937	5.906	.472	(4J1R4E15)	GYM25RD-E12-100	●		
			5.315	7.874	.472	(4J1R4E16)	GYM25RD-E12-135	●		
			7.087	9.843	.472	(4J1R4E17)	GYM25RD-E12-180	●		

*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*2 Refer to page F072 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

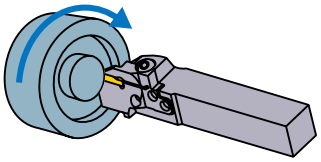
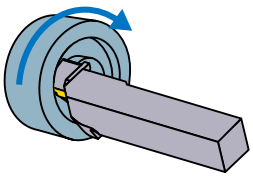


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

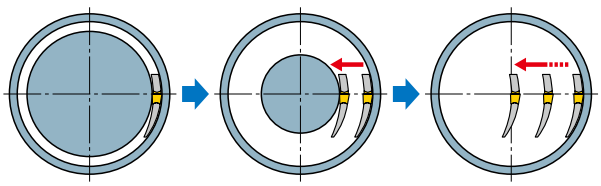
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHRUS20D00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHRUS24E00-M25R			

Dimensions (inch) *1						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0239E020N-GU GY2M0250E020N-GU GY2M0239E020N-GS GY2M0250E020N-GS GY2M0239E020N-GM GY2M0250E020N-GM GY2M0250E020R05-GM GY2M0250E020L05-GM GY2M0250E020N-MS (Gauge insert) GY2M0250E020N-MM GY2M0250E125N-BM GY1G0239E020N-GFGS GY1G0250E020N-GFGS	F014 I F016
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			

Notes when selecting a modular blade (2)

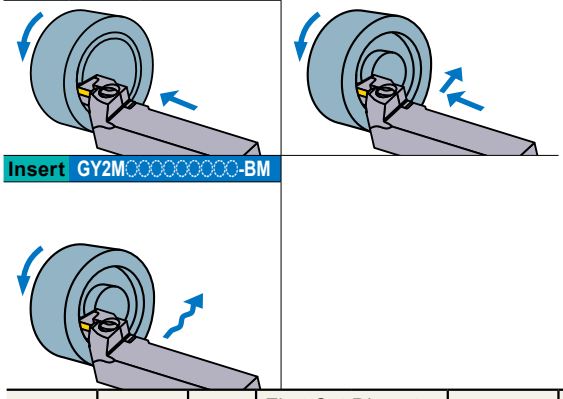
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

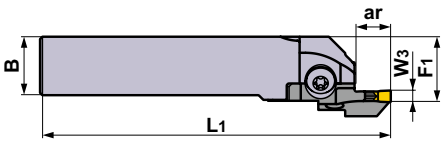
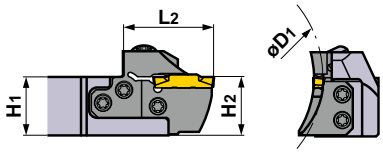


Fig. 1



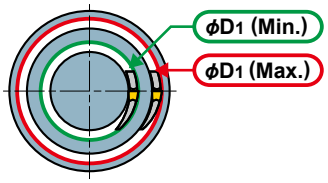
Left hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
NEW E	.094 .098	*2 L	1.575	1.969	.472	(4E1R4E11)	GYM25LD-E12-040	●	GYHLUS12C00-M25L	●
			1.969	2.362	.472	(4E1R4E12)	GYM25LD-E12-050	●		
			2.362	2.953	.472	(4E1R4E13)	GYM25LD-E12-060	●		
			2.953	3.937	.472	(4E1R4E14)	GYM25LD-E12-075	●		
			3.937	5.906	.472	(4E1R4E15)	GYM25LD-E12-100	●		
			5.315	7.874	.472	(4E1R4E16)	GYM25LD-E12-135	●		
			7.087	9.843	.472	(4E1R4E17)	GYM25LD-E12-180	●		
			1.575	1.969	.472	(4G1R4E11)	GYM25LD-E12-040	●	GYHLUS16D00-M25L	●
			1.969	2.362	.472	(4G1R4E12)	GYM25LD-E12-050	●		
			2.362	2.953	.472	(4G1R4E13)	GYM25LD-E12-060	●		
			2.953	3.937	.472	(4G1R4E14)	GYM25LD-E12-075	●		
			3.937	5.906	.472	(4G1R4E15)	GYM25LD-E12-100	●		
			5.315	7.874	.472	(4G1R4E16)	GYM25LD-E12-135	●		
			7.087	9.843	.472	(4G1R4E17)	GYM25LD-E12-180	●		

*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*2 Refer to page F066 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained.

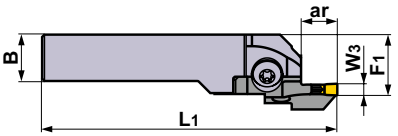
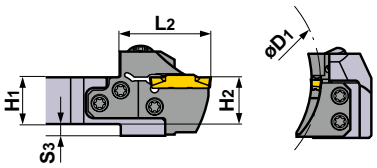


Fig. 2

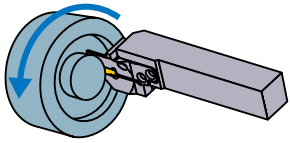
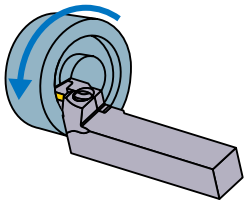


Left hand tool holder shown.

* Wrench : ①For Clamp Screw ②For Blade Screw.

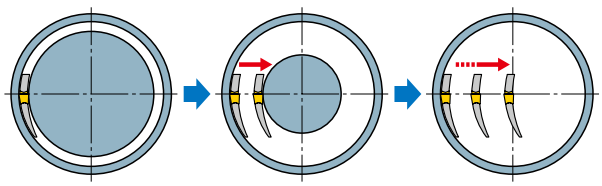
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHLUS12C00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D00-M25L			

Dimensions (inch) *1							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
.750	.750	5.000	1.535	.750	1.000	.250	2		GY2M0239E020N-GU GY2M0250E020N-GU GY2M0239E020N-GS GY2M0250E020N-GS GY2M0239E020N-GM GY2M0250E020N-GM GY2M0250E020R05-GM GY2M0250E020L05-GM GY2M0250E020N-MS (Gauge insert) GY2M0250E020N-MM GY2M0250E125N-BM GY1G0239E020N-GFGS GY1G0250E020N-GFGS	F014 I F016
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
.750	.750	5.000	1.535	.750	1.000	.250	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			

Notes when selecting a modular blade (2)

- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.

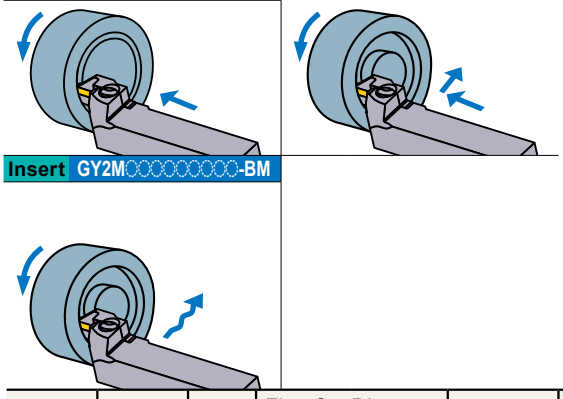


GROOVING

GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

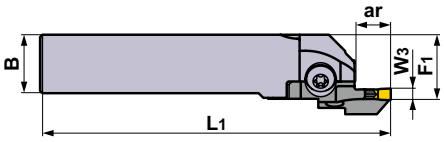
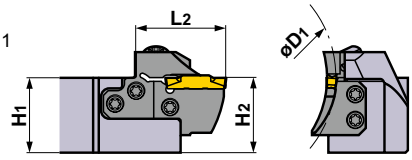


Fig. 1



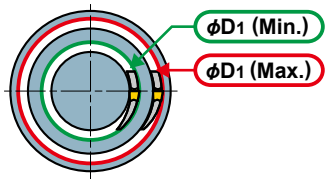
Left hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
NEW E	.094 .098	*2 L	1.575	1.969	.472	(4Q1R4D11)	GYM25LD-E12-040	●	GYHLUS20D00-M25L	●
			1.969	2.362	.472	(4Q1R4D12)	GYM25LD-E12-050	●		
			2.362	2.953	.472	(4Q1R4D13)	GYM25LD-E12-060	●		
			2.953	3.937	.472	(4Q1R4D14)	GYM25LD-E12-075	●		
			3.937	5.906	.472	(4Q1R4D15)	GYM25LD-E12-100	●		
			5.315	7.874	.472	(4Q1R4D16)	GYM25LD-E12-135	●		
			7.087	9.843	.472	(4Q1R4D17)	GYM25LD-E12-180	●		
			1.575	1.969	.472	(4J1R4D11)	GYM25LD-E12-040	●	GYHLUS24E00-M25L	●
			1.969	2.362	.472	(4J1R4D12)	GYM25LD-E12-050	●		
			2.362	2.953	.472	(4J1R4D13)	GYM25LD-E12-060	●		
			2.953	3.937	.472	(4J1R4D14)	GYM25LD-E12-075	●		
			3.937	5.906	.472	(4J1R4D15)	GYM25LD-E12-100	●		
			5.315	7.874	.472	(4J1R4D16)	GYM25LD-E12-135	●		
			7.087	9.843	.472	(4J1R4D17)	GYM25LD-E12-180	●		

*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*2 Refer to page F068 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

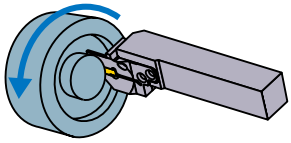
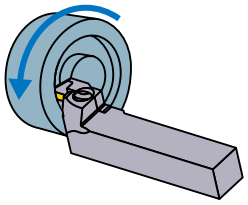


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

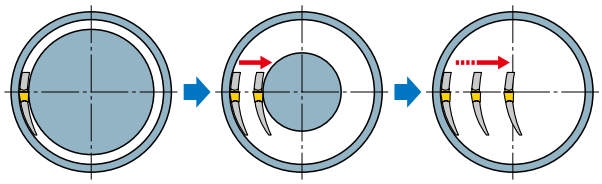
SPARE PARTS

Modular Holder Number	 Clamp Screw	 (5 pcs.) Blade Screw	 * Wrench
GYHLUS20D00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS24E00-M25L			

Dimensions (inch) *1						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0239E020N-GU GY2M0250E020N-GU GY2M0239E020N-GS GY2M0250E020N-GS GY2M0239E020N-GM GY2M0250E020N-GM GY2M0250E020R05-GM GY2M0250E020L05-GM GY2M0250E020N-MS (Gauge insert) GY2M0250E020N-MM GY2M0250E125N-BM GY1G0239E020N-GFGS GY1G0250E020N-GFGS	F014 I F016
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			

Notes when selecting a modular blade (2)

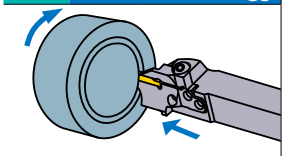
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



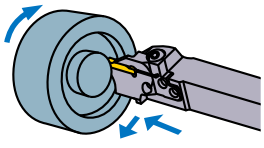
GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

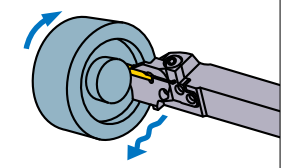
Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS



Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.

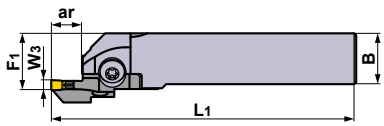




Fig. 1

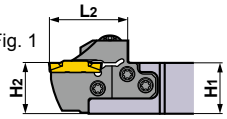
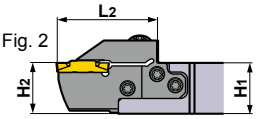


Fig. 2



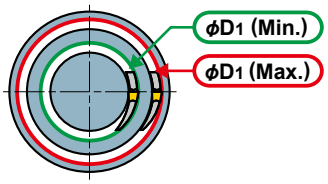
Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
F	.118 .125	*3 R	1.378	1.575	.472	(4F1R4F11)	GYM25RD-F12-035	●	GYHRUS12C00-M25R	●
			1.575	1.969	.472	(4F1R4F12)	GYM25RD-F12-040	●		
			1.969	2.362	.472	(4F1R4F13)	GYM25RD-F12-050	●		
			2.362	2.953	.472	(4F1R4F14)	GYM25RD-F12-060	●		
					.787 *1	(4F1R4F24)	GYM25RD-F20-060	●		
			2.953	3.937	.472	(4F1R4F15)	GYM25RD-F12-075	●		
					.787 *1	(4F1R4F25)	GYM25RD-F20-075	●		
			3.937	5.906	.472	(4F1R4F16)	GYM25RD-F12-100	●		
					.787 *1	(4F1R4F26)	GYM25RD-F20-100	●		
			5.315	7.874	.472	(4F1R4F17)	GYM25RD-F12-135	●		
					.787 *1	(4F1R4F27)	GYM25RD-F20-135	●		
			7.087	9.843	.472	(4F1R4F18)	GYM25RD-F12-180	●		
					.787 *1	(4F1R4F28)	GYM25RD-F20-180	●		
			NEW 8.858	39.331	.472	(4F1R4F19)	GYM25RD-F12-225	●		
					.787 *1	(4F1R4F29)	GYM25RD-F20-225	●		
			1.378	1.575	.472	(4H1R4F11)	GYM25RD-F12-035	●	GYHRUS16D00-M25R	●
			1.575	1.969	.472	(4H1R4F12)	GYM25RD-F12-040	●		
			1.969	2.362	.472	(4H1R4F13)	GYM25RD-F12-050	●		
			2.362	2.953	.472	(4H1R4F14)	GYM25RD-F12-060	●		
					.787 *1	(4H1R4F24)	GYM25RD-F20-060	●		
			2.953	3.937	.472	(4H1R4F15)	GYM25RD-F12-075	●		
					.787 *1	(4H1R4F25)	GYM25RD-F20-075	●		
			3.937	5.906	.472	(4H1R4F16)	GYM25RD-F12-100	●		
					.787 *1	(4H1R4F26)	GYM25RD-F20-100	●		
			5.315	7.874	.472	(4H1R4F17)	GYM25RD-F12-135	●		
					.787 *1	(4H1R4F27)	GYM25RD-F20-135	●		
			7.087	9.843	.472	(4H1R4F18)	GYM25RD-F12-180	●		
					.787 *1	(4H1R4F28)	GYM25RD-F20-180	●		
			NEW 8.858	39.331	.472	(4H1R4F19)	GYM25RD-F12-225	●		
					.787 *1	(4H1R4F28)	GYM25RD-F20-225	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then L1, L2, F1 and D1 values may vary.
*3 Refer to page F078 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained.

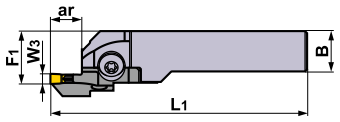




Fig. 3

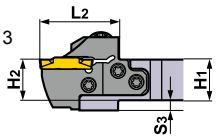
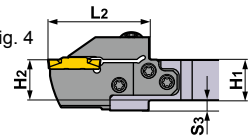


Fig. 4

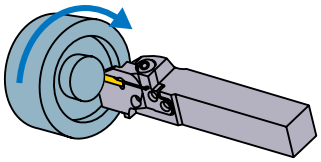
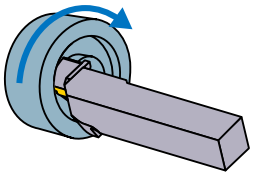


Right hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

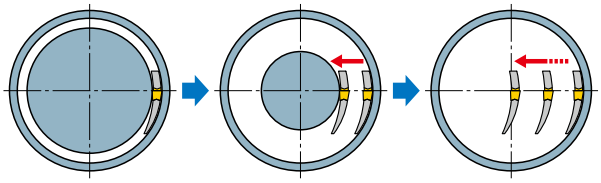
SPARE PARTS

Modular Holder Number	 Clamp Screw	 (5 pcs.) Blade Screw	 ∗ Wrench
GYHRUS12C00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHRUS16D00-M25R			

Dimensions (inch) ∗2							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0300F020N-GS GY2M0318F020N-GS	F014 – F016
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.236	1.772	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0300F030N-GM GY2M0318F030N-GM	
.750	.750	5.236	1.772	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0300F030R05-GM GY2M0300F030L05-GM	
.750	.750	5.236	1.772	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0300F020N-MS GY2M0300F040N-MS (Gauge insert)	
.750	.750	5.236	1.772	.750	1.000	.250	4			
1.000	1.000	6.000	1.535	1.000	1.125	—	1		GY2M0300F020N-MM GY2M0300F040N-MM GY2M0300F080N-MM	
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.236	1.772	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1		GY2M0300F150N-BM GY2M0318F159N-BM	
1.000	1.000	6.236	1.772	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.236	1.772	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1		GY1G0300F020N-GFGS GY1G0318F020N-GFGS	
1.000	1.000	6.236	1.772	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.236	1.772	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.236	1.772	1.000	1.125	—	2			

Notes when selecting a modular blade (2)

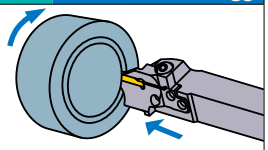
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



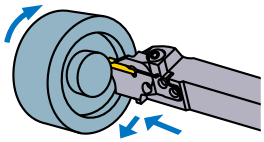
GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

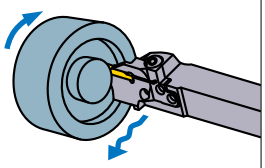
Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS



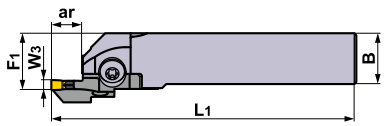
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.



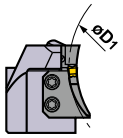


Fig. 1

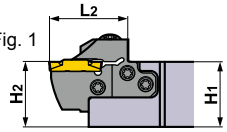
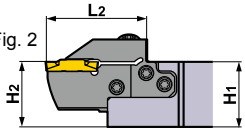


Fig. 2



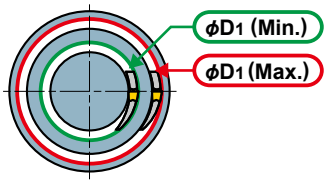
Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
F	.118 .125	*3 R	1.378	1.575	.472	(4K1R4F11)	GYM25RD-F12-035	●	GYHRUS20D00-M25R	●
			1.575	1.969	.472	(4K1R4F12)	GYM25RD-F12-040	●		
			1.969	2.362	.472	(4K1R4F13)	GYM25RD-F12-050	●		
			2.362	2.953	.472	(4K1R4F14)	GYM25RD-F12-060	●		
					.787 *1	(4K1R4F24)	GYM25RD-F20-060	●		
			2.953	3.937	.472	(4K1R4F15)	GYM25RD-F12-075	●		
					.787 *1	(4K1R4F25)	GYM25RD-F20-075	●		
			3.937	5.906	.472	(4K1R4F16)	GYM25RD-F12-100	●		
					.787 *1	(4K1R4F26)	GYM25RD-F20-100	●		
			5.315	7.874	.472	(4K1R4F17)	GYM25RD-F12-135	●		
					.787 *1	(4K1R4F27)	GYM25RD-F20-135	●		
			7.087	9.843	.472	(4K1R4F18)	GYM25RD-F12-180	●		
					.787 *1	(4K1R4F28)	GYM25RD-F20-180	●		
			NEW 8.858	39.331	.472	(4K1R4F19)	GYM25RD-F12-225	●		
					.787 *1	(4K1R4F29)	GYM25RD-F20-225	●		
			1.378	1.575	.472	(4M1R4F11)	GYM25RD-F12-035	●	GYHRUS24E00-M25R	●
			1.575	1.969	.472	(4M1R4F12)	GYM25RD-F12-040	●		
			1.969	2.362	.472	(4M1R4F13)	GYM25RD-F12-050	●		
			2.362	2.953	.472	(4M1R4F14)	GYM25RD-F12-060	●		
					.787 *1	(4M1R4F24)	GYM25RD-F20-060	●		
			2.953	3.937	.472	(4M1R4F15)	GYM25RD-F12-075	●		
					.787 *1	(4M1R4F25)	GYM25RD-F20-075	●		
			3.937	5.906	.472	(4M1R4F16)	GYM25RD-F12-100	●		
					.787 *1	(4M1R4F26)	GYM25RD-F20-100	●		
			5.315	7.874	.472	(4M1R4F17)	GYM25RD-F12-135	●		
					.787 *1	(4M1R4F27)	GYM25RD-F20-135	●		
			7.087	9.843	.472	(4M1R4F18)	GYM25RD-F12-180	●		
					.787 *1	(4M1R4F28)	GYM25RD-F20-180	●		
			NEW 8.858	39.331	.472	(4M1R4F19)	GYM25RD-F12-225	●		
					.787 *1	(4M1R4F29)	GYM25RD-F20-225	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F080 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

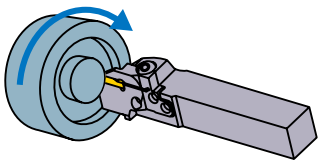
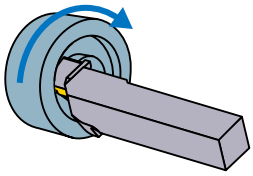


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

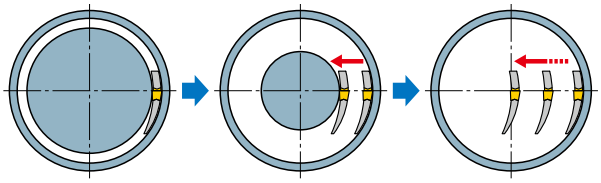
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHRUS20D00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHRUS24E00-M25R			

Dimensions (inch) *2						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0300F020N-GS GY2M0318F020N-GS	F014 ı F016
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.236	1.772	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0300F030N-GM GY2M0318F030N-GM	
1.250	1.250	6.236	1.772	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.236	1.772	1.250	1.375	2		GY2M0300F030R05-GM GY2M0300F030L05-GM	
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.236	1.772	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0300F020N-MS GY2M0300F040N-MS (Gauge insert)	
1.250	1.250	6.236	1.772	1.250	1.375	2			
1.500	1.500	7.000	1.535	1.500	1.625	1		GY2M0300F020N-MM GY2M0300F040N-MM GY2M0300F080N-MM	
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.236	1.772	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1		GY2M0300F150N-BM GY2M0318F159N-BM	
1.500	1.500	7.236	1.772	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.236	1.772	1.500	1.625	2		GY1G0300F020N-GFGS GY1G0318F020N-GFGS	
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.236	1.772	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.236	1.772	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.236	1.772	1.500	1.625	2			

Notes when selecting a modular blade (2)

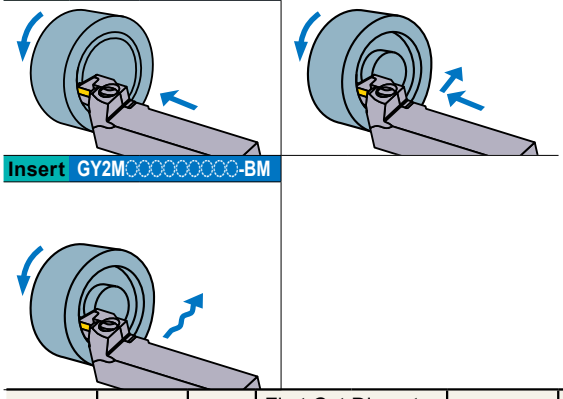
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

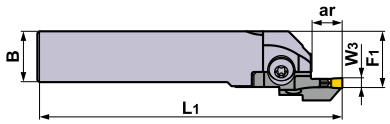


Fig. 1

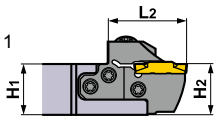
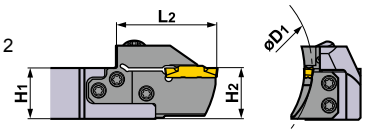


Fig. 2



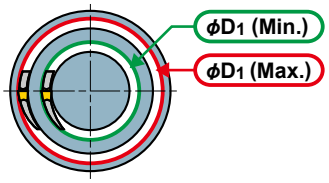
Left hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
F	.118 .125	*3 L	1.378	1.575	.472	(4F1L4F11)	GYM25LD-F12-035	●	GYHLUS12C00-M25L	●
			1.575	1.969	.472	(4F1L4F12)	GYM25LD-F12-040	●		
			1.969	2.362	.472	(4F1L4F13)	GYM25LD-F12-050	●		
			2.362	2.953	.472	(4F1L4F14)	GYM25LD-F12-060	●		
					.787 *1	(4F1L4F24)	GYM25LD-F20-060	●		
			2.953	3.937	.472	(4F1L4F15)	GYM25LD-F12-075	●		
					.787 *1	(4F1L4F25)	GYM25LD-F20-075	●		
			3.937	5.906	.472	(4F1L4F16)	GYM25LD-F12-100	●		
					.787 *1	(4F1L4F26)	GYM25LD-F20-100	●		
			5.315	7.874	.472	(4F1L4F17)	GYM25LD-F12-135	●		
					.787 *1	(4F1L4F27)	GYM25LD-F20-135	●		
			7.087	9.843	.472	(4F1L4F18)	GYM25LD-F12-180	●		
					.787 *1	(4F1L4F28)	GYM25LD-F20-180	●		
			NEW 8.858	39.331	.472	(4F1L4F19)	GYM25LD-F12-225	●		
					.787 *1	(4F1L4F29)	GYM25LD-F20-225	●		
			1.378	1.575	.472	(4H1L4F11)	GYM25LD-F12-035	●	GYHLUS16D00-M25L	●
			1.575	1.969	.472	(4H1L4F12)	GYM25LD-F12-040	●		
			1.969	2.362	.472	(4H1L4F13)	GYM25LD-F12-050	●		
			2.362	2.953	.472	(4H1L4F14)	GYM25LD-F12-060	●		
					.787 *1	(4H1L4F24)	GYM25LD-F20-060	●		
			2.953	3.937	.472	(4H1L4F15)	GYM25LD-F12-075	●		
					.787 *1	(4H1L4F25)	GYM25LD-F20-075	●		
			3.937	5.906	.472	(4H1L4F16)	GYM25LD-F12-100	●		
					.787 *1	(4H1L4F26)	GYM25LD-F20-100	●		
			5.315	7.874	.472	(4H1L4F17)	GYM25LD-F12-135	●		
					.787 *1	(4H1L4F27)	GYM25LD-F20-135	●		
			7.087	9.843	.472	(4H1L4F18)	GYM25LD-F12-180	●		
					.787 *1	(4H1L4F28)	GYM25LD-F20-180	●		
			NEW 8.858	39.331	.472	(4H1L4F19)	GYM25LD-F12-225	●		
					.787 *1	(4H1L4F29)	GYM25LD-F20-225	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F074 for right hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained.

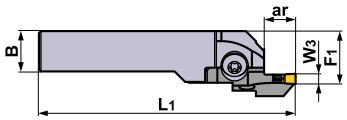


Fig. 3

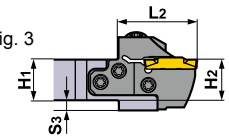
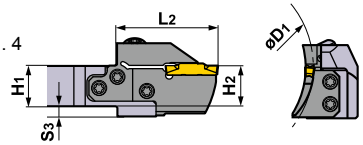


Fig. 4

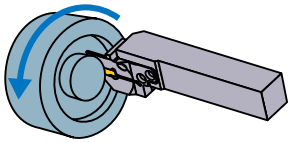
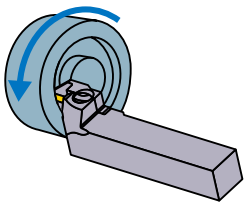


Left hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

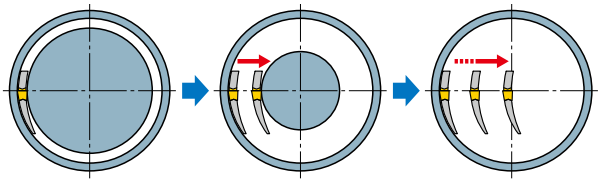
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗ Wrench
GYHLUS12C00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D00-M25L			

Dimensions (inch) ∗2							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0300F020N-GS GY2M0318F020N-GS	F014 ı F016
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.236	1.772	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0300F030N-GM GY2M0318F030N-GM	
.750	.750	5.236	1.772	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0300F030R05-GM GY2M0300F030L05-GM	
.750	.750	5.236	1.772	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0300F020N-MS GY2M0300F040N-MS (Gauge insert)	
.750	.750	5.236	1.772	.750	1.000	.250	4			
1.000	1.000	6.000	1.535	1.000	1.125	—	1		GY2M0300F020N-MM GY2M0300F040N-MM GY2M0300F080N-MM	
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1		GY2M0300F150N-BM GY2M0318F159N-BM	
1.000	1.000	6.236	1.772	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.236	1.772	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1		GY1G0300F020N-GFGS GY1G0318F020N-GFGS	
1.000	1.000	6.236	1.772	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.236	1.772	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.236	1.772	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.236	1.772	1.000	1.125	—	2			

Notes when selecting a modular blade (2)

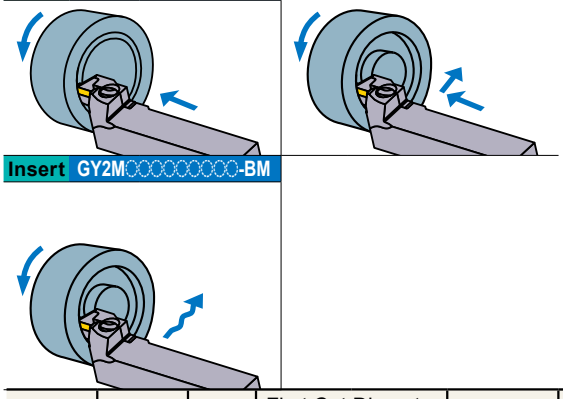
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

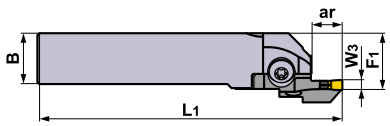


Fig. 1

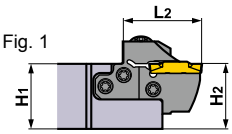
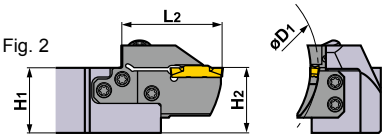


Fig. 2



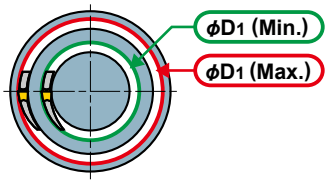
Left hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
F	.118 .125	*3 L	1.378	1.575	.472	(4K1L4F11)	GYM25LD-F12-035	●	GYHLUS20D00-M25L	●
			1.575	1.969	.472	(4K1L4F12)	GYM25LD-F12-040	●		
			1.969	2.362	.472	(4K1L4F13)	GYM25LD-F12-050	●		
			2.362	2.953	.472	(4K1L4F14)	GYM25LD-F12-060	●		
					.787 *1	(4K1L4F24)	GYM25LD-F20-060	●		
			2.953	3.937	.472	(4K1L4F15)	GYM25LD-F12-075	●		
					.787 *1	(4K1L4F25)	GYM25LD-F20-075	●		
			3.937	5.906	.472	(4K1L4F16)	GYM25LD-F12-100	●		
					.787 *1	(4K1L4F26)	GYM25LD-F20-100	●		
			5.315	7.874	.472	(4K1L4F17)	GYM25LD-F12-135	●		
					.787 *1	(4K1L4F27)	GYM25LD-F20-135	●		
			7.087	9.843	.472	(4K1L4F18)	GYM25LD-F12-180	●		
					.787 *1	(4K1L4F28)	GYM25LD-F20-180	●		
			NEW 8.858	39.331	.472	(4K1L4F19)	GYM25LD-F12-225	●		
					.787 *1	(4K1L4F29)	GYM25LD-F20-225	●		
			1.378	1.575	.472	(4M1L4F11)	GYM25LD-F12-035	●	GYHLUS24E00-M25L	●
			1.575	1.969	.472	(4M1L4F12)	GYM25LD-F12-040	●		
			1.969	2.362	.472	(4M1L4F13)	GYM25LD-F12-050	●		
			2.362	2.953	.472	(4M1L4F14)	GYM25LD-F12-060	●		
					.787 *1	(4M1L4F24)	GYM25LD-F20-060	●		
			2.953	3.937	.472	(4M1L4F15)	GYM25LD-F12-075	●		
					.787 *1	(4M1L4F25)	GYM25LD-F20-075	●		
			3.937	5.906	.472	(4M1L4F16)	GYM25LD-F12-100	●		
					.787 *1	(4M1L4F26)	GYM25LD-F20-100	●		
			5.315	7.874	.472	(4M1L4F17)	GYM25LD-F12-135	●		
					.787 *1	(4M1L4F27)	GYM25LD-F20-135	●		
			7.087	9.843	.472	(4M1L4F18)	GYM25LD-F12-180	●		
					.787 *1	(4M1L4F28)	GYM25LD-F20-180	●		
			NEW 8.858	39.331	.472	(4M1L4F19)	GYM25LD-F12-225	●		
					.787 *1	(4M1L4F29)	GYM25LD-F20-225	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F076 for right hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

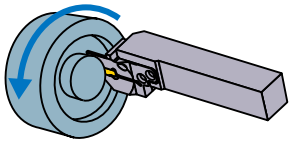
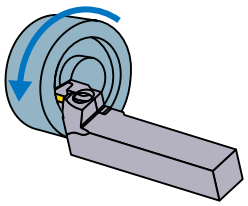


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

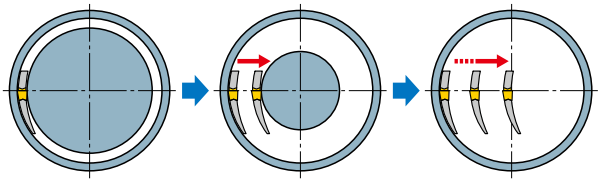
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHLUS20D00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS24E00-M25L			

Dimensions (inch) *2						Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1			Geometry / Insert Number	Page
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0300F020N-GS GY2M0318F020N-GS GY2M0300F030N-GM GY2M0318F030N-GM GY2M0300F030R05-GM GY2M0300F030L05-GM GY2M0300F020N-MS GY2M0300F040N-MS (Gauge insert) GY2M0300F020N-MM GY2M0300F040N-MM GY2M0300F080N-MM GY2M0300F150N-BM GY2M0318F159N-BM GY1G0300F020N-GFGS GY1G0318F020N-GFGS	F014 ı F016
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.236	1.772	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.236	1.772	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.236	1.772	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.236	1.772	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.236	1.772	1.250	1.375	2			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.236	1.772	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.236	1.772	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.236	1.772	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.236	1.772	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.236	1.772	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.236	1.772	1.500	1.625	2			

Notes when selecting a modular blade (2)

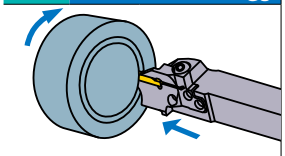
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



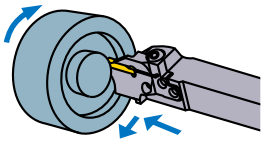
GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

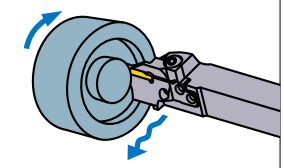
Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS



Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.

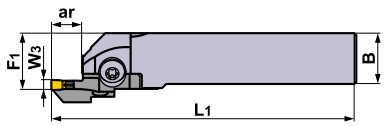




Fig. 1

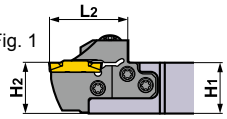
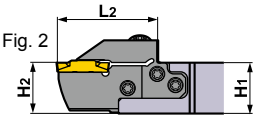


Fig. 2



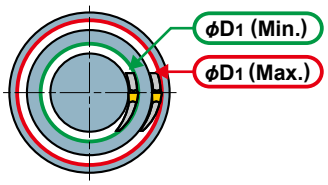
Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
G	.157	*3 R	1.575	1.969	.551	(4F1R4G11)	GYM25RD-G14-040	●	GYHRUS12C00-M25R	●
			1.969	2.362	.551	(4F1R4G12)	GYM25RD-G14-050	●		
			2.362	3.346	.551	(4F1R4G13)	GYM25RD-G14-060	●		
					.984 *1	(4F1R4G23)	GYM25RD-G25-060	●		
			3.346	4.921	.551	(4F1R4G14)	GYM25RD-G14-085	●		
					.984 *1	(4F1R4G24)	GYM25RD-G25-085	●		
			4.921	7.874	.551	(4F1R4G15)	GYM25RD-G14-125	●		
					.984 *1	(4F1R4G25)	GYM25RD-G25-125	●		
			7.087	11.024	.551	(4F1R4G16)	GYM25RD-G14-180	●		
					.984 *1	(4F1R4G26)	GYM25RD-G25-180	●		
			9.843	39.331	.551	(4F1R4G17)	GYM25RD-G14-250	●		
					.984 *1	(4F1R4G27)	GYM25RD-G25-250	●		
			1.575	1.969	.551	(4H1R4G11)	GYM25RD-G14-040	●	GYHRUS16D00-M25R	●
			1.969	2.362	.551	(4H1R4G12)	GYM25RD-G14-050	●		
			2.362	3.346	.551	(4H1R4G13)	GYM25RD-G14-060	●		
					.984 *1	(4H1R4G23)	GYM25RD-G25-060	●		
			3.346	4.921	.551	(4H1R4G14)	GYM25RD-G14-085	●		
					.984 *1	(4H1R4G24)	GYM25RD-G25-085	●		
			4.921	7.874	.551	(4H1R4G15)	GYM25RD-G14-125	●		
					.984 *1	(4H1R4G25)	GYM25RD-G25-125	●		
			7.087	11.024	.551	(4H1R4G16)	GYM25RD-G14-180	●		
					.984 *1	(4H1R4G26)	GYM25RD-G25-180	●		
			9.843	39.331	.551	(4H1R4G17)	GYM25RD-G14-250	●		
					.984 *1	(4H1R4G27)	GYM25RD-G25-250	●		

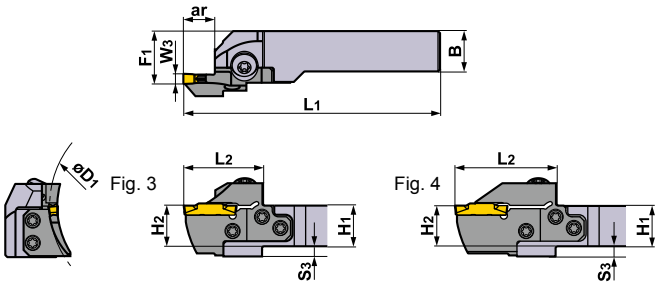
*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F086 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained.

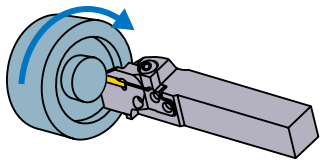
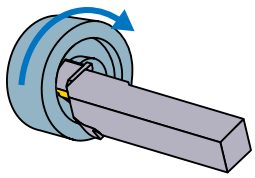


Right hand tool holder shown.

* Wrench : ①For Clamp Screw ②For Blade Screw.

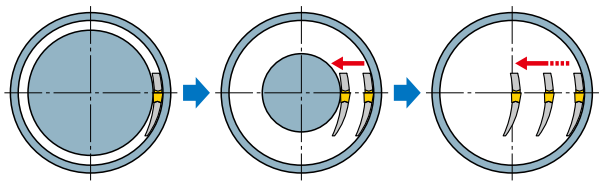
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYGRUS12C00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYGRUS16D00-M25R			

Dimensions (inch) *2							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0400G030N-GU GY2M0400G020N-GS GY2M0400G030N-GM GY2M0400G030R05-GM GY2M0400G030L05-GM GY2M0400G020N-MS GY2M0400G040N-MS (Gauge insert) GY2M0400G020N-MM GY2M0400G040N-MM GY2M0400G080N-MM GY2M0400G200N-BM GY1G0400G020N-GFGS	F014 ı F016
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.433	1.969	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.433	1.969	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.433	1.969	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.433	1.969	.750	1.000	.250	4			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			

Notes when selecting a modular blade (2)

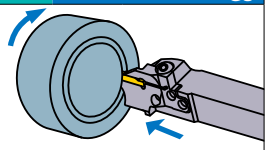
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



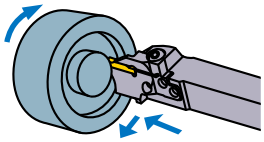
GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

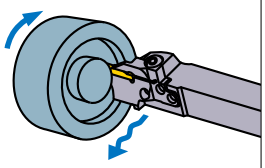
Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS



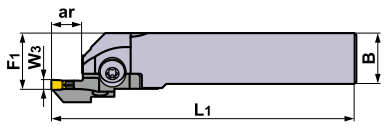
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.



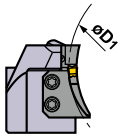


Fig. 1

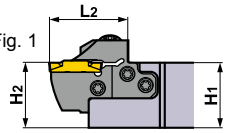
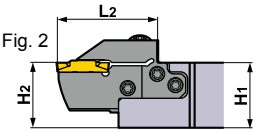


Fig. 2



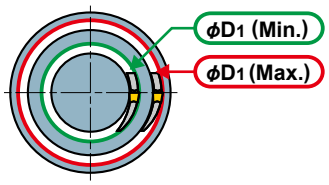
Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
G	.157	R *3	1.575	1.969	.551	(4K1R4G11)	GYM25RD-G14-040	●	GYHRUS20D00-M25R	●
			1.969	2.362	.551	(4K1R4G12)	GYM25RD-G14-050	●		
			2.362	3.346	.551	(4K1R4G13)	GYM25RD-G14-060	●		
					.984 *1	(4K1R4G23)	GYM25RD-G25-060	●		
			3.346	4.921	.551	(4K1R4G14)	GYM25RD-G14-085	●		
					.984 *1	(4K1R4G24)	GYM25RD-G25-085	●		
			4.921	7.874	.551	(4K1R4G15)	GYM25RD-G14-125	●		
					.984 *1	(4K1R4G25)	GYM25RD-G25-125	●		
			7.087	11.024	.551	(4K1R4G16)	GYM25RD-G14-180	●		
					.984 *1	(4K1R4G26)	GYM25RD-G25-180	●		
			9.843	39.331	.551	(4K1R4G17)	GYM25RD-G14-250	●		
					.984 *1	(4K1R4G27)	GYM25RD-G25-250	●		
			1.575	1.969	.551	(4M1R4G11)	GYM25RD-G14-040	●	GYHRUS24E00-M25R	●
			1.969	2.362	.551	(4M1R4G12)	GYM25RD-G14-050	●		
			2.362	3.346	.551	(4M1R4G13)	GYM25RD-G14-060	●		
					.984 *1	(4M1R4G23)	GYM25RD-G25-060	●		
			3.346	4.921	.551	(4M1R4G14)	GYM25RD-G14-085	●		
					.984 *1	(4M1R4G24)	GYM25RD-G25-085	●		
			4.921	7.874	.551	(4M1R4G15)	GYM25RD-G14-125	●		
					.984 *1	(4M1R4G25)	GYM25RD-G25-125	●		
			7.087	11.024	.551	(4M1R4G16)	GYM25RD-G14-180	●		
					.984 *1	(4M1R4G26)	GYM25RD-G25-180	●		
			9.843	39.331	.551	(4M1R4G17)	GYM25RD-G14-250	●		
					.984 *1	(4M1R4G27)	GYM25RD-G25-250	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F088 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

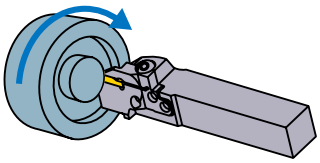
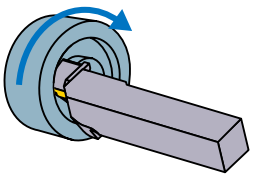


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

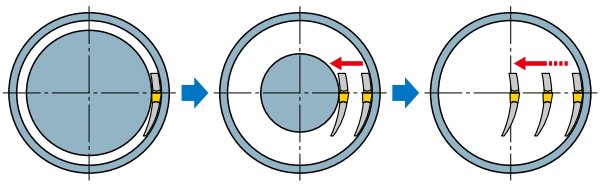
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHRUS20D00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHRUS24E00-M25R			

Dimensions (inch) *2						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0400G030N-GU GY2M0400G020N-GS GY2M0400G030N-GM GY2M0400G030R05-GM GY2M0400G030L05-GM GY2M0400G020N-MS GY2M0400G040N-MS (Gauge insert) GY2M0400G020N-MM GY2M0400G040N-MM GY2M0400G080N-MM GY2M0400G200N-BM GY1G0400G020N-GFGS	F014 ı F016
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.433	1.969	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.433	1.969	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.433	1.969	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.433	1.969	1.250	1.375	2			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.433	1.969	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.433	1.969	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.433	1.969	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.433	1.969	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.433	1.969	1.500	1.625	2			

Notes when selecting a modular blade (2)

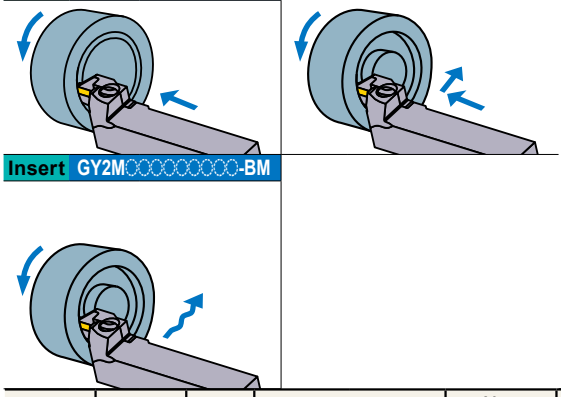
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

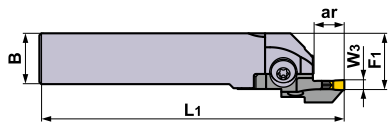


Fig. 1

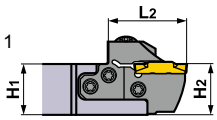
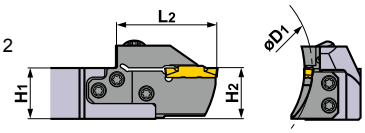


Fig. 2



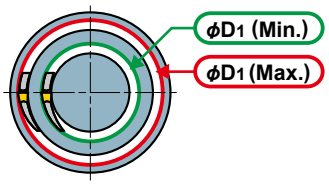
Left hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
G	.157	L *3	1.575	1.969	.551	(4F1L4G11)	**GYM25LD-G14-040**	●	**GYHLUS12C00-M25L**	●
			1.969	2.362	.551	(4F1L4G12)	**GYM25LD-G14-050**	●		
			2.362	3.346	.551	(4F1L4G13)	**GYM25LD-G14-060**	●		
					.984 *1	(4F1L4G23)	**GYM25LD-G25-060**	●		
			3.346	4.921	.551	(4F1L4G14)	**GYM25LD-G14-085**	●		
					.984 *1	(4F1L4G24)	**GYM25LD-G25-085**	●		
			4.921	7.874	.551	(4F1L4G15)	**GYM25LD-G14-125**	●		
					.984 *1	(4F1L4G25)	**GYM25LD-G25-125**	●		
			7.087	11.024	.551	(4F1L4G16)	**GYM25LD-G14-180**	●		
					.984 *1	(4F1L4G26)	**GYM25LD-G25-180**	●		
			9.843	39.331	.551	(4F1L4G17)	**GYM25LD-G14-250**	●		
					.984 *1	(4F1L4G27)	**GYM25LD-G25-250**	●		
			1.575	1.969	.551	(4H1L4G11)	**GYM25LD-G14-040**	●	**GYHLUS16D00-M25L**	●
			1.969	2.362	.551	(4H1L4G12)	**GYM25LD-G14-050**	●		
			2.362	3.346	.551	(4H1L4G13)	**GYM25LD-G14-060**	●		
					.984 *1	(4H1L4G23)	**GYM25LD-G25-060**	●		
			3.346	4.921	.551	(4H1L4G14)	**GYM25LD-G14-085**	●		
					.984 *1	(4H1L4G24)	**GYM25LD-G25-085**	●		
			4.921	7.874	.551	(4H1L4G15)	**GYM25LD-G14-125**	●		
					.984 *1	(4H1L4G25)	**GYM25LD-G25-125**	●		
			7.087	11.024	.551	(4H1L4G16)	**GYM25LD-G14-180**	●		
					.984 *1	(4H1L4G26)	**GYM25LD-G25-180**	●		
			9.843	39.331	.551	(4H1L4G17)	**GYM25LD-G14-250**	●		
					.984 *1	(4H1L4G27)	**GYM25LD-G25-250**	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F082 for right hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained.

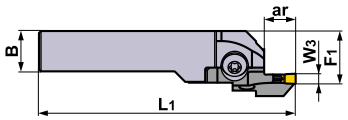


Fig. 3

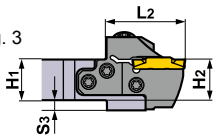
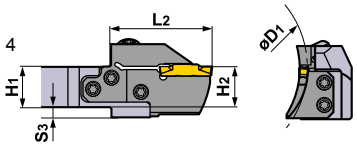


Fig. 4

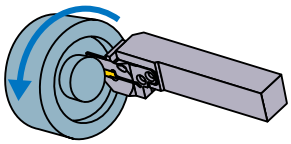
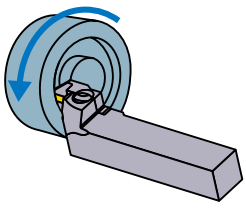


Left hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

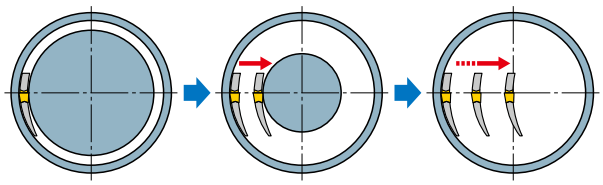
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗ Wrench (①/②)
GYHLUS12C00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D00-M25L			

Dimensions (inch) ∗2							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0400G030N-GU GY2M0400G020N-GS GY2M0400G030N-GM GY2M0400G030R05-GM GY2M0400G030L05-GM GY2M0400G020N-MS GY2M0400G040N-MS (Gauge insert) GY2M0400G020N-MM GY2M0400G040N-MM GY2M0400G080N-MM GY2M0400G200N-BM GY1G0400G020N-GFGS	F014 – F016
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.433	1.969	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.433	1.969	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.433	1.969	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.433	1.969	.750	1.000	.250	4			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			

Notes when selecting a modular blade (2)

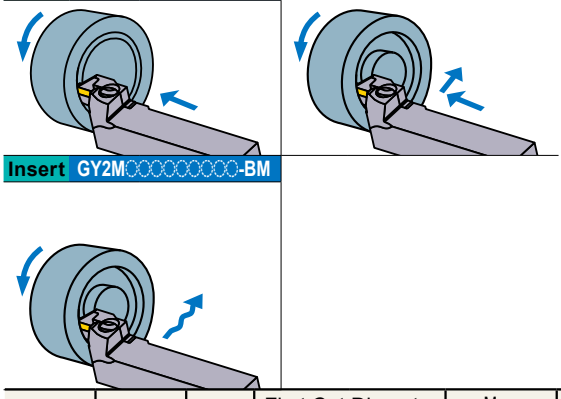
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

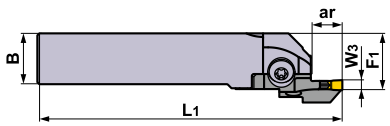


Fig. 1

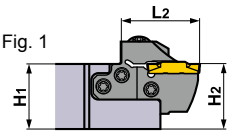
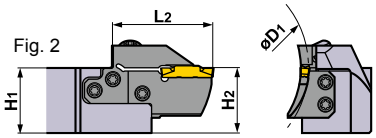


Fig. 2



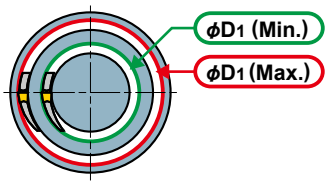
Left hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
G	.157	L *3	1.575	1.969	.551	(4K1L4G11)	GYM25LD-G14-040	●	GYHLUS20D00-M25L	●
			1.969	2.362	.551	(4K1L4G12)	GYM25LD-G14-050	●		
			2.362	3.346	.551	(4K1L4G13)	GYM25LD-G14-060	●		
					.984 *1	(4K1L4G23)	GYM25LD-G25-060	●		
			3.346	4.921	.551	(4K1L4G14)	GYM25LD-G14-085	●		
					.984 *1	(4K1L4G24)	GYM25LD-G25-085	●		
			4.921	7.874	.551	(4K1L4G15)	GYM25LD-G14-125	●		
					.984 *1	(4K1L4G25)	GYM25LD-G25-125	●		
			7.087	11.024	.551	(4K1L4G16)	GYM25LD-G14-180	●		
					.984 *1	(4K1L4G26)	GYM25LD-G25-180	●		
			9.843	39.331	.551	(4K1L4G17)	GYM25LD-G14-250	●		
					.984 *1	(4K1L4G27)	GYM25LD-G25-250	●		
			1.575	1.969	.551	(4M1L4G11)	GYM25LD-G14-040	●	GYHLUS24E00-M25L	●
			1.969	2.362	.551	(4M1L4G12)	GYM25LD-G14-050	●		
			2.362	3.346	.551	(4M1L4G13)	GYM25LD-G14-060	●		
					.984 *1	(4M1L4G23)	GYM25LD-G25-060	●		
			3.346	4.921	.551	(4M1L4G14)	GYM25LD-G14-085	●		
					.984 *1	(4M1L4G24)	GYM25LD-G25-085	●		
			4.921	7.874	.551	(4M1L4G15)	GYM25LD-G14-125	●		
					.984 *1	(4M1L4G25)	GYM25LD-G25-125	●		
			7.087	11.024	.551	(4M1L4G16)	GYM25LD-G14-180	●		
					.984 *1	(4M1L4G26)	GYM25LD-G25-180	●		
			9.843	39.331	.551	(4M1L4G17)	GYM25LD-G14-250	●		
					.984 *1	(4M1L4G27)	GYM25LD-G25-250	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F084 for right hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

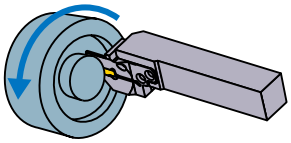
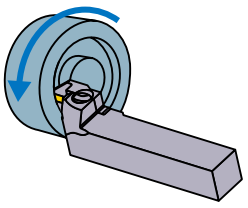


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

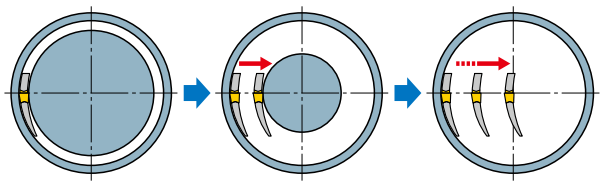
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHLUS20D00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS24E00-M25L			

Dimensions (inch) *2						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0400G030N-GU	F014 – F016
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0400G020N-GS	
1.250	1.250	6.433	1.969	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0400G030N-GM	
1.250	1.250	6.433	1.969	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0400G030R05-GM GY2M0400G030L05-GM	
1.250	1.250	6.433	1.969	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0400G020N-MS GY2M0400G040N-MS (Gauge insert)	
1.250	1.250	6.433	1.969	1.250	1.375	2			
1.500	1.500	7.000	1.535	1.500	1.625	1		GY2M0400G020N-MM GY2M0400G040N-MM GY2M0400G080N-MM	
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.433	1.969	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1		GY2M0400G200N-BM	
1.500	1.500	7.433	1.969	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1		GY1G0400G020N-GFGS	
1.500	1.500	7.433	1.969	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.433	1.969	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.433	1.969	1.500	1.625	2			

Notes when selecting a modular blade (2)

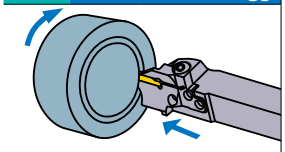
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



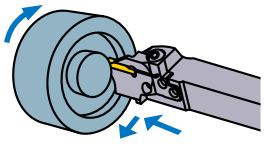
GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

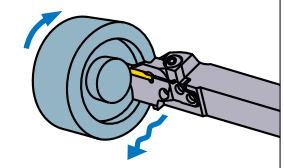
Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS



Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.

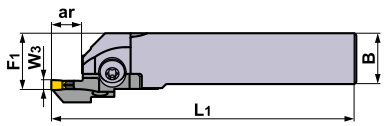




Fig. 1

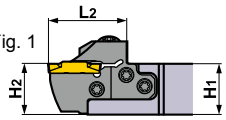
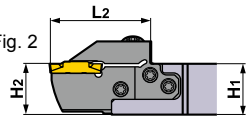


Fig. 2



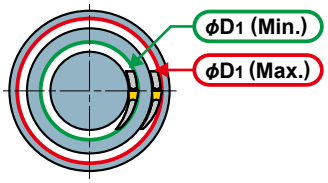
Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
H	.187 .197	*3 R	1.969	2.362	.551	(4F1R4H11)	**GYM25RD-H14-050**	●	**GYHRUS12C00-M25R**	●
			2.362	3.346	.551	(4F1R4H12)	**GYM25RD-H14-060**	●		
					.984 *1	(4F1R4H22)	**GYM25RD-H25-060**	●		
			3.346	4.921	.551	(4F1R4H13)	**GYM25RD-H14-085**	●		
					.984 *1	(4F1R4H23)	**GYM25RD-H25-085**	●		
			4.921	7.874	.551	(4F1R4H14)	**GYM25RD-H14-125**	●		
					.984 *1	(4F1R4H24)	**GYM25RD-H25-125**	●		
			7.087	11.024	.551	(4F1R4H15)	**GYM25RD-H14-180**	●		
					.984 *1	(4F1R4H25)	**GYM25RD-H25-180**	●		
			9.843	39.331	.551	(4F1R4H16)	**GYM25RD-H14-250**	●		
					.984 *1	(4F1R4H26)	**GYM25RD-H25-250**	●		
			1.969	2.362	.551	(4H1R4H11)	**GYM25RD-H14-050**	●	**GYHRUS16D00-M25R**	●
			2.362	3.346	.551	(4H1R4H12)	**GYM25RD-H14-060**	●		
					.984 *1	(4H1R4H22)	**GYM25RD-H25-060**	●		
			3.346	4.921	.551	(4H1R4H13)	**GYM25RD-H14-085**	●		
					.984 *1	(4H1R4H23)	**GYM25RD-H25-085**	●		
			4.921	7.874	.551	(4H1R4H14)	**GYM25RD-H14-125**	●		
					.984 *1	(4H1R4H24)	**GYM25RD-H25-125**	●		
			7.087	11.024	.551	(4H1R4H15)	**GYM25RD-H14-180**	●		
					.984 *1	(4H1R4H25)	**GYM25RD-H25-180**	●		
			9.843	39.331	.551	(4H1R4H16)	**GYM25RD-H14-250**	●		
					.984 *1	(4H1R4H26)	**GYM25RD-H25-250**	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F094 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained.

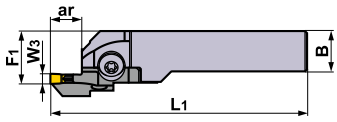




Fig. 3

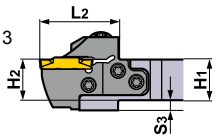
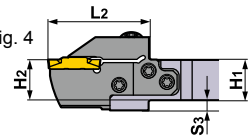


Fig. 4

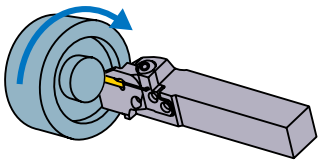
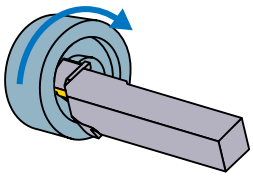


Right hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

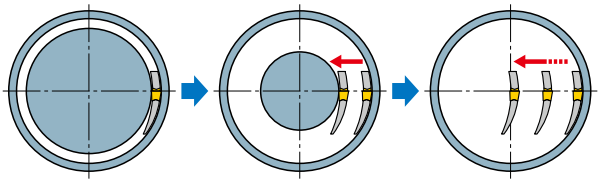
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗ Wrench
GYHRUS12C00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHRUS16D00-M25R			

Dimensions (inch) ∗2							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0475H040N-GU GY2M0500H040N-GU	F014 ı F016
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0475H030N-GS GY2M0500H030N-GS	
.750	.750	5.433	1.969	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0475H040N-GM GY2M0500H040N-GM	
.750	.750	5.433	1.969	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0500H040R05-GM GY2M0500H040L05-GM	
.750	.750	5.433	1.969	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0500H040N-MS GY2M0500H080N-MS (Gauge insert)	
.750	.750	5.433	1.969	.750	1.000	.250	4			
1.000	1.000	6.000	1.535	1.000	1.125	—	1		GY2M0500H040N-MM GY2M0500H080N-MM	
1.000	1.000	6.000	1.535	1.000	1.125	—	1		GY2M0475H238N-BM GY2M0500H250N-BM	
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1		GY1G0475H020N-GFGS GY1G0500H020N-GFGS	
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			

Notes when selecting a modular blade (2)

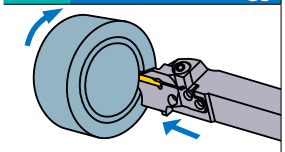
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



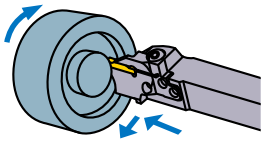
GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

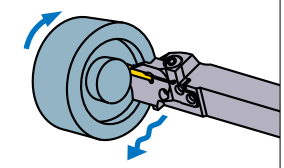
Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS



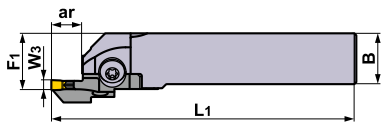
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.



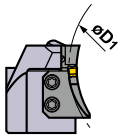


Fig. 1

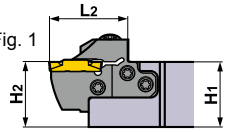
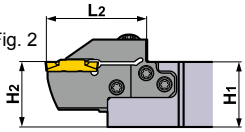


Fig. 2



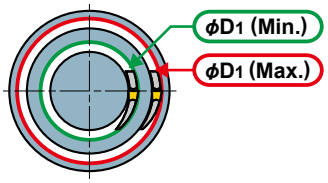
Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
H	.187 .197	*3 R	1.969	2.362	.551	(4K1R4H11)	GYM25RD-H14-050	●	GYHRUS20D00-M25R	●
			2.362	3.346	.551	(4K1R4H12)	GYM25RD-H14-060	●		
					.984 *1	(4K1R4H22)	GYM25RD-H25-060	●		
			3.346	4.921	.551	(4K1R4H13)	GYM25RD-H14-085	●		
					.984 *1	(4K1R4H23)	GYM25RD-H25-085	●		
			4.921	7.874	.551	(4K1R4H14)	GYM25RD-H14-125	●		
					.984 *1	(4K1R4H24)	GYM25RD-H25-125	●		
			7.087	11.024	.551	(4K1R4H15)	GYM25RD-H14-180	●		
					.984 *1	(4K1R4H25)	GYM25RD-H25-180	●		
			9.843	39.331	.551	(4K1R4H16)	GYM25RD-H14-250	●		
					.984 *1	(4K1R4H26)	GYM25RD-H25-250	●		
			1.969	2.362	.551	(4M1R4H11)	GYM25RD-H14-050	●	GYHRUS24E00-M25R	●
			2.362	3.346	.551	(4M1R4H12)	GYM25RD-H14-060	●		
					.984 *1	(4M1R4H22)	GYM25RD-H25-060	●		
			3.346	4.921	.551	(4M1R4H13)	GYM25RD-H14-085	●		
					.984 *1	(4M1R4H23)	GYM25RD-H25-085	●		
			4.921	7.874	.551	(4M1R4H14)	GYM25RD-H14-125	●		
					.984 *1	(4M1R4H24)	GYM25RD-H25-125	●		
			7.087	11.024	.551	(4M1R4H15)	GYM25RD-H14-180	●		
					.984 *1	(4M1R4H25)	GYM25RD-H25-180	●		
			9.843	39.331	.551	(4M1R4H16)	GYM25RD-H14-250	●		
					.984 *1	(4M1R4H26)	GYM25RD-H25-250	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F096 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

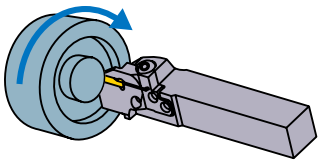
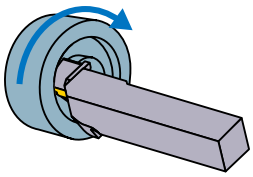


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

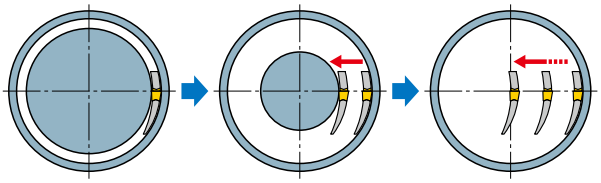
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHRUS20D00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHRUS24E00-M25R			

Dimensions (inch) *2						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0475H040N-GU GY2M0500H040N-GU	F014 – F016
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.433	1.969	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0475H030N-GS GY2M0500H030N-GS	
1.250	1.250	6.433	1.969	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0475H040N-GM GY2M0500H040N-GM	
1.250	1.250	6.433	1.969	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0500H040R05-GM GY2M0500H040L05-GM	
1.250	1.250	6.433	1.969	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.433	1.969	1.250	1.375	2			
1.500	1.500	7.000	1.535	1.500	1.625	1		GY2M0500H040N-MS GY2M0500H080N-MS (Gauge insert)	
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.433	1.969	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1		GY2M0500H040N-MM GY2M0500H080N-MM	
1.500	1.500	7.433	1.969	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1		GY2M0475H238N-BM GY2M0500H250N-BM	
1.500	1.500	7.433	1.969	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1		GY1G0475H020N-GFGS GY1G0500H020N-GFGS	
1.500	1.500	7.433	1.969	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.433	1.969	1.500	1.625	2			

Notes when selecting a modular blade (2)

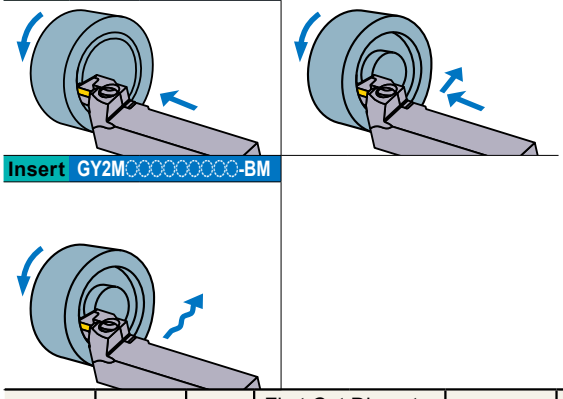
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

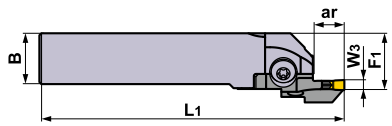


Fig. 1

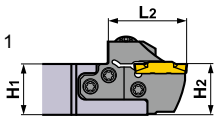
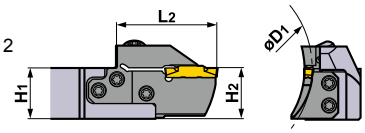


Fig. 2



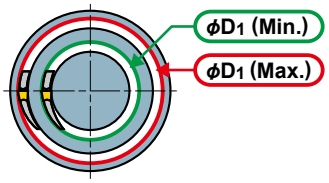
Left hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
H	.187 .197	*3 L	1.969	2.362	.551	(4F1L4H11)	GYM25LD-H14-050	●	GYHLUS12C00-M25L	●
			2.362	3.346	.551	(4F1L4H12)	GYM25LD-H14-060	●		
					.984 *1	(4F1L4H22)	GYM25LD-H25-060	●		
			3.346	4.921	.551	(4F1L4H13)	GYM25LD-H14-085	●		
					.984 *1	(4F1L4H23)	GYM25LD-H25-085	●		
			4.921	7.874	.551	(4F1L4H14)	GYM25LD-H14-125	●		
					.984 *1	(4F1L4H24)	GYM25LD-H25-125	●		
			7.087	11.024	.551	(4F1L4H15)	GYM25LD-H14-180	●		
					.984 *1	(4F1L4H25)	GYM25LD-H25-180	●		
			9.843	39.331	.551	(4F1L4H16)	GYM25LD-H14-250	●		
					.984 *1	(4F1L4H26)	GYM25LD-H25-250	●		
			1.969	2.362	.551	(4H1L4H11)	GYM25LD-H14-050	●	GYHLUS16D00-M25L	●
			2.362	3.346	.551	(4H1L4H12)	GYM25LD-H14-060	●		
					.984 *1	(4H1L4H22)	GYM25LD-H25-060	●		
			3.346	4.921	.551	(4H1L4H13)	GYM25LD-H14-085	●		
					.984 *1	(4H1L4H23)	GYM25LD-H25-085	●		
			4.921	7.874	.551	(4H1L4H14)	GYM25LD-H14-125	●		
					.984 *1	(4H1L4H24)	GYM25LD-H25-125	●		
			7.087	11.024	.551	(4H1L4H15)	GYM25LD-H14-180	●		
					.984 *1	(4H1L4H25)	GYM25LD-H25-180	●		
			9.843	39.331	.551	(4H1L4H16)	GYM25LD-H14-250	●		
					.984 *1	(4H1L4H26)	GYM25LD-H25-250	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F090 for right hand tools.

Notes when selecting a modular blade (1)

●Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained.

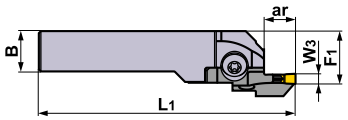


Fig. 3

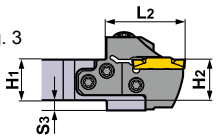
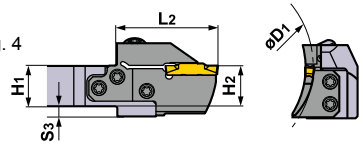


Fig. 4

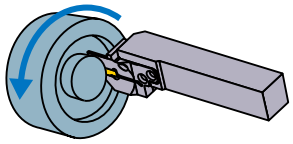
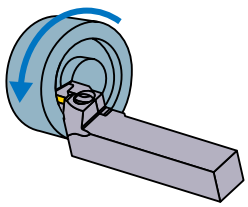


Left hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

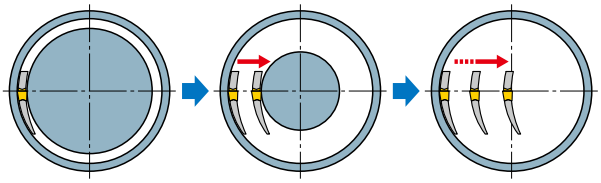
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗ Wrench
GYHLUS12C00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D00-M25L			

Dimensions (inch) ∗2							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0475H040N-GU GY2M0500H040N-GU	F014 I F016
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0475H030N-GS GY2M0500H030N-GS	
.750	.750	5.433	1.969	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0475H040N-GM GY2M0500H040N-GM	
.750	.750	5.433	1.969	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0500H040R05-GM GY2M0500H040L05-GM	
.750	.750	5.433	1.969	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0500H040N-MS GY2M0500H080N-MS (Gauge insert)	
.750	.750	5.433	1.969	.750	1.000	.250	4			
1.000	1.000	6.000	1.535	1.000	1.125	—	1		GY2M0500H040N-MM GY2M0500H080N-MM	
1.000	1.000	6.000	1.535	1.000	1.125	—	1		GY2M0475H238N-BM GY2M0500H250N-BM	
1.000	1.000	6.433	1.969	1.000	1.125	—	2		GY1G0475H020N-GFGS GY1G0500H020N-GFGS	
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			

Notes when selecting a modular blade (2)

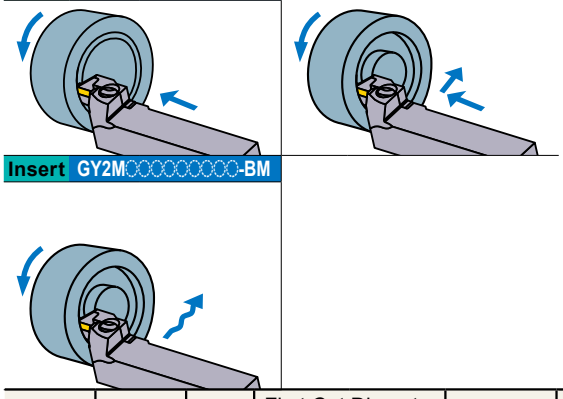
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

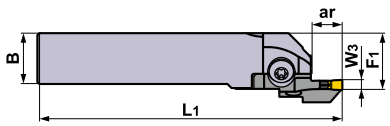


Fig. 1

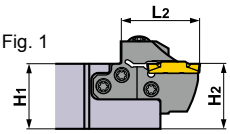
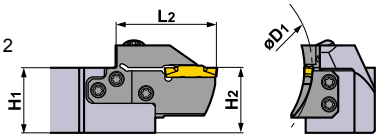


Fig. 2



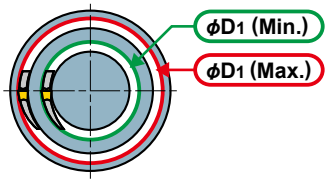
Left hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
H	.187 .197	*3 L	1.969	2.362	.551	(4K1L4H11)	GYM25LD-H14-050	●	GYHLUS20D00-M25L	●
			2.362	3.346	.551	(4K1L4H12)	GYM25LD-H14-060	●		
					.984 *1	(4K1L4H22)	GYM25LD-H25-060	●		
			3.346	4.921	.551	(4K1L4H13)	GYM25LD-H14-085	●		
					.984 *1	(4K1L4H23)	GYM25LD-H25-085	●		
			4.921	7.874	.551	(4K1L4H14)	GYM25LD-H14-125	●		
					.984 *1	(4K1L4H24)	GYM25LD-H25-125	●		
			7.087	11.024	.551	(4K1L4H15)	GYM25LD-H14-180	●		
					.984 *1	(4K1L4H25)	GYM25LD-H25-180	●		
			9.843	39.331	.551	(4K1L4H16)	GYM25LD-H14-250	●		
					.984 *1	(4K1L4H26)	GYM25LD-H25-250	●		
			1.969	2.362	.551	(4M1L4H11)	GYM25LD-H14-050	●	GYHLUS24E00-M25L	●
			2.362	3.346	.551	(4M1L4H12)	GYM25LD-H14-060	●		
					.984 *1	(4M1L4H22)	GYM25LD-H25-060	●		
			3.346	4.921	.551	(4M1L4H13)	GYM25LD-H14-085	●		
					.984 *1	(4M1L4H23)	GYM25LD-H25-085	●		
			4.921	7.874	.551	(4M1L4H14)	GYM25LD-H14-125	●		
					.984 *1	(4M1L4H24)	GYM25LD-H25-125	●		
			7.087	11.024	.551	(4M1L4H15)	GYM25LD-H14-180	●		
					.984 *1	(4M1L4H25)	GYM25LD-H25-180	●		
			9.843	39.331	.551	(4M1L4H16)	GYM25LD-H14-250	●		
					.984 *1	(4M1L4H26)	GYM25LD-H25-250	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F092 for right hand tools.

Notes when selecting a modular blade (1)

●Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

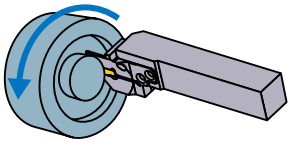
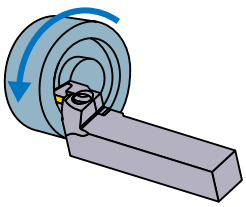


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

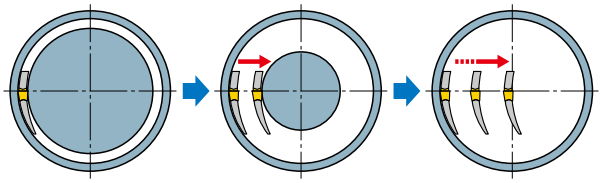
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHLUS20D00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS24E00-M25L			

Dimensions (inch) *2						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0475H040N-GU GY2M0500H040N-GU	F014 – F016
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.433	1.969	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0475H030N-GS GY2M0500H030N-GS	
1.250	1.250	6.433	1.969	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0475H040N-GM GY2M0500H040N-GM	
1.250	1.250	6.433	1.969	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1		GY2M0500H040R05-GM GY2M0500H040L05-GM	
1.250	1.250	6.433	1.969	1.250	1.375	2			
1.250	1.250	6.000	1.535	1.250	1.375	1			
1.250	1.250	6.433	1.969	1.250	1.375	2			
1.500	1.500	7.000	1.535	1.500	1.625	1		GY2M0500H040N-MS GY2M0500H080N-MS (Gauge insert)	
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.433	1.969	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1		GY2M0500H040N-MM GY2M0500H080N-MM	
1.500	1.500	7.433	1.969	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1		GY2M0475H238N-BM GY2M0500H250N-BM	
1.500	1.500	7.433	1.969	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1		GY1G0475H020N-GFGS GY1G0500H020N-GFGS	
1.500	1.500	7.433	1.969	1.500	1.625	2			
1.500	1.500	7.000	1.535	1.500	1.625	1			
1.500	1.500	7.433	1.969	1.500	1.625	2			

Notes when selecting a modular blade (2)

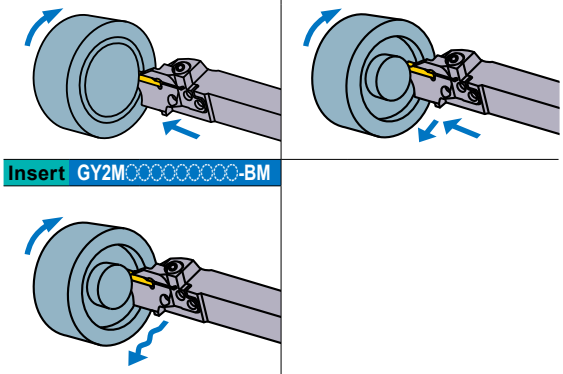
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



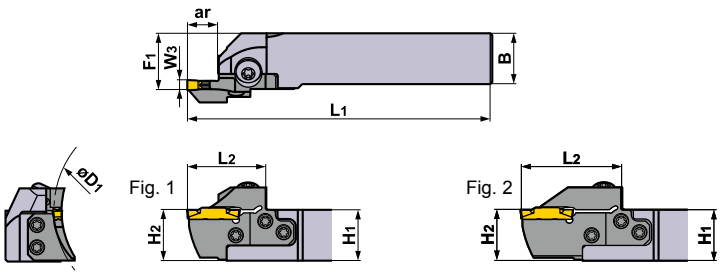
GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.



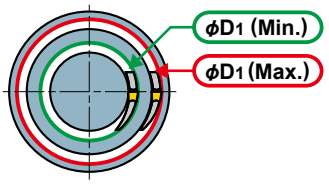
Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
J	.236 .250	*3 R	1.969	2.756	.551	(4F1R4J11)	GYM25RD-J14-050	●	GYHRUS12C00-M25R	●
			2.756	4.331	.551	(4F1R4J12)	GYM25RD-J14-070	●		
					.984 *1	(4F1R4J22)	GYM25RD-J25-070	●		
			4.331	7.874	.551	(4F1R4J13)	GYM25RD-J14-110	●		
					.984 *1	(4F1R4J23)	GYM25RD-J25-110	●		
			6.693	11.024	.551	(4F1R4J14)	GYM25RD-J14-170	●		
					.984 *1	(4F1R4J24)	GYM25RD-J25-170	●		
			9.843	39.331	.551	(4F1R4J15)	GYM25RD-J14-250	●		
					.984 *1	(4F1R4J25)	GYM25RD-J25-250	●		
			1.969	2.756	.551	(4H1R4J11)	GYM25RD-J14-050	●	GYHRUS16D00-M25R	●
			2.756	4.331	.551	(4H1R4J12)	GYM25RD-J14-070	●		
					.984 *1	(4H1R4J22)	GYM25RD-J25-070	●		
			4.331	7.874	.551	(4H1R4J13)	GYM25RD-J14-110	●		
					.984 *1	(4H1R4J23)	GYM25RD-J25-110	●		
			6.693	11.024	.551	(4H1R4J14)	GYM25RD-J14-170	●		
					.984 *1	(4H1R4J24)	GYM25RD-J25-170	●		
			9.843	39.331	.551	(4H1R4J15)	GYM25RD-J14-250	●		
					.984 *1	(4H1R4J25)	GYM25RD-J25-250	●		
			1.969	2.756	.551	(4K1R4J11)	GYM25RD-J14-050	●	GYHRUS20D00-M25R	●
			2.756	4.331	.551	(4K1R4J12)	GYM25RD-J14-070	●		
					.984 *1	(4K1R4J22)	GYM25RD-J25-070	●		
			4.331	7.874	.551	(4K1R4J13)	GYM25RD-J14-110	●		
					.984 *1	(4K1R4J23)	GYM25RD-J25-110	●		
			6.693	11.024	.551	(4K1R4J14)	GYM25RD-J14-170	●		
					.984 *1	(4K1R4J24)	GYM25RD-J25-170	●		
			9.843	39.331	.551	(4K1R4J15)	GYM25RD-J14-250	●		
					.984 *1	(4K1R4J25)	GYM25RD-J25-250	●		
			1.969	2.756	.551	(4M1R4J11)	GYM25RD-J14-050	●	GYHRUS24E00-M25R	●
			2.756	4.331	.551	(4M1R4J12)	GYM25RD-J14-070	●		
					.984 *1	(4M1R4J22)	GYM25RD-J25-070	●		
			4.331	7.874	.551	(4M1R4J13)	GYM25RD-J14-110	●		
					.984 *1	(4M1R4J23)	GYM25RD-J25-110	●		
			6.693	11.024	.551	(4M1R4J14)	GYM25RD-J14-170	●		
					.984 *1	(4M1R4J24)	GYM25RD-J25-170	●		
			9.843	39.331	.551	(4M1R4J15)	GYM25RD-J14-250	●		
					.984 *1	(4M1R4J25)	GYM25RD-J25-250	●		

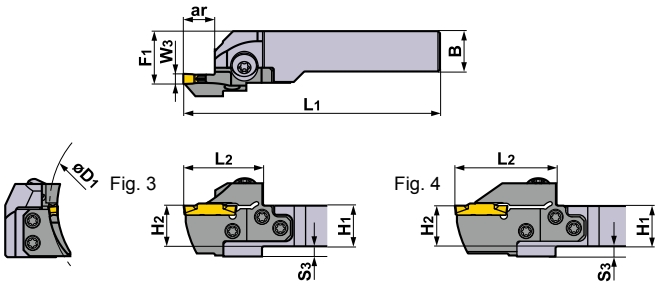
*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F078 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained.

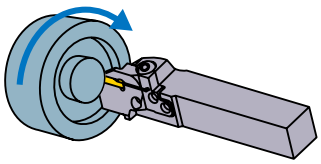
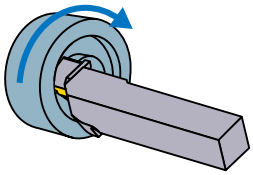


Right hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

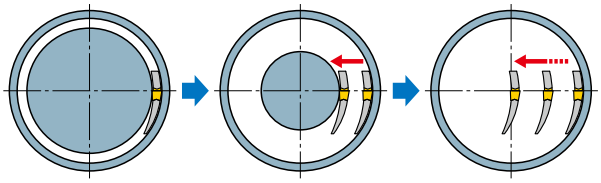
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗ Wrench (①, ②)
GYHRUS12C00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHRUS16D00-M25R			
GYHRUS20D00-M25R			
GYHRUS24E00-M25R			

Dimensions (inch) ∗2							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0600J040N-GU GY2M0635J040N-GU	F014 I F016
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.433	1.969	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.433	1.969	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.433	1.969	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.433	1.969	.750	1.000	.250	4			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1		GY2M0600J030N-GS GY2M0635J030N-GS	
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1		GY2M0600J040N-GM GY2M0635J040N-GM	
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.250	1.250	6.000	1.535	1.250	1.375	—	1			
1.250	1.250	6.000	1.535	1.250	1.375	—	1		GY2M0600J040N-MS GY2M0600J080N-MS (Gauge insert)	
1.250	1.250	6.433	1.969	1.250	1.375	—	2			
1.250	1.250	6.000	1.535	1.250	1.375	—	1			
1.250	1.250	6.433	1.969	1.250	1.375	—	2			
1.250	1.250	6.000	1.535	1.250	1.375	—	1		GY2M0600J040N-MM GY2M0600J080N-MM	
1.250	1.250	6.433	1.969	1.250	1.375	—	2			
1.250	1.250	6.000	1.535	1.250	1.375	—	1			
1.250	1.250	6.433	1.969	1.250	1.375	—	2			
1.500	1.500	7.000	1.535	1.500	1.625	—	1			
1.500	1.500	7.000	1.535	1.500	1.625	—	1		GY2M0600J300N-BM GY2M0635J318N-BM	
1.500	1.500	7.433	1.969	1.500	1.625	—	2			
1.500	1.500	7.000	1.535	1.500	1.625	—	1			
1.500	1.500	7.433	1.969	1.500	1.625	—	2			
1.500	1.500	7.000	1.535	1.500	1.625	—	1			
1.500	1.500	7.433	1.969	1.500	1.625	—	2			
1.500	1.500	7.000	1.535	1.500	1.625	—	1			
1.500	1.500	7.433	1.969	1.500	1.625	—	2			

Notes when selecting a modular blade (2)

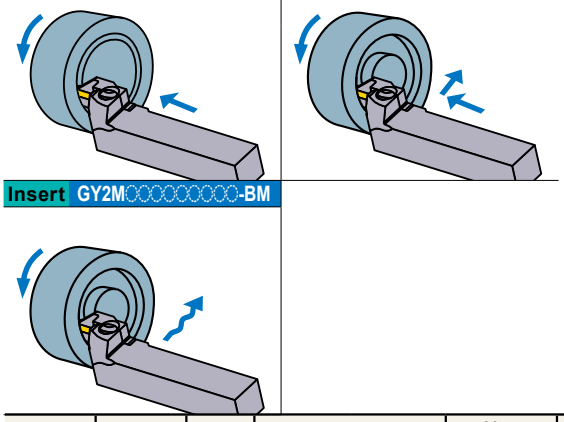
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



GY SERIES (FACE GROOVING)

3-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

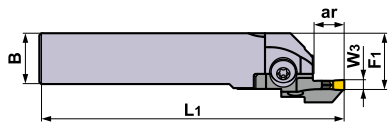


Fig. 1

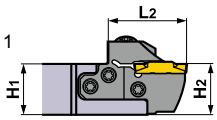
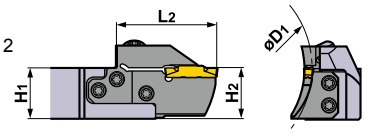


Fig. 2



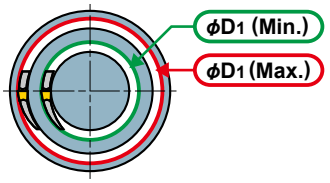
Left hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
J	.236 .250	*3 L	1.969	2.756	.551	(4F1L4J11)	GYM25LD-J14-050	●	GYHLUS12C00-M25L	●
			2.756	4.331	.551	(4F1L4J12)	GYM25LD-J14-070	●		
					.984 *1	(4F1L4J22)	GYM25LD-J25-070	●		
			4.331	7.874	.551	(4F1L4J13)	GYM25LD-J14-110	●		
					.984 *1	(4F1L4J23)	GYM25LD-J25-110	●		
			6.693	11.024	.551	(4F1L4J14)	GYM25LD-J14-170	●		
					.984 *1	(4F1L4J24)	GYM25LD-J25-170	●		
			9.843	39.331	.551	(4F1L4J15)	GYM25LD-J14-250	●		
					.984 *1	(4F1L4J25)	GYM25LD-J25-250	●		
			1.969	2.756	.551	(4H1L4J11)	GYM25LD-J14-050	●	GYHLUS16D00-M25L	●
			2.756	4.331	.551	(4H1L4J12)	GYM25LD-J14-070	●		
					.984 *1	(4H1L4J22)	GYM25LD-J25-070	●		
			4.331	7.874	.551	(4H1L4J13)	GYM25LD-J14-110	●		
					.984 *1	(4H1L4J23)	GYM25LD-J25-110	●		
			6.693	11.024	.551	(4H1L4J14)	GYM25LD-J14-170	●		
					.984 *1	(4H1L4J24)	GYM25LD-J25-170	●		
			9.843	39.331	.551	(4H1L4J15)	GYM25LD-J14-250	●		
					.984 *1	(4H1L4J25)	GYM25LD-J25-250	●		
			1.969	2.756	.551	(4K1L4J11)	GYM25LD-J14-050	●	GYHLUS20D00-M25L	●
			2.756	4.331	.551	(4K1L4J12)	GYM25LD-J14-070	●		
					.984 *1	(4K1L4J22)	GYM25LD-J25-070	●		
			4.331	7.874	.551	(4K1L4J13)	GYM25LD-J14-110	●		
					.984 *1	(4K1L4J23)	GYM25LD-J25-110	●		
			6.693	11.024	.551	(4K1L4J14)	GYM25LD-J14-170	●		
					.984 *1	(4K1L4J24)	GYM25LD-J25-170	●		
			9.843	39.331	.551	(4K1L4J15)	GYM25LD-J14-250	●		
					.984 *1	(4K1L4J25)	GYM25LD-J25-250	●		
			1.969	2.756	.551	(4M1L4J11)	GYM25LD-J14-050	●	GYHLUS24E00-M25L	●
			2.756	4.331	.551	(4M1L4J12)	GYM25LD-J14-070	●		
					.984 *1	(4M1L4J22)	GYM25LD-J25-070	●		
			4.331	7.874	.551	(4M1L4J13)	GYM25LD-J14-110	●		
					.984 *1	(4M1L4J23)	GYM25LD-J25-110	●		
			6.693	11.024	.551	(4M1L4J14)	GYM25LD-J14-170	●		
					.984 *1	(4M1L4J24)	GYM25LD-J25-170	●		
			9.843	39.331	.551	(4M1L4J15)	GYM25LD-J14-250	●		
					.984 *1	(4M1L4J25)	GYM25LD-J25-250	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F098 for right hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained.

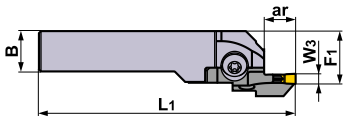


Fig. 3

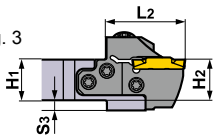
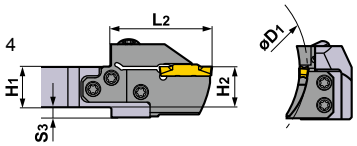


Fig. 4

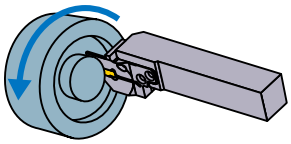
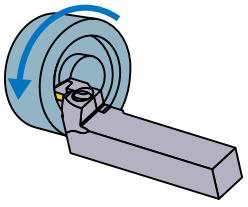


Left hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

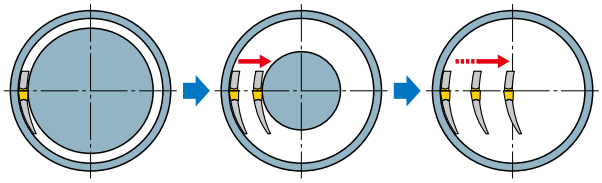
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗ Wrench (①②)
GYHLUS12C00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D00-M25L			
GYHLUS20D00-M25L			
GYHLUS24E00-M25L			

Dimensions (inch) ∗2							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
.750	.750	5.000	1.535	.750	1.000	.250	3		GY2M0600J040N-GU GY2M0635J040N-GU	F014 I F016
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.433	1.969	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.433	1.969	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.433	1.969	.750	1.000	.250	4			
.750	.750	5.000	1.535	.750	1.000	.250	3			
.750	.750	5.433	1.969	.750	1.000	.250	4			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2		GY2M0600J030N-GS GY2M0635J030N-GS	
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1			
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.000	1.000	6.000	1.535	1.000	1.125	—	1		GY2M0600J040N-GM GY2M0635J040N-GM	
1.000	1.000	6.433	1.969	1.000	1.125	—	2			
1.250	1.250	6.000	1.535	1.250	1.375	—	1			
1.250	1.250	6.000	1.535	1.250	1.375	—	1			
1.250	1.250	6.433	1.969	1.250	1.375	—	2		GY2M0600J040N-MS GY2M0600J080N-MS (Gauge insert)	
1.250	1.250	6.000	1.535	1.250	1.375	—	1			
1.250	1.250	6.433	1.969	1.250	1.375	—	2			
1.250	1.250	6.000	1.535	1.250	1.375	—	1			
1.250	1.250	6.433	1.969	1.250	1.375	—	2			
1.250	1.250	6.000	1.535	1.250	1.375	—	1		GY2M0600J040N-MM GY2M0600J080N-MM	
1.250	1.250	6.433	1.969	1.250	1.375	—	2			
1.500	1.500	7.000	1.535	1.500	1.625	—	1			
1.500	1.500	7.000	1.535	1.500	1.625	—	1			
1.500	1.500	7.433	1.969	1.500	1.625	—	2		GY2M0600J300N-BM GY2M0635J318N-BM	
1.500	1.500	7.000	1.535	1.500	1.625	—	1			
1.500	1.500	7.433	1.969	1.500	1.625	—	2			
1.500	1.500	7.000	1.535	1.500	1.625	—	1			
1.500	1.500	7.433	1.969	1.500	1.625	—	2			
1.500	1.500	7.000	1.535	1.500	1.625	—	1			
1.500	1.500	7.433	1.969	1.500	1.625	—	2			

Notes when selecting a modular blade (2)

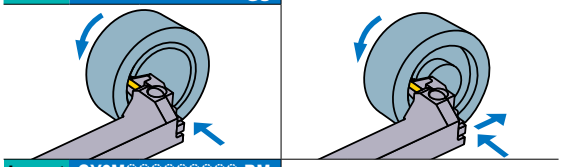
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



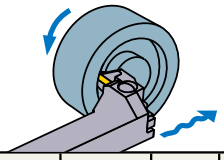
GY SERIES (FACE GROOVING)

4-1 90° type holder (Inch)

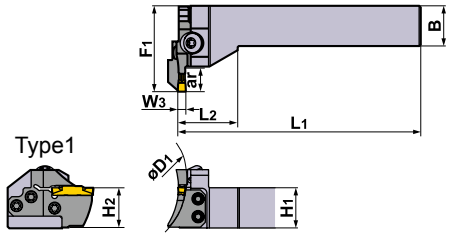
Insert GY2M○○○○○○○○○-GS GM
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF GS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.



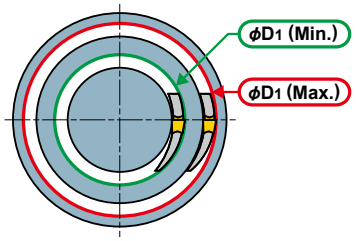
Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
NEW D	.079	R	1.575	1.969	.472	(5G1R4D11)	GYM25LD-D12-040	●	GYHRUS16D90-M25L	●
			1.969	2.362	.472	(5G1R4D12)	GYM25LD-D12-050	●		
			2.362	2.953	.472	(5G1R4D13)	GYM25LD-D12-060	●		
			2.953	3.937	.472	(5G1R4D14)	GYM25LD-D12-075	●		
			3.937	5.906	.472	(5G1R4D15)	GYM25LD-D12-100	●		
			5.315	7.874	.472	(5G1R4D16)	GYM25LD-D12-135	●		
			7.087	9.843	.472	(5G1R4D17)	GYM25LD-D12-180	●		
		L	1.575	1.969	.472	(5G1L4D11)	GYM25RD-D12-040	●	GYHLUS16D90-M25R	●
			1.969	2.362	.472	(5G1L4D12)	GYM25RD-D12-050	●		
			2.362	2.953	.472	(5G1L4D13)	GYM25RD-D12-060	●		
			2.953	3.937	.472	(5G1L4D14)	GYM25RD-D12-075	●		
			3.937	5.906	.472	(5G1L4D15)	GYM25RD-D12-100	●		
			5.315	7.874	.472	(5G1L4D16)	GYM25RD-D12-135	●		
			7.087	9.843	.472	(5G1L4D17)	GYM25RD-D12-180	●		

*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

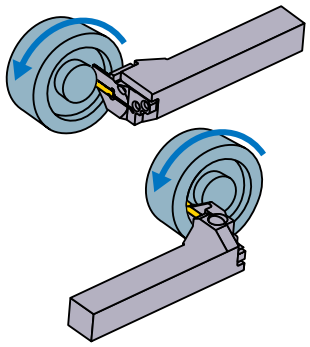
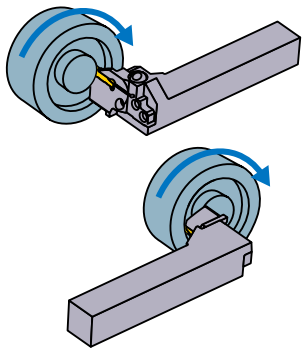


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

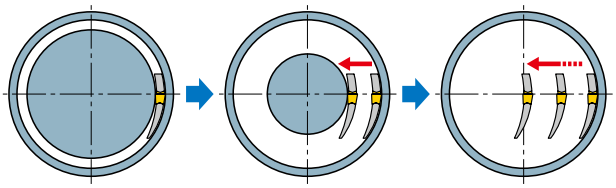
SPARE PARTS

Modular 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						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
1.000	1.000	6.000	1.500	1.000	2.094	1		GY2M0200D020N-GU GY2M0200D020N-GS GY2M0200D020N-GM GY2M0200D020R05-GM GY2M0200D020L05-GM GY2M0200D020N-MS (Gauge insert) GY2M0200D020N-MM GY2M0200D100N-BM GY1G0200D020N-GFGS	F014 – F016
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			

Notes when selecting a modular blade (2)

- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.

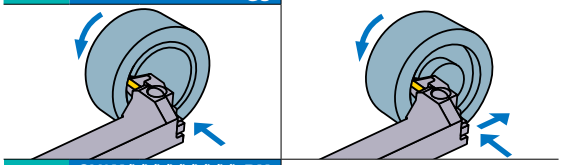


GROOVING

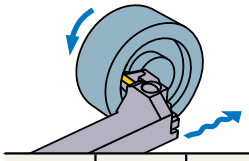
GY SERIES (FACE GROOVING)

4-1 90° type holder (Inch)

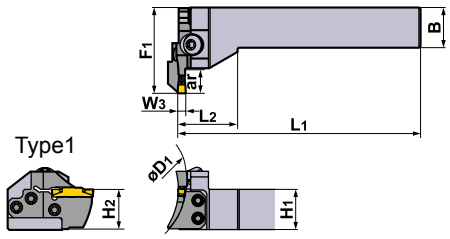
Insert GY2M○○○○○○○○○-GS/GM
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS



GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.



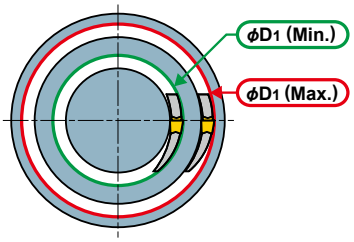
Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
NEW E	.094 .098	R	1.575	1.969	.472	(5G1R4E11)	GYM25LD-E12-040	●	GYHRUS16D90-M25L	●
			1.969	2.362	.472	(5G1R4E12)	GYM25LD-E12-050	●		
			2.362	2.953	.472	(5G1R4E13)	GYM25LD-E12-060	●		
			2.953	3.937	.472	(5G1R4E14)	GYM25LD-E12-075	●		
			3.937	5.906	.472	(5G1R4E15)	GYM25LD-E12-100	●		
			5.315	7.874	.472	(5G1R4E16)	GYM25LD-E12-135	●		
			7.087	9.843	.472	(5G1R4E17)	GYM25LD-E12-180	●		
		L	1.575	1.969	.472	(5G1L4E11)	GYM25RD-E12-040	●	GYHLUS16D90-M25R	●
			1.969	2.362	.472	(5G1L4E12)	GYM25RD-E12-050	●		
			2.362	2.953	.472	(5G1L4E13)	GYM25RD-E12-060	●		
			2.953	3.937	.472	(5G1L4E14)	GYM25RD-E12-075	●		
			3.937	5.906	.472	(5G1L4E15)	GYM25RD-E12-100	●		
			5.315	7.874	.472	(5G1L4E16)	GYM25RD-E12-135	●		
			7.087	9.843	.472	(5G1L4E17)	GYM25RD-E12-180	●		

*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

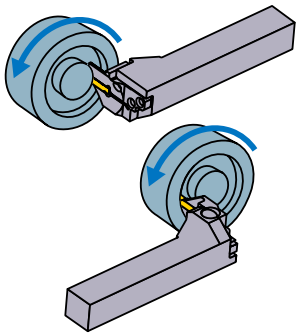
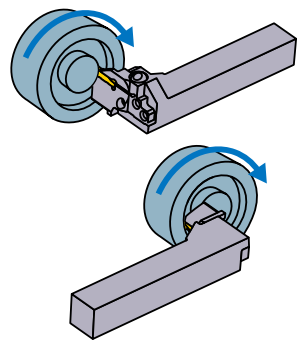


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

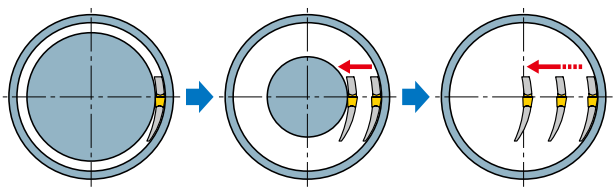
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHRUS16D90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D90-M25R			

Dimensions (inch) *1						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
1.000	1.000	6.000	1.500	1.000	2.094	1		GY2M0239E020N-GU GY2M0250E020N-GU GY2M0239E020N-GS GY2M0250E020N-GS GY2M0239E020N-GM GY2M0250E020N-GM GY2M0250E020R05-GM GY2M0250E020L05-GM GY2M0250E020N-MS (Gauge insert) GY2M0250E020N-MM GY2M0250E125N-BM GY1G0239E020N-GFGS GY1G0250E020N-GFGS	F014 ı F016
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			

Notes when selecting a modular blade (2)

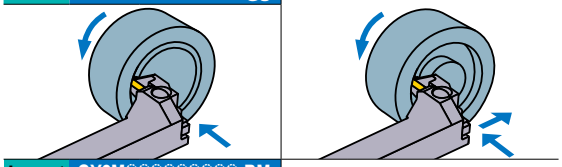
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



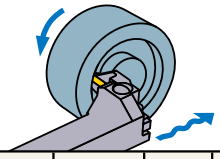
GY SERIES (FACE GROOVING)

4-1 90° type holder (Inch)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-GM
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF GS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.

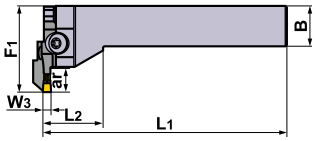


Fig. 2

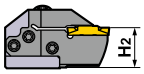
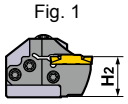
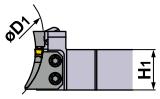


Fig. 1





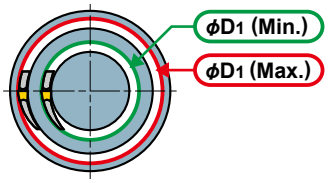
Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
F	.118 .125	R	1.378	1.575	.472	(5H1R4F11)	GYM25LD-F12-035	●	GYHRUS16D90-M25L	●
			1.575	1.969	.472	(5H1R4F12)	GYM25LD-F12-040	●		
			1.969	2.362	.472	(5H1R4F13)	GYM25LD-F12-050	●		
			2.362	2.953	.472	(5H1R4F14)	GYM25LD-F12-060	●		
					.787 *1	(5H1R4F24)	GYM25LD-F20-060	●		
			2.953	3.937	.472	(5H1R4F15)	GYM25LD-F12-075	●		
					.787 *1	(5H1R4F25)	GYM25LD-F20-075	●		
			3.937	5.906	.472	(5H1R4F16)	GYM25LD-F12-100	●		
					.787 *1	(5H1R4F26)	GYM25LD-F20-100	●		
			5.315	7.874	.472	(5H1R4F17)	GYM25LD-F12-135	●		
					.787 *1	(5H1R4F27)	GYM25LD-F20-135	●		
			7.087	9.843	.472	(5H1R4F18)	GYM25LD-F12-180	●		
					.787 *1	(5H1R4F28)	GYM25LD-F20-180	●		
			NEW 8.858	39.331	.472	(5H1R4F19)	GYM25LD-F12-225	●		
					.787 *1	(5H1R4F29)	GYM25LD-F20-225	●		
		L	1.378	1.575	.472	(5H1L4F11)	GYM25RD-F12-035	●	GYHLUS16D90-M25R	●
			1.575	1.969	.472	(5H1L4F12)	GYM25RD-F12-040	●		
			1.969	2.362	.472	(5H1L4F13)	GYM25RD-F12-050	●		
			2.362	2.953	.472	(5H1L4F14)	GYM25RD-F12-060	●		
					.787 *1	(5H1L4F24)	GYM25RD-F20-060	●		
			2.953	3.937	.472	(5H1L4F15)	GYM25RD-F12-075	●		
					.787 *1	(5H1L4F25)	GYM25RD-F20-075	●		
			3.937	5.906	.472	(5H1L4F16)	GYM25RD-F12-100	●		
					.787 *1	(5H1L4F26)	GYM25RD-F20-100	●		
			5.315	7.874	.472	(5H1L4F17)	GYM25RD-F12-135	●		
					.787 *1	(5H1L4F27)	GYM25RD-F20-135	●		
			7.087	9.843	.472	(5H1L4F18)	GYM25RD-F12-180	●		
					.787 *1	(5H1L4F28)	GYM25RD-F20-180	●		
			NEW 8.858	39.331	.472	(5H1L4F19)	GYM25RD-F12-225	●		
					.787 *1	(5H1L4F29)	GYM25RD-F20-225	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

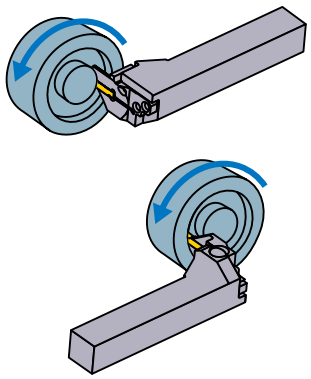
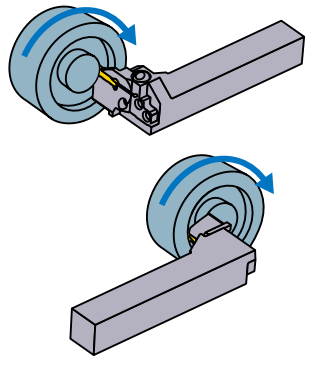


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

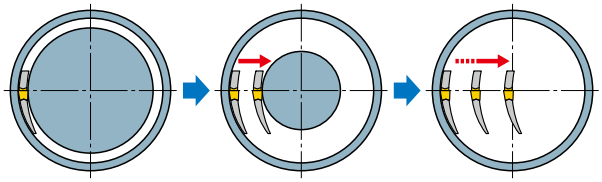
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHRUS16D90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D90-M25R			

Dimensions (inch) *2						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
1.000	1.000	6.000	1.500	1.000	2.094	1		GY2M0300F020N-GS GY2M0318F020N-GS GY2M0300F030N-GM GY2M0318F030N-GM GY2M0300F030R05-GM GY2M0300F030L05-GM GY2M0300F020N-MS GY2M0300F040N-MS (Gauge insert) GY2M0300F020N-MM GY2M0300F040N-MM GY2M0300F080N-MM GY2M0300F150N-BM GY2M0318F159N-BM GY1G0300F020N-GFGS GY1G0318F020N-GFGS	F014 ı F016
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.330	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.330	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.330	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.330	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.330	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.330	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.330	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.330	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.330	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.330	2			

Notes when selecting a modular blade (2)

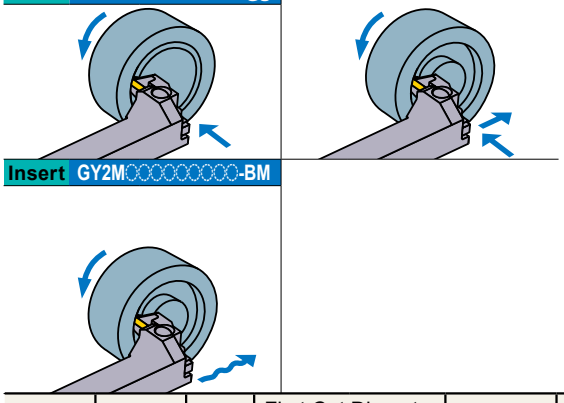
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



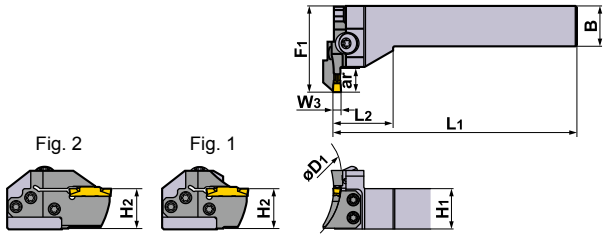
GY SERIES (FACE GROOVING)

4-1 90° type holder (Inch)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.



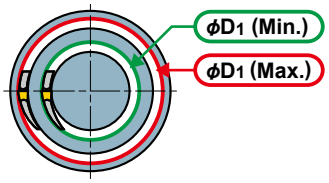
Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
G	.157	R	1.575	1.969	.551	(5H1R4G11)	GYM25LD-G14-040	●	GYHRUS16D90-M25L	●
			1.969	2.362	.551	(5H1R4G12)	GYM25LD-G14-050	●		
			2.362	3.346	.551	(5H1R4G13)	GYM25LD-G14-060	●		
					.984 *1	(5H1R4G23)	GYM25LD-G25-060	●		
			3.346	4.921	.551	(5H1R4G14)	GYM25LD-G14-085	●		
					.984 *1	(5H1R4G24)	GYM25LD-G25-085	●		
			4.921	7.874	.551	(5H1R4G15)	GYM25LD-G14-125	●		
					.984 *1	(5H1R4G25)	GYM25LD-G25-125	●		
			7.087	11.024	.551	(5H1R4G16)	GYM25LD-G14-180	●		
					.984 *1	(5H1R4G26)	GYM25LD-G25-180	●		
			9.843	39.331	.551	(5H1R4G17)	GYM25LD-G14-250	●		
					.984 *1	(5H1R4G27)	GYM25LD-G25-250	●		
		L	1.575	1.969	.551	(5H1L4G11)	GYM25RD-G14-040	●	GYHLUS16D90-M25R	●
			1.969	2.362	.551	(5H1L4G12)	GYM25RD-G14-050	●		
			2.362	3.346	.551	(5H1L4G13)	GYM25RD-G14-060	●		
					.984 *1	(5H1L4G23)	GYM25RD-G25-060	●		
			3.346	4.921	.551	(5H1L4G14)	GYM25RD-G14-085	●		
					.984 *1	(5H1L4G24)	GYM25RD-G25-085	●		
			4.921	7.874	.551	(5H1L4G15)	GYM25RD-G14-125	●		
					.984 *1	(5H1L4G25)	GYM25RD-G25-125	●		
			7.087	11.024	.551	(5H1L4G16)	GYM25RD-G14-180	●		
					.984 *1	(5H1L4G26)	GYM25RD-G25-180	●		
			9.843	39.331	.551	(5H1L4G17)	GYM25RD-G14-250	●		
					.984 *1	(5H1L4G27)	GYM25RD-G25-250	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

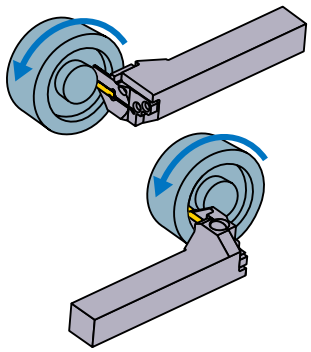
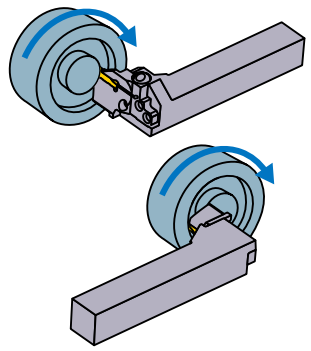


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

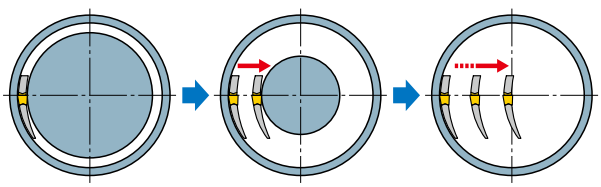
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHRUS16D90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D90-M25R			

Dimensions (inch) *2						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
1.000	1.000	6.000	1.500	1.000	2.094	1		GY2M0400G030N-GU GY2M0400G020N-GS GY2M0400G030N-GM GY2M0400G030R05-GM GY2M0400G030L05-GM GY2M0400G020N-MS GY2M0400G040N-MS (Gauge insert) GY2M0400G020N-MM GY2M0400G040N-MM GY2M0400G080N-MM GY2M0400G200N-BM GY1G0400G020N-GFGS	F014 ı F016
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			

Notes when selecting a modular blade (2)

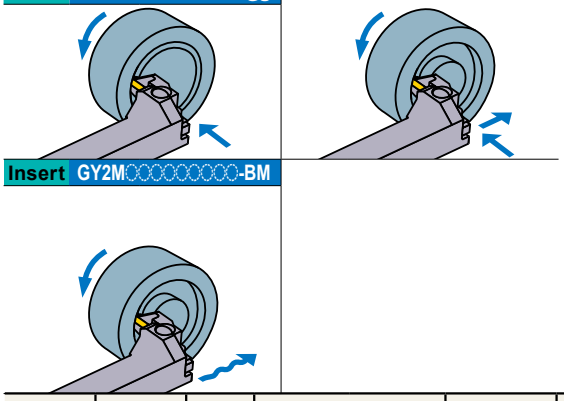
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



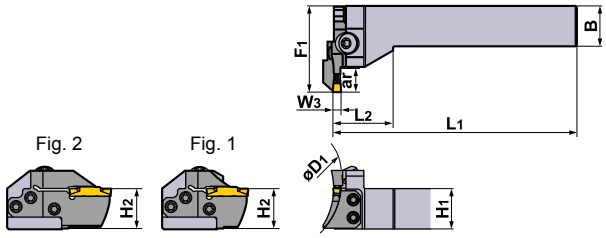
GY SERIES (FACE GROOVING)

4-1 90° type holder (Inch)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.



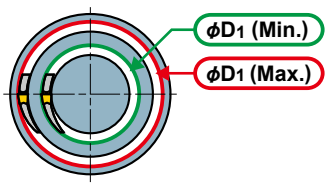
Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
H	.187 .197	R	1.969	2.362	.551	(5H1R4H11)	GYM25LD-H14-050	●	GYHRUS16D90-M25L	●
			2.362	3.346	.551	(5H1R4H12)	GYM25LD-H14-060	●		
					.984 *1	(5H1R4H22)	GYM25LD-H25-060	●		
			3.346	4.921	.551	(5H1R4H13)	GYM25LD-H14-085	●		
					.984 *1	(5H1R4H23)	GYM25LD-H25-085	●		
			4.921	7.874	.551	(5H1R4H14)	GYM25LD-H14-125	●		
					.984 *1	(5H1R4H24)	GYM25LD-H25-125	●		
			7.087	11.024	.551	(5H1R4H15)	GYM25LD-H14-180	●		
					.984 *1	(5H1R4H25)	GYM25LD-H25-180	●		
			9.843	39.331	.551	(5H1R4H16)	GYM25LD-H14-250	●		
					.984 *1	(5H1R4H26)	GYM25LD-H25-250	●		
		L	1.969	2.362	.551	(5H1L4H11)	GYM25RD-H14-050	●	GYHLUS16D90-M25R	●
			2.362	3.346	.551	(5H1L4H12)	GYM25RD-H14-060	●		
					.984 *1	(5H1L4H22)	GYM25RD-H25-060	●		
			3.346	4.921	.551	(5H1L4H13)	GYM25RD-H14-085	●		
					.984 *1	(5H1L4H23)	GYM25RD-H25-085	●		
			4.921	7.874	.551	(5H1L4H14)	GYM25RD-H14-125	●		
					.984 *1	(5H1L4H24)	GYM25RD-H25-125	●		
			7.087	11.024	.551	(5H1L4H15)	GYM25RD-H14-180	●		
					.984 *1	(5H1L4H25)	GYM25RD-H25-180	●		
			9.843	39.331	.551	(5H1L4H16)	GYM25RD-H14-250	●		
					.984 *1	(5H1L4H26)	GYM25RD-H25-250	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

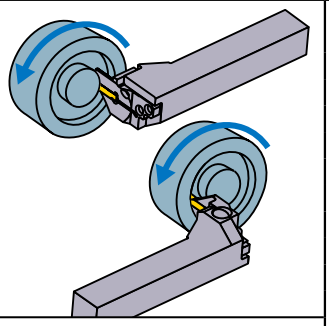
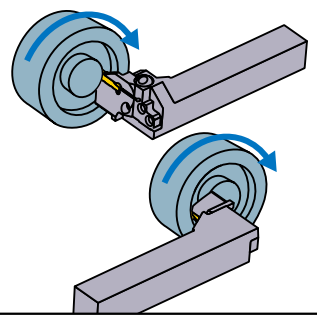


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

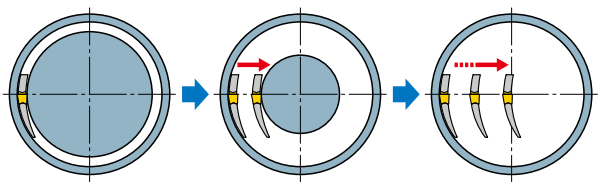
SPARE PARTS

Modular 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) *2						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
1.000	1.000	6.000	1.500	1.000	2.094	1		GY2M0475H040N-GU GY2M0500H040N-GU	F014 – F016
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1		GY2M0475H030N-GS GY2M0500H030N-GS	
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1		GY2M0475H040N-GM GY2M0500H040N-GM	
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1		GY2M0500H040R05-GM GY2M0500H040L05-GM	
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1		GY2M0500H040N-MS GY2M0500H080N-MS (Gauge insert)	
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2		GY2M0500H040N-MM GY2M0500H080N-MM	
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1		GY2M0475H238N-BM GY2M0500H250N-BM	
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1		GY1G0475H020N-GFGS GY1G0500H020N-GFGS	
1.000	1.000	6.000	1.500	1.000	2.527	2			

Notes when selecting a modular blade (2)

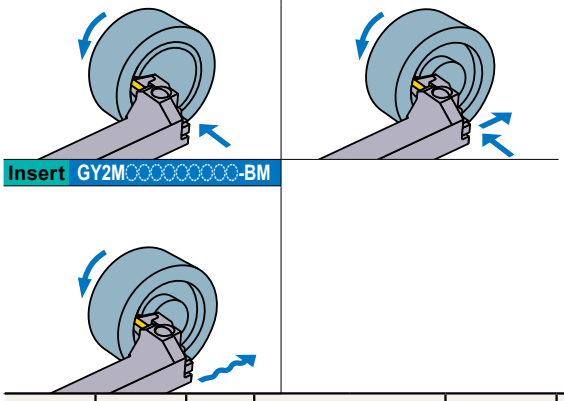
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



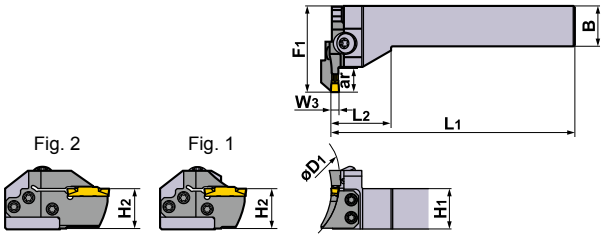
GY SERIES (FACE GROOVING)

4-1 90° type holder (Inch)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.



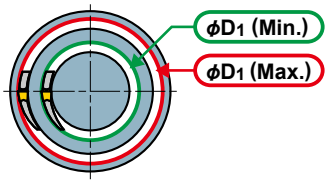
Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	First Cut Diameter D1 (inch) Min.	First Cut Diameter D1 (inch) Max.	Max. Groove Depth ar (inch)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
J	.236 .250	R	1.969	2.756	.551	(5H1R4J11)	GYM25LD-J14-050	●	GYHRUS16D90-M25L	●
			2.756	4.331	.551	(5H1R4J12)	GYM25LD-J14-070	●		
					.984 *1	(5H1R4J22)	GYM25LD-J25-070	●		
			4.331	7.874	.551	(5H1R4J13)	GYM25LD-J14-110	●		
					.984 *1	(5H1R4J23)	GYM25LD-J25-110	●		
			6.693	11.024	.551	(5H1R4J14)	GYM25LD-J14-170	●		
					.984 *1	(5H1R4J24)	GYM25LD-J25-170	●		
			9.843	39.331	.551	(5H1R4J15)	GYM25LD-J14-250	●		
					.984 *1	(5H1R4J25)	GYM25LD-J25-250	●		
		L	1.969	2.756	.551	(5H1L4J11)	GYM25RD-J14-050	●	GYHLUS16D90-M25R	●
			2.756	4.331	.551	(5H1L4J12)	GYM25RD-J14-070	●		
					.984 *1	(5H1L4J22)	GYM25RD-J25-070	●		
			4.331	7.874	.551	(5H1L4J13)	GYM25RD-J14-110	●		
					.984 *1	(5H1L4J23)	GYM25RD-J25-110	●		
			6.693	11.024	.551	(5H1L4J14)	GYM25RD-J14-170	●		
					.984 *1	(5H1L4J24)	GYM25RD-J25-170	●		
			9.843	39.331	.551	(5H1L4J15)	GYM25RD-J14-250	●		
					.984 *1	(5H1L4J25)	GYM25RD-J25-250	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

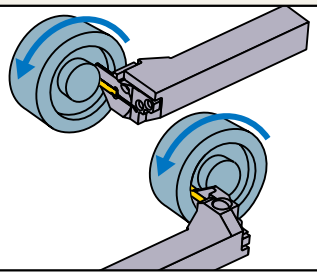
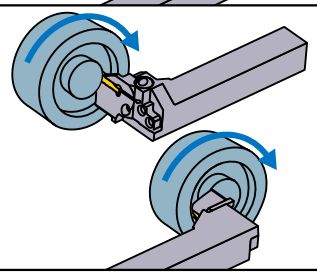


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

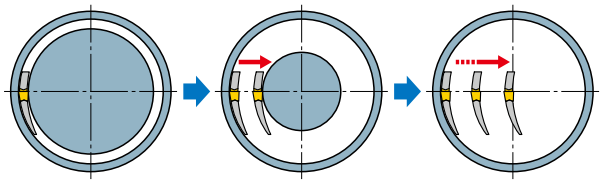
SPARE PARTS

Modular 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) *2						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
1.000	1.000	6.000	1.500	1.000	2.094	1		GY2M0600J040N-GU GY2M0635J040N-GU GY2M0600J030N-GS GY2M0635J030N-GS GY2M0600J040N-GM GY2M0635J040N-GM GY2M0600J040N-MS GY2M0600J080N-MS (Gauge insert) GY2M0600J040N-MM GY2M0600J080N-MM GY2M0600J300N-BM GY2M0635J318N-BM	F014 I F016
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			
1.000	1.000	6.000	1.500	1.000	2.094	1			
1.000	1.000	6.000	1.500	1.000	2.527	2			

Notes when selecting a modular blade (2)

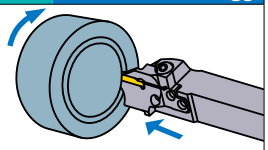
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



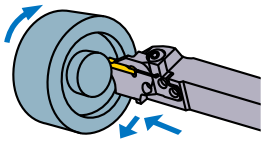
GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

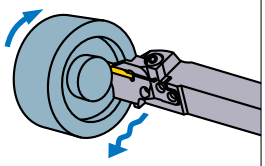
Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS



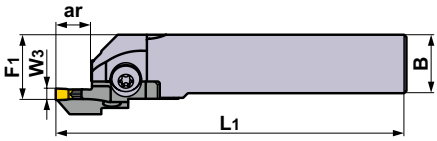
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS

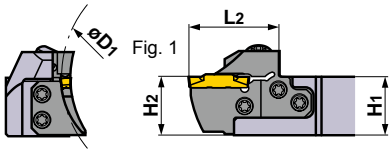


Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.





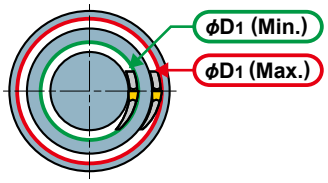
Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
NEW D	2.00	*2 R	40	50	12	(4E1R4D11)	GYM25RD-D12-040	●	GYHR2020K00-M25R	●
			50	60	12	(4E1R4D12)	GYM25RD-D12-050	●		
			60	75	12	(4E1R4D13)	GYM25RD-D12-060	●		
			75	100	12	(4E1R4D14)	GYM25RD-D12-075	●		
			100	150	12	(4E1R4D15)	GYM25RD-D12-100	●		
			135	200	12	(4E1R4D16)	GYM25RD-D12-135	●		
			180	250	12	(4E1R4D17)	GYM25RD-D12-180	●		
			40	50	12	(4G1R4D11)	GYM25RD-D12-040	●	GYHR2525M00-M25R	●
			50	60	12	(4G1R4D12)	GYM25RD-D12-050	●		
			60	75	12	(4G1R4D13)	GYM25RD-D12-060	●		
			75	100	12	(4G1R4D14)	GYM25RD-D12-075	●		
			100	150	12	(4G1R4D15)	GYM25RD-D12-100	●		
			135	200	12	(4G1R4D16)	GYM25RD-D12-135	●		
			180	250	12	(4G1R4D17)	GYM25RD-D12-180	●		

*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*2 Refer to page F118 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained.

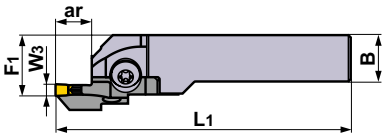
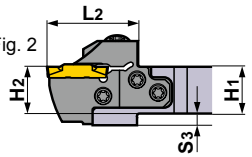




Fig. 2

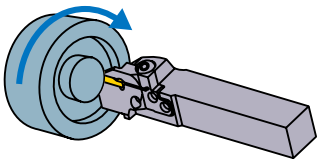
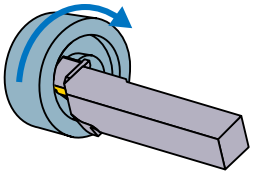


Right hand tool holder shown.

* Wrench : ①For Clamp Screw ②For Blade Screw.

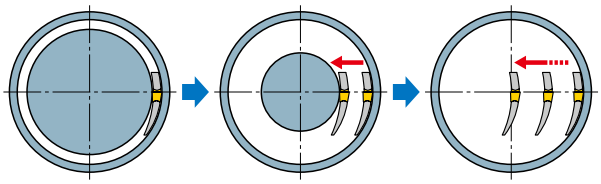
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHR2020K00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR2525M00-M25R			

Dimensions (mm) *1							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
20	20	125	39	20	26	5	2		GY2M0200D020N-GU GY2M0200D020N-GS GY2M0200D020N-GM GY2M0200D020R05-GM GY2M0200D020L05-GM GY2M0200D020N-MS (Gauge insert) GY2M0200D020N-MM GY2M0200D100N-BM GY1G0200D020N-GFGS	F014 – F016
20	20	125	39	20	26	5	2			
20	20	125	39	20	26	5	2			
20	20	125	39	20	26	5	2			
20	20	125	39	20	26	5	2			
20	20	125	39	20	26	5	2			
20	20	125	39	20	26	5	2			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			

Notes when selecting a modular blade (2)

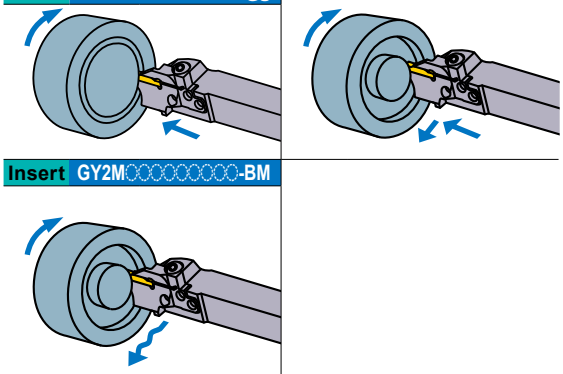
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



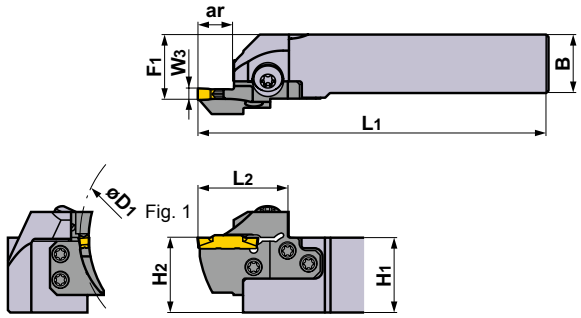
GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.



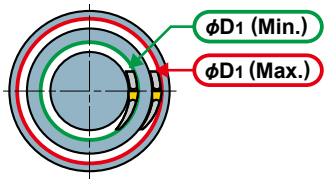
Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
NEW D	2.00	*2 R	40	50	12	(4Q1R4D11)	GYM25RD-D12-040	●	GYHR3225P00-M25R	●
			50	60	12	(4Q1R4D12)	GYM25RD-D12-050	●		
			60	75	12	(4Q1R4D13)	GYM25RD-D12-060	●		
			75	100	12	(4Q1R4D14)	GYM25RD-D12-075	●		
			100	150	12	(4Q1R4D15)	GYM25RD-D12-100	●		
			135	200	12	(4Q1R4D16)	GYM25RD-D12-135	●		
			180	250	12	(4Q1R4D17)	GYM25RD-D12-180	●		
			40	50	12	(4J1R4D11)	GYM25RD-D12-040	●	GYHR3232P00-M25R	●
			50	60	12	(4J1R4D12)	GYM25RD-D12-050	●		
			60	75	12	(4J1R4D13)	GYM25RD-D12-060	●		
			75	100	12	(4J1R4D14)	GYM25RD-D12-075	●		
			100	150	12	(4J1R4D15)	GYM25RD-D12-100	●		
			135	200	12	(4J1R4D16)	GYM25RD-D12-135	●		
			180	250	12	(4J1R4D17)	GYM25RD-D12-180	●		

*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*2 Refer to page F120 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

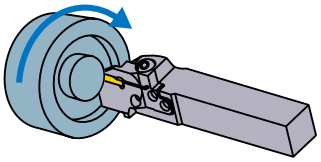
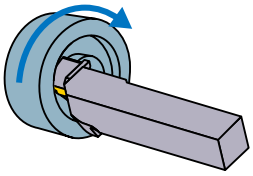


● : Inventory maintained.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

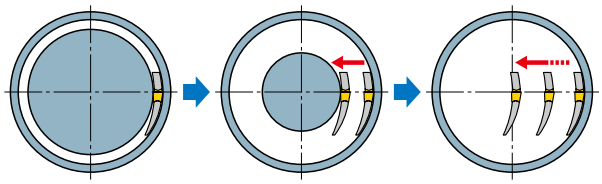
SPARE PARTS

Modular Holder Number	 Clamp Screw	 (5 pcs.) Blade Screw	 ∗ Wrench
GYHR3225P00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR3232P00-M25R			

Dimensions (mm) ∗1						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
32	25	170	39	32	28	1		GY2M0200D020N-GU GY2M0200D020N-GS GY2M0200D020N-GM GY2M0200D020R05-GM GY2M0200D020L05-GM GY2M0200D020N-MS (Gauge insert) GY2M0200D020N-MM GY2M0200D100N-BM GY1G0200D020N-GFGS	F014 ı F016
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			

Notes when selecting a modular blade (2)

- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.

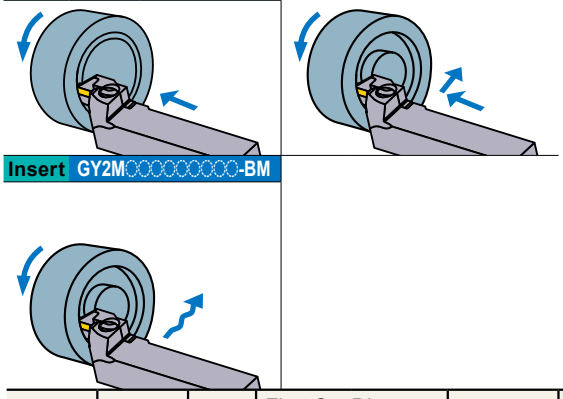


GROOVING

GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

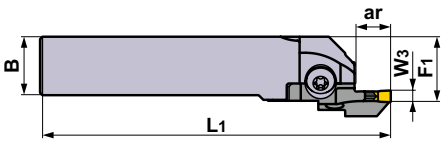
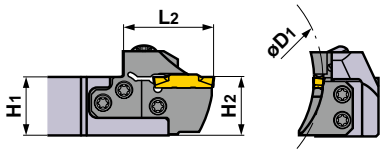


Fig. 1



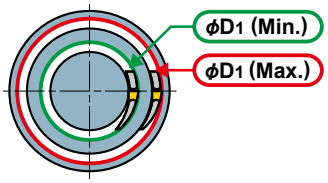
Left hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
NEW D	2.00	*2 L	40	50	12	(4E1R4D11)	GYM25LD-D12-040	●	GYHL2020K00-M25L	●
			50	60	12	(4E1R4D12)	GYM25LD-D12-050	●		
			60	75	12	(4E1R4D13)	GYM25LD-D12-060	●		
			75	100	12	(4E1R4D14)	GYM25LD-D12-075	●		
			100	150	12	(4E1R4D15)	GYM25LD-D12-100	●		
			135	200	12	(4E1R4D16)	GYM25LD-D12-135	●		
			180	250	12	(4E1R4D17)	GYM25LD-D12-180	●		
			40	50	12	(4G1R4D11)	GYM25LD-D12-040	●	GYHL2525M00-M25L	●
			50	60	12	(4G1R4D12)	GYM25LD-D12-050	●		
			60	75	12	(4G1R4D13)	GYM25LD-D12-060	●		
			75	100	12	(4G1R4D14)	GYM25LD-D12-075	●		
			100	150	12	(4G1R4D15)	GYM25LD-D12-100	●		
			135	200	12	(4G1R4D16)	GYM25LD-D12-135	●		
			180	250	12	(4G1R4D17)	GYM25LD-D12-180	●		

*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*2 Refer to page F114 for right hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained.

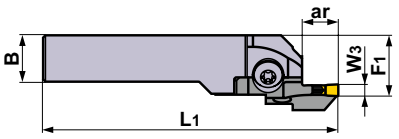
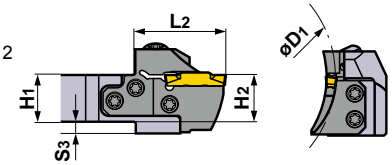


Fig. 2

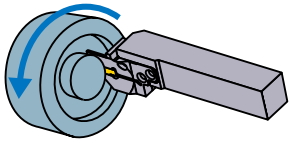
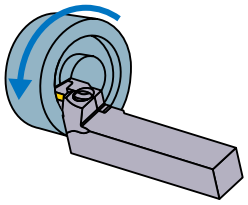


Left hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

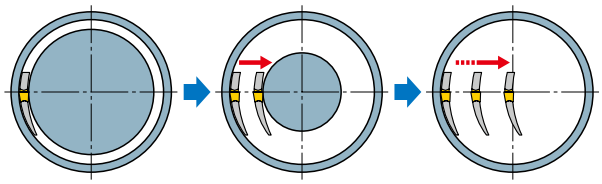
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗ Wrench
GYHL2020K00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M00-M25L			

Dimensions (mm) ∗1							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
20	20	125	39	20	26	5	2		GY2M0200D020N-GU GY2M0200D020N-GS GY2M0200D020N-GM GY2M0200D020R05-GM GY2M0200D020L05-GM GY2M0200D020N-MS (Gauge insert) GY2M0200D020N-MM GY2M0200D100N-BM GY1G0200D020N-GFGS	F014 I F016
20	20	125	39	20	26	5	2			
20	20	125	39	20	26	5	2			
20	20	125	39	20	26	5	2			
20	20	125	39	20	26	5	2			
20	20	125	39	20	26	5	2			
20	20	125	39	20	26	5	2			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			

Notes when selecting a modular blade (2)

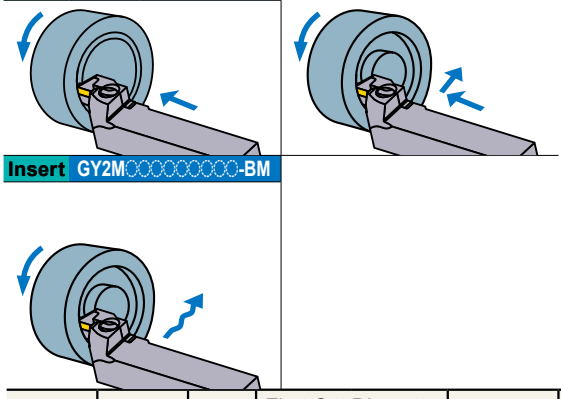
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF/GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

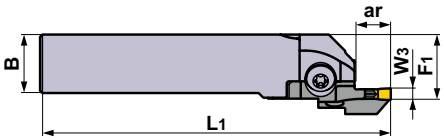
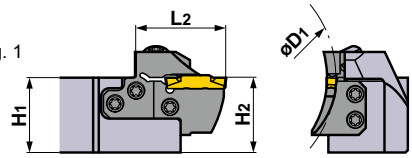


Fig. 1



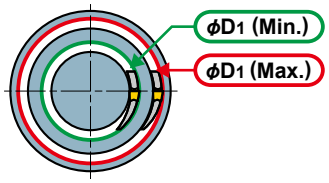
Left hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
NEW D	2.00	*2 L	40	50	12	(4Q1L4D11)	GYM25LD-D12-040	●	GYHL3225P00-M25L	●
			50	60	12	(4Q1L4D12)	GYM25LD-D12-050	●		
			60	75	12	(4Q1L4D13)	GYM25LD-D12-060	●		
			75	100	12	(4Q1L4D14)	GYM25LD-D12-075	●		
			100	150	12	(4Q1L4D15)	GYM25LD-D12-100	●		
			135	200	12	(4Q1L4D16)	GYM25LD-D12-135	●		
			180	250	12	(4Q1L4D17)	GYM25LD-D12-180	●		
			40	50	12	(4J1L4D11)	GYM25LD-D12-040	●	GYHL3232P00-M25L	●
			50	60	12	(4J1L4D12)	GYM25LD-D12-050	●		
			60	75	12	(4J1L4D13)	GYM25LD-D12-060	●		
			75	100	12	(4J1L4D14)	GYM25LD-D12-075	●		
			100	150	12	(4J1L4D15)	GYM25LD-D12-100	●		
			135	200	12	(4J1L4D16)	GYM25LD-D12-135	●		
			180	250	12	(4J1L4D17)	GYM25LD-D12-180	●		

*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*2 Refer to page F116 for right hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

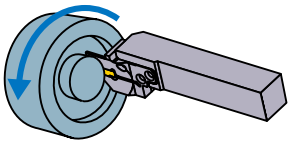
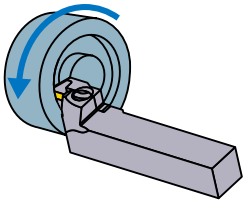


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

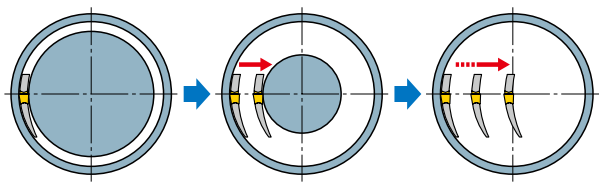
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHL3225P00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL3232P00-M25L			

Dimensions (mm) *1						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
32	25	170	39	32	28	1		GY2M0200D020N-GU GY2M0200D020N-GS GY2M0200D020N-GM GY2M0200D020R05-GM GY2M0200D020L05-GM GY2M0200D020N-MS (Gauge insert) GY2M0200D020N-MM GY2M0200D100N-BM GY1G0200D020N-GFGS	F014 – F016
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			

Notes when selecting a modular blade (2)

- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.

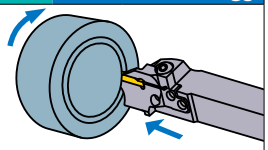


GROOVING

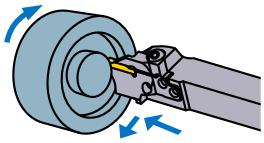
GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

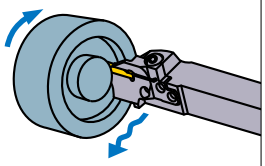
Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS



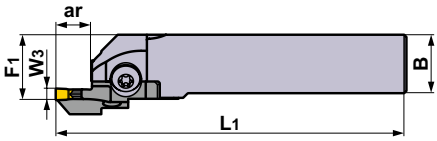
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.



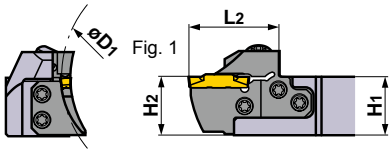


Fig. 1

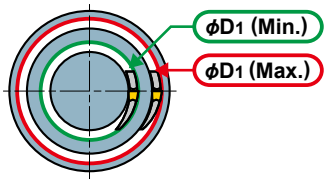
Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
NEW E	2.39 2.50	*2 R	40	50	12	(4E1R4E11)	GYM25RD-E12-040	●	GYHR2020K00-M25R	●
			50	60	12	(4E1R4E12)	GYM25RD-E12-050	●		
			60	75	12	(4E1R4E13)	GYM25RD-E12-060	●		
			75	100	12	(4E1R4E14)	GYM25RD-E12-075	●		
			100	150	12	(4E1R4E15)	GYM25RD-E12-100	●		
			135	200	12	(4E1R4E16)	GYM25RD-E12-135	●		
			180	250	12	(4E1R4E17)	GYM25RD-E12-180	●		
			40	50	12	(4G1R4E11)	GYM25RD-E12-040	●	GYHR2525M00-M25R	●
			50	60	12	(4G1R4E12)	GYM25RD-E12-050	●		
			60	75	12	(4G1R4E13)	GYM25RD-E12-060	●		
			75	100	12	(4G1R4E14)	GYM25RD-E12-075	●		
			100	150	12	(4G1R4E15)	GYM25RD-E12-100	●		
			135	200	12	(4G1R4E16)	GYM25RD-E12-135	●		
			180	250	12	(4G1R4E17)	GYM25RD-E12-180	●		

*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*2 Refer to page F126 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained.

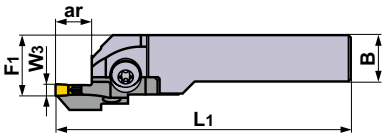
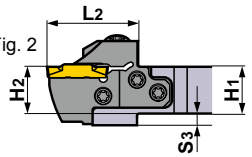




Fig. 2

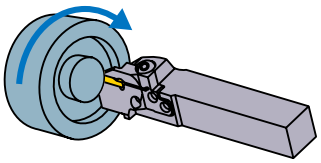
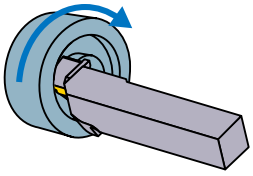


Right hand tool holder shown.

* Wrench : ①For Clamp Screw ②For Blade Screw.

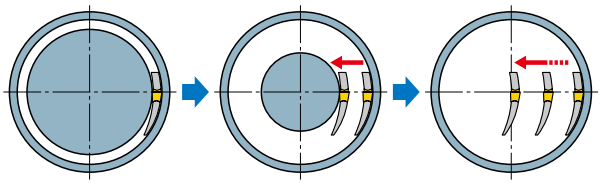
SPARE PARTS

Modular Holder Number	 Clamp Screw	 (5 pcs.) Blade Screw	 * Wrench
GYHR2020K00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR2525M00-M25R			

Dimensions (mm) *1							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
20	20	125	39	20	26	5	2		GY2M0239E020N-GU GY2M0250E020N-GU	F014 – F016
20	20	125	39	20	26	5	2		GY2M0239E020N-GS GY2M0250E020N-GS	
20	20	125	39	20	26	5	2		GY2M0239E020N-GM GY2M0250E020N-GM	
20	20	125	39	20	26	5	2		GY2M0250E020R05-GM GY2M0250E020L05-GM	
20	20	125	39	20	26	5	2			
25	25	150	39	25	28	—	1		GY2M0250E020N-MS (Gauge insert)	
25	25	150	39	25	28	—	1		GY2M0250E020N-MM	
25	25	150	39	25	28	—	1		GY2M0250E125N-BM	
25	25	150	39	25	28	—	1		GY1G0239E020N-GFGS GY1G0250E020N-GFGS	
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			

Notes when selecting a modular blade (2)

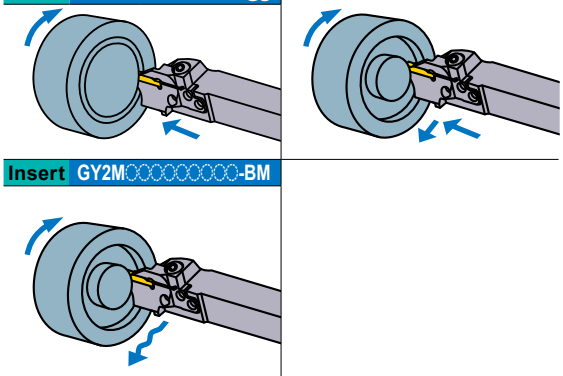
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



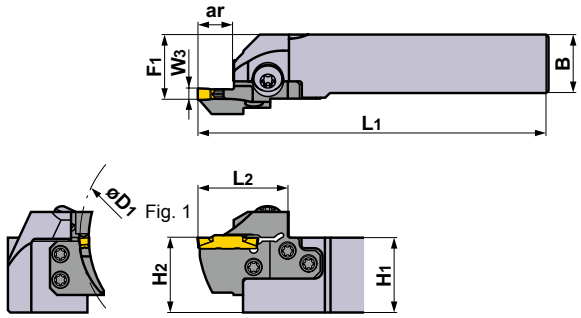
GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.



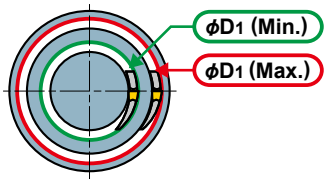
Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
NEW E	2.39 2.50	*2 R	40	50	12	(4Q1R4E11)	GYM25RD-E12-040	●	GYHR3225P00-M25R	●
			50	60	12	(4Q1R4E12)	GYM25RD-E12-050	●		
			60	75	12	(4Q1R4E13)	GYM25RD-E12-060	●		
			75	100	12	(4Q1R4E14)	GYM25RD-E12-075	●		
			100	150	12	(4Q1R4E15)	GYM25RD-E12-100	●		
			135	200	12	(4Q1R4E16)	GYM25RD-E12-135	●		
			180	250	12	(4Q1R4E17)	GYM25RD-E12-180	●		
			40	50	12	(4J1R4E11)	GYM25RD-E12-040	●	GYHR3232P00-M25R	●
			50	60	12	(4J1R4E12)	GYM25RD-E12-050	●		
			60	75	12	(4J1R4E13)	GYM25RD-E12-060	●		
			75	100	12	(4J1R4E14)	GYM25RD-E12-075	●		
			100	150	12	(4J1R4E15)	GYM25RD-E12-100	●		
			135	200	12	(4J1R4E16)	GYM25RD-E12-135	●		
			180	250	12	(4J1R4E17)	GYM25RD-E12-180	●		

*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*2 Refer to page F128 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

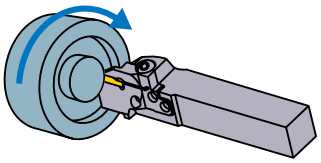
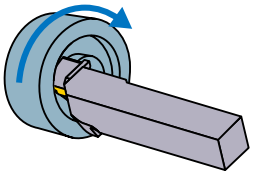


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

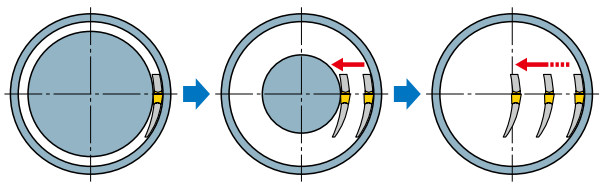
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHR3225P00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR3232P00-M25R			

Dimensions (mm) *1						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
32	25	170	39	32	28	1		GY2M0239E020N-GU GY2M0250E020N-GU GY2M0239E020N-GS GY2M0250E020N-GS GY2M0239E020N-GM GY2M0250E020N-GM GY2M0250E020R05-GM GY2M0250E020L05-GM GY2M0250E020N-MS (Gauge insert) GY2M0250E020N-MM GY2M0250E125N-BM GY1G0239E020N-GFGS GY1G0250E020N-GFGS	F014 – F016
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			

Notes when selecting a modular blade (2)

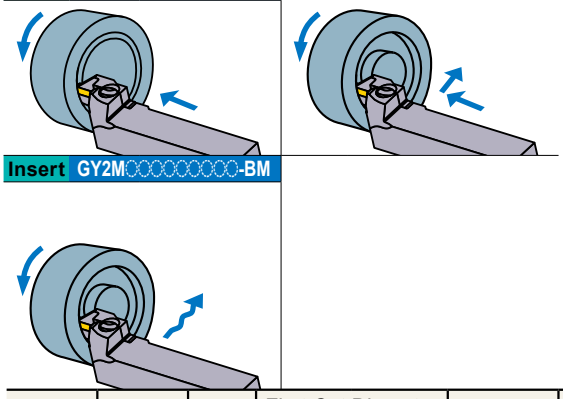
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

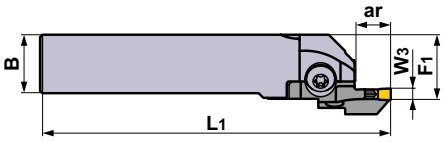
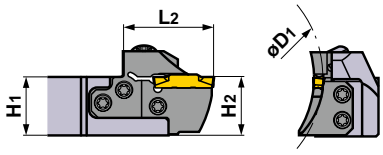


Fig. 1



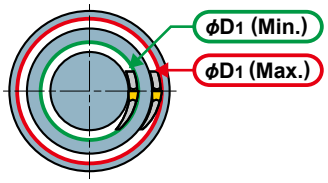
Left hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
NEW E	2.39 2.50	*2 L	40	50	12	(4E1R4E11)	GYM25LD-E12-040	●	GYHL2020K00-M25L	●
			50	60	12	(4E1R4E12)	GYM25LD-E12-050	●		
			60	75	12	(4E1R4E13)	GYM25LD-E12-060	●		
			75	100	12	(4E1R4E14)	GYM25LD-E12-075	●		
			100	150	12	(4E1R4E15)	GYM25LD-E12-100	●		
			135	200	12	(4E1R4E16)	GYM25LD-E12-135	●		
			180	250	12	(4E1R4E17)	GYM25LD-E12-180	●		
			40	50	12	(4G1R4E11)	GYM25LD-E12-040	●	GYHL2525M00-M25L	●
			50	60	12	(4G1R4E12)	GYM25LD-E12-050	●		
			60	75	12	(4G1R4E13)	GYM25LD-E12-060	●		
			75	100	12	(4G1R4E14)	GYM25LD-E12-075	●		
			100	150	12	(4G1R4E15)	GYM25LD-E12-100	●		
			135	200	12	(4G1R4E16)	GYM25LD-E12-135	●		
			180	250	12	(4G1R4E17)	GYM25LD-E12-180	●		

*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*2 Refer to page F122 for right hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained.

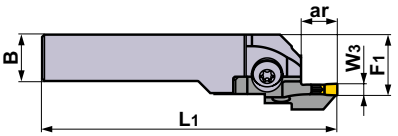
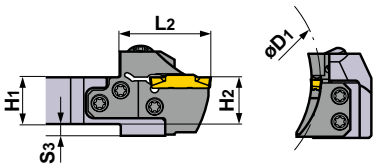


Fig. 2

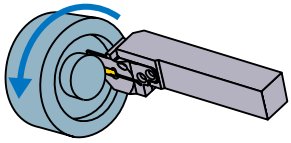
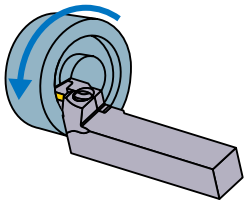


Right hand tool holder shown.

* Wrench : ①For Clamp Screw ②For Blade Screw.

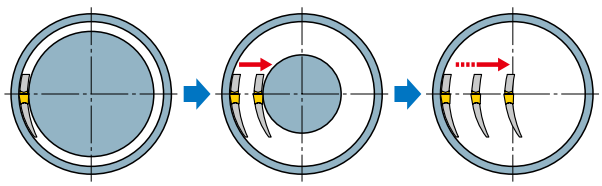
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHL2020K00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M00-M25L			

Dimensions (mm) *1							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
20	20	125	39	20	26	5	2		GY2M0239E020N-GU GY2M0250E020N-GU GY2M0239E020N-GS GY2M0250E020N-GS GY2M0239E020N-GM GY2M0250E020N-GM GY2M0250E020R05-GM GY2M0250E020L05-GM GY2M0250E020N-MS (Gauge insert) GY2M0250E020N-MM GY2M0250E125N-BM GY1G0239E020N-GFGS GY1G0250E020N-GFGS	F014 – F016
20	20	125	39	20	26	5	2			
20	20	125	39	20	26	5	2			
20	20	125	39	20	26	5	2			
20	20	125	39	20	26	5	2			
20	20	125	39	20	26	5	2			
20	20	125	39	20	26	5	2			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			

Notes when selecting a modular blade (2)

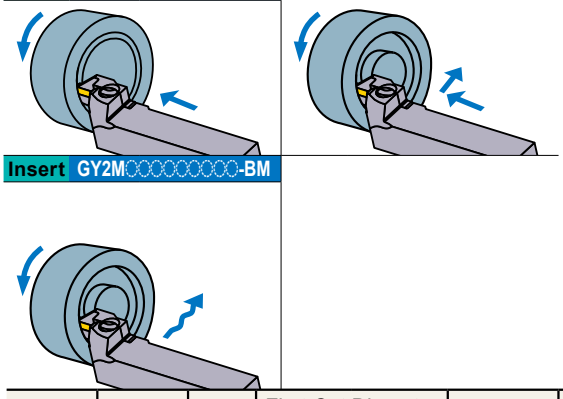
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

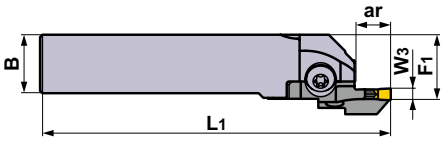
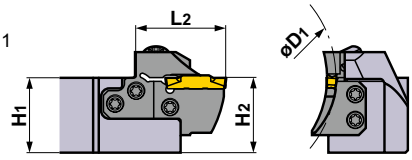


Fig. 1



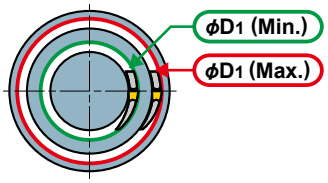
Left hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
NEW E	2.39 2.50	*2 L	40	50	12	(4Q1R4D11)	GYM25LD-E12-040	●	GYHL3225P00-M25L	●
			50	60	12	(4Q1R4D12)	GYM25LD-E12-050	●		
			60	75	12	(4Q1R4D13)	GYM25LD-E12-060	●		
			75	100	12	(4Q1R4D14)	GYM25LD-E12-075	●		
			100	150	12	(4Q1R4D15)	GYM25LD-E12-100	●		
			135	200	12	(4Q1R4D16)	GYM25LD-E12-135	●		
			180	250	12	(4Q1R4D17)	GYM25LD-E12-180	●		
			40	50	12	(4J1R4D11)	GYM25LD-E12-040	●	GYHL3232P00-M25L	●
			50	60	12	(4J1R4D12)	GYM25LD-E12-050	●		
			60	75	12	(4J1R4D13)	GYM25LD-E12-060	●		
			75	100	12	(4J1R4D14)	GYM25LD-E12-075	●		
			100	150	12	(4J1R4D15)	GYM25LD-E12-100	●		
			135	200	12	(4J1R4D16)	GYM25LD-E12-135	●		
			180	250	12	(4J1R4D17)	GYM25LD-E12-180	●		

*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*2 Refer to page F124 for right hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

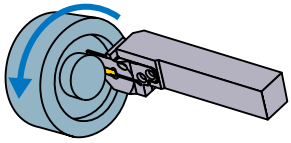
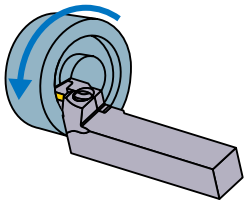


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

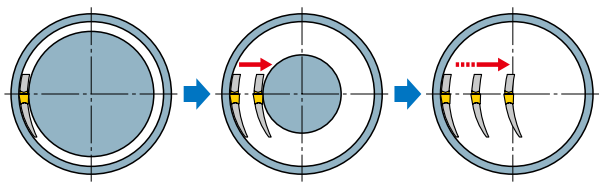
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHL3225P00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL3232P00-M25L			

Dimensions (mm) *1						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
32	25	170	39	32	28	1		GY2M0239E020N-GU GY2M0250E020N-GU GY2M0239E020N-GS GY2M0250E020N-GS GY2M0239E020N-GM GY2M0250E020N-GM GY2M0250E020R05-GM GY2M0250E020L05-GM GY2M0250E020N-MS (Gauge insert) GY2M0250E020N-MM GY2M0250E125N-BM GY1G0239E020N-GFGS GY1G0250E020N-GFGS	F014 ı F016
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			

Notes when selecting a modular blade (2)

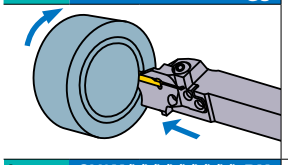
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



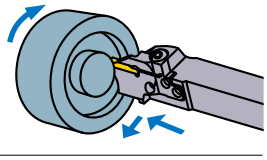
GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

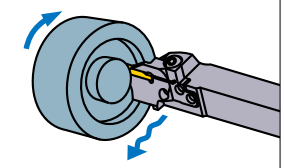
Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS



Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.

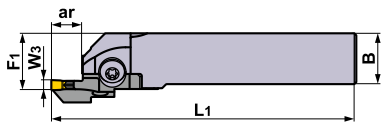




Fig. 1

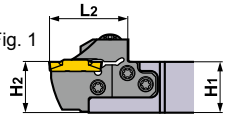
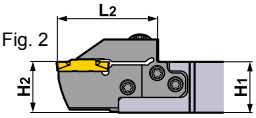


Fig. 2



Right hand tool holder shown.

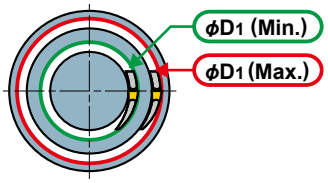
Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
F	3.00 3.18	*3 R	35	40	12	(4E1R4F11)	GYM25RD-F12-035	●	GYHR2020K00-M25R	●
			40	50	12	(4E1R4F12)	GYM25RD-F12-040	●		
			50	60	12	(4E1R4F13)	GYM25RD-F12-050	●		
			60	75	12	(4E1R4F14)	GYM25RD-F12-060	●		
					20 *1	(4E1R4F24)	GYM25RD-F20-060	●		
			75	100	12	(4E1R4F15)	GYM25RD-F12-075	●		
					20 *1	(4E1R4F25)	GYM25RD-F20-075	●		
			100	150	12	(4E1R4F16)	GYM25RD-F12-100	●		
					20 *1	(4E1R4F26)	GYM25RD-F20-100	●		
			135	200	12	(4E1R4F17)	GYM25RD-F12-135	●		
					20 *1	(4E1R4F27)	GYM25RD-F20-135	●		
			180	250	12	(4E1R4F18)	GYM25RD-F12-180	●		
					20 *1	(4E1R4F28)	GYM25RD-F20-180	●		
			NEW 225	999	12	(4E1R4F19)	GYM25RD-F12-225	●		
					20 *1	(4E1R4F29)	GYM25RD-F20-225	●		
			35	40	12	(4G1R4F11)	GYM25RD-F12-035	●	GYHR2525M00-M25R	●
			40	50	12	(4G1R4F12)	GYM25RD-F12-040	●		
			50	60	12 *1	(4G1R4F13)	GYM25RD-F12-050	●		
			60	75	12	(4G1R4F14)	GYM25RD-F12-060	●		
					20 *1	(4G1R4F24)	GYM25RD-F20-060	●		
			75	100	12	(4G1R4F15)	GYM25RD-F12-075	●		
					20 *1	(4G1R4F25)	GYM25RD-F20-075	●		
			100	150	12	(4G1R4F16)	GYM25RD-F12-100	●		
					20 *1	(4G1R4F26)	GYM25RD-F20-100	●		
			135	200	12	(4G1R4F17)	GYM25RD-F12-135	●		
					20 *1	(4G1R4F27)	GYM25RD-F20-135	●		
			180	250	12	(4G1R4F18)	GYM25RD-F12-180	●		
					20	(4G1R4F28)	GYM25RD-F20-180	●		
			NEW 225	999	12	(4G1R4F19)	GYM25RD-F12-225	●		
					20 *1	(4G1R4F29)	GYM25RD-F20-225	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then L1, L2, F1 and D1 values may vary.
*3 Refer to page F134 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

● : Inventory maintained.



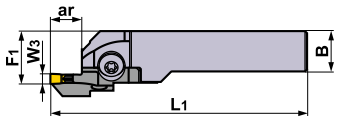




Fig. 3

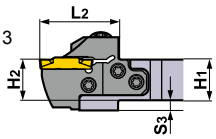
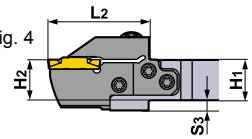


Fig. 4

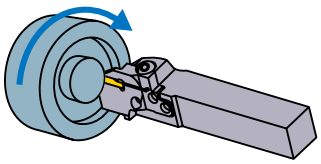
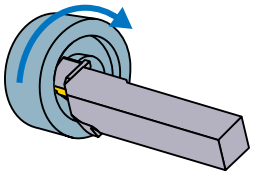


Right hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

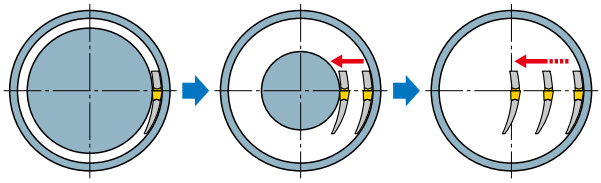
SPARE PARTS

Modular Holder Number	 Clamp Screw	 (5 pcs.) Blade Screw	 ∗ Wrench
GYHR2020K00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR2525M00-M25R			

Dimensions (mm) ∗2							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
20	20	125	39	20	26	5	3		GY2M0300F020N-GS GY2M0318F020N-GS	F014 – F016
20	20	125	39	20	26	5	3			
20	20	125	39	20	26	5	3			
20	20	125	39	20	26	5	3		GY2M0300F030N-GM GY2M0318F030N-GM	
20	20	131	45	20	26	5	4			
20	20	125	39	20	26	5	3			
20	20	131	45	20	26	5	4			
20	20	125	39	20	26	5	3		GY2M0300F030R05-GM GY2M0300F030L05-GM	
20	20	131	45	20	26	5	4			
20	20	125	39	20	26	5	3			
20	20	131	45	20	26	5	4			
20	20	125	39	20	26	5	3		GY2M0300F020N-MS GY2M0300F040N-MS (Gauge insert)	
20	20	131	45	20	26	5	4			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1		GY2M0300F020N-MM GY2M0300F040N-MM GY2M0300F080N-MM	
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1		GY2M0300F150N-BM GY2M0318F159N-BM	
25	25	156	45	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	156	45	25	28	—	2			
25	25	150	39	25	28	—	1		GY1G0300F020N-GFGS GY1G0318F020N-GFGS	
25	25	156	45	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	156	45	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	156	45	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	156	45	25	28	—	2			

Notes when selecting a modular blade (2)

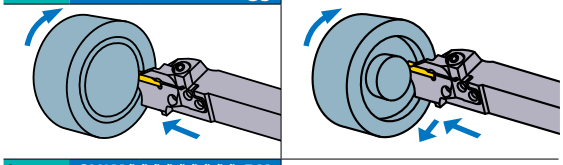
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



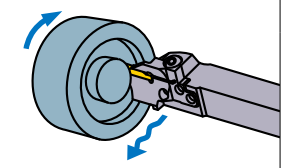
GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

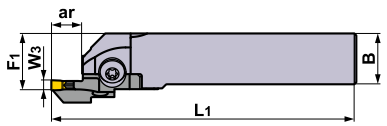
Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-GM
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF GS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.



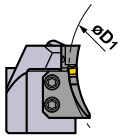


Fig. 1

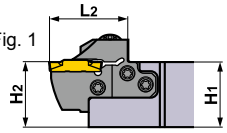
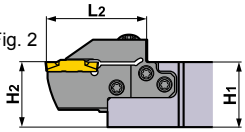


Fig. 2



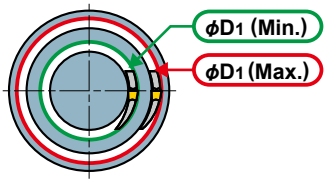
Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
F	3.00 3.18	R *3 NEW	35	40	12	(4Q1R4F11)	GYM25RD-F12-035	●	GYHR3225P00-M25R	★
			40	50	12	(4Q1R4F12)	GYM25RD-F12-040	●		
			50	60	12	(4Q1R4F13)	GYM25RD-F12-050	●		
			60	75	12	(4Q1R4F14)	GYM25RD-F12-060	●		
					20 *1	(4Q1R4F24)	GYM25RD-F20-060	●		
			75	100	12	(4Q1R4F15)	GYM25RD-F12-075	●		
					20 *1	(4Q1R4F25)	GYM25RD-F20-075	●		
			100	150	12	(4Q1R4F16)	GYM25RD-F12-100	●		
					20 *1	(4Q1R4F26)	GYM25RD-F20-100	●		
			135	200	12	(4Q1R4F17)	GYM25RD-F12-135	●		
					20 *1	(4Q1R4F27)	GYM25RD-F20-135	●		
			180	250	12	(4Q1R4F18)	GYM25RD-F12-180	●		
					20 *1	(4Q1R4F28)	GYM25RD-F20-180	●		
			NEW 225	999	12	(4Q1R4F19)	GYM25RD-F12-225	●		
					20 *1	(4Q1R4F29)	GYM25RD-F20-225	●		
			35	40	12	(4J1R4F11)	GYM25RD-F12-035	●	GYHR3232P00-M25R	★
			40	50	12	(4J1R4F12)	GYM25RD-F12-040	●		
			50	60	12	(4J1R4F13)	GYM25RD-F12-050	●		
			60	75	12	(4J1R4F14)	GYM25RD-F12-060	●		
					20 *1	(4J1R4F24)	GYM25RD-F20-060	●		
			75	100	12	(4J1R4F15)	GYM25RD-F12-075	●		
					20 *1	(4J1R4F25)	GYM25RD-F20-075	●		
			100	150	12	(4J1R4F16)	GYM25RD-F12-100	●		
					20 *1	(4J1R4F26)	GYM25RD-F20-100	●		
			135	200	12	(4J1R4F17)	GYM25RD-F12-135	●		
					20 *1	(4J1R4F27)	GYM25RD-F20-135	●		
			180	250	12	(4J1R4F18)	GYM25RD-F12-180	●		
					20 *1	(4J1R4F28)	GYM25RD-F20-180	●		
			NEW 225	999	12	(4J1R4F18)	GYM25RD-F12-225	●		
					20 *1	(4J1R4F28)	GYM25RD-F20-225	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F136 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

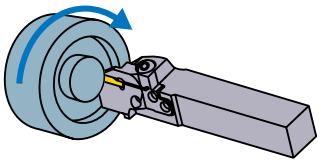
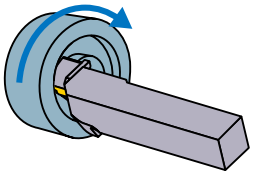


● : Inventory maintained. ★ : Inventory maintained in Japan.

* Wrench : ①For Clamp Screw ②For Blade Screw.

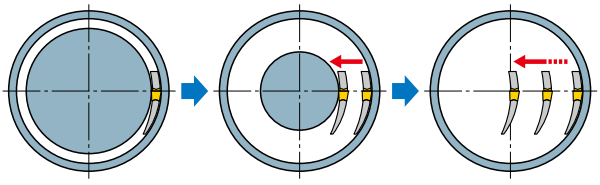
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHR3225P00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR3232P00-M25R			

Dimensions (mm) *2						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
32	25	170	39	32	28	1		GY2M0300F020N-GS GY2M0318F020N-GS GY2M0300F030N-GM GY2M0318F030N-GM GY2M0300F030R05-GM GY2M0300F030L05-GM GY2M0300F020N-MS GY2M0300F040N-MS (Gauge insert) GY2M0300F020N-MM GY2M0300F040N-MM GY2M0300F080N-MM GY2M0300F150N-BM GY2M0318F159N-BM GY1G0300F020N-GFGS GY1G0318F020N-GFGS	F014 – F016
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	176	45	32	28	2			
32	25	170	39	32	28	1			
32	25	176	45	32	28	2			
32	25	170	39	32	28	1			
32	25	176	45	32	28	2			
32	25	170	39	32	28	1			
32	25	176	45	32	28	2			
32	25	170	39	32	28	1			
32	25	176	45	32	28	2			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	176	45	32	35	2			
32	32	170	39	32	35	1			
32	32	176	45	32	35	2			
32	32	170	39	32	35	1			
32	32	176	45	32	35	2			
32	32	170	39	32	35	1			
32	32	176	45	32	35	2			
32	32	170	39	32	35	1			
32	32	176	45	32	35	2			
32	32	170	39	32	35	1			
32	32	176	45	32	35	2			

Notes when selecting a modular blade (2)

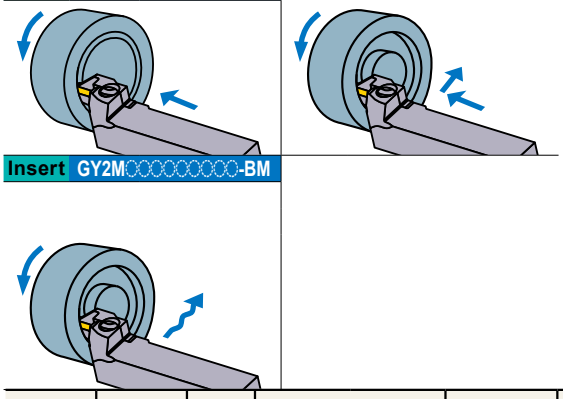
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

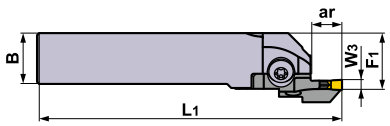


Fig. 1

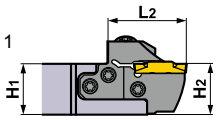
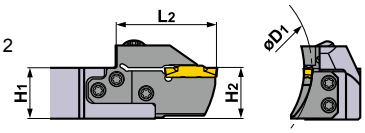


Fig. 2



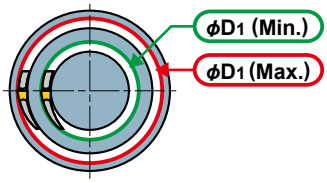
Left hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
F	3.00 3.18	*3 NEW L	35	40	12	(4E1L4F11)	GYM25LD-F12-035	●	GYHL2020K00-M25L	●
			40	50	12	(4E1L4F12)	GYM25LD-F12-040	●		
			50	60	12	(4E1L4F13)	GYM25LD-F12-050	●		
			60	75	12	(4E1L4F14)	GYM25LD-F12-060	●		
					20 *1	(4E1L4F24)	GYM25LD-F20-060	●		
			75	100	12	(4E1L4F15)	GYM25LD-F12-075	●		
					20 *1	(4E1L4F25)	GYM25LD-F20-075	●		
			100	150	12	(4E1L4F16)	GYM25LD-F12-100	●		
					20 *1	(4E1L4F26)	GYM25LD-F20-100	●		
			135	200	12	(4E1L4F17)	GYM25LD-F12-135	●		
					20 *1	(4E1L4F27)	GYM25LD-F20-135	●		
			180	250	12	(4E1L4F18)	GYM25LD-F12-180	●		
					20 *1	(4E1L4F28)	GYM25LD-F20-180	●		
			NEW 225	999	12	(4E1L4F19)	GYM25LD-F12-225	●		
					20 *1	(4E1L4F29)	GYM25LD-F20-225	●		
			35	40	12	(4G1L4F11)	GYM25LD-F12-035	●	GYHL2525M00-M25L	●
			40	50	12	(4G1L4F12)	GYM25LD-F12-040	●		
			50	60	12	(4G1L4F13)	GYM25LD-F12-050	●		
			60	75	12	(4G1L4F14)	GYM25LD-F12-060	●		
					20 *1	(4G1L4F24)	GYM25LD-F20-060	●		
			75	100	12	(4G1L4F15)	GYM25LD-F12-075	●		
					20 *1	(4G1L4F25)	GYM25LD-F20-075	●		
			100	150	12	(4G1L4F16)	GYM25LD-F12-100	●		
					20 *1	(4G1L4F26)	GYM25LD-F20-100	●		
			135	200	12	(4G1L4F17)	GYM25LD-F12-135	●		
					20 *1	(4G1L4F27)	GYM25LD-F20-135	●		
			180	250	12	(4G1L4F18)	GYM25LD-F12-180	●		
					20 *1	(4G1L4F28)	GYM25LD-F20-180	●		
			NEW 225	999	12	(4G1L4F19)	GYM25LD-F12-225	●		
					20 *1	(4G1L4F29)	GYM25LD-F20-225	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F130 for right hand tools.

Notes when selecting a modular blade (1)

- Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained.

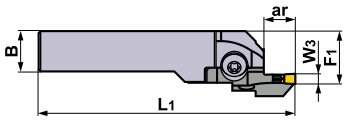


Fig. 3

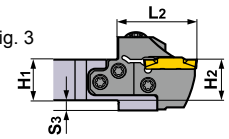
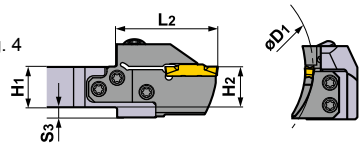


Fig. 4

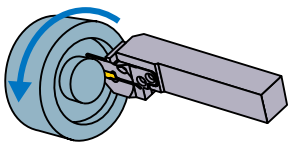
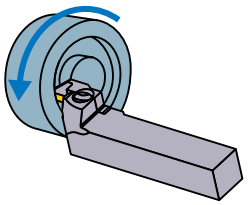


Left hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

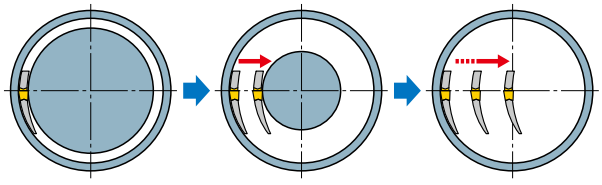
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗ Wrench ①②
GYHL2020K00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M00-M25L			

Dimensions (mm) ∗2							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
20	20	125	39	20	26	5	3		GY2M0300F020N-GS GY2M0318F020N-GS	F014 ı F016
20	20	125	39	20	26	5	3			
20	20	125	39	20	26	5	3			
20	20	125	39	20	26	5	3			
20	20	131	45	20	26	5	4			
20	20	125	39	20	26	5	3		GY2M0300F030N-GM GY2M0318F030N-GM	
20	20	131	45	20	26	5	4			
20	20	125	39	20	26	5	3			
20	20	131	45	20	26	5	4			
20	20	125	39	20	26	5	3		GY2M0300F030R05-GM GY2M0300F030L05-GM	
20	20	131	45	20	26	5	4			
20	20	125	39	20	26	5	3		GY2M0300F020N-MS GY2M0300F040N-MS (Gauge insert)	
20	20	131	45	20	26	5	4			
25	25	150	39	25	28	—	1		GY2M0300F020N-MM GY2M0300F040N-MM GY2M0300F080N-MM	
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1		GY2M0300F150N-BM GY2M0318F159N-BM	
25	25	156	45	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	156	45	25	28	—	2			
25	25	150	39	25	28	—	1		GY1G0300F020N-GFGS GY1G0318F020N-GFGS	
25	25	156	45	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	156	45	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	156	45	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	156	45	25	28	—	2			

Notes when selecting a modular blade (2)

- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.

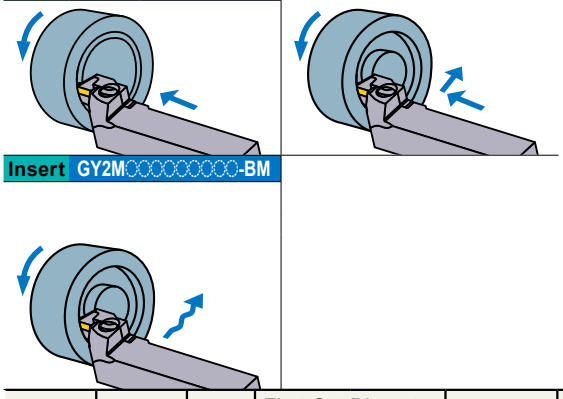


GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM

Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.



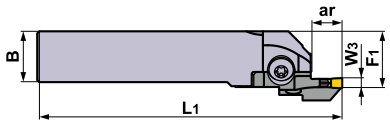


Fig. 1

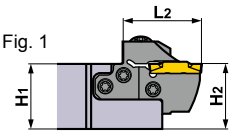
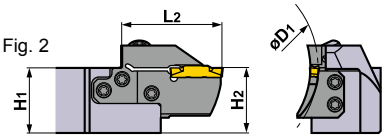


Fig. 2



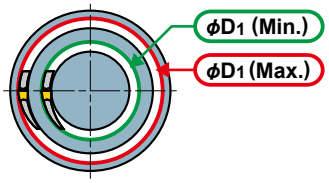
Left hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
F	3.00 3.18	*3 NEW L	35	40	12	(4Q1L4F11)	GYM25LD-F12-035	●	GYHL3225P00-M25L	★
			40	50	12	(4Q1L4F12)	GYM25LD-F12-040	●		
			50	60	12	(4Q1L4F13)	GYM25LD-F12-050	●		
			60	75	12	(4Q1L4F14)	GYM25LD-F12-060	●		
					20 *1	(4Q1L4F24)	GYM25LD-F20-060	●		
			75	100	12	(4Q1L4F15)	GYM25LD-F12-075	●		
					20 *1	(4Q1L4F25)	GYM25LD-F20-075	●		
			100	150	12	(4Q1L4F16)	GYM25LD-F12-100	●		
					20 *1	(4Q1L4F26)	GYM25LD-F20-100	●		
			135	200	12	(4Q1L4F17)	GYM25LD-F12-135	●		
					20 *1	(4Q1L4F27)	GYM25LD-F20-135	●		
			180	250	12	(4Q1L4F18)	GYM25LD-F12-180	●		
					20 *1	(4Q1L4F28)	GYM25LD-F20-180	●		
			NEW 225	999	12	(4Q1L4F19)	GYM25LD-F12-225	●		
					20 *1	(4Q1L4F20)	GYM25LD-F20-225	●		
			35	40	12	(4J1L4F11)	GYM25LD-F12-035	●	GYHL3232P00-M25L	★
			40	50	12	(4J1L4F12)	GYM25LD-F12-040	●		
			50	60	12	(4J1L4F13)	GYM25LD-F12-050	●		
			60	75	12	(4J1L4F14)	GYM25LD-F12-060	●		
					20 *1	(4J1L4F24)	GYM25LD-F20-060	●		
			75	100	12	(4J1L4F15)	GYM25LD-F12-075	●		
					20 *1	(4J1L4F25)	GYM25LD-F20-075	●		
			100	150	12	(4J1L4F16)	GYM25LD-F12-100	●		
					20 *1	(4J1L4F26)	GYM25LD-F20-100	●		
			135	200	12	(4J1L4F17)	GYM25LD-F12-135	●		
					20 *1	(4J1L4F27)	GYM25LD-F20-135	●		
			180	250	12	(4J1L4F18)	GYM25LD-F12-180	●		
					20 *1	(4J1L4F28)	GYM25LD-F20-180	●		
			NEW 225	999	12	(4J1L4F19)	GYM25LD-F12-225	●		
					20 *1	(4J1L4F20)	GYM25LD-F20-225	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F132 for right hand tools.

Notes when selecting a modular blade (1)

●Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

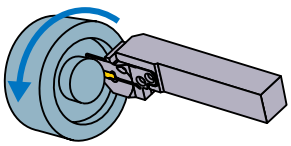
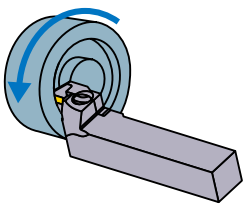


● : Inventory maintained. ★ : Inventory maintained in Japan.

* Wrench : ①For Clamp Screw ②For Blade Screw.

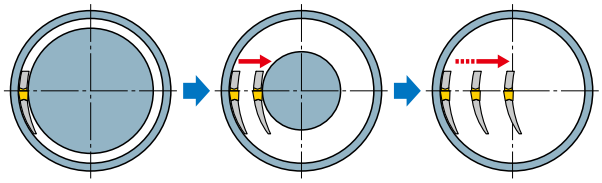
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHL3225P00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL3232P00-M25L			

Dimensions (mm) *2						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
32	25	170	39	32	28	1		GY2M0300F020N-GS GY2M0318F020N-GS GY2M0300F030N-GM GY2M0318F030N-GM GY2M0300F030R05-GM GY2M0300F030L05-GM GY2M0300F020N-MS GY2M0300F040N-MS (Gauge insert) GY2M0300F020N-MM GY2M0300F040N-MM GY2M0300F080N-MM GY2M0300F150N-BM GY2M0318F159N-BM GY1G0300F020N-GFGS GY1G0318F020N-GFGS	F014 ı F016
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	176	45	32	28	2			
32	25	170	39	32	28	1			
32	25	176	45	32	28	2			
32	25	170	39	32	28	1			
32	25	176	45	32	28	2			
32	25	170	39	32	28	1			
32	25	176	45	32	28	2			
32	25	170	39	32	28	1			
32	25	176	45	32	28	2			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	176	45	32	35	2			
32	32	170	39	32	35	1			
32	32	176	45	32	35	2			
32	32	170	39	32	35	1			
32	32	176	45	32	35	2			
32	32	170	39	32	35	1			
32	32	176	45	32	35	2			
32	32	170	39	32	35	1			
32	32	176	45	32	35	2			
32	32	170	39	32	35	1			
32	32	176	45	32	35	2			

Notes when selecting a modular blade (2)

- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.

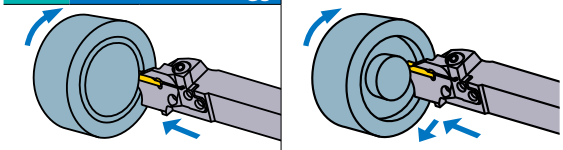


GROOVING

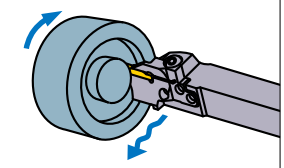
GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

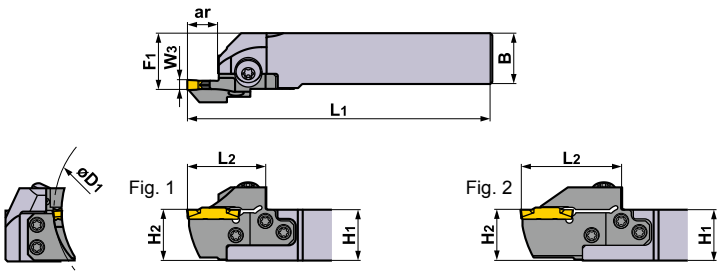
Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-GM
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF GS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.



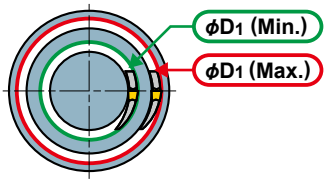
Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
G	4.00	R *3	40	50	14	(4E1R4G11)	GYM25RD-G14-040	●	GYHR2020K00-M25R	●
			50	60	14	(4E1R4G12)	GYM25RD-G14-050	●		
			60	85	14	(4E1R4G13)	GYM25RD-G14-060	●		
					25 *1	(4E1R4G23)	GYM25RD-G25-060	●		
			85	125	14	(4E1R4G14)	GYM25RD-G14-085	●		
					25 *1	(4E1R4G24)	GYM25RD-G25-085	●		
			125	200	14	(4E1R4G15)	GYM25RD-G14-125	●		
					25 *1	(4E1R4G25)	GYM25RD-G25-125	●		
			180	280	14	(4E1R4G16)	GYM25RD-G14-180	●		
					25 *1	(4E1R4G26)	GYM25RD-G25-180	●		
			250	999	14	(4E1R4G17)	GYM25RD-G14-250	●		
					25 *1	(4E1R4G27)	GYM25RD-G25-250	●		
			40	50	14	(4G1R4G11)	GYM25RD-G14-040	●	GYHR2525M00-M25R	●
			50	60	14	(4G1R4G12)	GYM25RD-G14-050	●		
			60	85	14	(4G1R4G13)	GYM25RD-G14-060	●		
					25 *1	(4G1R4G23)	GYM25RD-G25-060	●		
			85	125	14	(4G1R4G14)	GYM25RD-G14-085	●		
					25 *1	(4G1R4G24)	GYM25RD-G25-085	●		
			125	200	14	(4G1R4G15)	GYM25RD-G14-125	●		
					25 *1	(4G1R4G25)	GYM25RD-G25-125	●		
			180	280	14	(4G1R4G16)	GYM25RD-G14-180	●		
					25 *1	(4G1R4G26)	GYM25RD-G25-180	●		
			250	999	14	(4G1R4G17)	GYM25RD-G14-250	●		
					25 *1	(4G1R4G27)	GYM25RD-G25-250	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F142 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained.

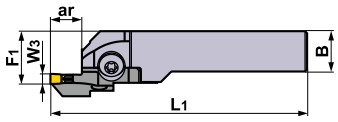




Fig. 3

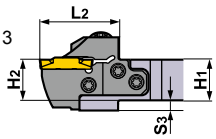
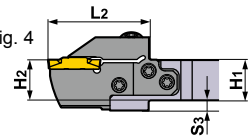


Fig. 4

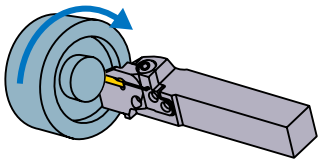
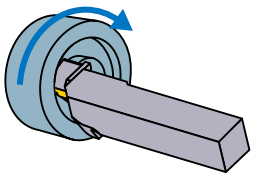


Right hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

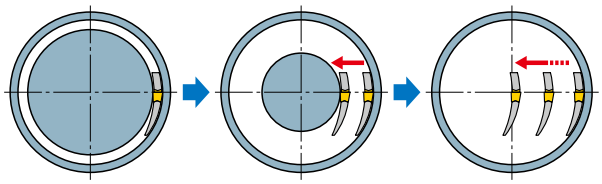
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗ Wrench
GYHR2020K00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR2525M00-M25R			

Dimensions (mm) ∗2							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
20	20	125	39	20	26	5	3		GY2M0400G030N-GU GY2M0400G020N-GS GY2M0400G030N-GM GY2M0400G030R05-GM GY2M0400G030L05-GM GY2M0400G020N-MS GY2M0400G040N-MS (Gauge insert) GY2M0400G020N-MM GY2M0400G040N-MM GY2M0400G080N-MM GY2M0400G200N-BM GY1G0400G020N-GFGS	F014 ı F016
20	20	125	39	20	26	5	3			
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4			
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4			
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4			
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			

Notes when selecting a modular blade (2)

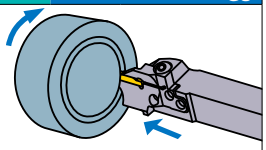
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



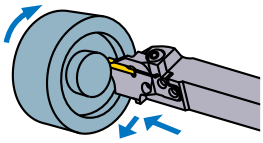
GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

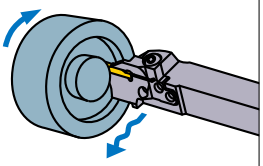
Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS



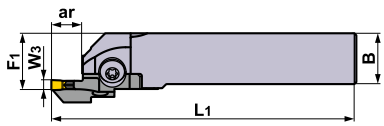
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.



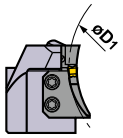


Fig. 1

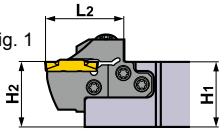
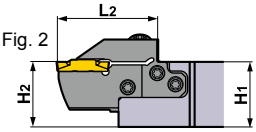


Fig. 2



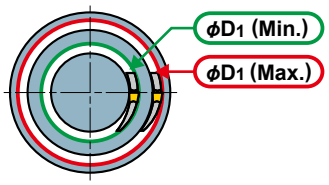
Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
G	4.00	R *3	40	50	14	(4Q1R4G11)	GYM25RD-G14-040	●	GYHR3225P00-M25R	★
			50	60	14	(4Q1R4G12)	GYM25RD-G14-050	●		
			60	85	14	(4Q1R4G13)	GYM25RD-G14-060	●		
					25 *1	(4Q1R4G23)	GYM25RD-G25-060	●		
			85	125	14	(4Q1R4G14)	GYM25RD-G14-085	●		
					25 *1	(4Q1R4G24)	GYM25RD-G25-085	●		
			125	200	14	(4Q1R4G15)	GYM25RD-G14-125	●		
					25 *1	(4Q1R4G25)	GYM25RD-G25-125	●		
			180	280	14	(4Q1R4G16)	GYM25RD-G14-180	●		
					25 *1	(4Q1R4G26)	GYM25RD-G25-180	●		
			250	999	14	(4Q1R4G17)	GYM25RD-G14-250	●		
					25 *1	(4Q1R4G27)	GYM25RD-G25-250	●		
			40	50	14	(4J1R4G11)	GYM25RD-G14-040	●	GYHR3232P00-M25R	★
			50	60	14	(4J1R4G12)	GYM25RD-G14-050	●		
			60	85	14	(4J1R4G13)	GYM25RD-G14-060	●		
					25 *1	(4J1R4G23)	GYM25RD-G25-060	●		
			85	125	14	(4J1R4G14)	GYM25RD-G14-085	●		
					25 *1	(4J1R4G24)	GYM25RD-G25-085	●		
			125	200	14	(4J1R4G15)	GYM25RD-G14-125	●		
					25 *1	(4J1R4G25)	GYM25RD-G25-125	●		
			180	280	14	(4J1R4G16)	GYM25RD-G14-180	●		
					25 *1	(4J1R4G26)	GYM25RD-G25-180	●		
			250	999	14	(4J1R4G17)	GYM25RD-G14-250	●		
					25 *1	(4J1R4G27)	GYM25RD-G25-250	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F144 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

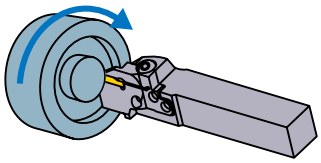
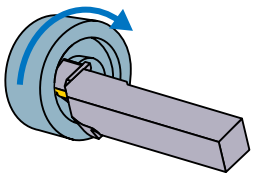


● : Inventory maintained. ★ : Inventory maintained in Japan.

* Wrench : ①For Clamp Screw ②For Blade Screw.

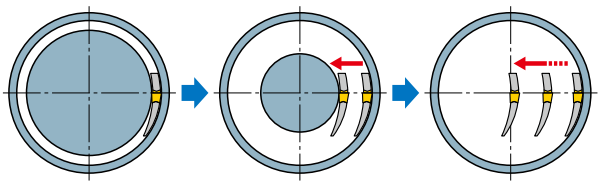
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHR3225P00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR3232P00-M25R			

Dimensions (mm) *2						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
32	25	170	39	32	28	1		GY2M0400G030N-GU GY2M0400G020N-GS GY2M0400G030N-GM GY2M0400G030R05-GM GY2M0400G030L05-GM GY2M0400G020N-MS GY2M0400G040N-MS (Gauge insert) GY2M0400G020N-MM GY2M0400G040N-MM GY2M0400G080N-MM GY2M0400G200N-BM GY1G0400G020N-GFGS	F014 ı F016
32	25	170	39	32	28	1			
32	25	170	39	32	28	1			
32	25	181	50	32	28	2			
32	25	170	39	32	28	1			
32	25	181	50	32	28	2			
32	25	170	39	32	28	1			
32	25	181	50	32	28	2			
32	25	170	39	32	28	1			
32	25	181	50	32	28	2			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1			
32	32	181	50	32	35	2			
32	32	170	39	32	35	1			
32	32	181	50	32	35	2			
32	32	170	39	32	35	1			
32	32	181	50	32	35	2			
32	32	170	39	32	35	1			
32	32	181	50	32	35	2			
32	32	170	39	32	35	1			
32	32	181	50	32	35	2			

Notes when selecting a modular blade (2)

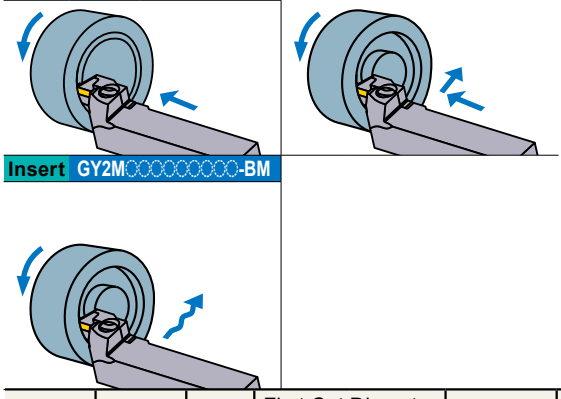
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

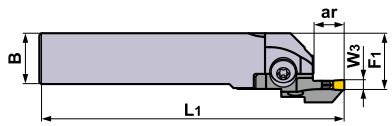


Fig. 1

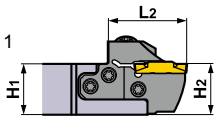
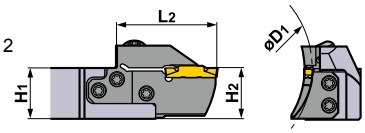


Fig. 2



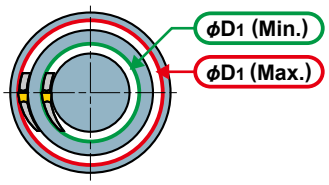
Left hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
G	4.00	L *3	40	50	14	(4E1L4G11)	GYM25LD-G14-040	●	GYHL2020K00-M25L	●
			50	60	14	(4E1L4G12)	GYM25LD-G14-050	●		
			60	85	14	(4E1L4G13)	GYM25LD-G14-060	●		
					25 *1	(4E1L4G23)	GYM25LD-G25-060	●		
			85	125	14	(4E1L4G14)	GYM25LD-G14-085	●		
					25 *1	(4E1L4G24)	GYM25LD-G25-085	●		
			125	200	14	(4E1L4G15)	GYM25LD-G14-125	●		
					25 *1	(4E1L4G25)	GYM25LD-G25-125	●		
			180	280	14	(4E1L4G16)	GYM25LD-G14-180	●		
					25 *1	(4E1L4G26)	GYM25LD-G25-180	●		
			250	999	14	(4E1L4G17)	GYM25LD-G14-250	●		
					25 *1	(4E1L4G27)	GYM25LD-G25-250	●		
			40	50	14	(4G1L4G11)	GYM25LD-G14-040	●	GYHL2525M00-M25L	●
			50	60	14	(4G1L4G12)	GYM25LD-G14-050	●		
			60	85	14	(4G1L4G13)	GYM25LD-G14-060	●		
					25 *1	(4G1L4G23)	GYM25LD-G25-060	●		
			85	125	14	(4G1L4G14)	GYM25LD-G14-085	●		
					25 *1	(4G1L4G24)	GYM25LD-G25-085	●		
			125	200	14	(4G1L4G15)	GYM25LD-G14-125	●		
					25 *1	(4G1L4G25)	GYM25LD-G25-125	●		
			180	280	14	(4G1L4G16)	GYM25LD-G14-180	●		
					25 *1	(4G1L4G26)	GYM25LD-G25-180	●		
			250	999	14	(4G1L4G17)	GYM25LD-G14-250	●		
					25 *1	(4G1L4G27)	GYM25LD-G25-250	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F138 for right hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained.

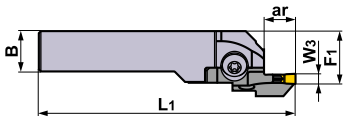


Fig. 3

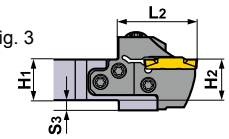
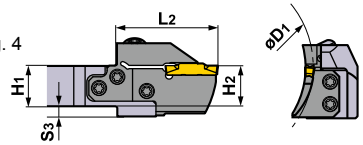


Fig. 4

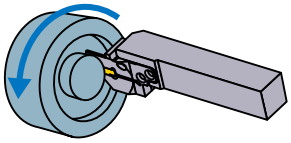
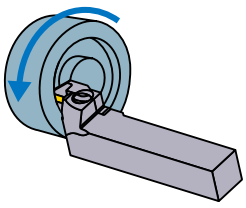


Left hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

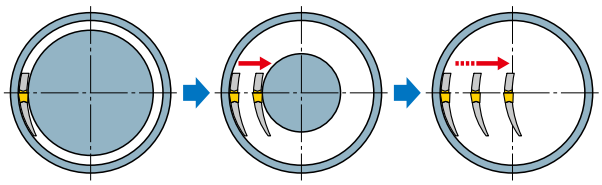
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗ Wrench
GYHL2020K00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M00-M25L			

Dimensions (mm) ∗2							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
20	20	125	39	20	26	5	3		GY2M0400G030N-GU GY2M0400G020N-GS GY2M0400G030N-GM GY2M0400G030R05-GM GY2M0400G030L05-GM GY2M0400G020N-MS GY2M0400G040N-MS (Gauge insert) GY2M0400G020N-MM GY2M0400G040N-MM GY2M0400G080N-MM GY2M0400G200N-BM GY1G0400G020N-GFGS	F014 I F016
20	20	125	39	20	26	5	3			
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4			
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4			
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4			
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			

Notes when selecting a modular blade (2)

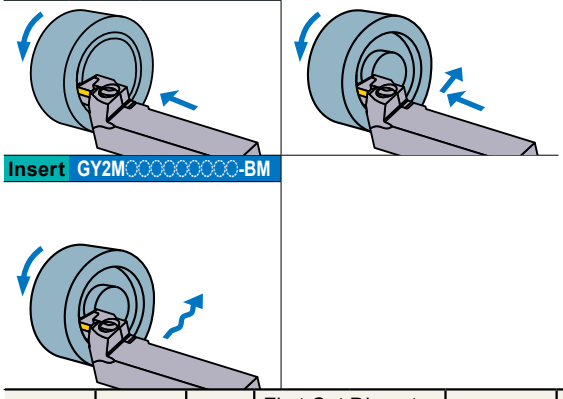
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

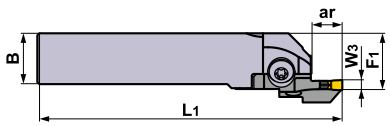


Fig. 1

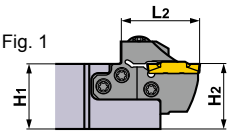
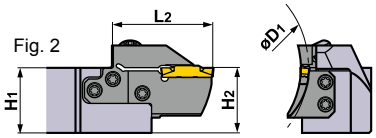


Fig. 2



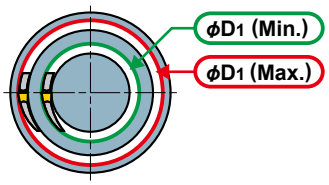
Left hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
G	4.00	L *3	40	50	14	(4Q1L4G11)	GYM25LD-G14-040	●	GYHL3225P00-M25L	★
			50	60	14	(4Q1L4G12)	GYM25LD-G14-050	●		
			60	85	14	(4Q1L4G13)	GYM25LD-G14-060	●		
					25 *1	(4Q1L4G23)	GYM25LD-G25-060	●		
			85	125	14	(4Q1L4G14)	GYM25LD-G14-085	●		
					25 *1	(4Q1L4G24)	GYM25LD-G25-085	●		
			125	200	14	(4Q1L4G15)	GYM25LD-G14-125	●		
					25 *1	(4Q1L4G25)	GYM25LD-G25-125	●		
			180	280	14	(4Q1L4G16)	GYM25LD-G14-180	●		
					25 *1	(4Q1L4G26)	GYM25LD-G25-180	●		
			250	999	14	(4Q1L4G17)	GYM25LD-G14-250	●		
					25 *1	(4Q1L4G27)	GYM25LD-G25-250	●		
			40	50	14	(4J1L4G11)	GYM25LD-G14-040	●	GYHL3232P00-M25L	★
			50	60	14	(4J1L4G12)	GYM25LD-G14-050	●		
			60	85	14	(4J1L4G13)	GYM25LD-G14-060	●		
					25 *1	(4J1L4G23)	GYM25LD-G25-060	●		
			85	125	14	(4J1L4G14)	GYM25LD-G14-085	●		
					25 *1	(4J1L4G24)	GYM25LD-G25-085	●		
			125	200	14	(4J1L4G15)	GYM25LD-G14-125	●		
					25 *1	(4J1L4G25)	GYM25LD-G25-125	●		
			180	280	14	(4J1L4G16)	GYM25LD-G14-180	●		
					25 *1	(4J1L4G26)	GYM25LD-G25-180	●		
			250	999	14	(4J1L4G17)	GYM25LD-G14-250	●		
					25 *1	(4J1L4G27)	GYM25LD-G25-250	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F140 for right hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

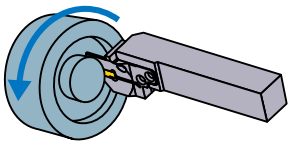
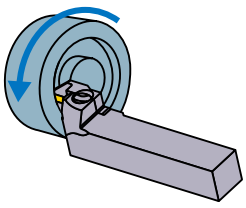


● : Inventory maintained. ★ : Inventory maintained in Japan.

* Wrench : ①For Clamp Screw ②For Blade Screw.

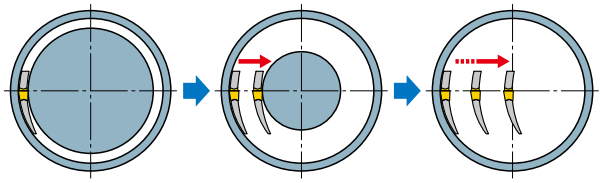
SPARE PARTS

Modular Holder Number	 Clamp Screw	 (5 pcs.) Blade Screw	 * Wrench
GYHL3225P00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL3232P00-M25L			

Dimensions (mm) *2						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
32	25	170	39	32	28	1		GY2M0400G030N-GU	F014 – F016
32	25	170	39	32	28	1		GY2M0400G020N-GS	
32	25	181	50	32	28	2			
32	25	170	39	32	28	1		GY2M0400G030N-GM	
32	25	181	50	32	28	2			
32	25	170	39	32	28	1		GY2M0400G030R05-GM GY2M0400G030L05-GM	
32	25	181	50	32	28	2			
32	25	170	39	32	28	1		GY2M0400G020N-MS GY2M0400G040N-MS (Gauge insert)	
32	25	181	50	32	28	2			
32	32	170	39	32	35	1			
32	32	170	39	32	35	1		GY2M0400G020N-MM GY2M0400G040N-MM GY2M0400G080N-MM	
32	32	181	50	32	35	2			
32	32	170	39	32	35	1			
32	32	181	50	32	35	2			
32	32	170	39	32	35	1		GY2M0400G200N-BM	
32	32	181	50	32	35	2			
32	32	170	39	32	35	1		GY1G0400G020N-GFGS	
32	32	181	50	32	35	2			
32	32	170	39	32	35	1			
32	32	181	50	32	35	2			

Notes when selecting a modular blade (2)

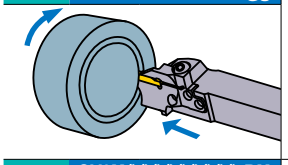
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



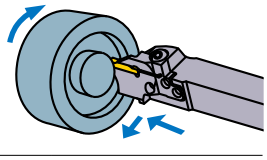
GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

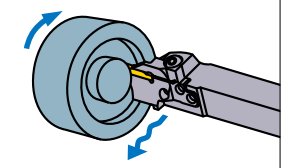
Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS



Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.

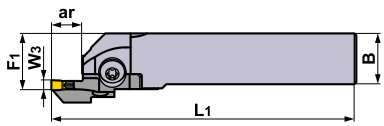




Fig. 1

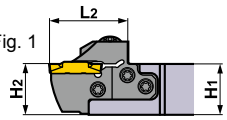
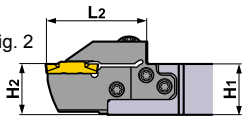


Fig. 2



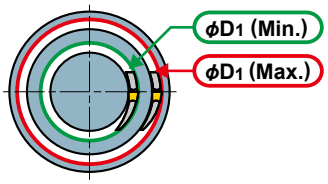
Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
H	4.75 5.00	*3 R	50	60	14	(4E1R4H11)	**GYM25RD-H14-050**	●	**GYHR2020K00-M25R**	●
			60	85	14	(4E1R4H12)	**GYM25RD-H14-060**	●		
					25 *1	(4E1R4H22)	**GYM25RD-H25-060**	●		
			85	125	14	(4E1R4H13)	**GYM25RD-H14-085**	●		
					25 *1	(4E1R4H23)	**GYM25RD-H25-085**	●		
			125	200	14	(4E1R4H14)	**GYM25RD-H14-125**	●		
					25 *1	(4E1R4H24)	**GYM25RD-H25-125**	●		
			180	280	14	(4E1R4H15)	**GYM25RD-H14-180**	●		
					25 *1	(4E1R4H25)	**GYM25RD-H25-180**	●		
			250	999	14	(4E1R4H16)	**GYM25RD-H14-250**	●		
					25 *1	(4E1R4H26)	**GYM25RD-H25-250**	●		
			50	60	14	(4G1R4H11)	**GYM25RD-H14-050**	●	**GYHR2525M00-M25R**	●
			60	85	14	(4G1R4H12)	**GYM25RD-H14-060**	●		
					25 *1	(4G1R4H22)	**GYM25RD-H25-060**	●		
			85	125	14	(4G1R4H13)	**GYM25RD-H14-085**	●		
					25 *1	(4G1R4H23)	**GYM25RD-H25-085**	●		
			125	200	14	(4G1R4H14)	**GYM25RD-H14-125**	●		
					25 *1	(4G1R4H24)	**GYM25RD-H25-125**	●		
			180	280	14	(4G1R4H15)	**GYM25RD-H14-180**	●		
					25 *1	(4G1R4H25)	**GYM25RD-H25-180**	●		
			250	999	14	(4G1R4H16)	**GYM25RD-H14-250**	●		
					25 *1	(4G1R4H26)	**GYM25RD-H25-250**	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F150 for left hand tools.

Notes when selecting a modular blade (1)

●Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D_1 minimum and D_1 maximum that are described in the table of dimensions.



● : Inventory maintained.

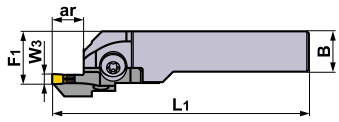




Fig. 3

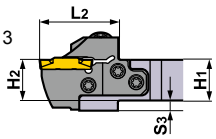
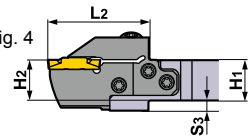


Fig. 4

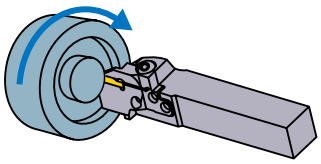
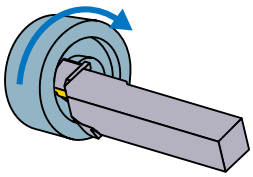


Right hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

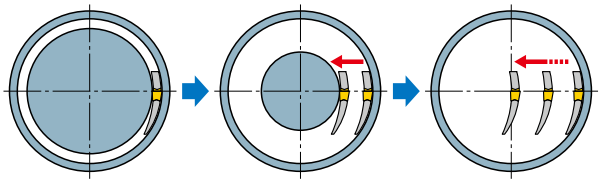
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗ Wrench
GYHR2020K00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR2525M00-M25R			

Dimensions (mm) ∗2							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
20	20	125	39	20	26	5	3		GY2M0475H040N-GU GY2M0500H040N-GU	F014 ı F016
20	20	125	39	20	26	5	3		GY2M0475H030N-GS GY2M0500H030N-GS	
20	20	136	50	20	26	5	4			
20	20	125	39	20	26	5	3		GY2M0475H040N-GM GY2M0500H040N-GM	
20	20	136	50	20	26	5	4			
20	20	125	39	20	26	5	3		GY2M0500H040R05-GM GY2M0500H040L05-GM	
20	20	136	50	20	26	5	4			
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4			
25	25	150	39	25	28	—	1		GY2M0500H040N-MS GY2M0500H080N-MS (Gauge insert)	
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			
25	25	150	39	25	28	—	1		GY2M0500H040N-MM GY2M0500H080N-MM	
25	25	161	50	25	28	—	2			
25	25	150	39	25	28	—	1		GY2M0475H238N-BM GY2M0500H250N-BM	
25	25	161	50	25	28	—	2			
25	25	150	39	25	28	—	1		GY1G0475H020N-GFGS GY1G0500H020N-GFGS	
25	25	161	50	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			

Notes when selecting a modular blade (2)

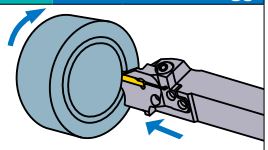
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



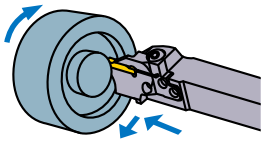
GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

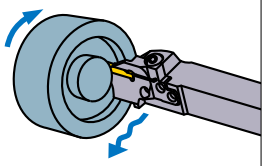
Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS



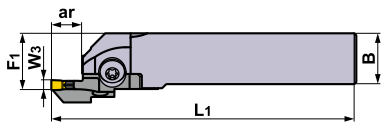
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.



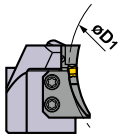


Fig. 1

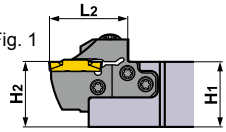
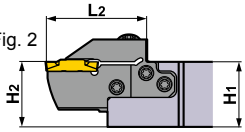


Fig. 2



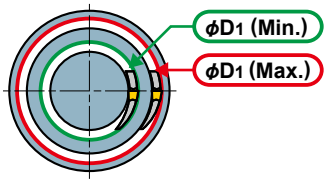
Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
H	4.75 5.00	*3 R	50	60	14	(4Q1R4H11)	GYM25RD-H14-050	●	GYHR3225P00-M25R	★
			60	85	14	(4Q1R4H12)	GYM25RD-H14-060	●		
					25 *1	(4Q1R4H22)	GYM25RD-H25-060	●		
			85	125	14	(4Q1R4H13)	GYM25RD-H14-085	●		
					25 *1	(4Q1R4H23)	GYM25RD-H25-085	●		
			125	200	14	(4Q1R4H14)	GYM25RD-H14-125	●		
					25 *1	(4Q1R4H24)	GYM25RD-H25-125	●		
			180	280	14	(4Q1R4H15)	GYM25RD-H14-180	●		
					25 *1	(4Q1R4H25)	GYM25RD-H25-180	●		
			250	999	14	(4Q1R4H16)	GYM25RD-H14-250	●		
					25 *1	(4Q1R4H26)	GYM25RD-H25-250	●		
			50	60	14	(4J1R4H11)	GYM25RD-H14-050	●	GYHR3232P00-M25R	★
			60	85	14	(4J1R4H12)	GYM25RD-H14-060	●		
					25 *1	(4J1R4H22)	GYM25RD-H25-060	●		
			85	125	14	(4J1R4H13)	GYM25RD-H14-085	●		
					25 *1	(4J1R4H23)	GYM25RD-H25-085	●		
			125	200	14	(4J1R4H14)	GYM25RD-H14-125	●		
					25 *1	(4J1R4H24)	GYM25RD-H25-125	●		
			180	280	14	(4J1R4H15)	GYM25RD-H14-180	●		
					25 *1	(4J1R4H25)	GYM25RD-H25-180	●		
			250	999	14	(4J1R4H16)	GYM25RD-H14-250	●		
					25 *1	(4J1R4H26)	GYM25RD-H25-250	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F152 for left hand tools.

Notes when selecting a modular blade (1)

●Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

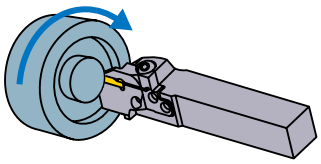
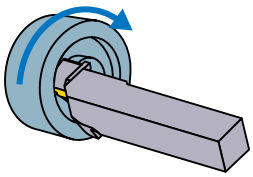


● : Inventory maintained. ★ : Inventory maintained in Japan.

* Wrench : ①For Clamp Screw ②For Blade Screw.

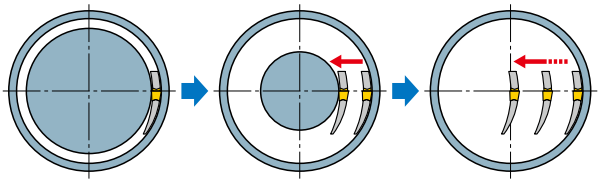
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHR3225P00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR3232P00-M25R			

Dimensions (mm) *2						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
32	25	170	39	32	28	1		GY2M0475H040N-GU GY2M0500H040N-GU	F014 – F016
32	25	170	39	32	28	1			
32	25	181	50	32	28	2			
32	25	170	39	32	28	1		GY2M0475H030N-GS GY2M0500H030N-GS	
32	25	181	50	32	28	2			
32	25	170	39	32	28	1		GY2M0475H040N-GM GY2M0500H040N-GM	
32	25	181	50	32	28	2			
32	25	170	39	32	28	1		GY2M0500H040R05-GM GY2M0500H040L05-GM	
32	25	181	50	32	28	2			
32	25	170	39	32	28	1			
32	25	181	50	32	28	2			
32	32	170	39	32	35	1		GY2M0500H040N-MS GY2M0500H080N-MS (Gauge insert)	
32	32	170	39	32	35	1			
32	32	181	50	32	35	2			
32	32	170	39	32	35	1		GY2M0500H040N-MM GY2M0500H080N-MM	
32	32	181	50	32	35	2			
32	32	170	39	32	35	1		GY2M0475H238N-BM GY2M0500H250N-BM	
32	32	181	50	32	35	2			
32	32	170	39	32	35	1		GY1G0475H020N-GFGS GY1G0500H020N-GFGS	
32	32	181	50	32	35	2			
32	32	170	39	32	35	1			
32	32	181	50	32	35	2			

Notes when selecting a modular blade (2)

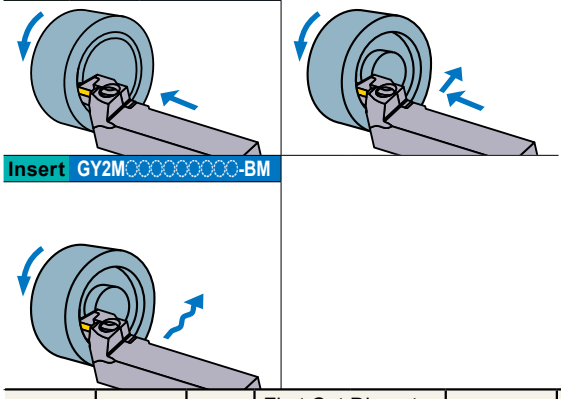
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

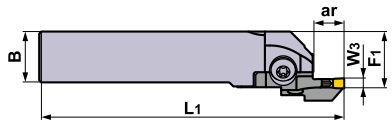


Fig. 1

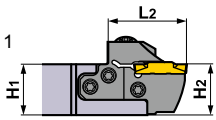
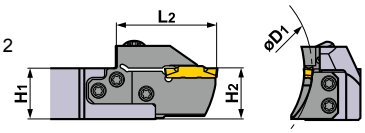


Fig. 2



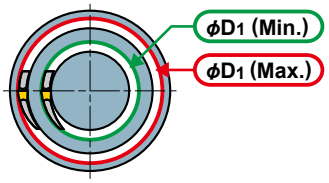
Left hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
H	4.75 5.00	*3 L	50	60	14	(4E1L4H11)	GYM25LD-H14-050	●	GYHL2020K00-M25L	●
			60	85	14	(4E1L4H12)	GYM25LD-H14-060	●		
					25 *1	(4E1L4H22)	GYM25LD-H25-060	●		
			85	125	14	(4E1L4H13)	GYM25LD-H14-085	●		
					25 *1	(4E1L4H23)	GYM25LD-H25-085	●		
			125	200	14	(4E1L4H14)	GYM25LD-H14-125	●		
					25 *1	(4E1L4H24)	GYM25LD-H25-125	●		
			180	280	14	(4E1L4H15)	GYM25LD-H14-180	●		
					25 *1	(4E1L4H25)	GYM25LD-H25-180	●		
			250	999	14	(4E1L4H16)	GYM25LD-H14-250	●		
					25 *1	(4E1L4H26)	GYM25LD-H25-250	●		
			50	60	14	(4G1L4H11)	GYM25LD-H14-050	●	GYHL2525M00-M25L	●
			60	85	14	(4G1L4H12)	GYM25LD-H14-060	●		
					25 *1	(4G1L4H22)	GYM25LD-H25-060	●		
			85	125	14	(4G1L4H13)	GYM25LD-H14-085	●		
					25 *1	(4G1L4H23)	GYM25LD-H25-085	●		
			125	200	14	(4G1L4H14)	GYM25LD-H14-125	●		
					25 *1	(4G1L4H24)	GYM25LD-H25-125	●		
			180	280	14	(4G1L4H15)	GYM25LD-H14-180	●		
					25 *1	(4G1L4H25)	GYM25LD-H25-180	●		
			250	999	14	(4G1L4H16)	GYM25LD-H14-250	●		
					25 *1	(4G1L4H26)	GYM25LD-H25-250	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F146 for right hand tools.

Notes when selecting a modular blade (1)

●Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D_1 minimum and D_1 maximum that are described in the table of dimensions.



● : Inventory maintained.

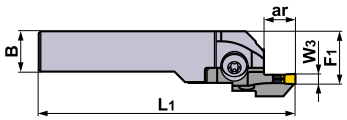


Fig. 3

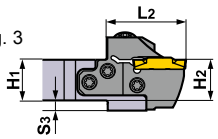
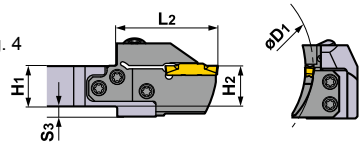


Fig. 4

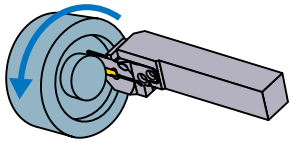
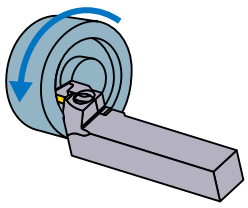


Left hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

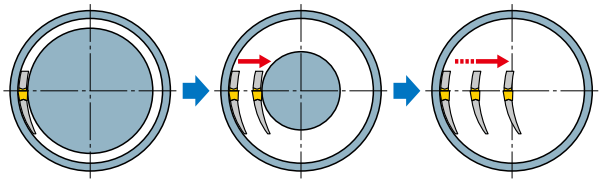
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗ Wrench
GYHL2020K00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M00-M25L			

Dimensions (mm) ∗2							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
20	20	125	39	20	26	5	3		GY2M0475H040N-GU GY2M0500H040N-GU	F014 ı F016
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4		GY2M0475H030N-GS GY2M0500H030N-GS	
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4		GY2M0475H040N-GM GY2M0500H040N-GM	
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4		GY2M0500H040R05-GM GY2M0500H040L05-GM	
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4			
25	25	150	39	25	28	—	1		GY2M0500H040N-MS GY2M0500H080N-MS (Gauge insert)	
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2		GY2M0500H040N-MM GY2M0500H080N-MM	
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2		GY2M0475H238N-BM GY2M0500H250N-BM	
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2		GY1G0475H020N-GFGS GY1G0500H020N-GFGS	
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			

Notes when selecting a modular blade (2)

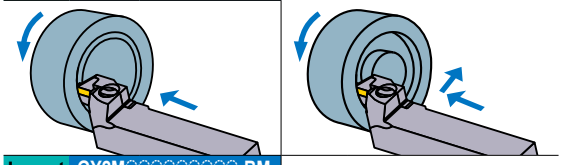
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



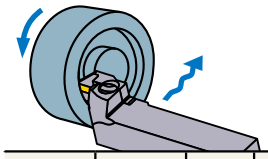
GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-GM
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

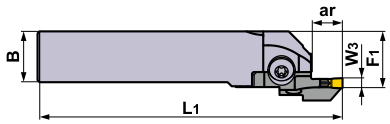


Fig. 1

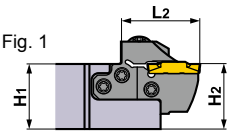
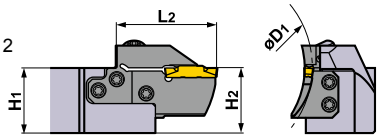


Fig. 2



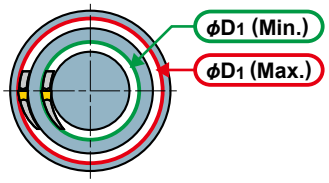
Left hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
H	4.75 5.00	*3 L	50	60	14	(4Q1L4H11)	GYM25LD-H14-050	●	GYHL3225P00-M25L	★
			60	85	14	(4Q1L4H12)	GYM25LD-H14-060	●		
					25 *1	(4Q1L4H22)	GYM25LD-H25-060	●		
			85	125	14	(4Q1L4H13)	GYM25LD-H14-085	●		
					25 *1	(4Q1L4H23)	GYM25LD-H25-085	●		
			125	200	14	(4Q1L4H14)	GYM25LD-H14-125	●		
					25 *1	(4Q1L4H24)	GYM25LD-H25-125	●		
			180	280	14	(4Q1L4H15)	GYM25LD-H14-180	●		
					25 *1	(4Q1L4H25)	GYM25LD-H25-180	●		
			250	999	14	(4Q1L4H16)	GYM25LD-H14-250	●		
					25 *1	(4Q1L4H26)	GYM25LD-H25-250	●		
			50	60	14	(4J1L4H11)	GYM25LD-H14-050	●	GYHL3232P00-M25L	★
			60	85	14	(4J1L4H12)	GYM25LD-H14-060	●		
					25 *1	(4J1L4H22)	GYM25LD-H25-060	●		
			85	125	14	(4J1L4H13)	GYM25LD-H14-085	●		
					25 *1	(4J1L4H23)	GYM25LD-H25-085	●		
			125	200	14	(4J1L4H14)	GYM25LD-H14-125	●		
					25 *1	(4J1L4H24)	GYM25LD-H25-125	●		
			180	280	14	(4J1L4H15)	GYM25LD-H14-180	●		
					25 *1	(4J1L4H25)	GYM25LD-H25-180	●		
			250	999	14	(4J1L4H16)	GYM25LD-H14-250	●		
					25 *1	(4J1L4H26)	GYM25LD-H25-250	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F148 for right hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

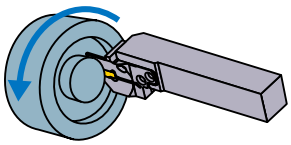
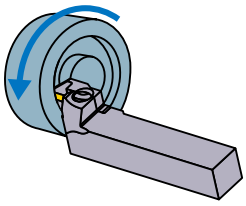


● : Inventory maintained. ★ : Inventory maintained in Japan.

* Wrench : ①For Clamp Screw ②For Blade Screw.

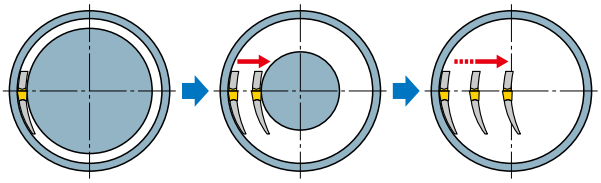
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	* Wrench
GYHL3225P00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL3232P00-M25L			

Dimensions (mm) *2						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
32	25	170	39	32	28	1		GY2M0475H040N-GU GY2M0500H040N-GU	F014 – F016
32	25	170	39	32	28	1			
32	25	181	50	32	28	2			
32	25	170	39	32	28	1		GY2M0475H030N-GS GY2M0500H030N-GS	
32	25	181	50	32	28	2			
32	25	170	39	32	28	1		GY2M0475H040N-GM GY2M0500H040N-GM	
32	25	181	50	32	28	2			
32	25	170	39	32	28	1		GY2M0500H040R05-GM GY2M0500H040L05-GM	
32	25	181	50	32	28	2			
32	25	170	39	32	28	1			
32	25	181	50	32	28	2			
32	32	170	39	32	35	1		GY2M0500H040N-MS GY2M0500H080N-MS (Gauge insert)	
32	32	170	39	32	35	1			
32	32	181	50	32	35	2			
32	32	170	39	32	35	1		GY2M0500H040N-MM GY2M0500H080N-MM	
32	32	181	50	32	35	2			
32	32	170	39	32	35	1		GY2M0475H238N-BM GY2M0500H250N-BM	
32	32	181	50	32	35	2			
32	32	170	39	32	35	1		GY1G0475H020N-GFGS GY1G0500H020N-GFGS	
32	32	181	50	32	35	2			
32	32	170	39	32	35	1			
32	32	181	50	32	35	2			

Notes when selecting a modular blade (2)

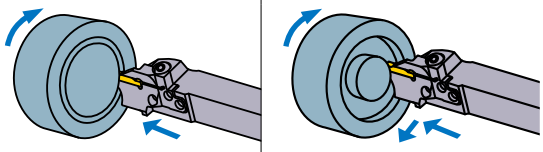
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



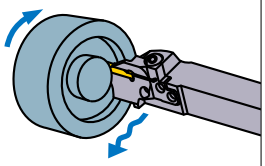
GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-GM
Insert GY2M○○○○○○○○○-MS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use right hand modular blade for right hand modular holder.

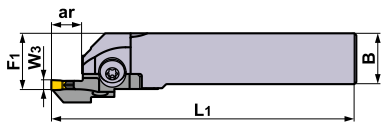




Fig. 1

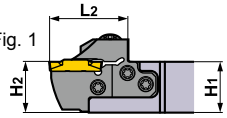
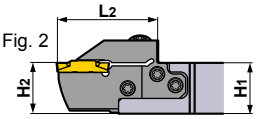


Fig. 2



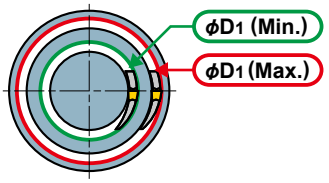
Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
J	6.00 6.35	*3 R	50	70	14	(4E1R4J11)	GYM25RD-J14-050	●	GYHR2020K00-M25R	●
			70	110	14	(4E1R4J12)	GYM25RD-J14-070	●		
					25 *1	(4E1R4J22)	GYM25RD-J25-070	●		
			110	200	14	(4E1R4J13)	GYM25RD-J14-110	●		
					25 *1	(4E1R4J23)	GYM25RD-J25-110	●		
			170	280	14	(4E1R4J14)	GYM25RD-J14-170	●		
					25 *1	(4E1R4J24)	GYM25RD-J25-170	●		
			250	999	14	(4E1R4J15)	GYM25RD-J14-250	●		
					25 *1	(4E1R4J25)	GYM25RD-J25-250	●		
			50	70	14	(4G1R4J11)	GYM25RD-J14-050	●	GYHR2525M00-M25R	●
			70	110	14	(4G1R4J12)	GYM25RD-J14-070	●		
					25 *1	(4G1R4J22)	GYM25RD-J25-070	●		
			110	200	14	(4G1R4J13)	GYM25RD-J14-110	●		
					25 *1	(4G1R4J23)	GYM25RD-J25-110	●		
			170	280	14	(4G1R4J14)	GYM25RD-J14-170	●		
					25 *1	(4G1R4J24)	GYM25RD-J25-170	●		
			250	999	14	(4G1R4J15)	GYM25RD-J14-250	●		
					25 *1	(4G1R4J25)	GYM25RD-J25-250	●		
			50	70	14	(4Q1R4J11)	GYM25RD-J14-050	●	GYHR3225P00-M25R	★
			70	110	14	(4Q1R4J12)	GYM25RD-J14-070	●		
					25 *1	(4Q1R4J22)	GYM25RD-J25-070	●		
			110	200	14	(4Q1R4J13)	GYM25RD-J14-110	●		
					25 *1	(4Q1R4J23)	GYM25RD-J25-110	●		
			170	280	14	(4Q1R4J14)	GYM25RD-J14-170	●		
					25 *1	(4Q1R4J24)	GYM25RD-J25-170	●		
			250	999	14	(4Q1R4J15)	GYM25RD-J14-250	●		
					25 *1	(4Q1R4J25)	GYM25RD-J25-250	●		
			50	70	14	(4J1R4J11)	GYM25RD-J14-050	●	GYHR3232P00-M25R	★
			70	110	14	(4J1R4J12)	GYM25RD-J14-070	●		
					25 *1	(4J1R4J22)	GYM25RD-J25-070	●		
			110	200	14	(4J1R4J13)	GYM25RD-J14-110	●		
					25 *1	(4J1R4J23)	GYM25RD-J25-110	●		
			170	280	14	(4J1R4J14)	GYM25RD-J14-170	●		
					25 *1	(4J1R4J24)	GYM25RD-J25-170	●		
			250	999	14	(4J1R4J15)	GYM25RD-J14-250	●		
					25 *1	(4J1R4J25)	GYM25RD-J25-250	●		

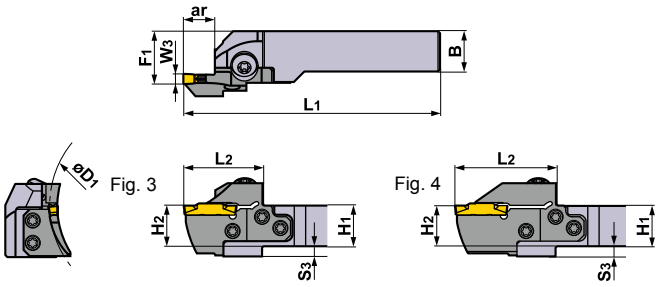
*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F156 for left hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained. ★ : Inventory maintained in Japan.

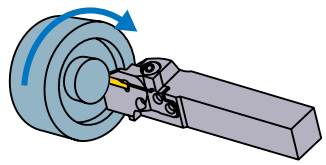
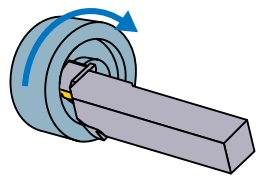


Right hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

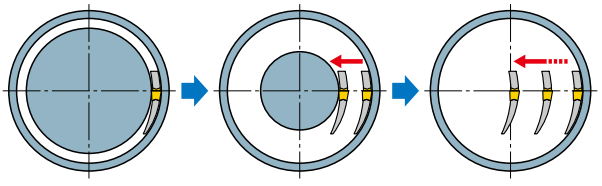
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗ Wrench (①, ②)
GYHR2020K00-M25R	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR2525M00-M25R			
GYHR3225P00-M25R			
GYHR3232P00-M25R			

Dimensions (mm) ∗2							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
20	20	125	39	20	26	5	3		GY2M0600J040N-GU GY2M0635J040N-GU	F014 ~ F016
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4			
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4			
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4			
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4			
25	25	150	39	25	28	—	1		GY2M0600J030N-GS GY2M0635J030N-GS	
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			
25	25	150	39	25	28	—	1		GY2M0600J040N-GM GY2M0635J040N-GM	
25	25	161	50	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			
32	25	170	39	32	28	—	1		GY2M0600J040N-MS GY2M0600J080N-MS (Gauge insert)	
32	25	170	39	32	28	—	1			
32	25	181	50	32	28	—	2			
32	25	170	39	32	28	—	1			
32	25	181	50	32	28	—	2			
32	25	170	39	32	28	—	1		GY2M0600J040N-MM GY2M0600J080N-MM	
32	25	181	50	32	28	—	2			
32	25	170	39	32	28	—	1			
32	25	181	50	32	28	—	2			
32	32	170	39	32	35	—	1		GY2M0600J300N-BM GY2M0635J318N-BM	
32	32	170	39	32	35	—	1			
32	32	181	50	32	35	—	2			
32	32	170	39	32	35	—	1			
32	32	181	50	32	35	—	2			
32	32	170	39	32	35	—	1			
32	32	181	50	32	35	—	2			
32	32	170	39	32	35	—	1			
32	32	181	50	32	35	—	2			

Notes when selecting a modular blade (2)

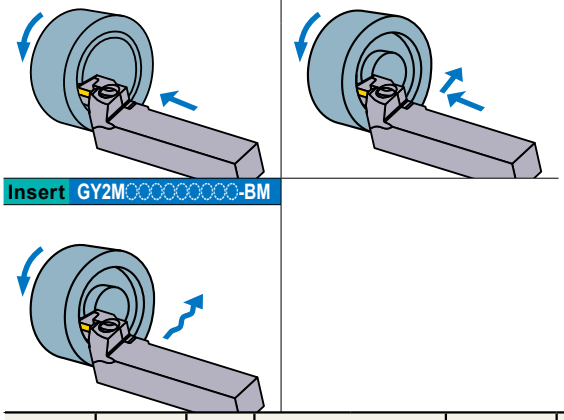
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



GY SERIES (FACE GROOVING)

3-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for left hand modular holder.

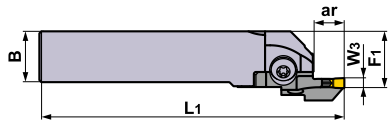


Fig. 1

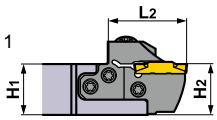
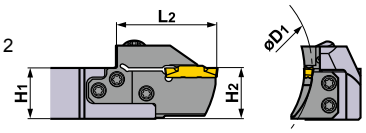


Fig. 2



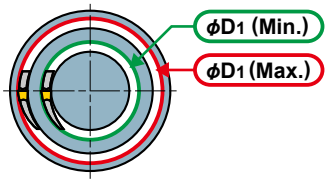
Left hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
J	6.00 6.35	*3 L	50	70	14	(4E1L4J11)	GYM25LD-J14-050	●	GYHL2020K00-M25L	●
			70	110	14	(4E1L4J12)	GYM25LD-J14-070	●		
					25 *1	(4E1L4J22)	GYM25LD-J25-070	●		
			110	200	14	(4E1L4J13)	GYM25LD-J14-110	●		
					25 *1	(4E1L4J23)	GYM25LD-J25-110	●		
			170	280	14	(4E1L4J14)	GYM25LD-J14-170	●		
					25 *1	(4E1L4J24)	GYM25LD-J25-170	●		
			250	999	14	(4E1L4J15)	GYM25LD-J14-250	●		
					25 *1	(4E1L4J25)	GYM25LD-J25-250	●		
			50	70	14	(4G1L4J11)	GYM25LD-J14-050	●	GYHL2525M00-M25L	●
			70	110	14	(4G1L4J12)	GYM25LD-J14-070	●		
					25 *1	(4G1L4J22)	GYM25LD-J25-070	●		
			110	200	14	(4G1L4J13)	GYM25LD-J14-110	●		
					25 *1	(4G1L4J23)	GYM25LD-J25-110	●		
			170	280	14	(4G1L4J14)	GYM25LD-J14-170	●		
					25 *1	(4G1L4J24)	GYM25LD-J25-170	●		
			250	999	14	(4G1L4J15)	GYM25LD-J14-250	●		
					25 *1	(4G1L4J25)	GYM25LD-J25-250	●		
			50	70	14	(4Q1L4J11)	GYM25LD-J14-050	●	GYHL3225P00-M25L	★
			70	110	14	(4Q1L4J12)	GYM25LD-J14-070	●		
					25 *1	(4Q1L4J22)	GYM25LD-J25-070	●		
			110	200	14	(4Q1L4J13)	GYM25LD-J14-110	●		
					25 *1	(4Q1L4J23)	GYM25LD-J25-110	●		
			170	280	14	(4Q1L4J14)	GYM25LD-J14-170	●		
					25 *1	(4Q1L4J24)	GYM25LD-J25-170	●		
			250	999	14	(4Q1L4J15)	GYM25LD-J14-250	●		
					25 *1	(4Q1L4J25)	GYM25LD-J25-250	●		
			50	70	14	(4J1L4J11)	GYM25LD-J14-050	●	GYHL3232P00-M25L	★
			70	110	14	(4J1L4J12)	GYM25LD-J14-070	●		
					25 *1	(4J1L4J22)	GYM25LD-J25-070	●		
			110	200	14	(4J1L4J13)	GYM25LD-J14-110	●		
					25 *1	(4J1L4J23)	GYM25LD-J25-110	●		
			170	280	14	(4J1L4J14)	GYM25LD-J14-170	●		
					25 *1	(4J1L4J24)	GYM25LD-J25-170	●		
			250	999	14	(4J1L4J15)	GYM25LD-J14-250	●		
					25 *1	(4J1L4J25)	GYM25LD-J25-250	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.
*3 Refer to page F154 for right hand tools.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.



● : Inventory maintained. ★ : Inventory maintained in Japan.

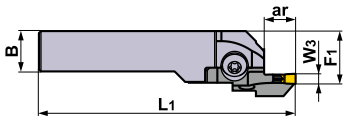


Fig. 3

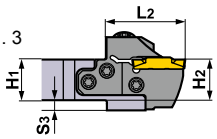
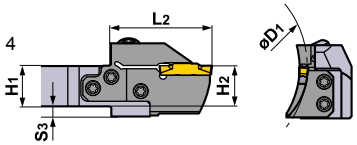


Fig. 4

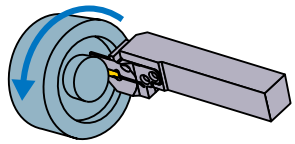
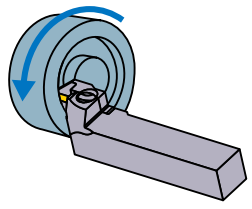


Left hand tool holder shown.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

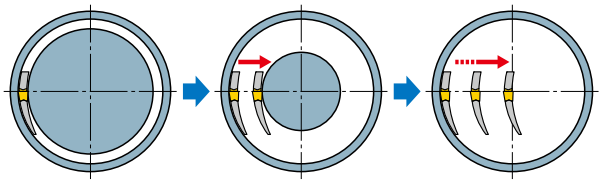
SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (5 pcs.)	∗ Wrench ①②
GYHL2020K00-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M00-M25L			
GYHL3225P00-M25L			
GYHL3232P00-M25L			

Dimensions (mm) ∗2							Fig.	Cutting Mode	Insert	
H1	B	L1	L2	H2	F1	S3			Geometry / Insert Number	Page
20	20	125	39	20	26	5	3		 GY2M0600J040N-GU GY2M0635J040N-GU  GY2M0600J030N-GS GY2M0635J030N-GS  GY2M0600J040N-GM GY2M0635J040N-GM  GY2M0600J040N-MS GY2M0600J080N-MS (Gauge insert)  GY2M0600J040N-MM GY2M0600J080N-MM  GY2M0600J300N-BM GY2M0635J318N-BM	F014 – F016
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4			
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4			
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4			
20	20	125	39	20	26	5	3			
20	20	136	50	20	26	5	4			
25	25	150	39	25	28	—	1			
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			
25	25	150	39	25	28	—	1			
25	25	161	50	25	28	—	2			
32	25	170	39	32	28	—	1			
32	25	170	39	32	28	—	1			
32	25	181	50	32	28	—	2			
32	25	170	39	32	28	—	1			
32	25	181	50	32	28	—	2			
32	25	170	39	32	28	—	1			
32	25	181	50	32	28	—	2			
32	25	170	39	32	28	—	1			
32	25	181	50	32	28	—	2			
32	32	170	39	32	35	—	1			
32	32	170	39	32	35	—	1			
32	32	181	50	32	35	—	2			
32	32	170	39	32	35	—	1			
32	32	181	50	32	35	—	2			
32	32	170	39	32	35	—	1			
32	32	181	50	32	35	—	2			
32	32	170	39	32	35	—	1			
32	32	181	50	32	35	—	2			

Notes when selecting a modular blade (2)

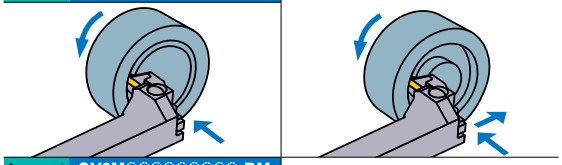
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



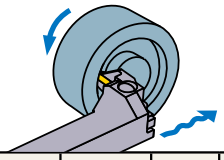
GY SERIES (FACE GROOVING)

4-2 90° type holder (Metric)

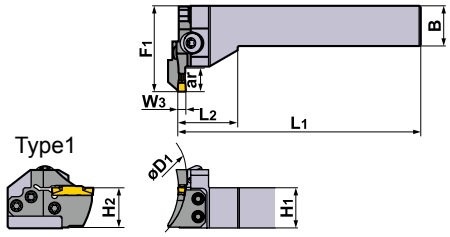
Insert GY2M○○○○○○○○○-GS GM
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF GS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.



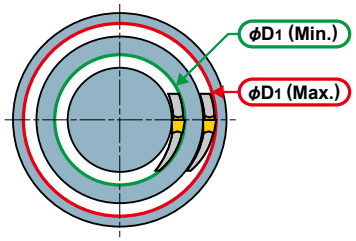
Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
NEW D	2.00	R	40	50	12	(5G1R4D11)	GYM25LD-D12-040	●	GYHR2525M90-M25L	●
			50	60	12	(5G1R4D12)	GYM25LD-D12-050	●		
			60	75	12	(5G1R4D13)	GYM25LD-D12-060	●		
			75	100	12	(5G1R4D14)	GYM25LD-D12-075	●		
			100	150	12	(5G1R4D15)	GYM25LD-D12-100	●		
			135	200	12	(5G1R4D16)	GYM25LD-D12-135	●		
			180	250	12	(5G1R4D17)	GYM25LD-D12-180	●		
		L	40	50	12	(5G1L4D11)	GYM25RD-D12-040	●	GYHL2525M90-M25R	●
			50	60	12	(5G1L4D12)	GYM25RD-D12-050	●		
			60	75	12	(5G1L4D13)	GYM25RD-D12-060	●		
			75	100	12	(5G1L4D14)	GYM25RD-D12-075	●		
			100	150	12	(5G1L4D15)	GYM25RD-D12-100	●		
			135	200	12	(5G1L4D16)	GYM25RD-D12-135	●		
			180	250	12	(5G1L4D17)	GYM25RD-D12-180	●		

*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

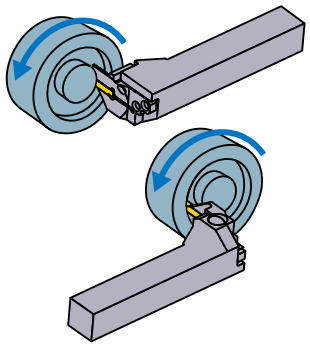
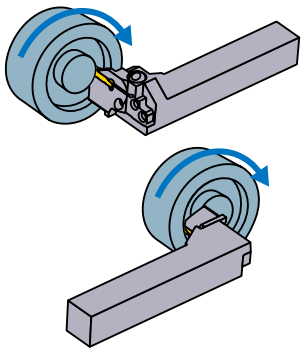


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

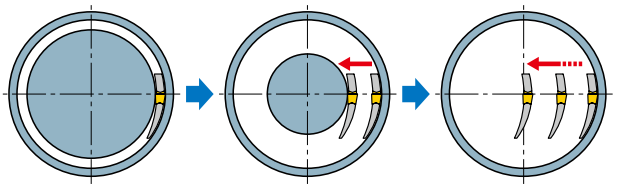
SPARE PARTS

Modular 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						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
25	25	150	38	25	53	1		GY2M0200D020N-GU GY2M0200D020N-GS GY2M0200D020N-GM GY2M0200D020R05-GM GY2M0200D020L05-GM GY2M0200D020N-MS (Gauge insert) GY2M0200D020N-MM GY2M0200D100N-BM GY1G0200D020N-GFGS	F014 – F016
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			

Notes when selecting a modular blade (2)

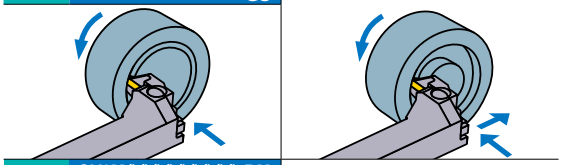
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



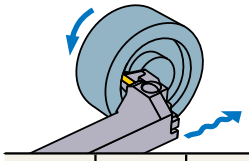
GY SERIES (FACE GROOVING)

4-2 90° type holder (Metric)

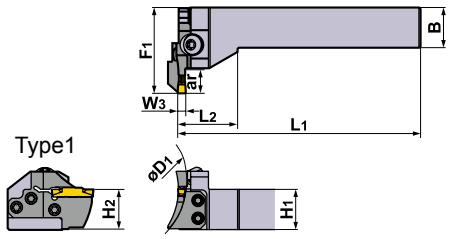
Insert GY2M○○○○○○○○○-GS/GM
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF/GS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.



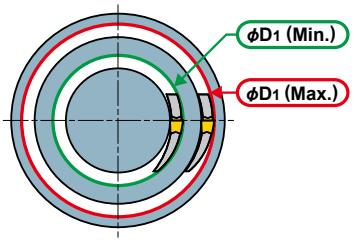
Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
NEW E	2.39 2.50	R	40	50	12	(5G1R4E11)	GYM25LD-E12-040	●	GYHR2525M90-M25L	●
			50	60	12	(5G1R4E12)	GYM25LD-E12-050	●		
			60	75	12	(5G1R4E13)	GYM25LD-E12-060	●		
			75	100	12	(5G1R4E14)	GYM25LD-E12-075	●		
			100	150	12	(5G1R4E15)	GYM25LD-E12-100	●		
			135	200	12	(5G1R4E16)	GYM25LD-E12-135	●		
			180	250	12	(5G1R4E17)	GYM25LD-E12-180	●		
		L	40	50	12	(5G1L4E11)	GYM25RD-E12-040	●	GYHL2525M90-M25R	●
			50	60	12	(5G1L4E12)	GYM25RD-E12-050	●		
			60	75	12	(5G1L4E13)	GYM25RD-E12-060	●		
			75	100	12	(5G1L4E14)	GYM25RD-E12-075	●		
			100	150	12	(5G1L4E15)	GYM25RD-E12-100	●		
			135	200	12	(5G1L4E16)	GYM25RD-E12-135	●		
			180	250	12	(5G1L4E17)	GYM25RD-E12-180	●		

*1 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

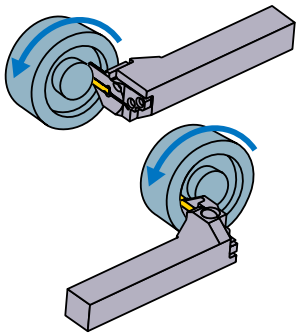
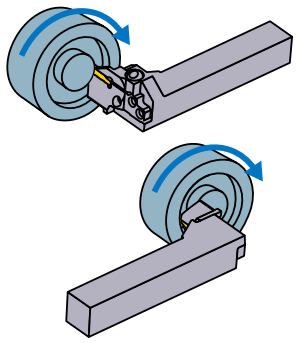


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

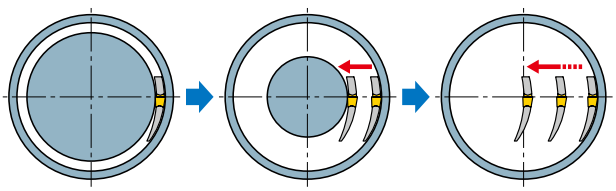
SPARE PARTS

Modular 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						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
25	25	150	38	25	53	1		GY2M0239E020N-GU GY2M0250E020N-GU GY2M0239E020N-GS GY2M0250E020N-GS GY2M0239E020N-GM GY2M0250E020N-GM GY2M0250E020R05-GM GY2M0250E020L05-GM GY2M0250E020N-MS (Gauge insert) GY2M0250E020N-MM GY2M0250E125N-BM GY1G0239E020N-GFGS GY1G0250E020N-GFGS	F014 ı F016
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			

Notes when selecting a modular blade (2)

- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.

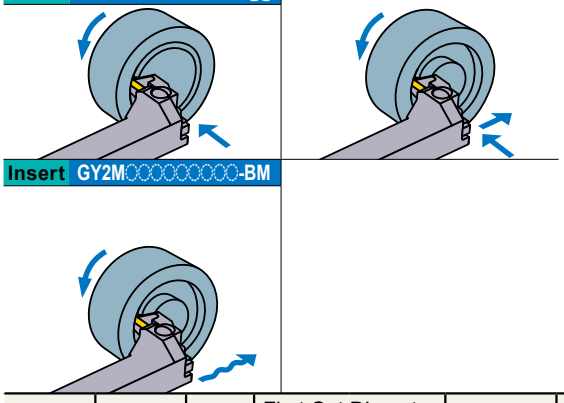


GROOVING

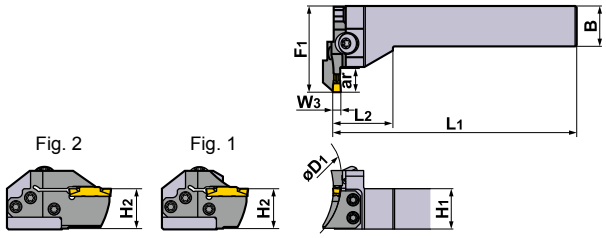
GY SERIES (FACE GROOVING)

4-2 90° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.



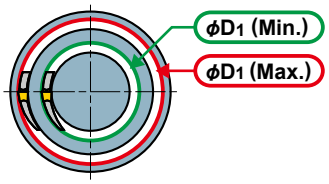
Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Modular Holder	Stock
F	3.00 3.18	R	35	40	12	(5G1R4F11)	GYM25LD-F12-035	●	GYHR2525M90-M25L	●
			40	50	12	(5G1R4F12)	GYM25LD-F12-040	●		
			50	60	12	(5G1R4F13)	GYM25LD-F12-050	●		
			60	75	12	(5G1R4F14)	GYM25LD-F12-060	●		
					20 *1	(5G1R4F24)	GYM25LD-F20-060	●		
			75	100	12	(5G1R4F15)	GYM25LD-F12-075	●		
					20 *1	(5G1R4F25)	GYM25LD-F20-075	●		
			100	150	12	(5G1R4F16)	GYM25LD-F12-100	●		
					20 *1	(5G1R4F26)	GYM25LD-F20-100	●		
			135	200	12	(5G1R4F17)	GYM25LD-F12-135	●		
					20 *1	(5G1R4F27)	GYM25LD-F20-135	●		
			180	250	12	(5G1R4F18)	GYM25LD-F12-180	●		
					20 *1	(5G1R4F28)	GYM25LD-F20-180	●		
			NEW 225	999	12	(5G1R4F19)	GYM25LD-F12-225	●		
					20 *1	(5G1R4F29)	GYM25LD-F20-225	●		
		L	35	40	12	(5G1L4F11)	GYM25RD-F12-035	●	GYHL2525M90-M25R	●
			40	50	12	(5G1L4F12)	GYM25RD-F12-040	●		
			50	60	12	(5G1L4F13)	GYM25RD-F12-050	●		
			60	75	12	(5G1L4F14)	GYM25RD-F12-060	●		
					20 *1	(5G1L4F24)	GYM25RD-F20-060	●		
			75	100	12	(5G1L4F15)	GYM25RD-F12-075	●		
					20 *1	(5G1L4F25)	GYM25RD-F20-075	●		
			100	150	12	(5G1L4F16)	GYM25RD-F12-100	●		
					20 *1	(5G1L4F26)	GYM25RD-F20-100	●		
			135	200	12	(5G1L4F17)	GYM25RD-F12-135	●		
					20 *1	(5G1L4F27)	GYM25RD-F20-135	●		
			180	250	12	(5G1L4F18)	GYM25RD-F12-180	●		
					20 *1	(5G1L4F28)	GYM25RD-F20-180	●		
			NEW 225	999	12	(5G1L4F19)	GYM25RD-F12-225	●		
					20 *1	(5G1L4F29)	GYM25RD-F20-225	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

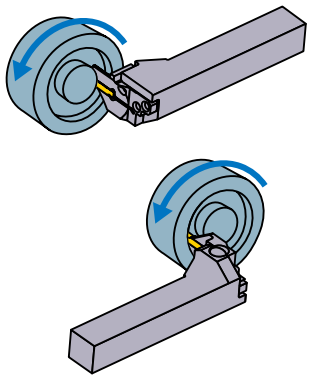
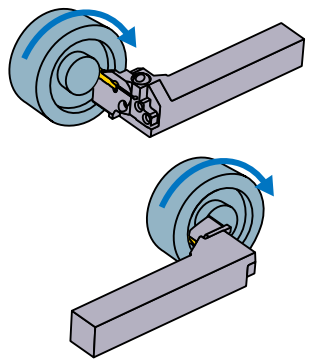


● : **Inventory maintained.**

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

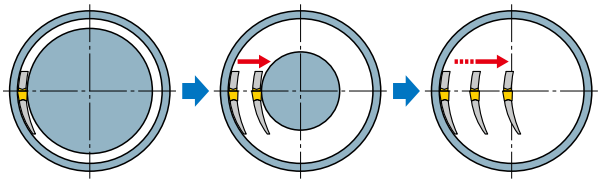
SPARE PARTS

Modular 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) ∗2						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
25	25	150	38	25	53	1		GY2M0300F020N-GS GY2M0318F020N-GS GY2M0300F030N-GM GY2M0318F030N-GM GY2M0300F030R05-GM GY2M0300F030L05-GM GY2M0300F020N-MS GY2M0300F040N-MS (Gauge insert) GY2M0300F020N-MM GY2M0300F040N-MM GY2M0300F080N-MM GY2M0300F150N-BM GY2M0318F159N-BM GY1G0300F020N-GFGS GY1G0318F020N-GFGS	F014 – F016
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	59	2			
25	25	150	38	25	53	1			
25	25	150	38	25	59	2			
25	25	150	38	25	53	1			
25	25	150	38	25	59	2			
25	25	150	38	25	53	1			
25	25	150	38	25	59	2			
25	25	150	38	25	53	1			
25	25	150	38	25	59	2			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	59	2			
25	25	150	38	25	53	1			
25	25	150	38	25	59	2			
25	25	150	38	25	53	1			
25	25	150	38	25	59	2			
25	25	150	38	25	53	1			
25	25	150	38	25	59	2			
25	25	150	38	25	53	1			
25	25	150	38	25	59	2			

Notes when selecting a modular blade (2)

- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.

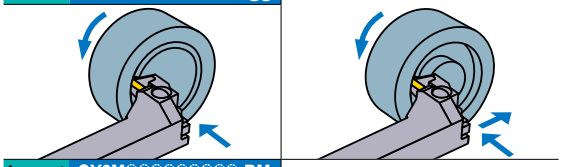


GROOVING

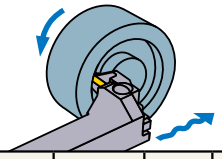
GY SERIES (FACE GROOVING)

4-2 90° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-GM
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GF GS



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.

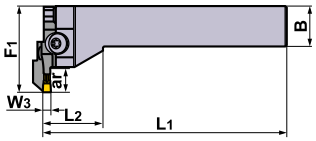


Fig. 2

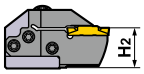
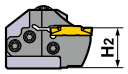
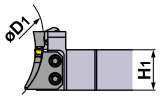


Fig. 1





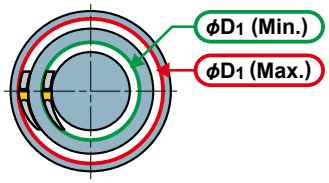
Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
G	4.00	R	40	50	14	(5G1R4G11)	GYM25LD-G14-040	●	GYHR2525M90-M25L	●
			50	60	14	(5G1R4G12)	GYM25LD-G14-050	●		
			60	85	14	(5G1R4G13)	GYM25LD-G14-060	●		
					25 *1	(5G1R4G23)	GYM25LD-G25-060	●		
			85	125	14	(5G1R4G14)	GYM25LD-G14-085	●		
					25 *1	(5G1R4G24)	GYM25LD-G25-085	●		
			125	200	14	(5G1R4G15)	GYM25LD-G14-125	●		
					25 *1	(5G1R4G25)	GYM25LD-G25-125	●		
			180	280	14	(5G1R4G16)	GYM25LD-G14-180	●		
					25 *1	(5G1R4G26)	GYM25LD-G25-180	●		
			250	999	14	(5G1R4G17)	GYM25LD-G14-250	●		
					25 *1	(5G1R4G27)	GYM25LD-G25-250	●		
		L	40	50	14	(5G1L4G11)	GYM25RD-G14-040	●	GYHL2525M90-M25R	●
			50	60	14	(5G1L4G12)	GYM25RD-G14-050	●		
			60	85	14	(5G1L4G13)	GYM25RD-G14-060	●		
					25 *1	(5G1L4G23)	GYM25RD-G25-060	●		
			85	125	14	(5G1L4G14)	GYM25RD-G14-085	●		
					25 *1	(5G1L4G24)	GYM25RD-G25-085	●		
			125	200	14	(5G1L4G15)	GYM25RD-G14-125	●		
					25 *1	(5G1L4G25)	GYM25RD-G25-125	●		
			180	280	14	(5G1L4G16)	GYM25RD-G14-180	●		
					25 *1	(5G1L4G26)	GYM25RD-G25-180	●		
			250	999	14	(5G1L4G17)	GYM25RD-G14-250	●		
					25 *1	(5G1L4G27)	GYM25RD-G25-250	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

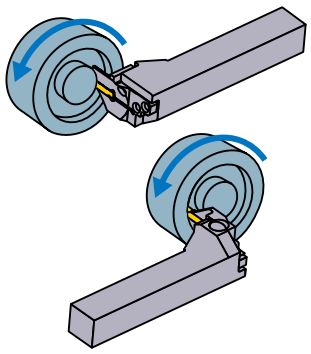
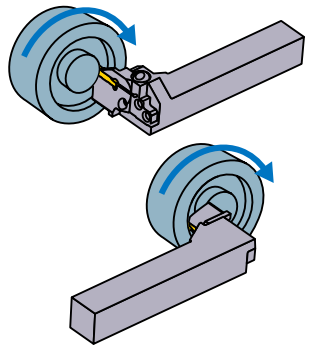


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

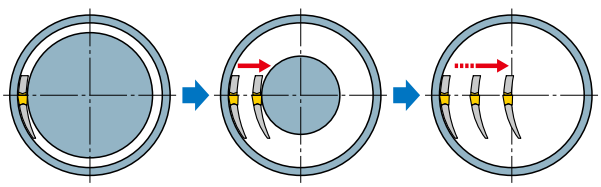
SPARE PARTS

Modular 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) *2						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
25	25	150	38	25	53	1		GY2M0400G030N-GU GY2M0400G020N-GS GY2M0400G030N-GM GY2M0400G030R05-GM GY2M0400G030L05-GM GY2M0400G020N-MS GY2M0400G040N-MS (Gauge insert) GY2M0400G020N-MM GY2M0400G040N-MM GY2M0400G080N-MM GY2M0400G200N-BM GY1G0400G020N-GFGS	F014 ı F016
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			

Notes when selecting a modular blade (2)

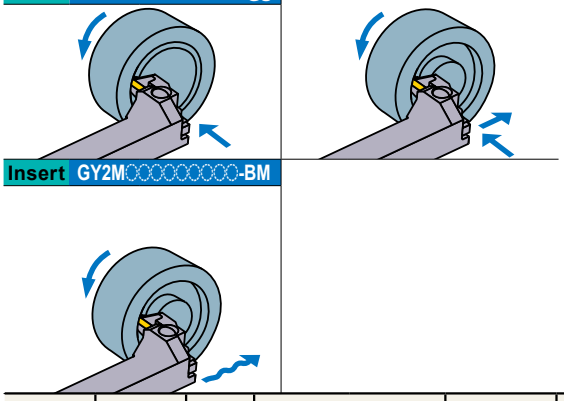
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.



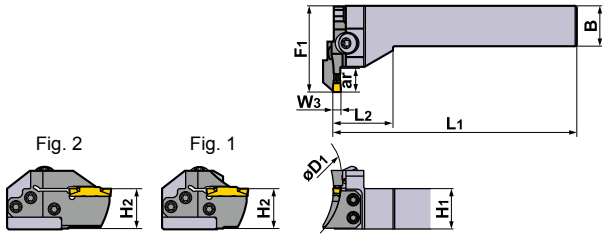
GY SERIES (FACE GROOVING)

4-2 90° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.



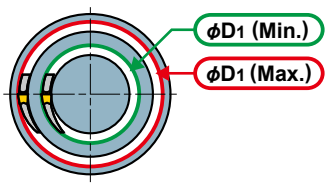
Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
H	4.75 5.00	R	50	60	14	(5G1R4H11)	GYM25LD-H14-050	●	GYHR2525M90-M25L	●
			60	85	14	(5G1R4H12)	GYM25LD-H14-060	●		
					25 *1	(5G1R4H22)	GYM25LD-H25-060	●		
			85	125	14	(5G1R4H13)	GYM25LD-H14-085	●		
					25 *1	(5G1R4H23)	GYM25LD-H25-085	●		
			125	200	14	(5G1R4H14)	GYM25LD-H14-125	●		
					25 *1	(5G1R4H24)	GYM25LD-H25-125	●		
			180	280	14	(5G1R4H15)	GYM25LD-H14-180	●		
					25 *1	(5G1R4H25)	GYM25LD-H25-180	●		
			250	999	14	(5G1R4H16)	GYM25LD-H14-250	●		
					25 *1	(5G1R4H26)	GYM25LD-H25-250	●		
		L	50	60	14	(5G1L4H11)	GYM25RD-H14-050	●	GYHL2525M90-M25R	●
			60	85	14	(5G1L4H12)	GYM25RD-H14-060	●		
					25 *1	(5G1L4H22)	GYM25RD-H25-060	●		
			85	125	14	(5G1L4H13)	GYM25RD-H14-085	●		
					25 *1	(5G1L4H23)	GYM25RD-H25-085	●		
			125	200	14	(5G1L4H14)	GYM25RD-H14-125	●		
					25 *1	(5G1L4H24)	GYM25RD-H25-125	●		
			180	280	14	(5G1L4H15)	GYM25RD-H14-180	●		
					25 *1	(5G1L4H25)	GYM25RD-H25-180	●		
			250	999	14	(5G1L4H16)	GYM25RD-H14-250	●		
					25 *1	(5G1L4H26)	GYM25RD-H25-250	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

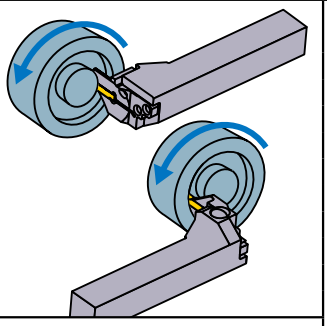
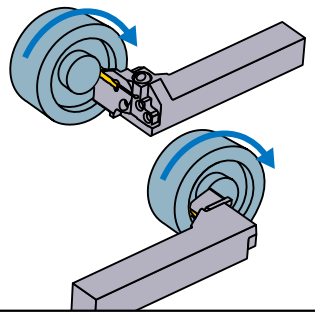


● : Inventory maintained.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

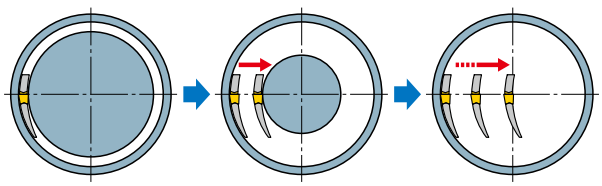
SPARE PARTS

Modular 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) ∗2						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
25	25	150	38	25	53	1		GY2M0475H040N-GU GY2M0500H040N-GU GY2M0475H030N-GS GY2M0500H030N-GS GY2M0475H040N-GM GY2M0500H040N-GM GY2M0500H040R05-GM GY2M0500H040L05-GM	F014 – F016
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1		GY2M0500H040N-MS GY2M0500H080N-MS (Gauge insert) GY2M0500H040N-MM GY2M0500H080N-MM GY2M0475H238N-BM GY2M0500H250N-BM GY1G0475H020N-GFGS GY1G0500H020N-GFGS	
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			

Notes when selecting a modular blade (2)

- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.

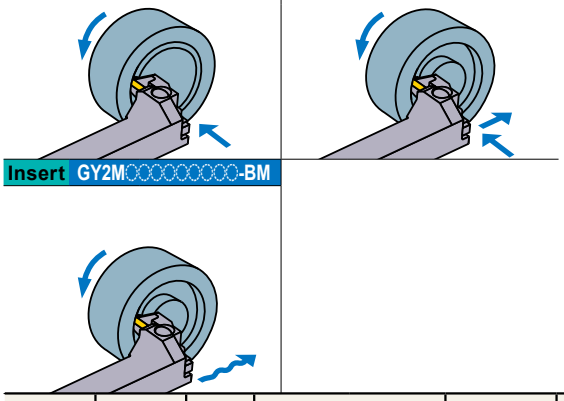


GROOVING

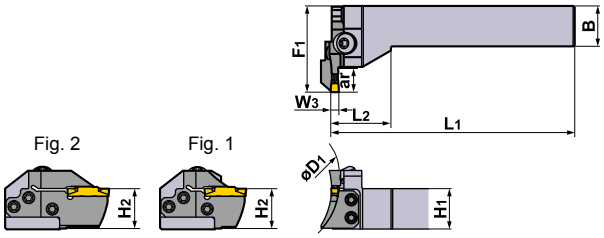
GY SERIES (FACE GROOVING)

4-2 90° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-GM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.



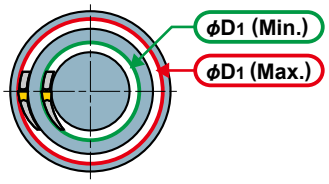
Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	First Cut Diameter D1 (mm) Min.	First Cut Diameter D1 (mm) Max.	Max. Groove Depth ar (mm)	ID	Order Number: Modular Blade	Stock	Order Number: Modular Holder	Stock
J	6.00 6.35	R	50	70	14	(5G1R4J11)	**GYM25LD-J14-050**	●	**GYHR2525M90-M25L**	●
			70	110	14	(5G1R4J12)	**GYM25LD-J14-070**	●		
					25 *1	(5G1R4J22)	**GYM25LD-J25-070**	●		
			110	200	14	(5G1R4J13)	**GYM25LD-J14-110**	●		
					25 *1	(5G1R4J23)	**GYM25LD-J25-110**	●		
			170	280	14	(5G1R4J14)	**GYM25LD-J14-170**	●		
					25 *1	(5G1R4J24)	**GYM25LD-J25-170**	●		
			250	999	14	(5G1R4J15)	**GYM25LD-J14-250**	●		
					25 *1	(5G1R4J25)	**GYM25LD-J25-250**	●		
		L	50	70	14	(5G1L4J11)	**GYM25RD-J14-050**	●	**GYHL2525M90-M25R**	●
			70	110	14	(5G1L4J12)	**GYM25RD-J14-070**	●		
					25 *1	(5G1L4J22)	**GYM25RD-J25-070**	●		
			110	200	14	(5G1L4J13)	**GYM25RD-J14-110**	●		
					25 *1	(5G1L4J23)	**GYM25RD-J25-110**	●		
			170	280	14	(5G1L4J14)	**GYM25RD-J14-170**	●		
					25 *1	(5G1L4J24)	**GYM25RD-J25-170**	●		
			250	999	14	(5G1L4J15)	**GYM25RD-J14-250**	●		
					25 *1	(5G1L4J25)	**GYM25RD-J25-250**	●		

*1 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F014-F016.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L2, F1** and **D1** values may vary.

Notes when selecting a modular blade (1)

● Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D1 minimum and D1 maximum that are described in the table of dimensions.

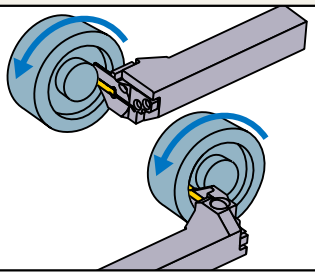
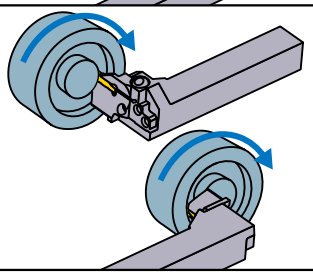


● : Inventory maintained.

* Wrench : ①For Clamp Screw ②For Blade Screw.

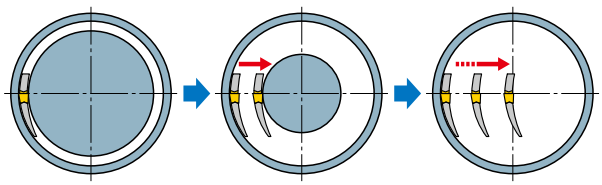
SPARE PARTS

Modular 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) *2						Fig.	Cutting Mode	Insert	
H_1	B	L_1	L_2	H_2	F_1			Geometry / Insert Number	Page
25	25	150	38	25	53	1		GY2M0600J040N-GU GY2M0635J040N-GU GY2M0600J030N-GS GY2M0635J030N-GS GY2M0600J040N-GM GY2M0635J040N-GM	F014 I F016
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1		GY2M0600J040N-MS GY2M0600J080N-MS (Gauge insert) GY2M0600J040N-MM GY2M0600J080N-MM GY2M0600J300N-BM GY2M0635J318N-BM	
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			
25	25	150	38	25	53	1			
25	25	150	38	25	64	2			

Notes when selecting a modular blade (2)

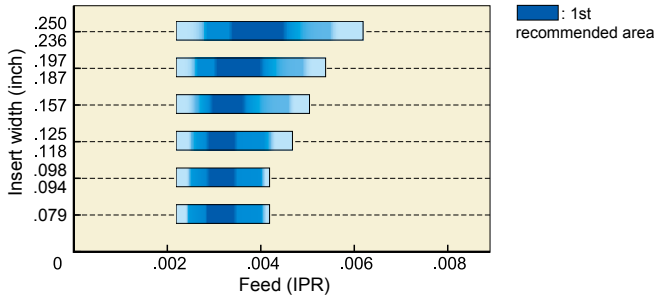
- When machining wide face grooves, select a modular blade suitable for the maximum diameter and machine from the outer diameter towards the center.
- When machining toward the center, there is no restriction cutting diameter.
- For details, please refer to page F172.

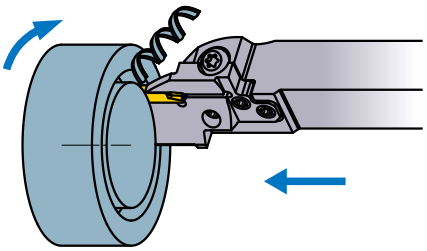


GROOVING

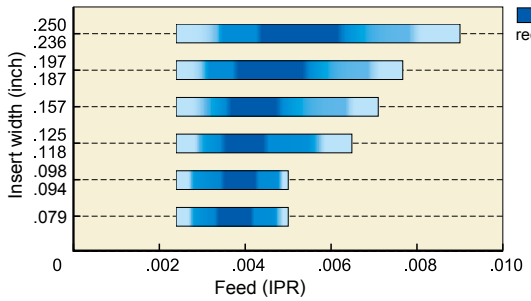
Recommended Cutting Conditions (Face Grooving)

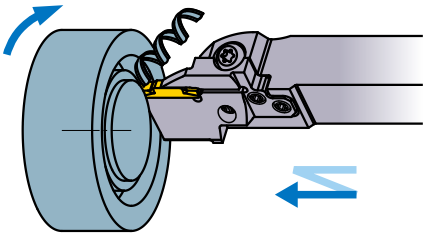
Grooving





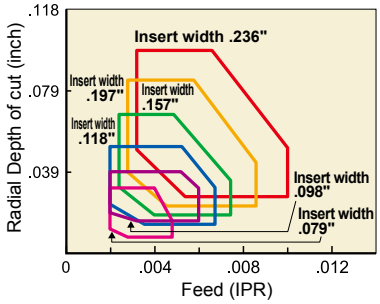
Plunging

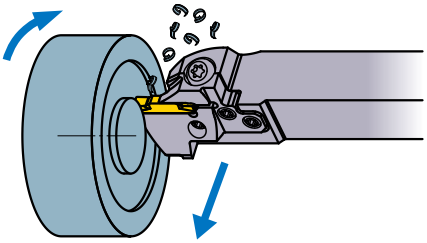




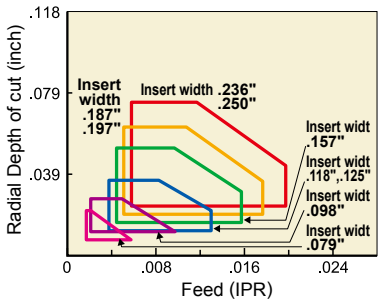
* After the 1st plunge, the width of cut should be set narrower than insert with W3.

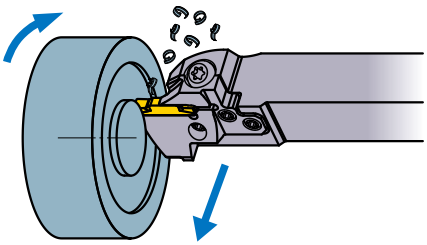
Traverse Machining (MM/MS Breaker)



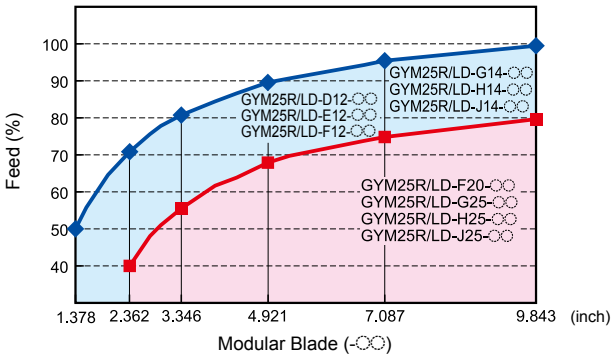


Traverse Machining (BM Breaker)





Relationship between the modular blade and feed per rotation



(Note) Adjust the feed per rotation in the cutting conditions to the percentage shown in the table above.

Recommended Cutting Speed (SFM)

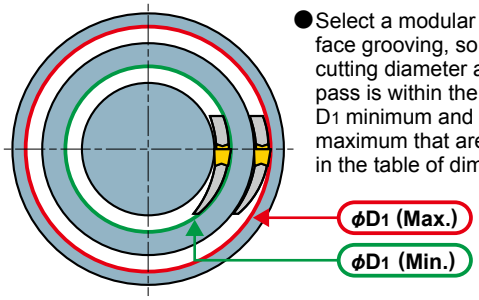
	Work Material	Hardness	Insert Grade	Cutting Speed (SFM) 165 330 495 660 825 990
P	Mild Steel	≤160HB	VP20RT	260 – 590
			VP10RT	295 – 625
			MY5015	360 – 825
			NX2525	230 – 560
	Carbon Steel Alloy Steel	160-280HB	VP20RT	195 – 460
			VP10RT	230 – 495
			MY5015	295 – 690
			NX2525	180 – 440
		≥280HB	VP20RT	165 – 360
			VP10RT	195 – 390
			MY5015	260 – 525
			NX2525	150 – 345
M	Stainless Steel	≤270HB	VP20RT	165 – 360
			VP10RT	195 – 390
K	Cast Iron	Tensile Strength ≤300MPa	VP20RT	195 – 460
			VP10RT	230 – 495
			MY5015	295 – 690
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP20RT	165 – 360
			VP10RT	195 – 390
			MY5015	260 – 525
S	Heat Resistant Alloy Titanium Alloy	–	VP20RT	100 – 195
			VP10RT	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.

TOOL SELECTION

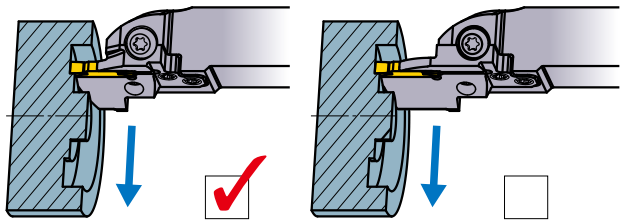
Notes when selecting the tool body

Modular blade (1)



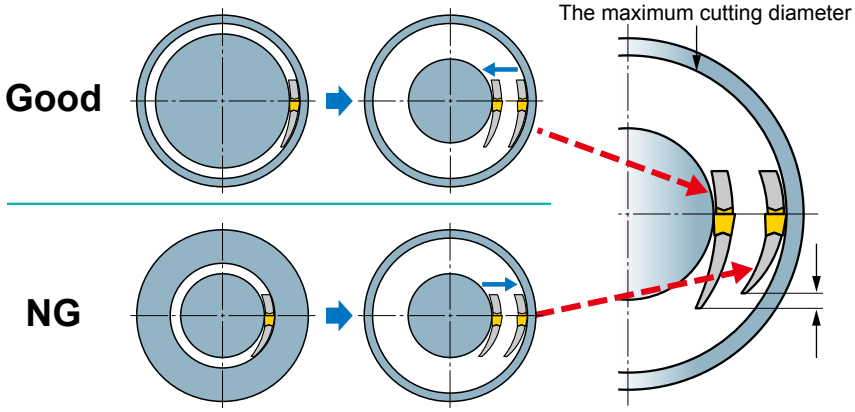
- Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of D_1 minimum and D_1 maximum that are described in the table of dimensions.

Modular blade (2)



- Select the shortest possible blade suitable for the application.

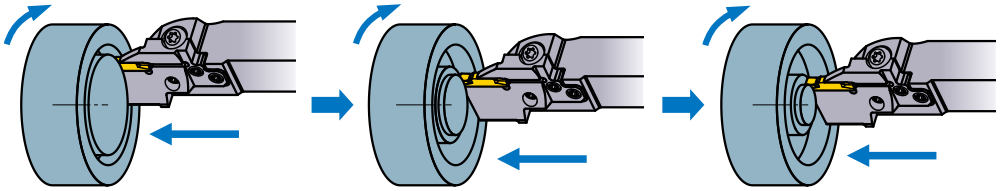
Modular blade (3)



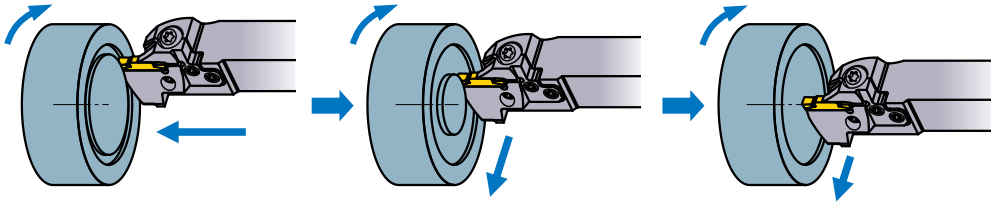
- Select the largest size blade within the maximum cutting diameter of the workpiece.
- Machine from the outer diameter towards the center.
- Increased machining stability and rigidity is possible if a modular blade with the largest possible back metal is used.

- At first, machine the maximum cutting diameter, there is no restriction in the cutting diameter on the remaining process.

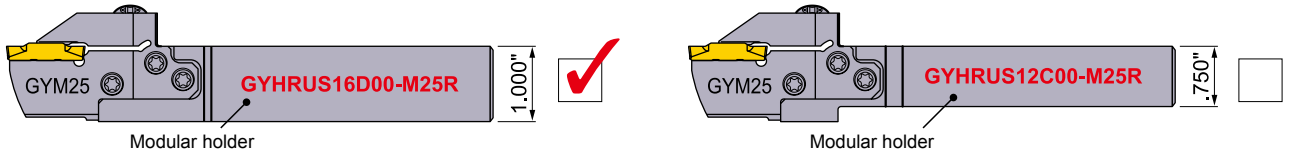
- When plunging in several passes.



- When combining plunging and infeed machining.



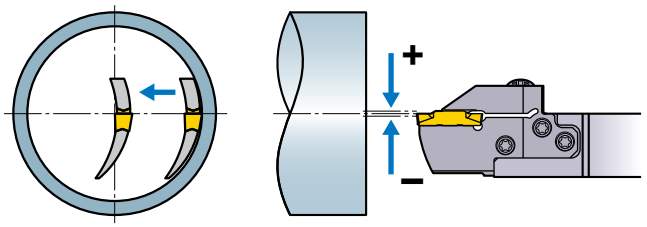
Modular holder



- To ensure sufficient clamping rigidity, select a modular holder with the largest possible shank size.

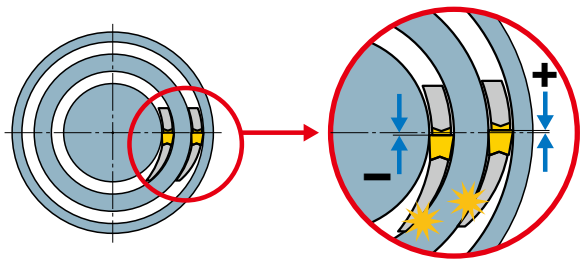
Notes when setting the tool

Setting the cutting edge height



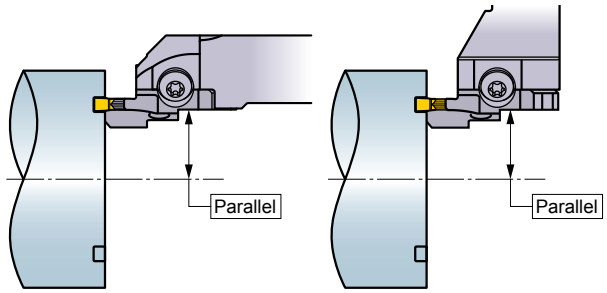
- Set the cutting edge height to ±.004" parallel to the central axis.
- Cutting edge center height check should be done by traverse machining towards the center with a very small depth of cut and ensure that an even surface and no material remains at the center point afterwards.

When interfering the wall of groove and the Modular blade



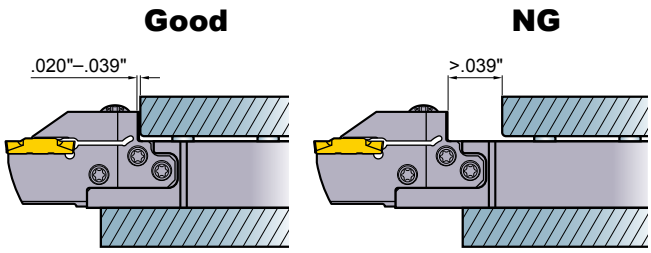
- If interference occurs even when the correct blade is used, the cutting edge height could be incorrect.
  - When interference occurs on the inner side of the blade, the cutting edge height is set too high.
  - When interference occurs on the outer side of the blade, the cutting edge height is set too 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.

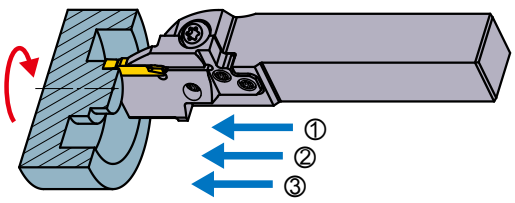
GROOVING

MACHINING RECOMMENDATIONS

Notes when face grooving (1)

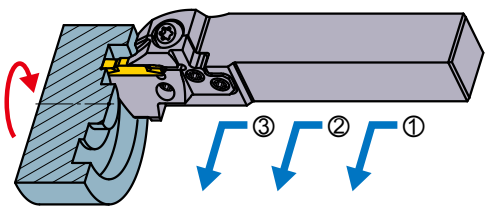
- **Always machine from the outer diameter towards the center.**

Machining narrow grooves



- Plunging in several passes is recommended.

Machining wide grooves

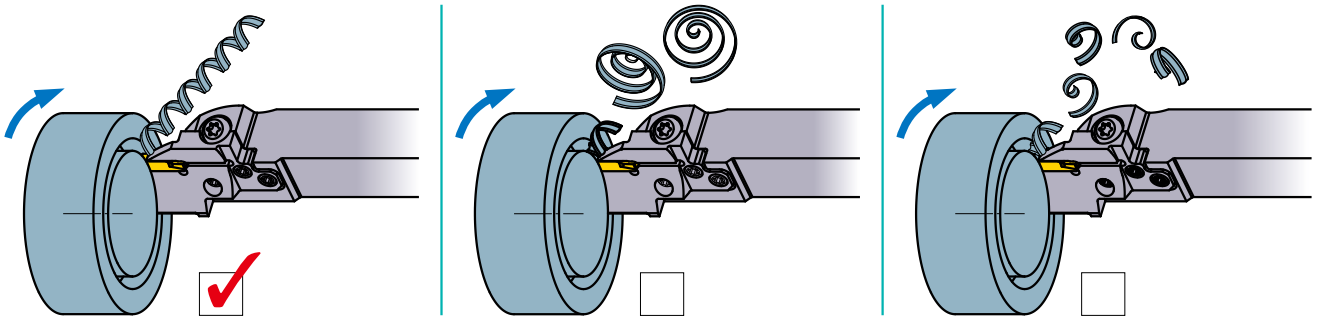


- Cross feed machining is recommended.

MACHINING RECOMMENDATIONS

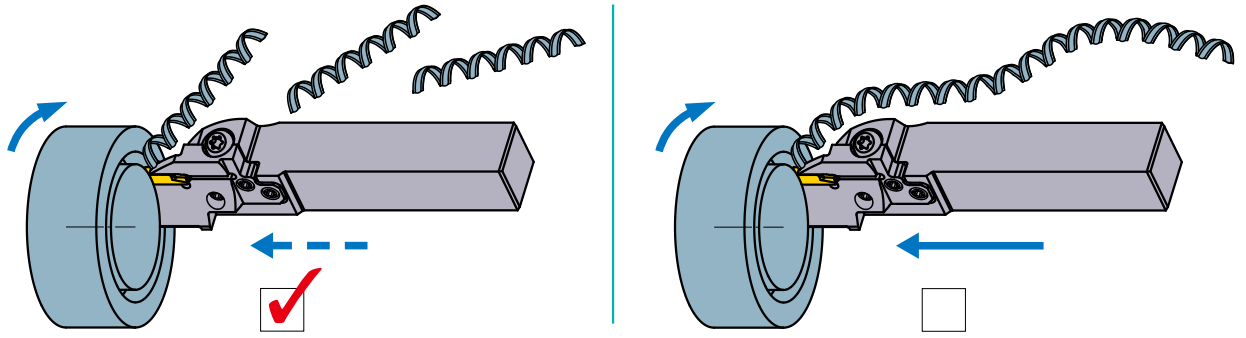
Notes when face grooving (2)

Notes on the first pass (1)



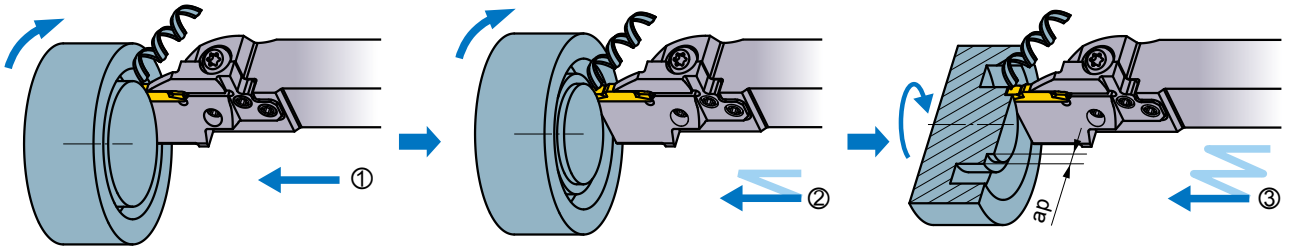
●During the first face grooving pass it is difficult to disperse broken chips and can lead to problems such as a chipped insert. Maintain longer chips that disperse easily by decreasing the feed per rotation.

Notes on the first pass (2)



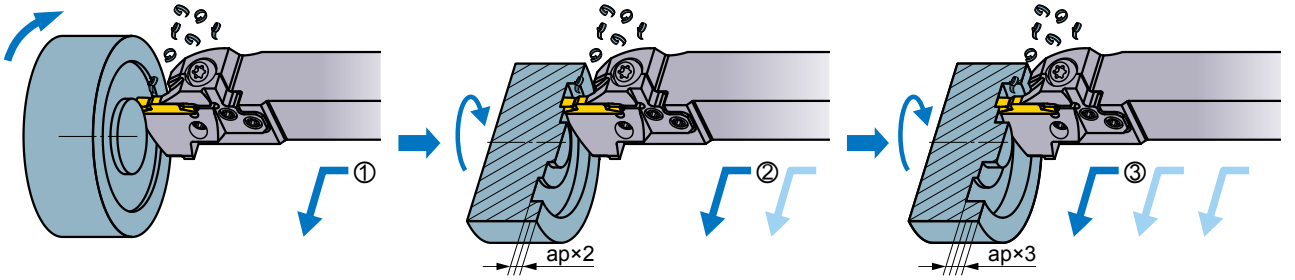
●When chips become too long, use peck feed to break them into a suitable length.

Notes when wide face grooving by plunging in several passes.



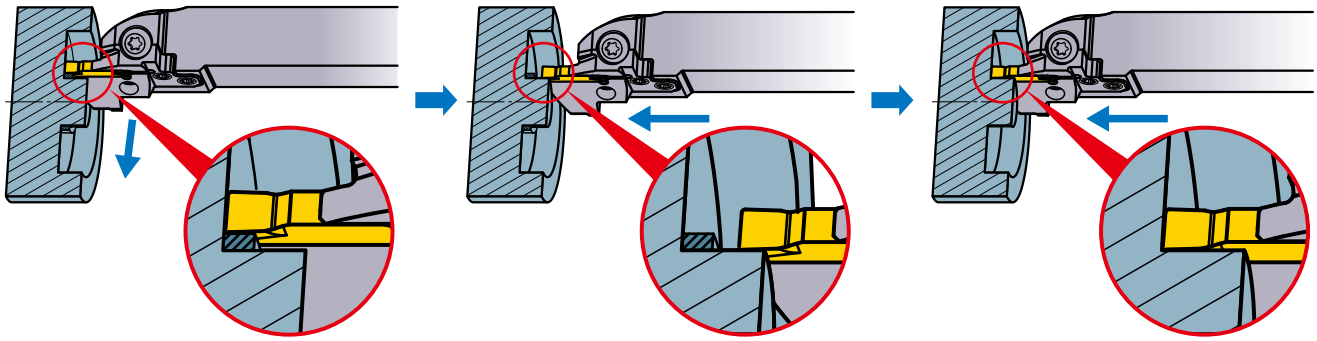
●When machining a face groove in several passes, machine from the outer diameter towards the center so that space for discharging chips is created to prevent insert damage caused by chip jamming.
●Plunging width of cut is recommended to be set at 60 - 80% of the insert width. This enhances the effect 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)



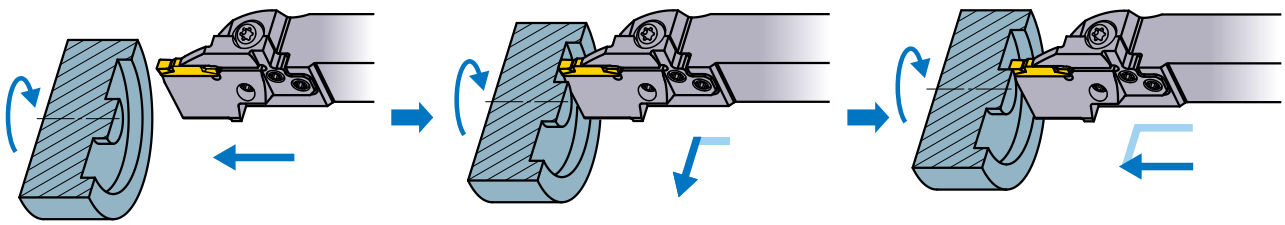
●When infeed machining at the bottom of deep groove, chips may interfere on the cutting edge near the center wall.
In such cases, stop infeed machining just before the center wall (at a point less than the insert width) then remove the remaining material by plunging.

Notes when copying (BM Breaker)



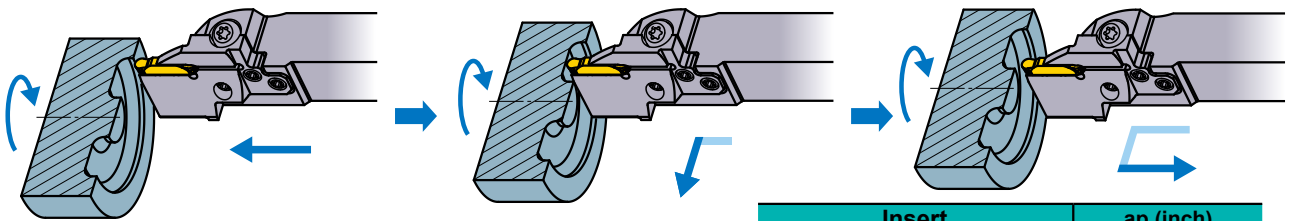
●With the BM breaker insert, 3 dimensional copying is possible. Set the depth of cut (ap) to 30% of the insert width.

Finishing (1)

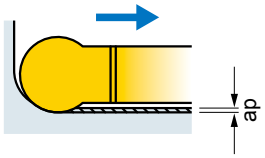


●When finish cutting, machine continuously from the outer wall to the bottom of the groove, then finally plunge cut the center wall.

Finishing (2) (BM Breaker)



●Carry out finishing in one process.
For the depth of cut (ap) when back turning, refer to the table on the right.

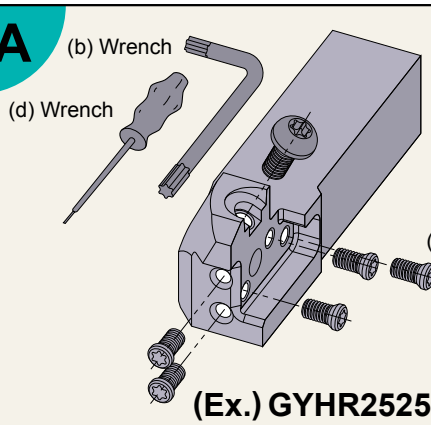


Insert	ap (inch)
GY2M0200D100N-BM	.004
GY2M0250E125N-BM	
GY2M0300F150N-BM	
GY2M0318F159N-BM	
GY2M0400G200N-BM	.006
GY2M0475H238N-BM	.008
GY2M0500H250N-BM	
GY2M0600J150N-BM	.010
GY2M0635J318N-BM	

ASSEMBLY INSTRUCTION

Assembly procedure

A



Holder

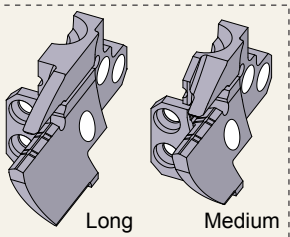
(a) Insert clamp screw x 1pc.

(Ex.) GYHR2525M00 - ① M25R

Modular Blade

(Ex.) ② ③

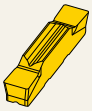
GY M25R D - F 20-060
GY M25R D - F 12-060



Insert

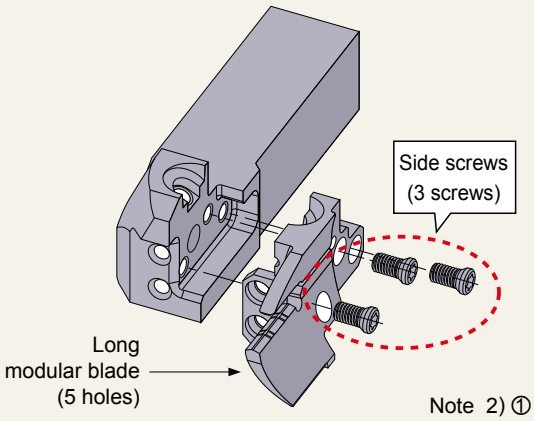
④

(Ex.)GY2M0300 F 040N-MS
GY2M0318 F 030N-GM



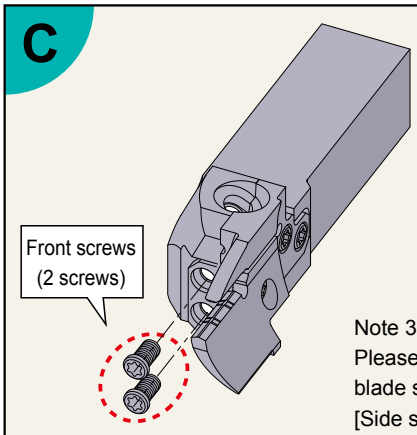
Note 1) ③ and ④ are changed by the insert size.

B



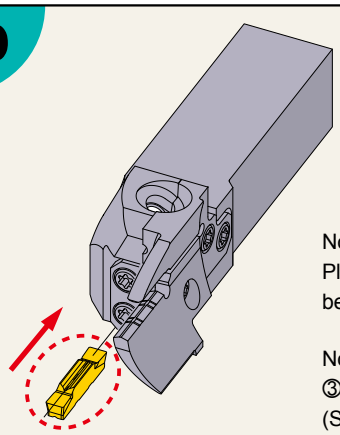
Note 2) ① and ② should be matched. (See caption A)

C



Note 3)
Please tighten the modular blade set screws in order of [Side screws] → [Front screws].

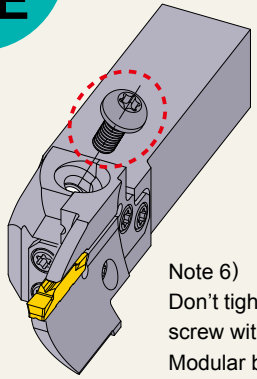
D



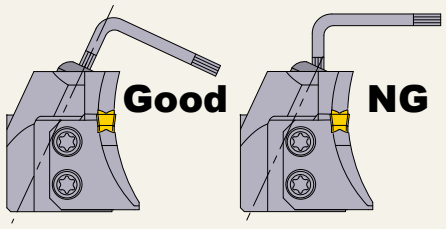
Note 4)
Please clean the insert-seat before installing the insert.

Note 5)
③ and ④ should be matched. (See caption A)

E

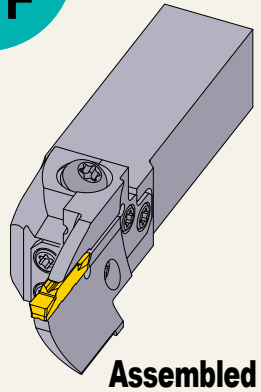


Note 6)
Don't tighten the insert clamp screw without installing the insert. Modular blade might be damaged.



Note 7)
The insert clamp screw is inclined. Ensure that the wrench is perpendicular to the screw tightening.

F

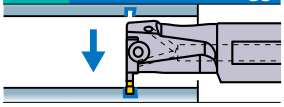


Memo

GY SERIES (INTERNAL GROOVING)

5-1 90° type holder (Inch)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.

● **Mono block type (Through air / coolant)**

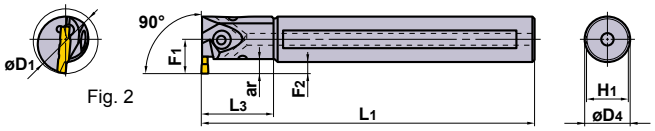


Fig. 2

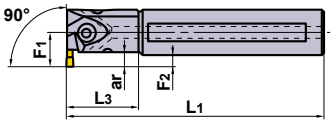


Fig. 1

Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	Max. Groove Depth ar (inch) *3	Min.Cutting Diameter D1 (inch)	ID	Order Number			
						Holder / Modular Holder	Stock	Modular Blade	Stock
D	.079	R	.236	1.000	(6F2R9D1)	GYARUS12K90A-D06	●	—	—
					(6F1R9D1)	GYARUS12Q90A-D06	●		
			.236	1.250	(6H2R9D1)	GYARUS16K90B-D06	●	—	—
					(6H1R9D1)	GYARUS16R90B-D06	●		
			.157—.374 *1	1.625	(6K2R3D1)	GYDRUS20L90C-M20L	●	GYM20LA-D10	●
					(6K1R3D1)	GYDRUS20S90C-M20L	●		
			.217—.374 *1	2.000	(6M2R3D1)	GYDRUS24M90D-M20L	●	GYM20LA-D10	●
					(6M1R3D1)	GYDRUS24T90D-M20L	●		
			.276—.453 *1	2.500	(6M2R4D1)	GYDRUS24M90D-M25L	●	GYM25LA-D12	●
					(6M1R4D1)	GYDRUS24T90D-M25L	●		
			.276—.453 *1	2.750	(6P2R4D1)	GYDRUS32P90F-M25L	●	GYM25LA-D12	●
					(6P1R4D1)	GYDRUS32T90F-M25L	●		
		L	.236	1.000	(6F2L9D1)	GYALUS12K90A-D06	●	—	—
					(6F1L9D1)	GYALUS12Q90A-D06	●		
			.236	1.250	(6H2L9D1)	GYALUS16K90B-D06	●	—	—
					(6H1L9D1)	GYALUS16R90B-D06	●		
			.157—.374 *1	1.625	(6K2L3D1)	GYDLUS20L90C-M20R	●	GYM20RA-D10	●
					(6K1L3D1)	GYDLUS20S90C-M20R	●		
			.217—.374 *1	2.000	(6M2L3D1)	GYDLUS24M90D-M20R	●	GYM20RA-D10	●
					(6M1L3D1)	GYDLUS24T90D-M20R	●		
			.276—.453 *1	2.500	(6M2L4D1)	GYDLUS24M90D-M25R	●	GYM25RA-D12	●
					(6M1L4D1)	GYDLUS24T90D-M25R	●		
			.276—.453 *1	2.750	(6P2L4D1)	GYDLUS32P90F-M25R	●	GYM25RA-D12	●
					(6P1L4D1)	GYDLUS32T90F-M25R	●		
E	.094 .098	R	.236	1.000	(6F2R9E1)	GYARUS12K90A-E06	●	—	—
					(6F1R9E1)	GYARUS12Q90A-E06	●		
			.236	1.250	(6H2R9E1)	GYARUS16K90B-E06	●	—	—
					(6H1R9E1)	GYARUS16R90B-E06	●		
			.157—.374 *1	1.625	(6K2R3E1)	GYDRUS20L90C-M20L	●	GYM20LA-E10	●
					(6K1R3E1)	GYDRUS20S90C-M20L	●		
			.217—.374 *1	2.000	(6M2R3E1)	GYDRUS24M90D-M20L	●	GYM20LA-E10	●
					(6M1R3E1)	GYDRUS24T90D-M20L	●		
			.276—.453 *1	2.500	(6M2R4E1)	GYDRUS24M90D-M25L	●	GYM25LA-E12	●
					(6M1R4E1)	GYDRUS24T90D-M25L	●		
			.276—.453 *1	2.750	(6P2R4E1)	GYDRUS32P90F-M25L	●	GYM25LA-E12	●
					(6P1R4E1)	GYDRUS32T90F-M25L	●		
		L	.236	1.000	(6F2L9E1)	GYALUS12K90A-E06	●	—	—
					(6F1L9E1)	GYALUS12Q90A-E06	●		
			.236	1.250	(6H2L9E1)	GYALUS16K90B-E06	●	—	—
					(6H1L9E1)	GYALUS16R90B-E06	●		
			.157—.374 *1	1.625	(6K2L3E1)	GYDLUS20L90C-M20R	●	GYM20RA-E10	●
					(6K1L3E1)	GYDLUS20S90C-M20R	●		
			.217—.374 *1	2.000	(6M2L3E1)	GYDLUS24M90D-M20R	●	GYM20RA-E10	●
					(6M1L3E1)	GYDLUS24T90D-M20R	●		
			.276—.453 *1	2.500	(6M2L4E1)	GYDLUS24M90D-M25R	●	GYM25RA-E12	●
					(6M1L4E1)	GYDLUS24T90D-M25R	●		
			.276—.453 *1	2.750	(6P2L4E1)	GYDLUS32P90F-M25R	●	GYM25RA-E12	●
					(6P1L4E1)	GYDLUS32T90F-M25R	●		

*1 The maximum groove depth varies according to the cutting diameter **D1**. For details, please refer to page F190.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L3, F1** and **F2** values may vary.
● : **Inventory maintained.**

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

●**Modular blade type (Through air / coolant)**

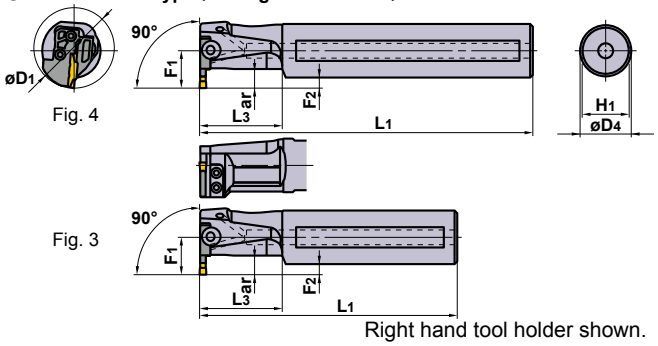


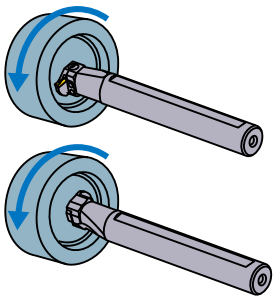
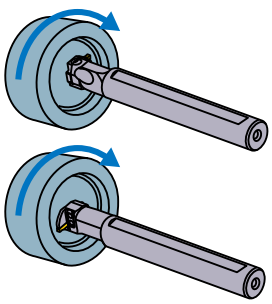
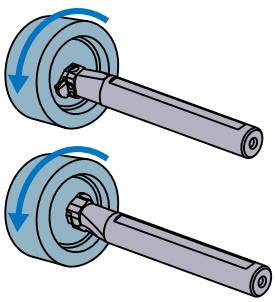
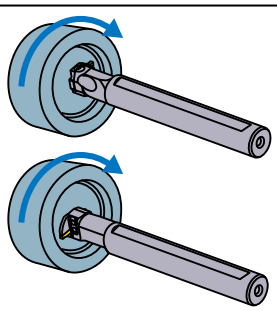
Fig. 4

Fig. 3

Right hand tool holder shown.

SPARE PARTS

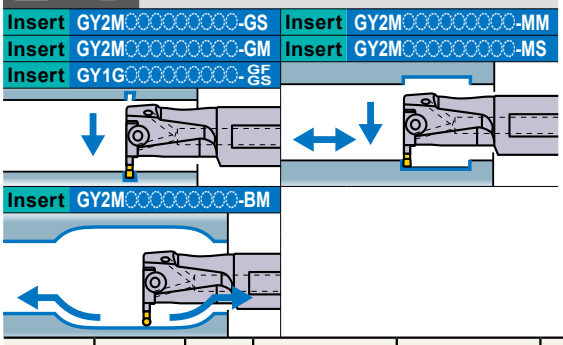
Modular Holder Number	Clamp Screw	Blade Screw (4 pcs.)	∗ Wrench
GYAR/LUS12○90A-○○○	GY05016S (Clamp Torque : 40 lbf-in)	–	TKY20R
GYAR/LUS16○90B-○○○			
GYDR/LUS20○90C-M20L/R	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/LUS24○90D-M20L/R			
GYDR/LUS24○90D-M25L/R		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYDR/LUS32○90F-M25L/R			

Dimensions (inch) ∗2						Fig.	Cutting Mode	Insert	
D4	**L1**	**L3**	**F1**	**F2**	**H1**			Geometry / Insert Number	Page
.750	5.000	1.250	.605	.230	.671	1		GY2M0200D020N-GS GY2M0200D020N-GM (Gauge insert) GY2M0200D020R05-GM GY2M0200D020L05-GM GY2M0200D020N-MM GY2M0200D100N-BM GY1G0200D020N-GFGS	F014 ı F016
.750	7.000	1.250	.605	.230	.671	2			
1.000	5.000	1.500	.730	.230	.921	1			
1.000	8.000	1.500	.730	.230	.921	2			
1.250	5.500	2.000	.875	.250	1.171	3			
1.250	10.000	2.000	.875	.250	1.171	4			
1.500	6.000	2.500	1.125	.375	1.382	3			
1.500	12.000	2.500	1.125	.375	1.382	4			
1.500	6.000	2.500	1.125	.375	1.382	3			
1.500	12.000	2.500	1.125	.375	1.382	4			
2.000	6.750	3.250	1.250	.250	1.882	3			
2.000	12.000	3.250	1.250	.250	1.882	4			
.750	5.000	1.250	.605	.230	.671	1			
.750	7.000	1.250	.605	.230	.671	2			
1.000	5.000	1.500	.730	.230	.921	1			
1.000	8.000	1.500	.730	.230	.921	2			
1.250	5.500	2.000	.875	.250	1.171	3			
1.250	10.000	2.000	.875	.250	1.171	4			
1.500	6.000	2.500	1.125	.375	1.382	3			
1.500	12.000	2.500	1.125	.375	1.382	4			
1.500	6.000	2.500	1.125	.375	1.382	3			
1.500	12.000	2.500	1.125	.375	1.382	4			
2.000	6.750	3.250	1.250	.250	1.882	3			
2.000	12.000	3.250	1.250	.250	1.882	4			
.750	5.000	1.250	.605	.230	.671	1		GY2M0239E020N-GS GY2M0250E020N-GS GY2M0239E020N-GM GY2M0250E020N-GM (Gauge insert) GY2M0250E020R05-GM GY2M0250E020L05-GM GY2M0250E020N-MM GY2M0250E125N-BM GY1G0239E020N-GFGS GY1G0250E020N-GFGS	F014 ı F016
.750	7.000	1.250	.605	.230	.671	2			
1.000	5.000	1.500	.730	.230	.921	1			
1.000	8.000	1.500	.730	.230	.921	2			
1.250	5.500	2.000	.875	.250	1.171	3			
1.250	10.000	2.000	.875	.250	1.171	4			
1.500	6.000	2.500	1.125	.375	1.382	3			
1.500	12.000	2.500	1.125	.375	1.382	4			
1.500	6.000	2.500	1.125	.375	1.382	3			
1.500	12.000	2.500	1.125	.375	1.382	4			
2.000	6.750	3.250	1.250	.250	1.882	3			
2.000	12.000	3.250	1.250	.250	1.882	4			
.750	5.000	1.250	.605	.230	.671	1			
.750	7.000	1.250	.605	.230	.671	2			
1.000	5.000	1.500	.730	.230	.921	1			
1.000	8.000	1.500	.730	.230	.921	2			
1.250	5.500	2.000	.875	.250	1.171	3			
1.250	10.000	2.000	.875	.250	1.171	4			
1.500	6.000	2.500	1.125	.375	1.382	3			
1.500	12.000	2.500	1.125	.375	1.382	4			
1.500	6.000	2.500	1.125	.375	1.382	3			
1.500	12.000	2.500	1.125	.375	1.382	4			
2.000	6.750	3.250	1.250	.250	1.882	3			
2.000	12.000	3.250	1.250	.250	1.882	4			

∗3 The maximum groove depth (ar) is a value within the dimension **L3**.

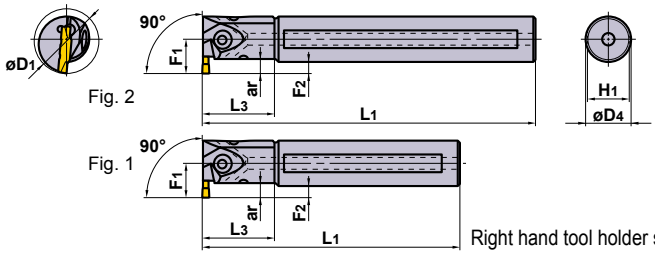
GY SERIES (INTERNAL GROOVING)

5-1 90° type holder (Inch)



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.

● **Mono block type (Through air / coolant)**



Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	Max. Groove Depth ar (inch) *3	Min.Cutting Diameter D1 (inch)	ID	Order Number: Holder / Modular Holder	Stock	Modular Blade	Stock
F	.118 .125	R	.236	1.000	(6F2R9F1)	GYARUS12K90A-F06	●	—	—
					(6F1R9F1)	GYARUS12Q90A-F06	●		
			.236	1.250	(6H2R9F1)	GYARUS16K90B-F06	●	—	—
					(6H1R9F1)	GYARUS16R90B-F06	●		
			.157—.374 *1	1.625	(6K2R3F1)	GYDRUS20L90C-M20L	●	GYM20LA-F10	●
					(6K1R3F1)	GYDRUS20S90C-M20L	●		
			.217—.374 *1	2.000	(6M2R3F1)	GYDRUS24M90D-M20L	●	GYM20LA-F10	●
					(6M1R3F1)	GYDRUS24T90D-M20L	●		
			.276—.453 *1	2.500	(6M2R4F1)	GYDRUS24M90D-M25L	●	GYM25LA-F12	●
					(6M1R4F1)	GYDRUS24T90D-M25L	●		
			.276—.453 *1	2.750	(6P2R4F1)	GYDRUS32P90F-M25L	●	GYM25LA-F12	●
					(6P1R4F1)	GYDRUS32T90F-M25L	●		
		L	.236	1.000	(6F2L9F1)	GYALUS12K90A-F06	●	—	—
					(6F1L9F1)	GYALUS12Q90A-F06	●		
			.236	1.250	(6H2L9F1)	GYALUS16K90B-F06	●	—	—
					(6H1L9F1)	GYALUS16R90B-F06	●		
			.157—.374 *1	1.625	(6K2L3F1)	GYDLUS20L90C-M20R	●	GYM20RA-F10	●
					(6K1L3F1)	GYDLUS20S90C-M20R	●		
			.217—.374 *1	2.000	(6M2L3F1)	GYDLUS24M90D-M20R	●	GYM20RA-F10	●
					(6M1L3F1)	GYDLUS24T90D-M20R	●		
			.276—.453 *1	2.500	(6M2L4F1)	GYDLUS24M90D-M25R	●	GYM25RA-F12	●
					(6M1L4F1)	GYDLUS24T90D-M25R	●		
			.276—.453 *1	2.750	(6P2L4F1)	GYDLUS32P90F-M25R	●	GYM25RA-F12	●
					(6P1L4F1)	GYDLUS32T90F-M25R	●		
G	.157	R	.276	1.250	(6H2R9G1)	GYARUS16K90B-G07	●	—	—
					(6H1R9G1)	GYARUS16R90B-G07	●		
			.197—.453 *1	1.625	(6K2R3G1)	GYDRUS20L90C-M20L	●	GYM20LA-G12	●
					(6K1R3G1)	GYDRUS20S90C-M20L	●		
			.236—.453 *1	2.000	(6M2R3G1)	GYDRUS24M90D-M20L	●	GYM20LA-G12	●
					(6M1R3G1)	GYDRUS24T90D-M20L	●		
			.315—.512 *1	2.500	(6M2R4G1)	GYDRUS24M90D-M25L	●	GYM25LA-G14	●
					(6M1R4G1)	GYDRUS24T90D-M25L	●		
			.295—.512 *1	2.750	(6P2R4G1)	GYDRUS32P90F-M25L	●	GYM25LA-G14	●
					(6P1R4G1)	GYDRUS32T90F-M25L	●		
		L	.276	1.250	(6H2L9G1)	GYALUS16K90B-G07	●	—	—
					(6H1L9G1)	GYALUS16R90B-G07	●		
			.197—.453 *1	1.625	(6K2L3G1)	GYDLUS20L90C-M20R	●	GYM20RA-G12	●
					(6K1L3G1)	GYDLUS20S90C-M20R	●		
			.236—.453 *1	2.000	(6M2L3G1)	GYDLUS24M90D-M20R	●	GYM20RA-G12	●
					(6M1L3G1)	GYDLUS24T90D-M20R	●		
			.315—.512 *1	2.500	(6M2L4G1)	GYDLUS24M90D-M25R	●	GYM25RA-G14	●
					(6M1L4G1)	GYDLUS24T90D-M25R	●		
			.295—.512 *1	2.750	(6P2L4G1)	GYDLUS32P90F-M25R	●	GYM25RA-G14	●
					(6P1L4G1)	GYDLUS32T90F-M25R	●		

*1 The maximum groove depth varies according to the cutting diameter **D1**. For details, please refer to page F190.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L3, F1** and **F2** values may vary.
● : **Inventory maintained.**

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

●**Modular blade type (Through air / coolant)**

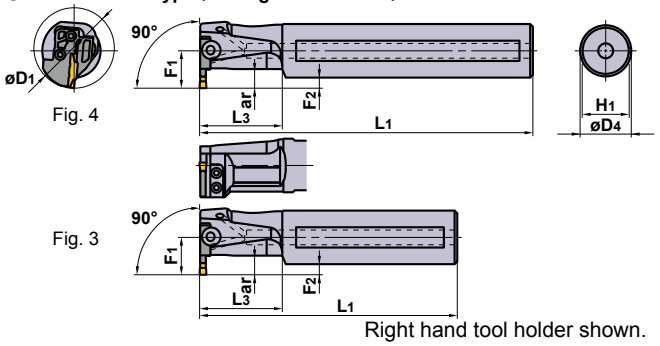


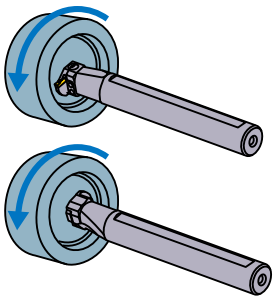
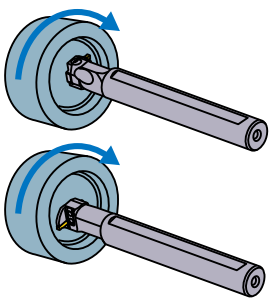
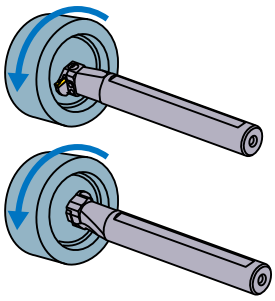
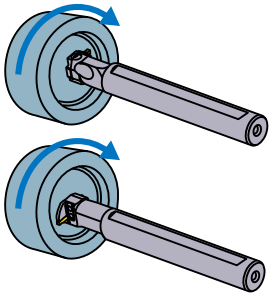
Fig. 4

Fig. 3

Right hand tool holder shown.

SPARE PARTS

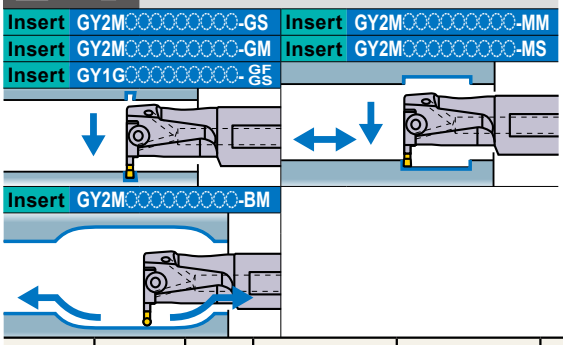
Modular Holder Number	Clamp Screw	Blade Screw (4 pcs.)	∗ Wrench
GYAR/LUS12○90A-○○○	GY05016S (Clamp Torque : 40 lbf-in)	—	TKY20R
GYAR/LUS16○90B-○○○			
GYDR/LUS20○90C-M20L/R	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/LUS24○90D-M20L/R			
GYDR/LUS24○90D-M25L/R		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYDR/LUS32○90F-M25L/R			

Dimensions (inch) ∗2						Fig.	Cutting Mode	Insert	
D4	**L1**	**L3**	**F1**	**F2**	**H1**			Geometry / Insert Number	Page
.750	5.000	1.250	.605	.230	.671	1		GY2M0300F020N-GS GY2M0318F020N-GS GY2M0300F030N-GM (Gauge insert) GY2M0318F030N-GM GY2M0300F030R05-GM GY2M0300F030L05-GM GY2M0300F020N-MS GY2M0300F040N-MS GY2M0300F020N-MM GY2M0300F040N-MM GY2M0300F080N-MM GY2M0300F150N-BM GY2M0318F159N-BM GY1G0300F020N-GFGS GY1G0318F020N-GFGS	F014 ı F016
.750	7.000	1.250	.605	.230	.671	2			
1.000	5.000	1.500	.730	.230	.921	1			
1.000	8.000	1.500	.730	.230	.921	2			
1.250	5.500	2.000	.875	.250	1.171	3			
1.250	10.000	2.000	.875	.250	1.171	4			
1.500	6.000	2.500	1.125	.375	1.382	3			
1.500	12.000	2.500	1.125	.375	1.382	4			
1.500	6.000	2.500	1.125	.375	1.382	3			
1.500	12.000	2.500	1.125	.375	1.382	4			
2.000	6.750	3.250	1.250	.250	1.882	3			
2.000	12.000	3.250	1.250	.250	1.882	4			
.750	5.000	1.250	.605	.230	.671	1			
.750	7.000	1.250	.605	.230	.671	2			
1.000	5.000	1.500	.730	.230	.921	1			
1.000	8.000	1.500	.730	.230	.921	2			
1.250	5.500	2.000	.875	.250	1.171	3			
1.250	10.000	2.000	.875	.250	1.171	4			
1.500	6.000	2.500	1.125	.375	1.382	3			
1.500	12.000	2.500	1.125	.375	1.382	4			
1.500	6.000	2.500	1.125	.375	1.382	3			
1.500	12.000	2.500	1.125	.375	1.382	4			
2.000	6.750	3.250	1.250	.250	1.882	3			
2.000	12.000	3.250	1.250	.250	1.882	4			
1.000	5.000	1.500	.730	.230	.921	1		GY2M0400G030N-GU GY2M0400G020N-GS GY2M0400G030N-GM (Gauge insert) GY2M0400G030R05-GM GY2M0400G030L05-GM GY2M0400G020N-MS GY2M0400G040N-MS GY2M0400G020N-MM GY2M0400G040N-MM GY2M0400G080N-MM GY2M0400G200N-BM GY1G0400G020N-GFGS	F014 ı F016
1.000	8.000	1.500	.730	.230	.921	2			
1.250	5.500	2.000	.875	.250	1.171	3			
1.250	10.000	2.000	.875	.250	1.171	4			
1.500	6.000	2.500	1.125	.375	1.382	3			
1.500	12.000	2.500	1.125	.375	1.382	4			
1.500	6.000	2.500	1.125	.375	1.382	3			
1.500	12.000	2.500	1.125	.375	1.382	4			
2.000	6.750	3.250	1.250	.250	1.882	3			
2.000	12.000	3.250	1.250	.250	1.882	4			
1.000	5.000	1.500	.730	.230	.921	1			
1.000	8.000	1.500	.730	.230	.921	2			
1.250	5.500	2.000	.875	.250	1.171	3			
1.250	10.000	2.000	.875	.250	1.171	4			
1.500	6.000	2.500	1.125	.375	1.382	3			
1.500	12.000	2.500	1.125	.375	1.382	4			
1.500	6.000	2.500	1.125	.375	1.382	3			
1.500	12.000	2.500	1.125	.375	1.382	4			
2.000	6.750	3.250	1.250	.250	1.882	3			
2.000	12.000	3.250	1.250	.250	1.882	4			

∗3 The maximum groove depth (ar) is a value within the dimension **L3**.

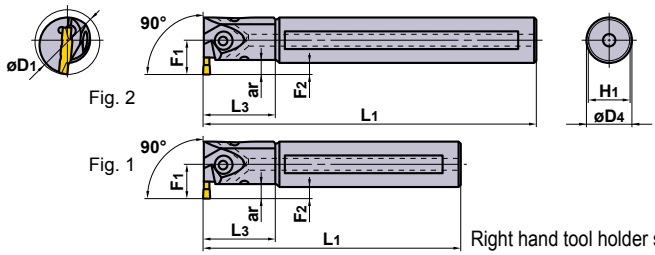
GY SERIES (INTERNAL GROOVING)

5-1 90° type holder (Inch)



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.

●Mono block type (Through air / coolant)



Right hand tool holder shown.

Seat Size	Insert Width W3 (inch)	Hand (R/L)	Max. Groove Depth ar *3 (inch)	Min.Cutting Diameter D1 (inch)	ID	Order Number: Holder / Modular Holder	Stock	Modular Blade	Stock
H	.187 .197	R	.276	1.250	(6H2R9H1)	GYARUS16K90B-H07	●	—	—
					(6H1R9H1)	GYARUS16R90B-H07	●		
			.197—.453 *1	1.625	(6K2R3H1)	GYDRUS20L90C-M20L	●	GYM20LA-H12	●
					(6K1R3H1)	GYDRUS20S90C-M20L	●		
			.236—.453 *1	2.000	(6M2R3H1)	GYDRUS24M90D-M20L	●	GYM20LA-H12	●
					(6M1R3H1)	GYDRUS24T90D-M20L	●		
			.315—.512 *1	2.500	(6M2R4H1)	GYDRUS24M90D-M25L	●	GYM25LA-H14	●
					(6M1R4H1)	GYDRUS24T90D-M25L	●		
			.295—.512 *1	2.750	(6P2R4H1)	GYDRUS32P90F-M25L	●	GYM25LA-H14	●
					(6P1R4H1)	GYDRUS32T90F-M25L	●		
		L	.276	1.250	(6H2L9H1)	GYALUS16K90B-H07	●	—	—
					(6H1L9H1)	GYALUS16R90B-H07	●		
			.197—.453 *1	1.625	(6K2L3H1)	GYDLUS20L90C-M20R	●	GYM20RA-H12	●
					(6K1L3H1)	GYDLUS20S90C-M20R	●		
			.236—.453 *1	2.000	(6M2L3H1)	GYDLUS24M90D-M20R	●	GYM20RA-H12	●
					(6M1L3H1)	GYDLUS24T90D-M20R	●		
			.315—.512 *1	2.500	(6M2L4H1)	GYDLUS24M90D-M25R	●	GYM25RA-H14	●
					(6M1L4H1)	GYDLUS24T90D-M25R	●		
			.295—.512 *1	2.750	(6P2L4H1)	GYDLUS32P90F-M25R	●	GYM25RA-H14	●
					(6P1L4H1)	GYDLUS32T90F-M25R	●		
J	.236 .250	R	.315—.512 *1	2.500	(6M2R4J1)	GYDRUS24M90D-M25L	●	GYM25LA-J14	●
					(6M1R4J1)	GYDRUS24T90D-M25L	●		
			.295—.512 *1	2.750	(6P2R4J1)	GYDRUS32P90F-M25L	●	GYM25LA-J14	●
					(6P1R4J1)	GYDRUS32T90F-M25L	●		
		L	.315—.512 *1	2.500	(6M2L4J1)	GYDLUS24M90D-M25R	●	GYM25RA-J14	●
					(6M1L4J1)	GYDLUS24T90D-M25R	●		
			.295—.512 *1	2.750	(6P2L4J1)	GYDLUS32P90F-M25R	●	GYM25RA-J14	●
					(6P1L4J1)	GYDLUS32T90F-M25R	●		

*1 The maximum groove depth varies according to the cutting diameter **D1**. For details, please refer to page F190.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L3, F1** and **F2** values may vary.
● : **Inventory maintained.**

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

●**Modular blade type (Through air / coolant)**

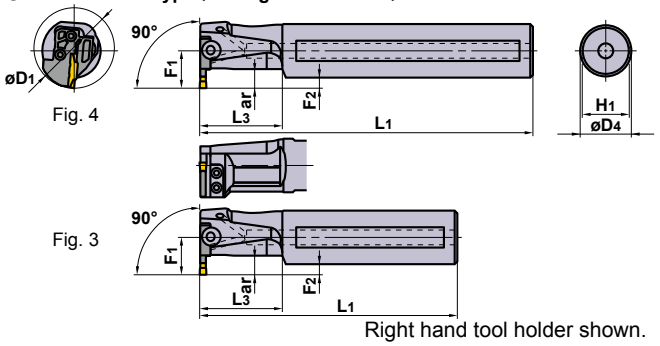


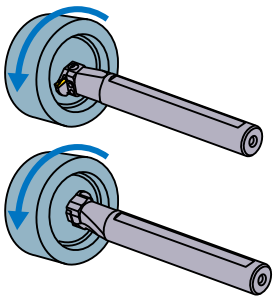
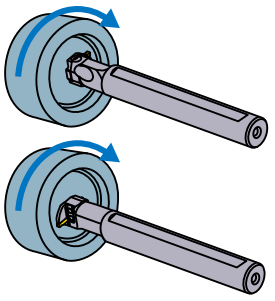
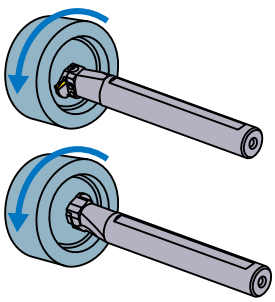
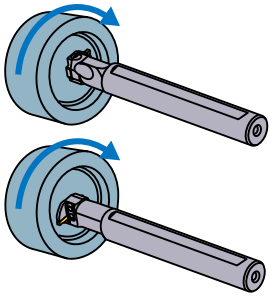
Fig. 4

Fig. 3

Right hand tool holder shown.

SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (4 pcs.)	∗ Wrench ①②
GYAR/LUS16○90B-○○○	GY05016S (Clamp Torque : 40 lbf-in)	—	TKY20R
GYDR/LUS20○90C-M20L/R	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/LUS24○90D-M20L/R			
GYDR/LUS24○90D-M25L/R		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYDR/LUS32○90F-M25L/R			

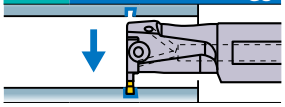
Dimensions (inch) ∗2						Fig.	Cutting Mode	Insert	
D4	**L1**	**L3**	**F1**	**F2**	**H1**			Geometry / Insert Number	Page
1.000	5.000	1.500	.730	.230	.921	1		GY2M0475H040N-GU GY2M0500H040N-GU	F014 – F016
1.000	8.000	1.500	.730	.230	.921	2			
1.250	5.500	2.000	.875	.250	1.171	3		GY2M0475H030N-GS GY2M0500H030N-GS	
1.250	10.000	2.000	.875	.250	1.171	4			
1.500	6.000	2.500	1.125	.375	1.382	3		GY2M0475H040N-GM GY2M0500H040N-GM (Gauge insert)	
1.500	12.000	2.500	1.125	.375	1.382	4			
1.500	6.000	2.500	1.125	.375	1.382	3		GY2M0500H040R05-GM GY2M0500H040L05-GM	
1.500	12.000	2.500	1.125	.375	1.382	4			
2.000	6.750	3.250	1.250	.250	1.882	3			
2.000	12.000	3.250	1.250	.250	1.882	4			
1.000	5.000	1.500	.730	.230	.921	1		GY2M0500H040N-MS GY2M0500H080N-MS	
1.000	8.000	1.500	.730	.230	.921	2			
1.250	5.500	2.000	.875	.250	1.171	3		GY2M0500H040N-MM GY2M0500H080N-MM	
1.250	10.000	2.000	.875	.250	1.171	4			
1.500	6.000	2.500	1.125	.375	1.382	3		GY2M0475H238N-BM GY2M0500H250N-BM	
1.500	12.000	2.500	1.125	.375	1.382	4			
1.500	6.000	2.500	1.125	.375	1.382	3		GY1G0475H020N-GFGS GY1G0500H020N-GFGS	
1.500	12.000	2.500	1.125	.375	1.382	4			
2.000	6.750	3.250	1.250	.250	1.882	3			
2.000	12.000	3.250	1.250	.250	1.882	4			
1.500	6.000	2.500	1.125	.375	1.382	3		GY2M0600J040N-GU GY2M0635J040N-GU	F014 – F016
1.500	12.000	2.500	1.125	.375	1.382	4			
2.000	6.750	3.250	1.250	.250	1.882	3		GY2M0600J030N-GS GY2M0635J030N-GS	
2.000	12.000	3.250	1.250	.250	1.882	4			
								GY2M0600J040N-GM (Gauge insert) GY2M0635J040N-GM	
1.500	6.000	2.500	1.125	.375	1.382	3		GY2M0600J040N-MS GY2M0600J080N-MS	
1.500	12.000	2.500	1.125	.375	1.382	4			
2.000	6.750	3.250	1.250	.250	1.882	3		GY2M0600J040N-MM GY2M0600J080N-MM	
2.000	12.000	3.250	1.250	.250	1.882	4			
								GY2M0600J300N-BM GY2M0635J318N-BM	

∗3 The maximum groove depth (ar) is a value within the dimension **L3**.

GY SERIES (INTERNAL GROOVING)

5-2 90° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.

● **Mono block type (Through air / coolant)**

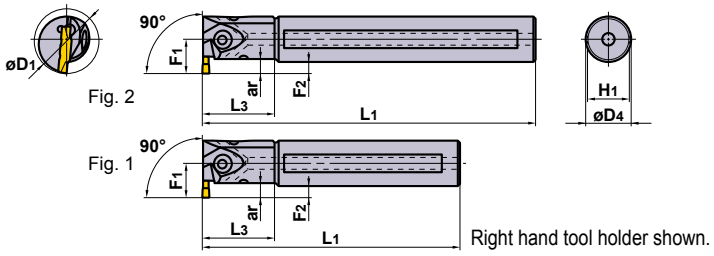


Fig. 2

Fig. 1

Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	Max. Groove Depth ar (mm) *3	Min.Cutting Diameter D1 (mm)	ID	Order Number			
						Holder / Modular Holder	Stock	Modular Blade	Stock
D	2.00	R	6	25	(6E2R9D1)	GYAR20K90A-D06	●	—	—
					(6E1R9D1)	GYAR20Q90A-D06	●		
			6	32	(6G2R9D1)	GYAR25K90B-D06	●	—	—
					(6G1R9D1)	GYAR25R90B-D06	●		
			4—9.5 *1	40	(6J2R3D1)	GYDR32L90C-M20L	●	GYM20LA-D10	●
					(6J1R3D1)	GYDR32S90C-M20L	●		
			5.5—9.5 *1	50	(6L2R3D1)	GYDR40M90D-M20L	●	GYM20LA-D10	●
					(6L1R3D1)	GYDR40T90D-M20L	●		
			7—11.5 *1	60	(6L2R4D1)	GYDR40M90D-M25L	●	GYM25LA-D12	●
					(6L1R4D1)	GYDR40T90D-M25L	●		
			7—11.5 *1	70	(6N2R4D1)	GYDR50P90F-M25L	●	GYM25LA-D12	●
					(6N1R4D1)	GYDR50T90F-M25L	●		
		L	6	25	(6E2L9D1)	GYAL20K90A-D06	●	—	—
					(6E1L9D1)	GYAL20Q90A-D06	●		
			6	32	(6G2L9D1)	GYAL25K90B-D06	●	—	—
					(6G1L9D1)	GYAL25R90B-D06	●		
			4—9.5 *1	40	(6J2L3D1)	GYDL32L90C-M20R	●	GYM20RA-D10	●
					(6J1L3D1)	GYDL32S90C-M20R	●		
			5.5—9.5 *1	50	(6L2L3D1)	GYDL40M90D-M20R	●	GYM20RA-D10	●
					(6L1L3D1)	GYDL40T90D-M20R	●		
			7—11.5 *1	60	(6L2L4D1)	GYDL40M90D-M25R	●	GYM25RA-D12	●
					(6L1L4D1)	GYDL40T90D-M25R	●		
			7—11.5 *1	70	(6N2L4D1)	GYDL50P90F-M25R	●	GYM25RA-D12	●
					(6N1L4D1)	GYDL50T90F-M25R	●		
E	2.39 2.50	R	6	25	(6E2R9E1)	GYAR20K90A-E06	●	—	—
					(6E1R9E1)	GYAR20Q90A-E06	●		
			6	32	(6G2R9E1)	GYAR25K90B-E06	●	—	—
					(6G1R9E1)	GYAR25R90B-E06	●		
			4—9.5 *1	40	(6J2R3E1)	GYDR32L90C-M20L	●	GYM20LA-E10	●
					(6J1R3E1)	GYDR32S90C-M20L	●		
			5.5—9.5 *1	50	(6L2R3E1)	GYDR40M90D-M20L	●	GYM20LA-E10	●
					(6L1R3E1)	GYDR40T90D-M20L	●		
			7—11.5 *1	60	(6L2R4E1)	GYDR40M90D-M25L	●	GYM25LA-E12	●
					(6L1R4E1)	GYDR40T90D-M25L	●		
			7—11.5 *1	70	(6N2R4E1)	GYDR50P90F-M25L	●	GYM25LA-E12	●
					(6N1R4E1)	GYDR50T90F-M25L	●		
		L	6	25	(6E2L9E1)	GYAL20K90A-E06	●	—	—
					(6E1L9E1)	GYAL20Q90A-E06	●		
			6	32	(6G2L9E1)	GYAL25K90B-E06	●	—	—
					(6G1L9E1)	GYAL25R90B-E06	●		
			4—9.5 *1	40	(6J2L3E1)	GYDL32L90C-M20R	●	GYM20RA-E10	●
					(6J1L3E1)	GYDL32S90C-M20R	●		
			5.5—9.5 *1	50	(6L2L3E1)	GYDL40M90D-M20R	●	GYM20RA-E10	●
					(6L1L3E1)	GYDL40T90D-M20R	●		
			7—11.5 *1	60	(6L2L4E1)	GYDL40M90D-M25R	●	GYM25RA-E12	●
					(6L1L4E1)	GYDL40T90D-M25R	●		
			7—11.5 *1	70	(6N2L4E1)	GYDL50P90F-M25R	●	GYM25RA-E12	●
					(6N1L4E1)	GYDL50T90F-M25R	●		

*1 The maximum groove depth varies according to the cutting diameter **D1**. For details, please refer to page F190.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L3, F1** and **F2** values may vary.
● : **Inventory maintained.**

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

●Modular blade type (Through air / coolant)

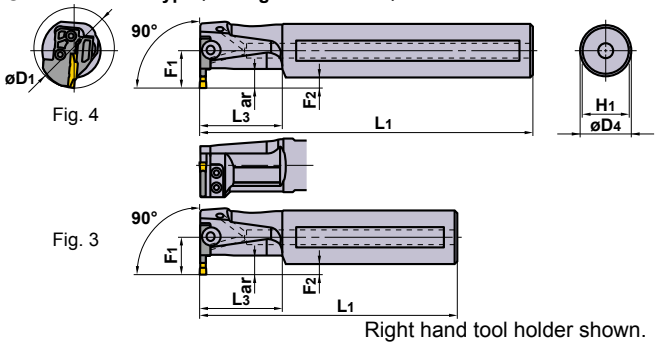


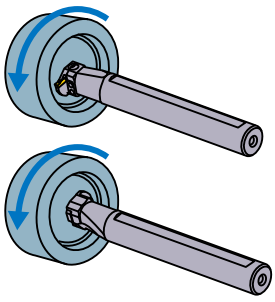
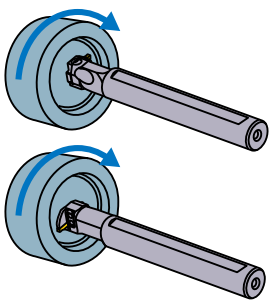
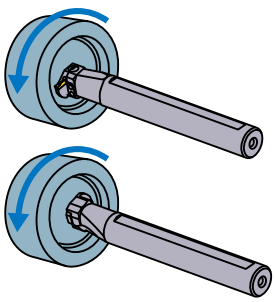
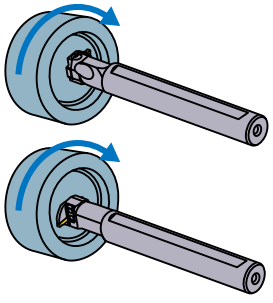
Fig. 4

Fig. 3

Right hand tool holder shown.

SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (4 pcs.)	∗ Wrench
GYAR/L20○90A-○06	GY05016S (Clamp Torque : 40 lbf-in)	–	TKY20R
GYAR/L25○90B-○06			
GYDR/L32○90C-M20L/R	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/L40○90D-M20L/R			
GYDR/L40○90D-M25L/R		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYDR/L50○90F-M25L/R			

Dimensions (mm) ∗2						Fig.	Cutting Mode	Insert	
D4	L1	L3	F1	F2	H1			Geometry / Insert Number	Page
20	125	30	14.5	4.5	18	1		GY2M0200D020N-GS GY2M0200D020N-GM (Gauge insert) GY2M0200D020R05-GM GY2M0200D020L05-GM GY2M0200D020N-MM GY2M0200D100N-BM GY1G0200D020N-GFGS	F014 ı F016
20	180	30	14.5	4.5	18	2			
25	125	40	19	6.5	23	1			
25	200	40	19	6.5	23	2			
32	140	50	22	6.0	30	3			
32	250	50	22	6.0	30	4			
40	150	60	28	8.0	37	3			
40	300	60	28	8.0	37	4			
40	150	60	28	8.0	37	3			
40	300	60	28	8.0	37	4			
50	170	80	34	9.0	47	3			
50	300	80	34	9.0	47	4			
20	125	30	14.5	4.5	18	1			
20	180	30	14.5	4.5	18	2			
25	125	40	19	6.5	23	1			
25	200	40	19	6.5	23	2			
32	140	50	22	6.0	30	3			
32	250	50	22	6.0	30	4			
40	150	60	28	8.0	37	3			
40	300	60	28	8.0	37	4			
40	150	60	28	8.0	37	3			
40	300	60	28	8.0	37	4			
50	170	80	34	9.0	47	3			
50	300	80	34	9.0	47	4			
20	125	30	14.5	4.5	18	1		GY2M0239E020N-GS GY2M0250E020N-GS GY2M0239E020N-GM GY2M0250E020N-GM (Gauge insert) GY2M0250E020R05-GM GY2M0250E020L05-GM GY2M0250E020N-MM GY2M0250E125N-BM GY1G0239E020N-GFGS GY1G0250E020N-GFGS	F014 ı F016
20	180	30	14.5	4.5	18	2			
25	125	40	19	6.5	23	1			
25	200	40	19	6.5	23	2			
32	140	50	22	6.0	30	3			
32	250	50	22	6.0	30	4			
40	150	60	28	8.0	37	3			
40	300	60	28	8.0	37	4			
40	150	60	28	8.0	37	3			
40	300	60	28	8.0	37	4			
50	170	80	34	9.0	47	3			
50	300	80	34	9.0	47	4			
20	125	30	14.5	4.5	18	1			
20	180	30	14.5	4.5	18	2			
25	125	40	19	6.5	23	1			
25	200	40	19	6.5	23	2			
32	140	50	22	6.0	30	3			
32	250	50	22	6.0	30	4			
40	150	60	28	8.0	37	3			
40	300	60	28	8.0	37	4			
40	150	60	28	8.0	37	3			
40	300	60	28	8.0	37	4			
50	170	80	34	9.0	47	3			
50	300	80	34	9.0	47	4			

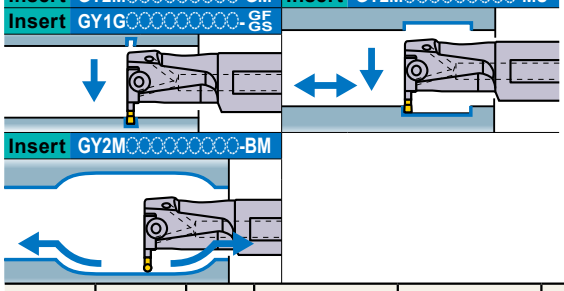
∗3 The maximum groove depth (ar) is a value within the dimension **L3**.

GROOVING

GY SERIES (INTERNAL GROOVING)

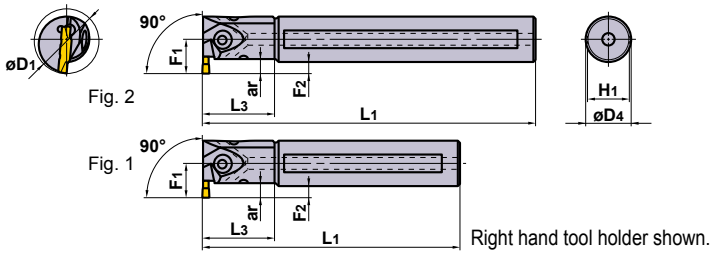
5-2 90° type holder (Metric)

Insert GY2M○○○○○○○○○-GS
Insert GY2M○○○○○○○○○-GM
Insert GY1G○○○○○○○○○-GF GS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.

● Mono block type (Through air / coolant)



Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	Max. Groove Depth ar (mm) *3	Min.Cutting Diameter D1 (mm)	ID	Order Number			
						Holder / Modular Holder	Stock	Modular Blade	Stock
F	3.00 3.18	R	6	25	(6E2R9F1)	GYAR20K90A-F06	●	—	—
					(6E1R9F1)	GYAR20Q90A-F06	●		
			6	32	(6G2R9F1)	GYAR25K90B-F06	●	—	—
					(6G1R9F1)	GYAR25R90B-F06	●		
			4—9.5 *1	40	(6J2R3F1)	GYDR32L90C-M20L	●	GYM20LA-F10	●
					(6J1R3F1)	GYDR32S90C-M20L	●		
			5.5—9.5 *1	50	(6L2R3F1)	GYDR40M90D-M20L	●	GYM20LA-F10	●
					(6L1R3F1)	GYDR40T90D-M20L	●		
			7—11.5 *1	60	(6L2R4F1)	GYDR40M90D-M25L	●	GYM25LA-F12	●
					(6L1R4F1)	GYDR40T90D-M25L	●		
			7—11.5 *1	70	(6N2R4F1)	GYDR50P90F-M25L	●	GYM25LA-F12	●
					(6N1R4F1)	GYDR50T90F-M25L	●		
		L	6	25	(6E2L9F1)	GYAL20K90A-F06	●	—	—
					(6E1L9F1)	GYAL20Q90A-F06	●		
			6	32	(6G2L9F1)	GYAL25K90B-F06	●	—	—
					(6G1L9F1)	GYAL25R90B-F06	●		
			4—9.5 *1	40	(6J2L3F1)	GYDL32L90C-M20R	●	GYM20RA-F10	●
					(6J1L3F1)	GYDL32S90C-M20R	●		
			5.5—9.5 *1	50	(6L2L3F1)	GYDL40M90D-M20R	●	GYM20RA-F10	●
					(6L1L3F1)	GYDL40T90D-M20R	●		
			7—11.5 *1	60	(6L2L4F1)	GYDL40M90D-M25R	●	GYM25RA-F12	●
					(6L1L4F1)	GYDL40T90D-M25R	●		
			7—11.5 *1	70	(6N2L4F1)	GYDL50P90F-M25R	●	GYM25RA-F12	●
					(6N1L4F1)	GYDL50T90F-M25R	●		
G	4.00	R	7	32	(6G2R9G1)	GYAR25K90B-G07	●	—	—
					(6G1R9G1)	GYAR25R90B-G07	●		
			4.5—11.5 *1	40	(6J2R3G1)	GYDR32L90C-M20L	●	GYM20LA-G12	●
					(6J1R3G1)	GYDR32S90C-M20L	●		
			6—11.5 *1	50	(6L2R3G1)	GYDR40M90D-M20L	●	GYM20LA-G12	●
					(6L1R3G1)	GYDR40T90D-M20L	●		
			7.5—13 *1	60	(6L2R4G1)	GYDR40M90D-M25L	●	GYM25LA-G14	●
					(6L1R4G1)	GYDR40T90D-M25L	●		
			7.5—13 *1	70	(6N2R4G1)	GYDR50P90F-M25L	●	GYM25LA-G14	●
					(6N1R4G1)	GYDR50T90F-M25L	●		
		L	7	32	(6G2L9G1)	GYAL25K90B-G07	●	—	—
					(6G1L9G1)	GYAL25R90B-G07	●		
			4.5—11.5 *1	40	(6J2L3G1)	GYDL32L90C-M20R	●	GYM20RA-G12	●
					(6J1L3G1)	GYDL32S90C-M20R	●		
			6—11.5 *1	50	(6L2L3G1)	GYDL40M90D-M20R	●	GYM20RA-G12	●
					(6L1L3G1)	GYDL40T90D-M20R	●		
			7.5—13 *1	60	(6L2L4G1)	GYDL40M90D-M25R	●	GYM25RA-G14	●
					(6L1L4G1)	GYDL40T90D-M25R	●		
			7.5—13 *1	70	(6N2L4G1)	GYDL50P90F-M25R	●	GYM25RA-G14	●
					(6N1L4G1)	GYDL50T90F-M25R	●		

*1 The maximum groove depth varies according to the cutting diameter D1. For details, please refer to page F190.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then L1, L3, F1 and F2 values may vary.
● : Inventory maintained.

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

●**Modular blade type (Through air / coolant)**

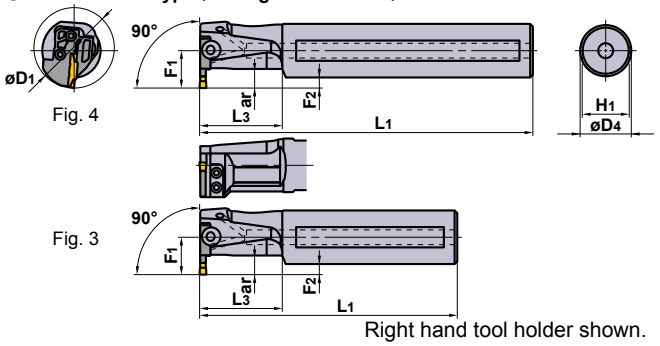


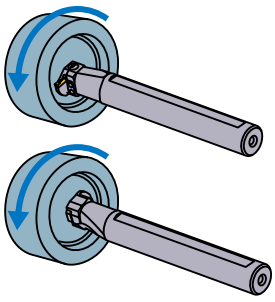
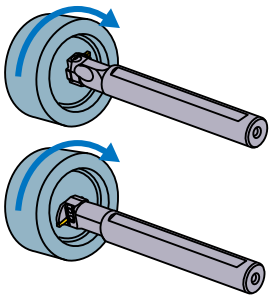
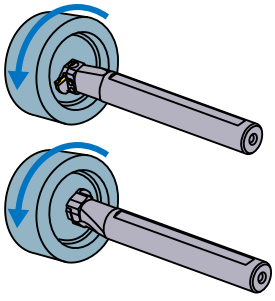
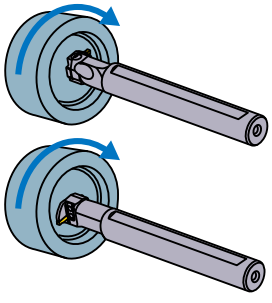
Fig. 4

Fig. 3

Right hand tool holder shown.

SPARE PARTS

Modular Holder Number	Clamp Screw	Blade Screw (4 pcs.)	∗ Wrench
GYAR/L20○90A-F06	GY05016S (Clamp Torque : 40 lbf-in)	—	TKY20R
GYAR/L25○90B-○○○			
GYDR/L32○90C-M20L/R	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/L40○90D-M20L/R			
GYDR/L40○90D-M25L/R		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYDR/L50○90F-M25L/R			

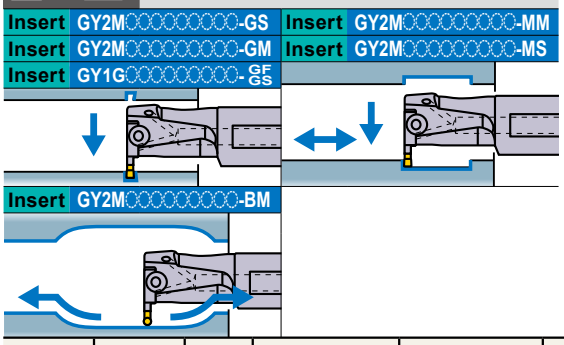
Dimensions (mm) ∗2						Fig.	Cutting Mode	Insert	
D4	L1	L3	F1	F2	H1			Geometry / Insert Number	Page
20	125	30	14.5	4.5	18	1		GY2M0300F020N-GS GY2M0318F020N-GS GY2M0300F030N-GM (Gauge insert) GY2M0318F030N-GM GY2M0300F030R05-GM GY2M0300F030L05-GM GY2M0300F020N-MS GY2M0300F040N-MS GY2M0300F020N-MM GY2M0300F040N-MM GY2M0300F080N-MM GY2M0300F150N-BM GY2M0318F159N-BM GY1G0300F020N-GFGS GY1G0318F020N-GFGS	F014 ı F016
20	180	30	14.5	4.5	18	2			
25	125	40	19	6.5	23	1			
25	200	40	19	6.5	23	2			
32	140	50	22	6.0	30	3			
32	250	50	22	6.0	30	4			
40	150	60	28	8.0	37	3			
40	300	60	28	8.0	37	4			
40	150	60	28	8.0	37	3			
40	300	60	28	8.0	37	4			
50	170	80	34	9.0	47	3			
50	300	80	34	9.0	47	4			
20	125	30	14.5	4.5	18	1			
20	180	30	14.5	4.5	18	2			
25	125	40	19	6.5	23	1			
25	200	40	19	6.5	23	2			
32	140	50	22	6.0	30	3			
32	250	50	22	6.0	30	4			
40	150	60	28	8.0	37	3			
40	300	60	28	8.0	37	4			
40	150	60	28	8.0	37	3			
40	300	60	28	8.0	37	4			
50	170	80	34	9.0	47	3			
50	300	80	34	9.0	47	4			
25	125	40	19	6.5	23	1		GY2M0400G030N-GU GY2M0400G020N-GS GY2M0400G030N-GM (Gauge insert) GY2M0400G030R05-GM GY2M0400G030L05-GM GY2M0400G020N-MS GY2M0400G040N-MS GY2M0400G020N-MM GY2M0400G040N-MM GY2M0400G080N-MM GY2M0400G200N-BM GY1G0400G020N-GFGS	F014 ı F016
25	200	40	19	6.5	23	2			
32	140	50	22	6.0	30	3			
32	250	50	22	6.0	30	4			
40	150	60	28	8.0	37	3			
40	300	60	28	8.0	37	4			
40	150	60	28	8.0	37	3			
40	300	60	28	8.0	37	4			
50	170	80	34	9.0	47	3			
50	300	80	34	9.0	47	4			
25	125	40	19	6.5	23	1			
25	200	40	19	6.5	23	2			
32	140	50	22	6.0	30	3			
32	250	50	22	6.0	30	4			
40	150	60	28	8.0	37	3			
40	300	60	28	8.0	37	4			
40	150	60	28	8.0	37	3			
40	300	60	28	8.0	37	4			
50	170	80	34	9.0	47	3			
50	300	80	34	9.0	47	4			

∗3 The maximum groove depth (ar) is a value within the dimension **L3**.

GROOVING

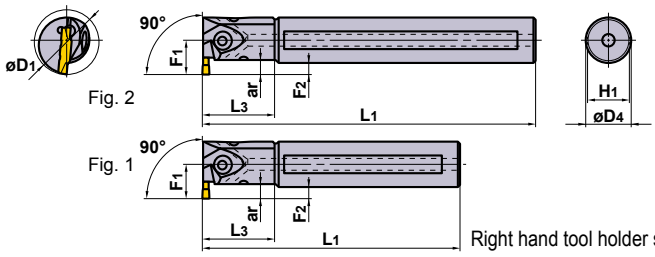
GY SERIES (INTERNAL GROOVING)

5-2 90° type holder (Metric)



Note 1) For modular blades and modular holders, please order separately.
Note 2) Please use left hand modular blade for right hand modular holder and right hand modular blade for left hand modular holder.

● **Mono block type (Through air / coolant)**



Right hand tool holder shown.

Seat Size	Insert Width W3 (mm)	Hand (R/L)	Max. Groove Depth ar (mm) *3	Min.Cutting Diameter D1 (mm)	ID	Order Number: Holder / Modular Holder	Stock	Order Number: Modular Blade	Stock
H	4.75 5.00	R	7	32	(6G2R9H1)	**GYAR25K90B-H07**	●	—	—
					(6G1R9H1)	**GYAR25R90B-H07**	●		
			4.5—11.5 *1	40	(6J2R3H1)	**GYDR32L90C-M20L**	●	**GYM20LA-H12**	●
					(6J1R3H1)	**GYDR32S90C-M20L**	●		
			6—11.5 *1	50	(6L2R3H1)	**GYDR40M90D-M20L**	●	**GYM20LA-H12**	●
					(6L1R3H1)	**GYDR40T90D-M20L**	●		
			7.5—13 *1	60	(6L2R4H1)	**GYDR40M90D-M25L**	●	**GYM25LA-H14**	●
					(6L1R4H1)	**GYDR40T90D-M25L**	●		
			7.5—13 *1	70	(6N2R4H1)	**GYDR50P90F-M25L**	●	**GYM25LA-H14**	●
					(6N1R4H1)	**GYDR50T90F-M25L**	●		
		L	7	32	(6G2L9H1)	**GYAL25K90B-H07**	●	—	—
					(6G1L9H1)	**GYAL25R90B-H07**	●		
			4.5—11.5 *1	40	(6J2L3H1)	**GYDL32L90C-M20R**	●	**GYM20RA-H12**	●
					(6J1L3H1)	**GYDL32S90C-M20R**	●		
			6—11.5 *1	50	(6L2L3H1)	**GYDL40M90D-M20R**	●	**GYM20RA-H12**	●
					(6L1L3H1)	**GYDL40T90D-M20R**	●		
			7.5—13 *1	60	(6L2L4H1)	**GYDL40M90D-M25R**	●	**GYM25RA-H14**	●
					(6L1L4H1)	**GYDL40T90D-M25R**	●		
			7.5—13 *1	70	(6N2L4H1)	**GYDL50P90F-M25R**	●	**GYM25RA-H14**	●
					(6N1L4H1)	**GYDL50T90F-M25R**	●		
J	6.00 6.35	R	7.5—13 *1	60	(6L2R4J1)	**GYDR40M90D-M25L**	●	**GYM25LA-J14**	●
					(6L1R4J1)	**GYDR40T90D-M25L**	●		
			7.5—13 *1	70	(6N2R4J1)	**GYDR50P90F-M25L**	●	**GYM25LA-J14**	●
					(6N1R4J1)	**GYDR50T90F-M25L**	●		
		L	7.5—13 *1	60	(6L2L4J1)	**GYDL40M90D-M25R**	●	**GYM25RA-J14**	●
					(6L1L4J1)	**GYDL40T90D-M25R**	●		
			7.5—13 *1	70	(6N2L4J1)	**GYDL50P90F-M25R**	●	**GYM25RA-J14**	●
					(6N1L4J1)	**GYDL50T90F-M25R**	●		

*1 The maximum groove depth varies according to the cutting diameter **D1**. For details, please refer to page F190.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **L1, L3, F1** and **F2** values may vary.
● : **Inventory maintained.**

∗ Wrench : ①For Clamp Screw ②For Blade Screw.

●**Modular blade type (Through air / coolant)**

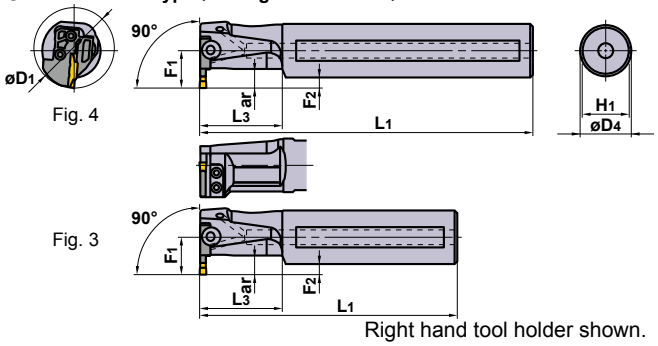


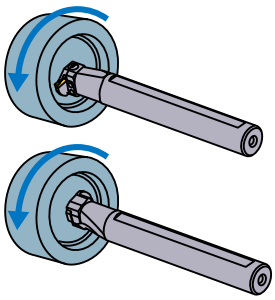
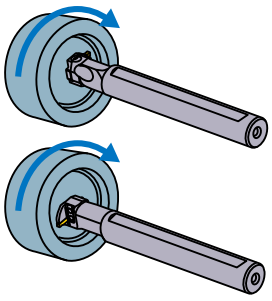
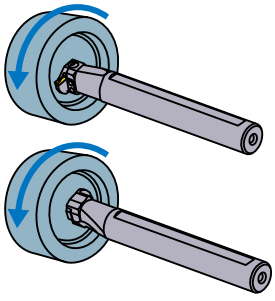
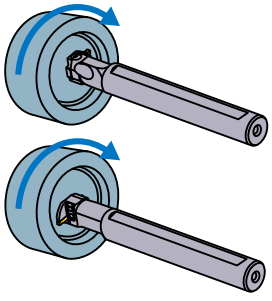
Fig. 4

Fig. 3

Right hand tool holder shown.

SPARE PARTS

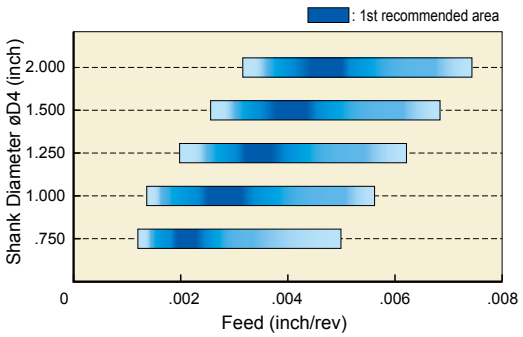
Modular Holder Number	Clamp Screw	Blade Screw (4 pcs.)	∗ Wrench
GYAR/L25○90B-H07	GY05016S (Clamp Torque : 40 lbf-in)	–	TKY20R
GYDR/L32○90C-M20L/R	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/L40○90D-M20L/R			
GYDR/L40○90D-M25L/R		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYDR/L50○90F-M25L/R			

Dimensions (mm) ∗2						Fig.	Cutting Mode	Insert	
D4	L1	L3	F1	F2	H1			Geometry / Insert Number	Page
25	125	40	19	6.5	23	1		GY2M0475H040N-GU GY2M0500H040N-GU	F014 – F016
25	200	40	19	6.5	23	2			
32	140	50	22	6.0	30	3		GY2M0475H030N-GS GY2M0500H030N-GS	
32	250	50	22	6.0	30	4			
40	150	60	28	8.0	37	3		GY2M0475H040N-GM GY2M0500H040N-GM (Gauge insert)	
40	300	60	28	8.0	37	4			
40	150	60	28	8.0	37	3		GY2M0500H040R05-GM GY2M0500H040L05-GM	
40	300	60	28	8.0	37	4			
50	170	80	34	9.0	47	3			
50	300	80	34	9.0	47	4			
25	125	40	19	6.5	23	1		GY2M0500H040N-MS GY2M0500H080N-MS	
25	200	40	19	6.5	23	2			
32	140	50	22	6.0	30	3		GY2M0500H040N-MM GY2M0500H080N-MM	
32	250	50	22	6.0	30	4			
40	150	60	28	8.0	37	3		GY2M0475H238N-BM GY2M0500H250N-BM	
40	300	60	28	8.0	37	4			
40	150	60	28	8.0	37	3		GY1G0475H020N-GFGS GY1G0500H020N-GFGS	
40	300	60	28	8.0	37	4			
50	170	80	34	9.0	47	3			
50	300	80	34	9.0	47	4			
40	150	60	28	8.0	37	3		GY2M0600J040N-GU GY2M0635J040N-GU	F014 – F016
40	300	60	28	8.0	37	4			
50	170	80	34	9.0	47	3		GY2M0600J030N-GS GY2M0635J030N-GS	
50	300	80	34	9.0	47	4			
								GY2M0600J040N-GM (Gauge insert) GY2M0635J040N-GM	
40	150	60	28	8.0	37	3		GY2M0600J040N-MS GY2M0600J080N-MS	
40	300	60	28	8.0	37	4			
50	170	80	34	9.0	47	3		GY2M0600J040N-MM GY2M0600J080N-MM	
50	300	80	34	9.0	47	4			
								GY2M0600J300N-BM GY2M0635J318N-BM	

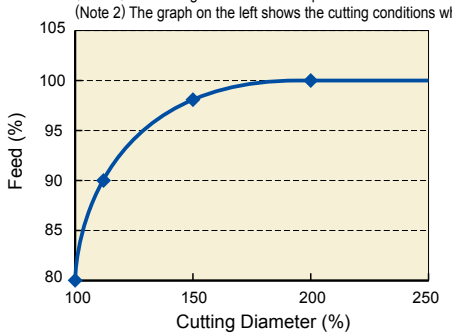
∗3 The maximum groove depth (ar) is a value within the dimension **L3**.

Recommended Cutting Conditions [Internal Grooving]

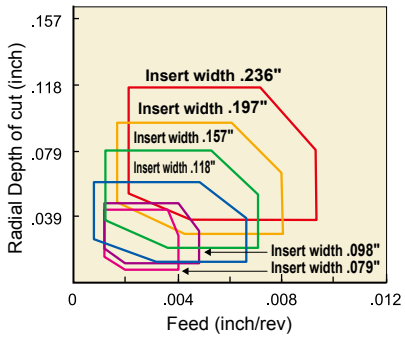
Grooving



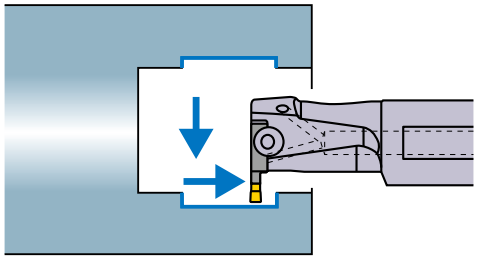
(Note 1) The cutting diameter 100% represents the minimum cutting diameter (øD1).
(Note 2) The graph on the left shows the cutting conditions when setting the feed to 100%.



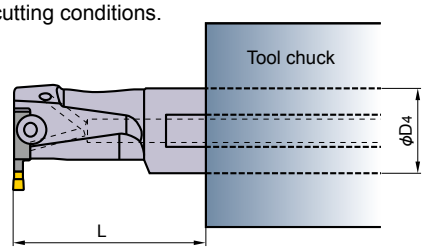
Traverse Machining (MM/MS Breaker)



● When traverse machining a blind hole, it is recommended to carry out back turning considering chip disposal.



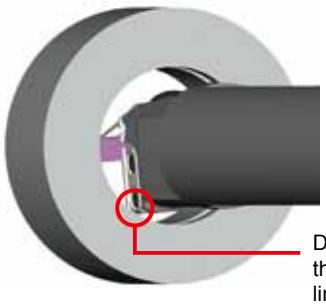
(Note) The above cutting conditions are for when using the tool overhang (L) 1.6-2.0 times larger than the shank diameter (øD4). (L/D=1.6-2.0)
When using L/D larger than 2.0, reduce the cutting conditions.



Limitation of the Maximum Groove Depth

●When using the mono block type
The maximum groove depth is not limited by the cutting diameter.

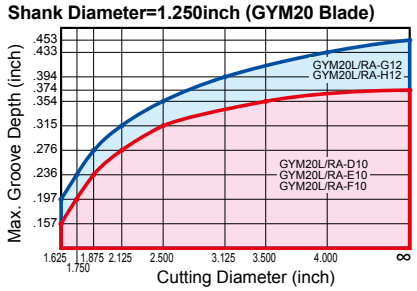
●When using the modular blade type
The maximum groove depth is limited by the cutting diameter.



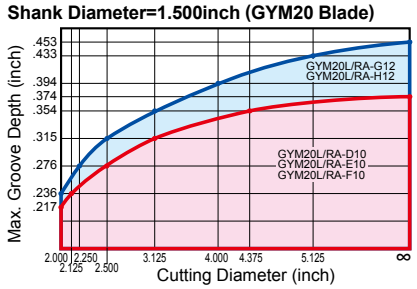
Due to interference of this part, the maximum groove depth is limited by the cutting diameter.

INCH SHANK

Shank Diameter=1.250inch (GYM20 Blade)



Shank Diameter=1.500inch (GYM20 Blade)



Recommended Cutting Speed (SFM)

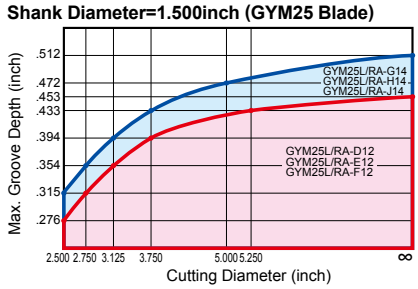
	Work Material	Hardness	Insert Grade	Cutting Speed (SFM) 165 330 495 660 825 990
P	Mild Steel	≤160HB	VP20RT	260 – 590
			VP10RT	295 – 625
			MY5015	360 – 825
			NX2525	230 – 560
	Carbon Steel Alloy Steel	160-280HB	VP20RT	195 – 460
			VP10RT	230 – 495
			MY5015	295 – 690
			NX2525	180 – 440
		≥280HB	VP20RT	165 – 360
			VP10RT	195 – 395
			MY5015	260 – 525
			NX2525	150 – 345
M	Stainless Steel	≤270HB	VP20RT	165 – 360
			VP10RT	195 – 395
K	Cast Iron	Tensile Strength ≤300MPa	VP20RT	165 – 460
			VP10RT	230 – 495
			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
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.

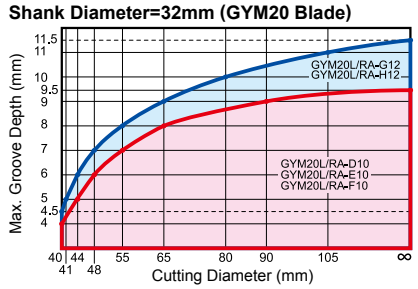
GROOVING

METRIC SHANK

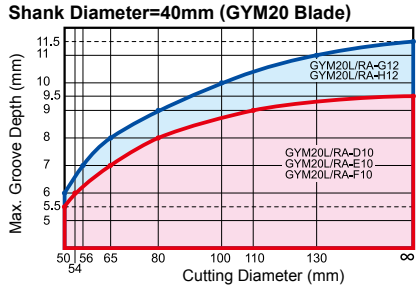
Shank Diameter=1.500inch (GYM25 Blade)



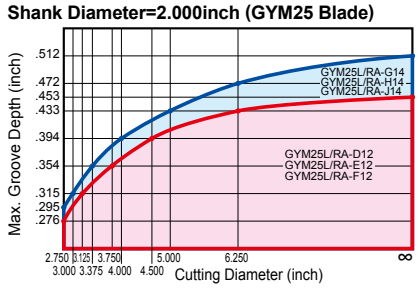
Shank Diameter=32mm (GYM20 Blade)



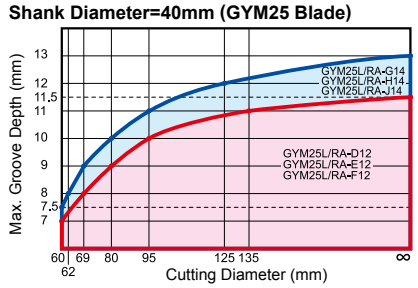
Shank Diameter=40mm (GYM20 Blade)



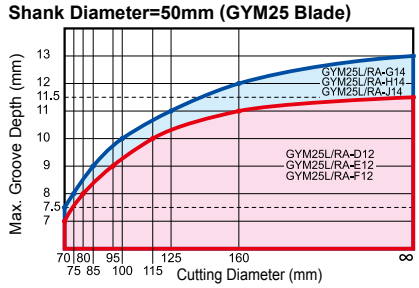
Shank Diameter=2.000inch (GYM25 Blade)



Shank Diameter=40mm (GYM25 Blade)



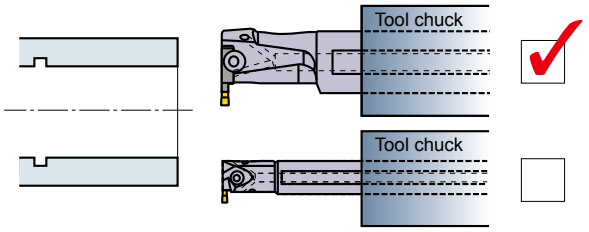
Shank Diameter=50mm (GYM25 Blade)



RECOMMENDATIONS FOR INTERNAL GROOVING

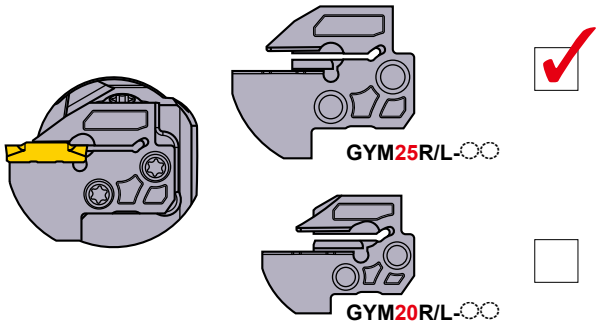
Notes when selecting the tool body

Holder



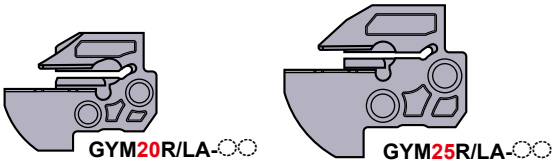
●When the overhang is the same, select a holder with the largest possible shank size to ensure sufficient clamping rigidity.

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)

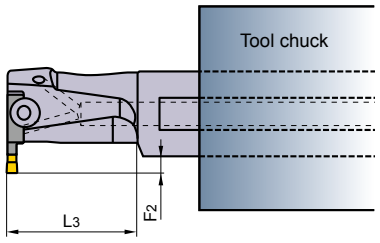


GYM20R/LA-D10	GYM25R/LA-D12
GYM20R/LA-E10	GYM25R/LA-E12
GYM20R/LA-F10	GYM25R/LA-F12
GYM20R/LA-G12	GYM25R/LA-G14
GYM20R/LA-H12	GYM25R/LA-H14
	GYM25R/LA-J14

●For an internal holder, select a modular blade listed above.

Notes when setting the tool

Over hang

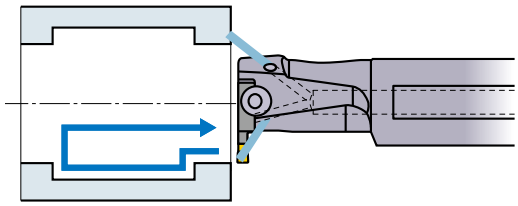


●The maximum groove depth is limited to the dimension L_3. When machining with longer overhangs, refer to the dimension F_2 of the tool used.

Notes on multi-function machining (MS and MM breakers)

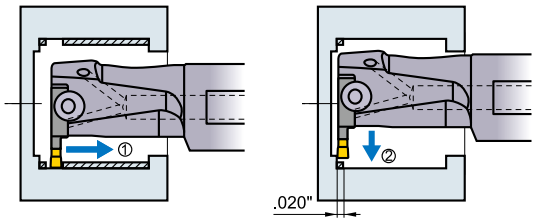
For internal grooving, the machining methods for external grooving (F053 – 054) can be used, but please note the following precautions.

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

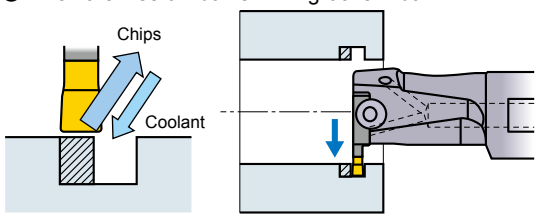


●As continuous chips tend to elongate at the back of the bore, the above operation is recommended.
The recommended width of cut for ② is .020 inch.

Machining Wide Grooves

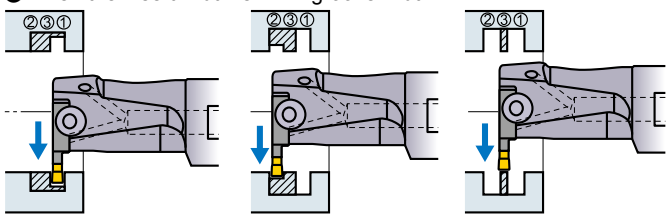
Grooving

●When the insert width is x 2 ≥ groove width



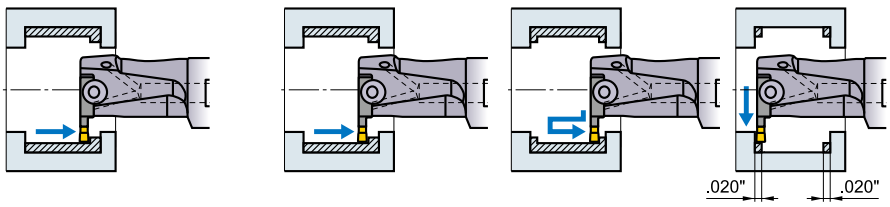
●When the depth of cut is shallower than the insert width, continuous chips are usually produced. When plunging in several passes, it is recommended to carry out machining in the steps above. This ensures that coolant reaches the cutting edge and chips are easily discharged.

●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.

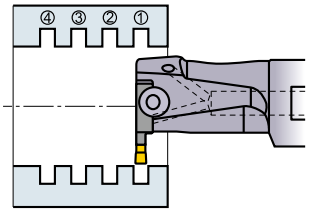
Turning



●When chip breaking and disposal are especially important, cross-feed machining is recommended.

●Wide face grooving when the corner R of the work piece is equal to the corner R of the insert, machine as shown above. (When corner R of the work piece 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.

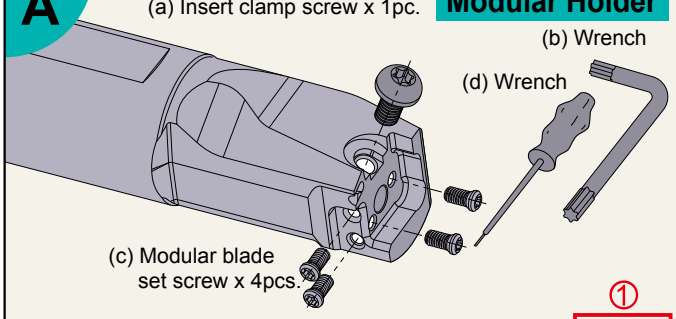
Machining instruction



●It is recommended to carry out grooving from the front end of the workpiece. This reduces workpiece deflection.

ASSEMBLY INSTRUCTION

A

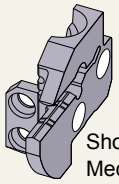


Modular Holder

① (Ex.) GYDLUS24M90D - M20R
GYDLUS32P90F - M25R

Modular Blade

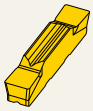
② ③ (Ex.) GY M20R A - F 10
GY M25R A - F 12



Short, Medium (4 holes)

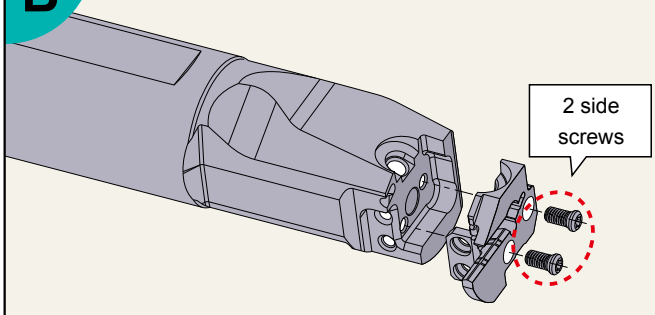
Insert

④ (Ex.) GY2M0300 F 040N-MS
GY2M0318 F 030N-GM

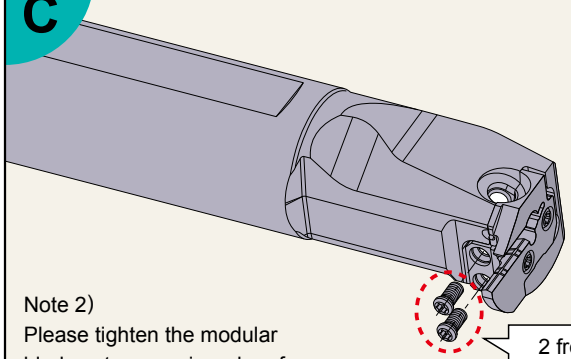


Note 1) ③ and ④ are changed by the insert size.

B



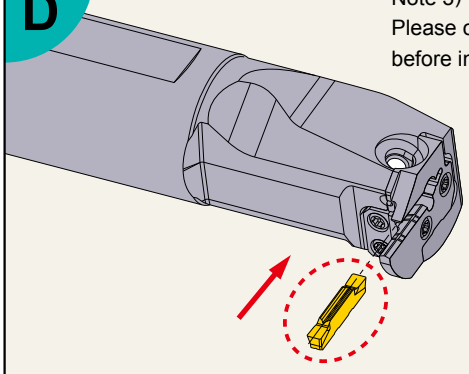
C



Note 2)
Please tighten the modular blade set screws in order of [Side screws] → [Front screws].

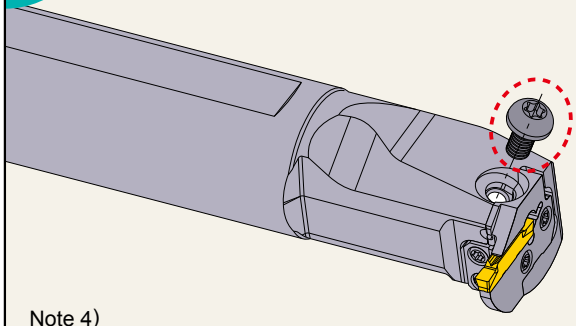
2 front screws

D



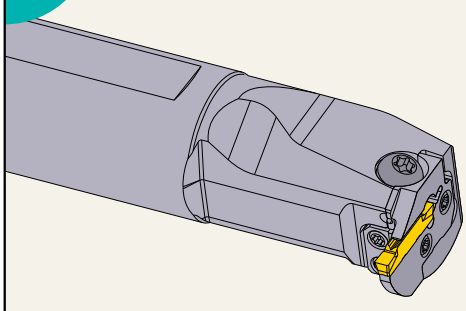
Note 3)
Please clean the insert-seat before installing the insert.

E

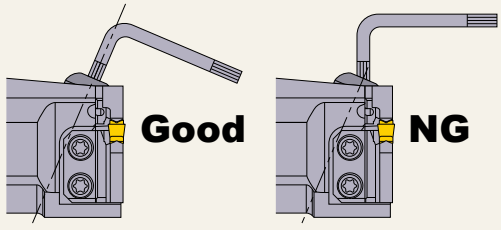


Note 4)
Don't tighten the insert clamp screw without installing the insert.
This will prevent modular blade damage.

F



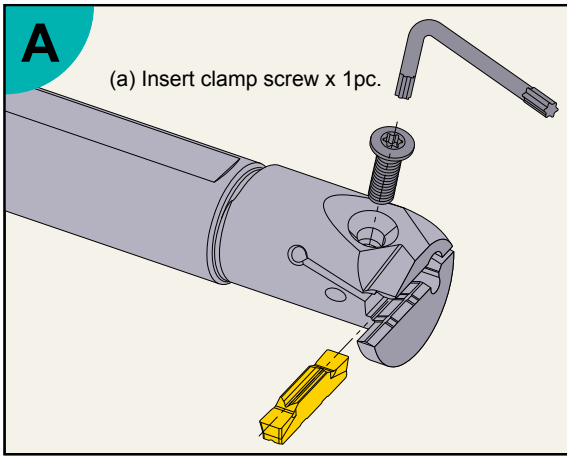
Assembled



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

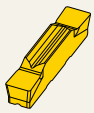
(b) Wrench

Insert

(Ex.)

GY2M0300 **F** 040N - MS (①)

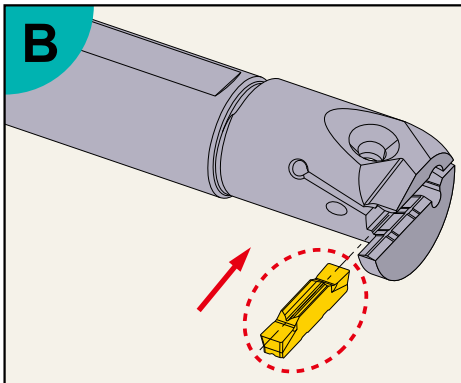
GY2M0318 **F** 030N - GM (①)



(Ex.) GYAL○○○90○ - **F** 06 (②)

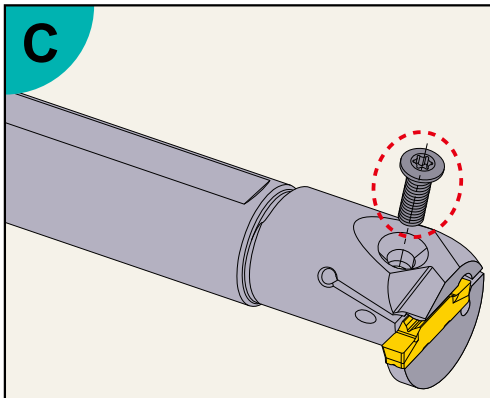
Note 1) ① and ② are changed by the insert size.

B

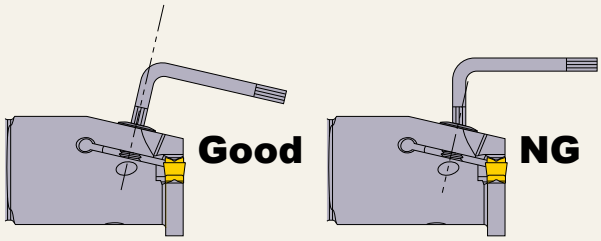


Note 2)
Please clean the insert-seat before installing the insert.

C

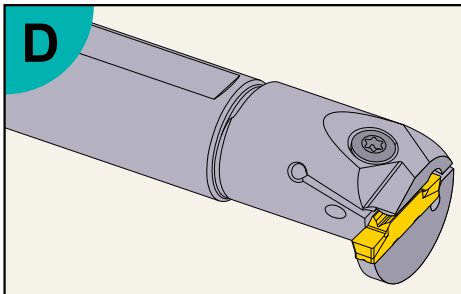


Note 3)
Don't tighten the insert clamp screw
without installing the insert.
This will prevent modular blade damage.



Note 4)
The insert clamp screw is inclined.
Ensure that the wrench is perpendicular to the screw tightening.

D



Assembled

CORRESPONDING TABLE OF HOLDERS/MODULAR BLADES

External grooving / Cutting off / Copying (00° type/90° type holder)

Modular Holder Number		Modular Blade Number	Max. Groove Depth (inch)	Insert Width (inch)	Page
(Inch holder) **GYHRUS10B00-M20R** (Metric holder) **GYHR1616J00-M20R**	For External Grooving	GYM20RA-D06	.236	.079	F018
		GYM20RA-D10	.394		F020
		GYM20RB-D18	.709		F022
		GYM20RA-E06	.236	.094 .098	F024
		GYM20RA-E10	.394		F026
		GYM20RB-E18	.709		F034
		GYM20RA-F06	.236	.118 .125	F036
		GYM20RA-F10	.394		F038
		GYM20RB-F18	.709		F040
		GYM20RA-G12	.472	.157	F042
		GYM20RA-H12	.472	.187 .197	
(Inch holder) **GYHLUS10B00-M20L** (Metric holder) **GYHL1616J00-M20L**	For External Grooving	GYM20LA-D06	.236	.079	F018
		GYM20LA-D10	.394		F020
		GYM20LB-D18	.709		F022
		GYM20LA-E06	.236	.094 .098	F024
		GYM20LA-E10	.394		F026
		GYM20LB-E18	.709		F034
		GYM20LA-F06	.236	.118 .125	F036
		GYM20LA-F10	.394		F038
		GYM20LB-F18	.709		F040
		GYM20LA-G12	.472	.157	F042
		GYM20LA-H12	.472	.187 .197	
(Inch holder) **GYHRUS12C00-M20R** **GYHLUS12C90-M20R** (Metric holder) **GYHR2020K00-M20R** **GYHL2020K90-M20R**	For External Grooving	GYM20RA-D06	.236	.079	F018
		GYM20RA-D10	.394		F020
		GYM20RB-D18	.709		F022
		GYM20RA-E06	.236	.094 .098	F024
		GYM20RA-E10	.394		F026
		GYM20RB-E18	.709		F030
		GYM20RA-F06	.236	.118 .125	F032
		GYM20RA-F10	.394		F034
		GYM20RB-F18	.709		F036
		GYM20RA-G12	.472	.157	F038
		GYM20RA-H12	.472	.187 .197	F040
					F042
					F044
					F046
					F048
(Inch holder) **GYHLUS12C00-M20L** **GYHRUS12C90-M20L** (Metric holder) **GYHL2020K00-M20L** **GYHR2020K90-M20L**	For External Grooving	GYM20LA-D06	.236	.079	F018
		GYM20LA-D10	.394		F020
		GYM20LB-D18	.709		F022
		GYM20LA-E06	.236	.094 .098	F024
		GYM20LA-E10	.394		F026
		GYM20LB-E18	.709		F030
		GYM20LA-F06	.236	.118 .125	F032
		GYM20LA-F10	.394		F034
		GYM20LB-F18	.709		F036
		GYM20LA-G12	.472	.157	F038
		GYM20LA-H12	.472	.187 .197	F040
					F042
					F046
					F048

Note) The modular blade number highlighted in red is also compatible with internal holders.

External grooving / Cutting off / Copying (00° type holder)
Face grooving / Copying (00° type holder)

Modular Holder Number		Modular Blade Number	Max. Groove Depth (inch)	Insert Width (inch)	Page
(Inch holder) **GYHRUS12C00-M25R** (Metric holder) **GYHR2020K00-M25R**	For External Grooving	GYM25RA-D06	.236	.079	F018
		GYM25RA-D12	.472		F020
		GYM25RA-D20	.787		F022
		GYM25RA-E06	.236	.094 .098	F024
		GYM25RA-E12	.472		F026
		GYM25RA-E20	.787		F028
		GYM25RA-F06	.236	.118 .125	F034
		GYM25RA-F12	.472		F036
		GYM25RA-F20	.787		F038
		GYM25RA-G08	.315	.157	F040
		GYM25RA-G14	.551		F042
		GYM25RA-G25	.984		F044
		GYM25RA-H08	.315	.187 .197	
		GYM25RA-H14	.551		
		GYM25RA-H25	.984		
		GYM25RA-J08	.315	.236 .250	
		GYM25RA-J14	.551		
		GYM25RA-J25	.984		
	For Face Grooving	GYM25RD-D12-040	.472	.079	F058
		GYM25RD-D12-050	.472		F066
		GYM25RD-D12-060	.472		F074
		GYM25RD-D12-075	.472		F114
		GYM25RD-D12-100	.472		F122
		GYM25RD-D12-135	.472		F130
		GYM25RD-D12-180	.472		
		GYM25RD-E12-040	.472	.094 .098	
		GYM25RD-E12-050	.472		
		GYM25RD-E12-060	.472		
		GYM25RD-E12-075	.472		
		GYM25RD-E12-100	.472		
		GYM25RD-E12-135	.472		
		GYM25RD-E12-180	.472		
		GYM25RD-F12-035	.472	.118 .125	
		GYM25RD-F12-040	.472		
		GYM25RD-F12-050	.472		
		GYM25RD-F12-060	.472		
		GYM25RD-F20-060	.787		
		GYM25RD-F12-075	.472		
		GYM25RD-F20-075	.787		
		GYM25RD-F12-100	.472		
		GYM25RD-F20-100	.787		
		GYM25RD-F12-135	.472		
		GYM25RD-F20-135	.787		
		GYM25RD-F12-180	.472		
		GYM25RD-F20-180	.787		
		GYM25RD-F12-225	.472		
		GYM25RD-F20-225	.787		
		GYM25RD-G14-040	.551	.157	F082
		GYM25RD-G14-050	.551		F138
		GYM25RD-G14-060	.551		
		GYM25RD-G25-060	.984		
		GYM25RD-G14-085	.551		
		GYM25RD-G25-085	.984		
		GYM25RD-G14-125	.551		
		GYM25RD-G25-125	.984		
		GYM25RD-G14-180	.551		
		GYM25RD-G25-180	.984		
		GYM25RD-G14-250	.551		
		GYM25RD-G25-250	.984		

● External grooving / Cutting off / Copying (00º type holder)
● Face grooving / Copying (00º type holder)

Modular Holder Number		Modular Blade Number	Max. Groove Depth (inch)	Insert Width (inch)	Page
(Inch holder) **GYHRUS12C00-M25R** (Metric holder) **GYHR2020K00-M25R**	For Face Grooving	GYM25RD-H14-050	.551	.187 .197	F090 F146
		GYM25RD-H14-060	.551		
		GYM25RD-H25-060	.984		
		GYM25RD-H14-085	.551		
		GYM25RD-H25-085	.984		
		GYM25RD-H14-125	.551		
		GYM25RD-H25-125	.984		
		GYM25RD-H14-180	.551		
		GYM25RD-H25-180	.984		
		GYM25RD-H14-250	.551		
		GYM25RD-H25-250	.984		
		GYM25RD-J14-050	.551	.236 .250	F098 F154
		GYM25RD-J14-070	.551		
		GYM25RD-J25-070	.984		
		GYM25RD-J14-110	.551		
		GYM25RD-J25-110	.984		
		GYM25RD-J14-170	.551		
		GYM25RD-J25-170	.984		
		GYM25RD-J14-250	.551		
		GYM25RD-J25-250	.984		
(Inch holder) **GYHLUS12C00-M25L** (Metric holder) **GYHL2020K00-M25L**	For External Grooving	GYM25LA-D06	.236	.079	F018
		GYM25LA-D12	.472		
		GYM25LA-D20	.787		
		GYM25LA-E06	.236	.094	F020
		GYM25LA-E12	.472	.098	F022
		GYM25LA-E20	.787		F024
		GYM25LA-F06	.236	.118	F026
		GYM25LA-F12	.472	.125	F028
		GYM25LA-F20	.787		F034
		GYM25LA-G08	.315	.157	F036
		GYM25LA-G14	.551		F038
		GYM25LA-G25	.984		
		GYM25LA-H08	.315	.187	F040
		GYM25LA-H14	.551	.197	F042
		GYM25LA-H25	.984		F044
		GYM25LA-J08	.315	.236	
		GYM25LA-J14	.551	.250	
		GYM25LA-J25	.984		
	For Face Grooving	GYM25LD-D12-040	.472	.079	F062 F118
		GYM25LD-D12-050	.472		
		GYM25LD-D12-060	.472		
		GYM25LD-D12-075	.472		
		GYM25LD-D12-100	.472		
		GYM25LD-D12-135	.472		
		GYM25LD-D12-180	.472		
		GYM25LD-E12-040	.472	.094 .098	F070 F126
		GYM25LD-E12-050	.472		
		GYM25LD-E12-060	.472		
		GYM25LD-E12-075	.472		
		GYM25LD-E12-100	.472		
		GYM25LD-E12-135	.472		
		GYM25LD-E12-180	.472		

Note) The modular blade number highlighted in red is also compatible with internal holders.

Modular Holder Number		Modular Blade Number	Max. Groove Depth (inch)	Insert Width (inch)	Page
(Inch holder) **GYHLUS12C00-M25L** (Metric holder) **GYHL2020K00-M25L**	For Face Grooving	GYM25LD-F12-035	.472	.118 .125	F078 F134
		GYM25LD-F12-040	.472		
		GYM25LD-F12-050	.472		
		GYM25LD-F12-060	.472		
		GYM25LD-F20-060	.787		
		GYM25LD-F12-075	.472		
		GYM25LD-F20-075	.787		
		GYM25LD-F12-100	.472		
		GYM25LD-F20-100	.787		
		GYM25LD-F12-135	.472		
		GYM25LD-F20-135	.787		
		GYM25LD-F12-180	.472		
		GYM25LD-F20-180	.787		
		GYM25LD-F12-225	.472		
		GYM25LD-F20-225	.787		
		GYM25LD-G14-040	.551	.157	F086 F142
		GYM25LD-G14-050	.551		
		GYM25LD-G14-060	.551		
		GYM25LD-G25-060	.984		
		GYM25LD-G14-085	.551		
		GYM25LD-G25-085	.984		
		GYM25LD-G14-125	.551		
		GYM25LD-G25-125	.984		
		GYM25LD-G14-180	.551		
		GYM25LD-G25-180	.984		
		GYM25LD-G14-250	.551		
		GYM25LD-G25-250	.984		
		GYM25LD-H14-050	.551	.187 .197	F094 F150
		GYM25LD-H14-060	.551		
		GYM25LD-H25-060	.984		
		GYM25LD-H14-085	.551		
		GYM25LD-H25-085	.984		
		GYM25LD-H14-125	.551		
		GYM25LD-H25-125	.984		
		GYM25LD-H14-180	.551		
		GYM25LD-H25-180	.984		
		GYM25LD-H14-250	.551		
		GYM25LD-H25-250	.984		
		GYM25LD-J14-050	.551	.236 .250	F100 F156
		GYM25LD-J14-070	.551		
		GYM25LD-J25-070	.984		
		GYM25LD-J14-110	.551		
		GYM25LD-J25-110	.984		
		GYM25LD-J14-170	.551		
		GYM25LD-J25-170	.984		
		GYM25LD-J14-250	.551		
		GYM25LD-J25-250	.984		

CORRESPONDING TABLE OF HOLDERS/MODULAR BLADES

- External grooving / Cutting off / Copying (00° type/90° type holder)
- Face grooving / Copying (00° type/90° type holder)

Modular Holder Number	Modular Blade				
		Modular Blade Number	Max. Groove Depth (inch)	Insert Width (inch)	Page
(Inch holder) GYHRUS16D00-M25R GYHLUS16D90-M25R (Metric holder) GYHR2525M00-M25R GYHL2525M90-M25R	For External Grooving	GYM25RA-D06	.236	.079	F018
		GYM25RA-D12	.472		F020
		GYM25RA-D20	.787		F022
		GYM25RA-E06	.236	.094 .098	F024
		GYM25RA-E12	.472		F026
		GYM25RA-E20	.787		F028
		GYM25RA-F06	.236	.118 .125	F030
		GYM25RA-F12	.472		F032
		GYM25RA-F20	.787		F034
		GYM25RA-G08	.315	.157	F036
		GYM25RA-G14	.551		F038
		GYM25RA-G25	.984		F040
		GYM25RA-H08	.315	.187 .197	F042
		GYM25RA-H14	.551		F044
		GYM25RA-H25	.984		F046
		GYM25RA-J08	.315	.236 .250	F048
		GYM25RA-J14	.551		
		GYM25RA-J25	.984		
	For Face Grooving	GYM25RD-D12-040	.472	.079	F058
		GYM25RD-D12-050	.472		F066
		GYM25RD-D12-060	.472		F074
		GYM25RD-D12-075	.472		F102
		GYM25RD-D12-100	.472		F104
		GYM25RD-D12-135	.472		F106
		GYM25RD-D12-180	.472		F114
		GYM25RD-E12-040	.472	.094 .098	F122
		GYM25RD-E12-050	.472		F130
		GYM25RD-E12-060	.472		F158
		GYM25RD-E12-075	.472		F160
		GYM25RD-E12-100	.472		F162
		GYM25RD-E12-135	.472		
		GYM25RD-E12-180	.472		
		GYM25RD-F12-035	.472	.118 .125	
		GYM25RD-F12-040	.472		
		GYM25RD-F12-050	.472		
		GYM25RD-F12-060	.472		
		GYM25RD-F20-060	.787		
		GYM25RD-F12-075	.472		
		GYM25RD-F20-075	.787		
		GYM25RD-F12-100	.472		
		GYM25RD-F20-100	.787		
		GYM25RD-F12-135	.472		
		GYM25RD-F20-135	.787		
		GYM25RD-F12-180	.472		
		GYM25RD-F20-180	.787		
		GYM25RD-F12-225	.472		
		GYM25RD-F20-225	.787		
		GYM25RD-G14-040	.551	.157	F082
		GYM25RD-G14-050	.551		F108
		GYM25RD-G14-060	.551		F138
		GYM25RD-G25-060	.984		F164
		GYM25RD-G14-085	.551		
		GYM25RD-G25-085	.984		
		GYM25RD-G14-125	.551		
		GYM25RD-G25-125	.984		
		GYM25RD-G14-180	.551		
		GYM25RD-G25-180	.984		
		GYM25RD-G14-250	.551		
		GYM25RD-G25-250	.984		

Modular Holder Number	Modular Blade				
		Modular Blade Number	Max. Groove Depth (inch)	Insert Width (inch)	Page
(Inch holder) GYHRUS16D00-M25R GYHLUS16D90-M25R (Metric holder) GYHR2525M00-M25R GYHL2525M90-M25R	For Face Grooving	GYM25RD-H14-050	.551	.187 .197	F090
		GYM25RD-H14-060	.551		F110
		GYM25RD-H25-060	.984		F146
		GYM25RD-H14-085	.551		F166
		GYM25RD-H25-085	.984		
		GYM25RD-H14-125	.551		
		GYM25RD-H25-125	.984		
		GYM25RD-H14-180	.551		
		GYM25RD-H25-180	.984		
		GYM25RD-H14-250	.551		
		GYM25RD-H25-250	.984		
		GYM25RD-J14-050	.551	.236 .250	F098
		GYM25RD-J14-070	.551		F112
		GYM25RD-J25-070	.984		F154
		GYM25RD-J14-110	.551		F168
		GYM25RD-J25-110	.984		
		GYM25RD-J14-170	.551		
		GYM25RD-J25-170	.984		
		GYM25RD-J14-250	.551		
		GYM25RD-J25-250	.984		
(Inch holder) GYHLUS16D00-M25L GYHRUS16D90-M25L (Metric holder) GYHL2525M00-M25L GYHR2525M90-M25L	For External Grooving	GYM25LA-D06	.236	.079	F018
		GYM25LA-D12	.472		F020
		GYM25LA-D20	.787		F022
		GYM25LA-E06	.236	.094 .098	F024
		GYM25LA-E12	.472		F026
		GYM25LA-E20	.787		F028
		GYM25LA-F06	.236	.118 .125	F030
		GYM25LA-F12	.472		F032
		GYM25LA-F20	.787		F034
		GYM25LA-G08	.315	.157	F036
		GYM25LA-G14	.551		F038
		GYM25LA-G25	.984		F040
		GYM25LA-H08	.315	.187 .197	F042
		GYM25LA-H14	.551		F044
		GYM25LA-H25	.984		F046
		GYM25LA-J08	.315	.236 .250	F048
		GYM25LA-J14	.551		
		GYM25LA-J25	.984		
	For Face Grooving	GYM25LD-D12-040	.472	.079	F062
		GYM25LD-D12-050	.472		F070
		GYM25LD-D12-060	.472		F102
		GYM25LD-D12-075	.472		F104
		GYM25LD-D12-100	.472		F118
		GYM25LD-D12-135	.472		F126
		GYM25LD-D12-180	.472		F158
		GYM25LD-E12-040	.472	.094 .098	F160
		GYM25LD-E12-050	.472		
		GYM25LD-E12-060	.472		
		GYM25LD-E12-075	.472		
		GYM25LD-E12-100	.472		
		GYM25LD-E12-135	.472		
		GYM25LD-E12-180	.472		

Note) The modular blade number highlighted in red is also compatible with internal holders.

● External grooving / Cutting off / Copying (00° type/90° type holder)
● Face grooving / Copying (00° type/90° type holder)

Modular Holder Number		Modular Blade Number	Max. Groove Depth (inch)	Insert Width (inch)	Page
(Inch holder) **GYHLUS16D00-M25L** **GYHRUS16D90-M25L** (Metric holder) **GYHL2525M00-M25L** **GYHR2525M90-M25L**	For Face Grooving	**GYM25LD-F12-035**	.472	.118 .125	**F078** **F106** **F134** **F162**
		GYM25LD-F12-040	.472		
		GYM25LD-F12-050	.472		
		GYM25LD-F12-060	.472		
		GYM25LD-F20-060	.787		
		GYM25LD-F12-075	.472		
		GYM25LD-F20-075	.787		
		GYM25LD-F12-100	.472		
		GYM25LD-F20-100	.787		
		GYM25LD-F12-135	.472		
		GYM25LD-F20-135	.787		
		GYM25LD-F12-180	.472		
		GYM25LD-F20-180	.787		
		GYM25LD-F12-225	.472		
		GYM25LD-F20-225	.787		
		GYM25LD-G14-040	.551	.157	**F086** **F108** **F142** **F164**
		GYM25LD-G14-050	.551		
		GYM25LD-G14-060	.551		
		GYM25LD-G25-060	.984		
		GYM25LD-G14-085	.551		
		GYM25LD-G25-085	.984		
		GYM25LD-G14-125	.551		
		GYM25LD-G25-125	.984		
		GYM25LD-G14-180	.551		
		GYM25LD-G25-180	.984		
		GYM25LD-G14-250	.551		
		GYM25LD-G25-250	.984		
		GYM25LD-H14-050	.551	.187 .197	**F094** **F110** **F150** **F166**
		GYM25LD-H14-060	.551		
		GYM25LD-H25-060	.984		
		GYM25LD-H14-085	.551		
		GYM25LD-H25-085	.984		
		GYM25LD-H14-125	.551		
		GYM25LD-H25-125	.984		
		GYM25LD-H14-180	.551		
		GYM25LD-H25-180	.984		
		GYM25LD-H14-250	.551		
		GYM25LD-H25-250	.984		
		GYM25LD-J14-050	.551	.236 .250	**F100** **F112** **F156** **F168**
		GYM25LD-J14-070	.551		
		GYM25LD-J25-070	.984		
		GYM25LD-J14-110	.551		
		GYM25LD-J25-110	.984		
		GYM25LD-J14-170	.551		
		GYM25LD-J25-170	.984		
		GYM25LD-J14-250	.551		
		GYM25LD-J25-250	.984		

Modular Holder Number		Modular Blade Number	Max. Groove Depth (inch)	Insert Width (inch)	Page
(Inch holder) **GYHRUS20D00-M25R** (Metric holder) **GYHR3225P00-M25R**	For External Grooving	**GYM25RA-D06**	.236	.079	**F018**
		GYM25RA-D12	.472		
		GYM25RA-D20	.787		
		GYM25RA-E06	.236	.094 .098	**F020** **F022**
		GYM25RA-E12	.472		
		GYM25RA-E20	.787		
		GYM25RA-F06	.236	.118 .125	**F024** **F026** **F028**
		GYM25RA-F12	.472		
		GYM25RA-F20	.787		
		GYM25RA-G08	.315	.157	**F034** **F036** **F038**
		GYM25RA-G14	.551		
		GYM25RA-G25	.984		
		GYM25RA-H08	.315	.187 .197	**F040** **F042** **F044**
		GYM25RA-H14	.551		
		GYM25RA-H25	.984		
		GYM25RA-J08	.315	.236 .250	
		GYM25RA-J14	.551		
		GYM25RA-J25	.984		
	For Face Grooving	**GYM25RD-D12-040**	.472	.079	**F060** **F068** **F076** **F116** **F124** **F132**
		GYM25RD-D12-050	.472		
		GYM25RD-D12-060	.472		
		GYM25RD-D12-075	.472		
		GYM25RD-D12-100	.472		
		GYM25RD-D12-135	.472		
		GYM25RD-D12-180	.472		
		GYM25RD-E12-040	.472	.094 .098	
		GYM25RD-E12-050	.472		
		GYM25RD-E12-060	.472		
		GYM25RD-E12-075	.472		
		GYM25RD-E12-100	.472		
		GYM25RD-E12-135	.472		
		GYM25RD-E12-180	.472		
		GYM25RD-F12-035	.472	.118 .125	
		GYM25RD-F12-040	.472		
		GYM25RD-F12-050	.472		
		GYM25RD-F12-060	.472		
		GYM25RD-F20-060	.787		
		GYM25RD-F12-075	.472		
		GYM25RD-F20-075	.787		
		GYM25RD-F12-100	.472		
		GYM25RD-F20-100	.787		
		GYM25RD-F12-135	.472		
		GYM25RD-F20-135	.787		
		GYM25RD-F12-180	.472		
		GYM25RD-F20-180	.787		
		GYM25RD-F12-225	.472		
		GYM25RD-F20-225	.787		
		GYM25RD-G14-040	.551	.157	**F084** **F140**
		GYM25RD-G14-050	.551		
		GYM25RD-G14-060	.551		
		GYM25RD-G25-060	.984		
		GYM25RD-G14-085	.551		
		GYM25RD-G25-085	.984		
		GYM25RD-G14-125	.551		
		GYM25RD-G25-125	.984		
		GYM25RD-G14-180	.551		
		GYM25RD-G25-180	.984		
		GYM25RD-G14-250	.551		
		GYM25RD-G25-250	.984		

CORRESPONDING TABLE OF HOLDERS/MODULAR BLADES

- External grooving / Cutting off / Copying (00° type holder)
- Face grooving / Copying (00° type holder)

Modular Holder Number		Modular Blade Number	Max. Groove Depth (inch)	Insert Width (inch)	Page
(Inch holder) **GYHRUS20D00-M25R** (Metric holder) **GYHR3225P00-M25R**	For Face Grooving	GYM25RD-H14-050	.551	.187 .197	F092 F148
		GYM25RD-H14-060	.551		
		GYM25RD-H25-060	.984		
		GYM25RD-H14-085	.551		
		GYM25RD-H25-085	.984		
		GYM25RD-H14-125	.551		
		GYM25RD-H25-125	.984		
		GYM25RD-H14-180	.551		
		GYM25RD-H25-180	.984		
		GYM25RD-H14-250	.551		
		GYM25RD-H25-250	.984		
		GYM25RD-J14-050	.551	.236 .250	F098 F154
		GYM25RD-J14-070	.551		
		GYM25RD-J25-070	.984		
		GYM25RD-J14-110	.551		
		GYM25RD-J25-110	.984		
		GYM25RD-J14-170	.551		
		GYM25RD-J25-170	.984		
		GYM25RD-J14-250	.551		
		GYM25RD-J25-250	.984		
(Inch holder) **GYHLUS20D00-M25L** (Metric holder) **GYHL3225P00-M25L**	For External Grooving	GYM25LA-D06	.236	.079	F018
		GYM25LA-D12	.472		
		GYM25LA-D20	.787		
		GYM25LA-E06	.236	.094 .098	F020 F022 F024
		GYM25LA-E12	.472		
		GYM25LA-E20	.787		
		GYM25LA-F06	.236	.118 .125	F026 F028 F034
		GYM25LA-F12	.472		
		GYM25LA-F20	.787		
		GYM25LA-G08	.315	.157	F036 F038 F040
		GYM25LA-G14	.551		
		GYM25LA-G25	.984		
		GYM25LA-H08	.315	.187 .197	F042 F044 F064
		GYM25LA-H14	.551		
		GYM25LA-H25	.984		
		GYM25LA-J08	.315	.236 .250	F072 F120 F128
		GYM25LA-J14	.551		
		GYM25LA-J25	.984		
	For Face Grooving	GYM25LD-D12-040	.472	.079	
		GYM25LD-D12-050	.472		
		GYM25LD-D12-060	.472		
		GYM25LD-D12-075	.472		
		GYM25LD-D12-100	.472		
		GYM25LD-D12-135	.472		
		GYM25LD-D12-180	.472		
		GYM25LD-E12-040	.472	.094 .098	
		GYM25LD-E12-050	.472		
		GYM25LD-E12-060	.472		
		GYM25LD-E12-075	.472		
		GYM25LD-E12-100	.472		
		GYM25LD-E12-135	.472		
		GYM25LD-E12-180	.472		

Modular Holder Number		Modular Blade Number	Max. Groove Depth (inch)	Insert Width (inch)	Page
(Inch holder) **GYHLUS20D00-M25L** (Metric holder) **GYHL3225P00-M25L**	For Face Grooving	GYM25LD-F12-035	.472	.118 .125	F080 F136
		GYM25LD-F12-040	.472		
		GYM25LD-F12-050	.472		
		GYM25LD-F12-060	.472		
		GYM25LD-F20-060	.787		
		GYM25LD-F12-075	.472		
		GYM25LD-F20-075	.787		
		GYM25LD-F12-100	.472		
		GYM25LD-F20-100	.787		
		GYM25LD-F12-135	.472		
		GYM25LD-F20-135	.787		
		GYM25LD-F12-180	.472		
		GYM25LD-F20-180	.787		
		GYM25LD-F12-225	.472		
		GYM25LD-F20-225	.787		
		GYM25LD-G14-040	.551	.157	F088 F144
		GYM25LD-G14-050	.551		
		GYM25LD-G14-060	.551		
		GYM25LD-G25-060	.984		
		GYM25LD-G14-085	.551		
		GYM25LD-G25-085	.984		
		GYM25LD-G14-125	.551		
		GYM25LD-G25-125	.984		
		GYM25LD-G14-180	.551		
		GYM25LD-G25-180	.984		
		GYM25LD-G14-250	.551		
		GYM25LD-G25-250	.984		
		GYM25LD-H14-050	.551	.187 .197	F096 F152
		GYM25LD-H14-060	.551		
		GYM25LD-H25-060	.984		
		GYM25LD-H14-085	.551		
		GYM25LD-H25-085	.984		
		GYM25LD-H14-125	.551		
		GYM25LD-H25-125	.984		
		GYM25LD-H14-180	.551		
		GYM25LD-H25-180	.984		
		GYM25LD-H14-250	.551		
		GYM25LD-H25-250	.984		
		GYM25LD-J14-050	.551	.236 .250	F100 F156
		GYM25LD-J14-070	.551		
		GYM25LD-J25-070	.984		
		GYM25LD-J14-110	.551		
		GYM25LD-J25-110	.984		
		GYM25LD-J14-170	.551		
		GYM25LD-J25-170	.984		
		GYM25LD-J14-250	.551		
		GYM25LD-J25-250	.984		

● **External grooving / Cutting off / Copying (00º type holder)**
● **Face grooving / Copying (00º type holder)**

Modular Holder Number		Modular Blade Number	Max. Groove Depth (inch)	Insert Width (inch)	Page
(Inch holder) **GYHRUS24E00-M25R** (Metric holder) **GYHR3232P00-M25R**	For External Grooving	**GYM25RA-D06**	.236	.079	**F018**
		GYM25RA-D12	.472		
		GYM25RA-D20	.787		
		GYM25RA-E06	.236	.094	**F020**
		GYM25RA-E12	.472	.098	**F022**
		GYM25RA-E20	.787		**F024**
		GYM25RA-F06	.236	.118	**F026**
		GYM25RA-F12	.472	.125	**F028**
		GYM25RA-F20	.787		**F034**
		GYM25RA-G08	.315	.157	**F036**
		GYM25RA-G14	.551		**F038**
		GYM25RA-G25	.984		**F040**
		GYM25RA-H08	.315	.187	**F042**
		GYM25RA-H14	.551	.197	**F044**
		GYM25RA-H25	.984		
		GYM25RA-J08	.315	.236	
		GYM25RA-J14	.551	.250	
		GYM25RA-J25	.984		
	For Face Grooving	**GYM25RD-D12-040**	.472	.079	**F060**
		GYM25RD-D12-050	.472		**F068**
		GYM25RD-D12-060	.472		**F076**
		GYM25RD-D12-075	.472		**F116**
		GYM25RD-D12-100	.472		**F124**
		GYM25RD-D12-135	.472		**F132**
		GYM25RD-D12-180	.472		
		GYM25RD-E12-040	.472	.094	
		GYM25RD-E12-050	.472	.098	
		GYM25RD-E12-060	.472		
		GYM25RD-E12-075	.472		
		GYM25RD-E12-100	.472		
		GYM25RD-E12-135	.472		
		GYM25RD-E12-180	.472		
		GYM25RD-F12-035	.472	.118	
		GYM25RD-F12-040	.472	.125	
		GYM25RD-F12-050	.472		
		GYM25RD-F12-060	.472		
		GYM25RD-F20-060	.787		
		GYM25RD-F12-075	.472		
		GYM25RD-F20-075	.787		
		GYM25RD-F12-100	.472		
		GYM25RD-F20-100	.787		
		GYM25RD-F12-135	.472		
		GYM25RD-F20-135	.787		
		GYM25RD-F12-180	.472		
		GYM25RD-F20-180	.787		
		GYM25RD-F12-225	.472		
		GYM25RD-F20-225	.787		

Modular Holder Number		Modular Blade Number	Max. Groove Depth (inch)	Insert Width (inch)	Page
(Inch holder) **GYHRUS24E00-M25R** (Metric holder) **GYHR3232P00-M25R**	For Face Grooving	**GYM25RD-G14-040**	.551	.157	**F084**
		GYM25RD-G14-050	.551		**F140**
		GYM25RD-G14-060	.551		
		GYM25RD-G25-060	.984		
		GYM25RD-G14-085	.551		
		GYM25RD-G25-085	.984		
		GYM25RD-G14-125	.551		
		GYM25RD-G25-125	.984		
		GYM25RD-G14-180	.551		
		GYM25RD-G25-180	.984		
		GYM25RD-G14-250	.551		
		GYM25RD-G25-250	.984		
		GYM25RD-H14-050	.551	.187	**F092**
		GYM25RD-H14-060	.551	.197	**F148**
		GYM25RD-H25-060	.984		
		GYM25RD-H14-085	.551		
		GYM25RD-H25-085	.984		
		GYM25RD-H14-125	.551		
		GYM25RD-H25-125	.984		
		GYM25RD-H14-180	.551		
		GYM25RD-H25-180	.984		
		GYM25RD-H14-250	.551		
		GYM25RD-H25-250	.984		
		GYM25RD-J14-050	.551	.236	**F098**
		GYM25RD-J14-070	.551	.250	**F154**
		GYM25RD-J25-070	.984		
		GYM25RD-J14-110	.551		
		GYM25RD-J25-110	.984		
		GYM25RD-J14-170	.551		
		GYM25RD-J25-170	.984		
		GYM25RD-J14-250	.551		
		GYM25RD-J25-250	.984		

CORRESPONDING TABLE OF HOLDERS/MODULAR BLADES

- External grooving / Cutting off / Copying (00º type holder)
- Face grooving / Copying (00º type holder)

Modular Holder Number	Modular Blade			Insert Width (inch)	Page
		Modular Blade Number	Max. Groove Depth (inch)		
(Inch holder) **GYHLUS24E00-M25L** (Metric holder) **GYHL3232P00-M25L**	For External Grooving	GYM25LA-D06	.236	.079	F018
		GYM25LA-D12	.472		
		GYM25LA-D20	.787		
		GYM25LA-E06	.236	.094	F020
		GYM25LA-E12	.472	.098	F022
		GYM25LA-E20	.787		F024
		GYM25LA-F06	.236	.118	F026
		GYM25LA-F12	.472	.125	F028
		GYM25LA-F20	.787		F034
		GYM25LA-G08	.315	.157	F036
		GYM25LA-G14	.551		F038
		GYM25LA-G25	.984		F040
		GYM25LA-H08	.315	.187	F038
		GYM25LA-H14	.551	.197	F042
		GYM25LA-H25	.984		
		GYM25LA-J08	.315	.236	
		GYM25LA-J14	.551	.250	
		GYM25LA-J25	.984		
	For Face Grooving	GYM25LD-D12-040	.472	.079	F064
		GYM25LD-D12-050	.472		F072
		GYM25LD-D12-060	.472		F080
		GYM25LD-D12-075	.472		F120
		GYM25LD-D12-100	.472		F128
		GYM25LD-D12-135	.472		F136
		GYM25LD-D12-180	.472		
		GYM25LD-E12-040	.472	.094	
		GYM25LD-E12-050	.472	.098	
		GYM25LD-E12-060	.472		
		GYM25LD-E12-075	.472		
		GYM25LD-E12-100	.472		
		GYM25LD-E12-135	.472		
		GYM25LD-E12-180	.472		
		GYM25LD-F12-035	.472	.118	
		GYM25LD-F12-040	.472	.125	
		GYM25LD-F12-050	.472		
		GYM25LD-F12-060	.472		
		GYM25LD-F20-060	.787		
		GYM25LD-F12-075	.472		
		GYM25LD-F20-075	.787		
		GYM25LD-F12-100	.472		
		GYM25LD-F20-100	.787		
		GYM25LD-F12-135	.472		
		GYM25LD-F20-135	.787		
		GYM25LD-F12-180	.472		
		GYM25LD-F20-180	.787		
		GYM25LD-F12-225	.472		
		GYM25LD-F20-225	.787		

Modular Holder Number	Modular Blade			Insert Width (inch)	Page
		Modular Blade Number	Max. Groove Depth (inch)		
(Inch holder) **GYHLUS24E00-M25L** (Metric holder) **GYHL3232P00-M25L**	For Face Grooving	GYM25LD-G14-040	.551	.157	F088
		GYM25LD-G14-050	.551		F144
		GYM25LD-G14-060	.551		
		GYM25LD-G25-060	.984		
		GYM25LD-G14-085	.551		
		GYM25LD-G25-085	.984		
		GYM25LD-G14-125	.551		
		GYM25LD-G25-125	.984		
		GYM25LD-G14-180	.551		
		GYM25LD-G25-180	.984		
		GYM25LD-G14-250	.551		
		GYM25LD-G25-250	.984		
		GYM25LD-H14-050	.551	.187	F096
		GYM25LD-H14-060	.551	.197	F152
		GYM25LD-H25-060	.984		
		GYM25LD-H14-085	.551		
		GYM25LD-H25-085	.984		
		GYM25LD-H14-125	.551		
		GYM25LD-H25-125	.984		
		GYM25LD-H14-180	.551		
		GYM25LD-H25-180	.984		
		GYM25LD-H14-250	.551		
		GYM25LD-H25-250	.984		
		GYM25LD-J14-050	.551	.236	F100
		GYM25LD-J14-070	.551	.250	F156
		GYM25LD-J25-070	.984		
		GYM25LD-J14-110	.551		
		GYM25LD-J25-110	.984		
		GYM25LD-J14-170	.551		
		GYM25LD-J25-170	.984		
		GYM25LD-J14-250	.551		
		GYM25LD-J25-250	.984		

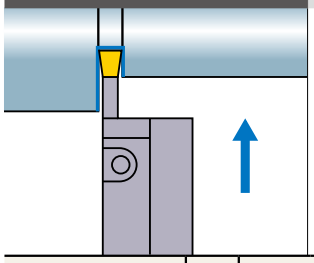
Internal grooving / Copying (90° type holder)

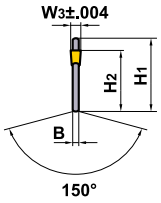
Modular Holder Number		Modular Blade Number	Max. Groove Depth (inch)	Insert Width (inch)	Page
(Inch holder) **GYDRUS20L90C-M20L** **GYDRUS20S90C-M20L** (Metric holder) **GYDR32L90C-M20L** **GYDR32S90C-M20L**	For Internal Grooving	**GYM20LA-D10**	.157-.374	.079	**F178**
		GYM20LA-E10	.157-.374	.094 .098	**F178** **F180**
		GYM20LA-F10	.157-.374	.118 .125	**F180** **F182** **F184**
		GYM20LA-G12	.197-.453	.157	**F186**
		GYM20LA-H12	.197-.453	.187 .197	**F186** **F188**
(Inch holder) **GYDLUS20L90C-M20R** **GYDLUS20S90C-M20R** (Metric holder) **GYDL32L90C-M20R** **GYDL32S90C-M20R**	For Internal Grooving	**GYM20RA-D10**	.157-.374	.079	**F178**
		GYM20RA-E10	.157-.374	.094 .098	**F178** **F180**
		GYM20RA-F10	.157-.374	.118 .125	**F180** **F182** **F184**
		GYM20RA-G12	.197-.453	.157	**F186**
		GYM20RA-H12	.197-.453	.187 .197	**F186** **F188**
(Inch holder) **GYDRUS24M90D-M20L** **GYDRUS24T90D-M20L** (Metric holder) **GYDR40M90D-M20L** **GYDR40T90D-M20L**	For Internal Grooving	**GYM20LA-D10**	.217-.374	.079	**F178**
		GYM20LA-E10	.217-.374	.094 .098	**F178** **F180**
		GYM20LA-F10	.217-.374	.118 .125	**F180** **F182** **F184**
		GYM20LA-G12	.236-.453	.157	**F186**
		GYM20LA-H12	.236-.453	.187 .197	**F186** **F188**
(Inch holder) **GYDLUS24M90D-M20R** **GYDLUS24T90D-M20R** (Metric holder) **GYDL40M90D-M20R** **GYDL40T90D-M20R**	For Internal Grooving	**GYM20RA-D10**	.217-.374	.079	**F178**
		GYM20RA-E10	.217-.374	.094 .098	**F178** **F180**
		GYM20RA-F10	.217-.374	.118 .125	**F180** **F182** **F184**
		GYM20RA-G12	.236-.453	.157	**F186**
		GYM20RA-H12	.236-.453	.187 .197	**F186** **F188**
(Inch holder) **GYDRUS24M90D-M25L** **GYDRUS24T90D-M25L** **GYDRUS32P90F-M25L** **GYDRUS32T90F-M25L** (Metric holder) **GYDR40M90D-M25L** **GYDR40T90D-M25L** **GYDR50P90F-M25L** **GYDR50T90F-M25L**	For Internal Grooving	**GYM25LA-D12**	.276-.453	.079	**F178**
		GYM25LA-E12	.276-.453	.094 .098	**F178** **F180**
		GYM25LA-F12	.276-.453	.118 .125	**F180** **F182** **F184**
		GYM25LA-G14	.295-.512	.157	**F184**
		GYM25LA-H14	.295-.512	.187 .197	**F186** **F188**
		GYM25LA-J14	.295-.512	.236 .250	**F188**
(Inch holder) **GYDLUS24M90D-M25R** **GYDLUS24T90D-M25R** **GYDLUS32P90F-M25R** **GYDLUS32T90F-M25R** (Metric holder) **GYDL40M90D-M25R** **GYDL40T90D-M25R** **GYDL50P90F-M25R** **GYDL50T90F-M25R**	For Internal Grooving	**GYM25RA-D12**	.276-.453	.079	**F178**
		GYM25RA-E12	.276-.453	.094 .098	**F178** **F180**
		GYM25RA-F12	.276-.453	.118 .125	**F180** **F182** **F184**
		GYM25RA-G14	.295-.512	.157	**F184**
		GYM25RA-H14	.295-.512	.187 .197	**F186** **F188**
		GYM25RA-J14	.295-.512	.236 .250	**F188**

UG HOLDER

- Strengthened insert clamping force.
- Block and blade type and solid type series.
- Groove width .087－.201inch.

UGHN External cutting off, Grooving

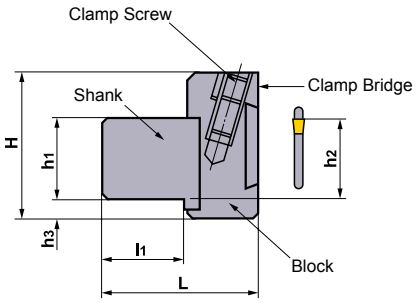


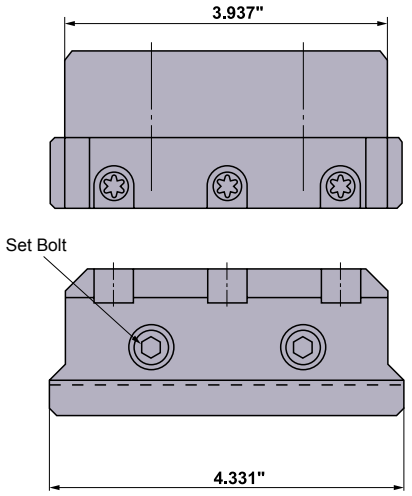




Order Number	Stock	Insert Number		Cutting Width (inch) W3	Max. Cut off Diameter (inch)	Max. Groove Depth (inch)	Dimensions (inch) H1	B	L1	H2	Wrench	Tool Block
UGHN262	●	KGT	2○	.087	1.970	.787	1.024	.063	4.331	.843	UGS1	
263	●		3○	.122	2.950	1.280	1.024	.093	4.331	.843	UGS1	KGBN26-19.05-30 KGBN26-25.40-30
264	●		4○	.161	3.150	1.378	1.024	.126	4.331	.843	UGS1	
265	●		5○	.201	3.150	1.378	1.024	.157	4.331	.843	UGS1	
322	●		2○	.087	1.970	.787	1.260	.063	5.906	.984	UGS1	
323	●		3○	.122	3.937	1.772	1.260	.093	5.906	.984	UGS1	KGBN32-19.05-30 KGBN32-25.40-30
324	●		4○	.161	3.937	1.772	1.260	.126	5.906	.984	UGS1	
325	●		5○	.201	4.724	2.165	1.260	.157	5.906	.984	UGS1	

TOOL BLOCK



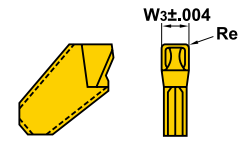
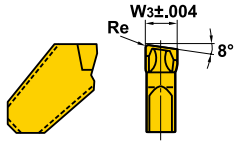


Order Number	Stock	Dimensions (inch) h1	h2	h3	H	l1	L	Clamp Bridge	Clamp Screw	Wrench	Set Bolt	Wrench
KGBN26-19.05-30	●	.750	.750	.470	1.772	.750	1.656	KGC1	LS15T	TKY25R	HSC08016	HKY60R
26-25.40-30	●	1.000	1.000	.220	1.772	1.000	1.906	KGC1	LS15T	TKY25R	HSC08016	HKY60R
32-19.05-30	●	.750	.750	.652	2.047	.750	1.656	KGC1	LS15T	TKY25R	HSC08016	HKY60R
32-25.40-30	●	1.000	1.000	.402	2.047	1.000	1.906	KGC1	LS15T	TKY25R	HSC08016	HKY60R

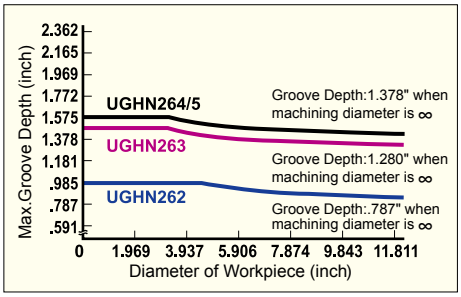
(Note) When ordering a block, clamp bridge and clamp screw are included.
When ordering a shank, set bolts are included.

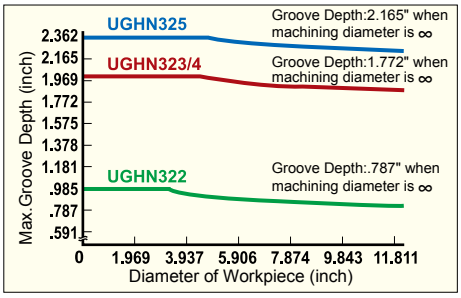
● : Inventory maintained. ▲ : This item to be discontinued within two years.

INSERTS

Order Number	Stock: Coated UE6020	Stock: Coated US735	Stock: Cermet NX2525	Stock: Cermet	Dimensions (inch): W3	Dimensions (inch): Re	Geometry
KGT2N	▲		●		.087 (2.2mm)	.008	
3N	▲	●	●		.122 (3.1mm)	.008	
4N	▲	●	●		.161 (4.1mm)	.008	
5N	▲	●	●		.201 (5.1mm)	.008	
KGT2R	▲		●		.087 (2.2mm)	.008	
2L	▲		●		.087 (2.2mm)	.008	
3R	▲	●	●		.122 (3.1mm)	.008	
3L	▲	●	●		.122 (3.1mm)	.008	
4R	▲	●	●		.161 (4.1mm)	.008	
4L	▲	●	●		.161 (4.1mm)	.008	
5R	▲	●	●		.201 (5.1mm)	.008	
5L	▲		●		.201 (5.1mm)	.008	Left hand insert shown.

(Note) Above insert is not compatible with other manufacturer´s holders.





RECOMMENDED CUTTING CONDITIONS

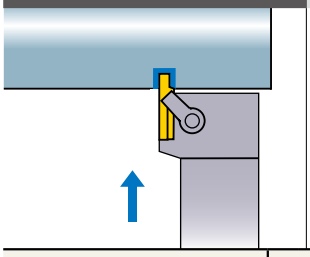
	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed (inch/rev): Groove Width .087"	Groove Width .122"	Groove Width .161"	Groove Width .201"
P	Mild Steel	≤180HB	**UE6020 ▪ NX2525**	390 (330—460)	.003 (.002—.004)	.004 (.003—.005)	.005 (.004—.006)	.005 (.004—.006)
P	Carbon Steel Alloy Steel	180—280HB	**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)

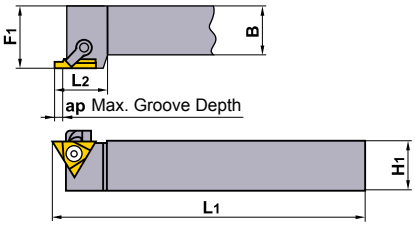
(Note) Please set cutting edge height .004 -.008inch higher than center.

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





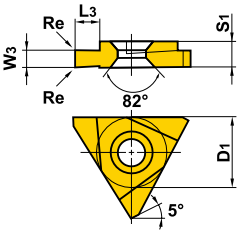
Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H1	B	L1	L2	F1	Max. Groove Depth (inch) ap	Insert Screw	Clamp Screw	Clamp
MTVOR/L-8-3B	●	●	TNMC	32○	.500	.500	4.500	1.000	.750	.057 / .156	GTS1	XNS35	CL6
10-3B	●	●		32○	.625	.625	4.500	1.000	.875	.057 / .156	GTS1	XNS35	CL6
12-3B	●	●		32○	.750	.750	4.500	1.000	1.000	.057 / .156	GTS1	XNS35	CL6
12-4B	●	●		43○	.750	.750	4.500	1.063	1.000	.156 / .234	GTS2	XNS36	CL6
16-4D	●	●		43○	1.000	1.000	6.000	1.063	1.250	.156 / .234	GTS2	XNS36	CL6
16-5D	●	●		54○	1.000	1.000	6.000	1.250	1.250	.297	GTS3	XNS36	CL6
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 (GROOVING)

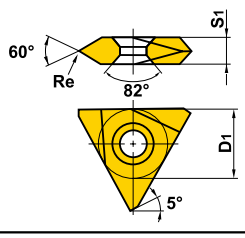
Order Number	Class	Stock Coated UP20M	Stock Cermet UTi20T	Dimensions (inch) W3	D1	S1	L3	Re	Geometry
TNMC32NGR032	E	●	●	.032	.375	.125	.057	≤.003	
32NGL032	E	●	●	.032	.375	.125	.057	≤.003	
32NGR063	E	●	●	.063	.375	.125	.156	≤.003	
32NGL063	E	●	●	.063	.375	.125	.156	≤.003	
43NGR063	E	●	●	.063	.500	.188	.156	≤.003	
43NGL063	E	●	●	.063	.500	.188	.156	≤.003	
43NGR094	E	●	●	.094	.500	.188	.156	≤.003	
43NGL094	E	●	●	.094	.500	.188	.156	≤.003	
43NGR125	E	●	●	.125	.500	.188	.234	≤.003	
43NGL125	E	●	●	.125	.500	.188	.234	≤.003	
43NGR156	E	●	●	.156	.500	.188	.234	≤.003	
43NGL156	E	●	●	.156	.500	.188	.234	≤.003	
54NGR187	E	●	●	.187	.625	.250	.297	≤.003	
54NGL187	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) D1	S1	Re	Geometry
TNMC32NV	E	●	●	8	.375	.125	.004	
43NV	E	●	●	6	.500	.187	.004	
54NV	E	●	●	4	.625	.250	.004	

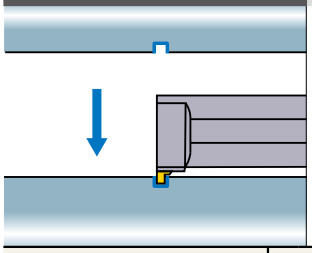


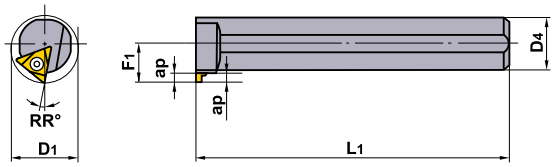
● : Inventory maintained.

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





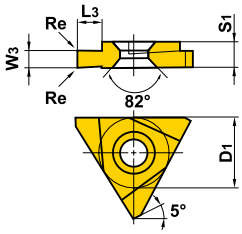
Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)				Min. Cutting Diameter (inch)	Max. Groove Depth (inch)		
	R	L			D4	L1	F1	RR	D1	ap	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 (GROOVING)

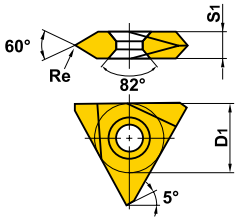
Order Number	Class	Stock		Dimensions (inch)					Geometry
		Coated	Carbide	W3	D1	S1	L3	Re	
		UP20M	UTi20T						
TNMC32NGR032	E	●	●	.032	.375	.125	.057	≤.003	
32NGL032	E	●	●	.032	.375	.125	.057	≤.003	
32NGR063	E	●	●	.063	.375	.125	.156	≤.003	
32NGL063	E	●	●	.063	.375	.125	.156	≤.003	
43NGR063	E	●	●	.063	.500	.188	.156	≤.003	
43NGL063	E	●	●	.063	.500	.188	.156	≤.003	
43NGR094	E	●	●	.094	.500	.188	.156	≤.003	
43NGL094	E	●	●	.094	.500	.188	.156	≤.003	
43NGR125	E	●	●	.125	.500	.188	.234	≤.003	
43NGL125	E	●	●	.125	.500	.188	.234	≤.003	
43NGR156	E	●	●	.156	.500	.188	.234	≤.003	
43NGL156	E	●	●	.156	.500	.188	.234	≤.003	
54NGR187	E	●	●	.187	.625	.250	.297	≤.003	
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		D1	S1	Re	
		UP20M	UTi20T					
TNMC32NV	E	●	●	8	.375	.125	.004	
43NV	E	●	●	6	.500	.187	.004	
54NV	E	●	●	4	.625	.250	.004	



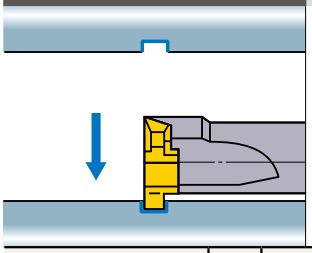
GROOVING

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

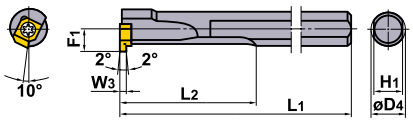
F TYPE

- Min. cutting diameter 10mm.
- Screw-on type.
- Usable for various applications.
- Max. groove depth: 3mm.

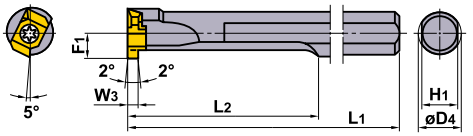
FSL51 Internal grooving, Threading



1 Corner type (FSL5108R,5110R)



2 Corner type (FSL5112R,5114R,5116R)

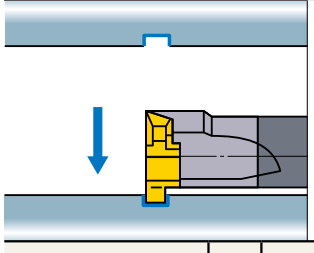


Metric Standard

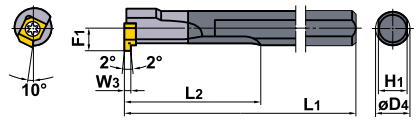
Right hand tool holder only.

Order Number	Stock	Insert Number				Dimensions (mm)						Min. Cutting Diameter (mm)	Max. Groove Depth (mm)	Clamp Screw	Wrench
	R	Grooving		Threading		D4	H1	L1	L2	F1	W3				
FSL5108R	★	MLG	10□□L	MLT	1001L	8	7	125	30	4.8	1.2 1.5 2.0	10	1.0	TS25	TKY08F
5110R	★	MLG	10□□L	MLT	1001L	10	9	150	40	5.8		12	1.0	TS25	TKY08F
5112R	★	MLG	14□□L	MLT	1401L	12	10.8	180	50	6.8	1.5 2.0 3.0	14	2.0	TS32	TKY08F
5114R	★	MLG	14□□L	MLT	1401L	14	12.4	180	60	7.8		16	2.0	TS32	TKY08F
5116R	★	MLG	20□□L	MLT	2001L	16	14	200	70	9.7	2.0 3.0 4.0	20	3.0	TS43	TKY15F

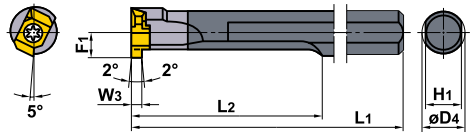
FSL52 Carbide shank



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)						Min. Cutting Diameter (mm)	Max. Groove Depth (mm)	Clamp Screw	Wrench
	R	Grooving		Threading		D4	H1	L1	L2	F1	W3				
FSL5208R	★	MLG	10□□L	MLT	1001L	8	7	125	60	4.8	1.2 1.5 2.0	10	1.0	TS25	TKY08F
5210R	★	MLG	10□□L	MLT	1001L	10	9	150	70	5.8		12	1.0	TS25	TKY08F
5212R	★	MLG	14□□L	MLT	1401L	12	10.8	180	80	6.8	1.5 2.0 3.0	14	2.0	TS32	TKY08F
5214R	★	MLG	14□□L	MLT	1401L	14	12.4	180	85	7.8		16	2.0	TS32	TKY08F
5216R	★	MLG	20□□L	MLT	2001L	16	14	200	115	9.7	2.0 3.0 4.0	20	3.0	TS43	TKY15F

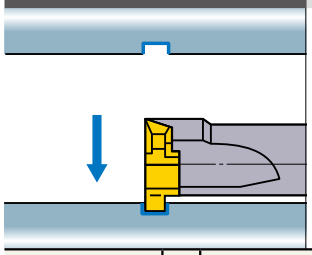
RECOMMENDED CUTTING CONDITIONS

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)

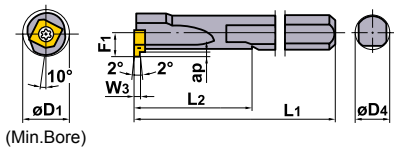
● : Inventory maintained. ★ : Inventory maintained in Japan.

S-SL5N

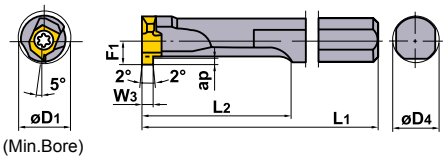
Internal grooving, Threading, Boring



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)					Min. Cutting Diameter (inch)	Max. Groove Depth (inch)		
	R	Grooving	Threading	D4	L1	L2	F1	W3	D1	ap	Clamp Screw	Wrench
S-SL5NR05	●	MLG10W○○○L	MLT1001L	.313	5.000	1.250	.188	.062 .094	.390	.039	TS25	TKY08F
06	●	MLG10W○○○L	MLT1001L	.375	6.000	1.500	.219		.449	.039	TS25	TKY08F
08	●	MLG14W○○○L	MLT1401L	.500	7.000	2.000	.281	.062 .094 .125	.579	.079	TS32	TKY08F
10	●	MLG20W○○○L	MLT2001L	.625	8.000	3.000	.375	.094 .125 .156	.791	.118	TS43	TKY15F
12	●	MLG20W○○○L	MLT2001L	.750	10.000	4.000	.438		.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 ➤ F164
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

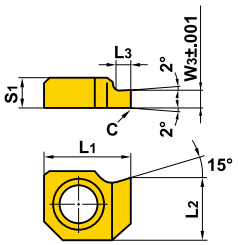
INTERNAL GROOVING

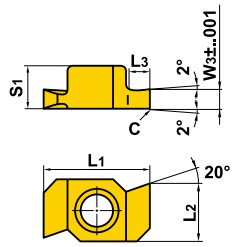
F TYPE

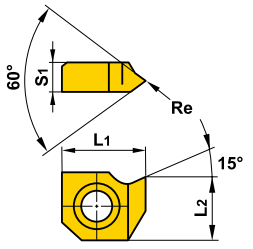
- Min. cutting diameter .390inch.
- Screw-on type.
- Usable for various applications.
- Max. groove depth: .118inch.

INSERTS

Application		Groove Width (inch) W_3	Order Number	Coated	Carbide		Dimensions (inch)						Geometry
				UP20M	UTi20T	HTi10	L_1	L_2	L_3	S_1	Re	C	
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)	**1015L**		★		.276	.197	.039	.094	—	.004	
		.079 (2.0mm)	**1020L**		★		.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)	**1420L**		★		.465	.256	.079	.187	—	.004	
		.118 (3.0mm)	**1430L**		★		.465	.256	.079	.187	—	.004	
		.079 (2.0mm)	**2020L**		★		.661	.356	.118	.250	—	.004	
		.118 (3.0mm)	**2030L**		★		.661	.356	.118	.250	—	.004	
		.157 (4.0mm)	**2040L**		★		.661	.356	.118	.250	—	.004	
Threading		Min.Pitch 13T.P.I	**MLT1001L**	●	●		.276	.197	—	.094	.004	—	**MLT1001L (1 Corner type)**
		Min.Pitch 11T.P.I	**1401L**	●	●		.465	.256	—	.187	.004	—	
		Min.Pitch 8T.P.I	**2001L**	●	●		.661	.356	—	.250	.004	—	





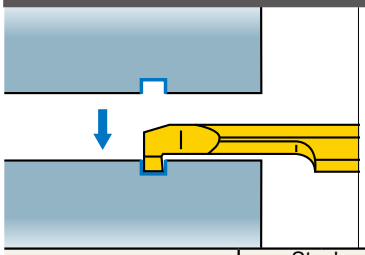


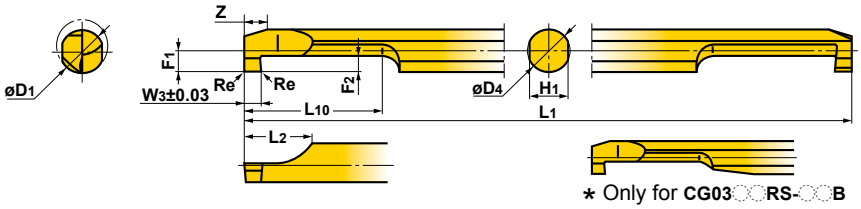
● : Inventory maintained. (1 MICRO-MINI TWIN in one case) ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.

MICRO-MINI TWIN

CG

Internal grooving





* Only for CG03◯◯RS-◯◯B

Order Number	Stock		Breaker	Min. Cutting Diameter (mm)	Groove Width (mm)	Max. Groove Depth (mm)	Dimensions (mm)							
	Micro Grain Carbide	Coated												
	TF15	VP15TF		D1	W3	F2	Re	D4	L1	L10	L2	F1	H1	Z
CG0305RS-10	●	●	Without	3	1	1	0.05	3	50	5	6	1.3	2.7	1.2
0305RS-10B	●	●	With	3	1	1	0.05	3	50	5	6	1.3	2.7	1.2
0306RS-20	●	●	Without	3	2	1	0.1	3	50	6	6	1.3	2.7	1.2
0306RS-20B	●	●	With	3	2	1	0.1	3	50	6	6	1.3	2.7	1.2
03RS-10	●	●	Without	3	1	1	0.05	3	50	10	6	1.3	2.7	1.2
03RS-10B	●	●	With	3	1	1	0.05	3	50	10	6	1.3	2.7	1.2
03RS-20	●	●	Without	3	2	1	0.1	3	50	11	6	1.3	2.7	1.2
03RS-20B	●	●	With	3	2	1	0.1	3	50	11	6	1.3	2.7	1.2
0407RS-10	●	●	Without	4	1	1.5	0.05	4	60	7	7	1.8	3.6	2.0
0407RS-10B	●	●	With	4	1	1.5	0.05	4	60	7	7	1.8	3.6	2.0
0408RS-20	●	●	Without	4	2	1.5	0.1	4	60	8	7	1.8	3.6	2.0
0408RS-20B	●	●	With	4	2	1.5	0.1	4	60	8	7	1.8	3.6	2.0
04RS-10	●	●	Without	4	1	1.5	0.05	4	60	15	7	1.8	3.6	2.0
04RS-10B	●	●	With	4	1	1.5	0.05	4	60	15	7	1.8	3.6	2.0
04RS-20	●	●	Without	4	2	1.5	0.1	4	60	16	7	1.8	3.6	2.0
04RS-20B	●	●	With	4	2	1.5	0.1	4	60	16	7	1.8	3.6	2.0
0510RS-10	●	●	Without	5	1	2	0.05	5	70	10	8	2.3	4.5	2.8
0510RS-10B	●	●	With	5	1	2	0.05	5	70	10	8	2.3	4.5	2.8
0511RS-20	●	●	Without	5	2	2	0.1	5	70	11	8	2.3	4.5	2.8
0511RS-20B	●	●	With	5	2	2	0.1	5	70	11	8	2.3	4.5	2.8
05RS-10	●	●	Without	5	1	2	0.05	5	70	20	8	2.3	4.5	2.8
05RS-10B	●	●	With	5	1	2	0.05	5	70	20	8	2.3	4.5	2.8
05RS-20	●	●	Without	5	2	2	0.1	5	70	21	8	2.3	4.5	2.8
05RS-20B	●	●	With	5	2	2	0.1	5	70	21	8	2.3	4.5	2.8
0610RS-10	●	●	Without	6	1	2	0.05	6	75	10	8	2.8	5.4	2.8
0610RS-10B	●	●	With	6	1	2	0.05	6	75	10	8	2.8	5.4	2.8
0611RS-20	●	●	Without	6	2	2	0.1	6	75	11	8	2.8	5.4	2.8
0611RS-20B	●	●	With	6	2	2	0.1	6	75	11	8	2.8	5.4	2.8
06RS-10	●	●	Without	6	1	2	0.05	6	75	20	8	2.8	5.4	2.8
06RS-10B	●	●	With	6	1	2	0.05	6	75	20	8	2.8	5.4	2.8
06RS-20	●	●	Without	6	2	2	0.1	6	75	21	8	2.8	5.4	2.8
06RS-20B	●	●	With	6	2	2	0.1	6	75	21	8	2.8	5.4	2.8
0712RS-10	●	●	Without	7	1	2	0.05	7	85	12	8	3.3	6.4	2.8
0712RS-10B	●	●	With	7	1	2	0.05	7	85	12	8	3.3	6.4	2.8
0713RS-20	●	●	Without	7	2	2	0.1	7	85	13	8	3.3	6.4	2.8
0713RS-20B	●	●	With	7	2	2	0.1	7	85	13	8	3.3	6.4	2.8
07RS-10	●	●	Without	7	1	2	0.05	7	85	25	8	3.3	6.4	2.8
07RS-10B	●	●	With	7	1	2	0.05	7	85	25	8	3.3	6.4	2.8
07RS-20	●	●	Without	7	2	2	0.1	7	85	26	8	3.3	6.4	2.8
07RS-20B	●	●	With	7	2	2	0.1	7	85	26	8	3.3	6.4	2.8

HOLDER ➤ E034, E036, E037
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

HOLDER

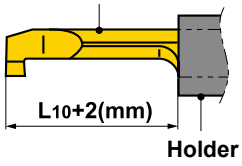
HOLDER CROSS REFERENCE LIST OF INCH SHANK STANDARD

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
		10252A	040◌RS-◌◌(B), 04RS-◌◌(B)	
		10315A	051◌RS-◌◌(B), 05RS-◌◌(B)	
		10378A	061◌RS-◌◌(B), 06RS-◌◌(B)	
		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.
		19040N	040◌RS-◌◌(B), 04RS-◌◌(B)	
		19050N	051◌RS-◌◌(B), 05RS-◌◌(B)	
		19060N	061◌RS-◌◌(B), 06RS-◌◌(B)	
		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
		16252A	040◌RS-◌◌(B), 04RS-◌◌(B)	
		16315A	051◌RS-◌◌(B), 05RS-◌◌(B)	
		16378A	061◌RS-◌◌(B), 06RS-◌◌(B)	
		16441A	071◌RS-◌◌(B), 07RS-◌◌(B)	

* Mitsubishi Materials obtained the makers' approval before entering their names in the list.

RECOMMENDED TOOL OVERHANG

MICRO-MINI TWIN
CG type



(Note) For L10, refer to page F211.

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
	1640N	040◌RS-◌◌(B), 04RS-◌◌(B)	
	1650N	051◌RS-◌◌(B), 05RS-◌◌(B)	
	1660N	061◌RS-◌◌(B), 06RS-◌◌(B)	
	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
	2040N	040◌RS-◌◌(B), 04RS-◌◌(B)	
	2050N	051◌RS-◌◌(B), 05RS-◌◌(B)	
	2060N	061◌RS-◌◌(B), 06RS-◌◌(B)	
	2070N	071◌RS-◌◌(B), 07RS-◌◌(B)	
Round Type Holder ϕ22mm	**RBH2230N**	030◌RS-◌◌(B), 03RS-◌◌(B)	STAR MICRONICS CO., LTD.
	2240N	040◌RS-◌◌(B), 04RS-◌◌(B)	
	2250N	051◌RS-◌◌(B), 05RS-◌◌(B)	
	2260N	061◌RS-◌◌(B), 06RS-◌◌(B)	
	2270N	071◌RS-◌◌(B), 07RS-◌◌(B)	
Round Type Holder ϕ25mm	**RBH2530N**	030◌RS-◌◌(B), 03RS-◌◌(B)	Tsugami Corporation MIYANO MACHINERY JAPAN INC. NC lathes
	2540N	040◌RS-◌◌(B), 04RS-◌◌(B)	
	2550N	051◌RS-◌◌(B), 05RS-◌◌(B)	
	2560N	061◌RS-◌◌(B), 06RS-◌◌(B)	
	2570N	071◌RS-◌◌(B), 07RS-◌◌(B)	
Square Type Holder □10mm	**SBH1030R**	030◌RS-◌◌(B), 03RS-◌◌(B)	NC lathes
	1040R	040◌RS-◌◌(B), 04RS-◌◌(B)	
	1050R	051◌RS-◌◌(B), 05RS-◌◌(B)	
	1060R	061◌RS-◌◌(B), 06RS-◌◌(B)	
	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.

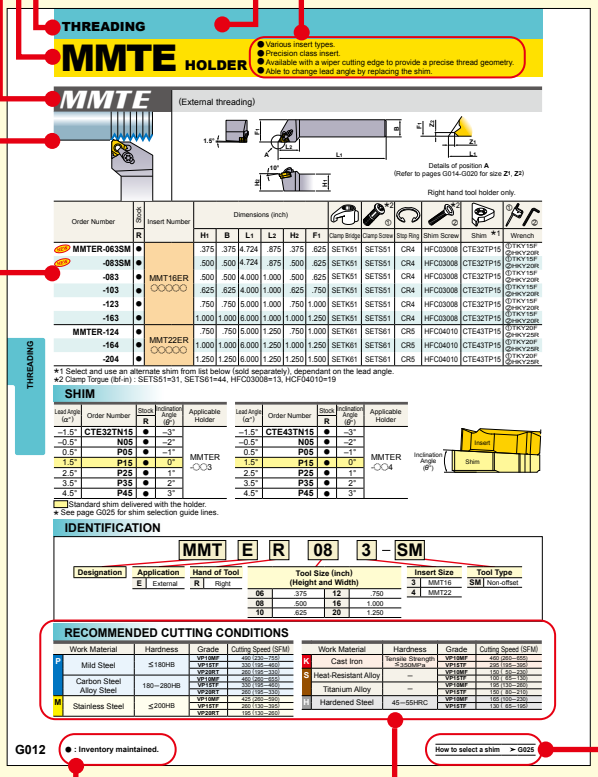
TYPE OF TOOL HOLDER
indicates the initial letters for the order number and cutting applications.

TITLE OF PRODUCT

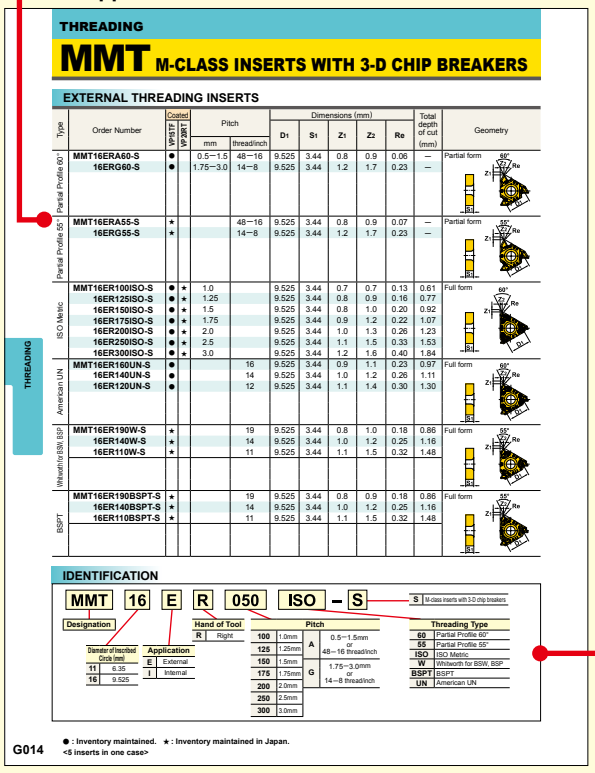
INDICATION OF EXTERNAL /INTERNAL APPLICATION

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
·SPARE PARTS
·STANDARD OF DEPTH OF CUT
indicates reference pages, including the above, on the right hand page of each double-page spread.

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▪HOLDER 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 HEAD G037
- MICRO-MINI TWIN(CT) BORING BARS G039

THREADING METHOD G022
STANDARD OF DEPTH OF CUT G026
TROUBLE SHOOTING G032

*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

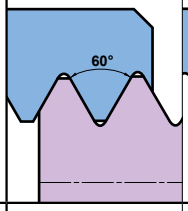
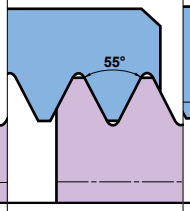
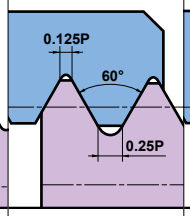
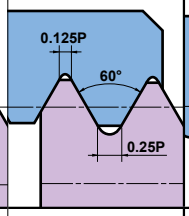
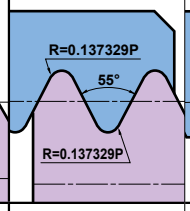
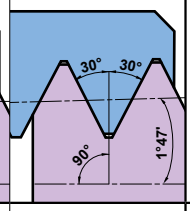
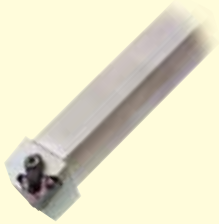
EXTERNAL CUTTING

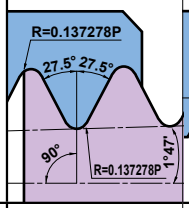
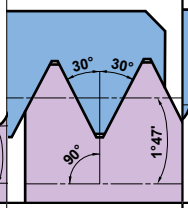
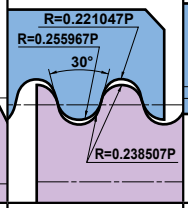
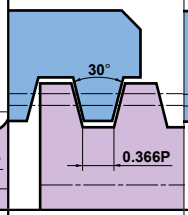
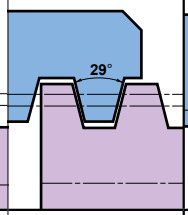
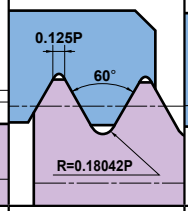
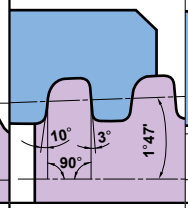
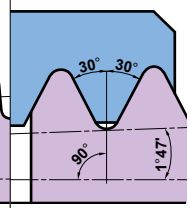
Name of Tool Holder	Insert Shape	Features
MMTE Holder  G012		● Various insert types. ● Precision class insert. ● Available with a wiper cutting edge to provide a precise thread geometry. ● Able to change lead angle by replacing the shim.
MTVO Holder  G034		● Multi-clamp type. ● Precision class insert. ● 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

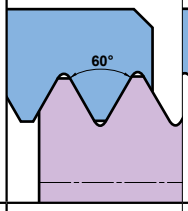
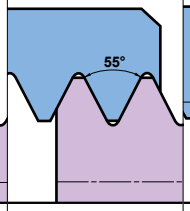
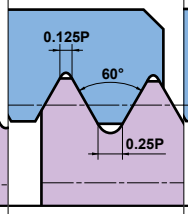
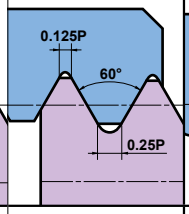
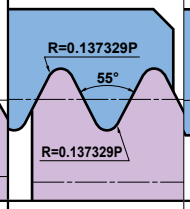
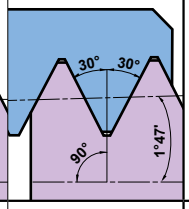
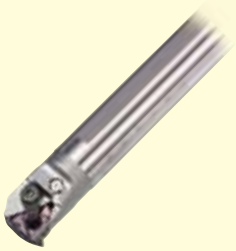
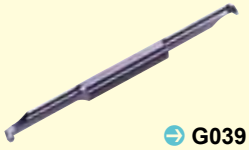
Name of Tool Holder	Insert Shape	Features
MMTI  G013		● Minimum cutting diameter .500 inch. ● Various insert types. ● Precision class insert. ● Available with a wiper cutting edge to provide a precise thread geometry. ● Able to change lead angle by replacing shim.
STHN/O  G035		● Screw-on type. ● Precision 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.

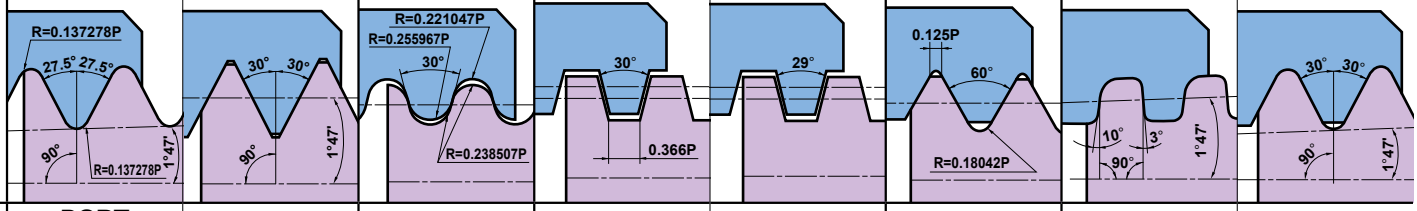
THREAD PITCH CROSS REFERENCE

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 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 transmissions		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 Rc Rp	NPTF	Rd	Tr	ACME	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
	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–

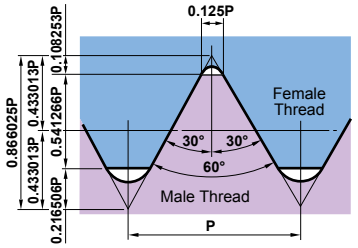
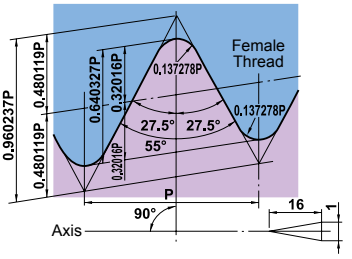
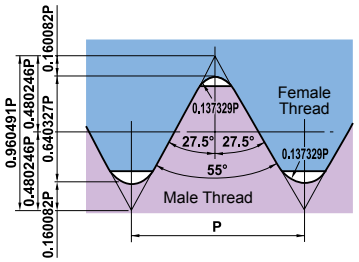
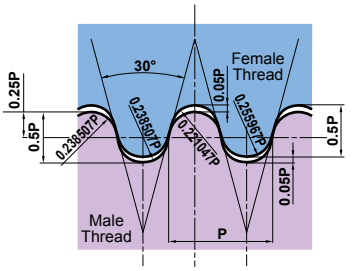
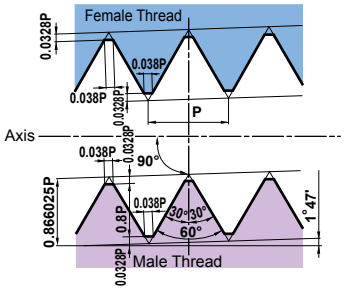
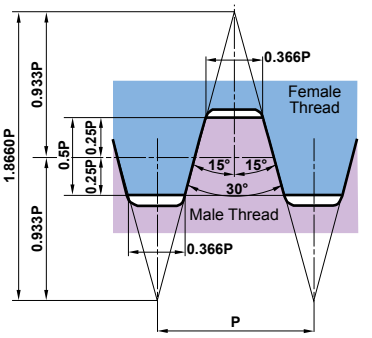
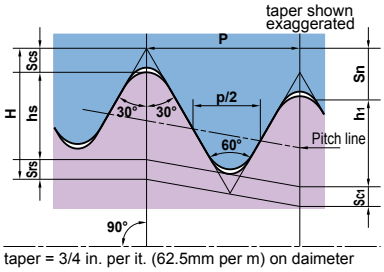
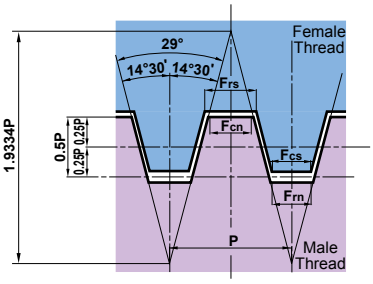
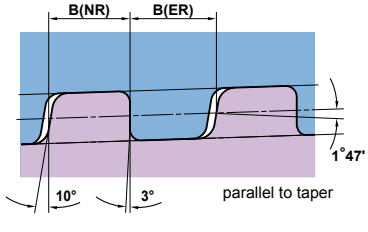
THREAD PITCH CROSS REFERENCE

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 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 transmissions		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 Rc Rp	NPTF	Rd	Tr	ACME	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 Rc Rp
Parallel Pipe Thread Whitworth for BSW, BSP		W G	Round DIN405		Rd
American NPT		NPT	ISO Trapezoidal 30°		Tr
API Round Casing & Tubing		CSG LCSG	American ACME		ACME
API Buttress Casing		BCSG			

PIPE THREADS AND TOOL SELECTION

Parallel Pipe Threads G

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, Rc

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



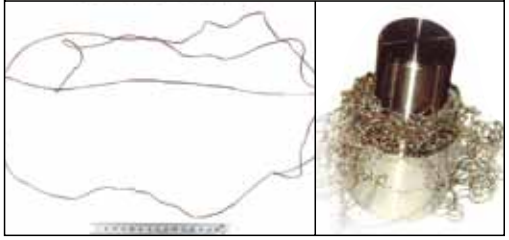
G-CLASS GROUND INSERTS



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

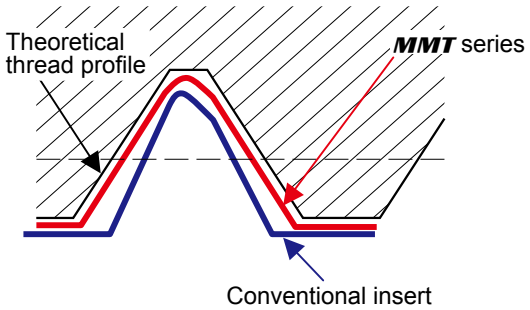


MMT



<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)

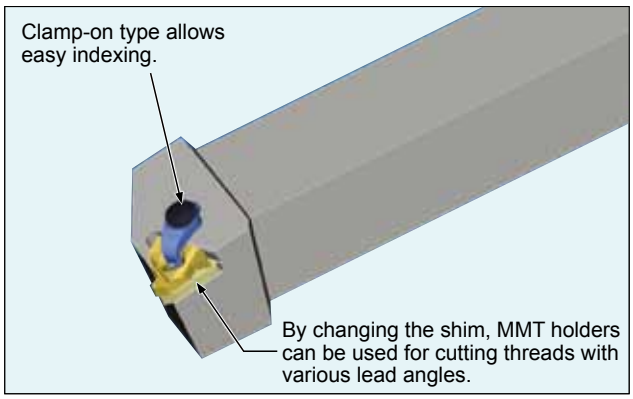


High precision threading can be achieved by using MMT inserts that feature a ground rake face and peripheral cutting edge.

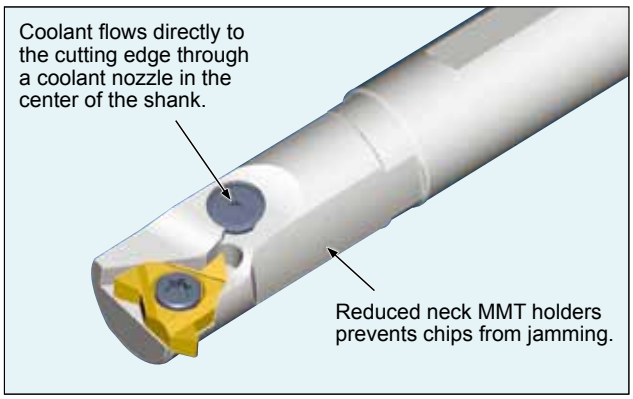
Thread Type	Threading Tolerance
ISO Metric	6g / 6H
American UN	2A / 2B
Whitworth for BSW, BSP	Medium Class A
BSPT	Standard BSPT
Round DIN 405	7h / 7H
ISO Trapezoidal 30°	7e / 7H
American ACME	3G
UNJ	3A
API Buttress Casing	Standard API
API Rounded Casing & Tubing	Standard API RD
American NPT	Standard NPT
American NPTF	Class2

HOLDER (Use of special surface treatment)

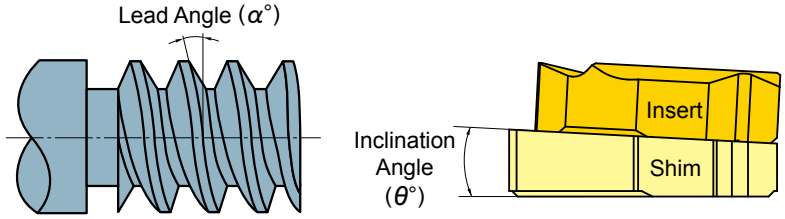
External



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 and page G025)

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	Precision of thread
M-class inserts with 3-D chip breakers 	◎	○

Insert	Chip control	Precision of thread
G-class inserts 	○	◎

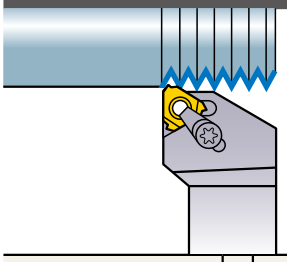
◎ : 1st recommendation
○ : 2nd recommendation

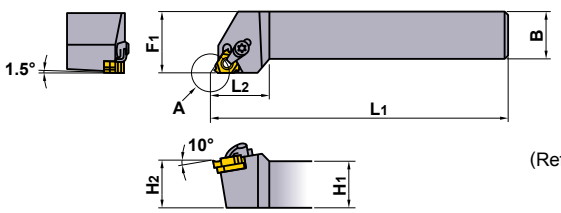
- For ideal chip control and a high cost performance ratio, M-class inserts with 3-D chip breakers are recommended.
- G-class inserts are recommended where higher precision is required.

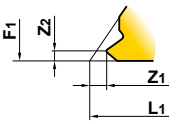
MMTE HOLDER

- Various insert types.
- Precision class insert.
- Available with a wiper cutting edge to provide a precise thread geometry.
- Able to change lead angle by replacing the shim.

MMTE (External threading)







Details of position **A**
(Refer to pages G014-G020 for size **Z1**, **Z2**)

Right hand tool holder only.

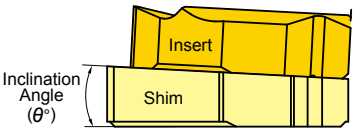
Order Number	Stock	Insert Number	Dimensions (inch)						Clamp Bridge	Clamp Screw *2 ①	Stop Ring	Shim Screw *2 ②	Shim *1	Wrench
	R		H_1	B	L_1	L_2	H_2	F_1						
NEW **MMTER-063SM**	●	MMT16ER ○○○○○	.375	.375	4.724	.875	.375	.625	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
NEW **-083SM**	●		.500	.500	4.724	.875	.500	.625	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
-083	●		.500	.500	4.000	1.000	.500	.625	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
-103	●		.625	.625	4.000	1.000	.625	.750	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
-123	●		.750	.750	5.000	1.000	.750	1.000	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
-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
-164	●		1.000	1.000	6.000	1.250	1.000	1.250	SETK61	SETS61	CR5	HFC04010	CTE43TP15	①TKY20F ②HKY25R
-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, HCF04010=19

SHIM

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
–1.5°	**CTE32TN15**	●	–3°	MMTER -○○3
–0.5°	**N05**	●	–2°	
0.5°	**P05**	●	–1°	
1.5°	**P15**	●	0°	
2.5°	**P25**	●	1°	
3.5°	**P35**	●	2°	
4.5°	**P45**	●	3°	

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
–1.5°	**CTE43TN15**	●	–3°	MMTER -○○4
–0.5°	**N05**	●	–2°	
0.5°	**P05**	●	–1°	
1.5°	**P15**	●	0°	
2.5°	**P25**	●	1°	
3.5°	**P35**	●	2°	
4.5°	**P45**	●	3°	



Standard shim delivered with the holder.
* See page G025 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.

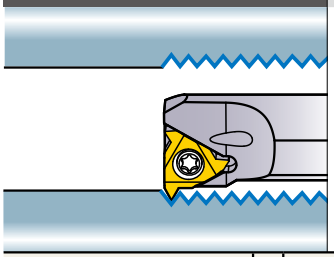
How to select a shim ➤ G025

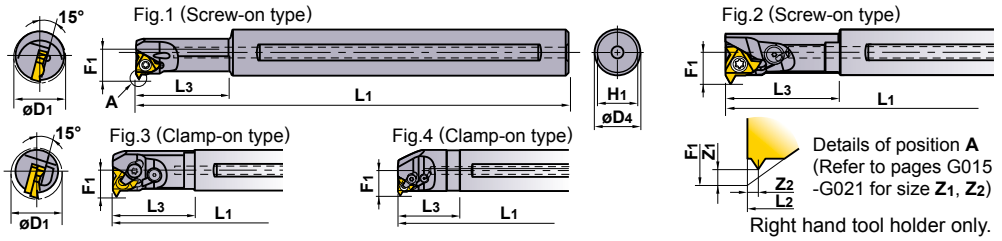
MMTI TYPE BORING BARS

- Minimum cutting diameter .500".
- Various insert types.
- Precision class insert.
- Available with a wiper cutting edge to provide a precise thread geometry.
- Able to change lead angle by replacing shim.

MMTI

(Internal threading)





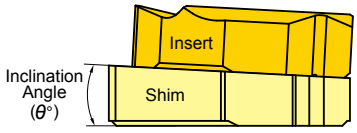
Order Number	Stock R	Insert Number	Lead Angle	Dimensions (inch) D4	L1	L3	F1	H1	Min. Cutting Diameter (inch) D1	Clamp Bridge	Clamp Screw *2 ①	Stop Ring	Shim Screw *2 ②	Shim *1	Wrench ① ②	Fig.
MMTIR102-0.50-1.5-C	●	MMT11IR ○○○○○	1.5°	.625	5.000	1.000	.340	.586	**.500**	–	TS25	–	–	–	①TKY08F	1
102-0.50-2.5-C	●		2.5°	.625	5.000	1.000	.340	.586	**.500**	–	TS25	–	–	–	①TKY08F	1
102-0.60-1.5-C	●		1.5°	.625	6.000	1.250	.380	.586	**.600**	–	TS25	–	–	–	①TKY08F	1
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
103-0.75-2.5-C	●		2.5°	.625	6.000	1.500	.480	.586	**.750**	–	CS350860T	–	–	–	①TKY15F	2
123-0.90-1.5-C	●		1.5°	.750	7.000	1.500	.510	.711	**.900**	SETK51	SETS51	CR4	HFC03006	CTI32TP15	①TKY15F ②HKY20R	3
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
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
124-0.95-2.5-C	●		2.5°	.750	7.000	2.000	.610	.711	**.950**	–	TS43	–	–	–	①TKY15F	2
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
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
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 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°	**N05**	●	–2°	
0.5°	**P05**	●	–1°	
1.5°	**P15**	●	0°	
2.5°	**P25**	●	1°	
3.5°	**P35**	●	2°	
4.5°	**P45**	●	3°	

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
–1.5°	**CTI43TN15**	●	–3°	MMTIR ○○4-○○○ -○○-C
–0.5°	**N05**	●	–2°	
0.5°	**P05**	●	–1°	
1.5°	**P15**	●	0°	
2.5°	**P25**	●	1°	
3.5°	**P35**	●	2°	
4.5°	**P45**	●	3°	



Standard shim delivered with the holder.
* See page G025 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)

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) D_1	S_1	Z_1	Z_2	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 60°
	16ERG60-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 55°
	16ERG55-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 60°
	16ER125ISO-S	●	★	1.25		9.525	3.44	0.8	0.9	0.16	0.77	
	16ER150ISO-S	●	★	1.5		9.525	3.44	0.8	1.0	0.20	0.92	
	16ER175ISO-S	●	★	1.75		9.525	3.44	0.9	1.2	0.22	1.07	
	16ER200ISO-S	●	★	2.0		9.525	3.44	1.0	1.3	0.26	1.23	
	16ER250ISO-S	●	★	2.5		9.525	3.44	1.1	1.5	0.33	1.53	
	16ER300ISO-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 60°
	16ER140UN-S	●			14	9.525	3.44	1.0	1.2	0.26	1.11	
	16ER120UN-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 55°
	16ER140W-S	★			14	9.525	3.44	1.0	1.2	0.25	1.16	
	16ER110W-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 55°
	16ER140BSPT-S	★			14	9.525	3.44	1.0	1.2	0.25	1.16	
	16ER110BSPT-S	★			11	9.525	3.44	1.1	1.5	0.32	1.48	

IDENTIFICATION

MMT | **16** | **E** | **R** | **050** | **ISO** | **–** | **S**

S M-class inserts with 3-D chip breakers

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

● : Inventory maintained. ★ : Inventory maintained in Japan.
<5 inserts in one case>

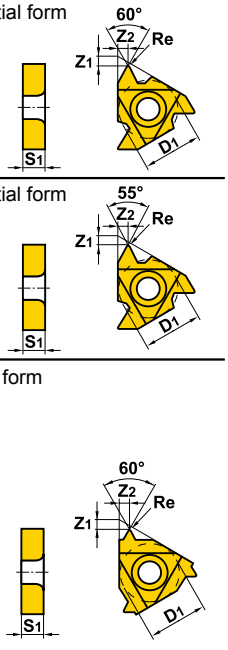
INTERNAL THREADING INSERTS

Type	Order Number	Coated VP15TF	Coated VP20RT	Pitch mm	Pitch thread/inch	Dimensions (mm) D_1	S_1	Z_1	Z_2	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
	16IRA60-S	●		0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.03	—	
	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
	16IRA55-S	★			48—16	9.525	3.44	0.8	0.9	0.07	—	
	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
	11IR125ISO-S	★		1.25		6.35	3.04	0.8	0.9	0.08	0.72	
	11IR150ISO-S	★		1.5		6.35	3.04	0.8	1.0	0.10	0.87	
	16IR100ISO-S	●	★	1.0		9.525	3.44	0.6	0.7	0.06	0.58	
	16IR125ISO-S	●	★	1.25		9.525	3.44	0.8	0.9	0.08	0.72	
	16IR150ISO-S	●	★	1.5		9.525	3.44	0.8	1.0	0.10	0.87	
	16IR175ISO-S	●	★	1.75		9.525	3.44	0.9	1.2	0.11	1.01	
	16IR200ISO-S	●	★	2.0		9.525	3.44	1.0	1.3	0.13	1.15	
	16IR250ISO-S	●	★	2.5		9.525	3.44	1.1	1.5	0.17	1.44	
	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
	16IR140UN-S	●			14	9.525	3.44	0.9	1.2	0.12	1.05	
	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
	16IR140W-S	★			14	9.525	3.44	1.0	1.2	0.25	1.16	
	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
	16IR140BSPT-S	★			14	9.525	3.44	1.0	1.2	0.25	1.16	
	16IR110BSPT-S	★			11	9.525	3.44	1.1	1.5	0.32	1.48	

MMT G-CLASS GROUND INSERTS

EXTERNAL THREADING INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	Dimensions (mm) D1	S1	Z1	Z2	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
		16ERG60	★	★	1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.27	—	
		16ERAG60	★		0.5—3.0	48—8	9.525	3.44	1.2	1.7	0.08	—	
		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
		16ERG55	★	★		14—8	9.525	3.44	1.2	1.7	0.21	—	
		16ERAG55	★			48—8	9.525	3.44	1.2	1.7	0.07	—	
		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
		16ER075ISO	●		0.75		9.525	3.44	0.6	0.6	0.10	0.46	
		16ER100ISO	●	★	1.0		9.525	3.44	0.7	0.7	0.16	0.61	
		16ER125ISO	●	★	1.25		9.525	3.44	0.8	0.9	0.19	0.77	
		16ER150ISO	●	★	1.5		9.525	3.44	0.8	1.0	0.23	0.92	
		16ER175ISO	●	★	1.75		9.525	3.44	0.9	1.2	0.21	1.07	
		16ER200ISO	●	★	2.0		9.525	3.44	1.0	1.3	0.31	1.23	
		16ER250ISO	●	★	2.5		9.525	3.44	1.1	1.5	0.32	1.53	
		16ER300ISO	●	★	3.0		9.525	3.44	1.2	1.6	0.46	1.84	
		22ER350ISO	★		3.5		12.7	4.64	1.6	2.3	0.45	2.15	
		22ER400ISO	★		4.0		12.7	4.64	1.6	2.3	0.52	2.45	
		22ER450ISO	★		4.5		12.7	4.64	1.7	2.4	0.58	2.76	
		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

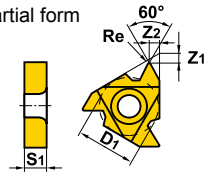
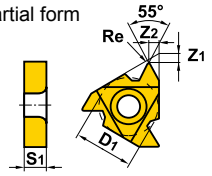
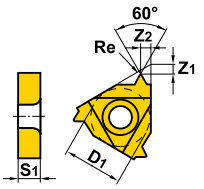
050	0.5mm	**A**	0.5—1.5mm or 48—16 thread/inch
075	0.75mm		
100	1.0mm	**G**	1.75—3.0mm or 14—8 thread/inch
125	1.25mm		
150	1.5mm		
175	1.75mm		
200	2.0mm	**AG**	0.5—3.0mm or 48—8 thread/inch
250	2.5mm		
300	3.0mm		
350	3.5mm		
400	4.0mm	**N**	3.5—5.0mm or 7—5 thread/inch
450	4.5mm		
500	5.0mm		

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	Dimensions (mm) D_1	S_1	Z_1	Z_2	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 
		16IRA60	★	★	0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.05	—	
		16IRG60	★	★	1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.16	—	
		16IRAG60	★		0.5—3.0	48—8	9.525	3.44	1.2	1.7	0.05	—	
		22IRN60	★		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 
		16IRA55	★	★		48—16	9.525	3.44	0.8	0.9	0.05	—	
		16IRG55	★	★		14—8	9.525	3.44	1.2	1.7	0.21	—	
		16IRAG55	★			48—8	9.525	3.44	1.2	1.7	0.07	—	
		22IRN55	★			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
		11IR075ISO	★		0.75		6.35	3.04	0.6	0.6	0.04	0.43	
		11IR100ISO	★	★	1.0		6.35	3.04	0.6	0.7	0.10	0.58	
		11IR125ISO	★	★	1.25		6.35	3.04	0.8	0.9	0.12	0.72	
		11IR150ISO	★	★	1.5		6.35	3.04	0.8	1.0	0.14	0.87	
		11IR175ISO	★		1.75		6.35	3.04	0.9	1.1	0.10	1.01	
		11IR200ISO	★		2.0		6.35	3.04	0.9	1.1	0.18	1.15	
		16IR050ISO	★		0.5		9.525	3.44	0.6	0.4	0.03	0.29	
		16IR075ISO	★		0.75		9.525	3.44	0.6	0.6	0.04	0.43	
		16IR100ISO	●	★	1.0		9.525	3.44	0.6	0.7	0.10	0.58	
		16IR125ISO	●	★	1.25		9.525	3.44	0.8	0.9	0.12	0.72	
		16IR150ISO	●	★	1.5		9.525	3.44	0.8	1.0	0.14	0.87	
		16IR175ISO	●	★	1.75		9.525	3.44	0.9	1.2	0.10	1.01	
		16IR200ISO	●	★	2.0		9.525	3.44	1.0	1.3	0.18	1.15	
		16IR250ISO	●	★	2.5		9.525	3.44	1.1	1.5	0.15	1.44	
		16IR300ISO	●	★	3.0		9.525	3.44	1.1	1.5	0.26	1.73	
		22IR350ISO	★		3.5		12.7	4.64	1.6	2.3	0.22	2.02	
		22IR400ISO	★		4.0		12.7	4.64	1.6	2.3	0.25	2.31	
		22IR450ISO	★		4.5		12.7	4.64	1.6	2.4	0.28	2.60	
		22IR500ISO	★		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		
400	4.0mm	**N**	3.5—5.0mm or 7—5 thread/inch
450	4.5mm		
500	5.0mm		

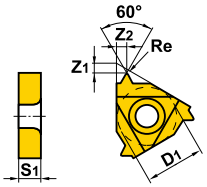
Threading Type

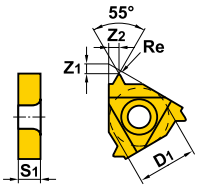
60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric
W	Whitworth for BSW, BSP
BSPT	BSPT
UN	American UN
RD	Round DIN 405
TR	ISO Trapezoidal 30°
ACME	American ACME
UNJ	UNJ
APBU	API Buttress Casing
APRD	API Round Casing &Tubing
NPT	NPT
NPTF	NPTF

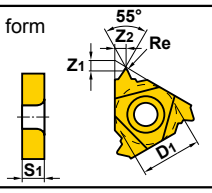
MMT G-CLASS GROUND INSERTS

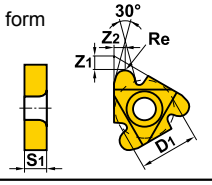
EXTERNAL THREADING INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	Dimensions (mm) D1	S1	Z1	Z2	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
		16ER280UN	●			28	9.525	3.44	0.6	0.7	0.10	0.56	
		16ER240UN	●			24	9.525	3.44	0.7	0.8	0.16	0.65	
		16ER200UN	●			20	9.525	3.44	0.8	0.9	0.19	0.78	
		16ER180UN	●			18	9.525	3.44	0.8	1.0	0.21	0.87	
		16ER160UN	●	★		16	9.525	3.44	0.9	1.1	0.24	0.97	
		16ER140UN	●	★		14	9.525	3.44	1.0	1.2	0.22	1.11	
		16ER130UN	●			13	9.525	3.44	1.0	1.3	0.24	1.20	
		16ER120UN	●	★		12	9.525	3.44	1.1	1.4	0.32	1.30	
		16ER110UN	●			11	9.525	3.44	1.1	1.5	0.29	1.42	
		16ER100UN	●			10	9.525	3.44	1.1	1.5	0.32	1.56	
		16ER090UN	●			9	9.525	3.44	1.2	1.7	0.35	1.73	
		16ER080UN	●			8	9.525	3.44	1.2	1.6	0.48	1.95	
		22ER070UN	★			7	12.7	4.64	1.6	2.3	0.47	2.22	
		22ER060UN	★			6	12.7	4.64	1.6	2.3	0.53	2.60	
		22ER050UN	★			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
		16ER260W	★			26	9.525	3.44	0.7	0.8	0.10	0.63	
		16ER200W	★			20	9.525	3.44	0.8	0.9	0.18	0.81	
		16ER190W	★	★		19	9.525	3.44	0.8	1.0	0.19	0.86	
		16ER180W	★			18	9.525	3.44	0.8	1.0	0.20	0.90	
		16ER160W	★			16	9.525	3.44	0.9	1.1	0.23	1.02	
		16ER140W	★	★		14	9.525	3.44	1.0	1.2	0.26	1.16	
		16ER120W	★			12	9.525	3.44	1.1	1.4	0.30	1.36	
		16ER110W	★	★		11	9.525	3.44	1.1	1.5	0.33	1.48	
		16ER100W	★			10	9.525	3.44	1.1	1.5	0.37	1.63	
		16ER090W	★			9	9.525	3.44	1.2	1.7	0.34	1.81	
		16ER080W	★			8	9.525	3.44	1.2	1.5	0.39	2.03	
		22ER070W	★			7	12.7	4.64	1.6	2.3	0.46	2.32	
		22ER060W	★			6	12.7	4.64	1.6	2.3	0.53	2.71	
		22ER050W	★			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
		16ER190BSPT	★	★		19	9.525	3.44	0.8	0.9	0.14	0.86	
		16ER140BSPT	★	★		14	9.525	3.44	1.0	1.2	0.26	1.16	
		16ER110BSPT	★	★		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
		16ER080RD	★			8	9.525	3.44	1.4	1.3	0.75	1.59	
		16ER060RD	★			6	9.525	3.44	1.5	1.7	1.00	2.12	
		22ER040RD	★			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) D_1	S_1	Z_1	Z_2	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
		11IR280UN	★			28	6.35	3.04	0.6	0.7	0.05	0.52	
		11IR240UN	★			24	6.35	3.04	0.7	0.8	0.09	0.61	
		11IR200UN	★			20	6.35	3.04	0.8	0.9	0.11	0.73	
		11IR180UN	★			18	6.35	3.04	0.8	1.0	0.12	0.81	
		11IR160UN	★			16	6.35	3.04	0.9	1.1	0.14	0.92	
		11IR140UN	★			14	6.35	3.04	0.9	1.1	0.11	1.05	
		16IR320UN	●			32	9.525	3.44	0.6	0.6	0.04	0.46	
		16IR280UN	●			28	9.525	3.44	0.6	0.7	0.05	0.52	
		16IR240UN	●			24	9.525	3.44	0.7	0.8	0.09	0.61	
		16IR200UN	●			20	9.525	3.44	0.8	0.9	0.11	0.73	
		16IR180UN	●			18	9.525	3.44	0.8	1.0	0.12	0.81	
		16IR160UN	●	★		16	9.525	3.44	0.9	1.1	0.14	0.92	
		16IR140UN	●	★		14	9.525	3.44	0.9	1.2	0.11	1.05	
		16IR130UN	●			13	9.525	3.44	1.0	1.3	0.10	1.13	
		16IR120UN	●	★		12	9.525	3.44	1.1	1.4	0.18	1.22	
		16IR110UN	●			11	9.525	3.44	1.1	1.5	0.13	1.33	
		16IR100UN	●			10	9.525	3.44	1.1	1.5	0.15	1.47	
		16IR090UN	●			9	9.525	3.44	1.2	1.7	0.17	1.63	
		16IR080UN	●			8	9.525	3.44	1.1	1.5	0.27	1.83	
		22IR070UN	★			7	12.7	4.64	1.6	2.3	0.23	2.09	
		22IR060UN	★			6	12.7	4.64	1.6	2.3	0.26	2.44	
		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
		11IR140W	★			14	6.35	3.04	0.9	1.1	0.26	1.16	
		16IR280W	★			28	9.525	3.44	0.6	0.7	0.09	0.58	
		16IR260W	★			26	9.525	3.44	0.7	0.8	0.10	0.63	
		16IR200W	★			20	9.525	3.44	0.8	0.9	0.18	0.81	
		16IR190W	★	★		19	9.525	3.44	0.8	1.0	0.19	0.86	
		16IR180W	★			18	9.525	3.44	0.8	1.0	0.20	0.90	
		16IR160W	★			16	9.525	3.44	0.9	1.1	0.23	1.02	
		16IR140W	★	★		14	9.525	3.44	1.0	1.2	0.26	1.16	
		16IR120W	★			12	9.525	3.44	1.1	1.4	0.30	1.36	
		16IR110W	★	★		11	9.525	3.44	1.1	1.5	0.33	1.48	
		16IR100W	★			10	9.525	3.44	1.1	1.5	0.37	1.63	
		16IR090W	★			9	9.525	3.44	1.2	1.7	0.34	1.81	
		16IR080W	★			8	9.525	3.44	1.2	1.5	0.39	2.03	
		22IR070W	★			7	12.7	4.64	1.6	2.3	0.46	2.32	
		22IR060W	★			6	12.7	4.64	1.6	2.3	0.53	2.71	
		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
		11IR140BSPT	★			14	6.35	3.04	0.9	1.0	0.26	1.16	
		16IR190BSPT	★	★		19	9.525	3.44	0.8	0.9	0.14	0.86	
		16IR140BSPT	★	★		14	9.525	3.44	1.0	1.2	0.26	1.16	
		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
		16IR080RD	★			8	9.525	3.44	1.4	1.4	0.70	1.59	
		16IR060RD	★			6	9.525	3.44	1.4	1.5	0.93	2.12	
		22IR040RD	★			4	12.7	4.64	2.2	2.3	1.40	3.18	

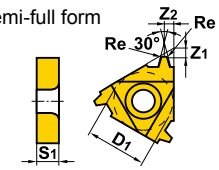
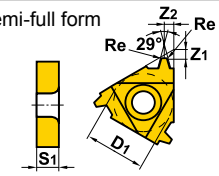
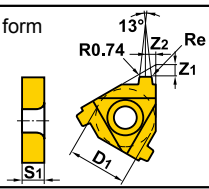
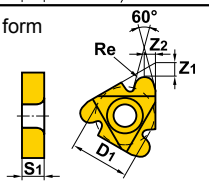
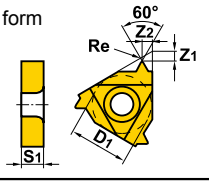
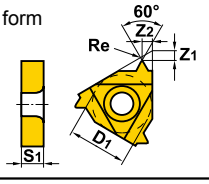
MMT G-CLASS GROUND INSERTS

EXTERNAL THREADING INSERTS

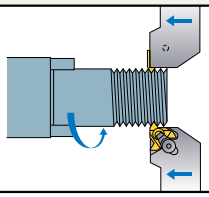
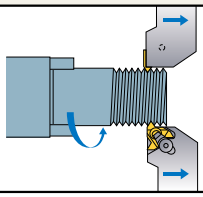
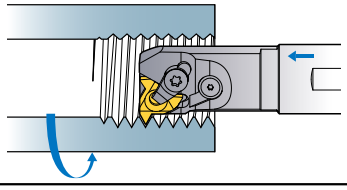
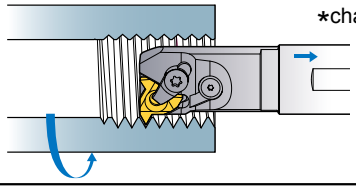
Type	Thread Tolerance	Order Number	Coated VP10MF		Pitch mm	Pitch thread/inch	Dimensions (mm) D_1	S_1	Z_1	Z_2	Re	Total depth of cut (mm)	Geometry
ISO Trapezoidal 30°	7e	**MMT16ER150TR**	★		1.5		9.525	3.44	1.0	1.1	0.08	0.90	Semi-full form
		16ER200TR	★		2.0		9.525	3.44	1.1	1.3	0.15	1.25	
		16ER300TR	★		3.0		9.525	3.44	1.3	1.5	0.15	1.75	
		22ER400TR	★		4.0		12.7	4.64	1.7	1.9	0.15	2.25	
		22ER500TR	★		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
		16ER100ACME	●			10	9.525	3.44	1.3	1.4	0.08	1.52	
		16ER080ACME	●			8	9.525	3.44	1.4	1.5	0.10	1.84	
		22ER060ACME	●			6	12.7	4.64	1.8	2.1	0.10	2.37	
		22ER050ACME	●			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
		16ER280UNJ	★			28	9.525	3.44	0.7	0.7	0.14	0.52	
		16ER240UNJ	★			24	9.525	3.44	0.7	0.8	0.17	0.61	
		16ER200UNJ	★			20	9.525	3.44	0.8	0.9	0.20	0.73	
		16ER180UNJ	★			18	9.525	3.44	0.8	1.0	0.22	0.81	
		16ER160UNJ	★			16	9.525	3.44	0.9	1.1	0.25	0.92	
		16ER140UNJ	★			14	9.525	3.44	1.0	1.2	0.29	1.05	
		16ER120UNJ	★			12	9.525	3.44	1.1	1.3	0.33	1.22	
		16ER100UNJ	★			10	9.525	3.44	1.2	1.5	0.40	1.47	
		16ER080UNJ	★			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
		16ER080APRD	●			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
		16ER180NPT	●			18	9.525	3.44	0.8	1.0	0.08	1.01	
		16ER140NPT	●			14	9.525	3.44	0.9	1.2	0.09	1.33	
		16ER115NPT	●			11.5	9.525	3.44	1.1	1.5	0.11	1.64	
		16ER080NPT	●			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
		16ER180NPTF	★			18	9.525	3.44	0.8	1.0	0.04	1.00	
		16ER140NPTF	★			14	9.525	3.44	0.9	1.2	0.04	1.35	
		16ER115NPTF	★			11.5	9.525	3.44	1.1	1.5	0.04	1.63	
		16ER080NPTF	★			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

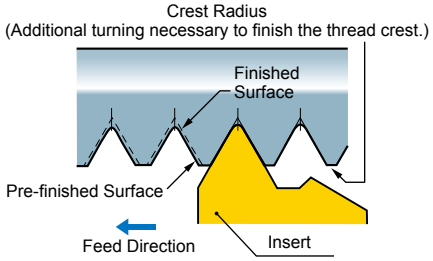
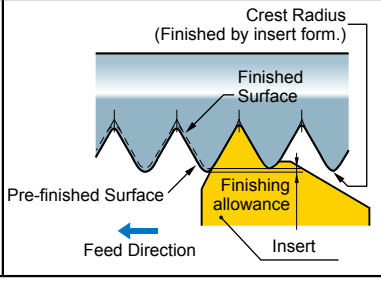
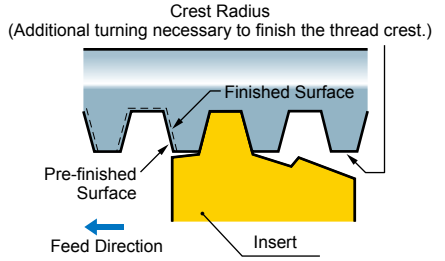
Type	Thread Tolerance	Order Number	Coated VP10MF		Pitch mm	Pitch thread/inch	Dimensions (mm) D_1	S_1	Z_1	Z_2	Re	Total depth of cut (mm)	Geometry
ISO Trapezoidal 30°	7H	**MMT16IR150TR**	★		1.5		9.525	3.44	1.0	1.1	0.08	0.90	Semi-full form 
		16IR200TR	★		2.0		9.525	3.44	1.1	1.3	0.15	1.25	
		16IR300TR	★		3.0		9.525	3.44	1.3	1.5	0.15	1.75	
		22IR400TR	★		4.0		12.7	4.64	1.7	1.9	0.15	2.25	
		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 
		16IR100ACME	●			10	9.525	3.44	1.2	1.3	0.08	1.52	
		16IR080ACME	●			8	9.525	3.44	1.4	1.5	0.10	1.84	
		22IR060ACME	●			6	12.7	4.64	1.8	2.1	0.10	2.37	
		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 
		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 
		16IR180NPT	●			18	9.525	3.44	0.8	1.0	0.08	1.01	
		16IR140NPT	●			14	9.525	3.44	0.9	1.2	0.09	1.33	
		16IR115NPT	●			11.5	9.525	3.44	1.1	1.5	0.11	1.64	
		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 
		16IR115NPTF	★			11.5	9.525	3.44	1.1	1.5	0.04	1.63	
		16IR080NPTF	★			8	9.525	3.44	1.3	1.8	0.04	2.38	

THREADING METHODS

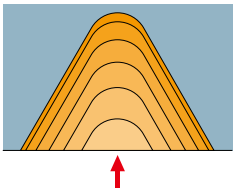
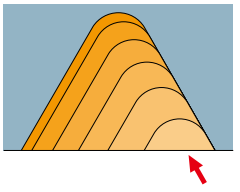
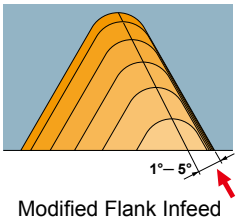
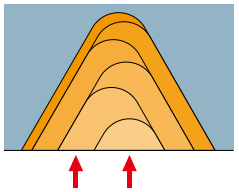
	Right Hand Thread	Left Hand Thread
EXTERNAL		 *change the shim
INTERNAL		 *change the shim

· 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.

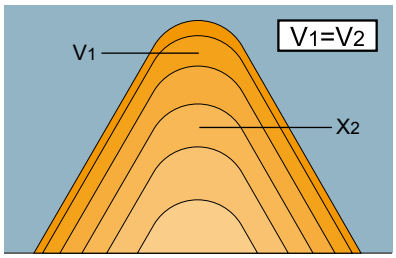
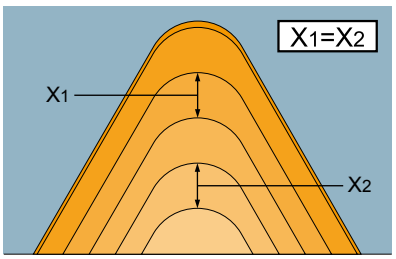
INSERT TYPES

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

Features		Radial Infeed	Flank Infeed	Modified Flank Infeed	Incremental Infeed
					
Advantages		● Easiest to use. (Standard programme 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.
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

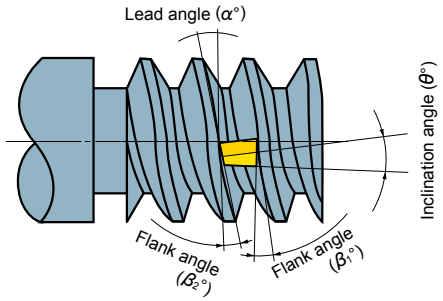
・A final pass should be performed at the same depth of cut as the last regular pass.

・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.



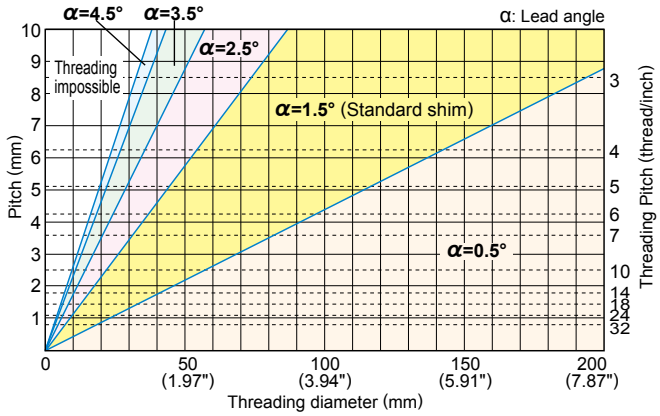
Shim reference table (Threading diameter)

Lead Angle / Pitch (mm)	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	≤ϕ1.9	ϕ1.9 – ϕ2.2	ϕ2.2 – ϕ2.8	ϕ2.8 – ϕ4.3	ϕ4.3 – ϕ11.4	≥ϕ11.4	≤ϕ4.3	ϕ4.3 – ϕ11.4	≥ϕ11.4
0.75	≤ϕ2.9	ϕ2.9 – ϕ3.2	ϕ3.2 – ϕ4.3	ϕ4.3 – ϕ6.5	ϕ6.5 – ϕ17.1	≥ϕ17.1	≤ϕ6.5	ϕ6.5 – ϕ17.1	≥ϕ17.1
1	≤ϕ3.8	ϕ3.8 – ϕ4.3	ϕ4.3 – ϕ5.7	ϕ5.7 – ϕ8.7	ϕ8.7 – ϕ22.8	≥ϕ22.8	≤ϕ8.7	ϕ8.7 – ϕ22.8	≥ϕ22.8
1.25	≤ϕ4.8	ϕ4.8 – ϕ5.4	ϕ5.4 – ϕ7.1	ϕ7.1 – ϕ10.9	ϕ10.9 – ϕ28.5	≥ϕ28.5	≤ϕ10.9	ϕ10.9 – ϕ28.5	≥ϕ28.5
1.5	≤ϕ5.7	ϕ5.7 – ϕ6.5	ϕ6.5 – ϕ8.5	ϕ8.5 – ϕ13.0	ϕ13.0 – ϕ34.2	≥ϕ34.2	≤ϕ13.0	ϕ13.0 – ϕ34.2	≥ϕ34.2
1.75	≤ϕ6.7	ϕ6.7 – ϕ7.6	ϕ7.6 – ϕ9.9	ϕ9.9 – ϕ15.2	ϕ15.2 – ϕ39.9	≥ϕ39.9	≤ϕ15.2	ϕ15.2 – ϕ39.9	≥ϕ39.9
2	≤ϕ7.6	ϕ7.6 – ϕ8.6	ϕ8.6 – ϕ11.4	ϕ11.4 – ϕ17.4	ϕ17.4 – ϕ45.6	≥ϕ45.6	≤ϕ17.4	ϕ17.4 – ϕ45.6	≥ϕ45.6
2.5	≤ϕ9.5	ϕ9.5 – ϕ10.8	ϕ10.8 – ϕ14.2	ϕ14.2 – ϕ21.7	ϕ21.7 – ϕ57.0	≥ϕ57.0	≤ϕ21.7	ϕ21.7 – ϕ57.0	≥ϕ57.0
3	≤ϕ11.4	ϕ11.4 – ϕ13.0	ϕ13.0 – ϕ17.0	ϕ17.0 – ϕ26.0	ϕ26.0 – ϕ68.4	≥ϕ68.4	≤ϕ26.0	ϕ26.0 – ϕ68.4	≥ϕ68.4
3.5	≤ϕ13.3	ϕ13.3 – ϕ15.1	ϕ15.1 – ϕ19.9	ϕ19.9 – ϕ30.4	ϕ30.4 – ϕ79.8	≥ϕ79.8	≤ϕ30.4	ϕ30.4 – ϕ79.8	≥ϕ79.8
4	≤ϕ15.2	ϕ15.2 – ϕ17.3	ϕ17.3 – ϕ22.7	ϕ22.7 – ϕ34.7	ϕ34.7 – ϕ91.2	≥ϕ91.2	≤ϕ34.7	ϕ34.7 – ϕ91.2	≥ϕ91.2
4.5	≤ϕ17.1	ϕ17.1 – ϕ19.4	ϕ19.4 – ϕ25.6	ϕ25.6 – ϕ39.1	ϕ39.1 – ϕ102.3	≥ϕ102.6	≤ϕ39.1	ϕ39.1 – ϕ102.6	≥ϕ102.6
5	≤ϕ19.0	ϕ19.0 – ϕ21.6	ϕ21.6 – ϕ28.4	ϕ28.4 – ϕ43.4	ϕ43.4 – ϕ114.0	≥ϕ114.0	≤ϕ43.4	ϕ43.4 – ϕ114.0	≥ϕ114.0

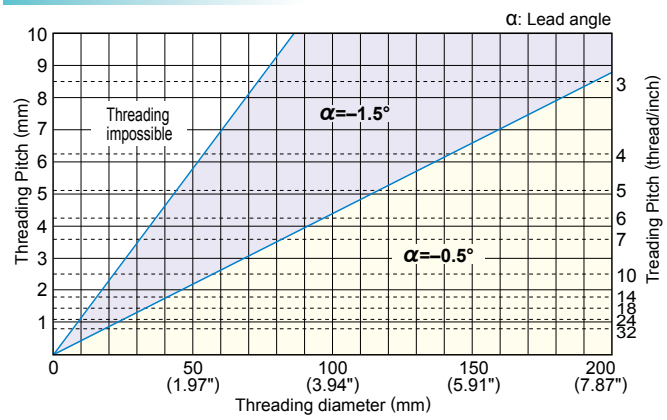
(Note) Back turning in the case of left hand threads.

Shim reference graph

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.)

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.**

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 9 and 10.
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.

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

Relief angle of an insert set on a holder

Thread helix angle	Internal relief angle	External relief angle
60°	8.5°	6°
55°	7°	7°
30°	4°	2.5°
29°	4°	2.5°

· 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											16ER075ISO	–
1.0	0.61	0.18	0.15	0.12	0.10	0.06										16ER100ISO	MMT16ER100ISO-S
1.25	0.77	0.19	0.17	0.14	0.11	0.10	0.06									16ER125ISO	16ER125ISO-S
1.5	0.92	0.22	0.21	0.17	0.14	0.12	0.06									16ER150ISO	16ER150ISO-S
1.75	1.07	0.22	0.21	0.16	0.13	0.11	0.09	0.09	0.06							16ER175ISO	16ER175ISO-S
2.0	1.23	0.24	0.23	0.17	0.16	0.14	0.12	0.11	0.06							16ER200ISO	16ER200ISO-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					16ER250ISO	16ER250ISO-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			16ER300ISO	16ER300ISO-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			22ER350ISO	–
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	22ER400ISO	–
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	22ER450ISO	–
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	22ER500ISO	–

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										16ER280UN	–
24	.026	.007	.006	.006	.005	.002										16ER240UN	–
20	.031	.008	.007	.005	.005	.004	.002									16ER200UN	–
18	.034	.009	.008	.006	.005	.004	.002									16ER180UN	–
16	.038	.009	.008	.006	.005	.004	.004	.002								16ER160UN	MMT16ER160UN-S
14	.044	.009	.008	.006	.005	.005	.005	.004	.002							16ER140UN	16ER140UN-S
13	.047	.010	.009	.007	.006	.005	.005	.003	.002							16ER130UN	–
12	.051	.011	.009	.007	.006	.006	.005	.005	.002							16ER120UN	MMT16ER120UN-S
11	.056	.011	.009	.007	.006	.006	.006	.005	.004	.002						16ER110UN	–
10	.061	.011	.009	.007	.006	.006	.006	.005	.005	.004	.002					16ER100UN	–
9	.068	.013	.011	.009	.007	.006	.006	.005	.005	.004	.002					16ER090UN	–
8	.077	.014	.012	.009	.007	.006	.006	.006	.006	.005	.004	.002				16ER080UN	–
7	.087	.015	.013	.011	.009	.008	.007	.006	.006	.005	.005	.002				22ER070UN	–
6	.102	.017	.014	.011	.010	.008	.007	.007	.006	.006	.005	.005	.004	.002		22ER060UN	–
5	.123	.017	.015	.012	.011	.009	.009	.008	.007	.007	.007	.007	.006	.006	.002	22ER050UN	–

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										16ER260W	–
20	.032	.008	.007	.006	.005	.004	.002									16ER200W	–
19	.034	.008	.007	.006	.006	.005	.002									16ER190W	MMT16ER190W-S
18	.035	.010	.007	.006	.005	.005	.002									16ER180W	–
16	.040	.008	.007	.006	.005	.004	.004	.004	.002							16ER160W	–
14	.046	.009	.008	.007	.006	.005	.005	.004	.002							16ER140W	MMT16ER140W-S
12	.054	.011	.010	.008	.006	.006	.006	.005	.002							16ER120W	–
11	.058	.011	.009	.008	.007	.006	.006	.005	.005	.002						16ER110W	MMT16ER110W-S
10	.064	.011	.010	.008	.007	.006	.006	.005	.005	.004	.002					16ER100W	–
9	.071	.011	.010	.008	.007	.006	.006	.006	.005	.005	.005	.002				16ER090W	–
8	.080	.012	.011	.009	.007	.007	.006	.006	.006	.005	.005	.004	.002			16ER080W	–
7	.091	.013	.013	.010	.009	.008	.007	.007	.006	.006	.006	.004	.002			22ER070W	–
6	.107	.014	.013	.011	.009	.008	.008	.007	.007	.006	.006	.006	.005	.005	.002	22ER060W	–
5	.128	.017	.016	.014	.011	.010	.009	.009	.008	.007	.007	.007	.006	.005	.002	22ER050W	–

(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
28	.023	.007	.006	.004	.004	.002								MMT16ER280BSPT	–
19	.034	.009	.007	.006	.005	.005	.002							16ER190BSPT	MMT16ER190BSPT-S
14	.046	.009	.008	.007	.006	.005	.005	.004	.002					16ER140BSPT	16ER140BSPT-S
11	.058	.010	.009	.008	.007	.006	.006	.005	.005	.002				16ER110BSPT	16ER110BSPT-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						16ER080RD
6	.083	.010	.010	.009	.009	.008	.007	.007	.006	.006	.005	.004	.002				16ER060RD
4	.125	.013	.013	.013	.012	.011	.010	.009	.009	.008	.007	.007	.006	.005	.002		22ER040RD

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									16ER200TR
3.0	1.75	0.32	0.31	0.24	0.19	0.18	0.17	0.15	0.13	0.06							16ER300TR
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	0.16				22ER400TR
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		22ER500TR

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							16ER100ACME
8	.072	.012	.010	.009	.007	.006	.006	.006	.005	.005	.004	.002					16ER080ACME
6	.093	.013	.012	.011	.009	.008	.007	.006	.006	.005	.005	.004	.005	.002			22ER060ACME
5	.110	.014	.013	.012	.010	.009	.008	.007	.007	.006	.006	.006	.005	.005	.002		22ER050ACME

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											16ER280UNJ
24	.024	.007	.006	.006	.003	.002											16ER240UNJ
20	.029	.007	.006	.005	.005	.004	.002										16ER200UNJ
18	.032	.009	.007	.006	.004	.004	.002										16ER180UNJ
16	.036	.010	.008	.006	.005	.004	.003										16ER160UNJ
14	.041	.010	.009	.007	.005	.004	.004	.002									16ER140UNJ
12	.048	.011	.011	.008	.007	.005	.004	.002									16ER120UNJ
10	.058	.012	.011	.008	.006	.005	.005	.005	.004	.002							16ER100UNJ
8	.072	.012	.012	.009	.007	.006	.006	.005	.005	.004	.004	.002					16ER080UNJ

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.

Standard of Depth of Cut (External Threading)

EXTERNAL (RADIAL INFEED)

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				16ER080APRD

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								16ER180NPT
14	.052	.009	.007	.006	.006	.005	.005	.004	.004	.004	.002						16ER140NPT
11.5	.065	.009	.007	.007	.006	.006	.005	.005	.005	.005	.004	.004	.002				16ER115NPT
8	.095	.013	.011	.009	.008	.007	.006	.006	.006	.005	.005	.005	.004	.004	.004	.002	16ER080NPT

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								16ER180NPTF
14	.053	.009	.008	.006	.006	.005	.005	.004	.004	.004	.002						16ER140NPTF
11.5	.064	.009	.009	.007	.006	.005	.005	.005	.004	.004	.004	.004	.002				16ER115NPTF
8	.094	.013	.011	.009	.007	.007	.006	.006	.006	.005	.005	.005	.004	.004	.004	.002	16ER080NPTF

(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											11IR075ISO	16IR075ISO	–	–
1.0	0.58	0.17	0.15	0.11	0.09	0.06										11IR100ISO	16IR100ISO	MMT11IR100ISO-S	MMT16IR100ISO-S
1.25	0.72	0.18	0.16	0.12	0.11	0.09	0.06									11IR125ISO	16IR125ISO	11IR125ISO-S	16IR125ISO-S
1.5	0.87	0.21	0.20	0.16	0.13	0.11	0.06									11IR150ISO	16IR150ISO	11IR150ISO-S	16IR150ISO-S
1.75	1.01	0.21	0.20	0.15	0.12	0.10	0.09	0.08	0.06							11IR175ISO	16IR175ISO	–	16IR175ISO-S
2.0	1.15	0.24	0.22	0.18	0.14	0.12	0.10	0.09	0.06							11IR200ISO	16IR200ISO	–	16IR200ISO-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					–	16IR250ISO	–	16IR250ISO-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			–	16IR300ISO	–	16IR300ISO-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			–	22IR350ISO	–	–
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	–	22IR400ISO	–	–
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	–	22IR450ISO	–	–
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	–	22IR500ISO	–	–

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										11IR280UN	16IR280UN	–
24	.024	.007	.006	.005	.004	.002										11IR240UN	16IR240UN	–
20	.029	.007	.006	.005	.005	.004	.002									11IR200UN	16IR200UN	–
18	.032	.008	.007	.006	.005	.004	.002									11IR180UN	16IR180UN	–
16	.036	.008	.007	.006	.005	.004	.004	.002								11IR160UN	16IR160UN	MMT16IR160UN-S
14	.041	.008	.007	.006	.005	.005	.004	.004	.002							11IR140UN	16IR140UN	16IR140UN-S
13	.044	.009	.007	.006	.006	.005	.005	.004	.002							–	16IR130UN	–
12	.048	.009	.009	.007	.006	.005	.005	.005	.002							–	16IR120UN	MMT16IR120UN-S
11	.052	.009	.009	.008	.006	.005	.005	.004	.004	.002						–	16IR110UN	–
10	.058	.010	.009	.008	.006	.005	.005	.005	.004	.004	.002					–	16IR100UN	–
9	.064	.012	.009	.008	.007	.006	.006	.005	.005	.004	.002					–	16IR090UN	–
8	.072	.012	.010	.008	.007	.006	.006	.006	.005	.005	.005	.002				–	16IR080UN	–
7	.082	.014	.012	.009	.008	.007	.007	.006	.006	.006	.005	.002				–	22IR070UN	–
6	.096	.016	.013	.010	.009	.007	.007	.006	.006	.006	.005	.005	.004	.002		–	22IR060UN	–
5	.115	.016	.014	.012	.010	.009	.008	.008	.007	.007	.006	.006	.005	.005	.002	–	22IR050UN	–

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										–	16IR260W	–
20	.032	.008	.007	.006	.005	.004	.002									–	16IR200W	–
19	.034	.008	.007	.006	.006	.005	.002									MMT11IR190W	16IR190W	MMT16IR190W-S
18	.035	.010	.007	.006	.005	.005	.002									–	16IR180W	–
16	.040	.008	.007	.006	.005	.004	.004	.004	.002							–	16IR160W	–
14	.046	.009	.008	.007	.006	.005	.005	.004	.002							MMT11IR140W	16IR140W	MMT16IR140W-S
12	.054	.011	.010	.008	.006	.006	.006	.005	.002							–	16IR120W	16IR120W-S
11	.058	.011	.009	.008	.007	.006	.006	.005	.004	.002						–	16IR110W	–
10	.064	.011	.010	.008	.007	.006	.006	.005	.005	.004	.002					–	16IR100W	–
9	.071	.011	.010	.008	.007	.006	.006	.006	.005	.005	.005	.002				–	16IR090W	–
8	.080	.012	.011	.009	.007	.007	.006	.006	.006	.005	.005	.004	.002			–	16IR080W	–
7	.091	.013	.013	.010	.009	.008	.007	.007	.006	.006	.006	.004	.002			–	22IR070W	–
6	.107	.014	.013	.011	.009	.008	.008	.007	.007	.006	.006	.006	.005	.005	.002	–	22IR060W	–
5	.128	.017	.016	.014	.011	.010	.009	.009	.008	.007	.007	.007	.006	.005	.002	–	22IR050W	–

(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)

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		11IR140BSPT	16IR140BSPT	16IR140BSPT-S
11	.058	.010	.009	.008	.007	.006	.006	.005	.005	.002	–	16IR110BSPT	16IR110BSPT-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					16IR080RD
6	.083	.010	.010	.009	.009	.008	.007	.007	.006	.006	.005	.004	.002			16IR060RD
4	.125	.013	.013	.013	.012	.011	.010	.009	.009	.008	.007	.007	.006	.005	.002	22IR040RD

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								16IR200TR
3	1.75	0.32	0.31	0.24	0.19	0.18	0.17	0.15	0.13	0.06						16IR300TR
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			22IR400TR
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	22IR500TR

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						16IR100ACME
8	.072	.012	.010	.009	.007	.006	.006	.006	.005	.005	.004	.002				16IR080ACME
6	.093	.013	.012	.011	.009	.008	.007	.006	.006	.005	.005	.005	.004	.002		22IR060ACME
5	.110	.014	.013	.012	.010	.009	.008	.007	.007	.006	.006	.006	.005	.005	.002	22IR050ACME

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	16IR080APRD

(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.

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								16IR180NPT
14	.052	.009	.007	.006	.006	.005	.005	.004	.004	.004	.002						16IR140NPT
11.5	.065	.009	.007	.007	.006	.006	.005	.005	.005	.005	.004	.004	.002				16IR115NPT
8	.095	.013	.011	.009	.008	.007	.006	.006	.006	.005	.005	.005	.004	.004	.004	.002	16IR080NPT

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				16IR115NPTF
8	.094	.013	.011	.009	.007	.007	.006	.006	.006	.005	.005	.005	.004	.004	.004	.002	16IR080NPTF

(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

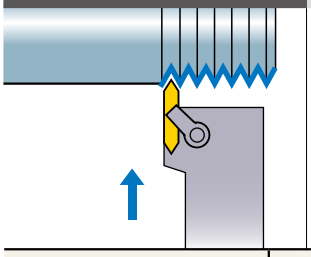
Problems	Observation	Causes	Solutions
Low thread precision.	Threads do not mesh with each other.	Incorrect tool installation.	Set the insert center height at 0".
			Check holder inclination (Lateral).
	Shallow thread.	Incorrect depth of cut.	Modify the depth of cut.
		Lack of insert wear or plastic deformation 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.

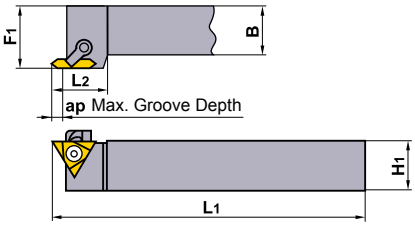
Memo

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





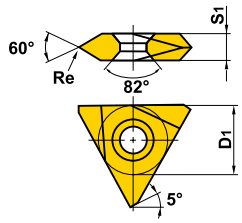
Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H1	B	L1	L2	F1	Max. Groove Depth (inch) ap	Insert Screw	Clamp Screw	Clamp
MTVOR/L-8-3B	●	●	TNMC	32○	.500	.500	4.500	1.000	.750	.057 / .156	GTS1	XNS35	CL6
10-3B	●	●		32○	.625	.625	4.500	1.000	.875	.057 / .156	GTS1	XNS35	CL6
12-3B	●	●		32○	.750	.750	4.500	1.000	1.000	.057 / .156	GTS1	XNS35	CL6
12-4B	●	●		43○	.750	.750	4.500	1.063	1.000	.156 / .234	GTS2	XNS36	CL6
16-4D	●	●		43○	1.000	1.000	6.000	1.063	1.250	.156 / .234	GTS2	XNS36	CL6
16-5D	●	●		54○	1.000	1.000	6.000	1.250	1.250	.297	GTS3	XNS36	CL6
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.

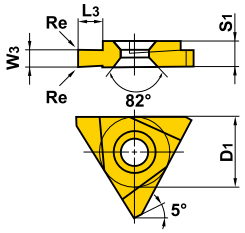
INSERTS (THREADING)

Order Number	Class	Stock Coated UP20M	Stock Carbide UTi20T	Min. Pitch (T.P.I)	Dimensions (inch) D1	S1	Re	Geometry
TNMC32NV	E	●	●	8	.375	.125	.004	
43NV	E	●	●	6	.500	.187	.004	
54NV	E	●	●	4	.625	.250	.004	



INSERTS (GROOVING)

Order Number	Class	Stock Coated UP20M	Stock Carbide UTi20T	Dimensions (inch) W3	D1	S1	L3	Re	Geometry
TNMC32NGR032	E	●	●	.032	.375	.125	.057	≤.003	
32NGL032	E	●	●	.032	.375	.125	.057	≤.003	
32NGR063	E	●	●	.063	.375	.125	.156	≤.003	
32NGL063	E	●	●	.063	.375	.125	.156	≤.003	
43NGR063	E	●	●	.063	.500	.188	.156	≤.003	
43NGL063	E	●	●	.063	.500	.188	.156	≤.003	
43NGR094	E	●	●	.094	.500	.188	.156	≤.003	
43NGL094	E	●	●	.094	.500	.188	.156	≤.003	
43NGR125	E	●	●	.125	.500	.188	.234	≤.003	
43NGL125	E	●	●	.125	.500	.188	.234	≤.003	
43NGR156	E	●	●	.156	.500	.188	.234	≤.003	
43NGL156	E	●	●	.156	.500	.188	.234	≤.003	
54NGR187	E	●	●	.187	.625	.250	.297	≤.003	
54NGL187	E	●	●	.187	.625	.250	.297	≤.003	



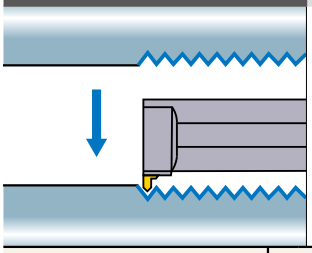
Right hand insert shown.

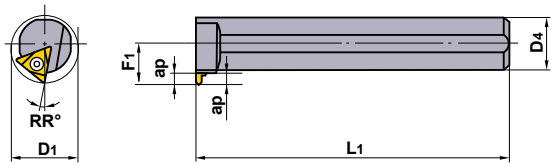
● : Inventory maintained.

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



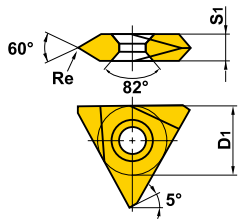


Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)				Min. Cutting Diameter (inch)	Max. Groove Depth (inch)		
	R	L			D4	L1	F1	RR	D1	ap	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

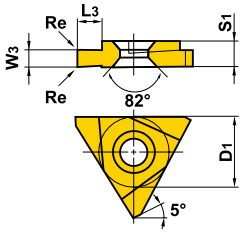
(Note) Please use left hand insert for right hand holder and right hand insert for left hand holder.

INSERTS (THREADING)

Order Number	Class	Stock		Min. Pitch (T.P.I)	Dimensions (inch)			Geometry
		Coated	Carbide		D1	S1	Re	
		UP20M	UTi20T					
TNMC32NV	E	●	●	8	.375	.125	.004	
43NV	E	●	●	6	.500	.187	.004	
54NV	E	●	●	4	.625	.250	.004	

INSERTS (GROOVING)

Order Number	Class	Stock		Dimensions (inch)					Geometry
		Coated	Carbide	W3	D1	S1	L3	Re	
		UP20M	UTi20T						
TNMC32NGR032	E	●	●	.032	.375	.125	.057	≤.003	
32NGL032	E	●	●	.032	.375	.125	.057	≤.003	
32NGR063	E	●	●	.063	.375	.125	.156	≤.003	
32NGL063	E	●	●	.063	.375	.125	.156	≤.003	
43NGR063	E	●	●	.063	.500	.188	.156	≤.003	
43NGL063	E	●	●	.063	.500	.188	.156	≤.003	
43NGR094	E	●	●	.094	.500	.188	.156	≤.003	
43NGL094	E	●	●	.094	.500	.188	.156	≤.003	
43NGR125	E	●	●	.125	.500	.188	.234	≤.003	
43NGL125	E	●	●	.125	.500	.188	.234	≤.003	
43NGR156	E	●	●	.156	.500	.188	.234	≤.003	
43NGL156	E	●	●	.156	.500	.188	.234	≤.003	
54NGR187	E	●	●	.187	.625	.250	.297	≤.003	
54NGL187	E	●	●	.187	.625	.250	.297	≤.003	

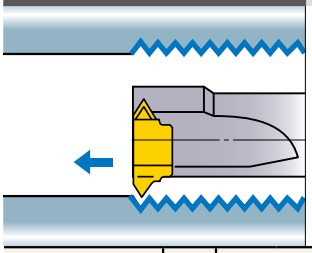


Right hand insert shown.

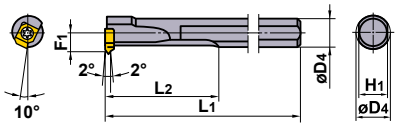
F TYPE

- Min. cutting diameter 10mm.
- Screw-on type.
- Usable for various applications.
- Max. groove depth: 3mm.

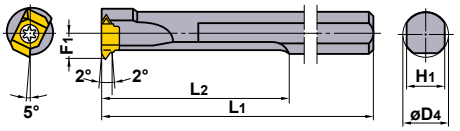
FSL51 Internal grooving, Threading



1 Corner type (FSL5108R,5110R)



2 Corner type (FSL5112R,5114R,5116R)

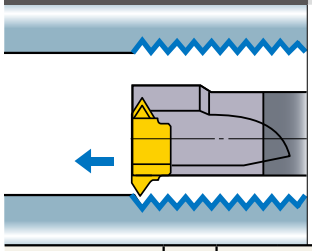


Metric Standard

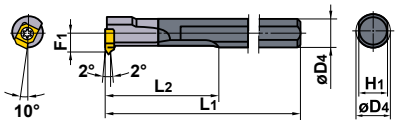
Right hand tool holder only.

Order Number	Stock	Insert Number				Dimensions (mm)						Min. Cutting Diameter (mm)	Max. Groove Depth (mm)	Clamp Screw	Wrench
	R	Grooving		Threading		D4	H1	L1	L2	F1	W3				
FSL5108R	★	MLG	10□□L	MLT	1001L	8	7	125	30	4.8	1.2 1.5 2.0	**10**	1.0	TS25	TKY08F
5110R	★		10□□L		1001L	10	9	150	40	5.8		**12**	1.0	TS25	TKY08F
5112R	★	MLG	14□□L	MLT	1401L	12	10.8	180	50	6.8	1.5 2.0 3.0	**14**	2.0	TS32	TKY08F
5114R	★		14□□L		1401L	14	12.4	180	60	7.8		**16**	2.0	TS32	TKY08F
5116R	★	MLG	20□□L	MLT	2001L	16	14	200	70	9.7	2.0 3.0 4.0	**20**	3.0	TS43	TKY15F

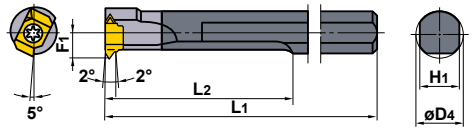
FSL52 Carbide shank



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)						Min. Cutting Diameter (mm)	Max. Groove Depth (mm)	Clamp Screw	Wrench
	R	Grooving		Threading		D4	H1	L1	L2	F1	W3				
FSL5208R	★	MLG	10□□L	MLT	1001L	8	7	125	60	4.8	1.2 1.5 2.0	**10**	1.0	TS25	TKY08F
5210R	★		10□□L		1001L	10	9	150	70	5.8		**12**	1.0	TS25	TKY08F
5212R	★	MLG	14□□L	MLT	1401L	12	10.8	180	80	6.8	1.5 2.0 3.0	**14**	2.0	TS32	TKY08F
5214R	★		14□□L		1401L	14	12.4	180	85	7.8		**16**	2.0	TS32	TKY08F
5216R	★	MLG	20□□L	MLT	2001L	16	14	200	115	9.7	2.0 3.0 4.0	**20**	3.0	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)

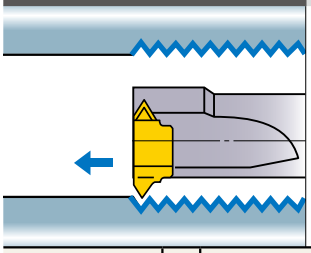
● : Inventory maintained. ★ : Inventory maintained in Japan.

F TYPE

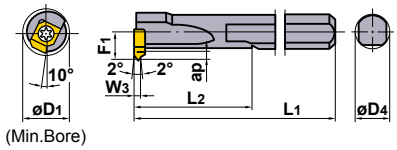
- Min. cutting diameter .390inch.
- Screw-on type.
- Usable for various applications.
- Max. groove depth: .118inch.

S-SL5N

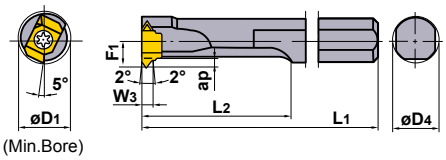
Internal grooving, Threading, Boring



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)					Min. Cutting Diameter (inch)	Max. Groove Depth (inch)		
	R	Grooving	Threading	D4	L1	L2	F1	W3	D1	ap	Clamp Screw	Wrench
S-SL5NR05	●	MLG10W○○○L	MLT1001L	.313	5.000	1.250	.188	.062 .094	.390	.039	TS25	TKY08F
06	●	MLG10W○○○L	MLT1001L	.375	6.000	1.500	.219		.449	.039	TS25	TKY08F
08	●	MLG14W○○○L	MLT1401L	.500	7.000	2.000	.281	.062 .094 .125	.579	.079	TS32	TKY08F
10	●	MLG20W○○○L	MLT2001L	.625	8.000	3.000	.375	.094 .125	.791	.118	TS43	TKY15F
12	●	MLG20W○○○L	MLT2001L	.750	10.000	4.000	.438	.156	.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 ➤ G038
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

F TYPE

- Min. cutting diameter .390inch.
- Screw-on type.
- Usable for various applications.
- Max. groove depth: .118inch.

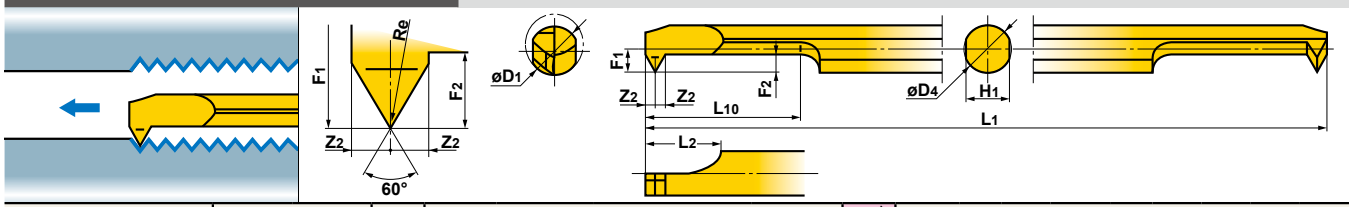
INSERTS

Application		Groove Width (inch) W_3	Order Number	Coated	Carbide		Dimensions (inch)						Geometry
				UP20M	UTi20T	HTi10	L_1	L_2	L_3	S_1	Re	C	
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)	**1015L**		★		.276	.197	.039	.094	—	.004	
		.079 (2.0mm)	**1020L**		★		.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)	**1420L**		★		.465	.256	.079	.187	—	.004	
		.118 (3.0mm)	**1430L**		★		.465	.256	.079	.187	—	.004	
		.079 (2.0mm)	**2020L**		★		.661	.356	.118	.250	—	.004	
		.118 (3.0mm)	**2030L**		★		.661	.356	.118	.250	—	.004	
		.157 (4.0mm)	**2040L**		★		.661	.356	.118	.250	—	.004	
Threading		Min.Pitch 13T.P.I	**MLT1001L**	●	●		.276	.197	—	.094	.004	—	**MLT1001L (1 Corner type)**
		Min.Pitch 11T.P.I	**1401L**	●	●		.465	.256	—	.187	.004	—	
		Min.Pitch 8T.P.I	**2001L**	●	●		.661	.356	—	.250	.004	—	
													MLT1401L /2001L (2 Corner type)

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

CT — Internal threading



Order Number	Stock		Breaker	Threads				Min. Cutting Diameter	Dimensions (mm)								
				Metric Screw		Unified Screw											
	Micro Grain Carbide	Coated		Thread	Pitch (mm)	Thread	Pitch (thread/inch)										
	TF15	VP15TF						D1	Re	D4	L1	L10	L2	F1	Z2	F2	H1
CT0305RS-M4	●	●	Without	≥ M4	0.5–1.0	≥ NO.8–32UNC	36–24	3	0.03	3	50	5.2	6	1.3	0.6	1.2	2.7
03RS-M4	●	●	Without	≥ M4	0.5–1.0	≥ NO.8–36UNF	36–24	3	0.03	3	50	10.2	6	1.3	0.6	1.2	2.7
03RS-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
0407RS-M6	●	●	Without	≥ M6	0.75–1.25	≥ 1/4–20UNC	28–20	4.5	0.05	4	60	7.6	7	1.8	0.8	1.7	3.6
04RS-M6	●	●	Without	≥ M6	0.75–1.25	≥ 1/4–28UNF	28–20	4.5	0.05	4	60	15.6	7	1.8	0.8	1.7	3.6
04RS-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
0511RS-M8	●	●	Without	≥ M8	0.75–1.5	≥ 5/16–18UNC	24–18	6	0.05	5	70	11	8	2.3	1	2.2	4.5
05RS-M8	●	●	Without	≥ M8	0.75–1.5	≥ 5/16–24UNF	24–18	6	0.05	5	70	21	8	2.3	1	2.2	4.5
05RS-M8B	●	●	With	≥ M8	0.75–1.5		24–18	6	0.05	5	70	21	8	2.3	1	2.2	4.5
0611RS-M10	●	●	Without	≥ M10	0.75–1.75	≥ 3/8–16UNC	24–16	7	0.05	6	75	11	8	2.8	1	2.2	5.4
06RS-M10	●	●	Without	≥ M10	0.75–1.75	≥ 3/8–24UNF	24–16	7	0.05	6	75	21	8	2.8	1	2.2	5.4
06RS-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

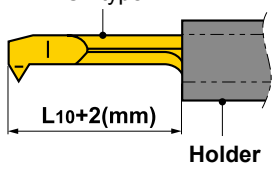
HOLDER CROSS REFERENCE LIST OF INCH SHANK STANDARD

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
		10252A	0407RS-M6, 04RS-M6(B)	
		10315A	0511RS-M8, 05RS-M8(B)	
		10378A	0611RS-M10, 06RS-M10(B)	
		10441A	—	
Round Type Holder ϕ.750inch	ID : Metric Type	**RBH19030N**	0305RS-M4, 03RS-M4(B)	Citizen Precision Machinery Co., Ltd.
		19040N	0407RS-M6, 04RS-M6(B)	
		19050N	0511RS-M8, 05RS-M8(B)	
		19060N	0611RS-M10, 06RS-M10(B)	
		19070N	—	
Round Type Holder ϕ1.000inch	ID : Metric Type	**RBH16189A**	0305RS-M4, 03RS-M4(B)	Citizen Precision Machinery Co., Ltd. NC lathes
		16252A	0407RS-M6, 04RS-M6(B)	
		16315A	0511RS-M8, 05RS-M8(B)	
		16378A	0611RS-M10, 06RS-M10(B)	
		16441A	—	

* Mitsubishi Materials obtained the makers' approval before entering their names in the list.

RECOMMENDED TOOL OVERHANG

MICRO-MINI TWIN
CT type



(Note) For L10, 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
	1640N	0407RS-M6, 04RS-M6(B)	
	1650N	0511RS-M8, 05RS-M8(B)	
	1660N	0611RS-M10, 06RS-M10(B)	
	1670N	–	
Round Type Holder ϕ20mm	**RBH2030N**	0305RS-M4, 03RS-M4(B)	Citizen Precision Machinery Co., Ltd. Tsugami Corporation MIYANO MACHINERY JAPAN INC. NC lathes
	2040N	0407RS-M6, 04RS-M6(B)	
	2050N	0511RS-M8, 05RS-M8(B)	
	2060N	0611RS-M10, 06RS-M10(B)	
	2070N	–	
Round Type Holder ϕ22mm	**RBH2230N**	0305RS-M4, 03RS-M4(B)	STAR MICRONICS CO., LTD.
	2240N	0407RS-M6, 04RS-M6(B)	
	2250N	0511RS-M8, 05RS-M8(B)	
	2260N	0611RS-M10, 06RS-M10(B)	
	2270N	–	
Round Type Holder ϕ25mm	**RBH2530N**	0305RS-M4, 03RS-M4(B)	Tsugami Corporation MIYANO MACHINERY JAPAN INC. NC lathes
	2540N	0407RS-M6, 04RS-M6(B)	
	2550N	0511RS-M8, 05RS-M8(B)	
	2560N	0611RS-M10, 06RS-M10(B)	
	2570N	–	
Square Type Holder □10mm	**SBH1030R**	0305RS-M4, 03RS-M4(B)	NC lathes
	1040R	0407RS-M6, 04RS-M6(B)	
	1050R	0511RS-M8, 05RS-M8(B)	
	1060R	0611RS-M10, 06RS-M10(B)	
	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.

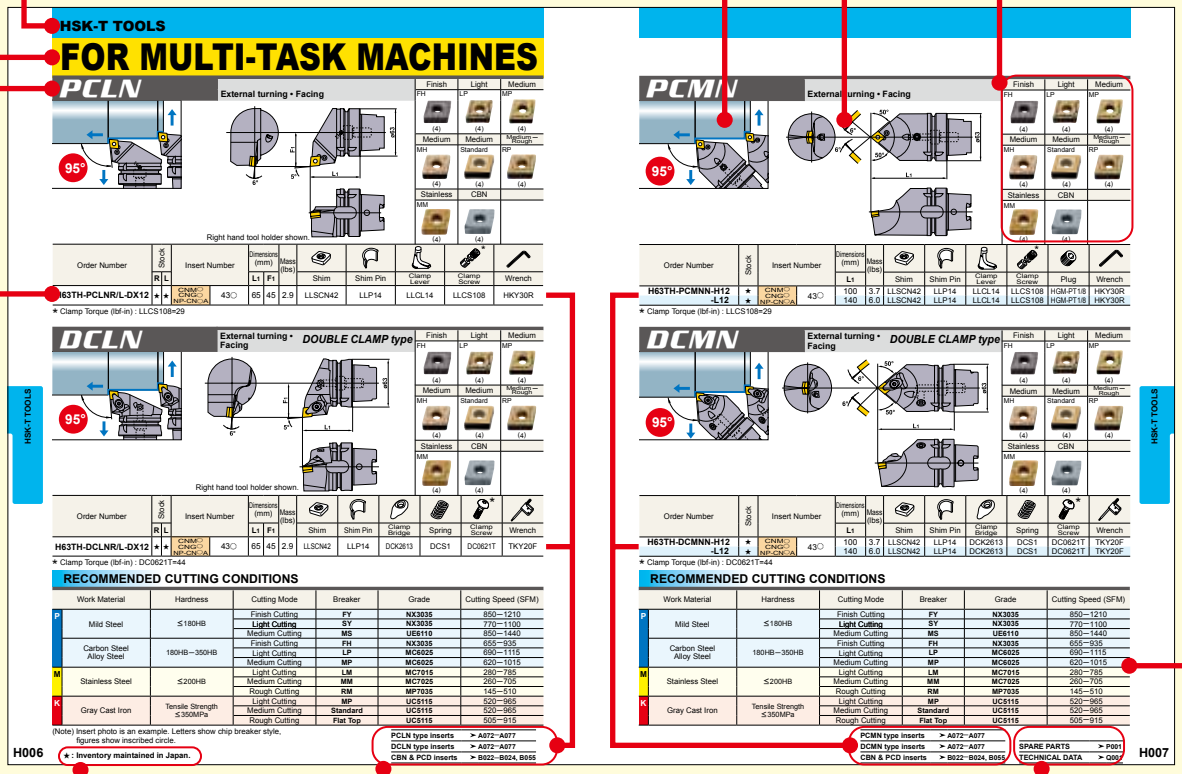
TITLE OF PRODUCT SERIES

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.

RECOMMENDED CUTTING CONDITIONS
for each work material classification, indicates recommended cutting conditions according to the ISO categories for cutting grades, P, M and K.

●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)

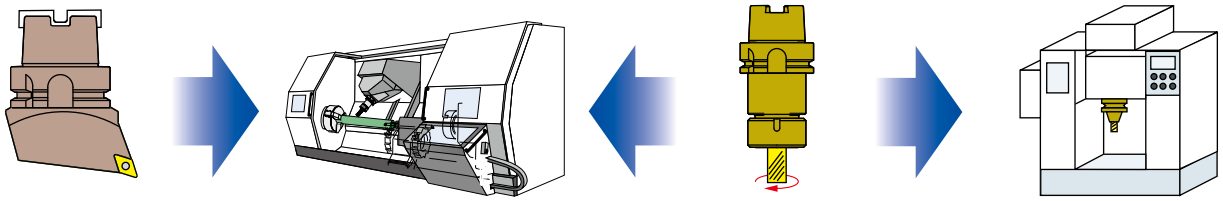
HSK-T is a new HSK system designed for turning on multi-task machines that are compatible with HSK-A type (ISO standard: ISO12164-1:2001). It was jointly developed by a consortium of Japanese manufacturers and is now used worldwide as the ICTM standard. The new HSK system was published as an ISO standard under the denomination of HSK-T type in 2008. (ISO12164-3:2008)



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



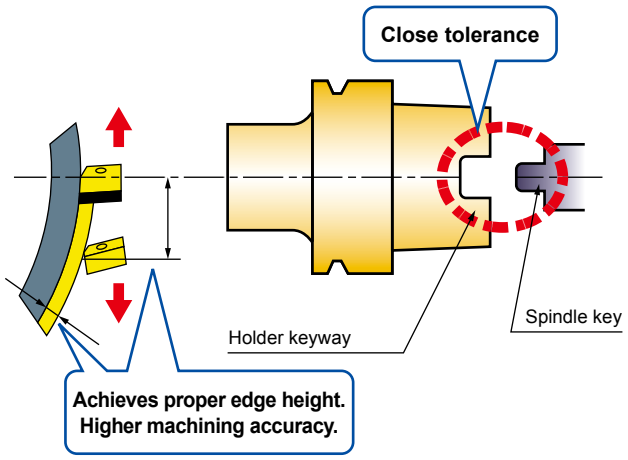
HSK-T
Turning tool holder

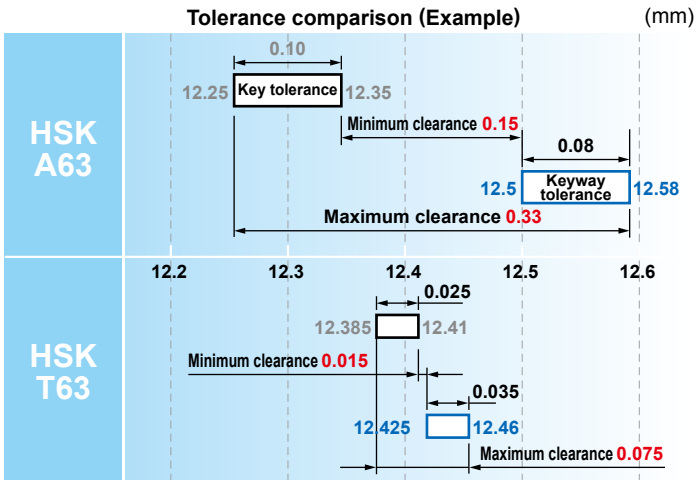
HSK-T spindle
Multi-task machines

HSK-A63 (ISO standard)
Rotating tool holder

HSK-A spindle
Machining center

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	

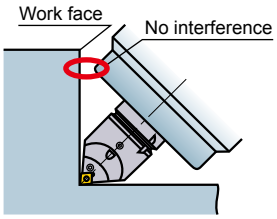
HSK-T○○ size (ICTM-HSK standard)
Manual clamping with through coolant holes

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

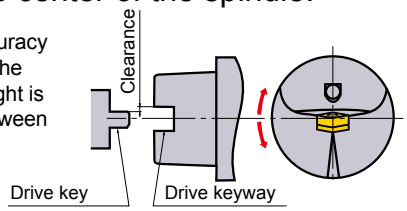
Avoid workpiece interference with improved tool accessibility.

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.



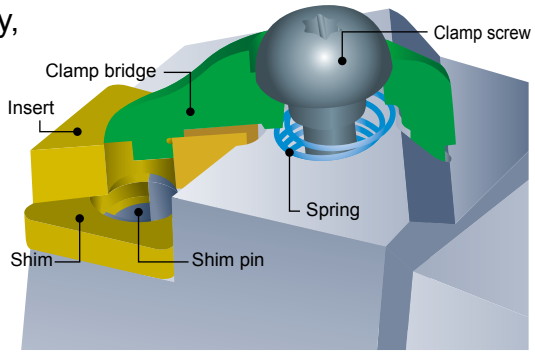
Improve centerline height by positioning the cutting edge at the center of the spindle.

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



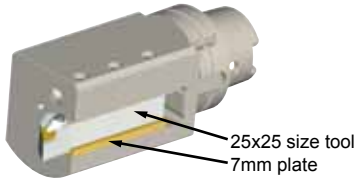
Sleeve



A single tool can be used with different sized tool holders.

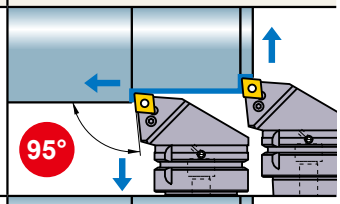
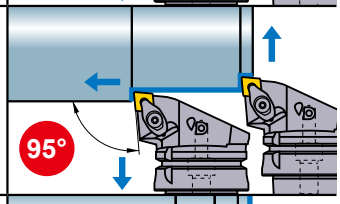
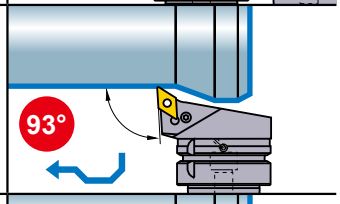
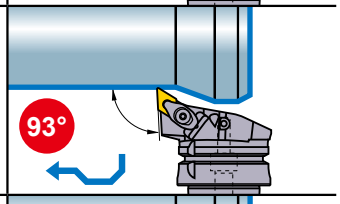
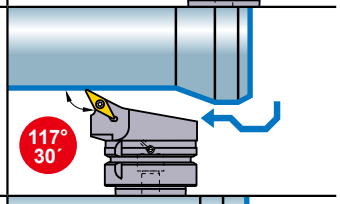
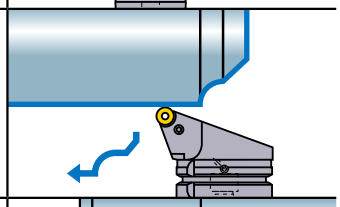
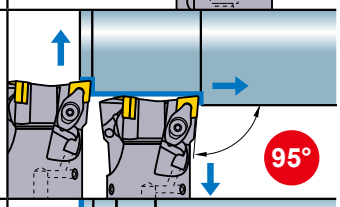
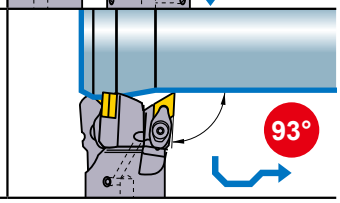
- Available for use with JIS B4126 (ISO 5610) 32x32 and 32x25 tools.
- Possible to fit a 25x25 tool by using a 7mm plate.
  Possible to fit a 1"x1" tool by using a 6.6mm plate.

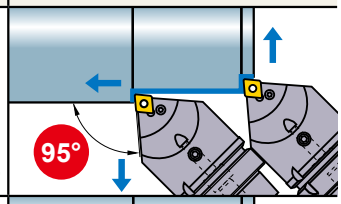
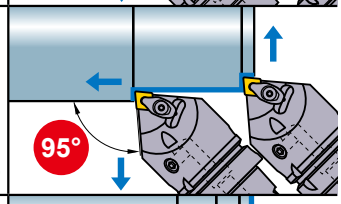
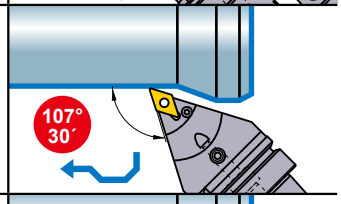
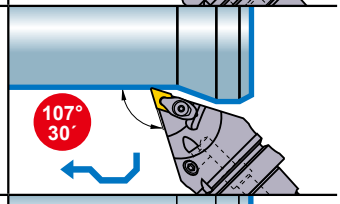
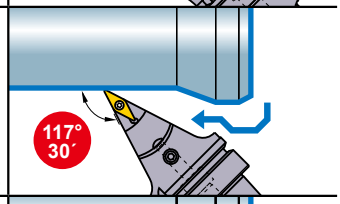
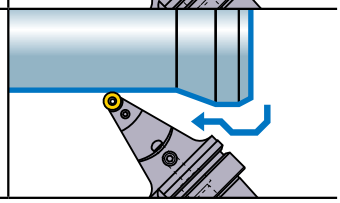
*Please prepare a plate on your own.



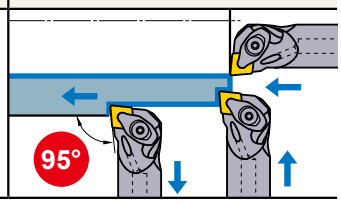
CLASSIFICATION OF HSK-T TOOLS

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	

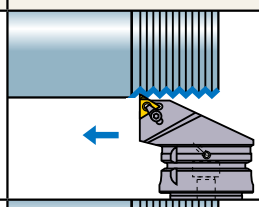
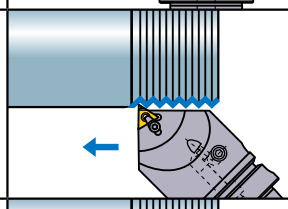
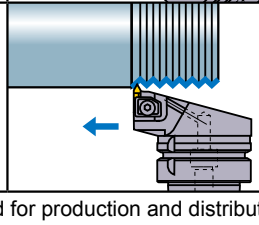
EXTERNAL TURNING • FACING • BORING

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	

THREADING

Order Number	Geometry
H63TH-MMTER-DX16  ➔H016	
H63TH-MMTENR-H/L16  ➔H016	
H63TH-MTHR/L-DX43  ➔H017	

BORING BAR HOLDERS

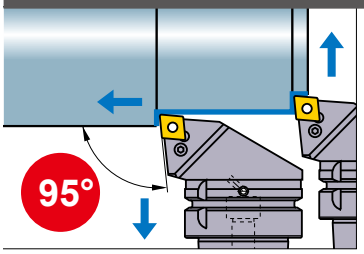
Order Number	Holder
H63TH-B○○-○○ ➔H021	
H100TH-B○○-○○○ ➔H022	
SL32○○-90 (Sleeve) ⁎2 ➔H022	

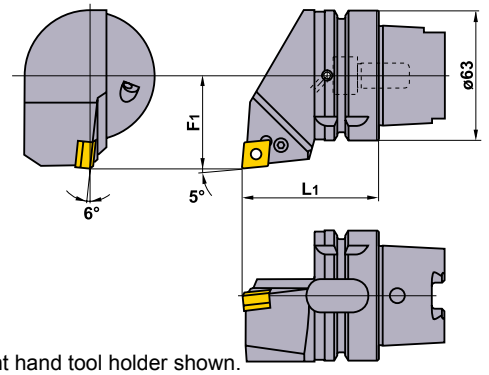
⁎1 Mitsubishi Materials is licensed for production and distribution of these tools from MORI SEIKI Co., LTD. under Japan Patent No.3720202.
⁎2 The SL32○○-90 sleeve is only for use with H100TH-B32-135.

FOR MULTI-TASK MACHINES

PCLN

External turning • Facing





Right hand tool holder shown.

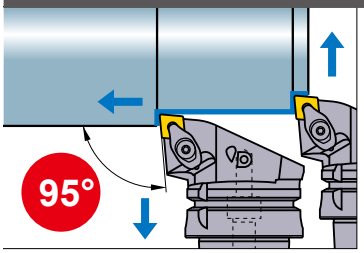
Finish	Light	Medium
FH  (4)	LP  (4)	MP  (4)
Medium	Medium	Medium–Rough
MH  (4)	Standard  (4)	RP  (4)
Stainless	CBN	
MM  (4)	 (4)	

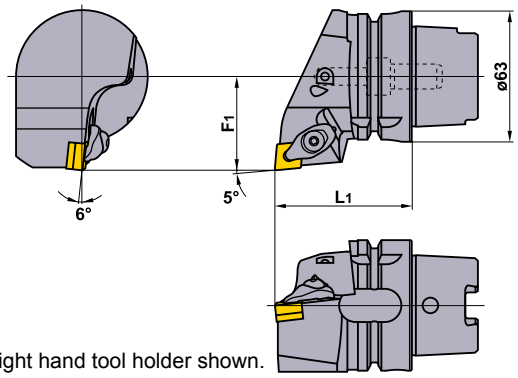
Order Number	Stock R	Stock L	Insert Number	Dimensions (mm) L_1	Dimensions (mm) F_1	Mass (lbs)	Shim	Shim Pin	Clamp Lever	Clamp Screw *	Wrench
H63TH-PCLNR/L-DX12	★	★	CNM○ CNG○ NP-CN○A 43○	65	45	2.9	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R

* Clamp Torque (lbf-in) : LLCS108=29

DCLN

External turning • Facing ***DOUBLE CLAMP type***





Right hand tool holder shown.

Finish	Light	Medium
FH  (4)	LP  (4)	MP  (4)
Medium	Medium	Medium–Rough
MH  (4)	Standard  (4)	RP  (4)
Stainless	CBN	
MM  (4)	 (4)	

Order Number	Stock R	Stock L	Insert Number	Dimensions (mm) L_1	Dimensions (mm) F_1	Mass (lbs)	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
H63TH-DCLNR/L-DX12	★	★	CNM○ CNG○ NP-CN○A 43○	65	45	2.9	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

* Clamp Torque (lbf-in) : DC0621T=44

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Cutting Mode	Breaker	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	Finish Cutting	**FY**	**NX3035**	850—1210
			Light Cutting	**SY**	**NX3035**	770—1100
			Medium Cutting	**MS**	**UE6110**	850—1440
	Carbon Steel Alloy Steel	180HB—350HB	Finish Cutting	**FH**	**NX3035**	655—935
			Light Cutting	**LP**	**MC6025**	690—1115
			Medium Cutting	**MP**	**MC6025**	620—1015
M	Stainless Steel	≤200HB	Light Cutting	**LM**	**MC7015**	280—785
			Medium Cutting	**MM**	**MC7025**	260—705
			Rough Cutting	**RM**	**MP7035**	145—510
K	Gray Cast Iron	Tensile Strength ≤350MPa	Light Cutting	**MP**	**UC5115**	520—965
			Medium Cutting	**Standard**	**UC5115**	520—965
			Rough Cutting	**Flat Top**	**UC5115**	505—915

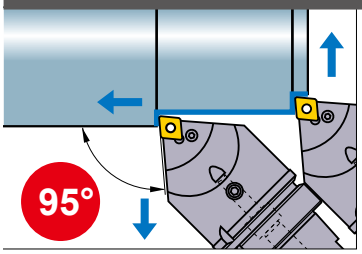
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

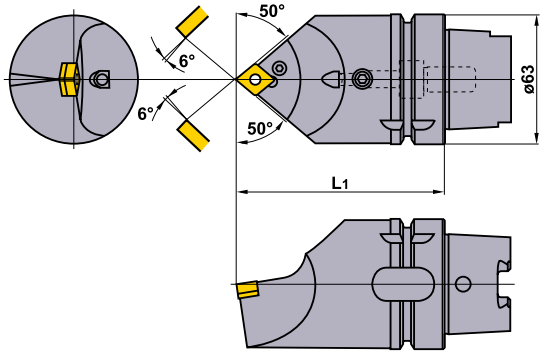
PCLN type inserts ➤ **A072—A077**
DCLN type inserts ➤ **A072—A077**
CBN & PCD inserts ➤ **B022—B024, B055**

★ : **Inventory maintained in Japan.**

PCMN

External turning • Facing





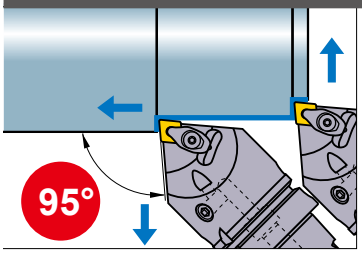
Finish	Light	Medium
FH	LP	MP
		
(4)	(4)	(4)
Medium	**Medium**	**Medium—Rough**
MH	Standard	RP
		
(4)	(4)	(4)
Stainless	**CBN**	
MM		
		
(4)	(4)	

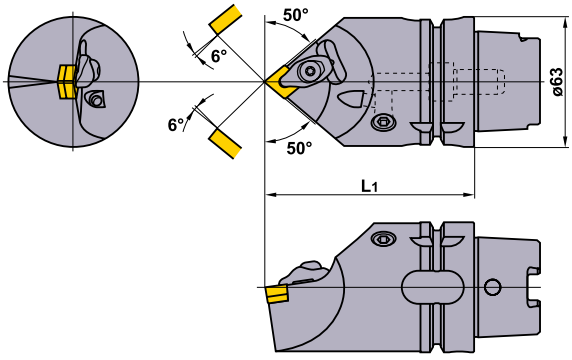
Order Number	Stock	Insert Number	Dimensions (mm) L1	Mass (lbs)	Shim	Shim Pin	Clamp Lever	Clamp Screw *	Plug	Wrench
H63TH-PCMNN-H12	★	CNM○ CNG○ NP-CN○A 43○	100	3.7	LLSCN42	LLP14	LLCL14	LLCS108	HGM-PT1/8	HKY30R
-L12	★		140	6.0	LLSCN42	LLP14	LLCL14	LLCS108	HGM-PT1/8	HKY30R

* Clamp Torque (lbf-in) : LLCS108=29

DCMN

External turning • Facing ***DOUBLE CLAMP type***





Finish	Light	Medium
FH	LP	MP
		
(4)	(4)	(4)
Medium	**Medium**	**Medium—Rough**
MH	Standard	RP
		
(4)	(4)	(4)
Stainless	**CBN**	
MM		
		
(4)	(4)	

Order Number	Stock	Insert Number	Dimensions (mm) L1	Mass (lbs)	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
H63TH-DCMNN-H12	★	CNM○ CNG○ NP-CN○A 43○	100	3.7	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-L12	★		140	6.0	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

* Clamp Torque (lbf-in) : DC0621T=44

RECOMMENDED CUTTING CONDITIONS

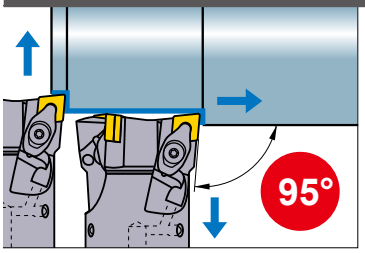
	Work Material	Hardness	Cutting Mode	Breaker	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	Finish Cutting	**FY**	**NX3035**	850—1210
			Light Cutting	**SY**	**NX3035**	770—1100
			Medium Cutting	**MS**	**UE6110**	850—1440
	Carbon Steel Alloy Steel	180HB—350HB	Finish Cutting	**FH**	**NX3035**	655—935
			Light Cutting	**LP**	**MC6025**	690—1115
			Medium Cutting	**MP**	**MC6025**	620—1015
M	Stainless Steel	≤200HB	Light Cutting	**LM**	**MC7015**	280—785
			Medium Cutting	**MM**	**MC7025**	260—705
			Rough Cutting	**RM**	**MP7035**	145—510
K	Gray Cast Iron	Tensile Strength ≤350MPa	Light Cutting	**MP**	**UC5115**	520—965
			Medium Cutting	**Standard**	**UC5115**	520—965
			Rough Cutting	**Flat Top**	**UC5115**	505—915

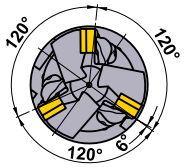
PCMN type inserts ➤ A072—A077
DCMN type inserts ➤ A072—A077
CBN & PCD inserts ➤ B022—B024, B055
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

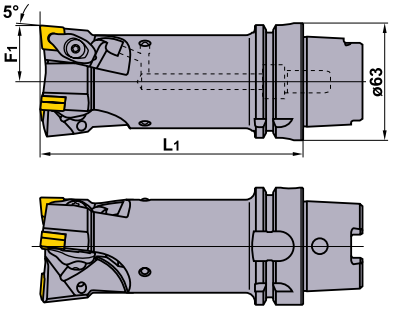
FOR MULTI-TASK MACHINES

DCLN

External turning • Facing — ***DOUBLE CLAMP type***







Left hand tool holder only.

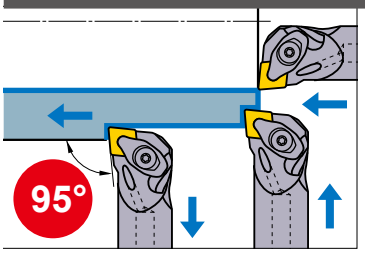
Finish	Light	Medium
FH	LP	MP
 (4)	 (4)	 (4)
Medium	**Medium**	**Medium—Rough**
MH	Standard	RP
 (4)	 (4)	 (4)
Stainless	**CBN**	
MM		
 (4)	 (4)	

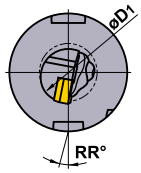
Order Number	Stock	Insert Number		Dimensions (mm)		Mass (lbs)	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
	L			L_1	F_1							
H63TH-DCLNL-L12-3	★	CNM○ CNG○ NP-CN○A	43○	140	30	4.9	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

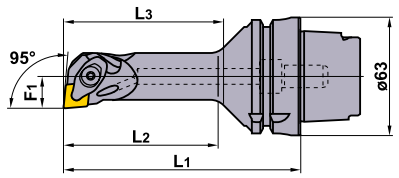
* Clamp Torque (lbf-in) : DC0621T=44

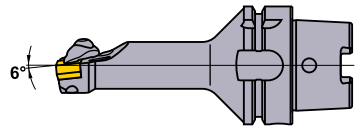
DCLN

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**
MH	Standard	RP
 (4)	 (4)	 (4)
Stainless	**CBN**	
MM		
 (4)	 (4)	

Order Number	Stock		Insert Number		Dimensions (mm)					Min. Cutting Diameter	Mass (lbs)	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
	R	L			L_1	L_2	L_3	F_1	RR°	D_1 (mm)							
H63TH-A25KDCLNR/L12	★	★	CNM○ CNG○ NP-CN○A	43○	125	82	84	17	11	32	2.4	LLSCP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
-A32LDCLNR/L12	★	★			140	100	102	22	13	40	3.9	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

* Clamp Torque (lbf-in) : DC0621T=44

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Cutting Mode	Breaker	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	Finish Cutting	**FY**	**NX3035**	850—1210
			Light Cutting	**SY**	**NX3035**	770—1100
			Medium Cutting	**MS**	**UE6110**	850—1440
	Carbon Steel Alloy Steel	180HB—350HB	Finish Cutting	**FH**	**NX3035**	655—935
			Light Cutting	**LP**	**MC6025**	690—1115
			Medium Cutting	**MP**	**MC6025**	620—1015
M	Stainless Steel	≤200HB	Light Cutting	**LM**	**MC7015**	280—785
			Medium Cutting	**MM**	**MC7025**	260—705
			Rough Cutting	**RM**	**MP7035**	145—510
K	Gray Cast Iron	Tensile Strength ≤350MPa	Light Cutting	**MP**	**UC5115**	520—965
			Medium Cutting	**Standard**	**UC5115**	520—965
			Rough Cutting	**Flat Top**	**UC5115**	505—915

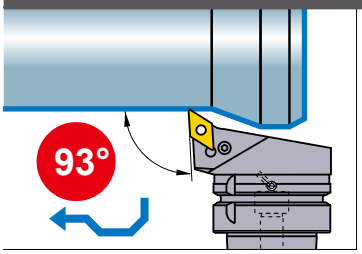
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

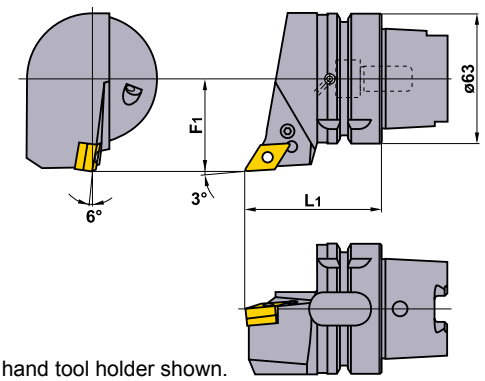
DCLN type inserts ➤ **A072—A077**
CBN & PCD inserts ➤ **B022—B024, B055**

★ : Inventory maintained in Japan.

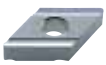
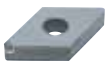
PDJN

External turning • Copying





Right hand tool holder shown.

Finish	Light	Medium
FH	LP	MP
		
(4)	(4)	(4)
Medium	**Medium–Rough**	**Stainless**
MH	RP	MM
		
(4)	(4)	(4)
G Class	**CBN**	
R/L		
		
(4)	(4)	

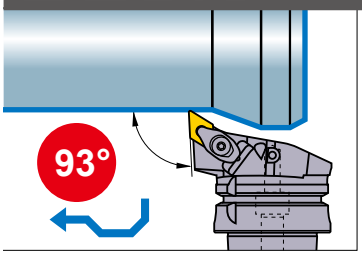
Order Number	Stock		Insert Number		Dimensions (mm)		Mass (lbs)	*2			*1	
	R	L			L_1	F_1		Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench
H63TH-PDJNR/L-DX15	★	★	DNMG NP-DNGA	43○	65	45	2.6	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HKY30R

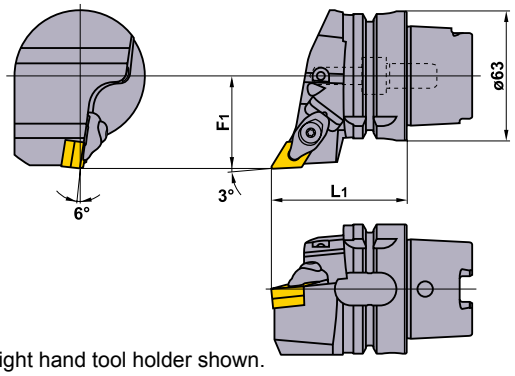
*1 Clamp Torque (lbf-in) : LLCS108=29

*2 Please use shim no. LLSDN42 with .25inch thick inserts. When using .25inch thick inserts, the shim should be ordered separately.

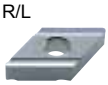
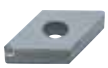
DDJN

External turning • Copying ***DOUBLE CLAMP type***





Right hand tool holder shown.

Finish	Light	Medium
FH	LP	MP
		
(4)	(4)	(4)
Medium	**Medium–Rough**	**Stainless**
MH	RP	MM
		
(4)	(4)	(4)
G Class	**CBN**	
R/L		
		
(4)	(4)	

Order Number	Stock		Insert Number		Dimensions (mm)		Mass (lbs)	*2				*1	
	R	L			L_1	F_1		Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench
H63TH-DDJNR/L-DX15	★	★	DNMG NP-DNGA	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.

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Cutting Mode	Breaker	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	Finish Cutting	**FY**	**NX3035**	850–1210
			Light Cutting	**SY**	**NX3035**	770–1100
			Medium Cutting	**MS**	**UE6110**	850–1440
	Carbon Steel Alloy Steel	180HB–350HB	Finish Cutting	**FH**	**NX3035**	655–935
			Light Cutting	**LP**	**MC6025**	690–1115
			Medium Cutting	**MP**	**MC6025**	620–1015
M	Stainless Steel	≤200HB	Light Cutting	**LM**	**MC7015**	280–785
			Medium Cutting	**MM**	**MC7025**	260–705
			Rough Cutting	**RM**	**MP7035**	145–510
K	Gray Cast Iron	Tensile Strength ≤350MPa	Light Cutting	**MP**	**UC5115**	520–965
			Medium Cutting	**Standard**	**UC5115**	520–965
			Rough Cutting	**Flat Top**	**UC5115**	505–915

PDJN type inserts ➤ **A078–A083**

DDJN type inserts ➤ **A078–A083**

CBN & PCD inserts ➤ **B025–B027, B055**

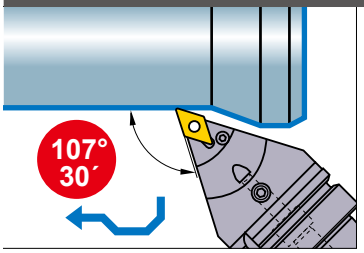
SPARE PARTS ➤ **P001**

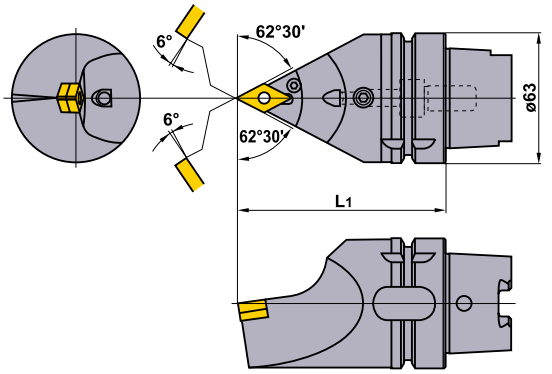
TECHNICAL DATA ➤ **Q001**

FOR MULTI-TASK MACHINES

PDNN

External turning • Copying





Finish	Light	Medium
FH	LP	MP
(4)	(4)	(4)
Medium	**Medium—Rough**	**Stainless**
MH	RP	MM
(4)	(4)	(4)
G Class	**CBN**	
R/L		
(4)	(4)	

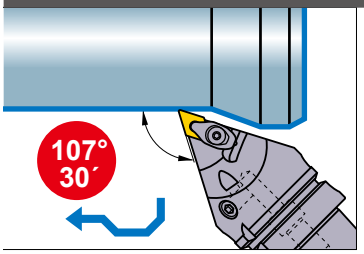
Order Number	Stock	Insert Number		Dimensions (mm) L1	Mass (lbs)	✶2 Shim	Shim Pin	Clamp Lever	✶1 Clamp Screw	Plug	Wrench
H63TH-PDNNN-H15	★	DNM○ DNG○ NP-DN○A	43○	100	3.5	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HGM-PT1/8	HKY30R
-L15	★			140	5.5	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HGM-PT1/8	HKY30R

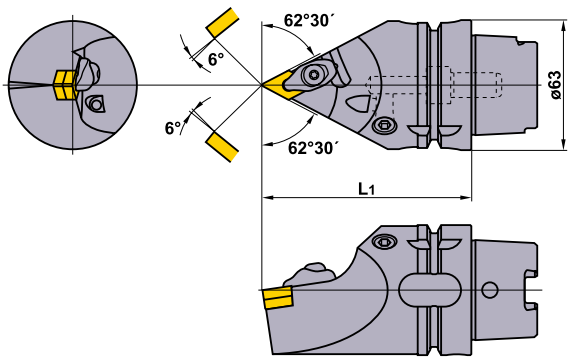
✶1 Clamp Torque (lbf-in) : LLCS108=29

✶2 Please use shim no. LLSDN42 with .25inch thick inserts. When using .25inch thick inserts, the shim should be ordered separately.

DDNN

External turning • Copying ***DOUBLE CLAMP type***





Finish	Light	Medium
FH	LP	MP
(4)	(4)	(4)
Medium	**Medium—Rough**	**Stainless**
MH	RP	MM
(4)	(4)	(4)
G Class	**CBN**	
R/L		
(4)	(4)	

Order Number	Stock	Insert Number		Dimensions (mm) L1	Mass (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
-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.

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Cutting Mode	Breaker	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	Finish Cutting	**FY**	**NX3035**	850—1210
			Light Cutting	**SY**	**NX3035**	770—1100
			Medium Cutting	**MS**	**UE6110**	850—1440
	Carbon Steel Alloy Steel	180HB—350HB	Finish Cutting	**FH**	**NX3035**	655—935
			Light Cutting	**LP**	**MC6025**	690—1115
			Medium Cutting	**MP**	**MC6025**	620—1015
M	Stainless Steel	≤200HB	Light Cutting	**LM**	**MC7015**	280—785
			Medium Cutting	**MM**	**MC7025**	260—705
			Rough Cutting	**RM**	**MP7035**	145—510
K	Gray Cast Iron	Tensile Strength ≤350MPa	Light Cutting	**MP**	**UC5115**	520—965
			Medium Cutting	**Standard**	**UC5115**	520—965
			Rough Cutting	**Flat Top**	**UC5115**	505—915

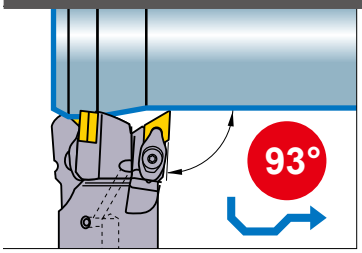
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

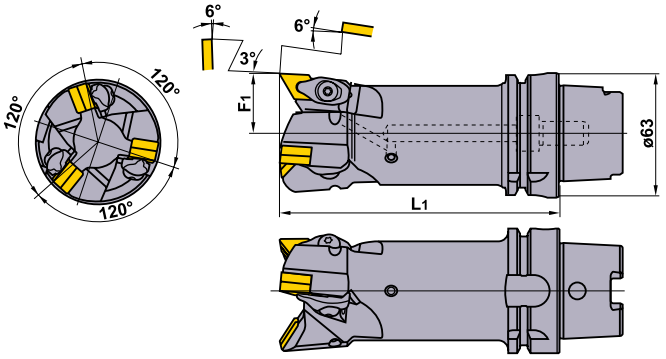
★ : **Inventory maintained in Japan.**

PDNN type inserts	**➤ A078—A083**
DDNN type inserts	**➤ A078—A083**
CBN & PCD inserts	**➤ B025—B027, B055**

DDJN

External turning • Facing — ***DOUBLE CLAMP type***





Left hand tool holder only.

Finish	Light
FH  (4)	LP  (4)
Medium	**Medium**
MP  (4)	MH  (4)
Medium – Rough	**Stainless**
RP  (4)	MM  (4)

Order Number	Stock	Insert Number		Dimensions (mm)		Mass (lbs)	✶2				✶1	
	L			L_1	F_1		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.

HSK-T TOOLS

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Cutting Mode	Breaker	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	Finish Cutting	**FY**	**NX3035**	850—1210
			Light Cutting	**SY**	**NX3035**	770—1100
			Medium Cutting	**MS**	**UE6110**	850—1440
	Carbon Steel Alloy Steel	180HB—350HB	Finish Cutting	**FH**	**NX3035**	655—935
			Light Cutting	**LP**	**MC6025**	690—1115
			Medium Cutting	**MP**	**MC6025**	620—1015
M	Stainless Steel	≤200HB	Light Cutting	**LM**	**MC7015**	280—785
			Medium Cutting	**MM**	**MC7025**	260—705
			Rough Cutting	**RM**	**MP7035**	145—510
K	Gray Cast Iron	Tensile Strength ≤350MPa	Light Cutting	**MP**	**UC5115**	520—965
			Medium Cutting	**Standard**	**UC5115**	520—965
			Rough Cutting	**Flat Top**	**UC5115**	505—915

DDJN type inserts ➤ A078—A083
CBN & PCD inserts ➤ B025—B027, B055
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

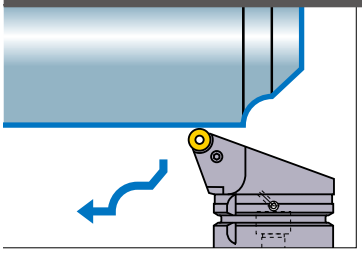
FOR MULTI-TASK MACHINES

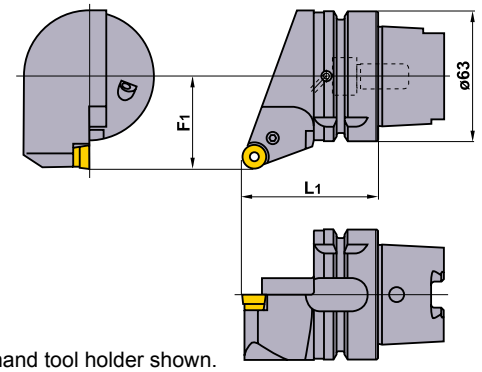
PRGC

External turning • Facing • Copying

Medium

(12)





Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)		Mass (lbs)	Shim	Shim Pin	Clamp Lever	Clamp Screw *	Wrench
	R	L			L1	F1						
H63TH-PRGCR/L-DX12	★	★	RCMX	1204M0	65	45	2.6	LLSRN123	LLP13	LLCL112	LLCS106	HKY25R

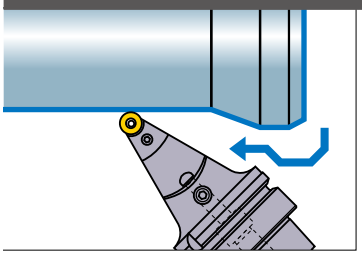
* Clamp Torque (lbf-in) : LLCS106=19

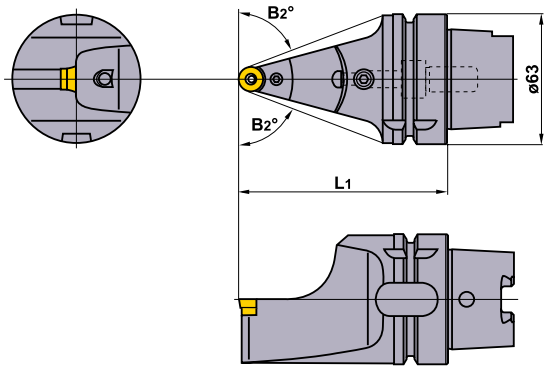
PRDC

External turning • Facing • Copying

Medium

(12)





Order Number	Stock	Insert Number		Dimensions (mm)		Mass (lbs)	Shim	Shim Pin	Clamp Lever	Clamp Screw *	Plug	Wrench
				L1	B2°							
H63TH-PRDCN-H12	★	RCMX	1204M0	100	69	3.1	LLSRN123	LLP13	LLCL112	LLCS106	HGM-PT1/8	HKY25R
-L12	★			140	75	5.1	LLSRN123	LLP13	LLCL112	LLCS106	HGM-PT1/8	HKY25R

* Clamp Torque (lbf-in) : LLCS106=19

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Cutting Mode	Breaker	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	Medium Cutting	**Standard**	**UE6110**	670—1150
	Carbon Steel • Alloy Steel	180HB—350HB	Medium Cutting	**Standard**	**UE6110**	490—850
M	Stainless Steel	≤200HB	Medium Cutting	**Standard**	**US735**	230—425

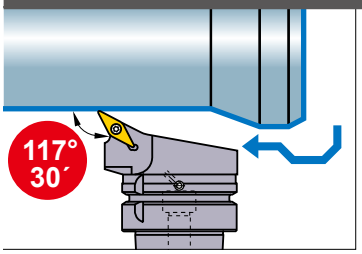
(Note) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

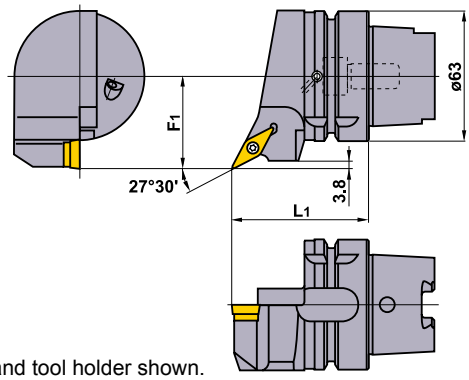
PRGC type inserts ➤ A112
PRDC type inserts ➤ A112

★ : Inventory maintained in Japan.

SVPB

Facing • Copying





Right hand tool holder shown.

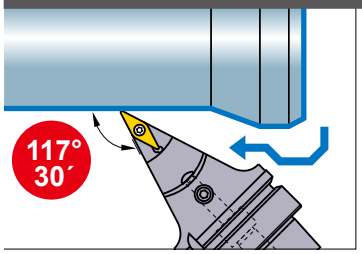
Finish	Light
R/L-F	SV
 (3)	 (3)
Medium	**Medium**
MV	MP
 (3)	 (3)
Stainless	**CBN**
MM	
 (3)	 (3)

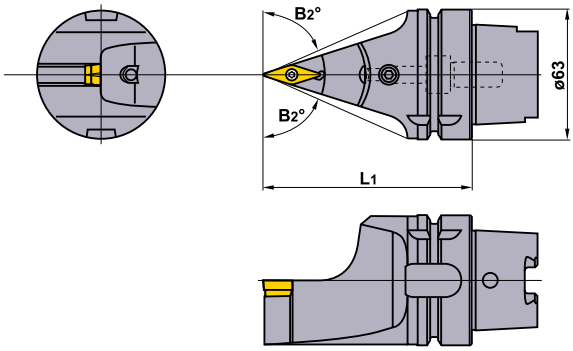
Order Number	Stock		Insert Number		Dimensions (mm)		Mass (lbs)			 *	
	R	L			L_1	F_1		Shim	Shim Pin	Clamp Screw	Wrench
H63TH-SVPBR/L-DX16	★	★	VBMT VBGT	33○	65	45	2.4	SPSVN32	BCP141	TS35D	TKY15F

* Clamp Torque (lbf-in) : TS35D=31

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)		Mass (lbs)			 *		
				L_1	$B_2°$		Shim	Shim Pin	Clamp Screw	Plug	Wrench
H63TH-SVVBN-H16	★	VBMT VBGT	33○	100	66°30'	2.9	SPSVN32	BCP141	TS35D	HGM-PT1/8	TKY15F
-L16	★			140	72°30'	4.9	SPSVN32	BCP141	TS35D	HGM-PT1/8	TKY15F

* Clamp Torque (lbf-in) : TS35D=31

RECOMMENDED CUTTING CONDITIONS

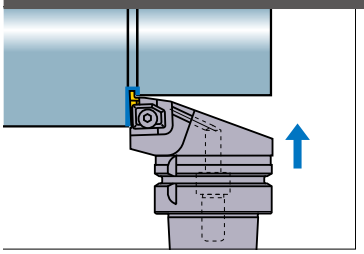
	Work Material	Hardness	Cutting Mode	Breaker	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	Finish Cutting	**F**	**AP25N**	820 (490—985)
			Medium Cutting	**MV**	**UE6020**	655 (490—820)
	Carbon Steel Alloy Steel	180HB—350HB	Finish Cutting	**F**	**AP25N**	690 (490—850)
			Medium Cutting	**MV**	**UE6020**	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)

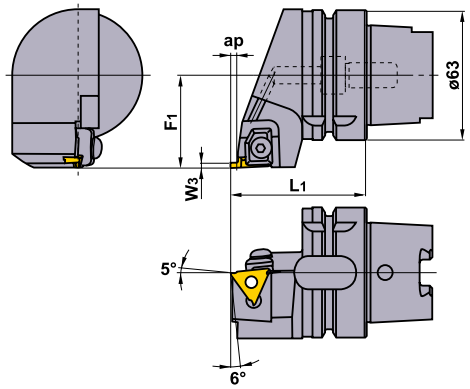
SVPB type inserts ➤ A133—A135
SVVB type inserts ➤ A133—A135
CBN inserts ➤ B048
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

FOR MULTI-TASK MACHINES

MG

Grooving





Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number	Groove Width W3 (mm)	Max. Groove Depth ap (mm)	Dimensions (mm) L1	Dimensions (mm) F1	Mass (lbs)	Clamp Bridge	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≤W3≤2.3	3							
-DX4323	★	★		2.3<W3≤3.3	4.5							
-DX4333	★	★		3.3<W3≤4.7	4.5							

* Clamp Torque (lbf-in) : HBH06020=62

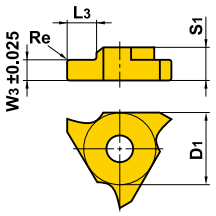
RECOMMENDED CUTTING CONDITIONS

	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)

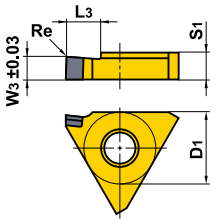
★ : Inventory maintained in Japan. (10 inserts in one case) (1 insert in one case for CBN)

INSERTS FOR MG TYPE

Order Number	Stock							Groove Width W_3 (mm)	Dimensions (mm)				Geometry (mm)
	Coated		Cermet		Carbide		CBN						
	VP20MF		NX2525		UTi20T		MB8025						
	R	L	R	L	R	L	R		L_3	D_1	S_1	Re	
MGTR/L43125	★	★	★	★	★	★	★	1.25	1.2	12.7	4.76	0.2	**MGTR/L...**
43145	★	★		★	★	★		1.45	1.5	12.7	4.76	0.2	
43150	★	★	★	★	★	★	★	1.5	3	12.7	4.76	0.2	
43175	★	★	★	★	★	★		1.75	3	12.7	4.76	0.2	
43200	★	★	★	★	★	★	★	2	3	12.7	4.76	0.2	
43230	★	★	★	★	★	★		2.3	3	12.7	4.76	0.2	
43250	★	★	★	★	★	★	★	2.5	4.5	12.7	4.76	0.3	
43260	★	★	★		★	★		2.6	4.5	12.7	4.76	0.3	
43270	★	★			★	★		2.7	4.5	12.7	4.76	0.3	
43280		★		★	★	★		2.8	4.5	12.7	4.76	0.3	
43300	★	★	★	★	★	★	★	3	4.5	12.7	4.76	0.3	
43320	★				★	★		3.2	4.5	12.7	4.76	0.3	
43330		★		★	★	★		3.3	4.5	12.7	4.76	0.3	
43350	★	★	★	★	★	★	★	3.5	4.5	12.7	4.76	0.3	
43400	★	★	★		★	★	★	4	4.5	12.7	4.76	0.3	
43420	★	★	★		★	★		4.2	4.5	12.7	4.76	0.4	
43430	★	★	★		★	★		4.3	4.5	12.7	4.76	0.4	
43450	★	★	★	★	★	★		4.5	4.5	12.7	4.76	0.4	
43470	★	★	★	★	★	★		4.7	4.5	12.7	4.76	0.4	



CBN Insert



Right hand insert shown.

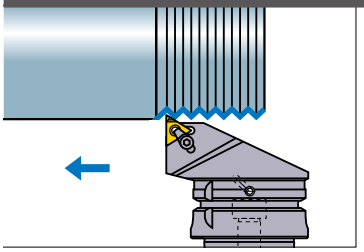
HSK-T TOOLS

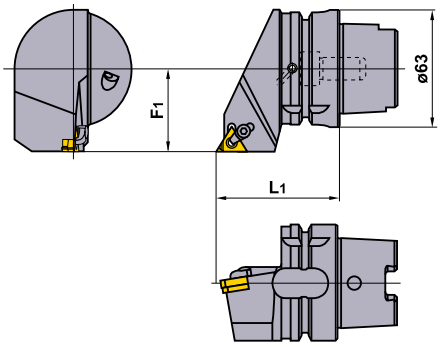
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

FOR MULTI-TASK MACHINES

MMTE

Threading





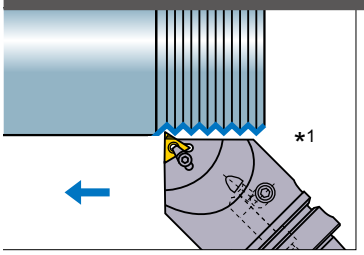
Right hand tool holder only.

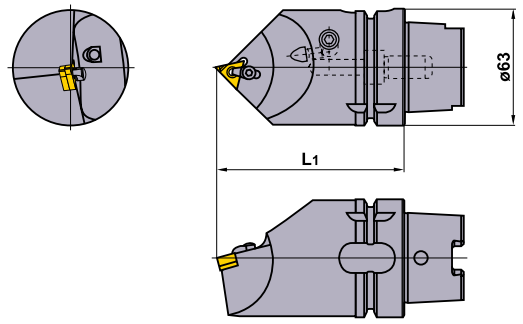
Order Number	Stock	Insert Number		Dimensions (mm)		Mass (lbs)	Clamp Bridge	Clamp Screw *	Stop Ring	Shim	Shim Screw *	Wrench
	R			L1	F1							
H63TH-MMTER-DX16	★	MMT16ER	○○○○○	65	45	2.6	SETK51	SETS51	CR4	CTE32TP15	HFC03008	①TKY15F ②HKY20R

* Clamp Torque (lbf-in) : SETS51=31, HFC03008=13

MMTEN

Threading





Tool holder for right hand insert only.

Order Number	Stock	Insert Number		Dimensions (mm)	Mass (lbs)	Clamp Bridge	Clamp Screw *2	Stop Ring	Shim	Shim Screw *2	Plug	Wrench
				L1								
H63TH-MMTENR-H16	★	MMT16ER	○○○○○	100	3.7	SETK51	SETS51	CR4	CTE32TP15	HFC03008	HGM-PT1/8	①TKY15F ②HKY20R
-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

RECOMMENDED CUTTING CONDITIONS

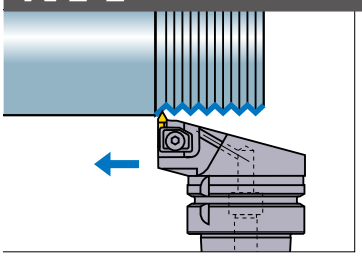
	Work Material	Hardness	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	**VP10MF**	490 (230—755)
			VP15TF	330 (195—460)
	Carbon Steel Alloy Steel	180—350HB	**VP10MF**	460 (260—655)
			VP15TF	330 (195—460)
M	Stainless Steel	≤200HB	**VP10MF**	425 (260—590)
			VP15TF	260 (130—390)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP10MF**	460 (260—655)
			VP15TF	295 (195—390)

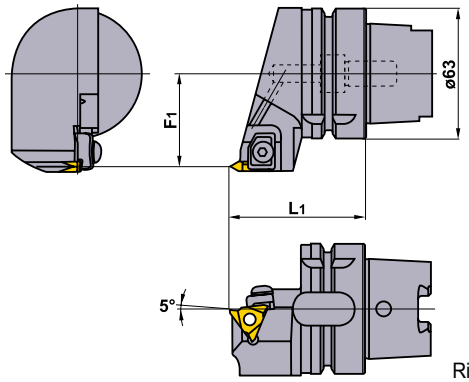
★ : Inventory maintained in Japan.

MMT type inserts ➢ G014, G016, G020

MT

Threading





Right hand tool holder shown.

Order Number *	Stock		Insert Number		Dimensions (mm)		Mass (lbs)		 *		
	R	L			L_1	F_1		Clamp Bridge	Clamp Screw	Spring	Wrench
H63TH-MTHR/L-DX43	★	★	MTTR/L	43○○○○	65	45	2.6	MTK1R/L	HBH06020	MES3	HKY40R

* Clamp Torque (lbf-in) : HBH06020=62

RECOMMENDED CUTTING CONDITIONS

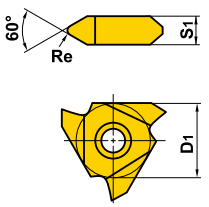
	Work Material	Hardness	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	**UP20M**	460 (330－590)
			NX55	655 (490－820)
			UTi20T	390 (330－490)
	Carbon Steel Alloy Steel	180HB－350HB	**UP20M**	390 (330－490)
			NX55	555 (490－655)
			UTi20T	330 (230－390)
M	Stainless Steel	≤200HB	**UP20M**	390 (260－490)
			UTi20T	330 (230－425)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**UP20M**	260 (195－330)
			UTi20T	260 (195－330)
			HTi10	330 (230－425)

MT type inserts ➤ H018
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

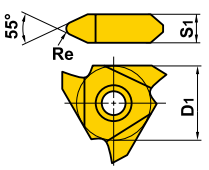
FOR MULTI-TASK MACHINES

INSERTS FOR MT TYPE

Type	Order Number	Class	Coated	Cermet		Carbide		Pitch		Dimensions (mm)			Geometry
			UP20M	NX2525	NX55	UTi20T	HTi10	mm	thread/inch	D_1	S_1	Re	
Partial Profile 60°	**MTTR436000**	G		★	▲	★		−0.8		12.7	4.76	0	**MTTR/L(60°) Partial profile**
	R436001	G	★	★	▲	★	★	1.0−1.75		12.7	4.76	0.1	
	L436001	G	★			★	★	1.0−1.75		12.7	4.76	0.1	
	R436002	G	★	★	▲	★	★	2.0−2.5		12.7	4.76	0.2	
	L436002	G		★	▲	★		2.0−2.5		12.7	4.76	0.2	
	R436003	G	★	★	▲	★	★	3.0−3.5		12.7	4.76	0.3	
	L436003	G		★	▲	★		3.0−3.5		12.7	4.76	0.3	
	R436004	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**
	R435502	G		★	▲	★			16−8	12.7	4.76	0.2	
	R435503	G		★	▲	★			11−8	12.7	4.76	0.3	



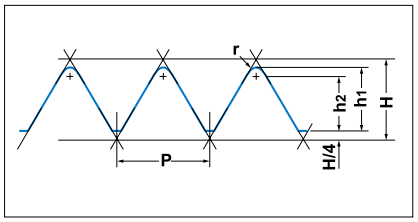
Right hand insert shown.



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

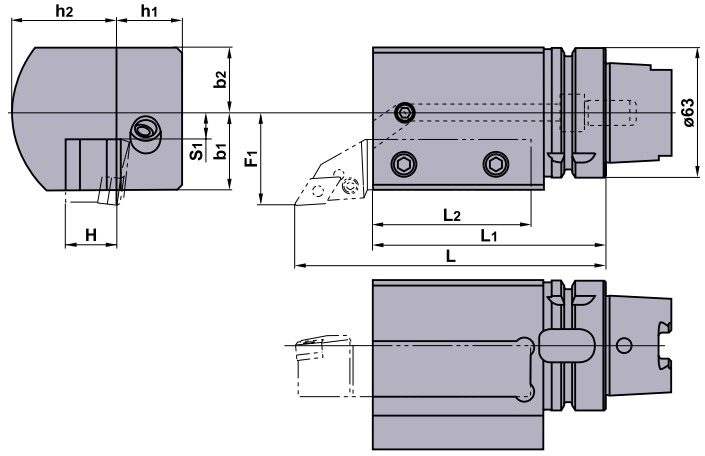
Unit : mm

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

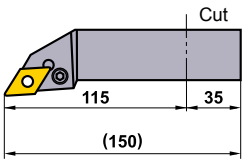
(Note) The first pass causes a high load on the cutting edge.
In order to avoid damage, keep the depth of cut to 0.4−0.5mm maximum.

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

EXTERNAL TURNING TOOL HOLDERS External turning • Facing



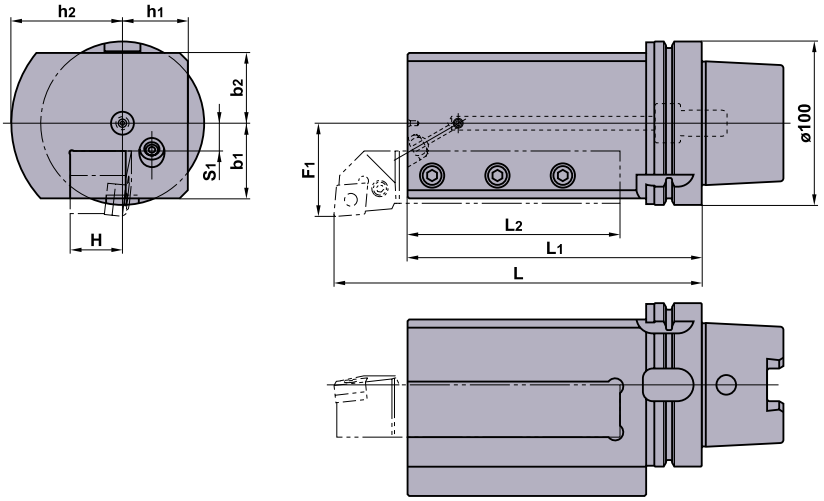
■This holder is for 25×25 size tools.
Please shorten the tool as shown below before use.



Right hand tool holder shown.

Order Number	Stock		Dimensions (mm)										Mass (lbs)		
	R	L	L	L1	L2	H	h1	h2	F1	S1	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

EXTERNAL TURNING TOOL HOLDERS External turning • Facing



■This holder is for 32×32 and 32 x 25 size tools.

Right hand tool holder shown.

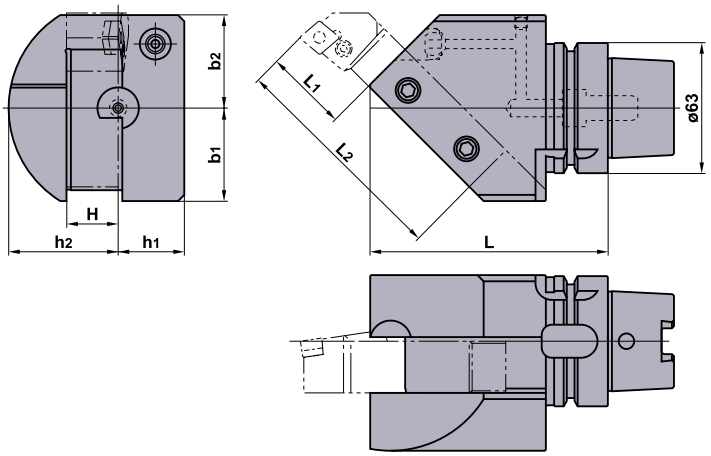
Order Number	Stock		Dimensions (mm)										Mass (lbs)			
	R	L	L	L1	L2	H	h1	h2	F1	S1	b1	b2		Clamp Screw	Nozzle Plug	Plug
H100TH-EV3232R/L-180	★	★	220	180	130	32	40	68	57	17	46	43	25.8	HSS14035	SNA4	HSS06006

(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.

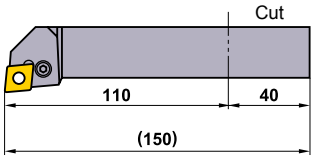
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

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.

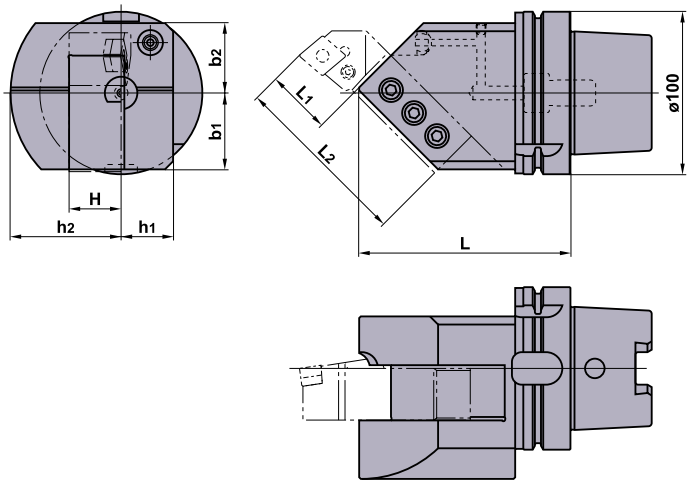


Mitsubishi Materials is licensed for production and distribution of these tools from MORI SEIKI Co., LTD. under Japan Patent No.3720202.

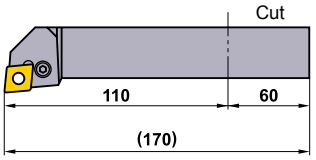
Right hand tool holder shown.

Order Number	Stock		Dimensions (mm)								Mass (lbs)			
	R	L	L	L1	L2	H	h1	h2	b1	b2		Clamp Screw	Nozzle Plug	Plug
H63TH-EN2525R/L-115	★	★	115	40	110	25	32	53	45	45	8.2	HSS12030	SNA4	HSS06006

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.



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Right hand tool holder shown.

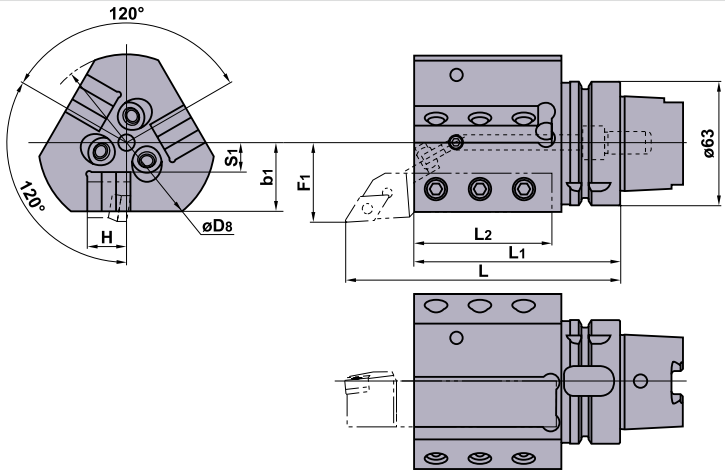
Order Number	Stock		Dimensions (mm)								Mass (lbs)			
	R	L	L	L1	L2	H	h1	h2	b1	b2		Clamp Screw	Nozzle Plug	Plug
H100TH-EN3232R/L-130	★	★	130	40	110	32	32	68	47	43	14.6	HSS14030	SNA4	HSS06006

(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.

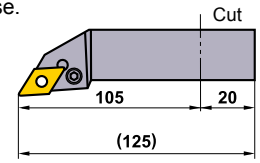
★ : Inventory maintained in Japan.

EXTERNAL TURNING TOOL HOLDERS

External turning • Facing



■This holder is for 20×20 size tools.
Please shorten the tool as shown below before use.

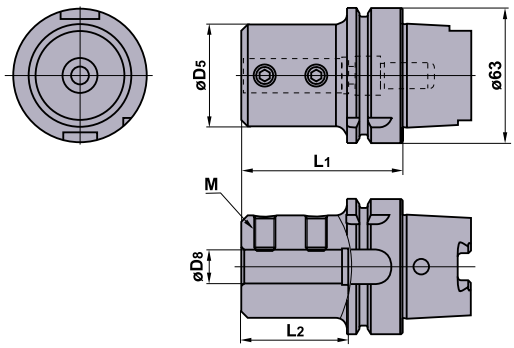


Right hand tool holder shown.

Order Number	Stock		Dimensions (mm)								Mass (lbs)			
	R	L	L	L1	L2	H	D8	F1	S1	b1		Clamp Screw	Nozzle Plug	Plug
H63TH-EV2020R/L-105-3	★	★	140	105	70	20	90	40	15	35	6.4	HSS12030	HSS05012	HSS06006

BORING BAR HOLDERS

Internal turning



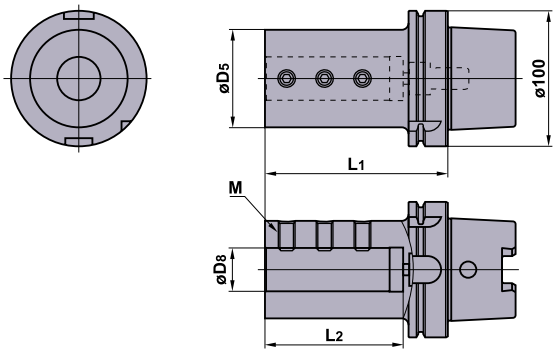
Order Number	Stock	Dimensions (mm)					Mass (lbs)	
		D5	D8	L1	L2	M		Clamp Screw
H63TH-B08-65	★	28	8	65	40	M8	2.0	HSS08010
-B10-70	★	35	10	70	45	M8	2.2	HSS08012
-B12-70	★	42	12	70	45	M8	2.4	HSS08012
-B16-75	★	48	16	75	50	M10	2.9	HSS10016
-B20-75	★	52	20	75	50	M10	3.1	HSS10016
-B25-83	★	62	25	83	58	M12	3.7	HSS12016
-B32-87	★	62	32	87	62	M12	3.7	HSS12016
-B40-97	★	65	40	97	72	M16	4.0	HSS16012

(Note) Please cut the boring bar to adjust the shank length, this also applies to indexable type drills.

SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

FOR MULTI-TASK MACHINES

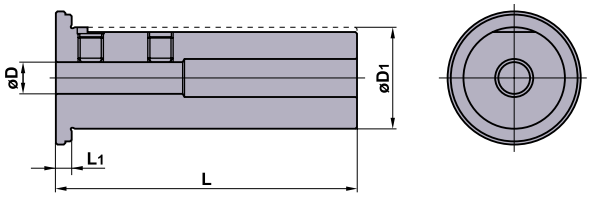
BORING BAR HOLDERS Internal turning



Order Number	Stock	Dimensions (mm)					Mass (lbs)	Clamp Screw
		D5	D8	L1	L2	M		
H100TH-B25-120	★	62	25	120	88	12	8.6	HSS12016
-B32-135	★	72	32	135	102	12	10.6	HSS12018
-B40-150	★	82	40	150	117	16	13.0	HSS16020
-B50-180	★	92	50	180	147	16	17.0	HSS16020

(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)				Mass (lbs)	Clamp Screw
		D	D1	L	L1		
SL3208-90	★	8	32	95	5	1.3	HSS06008
3210-90	★	10	32	95	5	1.1	HSS08008
3212-90	★	12	32	95	5	1.1	HSS08008
3216-90	★	16	32	95	5	1.1	HSS08006
3220-90	★	20	32	95	5	0.9	HSS08005

(Note) These sleeves are only compatible with H100TH-B32-135 holder.

★ : Inventory maintained in Japan.

SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

Memo

GUIDE TO SOLID CARBIDE END MILLS

●Section organization

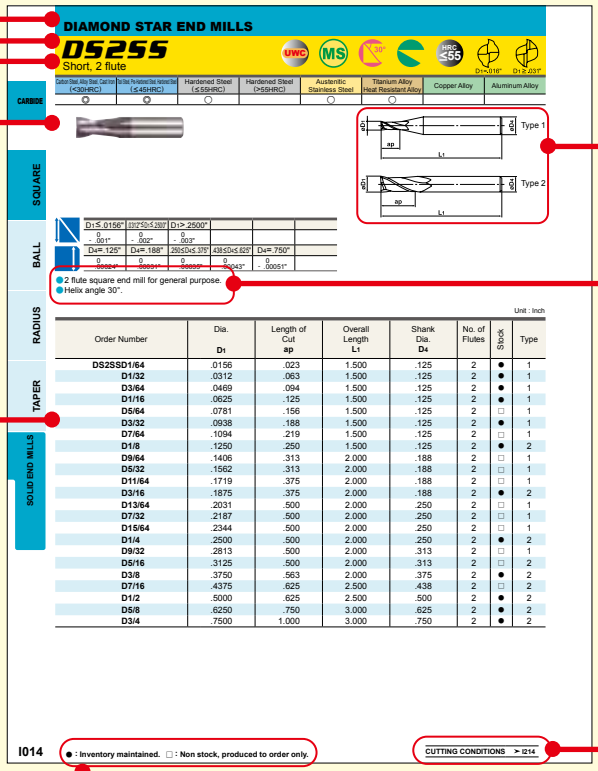
①Organized according to cutting mode for milling. (Refer to END MILL LIST.)

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
END MILLS SELECTION CHART I004

SOLID ENDMILL STANDARD
DIAMOND STAR END MILLS (DS Type) I014
MSTAR END MILLS (MS Type) I050
MIRACLE END MILLS (VC Type) I113
SMART MIRACLE END MILLS (VQ Type) I139
IMPACT MIRACLE END MILLS (VF Type) I151
DIAMOND COATED END MILLS (DFC Type) I197
DIAMOND COATED END MILLS (DF Type) I199
CBN END MILLS I208
UNCOATED CARBIDE END MILLS I210

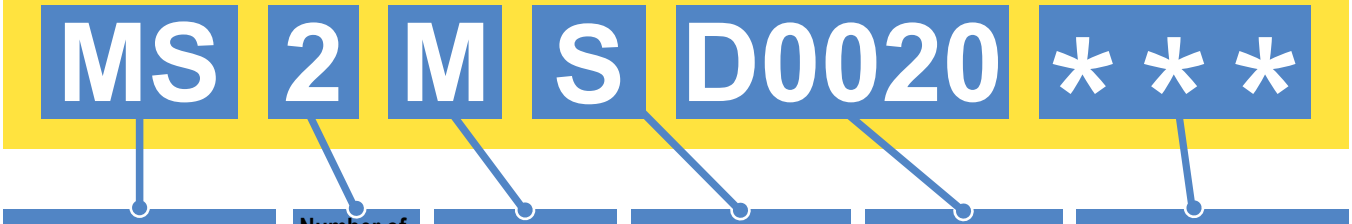
CUTTING CONDITONS I214

*Arranged by Alphabetical order

I212 **C2MHA**
I210 **C2SA**
I211 **C3SA**
I213 **C3SARB**
I208 **CBN2XLB**
I209 **CBN2XLRB**
I201 **DF2MB**
I202 **DF2XLB**
I204 **DF3XB**
I199 **DF4JC**
I200 **DF4XL**
I197 **DFC4JC**
I198 **DFCJRT**
I205 **DFPSRB**
I023 **DS2LB** (INCH)
I016 **DS2LS** (INCH)
I032 **DS2MRB** (INCH)
I015 **DS2MS** (INCH)
I022 **DS2SB** (INCH)
I031 **DS2SRB** (INCH)
I035 **DS2SRB_A** (INCH)
I036 **DS2SRB_NA** (INCH)
I014 **DS2SS** (INCH)
I018 **DS3MC** (INCH)
I039 **DS3MH_SS** (INCH)
I043 **DS3MHB_SS** (INCH)
I027 **DS3MHH60** (INCH)
I048 **DS3MHHRB** (INCH)
I037 **DS3MHR_A** (INCH)
I045 **DS3MHRB_SS** (INCH)
I024 **DS3SB** (INCH)
I017 **DS3SC** (INCH)
I038 **DS3SH_SS** (INCH)
I042 **DS3SHB_SS** (INCH)
I044 **DS3SHRB_SS** (INCH)
I026 **DS4LB** (INCH)
I021 **DS4LC** (INCH)
I030 **DS4LC_CB** (INCH)
I020 **DS4MC** (INCH)
I029 **DS4MC_CB** (INCH)
I034 **DS4MRB** (INCH)
I025 **DS4SB** (INCH)
I019 **DS4SC** (INCH)
I033 **DS4SRB** (INCH)
I041 **DS5LH_SS** (INCH)
I040 **DS5MH_SS** (INCH)
I047 **DS5MHRB_SS** (INCH)
I046 **DS5SHRB_SS** (INCH)
I028 **DS6MHH60** (INCH)
I049 **DS6MHHRB** (INCH)
I075 **MS2ES(35)**
I075 **MS2ES(45)**
I054 **MS2JS**
I055 **MS2LS**
I080 **MS2MB**
I053 **MS2MD**
I091 **MS2MRB**
I051 **MS2MS**
I098 **MS2MT**
I108 **MS2MTB**
I078 **MS2SB**
I050 **MS2SS**
I088 **MS2XB**
I056 **MS2XL**
I061 **MS2XL** (INCH)
I059 **MS2XL6**
I081 **MS2XLB**
I086 **MS2XLB** (INCH)
I093 **MS2XLRB**
I076 **MS3ES**
I077 **MS4EC**
I070 **MS4JC**
I102 **MS4LT**
I110 **MS4LTB**
I069 **MS4MC**
I094 **MS4MRB**
I068 **MS4SC**
I071 **MS4XL**
I074 **MS4XL** (INCH)
I087 **MS4XLB** (INCH)
I065 **MSJHD**
I063 **MSMHD**
I096 **MSMHDRB**
I066 **MSMHZD**
I067 **MSMHZD** (INCH)
I062 **MSSHD**
I138 **VC2C**
I119 **VC2ESB**
I120 **VC2PSB**
I121 **VC2PSBP**
I124 **VC3MB**
I130 **VC4JRB**
I125 **VC4MB**
I136 **VC4STB**
I116 **VC6MH**
I117 **VC8MH**
I131 **VCHFRB**
I133 **VCHFRB** (INCH)
I132 **VCHFRB**(TAPER NECK)
I114 **VCLD**
I113 **VCMDSC**
I115 **VCMH**
I134 **VCMHDRB**
I126 **VCPSRB**
I129 **VCPSRB**(TAPER NECK)
I118 **VCSFPR**
I122 **VCXB**
I153 **VF2MV**
I170 **VF2SB**
I172 **VF2SB**(INCH)
I173 **VF2SDB**
I174 **VF2SDBL**
I169 **VF2SSB**
I168 **VF2WB**
I151 **VF2XL**
I176 **VF2XLB**
I181 **VF2XLB**(INCH)
I175 **VF2XLBS**
I182 **VF3XB**
I185 **VF4MB**
I154 **VF4MV**
I186 **VF4SVB**
I158 **VF6MHV**
I159 **VF6MHVCH**
I194 **VF6MHVRB**
I195 **VF6MHVRBCH**
I166 **VF6SVRCH**
I160 **VF8MHVCH**
I196 **VF8MHVRBCH**
I187 **VFHVRB**
I189 **VFHVRB**(INCH)
I190 **VFHVRB**(TAPER NECK)
I157 **VFJHV**
I162 **VFMD**
I163 **VFMD**(INCH)
I167 **VFMFPR**
I155 **VFMHV**
I156 **VFMHVCH**
I192 **VFMHVRB**
I193 **VFMHVRBCH**
I161 **VFSD**
I164 **VFSFPR**
I165 **VFSFPRCH**
I145 **VQ4SVB**
I143 **VQMHV**
I144 **VQMHV**(INCH)
I146 **VQMHVRB**
I148 **VQMHVRB**(INCH)
I149 **VQMHVRBF**
I139 **VQMHZV**
I141 **VQMHZV**(INCH)
I142 **VQMHZVOH**

PRODUCT CODE CORRESPONDENCES

PRODUCT CODE OF END MILLS



End mill names

DS : Diamond star end mills
MS : Mstar end mills
VC : Miracle end mills
VQ : Smart Miracle end mills
VF : Impact Miracle end mills
DFC : Diamond coated end mills
DF : Diamond coated end mills
C : Carbide end mills
CBN : CBN end mills

Number of flutes

2 : 2flute
3 : 3flute
4 : 4flute
5 : 5flute
6 : 6flute
8 : 8flute

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 high hardened material
V : Irregular helix flutes
RB : Corner radius
H : High helix 45°
HH : High helix 60°
R : Roughing
FPR : 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

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.

Coverage

The best for hardened steels equal to or less than 55HRC.

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	General	2	MS	MS2SS	Short cut length, 2 flute	METRIC ϕ0.1−12	◎	◎	○		○	○			I050	I216
			MS	DS2SS	Short, 2 flute	INCH ϕ.0156−.7500	◎	◎	○		○	○			I014	I214
			MS	MS2MS	Medium cut length, 2 flute	METRIC ϕ0.2−20	◎	◎	○		○	○			I051	I216
			MS	DS2MS	Medium, 2 flute	INCH ϕ.0156−1.250	◎	◎	○		○	○			I015	I214
			MS	MS2JS	Semi long cut length, 2 flute	METRIC ϕ0.1−12	◎	◎	○		○	○			I054	I218
			MS	MS2LS	long cut length, 2 flute	METRIC ϕ0.2−12	◎	◎	○		○	○			I055	I219
			MS	DS2LS	Long, 2 flute	INCH ϕ.1250−1.000	◎	◎	○		○	○			I016	I214
		3	MS	DS3SC	Short, 3 flute	INCH ϕ.0156−.7500	◎	◎	○		○	○			I017	I214
			MS	DS3MC	Medium, 3 flute	INCH ϕ.0156−1.250	◎	◎	○		○	○			I018	I214
		4	MS	MS4SC	Short cut length, 4 flute	METRIC ϕ1−12	◎	◎	○		○	○			I068	I229
			MS	DS4SC	Short, 4 flute	INCH ϕ.0156−.7500	◎	◎	○		○	○			I019	I214
			MS	MS4MC	Medium cut length, 4 flute	METRIC ϕ1−20	◎	◎	○		○	○			I069	I229
			MS	DS4MC	Medium, 4 flute	INCH ϕ.0156−1.250	◎	◎	○		○	○			I020	I214
			MS	MS4JC	Semi long cut length, 4 flute	METRIC ϕ1−12	◎	◎	○		○	○			I070	I230
			MS	DS4LC	Long, 4 flute	INCH ϕ.1250−1.000	◎	◎	○		○	○			I021	I214

◎ : 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 ϕ1−20 INCH ϕ.0625−.7500	◎	◎	○		◎	○			METRIC I066 INCH I067	METRIC I227 INCH I228
		4	MS	MSSHD	High power, Short cut length, 4 flute	METRIC ϕ3−20	◎	◎	○		◎	◎			I062	I225
			MS	MSMHD	High power, Medium cut length, 4 flute	METRIC ϕ2−25	◎	◎	○		◎	◎			I063	I225
			MS	MSJHD	High power, Semi long cut length, 4 flute	METRIC ϕ2−20	◎	◎	○		◎	◎			I065	I226
	For Hardened Steel	2	MS	MS2MD	Medium cut length, 2 flute, Strong geometry type	METRIC ϕ1−12	◎	◎	○		◎	◎			I053	I217
			VF	VF2MV	Medium cut length, 2 flute, Irregular helix flutes	METRIC ϕ0.5−6	○	◎	◎	◎					I153	I274
		4	VF	VF4MV	Medium cut length, 4 flute, Irregular helix flutes	METRIC ϕ6−20	○	◎	◎	◎					I154	I275
		4 6	VF	VFSD	Short cut length, For hardened materials	METRIC ϕ1−12	○	◎	◎	◎					I161	I279
			VF	VFMD	Medium cut length, For hardened materials	METRIC ϕ1−25 INCH ϕ.0313−.5000	○	◎	◎	◎					METRIC I162 INCH I163	METRIC I279 INCH I280
			VC	VCMDSC	Medium cut length, 4−6 flute	METRIC ϕ0.5−3	○	◎	◎	◎					I113	I242
		6	VC	VCLD	Long cut length, 6 flute	METRIC ϕ6−25	○	◎	◎	◎					I114	I243
	For Difficult-to-cut Material	3	VQ	VQMHZV (NEW)	Medium cut length, 3 flute, for drilling and slotting	METRIC ϕ1−20 INCH ϕ.0625−.5000	◎	○			◎	◎			METRIC I139 INCH I141	METRIC I261 INCH I263
			VQ	VQMHZVOH (NEW)	Anti-vibration Smart miracle 3 flute slotting end mill with coolant holes	METRIC ϕ6−16	◎	○			◎	◎	○		I142	I265
			MS	DS3SH-SS	Short, 3 flute, For stainless steel	INCH ϕ.1250−.7500	○	○			◎	◎			I038	I214
			MS	DS3MH-SS	Medium, 3 flute, For stainless steel	INCH ϕ.1250−.7500	○	○			◎	◎			I039	I214

◎ : 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 ϕ.1250−1.000	○	○	○		◎	◎			I027	I214
		3 4	VC	VCMH	 Medium cut length, 3−4 flute, High helix angle	METRIC ϕ3−25	○	◎	○		◎	◎			I115	I244
		4	VQ	VQMHV NEW	 Medium cut length, 4 flute, Irregular helix flutes	METRIC ϕ2−25 INCH ϕ.1250−.5000	◎	○			◎	◎			METRIC I143 INCH I144	METRIC I267 INCH I269
			VF	VFMHV	 Medium cut length, Irregular helix flutes	METRIC ϕ2−20	○	○	○		◎	◎			I155	I276
			VF	VFMHVCH	 Medium cut length, 4 flute, Irregular helix flutes, with multiple internal through coolant holes	METRIC ϕ16,20					◎	◎			I156	I301
			VF	VFJHV	 Semi long cut length, 4 flute, Irregular helix flutes	METRIC ϕ2−20	○	○	○		◎	◎			I157	I277
		5	MS	DS5MH-SS	 Medium, 5 flute, For stainless steel	INCH ϕ.2500−.7500	○	○			◎	◎			I040	I214
			MS	DS5LH-SS	 Long, 5 flute, For stainless steel	INCH ϕ.2500−.7500	○	○			◎	◎			I041	I214
		6	MS	DS6MHH60	 High helix, Medium, 6 flute	INCH ϕ.1250−1.000	○	○	○		◎	◎			I028	I214
			VC	VC6MH	 Medium cut length, 6 flute, High helix angle	METRIC ϕ6−25	◎	◎	○		◎	◎			I116	I245
			VF	VF6MHV	 Medium cut length, 6 flute, Irregular helix flutes	METRIC ϕ6−20	○	○	○		◎	◎			I158	I278
			VF	VF6MHVCH	 Medium cut length, 6 flute, Irregular helix flutes with multiple internal through coolant holes	METRIC ϕ10−20					◎	◎			I159	I301
		8	VF	VF8MHVCH	 Medium cut length, 8 flute, Irregular helix flutes with multiple internal through coolant holes	METRIC ϕ16,ϕ20					◎	◎			I160	I302
			VC	VC8MH	 Medium cut length, 8 flute, High helix angle	METRIC ϕ20−25	◎	◎	○		◎	◎			I117	I245

◎ : 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 ϕ3−25								◎	I212	I314
			–	C2SA	2 flute, Short cut length, Relieved neck	METRIC ϕ3−20							○	◎	I210	I313
		3	–	C3SA	3 flute, Short cut length, Relieved neck	METRIC ϕ10−26							○	◎	I211	I313
	For Swiss Type Lathes	2	MS	MS2ES	2 flute, For Swiss type lathes	METRIC ϕ3−12	◎	◎	○		○	○			I075	I231
		3	MS	MS3ES	3 flute, For Swiss type lathes	METRIC ϕ3−12	◎	◎	○		○	○			I076	I231
		4	MS	MS4EC	4 flute, For Swiss type lathes	METRIC ϕ3−14	◎	◎	○		○	○			I077	I231
	For CFRP	–	DFC	DFC4JC	End mill, Semi long cutting length, 4 flute, For CFRP	METRIC ϕ6−12	CFRP : ○								I197	I304
	For Graphite	4	DF	DF4JC	Semi long cut length, 4 flute, For graphite	METRIC ϕ3−12	Graphite : ◎ GFPR,CFPR : ○							◎	I199	I305
			DF	DF4XL	Long neck, 4 flute, For graphite	METRIC ϕ1−12								◎	I200	I306
LONG NECK SQUARE	Rib Processing	2	MS	MS2XL	Short cut length, 2 flute, Long neck	METRIC ϕ0.2−6 INCH ϕ.0156−.2500	◎	◎	○		○	○			METRIC I056 INCH I061	METRIC I220 INCH I223
			MS	MS2XL6	Short cut length, 2 flute, 6mm shank	METRIC ϕ0.3−2.5	◎	◎	○		○	○			I059	I221
		4	MS	MS4XL	Short cut length, 4 flute, Long neck	METRIC ϕ1−10 INCH ϕ.0625−.2500	◎	◎	○		○	○			METRIC I071 INCH I074	METRIC I222 INCH I224
	For Hardened Steel	2	VF	VF2XL	2 flute, Long neck	METRIC ϕ0.1−3	○	◎	◎	◎					I151	I273
SQUARE WITH CROSS-NECK	For CFRP	–	DFC	DFCJRT	Cross-nick type end mill, Semi long cutting length, For CFRP	METRIC ϕ6−12	CFRP : ○								I198	I304

◎ : 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	Short, 3 flute, For stainless steel	METRIC R0.1−6	◎	◎	○		○	○			I078	I232
			MS	DS2SB	Ball nose, Short, 2 flute	INCH ϕ.0156−.7500	◎	◎	○		○	○			I022	I215
			MS	MS2MB	Ball nose, Medium cut length, 2 flute	METRIC R0.25−6	◎	◎	○		○	○			I080	I232
			MS	DS2LB	Ball nose, Long, 2 flute	INCH ϕ.1250−1.000	◎	◎	○		○	○			I023	I215
			VC	VC2ESB	Ball nose, Extra short cut length, 2 flute	METRIC R0.15−6	○	◎	◎	○	○	○			I119	I247
		3	MS	DS3SB	Ball nose, Short, 3 flute	INCH ϕ.1250−.7500	◎	◎	○		○	○			I024	I215
			VC	VC3MB	Ball nose, Medium cut length, 3 flute	METRIC R1−10	○	◎	◎	○	○	○			I124	I250
		4	MS	DS4SB	Ball nose, Short, 4 flute	INCH ϕ.0312−.7500	◎	◎	○		○	○			I025	I215
			MS	DS4LB	Ball nose, Long, 4 flute	INCH ϕ.1250−1.000	◎	◎	○		○	○			I026	I215
	For Complex Geometry	2	VF	VF2WB	Wide ball nose, Medium neck, 2 flute	METRIC R1−3	◎	◎	○		◎	◎			I168	I283
	Strong		VF	VF2SDB	Ball nose, Short cut length, 2 flute, Strong geometry	METRIC R0.5−10	○	◎	◎	○					I173	I286
	For Hardened Steel		VF	VF2SSB	Ball nose, Short cut length, 2 flute, For hardened materials	METRIC R0.5−6	○	◎	◎	◎	○	○			I169	I284
			VF	VF2SB	Ball nose, Short cut length, 2 flute, For hardened materials	METRIC R0.1−10 INCH R.0156−.2500	○	◎	◎	◎	○	○			METRIC I170 INCH I172	METRIC I284 INCH I285
		4	VF	VF4MB	Ball nose, Medium cut length, 4 flute	METRIC R0.5−6		◎	◎	◎	○	○			I185	I292
			VC	VC4MB	Ball nose, Medium cut length, 4 flute	METRIC R0.5−10	○	◎	◎	◎	○	○			I125	I251

◎ : Excellent ○ : Good None : Not Recommended

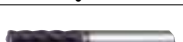
Shape	Type	Number of Flutes	Coating	Order Number	Shape	Cutting Diameter Range	Work Material P: Carbon Steel, Alloy Steel, Cast Iron	P: Tool Steel, Pre-Hardened Steel, Hardened Steel	H: Hardened Steel (—55HRC)	H: Hardened Steel (55HRC—)	M: Austenitic Stainless Steel	S: Titanium Alloy, Heat Resistant Alloy	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 R0.05—6	◎	◎	◎		○	○			I120	I248
			VC	VC2PSBP	 Ball nose, Short cut length, 2 flute, Ultra high precision	METRIC R0.02—6	◎	◎	◎		○	○			I121	I248
	Long Shank		VF	VF2SDBL	 Ball nose, Short cut length, 2 flute, Strong geometry, Long shank	METRIC R0.5—10	○	◎	◎	○					I174	I286
	Taper neck	3	VF	VF3XB	 Ball nose, 3 flute, Taper neck	METRIC R0.4—2.5	○	◎	◎	◎	○	○			I182	I290
		2	MS	MS2XB	 Ball nose, 2 flute, Taper neck	METRIC R0.1—2	◎	◎	○		○	○			I088	I235
			VC	VCXB	 Ball nose, 2 flute, Taper neck	METRIC R0.5—6	○	◎	◎	○	○	○			I122	I249
	For Difficult-to-cut Material	3	MS	DS3SHB-SS	 Ball nose, Short, 3 flute, For stainless steel	INCH φ.1250—.7500	○	○			◎	◎			I042	I215
			MS	DS3MHB-SS	 Ball nose, Medium, 3 flute, For stainless steel	INCH φ.1250—.7500	○	○			◎	◎			I043	I215
		4	VQ	VQ4SVB NEW	 Ball nose, Short cut length, 4 flute, Variable curve	METRIC R1—6	○	○			◎	◎	○		I145	I270
			VF	VF4SVB	 Ball nose, Short cut length, 4 flute, Variable curve	METRIC R1—10	○	○			◎	◎			I186	I293
	For Graphite	2	DF	DF2MB	 Ball nose, Medium cut length, 2 flute, For graphite	METRIC R3—6	Graphite : ◎ GFPR,CFPR : ○							◎	I201	I307
			DF	DF2XLB	 Ball nose, 2 flute, Long neck, For graphite	METRIC R0.2—2								◎	I202	I308
		3	DF	DF3XB	 Ball nose, 3 flute, Taper neck, For graphite	METRIC R0.5—2								◎	I204	I309

◎ : 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	Work Material P: Tool Steel, Pre-Hardened Steel, Hardened Steel	Work Material H: Hardened Steel (−55HRC)	Work Material H: Hardened Steel (55HRC−)	Work Material M: Austenitic Stainless Steel	Work Material S: Titanium Alloy, Heat Resistant Alloy	Work Material N: Copper Alloy	Work Material N: Aluminum Alloy	Page: Dimensions	Page: Cutting Conditions
LONG NECK BALL	Deep Slotting	2	VF	VF2XLB	Ball nose, Long neck, 2 flute, For hardened materials	METRIC R0.1−3 INCH R.0156−.1250	○	◎	◎	◎		○			METRIC I176 INCH I181	METRIC I288 INCH I289
			VF	VF2XLBS	Ball nose, Long neck, 2 flute, Short shank	METRIC R0.2−1	○	◎	◎	◎					I175	I288
			MS	MS2XLB	Ball nose, Short cut length, 2 flute, Long neck	METRIC R0.1−3 INCH R.0078−.1250	◎	◎	○		○	○			METRIC I081 INCH I086	METRIC I233 INCH I234
		4	MS	MS4XLB	Ball nose, 4 flute, Long neck	INCH R.0313−.1250	◎	◎	○		○	○			I087	I234
RADIUS	Corner Radius	2	MS	DS2SRB	Corner radius, Short, 2 flute	INCH ϕ.1250−.7500	◎	◎	○		○	○			I031	I214
			MS	MS2MRB	Corner radius, Medium cut length, 2 flute	METRIC ϕ1−12	◎	◎	○		○	○			I091	I216
			MS	DS2MRB	Corner radius, Medium, 2 flute	INCH ϕ.1250−.7500	◎	◎	○		○	○			I032	I214
		4	MS	DS4SRB	Corner radius, Short, 4 flute	INCH ϕ.1250−.7500	◎	◎	○		○	○			I033	I214
			MS	MS4MRB	Corner radius, Medium cut length, 4 flute	METRIC ϕ3−20	◎	◎	○		○	○			I094	I237
			MS	DS4MRB	Corner radius, Medium, 4 flute	INCH ϕ.1250−.7500	◎	◎	○		○	○			I034	I214
			VC	VC4JRB	Corner radius, Semi long cut length, 4 flute	METRIC ϕ3−20	○	◎	◎	○	○	○			I130	I254
			MS	MSMHDRB	High power, Corner radius, Medium cut length, 4 flute	METRIC ϕ2−20	◎	◎	◎		◎	◎			I096	I238
			VC	VCMHDRB	Corner radius, Medium cut length, 4 flute, High helix angle	METRIC ϕ2−25	○	◎	◎	○	◎	◎			I134	I257
	For Hardened Steel	2	VF	VFHVRB	4 flute, Corner radius, Short cut length, Irregular helix flutes	METRIC ϕ1−16 INCH ϕ.125−.500	◎	◎	◎	◎	○	○			METRIC I187 INCH I189	METRIC I294 INCH I298
	High Precision	2 4	VC	VCPSRB	Corner radius, Short cut length, 2-4 flute, High precision type	METRIC ϕ0.6−12	◎	◎	◎	◎	○	○			I126	I252

◎ : 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	High Feed	4	VC	VCHFRB	 High feed corner radius, 4 flute	METRIC ϕ2−16 INCH ϕ.125−.500	◎	◎	◎	○		○			METRIC I131 INCH I133	METRIC I255 INCH I256
	For Difficult-to-cut Material	3	MS	DS3SHRB-SS	 Corner radius, Short, 3 flute, For stainless steel	INCH ϕ.1250−.7500	○	○			◎	◎			I044	I214
			MS	DS3MHRB-SS	 Corner radius, Medium, 3 flute, For stainless steel	INCH ϕ.1250−.7500	○	○			◎	◎			I045	I214
			MS	DS3MHHRB	 Corner radius, High helix, Medium, 3 flute	INCH ϕ.1250−.6250	○	○	○		◎	◎			I048	I214
		4	VQ	VQMHVRB NEW	 Corner radius, Medium cut length, 4 flute, Irregular helix flutes	METRIC ϕ2−20 INCH ϕ.1250−.5000	◎	○			◎	◎	○		METRIC I146 INCH I148	METRIC I267 INCH I269
			VQ	VQMHVRBF NEW	 Corner radius, Medium cut length, 4 flute, Irregular helix flutes ,for finishing	METRIC ϕ6−16	○	○			○	◎			I149	I271
		4	VF	VFMHVRB	 Corner radius, Medium cut length, 4 flute, Irregular helix flutes	METRIC ϕ6−20	○	○	○		◎	◎			I192	I276
			VF	VFMHVRBCH	 Corner radius, Medium cut length, 4 flute, Irregular helix flutes, with multiple internal through coolant holes	METRIC ϕ16−20					◎	◎			I193	I301
		5	MS	DS5SHRB-SS	 Corner radius, Short, 5 flute, For stainless steel	INCH ϕ.2500−.7500	○	○			◎	◎			I046	I214
			MS	DS5MHRB-SS	 Corner radius, Medium, 5 flute, For stainless steel	INCH ϕ.2500−.7500	○	○			◎	◎			I047	I214
		6	MS	DS6MHHRB	 Corner radius, High helix, Medium, 6 flute	INCH ϕ.1250−.6250	○	○	○		◎	◎			I049	I214
			VF	VF6MHVRB	 Corner radius, Medium cut length, 6 flute, Irregular helix flutes	METRIC ϕ6−20	○	○	○		◎	◎			I194	I278
			VF	VF6MHVRBCH	 Corner radius, Medium cut length, 6 flute, Irregular helix flutes, with multiple internal through coolant holes	METRIC ϕ10−20					◎	◎			I195	I301
		8	VF	VF8MHVRBCH	Corner radius, Medium cut length, 8 flute, Irregular helix flutes, with multiple internal through coolant holes	METRIC ϕ16−20					◎	◎			I196	I302

◎ : 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 ϕ.1875−1.000							○	◎	I035	I214
			—	DS2SRB-NA○	Corner radius, Short, 2 flute, Neck relief	INCH ϕ.1875−1.000							○	◎	I036	I214
		3	—	C3SARB	Corner radius, Short cut length, 3 flute, For aluminum alloy	METRIC ϕ12−25							○	◎	I213	I313
	For Graphite	2 4	DF	DFPSRB	Corner radius, Short cut length, 2-4 flute, High precision, For graphite	METRIC ϕ0.5−12	Graphite : ◎ GFPR,CFPR : ○							◎	I205	I310
LONG NECK RADIUS	General	2	MS	MS2XLRB	Corner radius, Short cut length, 2 flute, Long neck	METRIC ϕ1−6	◎	◎	○		○	○			I093	I236
TAPER	Rib Processing	4	MS	MS4LT	Taper, Long cut length, 4 flute	METRIC ϕ0.2−3	◎	◎	○		○				I102	I240
TAPER BALL			MS	MS4LTB	Ball nose, 4 flute, Taper, For rib milling	METRIC R0.3−1	◎	◎	○		○	○			I110	I241
TAPER	Slope Machining	2	MS	MS2MT	Taper, Medium cut length, 2 flute	METRIC ϕ0.2−10	◎	◎	○		○	○			I098	I239
TAPER BALL			MS	MS2MTB	Ball nose taper, Medium cut length, 2 flute	METRIC R0.2−1.5	◎	◎	○		○	○			I108	I232
		4	VC	VC4STB	Ball nose taper, Short cut length, 4 flute	METRIC R0.3−4	○	◎	◎	◎	○	○			I136	I258
ROUGHING	Roughing	4	MS	DS4MC-CB	Chipbreaker, Medium, 4 flute	INCH ϕ.1250−1.000	◎	◎	○		○	○			I029	I214
			MS	DS4LC-CB	Chipbreaker, Long, 4 flute	INCH ϕ.1250−1.000	◎	◎	○		○	○			I030	I214
		3 4	VC	VCSFPR	Roughing, Short cut length, 3−4 flute	METRIC ϕ3−20	◎	◎	○		◎	◎			I118	I246
	For Difficult-to-cut Material		VF	VFSFPR	Roughing, Short cut length, 3−4 flute	METRIC ϕ3−20	◎	◎	○		◎	◎			I164	I281
		4	VF	VFSFPRCH	Roughing, Short cut length, 4 flute, with multiple internal through coolant holes	METRIC ϕ16, 20					◎	◎			I165	I302

◎ : 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 ϕ16, 20					◎	◎			I166	I303
		4	VF	VFMFPR	Roughing, Medium cut length, 4 flute	METRIC ϕ5−20	◎	◎	○		◎	◎			I167	I282
	Roughing Aluminum Alloy	3	–	DS3MHR-A	Roughing, Medium, 3 flute, For aluminum alloys	INCH ϕ.2500−1.000								◎	I037	I214
CHAMFERING	Chamfering	2	VC	VC2C	Chamfer cutter, 2 flute	METRIC ϕ2−12	◎	◎	◎	○	◎	◎		○	I138	I260

◎ : 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 R0.2−1	○	◎	◎	◎					I208	I311
LONG NECK RADIUS				CBN2XLRB	Corner radius, Short cut length, 2 flute, Long neck	METRIC ϕ0.5−2	○	◎	◎	◎					I209	I312

◎ : Excellent ○ : Good None : Not Recommended

DIAMOND STAR END MILLS

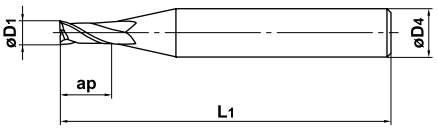
DS2SS

Short, 2 flute

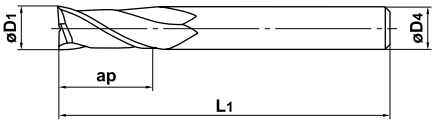
UWC MS 30° HRC ≤55 D1=.016" D1≥.031"

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

D1≤.0156"	.0312"≤D1≤.2500"	D1>.2500"			
0 - .001"	0 - .002"	0 - .003"			
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	D4=.750"	
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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS2SSD1/64	.0156	.023	1.500	.125	2	●	1
D1/32	.0312	.063	1.500	.125	2	●	1
D3/64	.0469	.094	1.500	.125	2	●	1
D1/16	.0625	.125	1.500	.125	2	●	1
D5/64	.0781	.156	1.500	.125	2	□	1
D3/32	.0938	.188	1.500	.125	2	●	1
D7/64	.1094	.219	1.500	.125	2	□	1
D1/8	.1250	.250	1.500	.125	2	●	2
D9/64	.1406	.313	2.000	.188	2	□	1
D5/32	.1562	.313	2.000	.188	2	□	1
D11/64	.1719	.375	2.000	.188	2	□	1
D3/16	.1875	.375	2.000	.188	2	●	2
D13/64	.2031	.500	2.000	.250	2	□	1
D7/32	.2187	.500	2.000	.250	2	□	1
D15/64	.2344	.500	2.000	.250	2	□	1
D1/4	.2500	.500	2.000	.250	2	●	2
D9/32	.2813	.500	2.000	.313	2	□	1
D5/16	.3125	.500	2.000	.313	2	□	2
D3/8	.3750	.563	2.000	.375	2	●	2
D7/16	.4375	.625	2.500	.438	2	□	2
D1/2	.5000	.625	2.500	.500	2	●	2
D5/8	.6250	.750	3.000	.625	2	●	2
D3/4	.7500	1.000	3.000	.750	2	●	2

● : Inventory maintained. □ : Non stock, produced to order only.

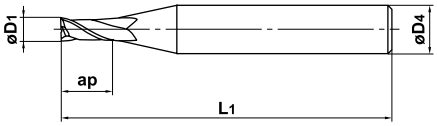
CUTTING CONDITIONS ➤ I214

DS2MS

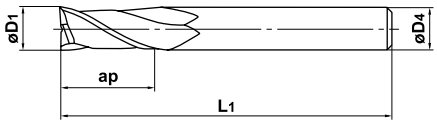
Medium, 2 flute

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



Type 2

D1≤.0156"	.0312"≤D1≤.2500"	D1>.2500"			
0 - .001"	0 - .002"	0 - .003"			
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	.750≤D4≤1.000"	D4=1.250"
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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS2MSD1/64	.0156	.040	1.500	.125	2	●	1
D1/32	.0312	.078	1.500	.125	2	●	1
D3/64	.0469	.109	1.500	.125	2	●	1
D1/16	.0625	.188	1.500	.125	2	●	1
D5/64	.0781	.234	1.500	.125	2	□	1
D3/32	.0938	.281	1.500	.125	2	●	1
D7/64	.1094	.328	1.500	.125	2	□	1
D1/8	.1250	.375	1.500	.125	2	●	2
D9/64	.1406	.500	2.000	.188	2	□	1
D5/32	.1562	.500	2.000	.188	2	□	1
D11/64	.1719	.563	2.000	.188	2	□	1
D3/16	.1875	.563	2.000	.188	2	●	1
D13/64	.2031	.625	2.500	.250	2	□	1
D7/32	.2187	.625	2.500	.250	2	□	1
D15/64	.2344	.750	2.500	.250	2	□	1
D1/4	.2500	.750	2.500	.250	2	●	2
D9/32	.2813	.750	2.500	.313	2	□	1
D5/16	.3125	.813	2.500	.313	2	□	2
D3/8	.3750	.875	2.500	.375	2	●	2
D7/16	.4375	1.000	2.750	.438	2	□	2
D1/2	.5000	1.000	3.000	.500	2	●	2
D9/16	.5625	1.125	3.500	.563	2	●	2
D5/8	.6250	1.250	3.500	.625	2	●	2
D3/4	.7500	1.500	4.000	.750	2	●	2
D7/8	.8750	1.500	4.000	.875	2	●	2
D1	1.000	1.500	4.000	1.000	2	□	2
D1-1/4	1.250	1.563	4.375	1.250	2	□	2

CUTTING CONDITIONS ➤ I214

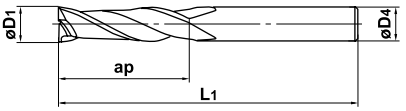
DIAMOND STAR END MILLS

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	.750≤D4≤1.000"	
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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS2LSD1/8	.1250	1.000	2.500	.125	2	●	1
D3/16	.1875	1.125	3.000	.188	2	●	1
D1/4	.2500	1.250	3.000	.250	2	●	1
D5/16	.3125	1.375	3.250	.313	2	□	1
D3/8	.3750	1.500	3.500	.375	2	●	1
D7/16	.4375	1.750	4.000	.438	2	□	1
D1/2	.5000	2.000	4.000	.500	2	●	1
D5/8	.6250	2.500	4.625	.625	2	●	1
D3/4	.7500	3.000	5.250	.750	2	●	1
D1	1.000	3.000	6.000	1.000	2	□	1

● : Inventory maintained. □ : Non stock, produced to order only.

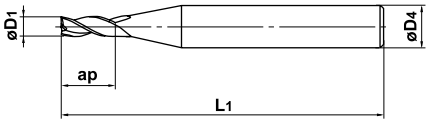
CUTTING CONDITIONS ➤ I214

DS3SC

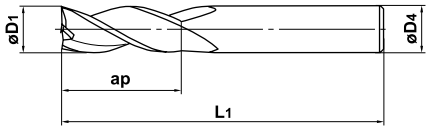
Short, 3 flute

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

D1≤.0156"	.0312"≤D1≤.2500"	D1>.2500"			
0 - .001"	0 - .002"	0 - .003"			
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	D4=.750"	
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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS3SCD1/64	.0156	.023	1.500	.125	3	●	1
D1/32	.0312	.063	1.500	.125	3	●	1
D3/64	.0469	.094	1.500	.125	3	●	1
D1/16	.0625	.125	1.500	.125	3	●	1
D5/64	.0781	.156	1.500	.125	3	□	1
D3/32	.0938	.188	1.500	.125	3	●	1
D7/64	.1094	.219	1.500	.125	3	□	1
D1/8	.1250	.250	1.500	.125	3	●	2
D9/64	.1406	.313	2.000	.188	3	□	1
D5/32	.1562	.313	2.000	.188	3	□	1
D11/64	.1719	.375	2.000	.188	3	□	1
D3/16	.1875	.375	2.000	.188	3	●	2
D13/64	.2031	.500	2.000	.250	3	□	1
D7/32	.2187	.500	2.000	.250	3	□	1
D15/64	.2344	.500	2.000	.250	3	□	1
D1/4	.2500	.500	2.000	.250	3	●	2
D9/32	.2813	.500	2.000	.313	3	□	1
D5/16	.3125	.500	2.000	.313	3	□	2
D3/8	.3750	.563	2.000	.375	3	●	2
D7/16	.4375	.625	2.500	.438	3	□	2
D1/2	.5000	.625	2.500	.500	3	●	2
D5/8	.6250	.750	3.000	.625	3	●	2
D3/4	.7500	1.000	3.000	.750	3	□	2

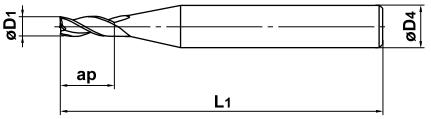
DIAMOND STAR END MILLS

DS3MC

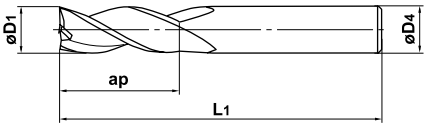
Medium, 3 flute

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

D1≤.0156"	.0312"≤D1≤.2500"	D1>.2500"			
0 - .001"	0 - .002"	0 - .003"			
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	.750≤D4≤1.000"	D4=1.250"
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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS3MCD1/64	.0156	.040	1.500	.125	3	●	1
D1/32	.0312	.078	1.500	.125	3	●	1
D3/64	.0469	.109	1.500	.125	3	□	1
D1/16	.0625	.188	1.500	.125	3	●	1
D5/64	.0781	.234	1.500	.125	3	●	1
D3/32	.0938	.281	1.500	.125	3	●	1
D7/64	.1094	.328	1.500	.125	3	●	1
D1/8	.1250	.375	1.500	.125	3	●	2
D9/64	.1406	.500	2.000	.188	3	□	1
D5/32	.1562	.500	2.000	.188	3	□	1
D11/64	.1719	.563	2.000	.188	3	□	1
D3/16	.1875	.563	2.000	.188	3	●	2
D13/64	.2031	.625	2.500	.250	3	□	1
D7/32	.2187	.625	2.500	.250	3	□	1
D15/64	.2344	.750	2.500	.250	3	□	1
D1/4	.2500	.750	2.500	.250	3	●	2
D9/32	.2813	.750	2.500	.313	3	□	1
D5/16	.3125	.813	2.500	.313	3	●	2
D3/8	.3750	.875	2.500	.375	3	●	2
D7/16	.4375	1.000	2.750	.438	3	□	2
D1/2	.5000	1.000	3.000	.500	3	●	2
D9/16	.5625	1.125	3.500	.563	3	●	2
D5/8	.6250	1.250	3.500	.625	3	●	2
D3/4	.7500	1.500	4.000	.750	3	●	2
D7/8	.8750	1.500	4.000	.875	3	□	2
D1	1.000	1.500	4.000	1.000	3	□	2
D1-1/4	1.250	1.563	4.375	1.250	3	□	2

● : Inventory maintained. □ : Non stock, produced to order only.

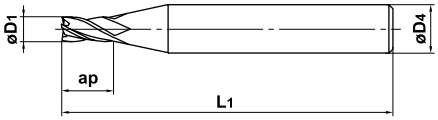
CUTTING CONDITIONS ➤ I214

DS4SC

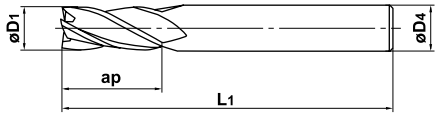
Short, 4 flute

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

D1≤.0156"	.0312"≤D1≤.2500"	D1>.2500"			
0 - .001"	0 - .002"	0 - .003"			
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	D4=.750"	
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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS4SCD1/64	.0156	.023	1.500	.125	4	●	1
D1/32	.0312	.063	1.500	.125	4	●	1
D3/64	.0469	.094	1.500	.125	4	●	1
D1/16	.0625	.125	1.500	.125	4	●	1
D5/64	.0781	.156	1.500	.125	4	□	1
D3/32	.0938	.188	1.500	.125	4	●	1
D7/64	.1094	.219	1.500	.125	4	□	1
D1/8	.1250	.250	1.500	.125	4	●	2
D9/64	.1406	.313	2.000	.188	4	□	1
D5/32	.1562	.313	2.000	.188	4	□	1
D11/64	.1719	.375	2.000	.188	4	□	1
D3/16	.1875	.375	2.000	.188	4	●	2
D13/64	.2031	.500	2.000	.250	4	□	1
D7/32	.2187	.500	2.000	.250	4	□	1
D15/64	.2344	.500	2.000	.250	4	□	1
D1/4	.2500	.500	2.000	.250	4	●	2
D9/32	.2813	.500	2.000	.313	4	□	1
D5/16	.3125	.500	2.000	.313	4	□	2
D3/8	.3750	.563	2.000	.375	4	●	2
D7/16	.4375	.625	2.500	.438	4	□	2
D1/2	.5000	.625	2.500	.500	4	●	2
D5/8	.6250	.750	3.000	.625	4	●	2
D3/4	.7500	1.000	3.000	.750	4	●	2

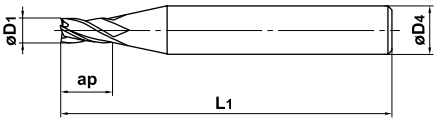
DIAMOND STAR END MILLS

DS4MC

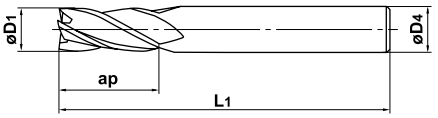
Medium, 4 flute

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

D1≤.0156"	.0312"≤D1≤.2500"	D1>.2500"			
0 - .001"	0 - .002"	0 - .003"			
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	.750≤D4≤1.000"	D4=1.250"
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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS4MCD1/64	.0156	.040	1.500	.125	4	●	1
D1/32	.0312	.078	1.500	.125	4	●	1
D3/64	.0469	.109	1.500	.125	4	●	1
D1/16	.0625	.188	1.500	.125	4	●	1
D5/64	.0781	.234	1.500	.125	4	□	1
D3/32	.0938	.281	1.500	.125	4	●	1
D7/64	.1094	.328	1.500	.125	4	□	1
D1/8	.1250	.375	1.500	.125	4	□	2
D9/64	.1406	.500	2.000	.188	4	□	1
D5/32	.1562	.500	2.000	.188	4	●	1
D11/64	.1719	.563	2.000	.188	4	□	1
D3/16	.1875	.563	2.000	.188	4	●	2
D13/64	.2031	.625	2.500	.250	4	□	1
D7/32	.2187	.625	2.500	.250	4	□	1
D15/64	.2344	.750	2.500	.250	4	□	1
D1/4	.2500	.750	2.500	.250	4	●	2
D9/32	.2813	.750	2.500	.313	4	□	1
D5/16	.3125	.813	2.500	.313	4	●	2
D3/8	.3750	.875	2.500	.375	4	●	2
D7/16	.4375	1.000	2.750	.438	4	●	2
D1/2	.5000	1.000	3.000	.500	4	●	2
D9/16	.5625	1.125	3.500	.563	4	●	2
D5/8	.6250	1.250	3.500	.625	4	●	2
D3/4	.7500	1.500	4.000	.750	4	●	2
D7/8	.8750	1.500	4.000	.875	4	●	2
D1	1.000	1.500	4.000	1.000	4	□	2
D1-1/4	1.250	1.563	4.375	1.250	4	□	2

● : Inventory maintained. □ : Non stock, produced to order only.

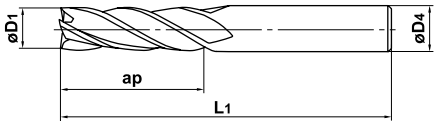
CUTTING CONDITIONS ➤ I214

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	.750≤D4≤1.000"	
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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS4LCD1/8	.1250	1.000	2.500	.125	4	●	1
D3/16	.1875	1.125	3.000	.188	4	●	1
D1/4	.2500	1.250	3.000	.250	4	●	1
D5/16	.3125	1.375	3.250	.313	4	□	1
D3/8	.3750	1.500	3.500	.375	4	●	1
D7/16	.4375	1.750	4.000	.438	4	□	1
D1/2	.5000	2.000	4.000	.500	4	●	1
D5/8	.6250	2.500	4.625	.625	4	●	1
D3/4	.7500	3.000	5.250	.750	4	●	1
D1	1.000	3.000	6.000	1.000	4	□	1

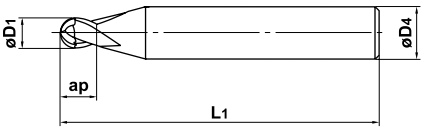
DIAMOND STAR END MILLS

DS2SB

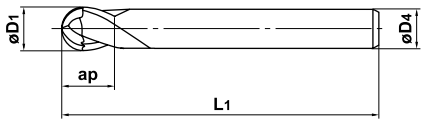
Ball nose, Short, 2 flute

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

D1≤.0156"	.0312"≤D1≤.2500"	D1>.2500"			
0 - .001"	0 - .002"	0 - .003"			
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	D4=.750"	
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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS2SBD1/64	.0156	.023	1.500	.125	2	●	1
D1/32	.0312	.063	1.500	.125	2	●	1
D3/64	.0469	.094	1.500	.125	2	●	1
D1/16	.0625	.125	1.500	.125	2	●	1
D3/32	.0938	.188	1.500	.125	2	●	1
D1/8	.1250	.250	1.500	.125	2	●	2
D9/64	.1406	.313	2.000	.188	2	□	1
D5/32	.1562	.313	2.000	.188	2	□	1
D11/64	.1719	.375	2.000	.188	2	□	1
D3/16	.1875	.375	2.000	.188	2	●	2
D13/64	.2031	.500	2.000	.250	2	□	1
D7/32	.2187	.500	2.000	.250	2	□	1
D15/64	.2344	.500	2.000	.250	2	□	1
D1/4	.2500	.500	2.000	.250	2	●	2
D5/16	.3125	.500	2.000	.313	2	□	2
D3/8	.3750	.563	2.000	.375	2	●	2
D7/16	.4375	.625	2.500	.438	2	□	2
D1/2	.5000	.625	2.500	.500	2	●	2
D5/8	.6250	.750	3.000	.625	2	●	2
D3/4	.7500	1.000	3.000	.750	2	●	2

● : Inventory maintained. □ : Non stock, produced to order only.

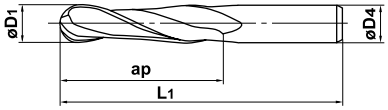
CUTTING CONDITIONS ➤ I215

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

$D_1 \leq .2500"$	$D_1 > .2500"$				
0 - .002"	0 - .003"				
$D_4 = .125"$	$D_4 = .188"$	$.250 \leq D_4 \leq .375"$	$.438 \leq D_4 \leq .625"$	$.750 \leq D_4 \leq 1.000"$	
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	Dia. **D1**	Length of Cut **ap**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
DS2LBD1/8	.1250	1.000	2.500	.125	2	●	1
D3/16	.1875	1.125	3.000	.188	2	●	1
D1/4	.2500	1.250	3.000	.250	2	●	1
D5/16	.3125	1.375	3.250	.313	2	□	1
D3/8	.3750	1.500	3.500	.375	2	●	1
D7/16	.4375	1.750	4.000	.438	2	□	1
D1/2	.5000	2.000	4.000	.500	2	●	1
D5/8	.6250	2.500	4.625	.625	2	●	1
D3/4	.7500	3.000	5.250	.750	2	●	1
D1	1.000	3.000	6.000	1.000	2	□	1

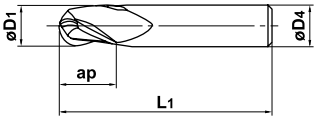
DIAMOND STAR END MILLS

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	D4=.750"	
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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS3SBD1/8	.1250	.250	1.500	.125	3	●	1
D3/16	.1875	.375	2.000	.188	3	●	1
D1/4	.2500	.500	2.000	.250	3	●	1
D5/16	.3125	.500	2.000	.313	3	□	1
D3/8	.3750	.563	2.000	.375	3	●	1
D7/16	.4375	.625	2.500	.438	3	□	1
D1/2	.5000	.625	2.500	.500	3	●	1
D5/8	.6250	.750	3.000	.625	3	●	1
D3/4	.7500	1.000	3.000	.750	3	●	1

● : Inventory maintained. □ : Non stock, produced to order only.

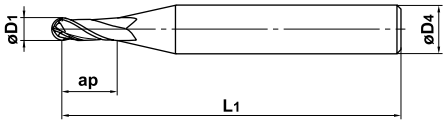
CUTTING CONDITIONS ➤ I215

DS4SB

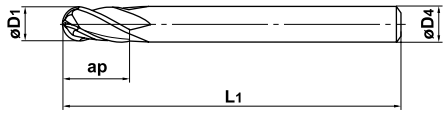
Ball nose, Short, 4 flute

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"≤D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	D4=.750"	
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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS4SBD1/32	.0312	.063	1.500	.125	4	●	1
D3/64	.0469	.094	1.500	.125	4	●	1
D1/16	.0625	.125	1.500	.125	4	●	1
D3/32	.0938	.188	1.500	.125	4	●	1
D1/8	.1250	.250	1.500	.125	4	●	2
D9/64	.1406	.313	2.000	.188	4	□	1
D5/32	.1562	.313	2.000	.188	4	□	1
D11/64	.1719	.375	2.000	.188	4	□	1
D3/16	.1875	.375	2.000	.188	4	●	2
D13/64	.2031	.500	2.000	.250	4	□	1
D7/32	.2187	.500	2.000	.250	4	□	1
D15/64	.2344	.500	2.000	.250	4	□	1
D1/4	.2500	.500	2.000	.250	4	●	2
D5/16	.3125	.500	2.000	.313	4	□	2
D3/8	.3750	.563	2.000	.375	4	●	2
D7/16	.4375	.625	2.500	.438	4	□	2
D1/2	.5000	.625	2.500	.500	4	●	2
D5/8	.6250	.750	3.000	.625	4	●	2
D3/4	.7500	1.000	3.000	.750	4	●	2

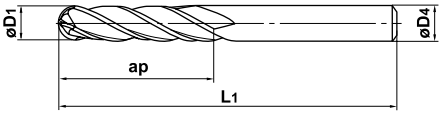
DIAMOND STAR END MILLS

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	.750≤D4≤1.000"	
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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS4LBD1/8	.1250	1.000	2.500	.125	4	●	1
D3/16	.1875	1.125	3.000	.188	4	●	1
D1/4	.2500	1.250	3.000	.250	4	●	1
D5/16	.3125	1.375	3.250	.313	4	□	1
D3/8	.3750	1.500	3.500	.375	4	●	1
D7/16	.4375	1.750	4.000	.438	4	□	1
D1/2	.5000	2.000	4.000	.500	4	●	1
D5/8	.6250	2.500	4.625	.625	4	●	1
D3/4	.7500	3.000	5.250	.750	4	●	1
D1	1.000	3.000	6.000	1.000	4	□	1

● : Inventory maintained. □ : Non stock, produced to order only.

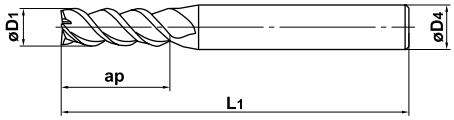
CUTTING CONDITIONS ➤ I215

DS3MHH60

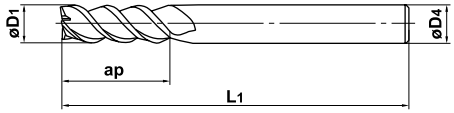
High helix, Medium, 3 flute

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	.750≤D4≤1.000"	
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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS3MHH60D1/8	.1250	.375	1.500	.125	3	●	2
D5/32	.1562	.500	2.000	.188	3	□	1
D3/16	.1875	.563	2.000	.188	3	●	2
D7/32	.2187	.625	2.500	.250	3	□	1
D1/4	.2500	.750	2.500	.250	3	●	2
D9/32	.2813	.750	2.500	.313	3	□	1
D5/16	.3125	.813	2.500	.313	3	□	2
D3/8	.3750	.875	2.500	.375	3	●	2
D7/16	.4375	1.000	2.750	.438	3	□	2
D1/2	.5000	1.000	3.000	.500	3	●	2
D9/16	.5625	1.125	3.500	.563	3	□	2
D5/8	.6250	1.250	3.500	.625	3	●	2
D3/4	.7500	1.500	4.000	.750	3	●	2
D7/8	.8750	1.500	4.000	.875	3	□	2
D1	1.000	1.500	4.000	1.000	3	□	2

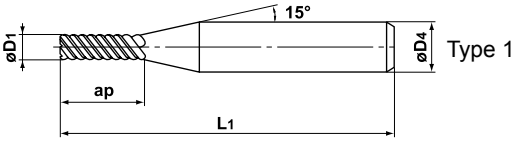
DIAMOND STAR END MILLS

DS6MHH60

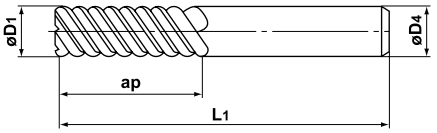
High helix, Medium, 6 flute

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	.750≤D4≤1.000"	
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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS6MHH60D1/8	.1250	.375	1.500	.125	6	●	2
D5/32	.1562	.500	2.000	.188	6	□	1
D3/16	.1875	.563	2.000	.188	6	●	2
D7/32	.2187	.625	2.500	.250	6	●	1
D1/4	.2500	.750	2.500	.250	6	●	2
D9/32	.2813	.750	2.500	.313	6	□	1
D5/16	.3125	.813	2.500	.313	6	□	2
D3/8	.3750	.875	2.500	.375	6	●	1
D7/16	.4375	1.000	2.750	.438	6	□	2
D1/2	.5000	1.000	3.000	.500	6	●	1
D9/16	.5625	1.125	3.500	.563	6	□	2
D5/8	.6250	1.250	3.500	.625	6	●	1
D3/4	.7500	1.500	4.000	.750	6	□	2
D7/8	.8750	1.500	4.000	.875	6	□	1
D1	1.000	1.500	4.000	1.000	6	□	2

● : Inventory maintained. □ : Non stock, produced to order only.

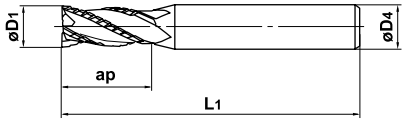
CUTTING CONDITIONS ➤ I214

DS4MC...CB

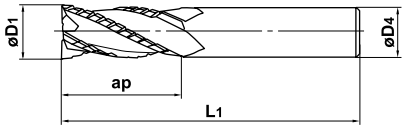
Chipbreaker, Medium, 4 flute

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	.750≤D4≤1.000"	
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"	

- 4 flute chipbreaker end mill.
- Helix angle 30°.

Unit : Inch

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS4MCD1/8CB	.1250	.375	1.500	.125	4	□	2
D5/32CB	.1562	.500	2.000	.188	4	□	1
D3/16CB	.1875	.563	2.000	.188	4	□	2
D7/32CB	.2187	.625	2.500	.250	4	□	1
D1/4CB	.2500	.750	2.500	.250	4	●	2
D9/32CB	.2813	.750	2.500	.313	4	□	1
D5/16CB	.3125	.813	2.500	.313	4	□	2
D3/8CB	.3750	.875	2.500	.375	4	●	2
D7/16CB	.4375	1.000	2.750	.438	4	□	2
D1/2CB	.5000	1.000	3.000	.500	4	●	2
D9/16CB	.5625	1.125	3.500	.563	4	□	2
D5/8CB	.6250	1.250	3.500	.625	4	●	2
D3/4CB	.7500	1.500	4.000	.750	4	□	2
D7/8CB	.8750	1.500	4.000	.875	4	□	2
D1CB	1.000	1.500	4.000	1.000	4	□	2

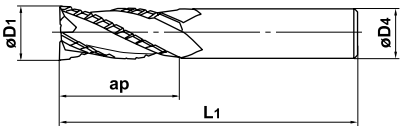
DIAMOND STAR END MILLS

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	.750≤D4≤1.000"	
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"	

- 4 flute chipbreaker end mill.
- Helix angle 30°.

Unit : Inch

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS4LCD1/8CB	.1250	1.000	2.500	.125	4	□	1
D3/16CB	.1875	1.125	3.000	.188	4	□	1
D1/4CB	.2500	1.250	3.000	.250	4	●	1
D5/16CB	.3125	1.375	3.250	.313	4	□	1
D3/8CB	.3750	1.500	3.500	.375	4	●	1
D7/16CB	.4375	1.750	4.000	.438	4	□	1
D1/2CB	.5000	2.000	4.000	.500	4	●	1
D5/8CB	.6250	2.500	4.625	.625	4	●	1
D3/4CB	.7500	3.000	5.250	.750	4	□	1
D1CB	1.000	3.000	6.000	1.000	4	□	1

● : Inventory maintained. □ : Non stock, produced to order only.

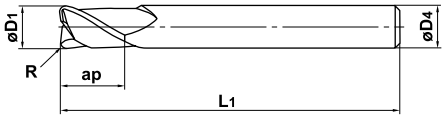
CUTTING CONDITIONS ➤ I214

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
D4=.125"	D4=.188"	.250≤D4≤.375"	.500≤D4≤.625"	D4=.750"	
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"	

- 2 flute radius end mill.
- General purpose.

Unit : Inch

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS2SRBD1/8R0.008	.1250	.008	.250	1.500	.125	2	●	1
D3/16R0.015	.1875	.015	.375	2.000	.188	2	●	1
D1/4R0.008	.2500	.008	.500	2.000	.250	2	●	1
D1/4R0.020	.2500	.020	.500	2.000	.250	2	●	1
D3/8R0.020	.3750	.020	.563	2.000	.375	2	●	1
D3/8R0.040	.3750	.040	.563	2.000	.375	2	●	1
D1/2R0.015	.5000	.015	.625	2.500	.500	2	●	1
D1/2R0.030	.5000	.030	.625	2.500	.500	2	●	1
D1/2R0.060	.5000	.060	.625	2.500	.500	2	●	1
D5/8R0.020	.6250	.020	.750	3.000	.625	2	●	1
D5/8R0.040	.6250	.040	.750	3.000	.625	2	●	1
D3/4R0.030	.7500	.030	1.000	3.000	.750	2	□	1
D3/4R0.060	.7500	.060	1.000	3.000	.750	2	□	1

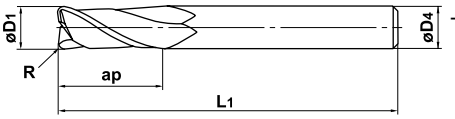
DIAMOND STAR END MILLS

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
D4=.125"	D4=.188"	.250≤D4≤.375"	.500≤D4≤.625"	D4=.750"	
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"	

- 2 flute radius end mill.
- General purpose.

Unit : Inch

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS2MRBD1/8R0.008	.1250	.008	.375	1.500	.125	2	●	1
D3/16R0.015	.1875	.015	.563	2.000	.188	2	●	1
D1/4R0.008	.2500	.008	.750	2.500	.250	2	●	1
D1/4R0.020	.2500	.020	.750	2.500	.250	2	●	1
D3/8R0.020	.3750	.020	.875	2.500	.375	2	●	1
D3/8R0.040	.3750	.040	.875	2.500	.375	2	●	1
D1/2R0.015	.5000	.015	1.000	3.000	.500	2	●	1
D1/2R0.030	.5000	.030	1.000	3.000	.500	2	●	1
D1/2R0.060	.5000	.060	1.000	3.000	.500	2	●	1
D5/8R0.020	.6250	.020	1.250	3.500	.625	2	●	1
D5/8R0.040	.6250	.040	1.250	3.500	.625	2	●	1
D3/4R0.030	.7500	.030	1.500	4.000	.750	2	□	1
D3/4R0.060	.7500	.060	1.500	4.000	.750	2	□	1

● : Inventory maintained. □ : Non stock, produced to order only.

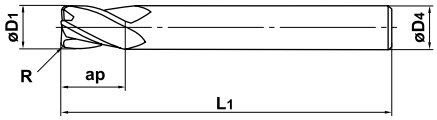
CUTTING CONDITIONS ➤ I214

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
D4=.125"	D4=.188"	.250≤D4≤.375"	.500≤D4≤.625"	D4=.750"	
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"	

- 4 flute radius end mill.
- General purpose.

Unit : Inch

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS4SRBD1/8R0.008	.1250	.008	.250	1.500	.125	4	●	1
D3/16R0.015	.1875	.015	.375	2.000	.188	4	●	1
D1/4R0.008	.2500	.008	.500	2.000	.250	4	●	1
D1/4R0.020	.2500	.020	.500	2.000	.250	4	●	1
D3/8R0.020	.3750	.020	.563	2.000	.375	4	●	1
D3/8R0.040	.3750	.040	.563	2.000	.375	4	●	1
D1/2R0.015	.5000	.015	.625	2.500	.500	4	●	1
D1/2R0.030	.5000	.030	.625	2.500	.500	4	●	1
D1/2R0.060	.5000	.060	.625	2.500	.500	4	●	1
D5/8R0.020	.6250	.020	.750	3.000	.625	4	●	1
D5/8R0.040	.6250	.040	.750	3.000	.625	4	●	1
D3/4R0.030	.7500	.030	1.000	3.000	.750	4	□	1
D3/4R0.060	.7500	.060	1.000	3.000	.750	4	□	1

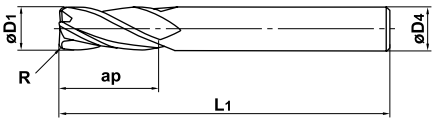
DIAMOND STAR END MILLS

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
D4=.125"	D4=.188"	.250≤D4≤.375"	.500≤D4≤.625"	D4=.750"	
0 - .00024"	0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"	

- 4 flute radius end mill.
- General purpose.

Unit : Inch

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS4MRBD1/8R0.008	.1250	.008	.375	1.500	.125	4	●	1
D3/16R0.015	.1875	.015	.563	2.000	.188	4	●	1
D1/4R0.008	.2500	.008	.750	2.500	.250	4	●	1
D1/4R0.020	.2500	.020	.750	2.500	.250	4	●	1
D3/8R0.020	.3750	.020	.875	2.500	.375	4	●	1
D3/8R0.040	.3750	.040	.875	2.500	.375	4	●	1
D1/2R0.015	.5000	.015	1.000	3.000	.500	4	●	1
D1/2R0.030	.5000	.030	1.000	3.000	.500	4	●	1
D1/2R0.060	.5000	.060	1.000	3.000	.500	4	●	1
D5/8R0.020	.6250	.020	1.250	3.500	.625	4	●	1
D5/8R0.040	.6250	.040	1.250	3.500	.625	4	●	1
D3/4R0.030	.7500	.030	1.500	4.000	.750	4	□	1
D3/4R0.060	.7500	.060	1.500	4.000	.750	4	□	1

● : Inventory maintained. □ : Non stock, produced to order only.

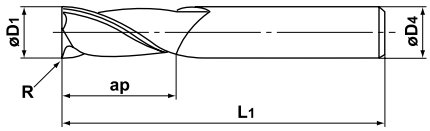
CUTTING CONDITIONS ➤ I214

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

0 - .003"					
D4=.188"	.250≤D4≤.375"	D4=.500"	.750≤D4≤1.000"		
0 - .00031"	0 - .00035"	0 - .00043"	0 - .00051"		

- 2 flute radius end mill for aluminum alloys.
- Helix angle 30°.

Unit : Inch

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS2SRBD3/16R0.008A2	.1875	.008	.250	2.000	.188	2	●	1
D1/4R0.011A2.5	.2500	.011	.313	2.500	.250	2	●	1
D3/8R0.015A2.5	.3750	.015	.500	2.500	.375	2	●	1
D3/8R0.015A3	.3750	.015	.500	3.000	.375	2	●	1
D3/8R0.015A4	.3750	.015	.500	4.000	.375	2	□	1
D1/2R0.020A3	.5000	.020	.625	3.000	.500	2	●	1
D1/2R0.020A4	.5000	.020	.625	4.000	.500	2	●	1
D1/2R0.020A5	.5000	.020	.625	5.000	.500	2	□	1
D3/4R0.030A4	.7500	.030	1.000	4.000	.750	2	●	1
D3/4R0.030A5	.7500	.030	1.000	5.000	.750	2	□	1
D3/4R0.030A6	.7500	.030	1.000	6.000	.750	2	□	1
D1R0.045A4	1.000	.045	1.250	4.000	1.000	2	□	1
D1R0.045A5	1.000	.045	1.250	5.000	1.000	2	□	1
D1R0.045A6	1.000	.045	1.250	6.000	1.000	2	□	1

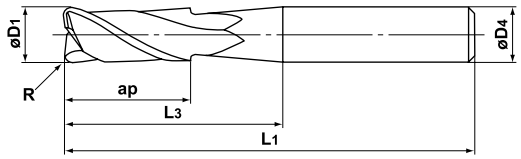
DIAMOND STAR END MILLS

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

0 -.003"					
D4=.188"	.250≤D4≤.375"	D4=.500"	.750≤D4≤1.000"		
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	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	Neck Length L3	No. of Flutes	Stock	Type
DS2SRBD3/16R0.008NA2	.1875	.008	.250	2.000	.188	.563	2	●	1
D1/4R0.011NA2.5	.2500	.011	.313	2.500	.250	.750	2	●	1
D3/8R0.015NA2.5	.3750	.015	.500	2.500	.375	.875	2	●	1
D3/8R0.015NA3	.3750	.015	.500	3.000	.375	1.375	2	●	1
D3/8R0.015NA4	.3750	.015	.500	4.000	.375	2.375	2	□	1
D1/2R0.020NA3	.5000	.020	.625	3.000	.500	1.125	2	●	1
D1/2R0.020NA4	.5000	.020	.625	4.000	.500	2.125	2	●	1
D1/2R0.020NA5	.5000	.020	.625	5.000	.500	3.125	2	●	1
D3/4R0.030NA4	.7500	.030	1.000	4.000	.750	1.875	2	●	1
D3/4R0.030NA5	.7500	.030	1.000	5.000	.750	2.875	2	□	1
D3/4R0.030NA6	.7500	.030	1.000	6.000	.750	3.875	2	□	1
D1R0.045NA4	1.000	.045	1.250	4.000	1.000	1.625	2	□	1
D1R0.045NA5	1.000	.045	1.250	5.000	1.000	2.625	2	□	1
D1R0.045NA6	1.000	.045	1.250	6.000	1.000	3.625	2	□	1

● : Inventory maintained. □ : Non stock, produced to order only.

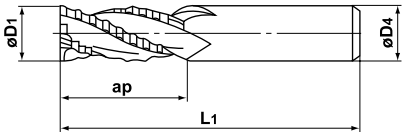
CUTTING CONDITIONS ➤ I214

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

0 - .005"					
.250≤D4≤.375"	D4=.500"	.750≤D4≤1.000"			
0 - .00035"	0 - .00043"	0 - .00051"			

- 3 flute rougher end mill for aluminum alloys.
- Helix angle 45°.

Unit : Inch

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS3MHRD1/4A	.2500	.750	2.500	.250	3	●	1
D3/8A	.3750	.875	2.500	.375	3	●	1
D1/2A	.5000	1.000	3.000	.500	3	●	1
D3/4A	.7500	1.500	4.000	.750	3	●	1
D1A	1.000	2.000	4.000	1.000	3	□	1

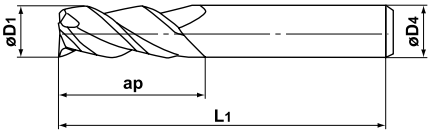
DIAMOND STAR END MILLS

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	D4=.750"	
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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS3SHD1/8SS	.1250	.250	1.500	.125	3	●	1
D3/16SS	.1875	.313	2.000	.188	3	●	1
D1/4SS	.2500	.375	2.000	.250	3	●	1
D5/16SS	.3125	.438	2.000	.313	3	□	1
D3/8SS	.3750	.500	2.000	.375	3	●	1
D7/16SS	.4375	.563	2.500	.438	3	□	1
D1/2SS	.5000	.625	2.500	.500	3	●	1
D5/8SS	.6250	.750	3.000	.625	3	●	1
D3/4SS	.7500	1.000	3.000	.750	3	□	1

● : Inventory maintained. □ : Non stock, produced to order only.

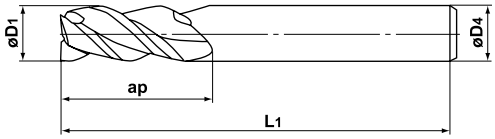
CUTTING CONDITIONS ➤ I214

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	D4=.750"	
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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS3MHD1/8SS	.1250	.375	1.500	.125	3	●	1
D3/16SS	.1875	.563	2.000	.188	3	●	1
D1/4SS	.2500	.750	2.500	.250	3	●	1
D5/16SS	.3125	.813	2.500	.313	3	□	1
D3/8SS	.3750	1.000	2.500	.375	3	●	1
D7/16SS	.4375	1.000	2.750	.438	3	□	1
D1/2SS	.5000	1.250	3.000	.500	3	●	1
D5/8SS	.6250	1.625	3.500	.625	3	●	1
D3/4SS	.7500	1.625	4.000	.750	3	□	1

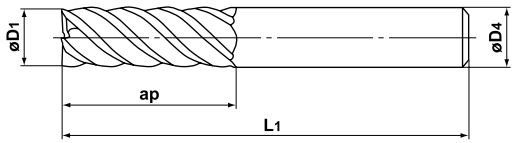
DIAMOND STAR END MILLS

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
.250≤D4≤.375"	.438≤D4≤.625"	D4=.750"			
0 - .00035"	0 - .00043"	0 - .00051"			

- 5 flute square end mill for stainless steel.
- Helix angle 45°.

Unit : Inch

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS5MHD1/4SS	.2500	.750	2.500	.250	5	●	1
D5/16SS	.3125	.813	2.500	.313	5	□	1
D3/8SS	.3750	1.000	2.500	.375	5	●	1
D7/16SS	.4375	1.000	2.750	.438	5	□	1
D1/2SS	.5000	1.250	3.000	.500	5	●	1
D5/8SS	.6250	1.625	3.500	.625	5	●	1
D3/4SS	.7500	1.625	4.000	.750	5	□	1

● : Inventory maintained. □ : Non stock, produced to order only.

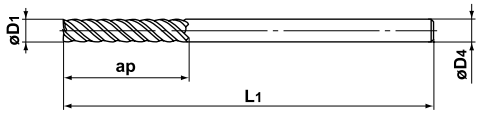
CUTTING CONDITIONS ➤ I214

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
.250≤D4≤.375"	.438≤D4≤.625"	D4=.750"			
0 - .00035"	0 - .00043"	0 - .00051"			

- 5 flute square end mill for stainless steel.
- Helix angle 45°.

Unit : Inch

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS5LHD1/4SS	.2500	1.250	4.000	.250	5	●	1
D5/16SS	.3125	1.250	4.000	.313	5	●	1
D3/8SS	.3750	1.500	4.000	.375	5	●	1
D7/16SS	.4375	2.000	4.000	.438	5	□	1
D1/2SS	.5000	2.000	4.000	.500	5	●	1
D5/8SS	.6250	2.500	5.000	.625	5	●	1
D3/4SS	.7500	3.250	6.000	.750	5	□	1

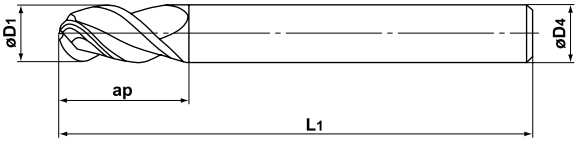
DIAMOND STAR END MILLS

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

D1≤.2500"	D1>.2500"			
0 - .002"	0 - .003"			
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	D4=.750"
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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS3SHBD1/8SS	.1250	.250	1.500	.125	3	●	1
D3/16SS	.1875	.313	2.000	.188	3	●	1
D1/4SS	.2500	.375	2.000	.250	3	●	1
D5/16SS	.3125	.438	2.000	.313	3	□	1
D3/8SS	.3750	.500	2.000	.375	3	●	1
D7/16SS	.4375	.563	2.500	.438	3	□	1
D1/2SS	.5000	.625	2.500	.500	3	●	1
D5/8SS	.6250	.750	3.000	.625	3	●	1
D3/4SS	.7500	1.000	3.000	.750	3	●	1

● : Inventory maintained. □ : Non stock, produced to order only.

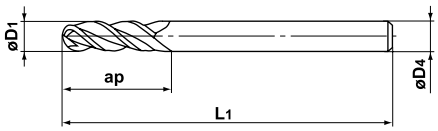
CUTTING CONDITIONS ➤ I215

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

D1≤.2500"	D1>.2500"			
0 - .002"	0 - .003"			
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	D4=.750"
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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS3MHBD1/8SS	.1250	.375	2.500	.125	3	●	1
D3/16SS	.1875	.563	2.000	.188	3	●	1
D1/4SS	.2500	.750	2.500	.250	3	●	1
D5/16SS	.3125	.813	2.500	.313	3	□	1
D3/8SS	.3750	1.000	2.500	.375	3	●	1
D7/16SS	.4375	1.000	2.750	.438	3	□	1
D1/2SS	.5000	1.250	3.000	.500	3	●	1
D5/8SS	.6250	1.625	3.500	.625	3	●	1
D3/4SS	.7500	1.625	4.000	.750	3	●	1

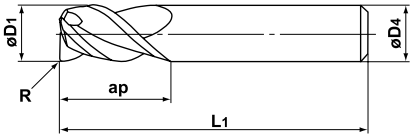
DIAMOND STAR END MILLS

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	D4=.750"	
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	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS3SHRBD1/8R0.008SS	.1250	.008	.250	1.500	.125	3	●	1
D3/16R0.008SS	.1875	.008	.313	2.000	.188	3	●	1
D1/4R0.015SS	.2500	.015	.375	2.000	.250	3	●	1
D5/16R0.015SS	.3125	.015	.438	2.000	.313	3	□	1
D3/8R0.020SS	.3750	.020	.500	2.000	.375	3	●	1
D7/16R0.020SS	.4375	.020	.563	1.500	.438	3	□	1
D1/2R0.030SS	.5000	.030	.625	1.500	.500	3	●	1
D5/8R0.030SS	.6250	.030	.750	3.000	.625	3	●	1
D3/4R0.035SS	.7500	.035	1.000	3.000	.750	3	●	1

● : Inventory maintained. □ : Non stock, produced to order only.

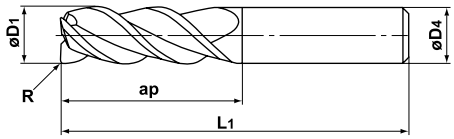
CUTTING CONDITIONS ➤ I214

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
D4=.125"	D4=.188"	.250≤D4≤.375"	.438≤D4≤.625"	D4=.750"	
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	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS3MHRBD1/8R0.008SS	.1250	.008	.375	1.500	.125	3	●	1
D3/16R0.008SS	.1875	.008	.563	2.000	.188	3	●	1
D1/4R0.015SS	.2500	.015	.750	2.500	.250	3	●	1
D5/16R0.015SS	.3125	.015	.813	2.500	.313	3	□	1
D3/8R0.020SS	.3750	.020	1.000	2.500	.375	3	●	1
D7/16R0.020SS	.4375	.020	1.000	2.750	.438	3	□	1
D1/2R0.030SS	.5000	.030	1.250	3.000	.500	3	●	1
D5/8R0.030SS	.6250	.030	1.625	3.500	.625	3	●	1
D3/4R0.035SS	.7500	.035	1.625	4.000	.750	3	□	1

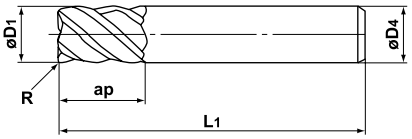
DIAMOND STAR END MILLS

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
.250≤D4≤.375"	.438≤D4≤.625"	D4=.750"			
0 - .00035"	0 - .00043"	0 - .00051"			

- 5 flute radius end mill for stainless steel.
- Helix angle 45°.

Unit : Inch

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS5SHRBD1/4R0.015SS	.2500	.015	.375	2.000	.250	5	●	1
D5/16R0.015SS	.3125	.015	.438	2.000	.313	5	□	1
D3/8R0.020SS	.3750	.020	.500	2.000	.375	5	●	1
D7/16R0.020SS	.4375	.020	.563	2.500	.438	5	□	1
D1/2R0.030SS	.5000	.030	.625	2.500	.500	5	●	1
D5/8R0.030SS	.6250	.030	.750	3.000	.625	5	●	1
D3/4R0.035SS	.7500	.035	1.000	3.000	.750	5	□	1

● : Inventory maintained. □ : Non stock, produced to order only.

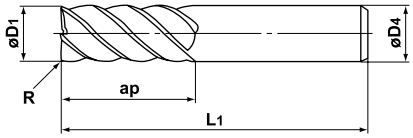
CUTTING CONDITIONS ➤ I214

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
.250≤D4≤.375"	.438≤D4≤.625"	D4=.750"			
0 - .00035"	0 - .00043"	0 - .00051"			

- 5 flute radius end mill for stainless steel.
- Helix angle 45°.

Unit : Inch

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS5MHRBD1/4R0.015SS	.2500	.015	.750	2.500	.250	5	●	1
D5/16R0.015SS	.3125	.015	.813	2.500	.313	5	●	1
D3/8R0.020SS	.3750	.020	1.000	2.500	.375	5	●	1
D7/16R0.020SS	.4375	.020	1.000	2.750	.438	5	□	1
D1/2R0.030SS	.5000	.030	1.250	3.000	.500	5	●	1
D5/8R0.030SS	.6250	.030	1.625	3.500	.625	5	●	1
D3/4R0.035SS	.7500	.035	1.625	4.000	.750	5	●	1

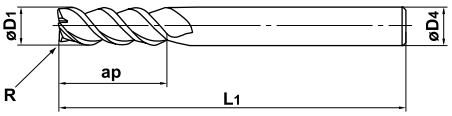
DIAMOND STAR END MILLS

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
D4=.125"	.250≤D4≤.375"	.500≤D4≤.625"			
0 - .00024"	0 - .00035"	0 - .00043"			

- 3 flute high helix radius end mill.
- Suitable for difficult-to-cut material.

Unit : Inch

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS3MHHRBD1/8R0.008	.1250	.008	.375	1.500	.125	3	●	1
D1/4R0.015	.2500	.015	.750	2.500	.250	3	●	1
D1/4R0.030	.2500	.030	.750	2.500	.250	3	●	1
D3/8R0.020	.3750	.020	.875	2.500	.375	3	●	1
D3/8R0.040	.3750	.040	.875	2.500	.375	3	●	1
D1/2R0.015	.5000	.015	1.000	3.000	.500	3	●	1
D1/2R0.030	.5000	.030	1.000	3.000	.500	3	●	1
D1/2R0.060	.5000	.060	1.000	3.000	.500	3	●	1
D5/8R0.030	.6250	.030	1.250	3.500	.625	3	●	1
D5/8R0.060	.6250	.060	1.250	3.500	.625	3	●	1

● : Inventory maintained.

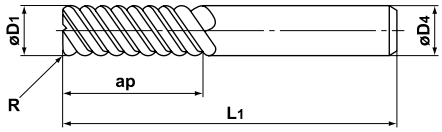
CUTTING CONDITIONS ➤ I214

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

D1≤.2500"	D1>.2500"				
0 - .002"	0 - .003"				
D4=.125"	.250≤D4≤.375"	.500≤D4≤.625"			
0 - .00024"	0 - .00035"	0 - .00043"			

- 6 flute high helix radius end mill.
- Suitable for difficult-to-cut material.

Unit : Inch

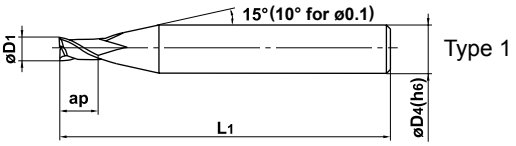
Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DS6MHHRBD1/8R0.008	.1250	.008	.375	1.500	.125	6	●	1
D1/4R0.015	.2500	.015	.750	2.500	.250	6	●	1
D1/4R0.030	.2500	.030	.750	2.500	.250	6	●	1
D3/8R0.020	.3750	.020	.875	2.500	.375	6	●	1
D3/8R0.040	.3750	.040	.875	2.500	.375	6	●	1
D1/2R0.015	.5000	.015	1.000	3.000	.500	6	●	1
D1/2R0.030	.5000	.030	1.000	3.000	.500	6	●	1
D1/2R0.060	.5000	.060	1.000	3.000	.500	6	●	1
D5/8R0.030	.6250	.030	1.250	3.500	.625	6	●	1
D5/8R0.060	.6250	.060	1.250	3.500	.625	6	●	1

MS2SS

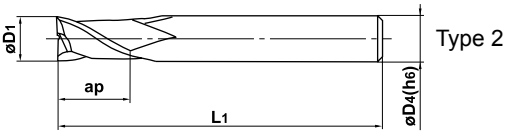
End mill, Short cut length, 2 flute

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
◎	◎	○		○	○		





Type 1



Type 2

D1=0.1	D1>0.1				
0 - 0.010	0 - 0.020				
4≤D4≤6	8≤D4≤10	D4=12			
0 - 0.008	0 - 0.009	0 - 0.011			

h6

● 2 flute end mill for general use.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS2SSD0010	0.1	0.15	40	4	2	★	1
D0020	0.2	0.3	40	4	2	★	1
D0030	0.3	0.45	40	4	2	★	1
D0040	0.4	0.6	40	4	2	★	1
D0050	0.5	0.75	40	4	2	★	1
D0060	0.6	0.9	40	4	2	★	1
D0070	0.7	1.1	40	4	2	★	1
D0080	0.8	1.2	40	4	2	★	1
D0090	0.9	1.4	40	4	2	★	1
D0100	1	1.5	40	4	2	★	1
D0120	1.2	1.8	40	4	2	★	1
D0150	1.5	2.3	40	4	2	★	1
D0180	1.8	2.7	40	4	2	★	1
D0200	2	3	40	4	2	★	1
D0250	2.5	3.8	40	4	2	★	1
D0300	3	4.5	45	6	2	★	1
D0400	4	6	50	6	2	★	1
D0500	5	7.5	50	6	2	★	1
D0600	6	9	50	6	2	★	2
D0700	7	10.5	60	8	2	★	1
D0800	8	12	60	8	2	★	2
D0900	9	13.5	70	10	2	★	1
D1000	10	15	70	10	2	★	2
D1100	11	16.5	75	12	2	★	1
D1200	12	18	75	12	2	★	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

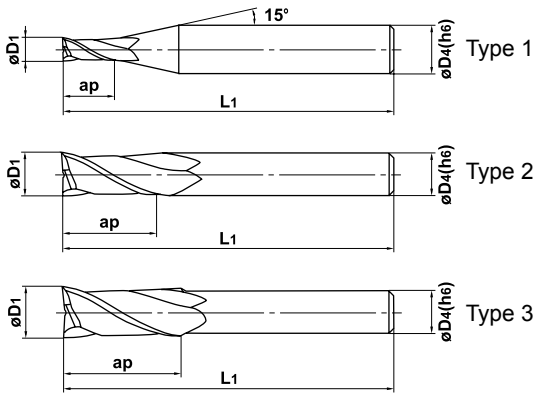
CUTTING CONDITIONS ➤ I216

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
◎	◎	○		○	○		





D1≤12	D1>12				
0 - 0.020	0 - 0.030				
4≤D4≤6	8≤D4≤10	12≤D4≤16	D4=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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS2MSD0020	0.2	0.4	40	4	2	●	1
D0030	0.3	0.6	40	4	2	●	1
D0040	0.4	0.8	40	4	2	●	1
D0050	0.5	1	40	4	2	●	1
D0060	0.6	1.2	40	4	2	●	1
D0070	0.7	1.4	40	4	2	●	1
D0080	0.8	1.6	40	4	2	●	1
D0090	0.9	1.8	40	4	2	●	1
D0100	1	2	40	4	2	●	1
D0110	1.1	2.2	40	4	2	●	1
D0120	1.2	2.4	40	4	2	●	1
D0130	1.3	2.6	40	4	2	●	1
D0140	1.4	2.8	40	4	2	●	1
D0150	1.5	3	40	4	2	●	1
D0160	1.6	3.2	40	4	2	●	1
D0170	1.7	3.4	40	4	2	●	1
D0180	1.8	3.6	40	4	2	●	1
D0190	1.9	3.8	40	4	2	●	1
D0200	2	4	40	4	2	●	1
D0210	2.1	4.2	40	4	2	●	1
D0220	2.2	4.4	40	4	2	●	1
D0230	2.3	4.6	40	4	2	●	1
D0240	2.4	4.8	40	4	2	●	1
D0250	2.5	5	40	4	2	●	1
D0260	2.6	5.2	40	4	2	●	1
D0270	2.7	5.4	40	4	2	●	1
D0280	2.8	5.6	40	4	2	●	1
D0290	2.9	5.8	40	4	2	●	1
D0300	3	6	45	6	2	●	1
D0310	3.1	6.2	45	6	2	★	1
D0320	3.2	6.4	45	6	2	★	1

CUTTING CONDITIONS ➤ I216

MS2MS

End mill, Medium cut length, 2 flute

Unit : mm

Order Number	Dia. D_1	Length of Cut ap	Overall Length L_1	Shank Dia. D_4	No. of Flutes	Stock	Type
MS2MSD0330	3.3	6.6	45	6	2	★	1
D0340	3.4	6.8	45	6	2	★	1
D0350	3.5	7	45	6	2	★	1
D0360	3.6	7.2	45	6	2	★	1
D0370	3.7	7.4	45	6	2	★	1
D0380	3.8	7.6	45	6	2	★	1
D0390	3.9	7.8	45	6	2	★	1
D0400	4	8	50	6	2	●	1
D0410	4.1	8.2	50	6	2	★	1
D0420	4.2	8.4	50	6	2	★	1
D0430	4.3	8.6	50	6	2	★	1
D0440	4.4	8.8	50	6	2	★	1
D0450	4.5	9	50	6	2	★	1
D0460	4.6	9.2	50	6	2	★	1
D0470	4.7	9.4	50	6	2	★	1
D0480	4.8	9.6	50	6	2	★	1
D0490	4.9	9.8	50	6	2	★	1
D0500	5	10	50	6	2	●	1
D0510	5.1	10.2	50	6	2	★	1
D0520	5.2	10.4	50	6	2	★	1
D0530	5.3	10.6	50	6	2	★	1
D0540	5.4	10.8	50	6	2	★	1
D0550	5.5	11	50	6	2	★	1
D0560	5.6	11.2	50	6	2	★	1
D0570	5.7	11.4	50	6	2	★	1
D0580	5.8	11.6	50	6	2	★	1
D0590	5.9	11.8	50	6	2	★	1
D0600	6	12	50	6	2	●	2
D0650	6.5	13	60	8	2	★	1
D0700	7	14	60	8	2	★	1
D0750	7.5	15	60	8	2	★	1
D0800	8	16	60	8	2	●	2
D0850	8.5	17	70	10	2	★	1
D0900	9	18	70	10	2	★	1
D0950	9.5	19	70	10	2	★	1
D1000	10	20	70	10	2	●	2
D1100	11	22	75	12	2	★	1
D1200	12	24	75	12	2	●	2
D1600	16	32	90	16	2	★	2
D1800	18	36	90	16	2	★	3
D2000	20	40	100	20	2	★	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

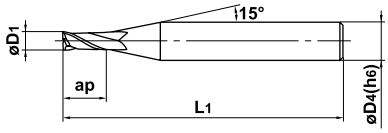
CUTTING CONDITIONS ➤ I216

MS2MD

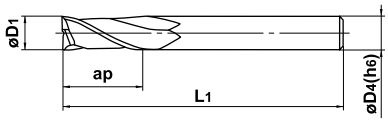
End mill, Medium cut length, 2 flute, Strong geometry type

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

0 - 0.020						
4≤D4≤6	8≤D4≤10	D4=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

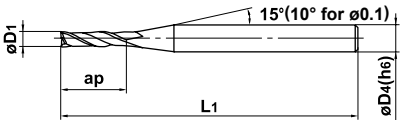
Order Number	Dia. **D1**	Length of Cut **ap**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
MS2MDD0100	1	2.5	40	4	2	★	1
D0150	1.5	3.8	40	4	2	★	1
D0200	2	5	40	4	2	★	1
D0250	2.5	6.3	40	4	2	★	1
D0300	3	7.5	50	6	2	★	1
D0400	4	10	50	6	2	★	1
D0500	5	12.5	50	6	2	★	1
D0600	6	15	50	6	2	★	2
D0800	8	20	60	8	2	★	2
D1000	10	25	70	10	2	★	2
D1200	12	30	90	12	2	★	2

MS2JS

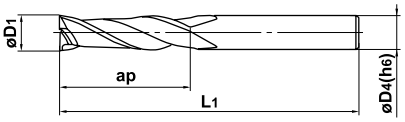
End mill, Semi long cut length, 2 flute

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
◎	◎	○		○	○		





Type 1



Type 2

h6

D1=0.1	D1>0.1				
0 - 0.010	0 - 0.020				
4≤D4≤6	8≤D4≤10	D4=12			
0 - 0.008	0 - 0.009	0 - 0.011			

● 2 flute end mill for general use.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS2JSD0010	0.1	0.3	40	4	2	●	1
D0020	0.2	0.6	40	4	2	●	1
D0030	0.3	0.9	40	4	2	●	1
D0040	0.4	1.2	40	4	2	●	1
D0050	0.5	1.5	40	4	2	●	1
D0060	0.6	1.8	40	4	2	●	1
D0070	0.7	2.1	40	4	2	●	1
D0080	0.8	2.4	40	4	2	●	1
D0090	0.9	2.7	40	4	2	●	1
D0100	1	3	40	4	2	●	1
D0120	1.2	3.6	40	4	2	●	1
D0150	1.5	4.5	40	4	2	●	1
D0180	1.8	5.4	40	4	2	●	1
D0200	2	6	40	4	2	●	1
D0250	2.5	7.5	40	4	2	●	1
D0300	3	9	45	6	2	●	1
D0400	4	12	50	6	2	●	1
D0500	5	15	50	6	2	●	1
D0600	6	18	50	6	2	●	2
D0800	8	24	70	8	2	●	2
D1000	10	30	90	10	2	●	2
D1200	12	36	90	12	2	●	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

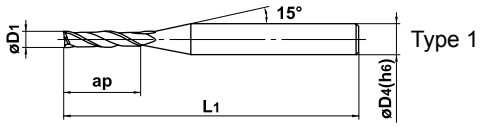
CUTTING CONDITIONS ➤ I218

MS2LS

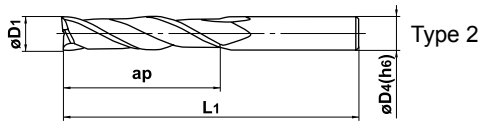
End mill, long cut length, 2 flute

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
◎	◎	○		○	○		





Type 1



Type 2

0 - 0.020					
4≤D4≤6	8≤D4≤10	D4=12			
0 - 0.008	0 - 0.009	0 - 0.011			

h6

● 2 flute end mill for general use.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS2LSD0020	0.2	0.8	40	4	2	★	1
D0030	0.3	1.2	40	4	2	★	1
D0040	0.4	1.6	40	4	2	★	1
D0050	0.5	2	40	4	2	★	1
D0060	0.6	2.4	40	4	2	★	1
D0070	0.7	2.8	40	4	2	★	1
D0080	0.8	3.2	40	4	2	★	1
D0090	0.9	3.6	40	4	2	★	1
D0100	1	4	40	4	2	★	1
D0150	1.5	6	40	4	2	★	1
D0200	2	8	40	4	2	★	1
D0250	2.5	10	50	4	2	★	1
D0300	3	12	50	6	2	★	1
D0400	4	16	50	6	2	★	1
D0500	5	20	60	6	2	★	1
D0600	6	24	60	6	2	★	2
D0800	8	32	70	8	2	★	2
D1000	10	40	90	10	2	★	2
D1200	12	48	110	12	2	★	2

MS2XL

End mill, Short cut length, 2 flute, Long neck





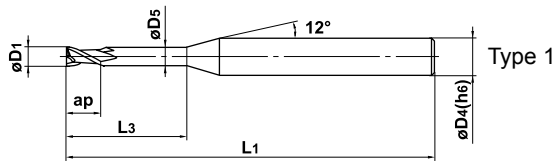


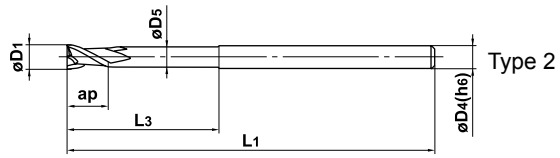





Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		









D1<0.5	D1≥0.5				
0 - 0.010	0 - 0.020				
4≤D4≤6					
0 - 0.008					

● 2 flute long neck end mill.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS2XLD0020N005	0.2	0.3	0.5	0.18	45	4	2	★	1
D0020N010	0.2	0.3	1	0.18	45	4	2	★	1
D0020N015	0.2	0.3	1.5	0.18	45	4	2	★	1
D0030N010	0.3	0.4	1	0.28	45	4	2	★	1
D0030N020	0.3	0.4	2	0.28	45	4	2	★	1
D0030N030	0.3	0.4	3	0.28	45	4	2	★	1
D0030N060	0.3	0.4	6	0.28	45	4	2	★	1
D0030N090	0.3	0.4	9	0.28	45	4	2	★	1
D0040N020	0.4	0.6	2	0.37	45	4	2	★	1
D0040N030	0.4	0.6	3	0.37	45	4	2	★	1
D0040N040	0.4	0.6	4	0.37	45	4	2	★	1
D0040N080	0.4	0.6	8	0.37	45	4	2	★	1
D0040N120	0.4	0.6	12	0.37	45	4	2	★	1
D0050N020	0.5	0.7	2	0.46	45	4	2	★	1
D0050N040	0.5	0.7	4	0.46	45	4	2	●	1
D0050N060	0.5	0.7	6	0.46	45	4	2	●	1
D0050N080	0.5	0.7	8	0.46	50	4	2	●	1
D0050N100	0.5	0.7	10	0.46	50	4	2	●	1
D0050N150	0.5	0.7	15	0.46	50	4	2	●	1
D0060N020	0.6	0.9	2	0.56	45	4	2	★	1
D0060N040	0.6	0.9	4	0.56	45	4	2	★	1
D0060N060	0.6	0.9	6	0.56	45	4	2	★	1
D0060N080	0.6	0.9	8	0.56	50	4	2	★	1
D0060N100	0.6	0.9	10	0.56	50	4	2	★	1
D0060N120	0.6	0.9	12	0.56	50	4	2	★	1
D0060N180	0.6	0.9	18	0.56	50	4	2	★	1
D0070N020	0.7	1	2	0.66	45	4	2	★	1
D0070N040	0.7	1	4	0.66	45	4	2	★	1
D0070N060	0.7	1	6	0.66	45	4	2	★	1
D0070N080	0.7	1	8	0.66	50	4	2	★	1
D0070N100	0.7	1	10	0.66	50	4	2	★	1

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

Order Number	Dia. D_1	Length of Cut ap	Neck Length L_3	Neck Dia. D_5	Overall Length L_1	Shank Dia. D_4	No. of Flutes	Stock	Type
MS2XLD0080N040	0.8	1.2	4	0.76	45	4	2	★	1
D0080N060	0.8	1.2	6	0.76	45	4	2	★	1
D0080N080	0.8	1.2	8	0.76	50	4	2	★	1
D0080N100	0.8	1.2	10	0.76	50	4	2	★	1
D0080N120	0.8	1.2	12	0.76	50	4	2	★	1
D0080N160	0.8	1.2	16	0.76	50	4	2	★	1
D0080N240	0.8	1.2	24	0.76	60	4	2	★	1
D0090N060	0.9	1.4	6	0.86	45	4	2	★	1
D0090N080	0.9	1.4	8	0.86	50	4	2	★	1
D0090N100	0.9	1.4	10	0.86	50	4	2	★	1
D0090N150	0.9	1.4	15	0.86	60	4	2	★	1
D0100N040	1	1.5	4	0.95	50	4	2	●	1
D0100N060	1	1.5	6	0.95	50	4	2	●	1
D0100N080	1	1.5	8	0.95	50	4	2	●	1
D0100N100	1	1.5	10	0.95	50	4	2	●	1
D0100N120	1	1.5	12	0.95	50	4	2	●	1
D0100N160	1	1.5	16	0.95	60	4	2	●	1
D0100N200	1	1.5	20	0.95	60	4	2	●	1
D0100N250	1	1.5	25	0.95	70	4	2	★	1
D0100N300	1	1.5	30	0.95	70	4	2	★	1
D0120N060	1.2	1.8	6	1.15	50	4	2	★	1
D0120N080	1.2	1.8	8	1.15	50	4	2	★	1
D0120N100	1.2	1.8	10	1.15	50	4	2	★	1
D0120N120	1.2	1.8	12	1.15	50	4	2	★	1
D0120N160	1.2	1.8	16	1.15	60	4	2	★	1
D0120N200	1.2	1.8	20	1.15	60	4	2	★	1
D0150N060	1.5	2.3	6	1.45	50	4	2	★	1
D0150N080	1.5	2.3	8	1.45	50	4	2	★	1
D0150N100	1.5	2.3	10	1.45	50	4	2	★	1
D0150N120	1.5	2.3	12	1.45	50	4	2	★	1
D0150N140	1.5	2.3	14	1.45	60	4	2	★	1
D0150N160	1.5	2.3	16	1.45	60	4	2	★	1
D0150N180	1.5	2.3	18	1.45	60	4	2	★	1
D0150N200	1.5	2.3	20	1.45	60	4	2	★	1
D0150N250	1.5	2.3	25	1.45	70	4	2	★	1
D0150N300	1.5	2.3	30	1.45	70	4	2	★	1
D0150N380	1.5	2.3	38	1.45	80	4	2	★	1
D0150N450	1.5	2.3	45	1.45	80	4	2	★	1
D0200N060	2	3	6	1.94	50	4	2	★	1
D0200N080	2	3	8	1.94	50	4	2	★	1
D0200N100	2	3	10	1.94	50	4	2	●	1
D0200N120	2	3	12	1.94	50	4	2	★	1
D0200N140	2	3	14	1.94	60	4	2	●	1
D0200N160	2	3	16	1.94	60	4	2	●	1
D0200N180	2	3	18	1.94	60	4	2	★	1
D0200N200	2	3	20	1.94	60	4	2	●	1
D0200N250	2	3	25	1.94	70	4	2	●	1
D0200N300	2	3	30	1.94	70	4	2	●	1
D0200N350	2	3	35	1.94	80	4	2	★	1
D0200N400	2	3	40	1.94	90	4	2	★	1
D0200N500	2	3	50	1.94	100	4	2	★	1

MS2XL

End mill, Short cut length, 2 flute, Long neck

Unit : mm

Order Number	Dia. D_1	Length of Cut ap	Neck Length L_3	Neck Dia. D_5	Overall Length L_1	Shank Dia. D_4	No. of Flutes	Stock	Type
MS2XLD0200N600	2	3	60	1.94	110	4	2	★	1
D0250N080	2.5	3.7	8	2.4	50	4	2	★	1
D0250N120	2.5	3.7	12	2.4	50	4	2	●	1
D0250N160	2.5	3.7	16	2.4	60	4	2	●	1
D0250N200	2.5	3.7	20	2.4	60	4	2	●	1
D0250N250	2.5	3.7	25	2.4	70	4	2	●	1
D0250N300	2.5	3.7	30	2.4	70	4	2	●	1
D0250N400	2.5	3.7	40	2.4	90	4	2	★	1
D0250N500	2.5	3.7	50	2.4	100	4	2	★	1
D0300N080	3	4.5	8	2.85	50	6	2	★	1
D0300N120	3	4.5	12	2.85	50	6	2	★	1
D0300N160	3	4.5	16	2.85	60	6	2	●	1
D0300N200	3	4.5	20	2.85	60	6	2	●	1
D0300N250	3	4.5	25	2.85	70	6	2	●	1
D0300N300	3	4.5	30	2.85	70	6	2	●	1
D0300N400	3	4.5	40	2.85	90	6	2	●	1
D0300N500	3	4.5	50	2.85	100	6	2	★	1
D0400N120	4	6	12	3.8	50	6	2	★	1
D0400N160	4	6	16	3.8	60	6	2	★	1
D0400N200	4	6	20	3.8	60	6	2	★	1
D0400N250	4	6	25	3.8	70	6	2	★	1
D0400N300	4	6	30	3.8	70	6	2	★	1
D0400N350	4	6	35	3.8	80	6	2	★	1
D0400N400	4	6	40	3.8	90	6	2	★	1
D0400N450	4	6	45	3.8	90	6	2	★	1
D0400N500	4	6	50	3.8	100	6	2	★	1
D0400N600	4	6	60	3.8	110	6	2	★	1
D0500N160	5	7.5	16	4.8	60	6	2	●	1
D0500N250	5	7.5	25	4.8	70	6	2	●	1
D0500N350	5	7.5	35	4.8	80	6	2	●	1
D0500N500	5	7.5	50	4.8	110	6	2	●	1
D0500N600	5	7.5	60	4.8	120	6	2	★	1
D0600N200	6	9	20	5.8	80	6	2	★	2
D0600N300	6	9	30	5.8	90	6	2	★	2
D0600N400	6	9	40	5.8	100	6	2	★	2
D0600N500	6	9	50	5.8	110	6	2	★	2
D0600N600	6	9	60	5.8	120	6	2	★	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

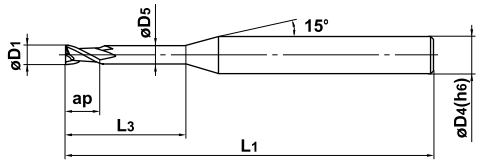
CUTTING CONDITIONS ➤ I220

MS2XL6

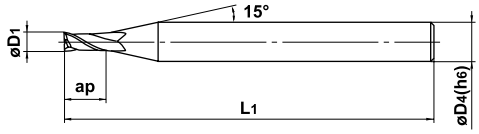
End mill, Short cut length, 2 flute, 6mm shank

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

h6	0 - 0.020					
	D4=6					
	0 - 0.008					

- 2 flute long neck end mill.
- ϕ6 shank type.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS2XL6D0030N008	0.3	0.8	—	—	50	6	2	●	2
D0030N015	0.3	0.5	1.5	0.27	50	6	2	●	1
D0040N010	0.4	0.6	1	0.36	50	6	2	●	1
D0040N020	0.4	0.6	2	0.36	50	6	2	●	1
D0050N013	0.5	0.8	1.3	0.46	50	6	2	●	1
D0050N025	0.5	0.8	2.5	0.46	50	6	2	●	1
D0060N015	0.6	0.9	1.5	0.56	50	6	2	●	1
D0060N030	0.6	0.9	3	0.56	50	6	2	●	1
D0070N018	0.7	1.1	1.8	0.66	50	6	2	●	1
D0070N035	0.7	1.1	3.5	0.66	50	6	2	●	1
D0080N020	0.8	1.2	2	0.76	50	6	2	●	1
D0080N040	0.8	1.2	4	0.76	50	6	2	●	1
D0090N023	0.9	1.4	2.3	0.86	50	6	2	●	1
D0090N045	0.9	1.4	4.5	0.86	50	6	2	●	1
D0100N025	1	1.5	2.5	0.94	50	6	2	●	1
D0100N050	1	1.5	5	0.94	50	6	2	●	1
D0110N028	1.1	1.7	2.8	1.04	50	6	2	●	1
D0110N055	1.1	1.7	5.5	1.04	50	6	2	●	1
D0120N030	1.2	1.8	3	1.14	50	6	2	●	1
D0120N060	1.2	1.8	6	1.14	50	6	2	●	1
D0130N033	1.3	2	3.3	1.24	50	6	2	●	1
D0130N065	1.3	2	6.5	1.24	50	6	2	●	1
D0140N035	1.4	2.1	3.5	1.34	50	6	2	●	1
D0140N070	1.4	2.1	7	1.34	50	6	2	●	1
D0150N038	1.5	2.3	3.8	1.44	50	6	2	●	1
D0150N075	1.5	2.3	7.5	1.44	50	6	2	●	1
D0160N040	1.6	2.4	4	1.54	50	6	2	●	1
D0160N080	1.6	2.4	8	1.54	50	6	2	●	1
D0170N043	1.7	2.6	4.3	1.64	50	6	2	●	1
D0170N085	1.7	2.6	8.5	1.64	50	6	2	●	1
D0180N045	1.8	2.7	4.5	1.74	50	6	2	●	1

CUTTING CONDITIONS ➤ I221

MS2XL6

End mill, Short cut length, 2 flute, 6mm shank

Unit : mm

Order Number	Dia. D_1	Length of Cut ap	Neck Length L_3	Neck Dia. D_5	Overall Length L_1	Shank Dia. D_4	No. of Flutes	Stock	Type
MS2XL6D0180N090	1.8	2.7	9	1.74	50	6	2	●	1
D0190N048	1.9	2.9	4.8	1.84	50	6	2	●	1
D0190N095	1.9	2.9	9.5	1.84	50	6	2	●	1
D0200N050	2	3	5	1.90	50	6	2	●	1
D0200N100	2	3	10	1.90	50	6	2	●	1
D0210N053	2.1	3.2	5.3	2.00	50	6	2	●	1
D0210N105	2.1	3.2	10.5	2.00	60	6	2	●	1
D0220N055	2.2	3.3	5.5	2.10	50	6	2	●	1
D0220N110	2.2	3.3	11	2.10	60	6	2	●	1
D0230N058	2.3	3.5	5.8	2.20	50	6	2	●	1
D0230N115	2.3	3.5	11.5	2.20	60	6	2	●	1
D0240N060	2.4	3.6	6	2.30	50	6	2	●	1
D0240N120	2.4	3.6	12	2.30	60	6	2	●	1
D0250N063	2.5	3.8	6.3	2.40	50	6	2	●	1
D0250N125	2.5	3.8	12.5	2.40	60	6	2	●	1

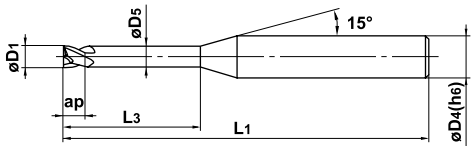
● : Inventory maintained.

CUTTING CONDITIONS ➤ I221

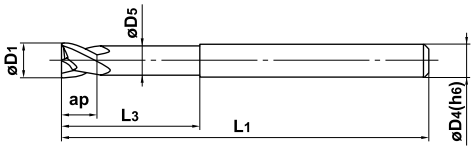
MS2XL – Inch sizes

Square, 2 flute, Long neck





Type 1



Type 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
◎	◎	○		○	○		

0 - .0008"					
D4=.1250"	D4=.1875"	D4=.2500"			
0 - .00024"	0 - .00031"	0 - .00035"			

h6

● 2 flute, long neck, square end mill for general purpose.

Unit : inch

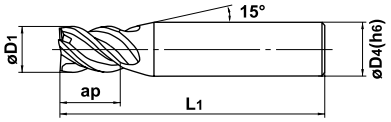
Order Number	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS2XLD1/64N0094	.0156	.0156	.0938	.0144	2.0	.1250	2	●	1
D1/64N0125	.0156	.0156	.1250	.0144	2.0	.1250	2	●	1
D1/64N0187	.0156	.0156	.1875	.0144	2.0	.1250	2	●	1
D1/32N0187	.0313	.0313	.1875	.0301	2.0	.1250	2	●	1
D1/32N0250	.0313	.0313	.2500	.0301	2.0	.1250	2	●	1
D1/32N0375	.0313	.0313	.3750	.0301	2.0	.1250	2	●	1
D1/16N0375	.0625	.0625	.3750	.0601	2.0	.1250	2	●	1
D1/16N0500	.0625	.0625	.5000	.0601	2.0	.1250	2	●	1
D1/16N0750	.0625	.0625	.7500	.0601	2.0	.1250	2	●	1
D3/32N0562	.0938	.0938	.5625	.0898	2.0	.1250	2	●	1
D3/32N0750	.0938	.0938	.7500	.0898	2.0	.1250	2	●	1
D3/32N1125	.0938	.0938	1.1250	.0898	2.5	.1250	2	●	1
D1/8N0750	.1250	.1250	.7500	.1211	2.0	.1250	2	●	2
D3/16N1125	.1875	.1875	1.1250	.1836	2.5	.1875	2	●	2
D1/4N1500	.2500	.2500	1.5000	.2441	3.0	.2500	2	●	2

MSSHD

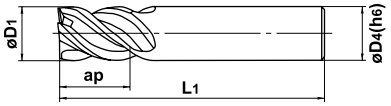
High power, Short cut length, 4 flute

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
◎	◎	○		◎	◎		

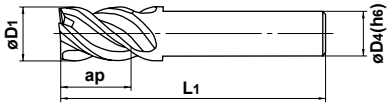




Type 1



Type 2



Type 3

h6

D1≤12	D1>12				
0 - 0.020	0 - 0.030				
D4=6	8≤D4≤10	12≤D4≤16	D4=20		
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013		

● 4 flute high power end mill.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MSSHDD0300	3	4.5	45	6	4	★	1
D0350	3.5	5.3	45	6	4	★	1
D0400	4	6	45	6	4	★	1
D0450	4.5	6.8	45	6	4	★	1
D0500	5	7.5	50	6	4	★	1
D0550	5.5	8.3	50	6	4	★	1
D0600	6	9	50	6	4	★	2
D0650	6.5	9.8	60	8	4	★	1
D0700	7	10.5	60	8	4	★	1
D0750	7.5	11.3	60	8	4	★	1
D0800	8	12	60	8	4	★	2
D0850	8.5	12.8	70	10	4	★	1
D0900	9	13.5	70	10	4	★	1
D0950	9.5	14.3	70	10	4	★	1
D1000	10	15	70	10	4	★	2
D1100	11	16.5	75	12	4	★	1
D1200	12	18	75	12	4	★	2
D1300	13	19.5	75	12	4	★	3
D1400	14	21	90	16	4	★	1
D1500	15	22.5	90	16	4	★	1
D1600	16	24	90	16	4	★	2
D1700	17	25.5	100	16	4	★	3
D1800	18	27	100	16	4	★	3
D1900	19	28.5	110	20	4	★	1
D2000	20	30	110	20	4	★	2

★ : Inventory maintained in Japan.

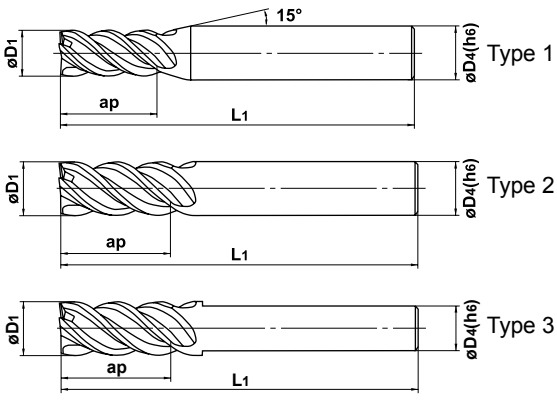
CUTTING CONDITIONS ➤ I225

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
◎	◎	○		◎	◎		





D1≤12	D1>12				
0 - 0.020	0 - 0.030				
4≤D4≤6	8≤D4≤10	12≤D4≤16	20≤D4≤25		
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013		

h6

● 4 flute high power end mill.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MSMHDD0200	2	4	45	4	4	★	1
D0210	2.1	5	45	4	4	★	1
D0220	2.2	5	45	4	4	★	1
D0230	2.3	5	45	4	4	★	1
D0240	2.4	5	45	4	4	★	1
D0250	2.5	5	45	4	4	★	1
D0260	2.6	6	45	4	4	★	1
D0270	2.7	6	45	4	4	★	1
D0280	2.8	6	45	4	4	★	1
D0290	2.9	6	45	4	4	★	1
D0300	3	8	45	6	4	★	1
D0310	3.1	8	45	6	4	★	1
D0320	3.2	8	45	6	4	★	1
D0330	3.3	8	45	6	4	★	1
D0340	3.4	8	45	6	4	★	1
D0350	3.5	8	45	6	4	★	1
D0360	3.6	11	45	6	4	★	1
D0370	3.7	11	45	6	4	★	1
D0380	3.8	11	45	6	4	★	1
D0390	3.9	11	45	6	4	★	1
D0400	4	11	45	6	4	★	1
D0410	4.1	12	45	6	4	★	1
D0420	4.2	12	45	6	4	★	1
D0430	4.3	12	45	6	4	★	1
D0440	4.4	12	45	6	4	★	1
D0450	4.5	12	45	6	4	★	1
D0460	4.6	13	50	6	4	★	1
D0470	4.7	13	50	6	4	★	1
D0480	4.8	13	50	6	4	★	1
D0490	4.9	13	50	6	4	★	1
D0500	5	13	50	6	4	★	1

MSMHD

High power, Medium cut length, 4 flute

Unit : mm

Order Number	Dia. **D1**	Length of Cut **ap**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
MSMHDD0510	5.1	13	50	6	4	★	1
D0520	5.2	13	50	6	4	★	1
D0530	5.3	13	50	6	4	★	1
D0540	5.4	13	50	6	4	★	1
D0550	5.5	13	50	6	4	★	1
D0560	5.6	13	50	6	4	★	1
D0570	5.7	13	50	6	4	★	1
D0580	5.8	13	50	6	4	★	1
D0590	5.9	13	50	6	4	★	1
D0600	6	13	50	6	4	★	2
D0650	6.5	16	60	8	4	★	1
D0700	7	19	60	8	4	★	1
D0750	7.5	19	60	8	4	★	1
D0800	8	19	60	8	4	★	2
D0850	8.5	19	70	10	4	★	1
D0900	9	22	70	10	4	★	1
D0950	9.5	22	70	10	4	★	1
D1000	10	22	70	10	4	★	2
D1100	11	26	75	12	4	★	1
D1200S10	12	26	75	10	4	★	3
D1200	12	26	75	12	4	★	2
D1300	13	26	75	12	4	★	3
D1400	14	30	90	16	4	★	1
D1500	15	35	90	16	4	★	1
D1600	16	35	90	16	4	★	2
D1700	17	35	100	16	4	★	3
D1800	18	40	100	16	4	★	3
D1900	19	40	110	20	4	★	1
D2000	20	45	110	20	4	★	2
D2200	22	50	125	20	4	★	3
D2500	25	55	125	25	4	★	2

★ : Inventory maintained in Japan.

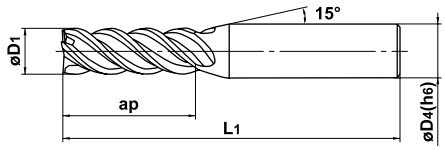
CUTTING CONDITIONS ➤ I225

MSJHD

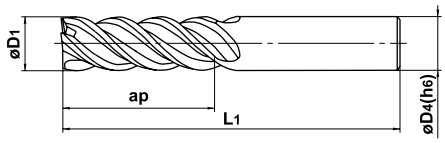
High power, Semi long cut length, 4 flute

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

h6

D1≤12	D1>12				
0 - 0.020	0 - 0.030				
D4=6	8≤D4≤10	12≤D4≤16	D4=20		
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013		

● 4 flute high power end mill.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MSJHDD0200	2	8	60	6	4	★	1
D0250	2.5	10	60	6	4	★	1
D0300	3	12	60	6	4	★	1
D0350	3.5	14	60	6	4	★	1
D0400	4	16	60	6	4	★	1
D0450	4.5	18	60	6	4	★	1
D0500	5	20	60	6	4	★	1
D0600	6	24	60	6	4	★	2
D0700	7	25	80	8	4	★	1
D0800	8	28	80	8	4	★	2
D0900	9	32	90	10	4	★	1
D1000	10	35	90	10	4	★	2
D1100	11	35	100	12	4	★	1
D1200	12	36	100	12	4	★	2
D1400	14	42	110	16	4	★	1
D1500	15	45	110	16	4	★	1
D1600	16	48	125	16	4	★	2
D2000	20	55	140	20	4	★	2

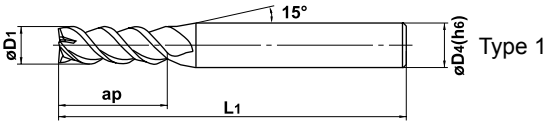
MSTAR END MILLS

MSMHZD

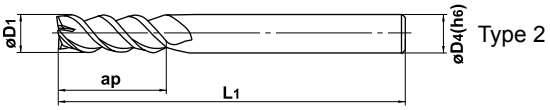
End mill, Medium cut length, 3 flute for drilling and slotting

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
◎	◎	○		◎	○		

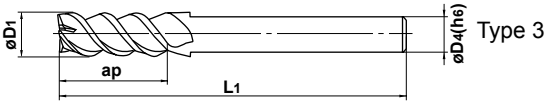




Type 1



Type 2



Type 3

D1≤12	D1>12				
0 - 0.020	0 - 0.030				
4≤D4≤6	8≤D4≤10	12≤D4≤16	D4=20		
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013		

h6

● 3 flute end mill for both drilling and slotting.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MSMHZDD0100	1	2	45	4	3	★	1
D0150	1.5	3	45	4	3	★	1
D0200	2	4	50	6	3	●	1
D0250	2.5	5	50	6	3	●	1
D0300	3	6	50	6	3	●	1
D0350	3.5	8	50	6	3	●	1
D0400	4	8	50	6	3	●	1
D0450	4.5	10	50	6	3	●	1
D0500	5	10	50	6	3	●	1
D0550	5.5	13	50	6	3	●	1
D0600	6	13	60	6	3	●	2
D0650	6.5	16	60	8	3	●	1
D0700	7	16	60	8	3	●	1
D0750	7.5	16	60	8	3	●	1
D0800	8	19	70	8	3	●	2
D0850	8.5	19	70	10	3	●	1
D0900	9	19	70	10	3	●	1
D0950	9.5	19	70	10	3	●	1
D1000	10	22	80	10	3	●	2
D1100	11	22	80	12	3	●	1
D1200	12	26	90	12	3	●	2
D1300	13	26	90	12	3	●	3
D1400	14	26	90	12	3	●	3
D1500	15	26	110	16	3	●	1
D1600	16	30	110	16	3	●	2
D2000	20	32	140	20	3	●	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

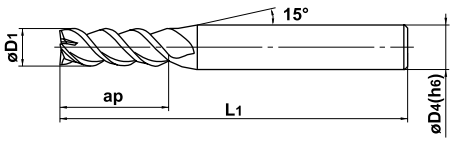
CUTTING CONDITIONS ➤ I227

MSMHZD – Inch sizes

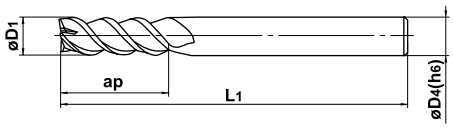
End mill, Medium cut length, 3 flute for drilling and slotting

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

D1<.5000"	D1≥.5000"				
0 - .0008"	0 - .0012"				
.250≤D4≤.375"	.500≤D4≤.625"	D4=.750"			
0 - .00035"	0 - .00043"	0 - .00051"			

● 3 flute end mill for both drilling and slotting.

Unit : inch

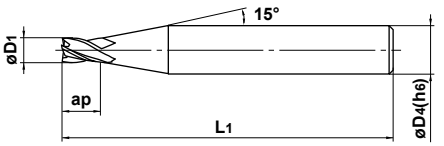
Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MSMHZDD1/16	.0625	.125	2.000	.250	3	●	1
D5/64	.0781	.156	2.000	.250	3	●	1
D3/32	.0938	.188	2.000	.250	3	●	1
D7/64	.1094	.250	2.000	.250	3	●	1
D1/8	.1250	.313	2.000	.250	3	●	2
D5/32	.1563	.313	2.000	.250	3	●	1
D3/16	.1875	.406	2.000	.250	3	●	1
D7/32	.2188	.406	2.000	.250	3	●	1
D1/4	.2500	.625	2.500	.250	3	●	2
D9/32	.2813	.625	2.500	.375	3	●	1
D5/16	.3125	.750	2.750	.375	3	●	1
D11/32	.3438	.750	2.750	.375	3	●	2
D3/8	.3750	.750	3.000	.375	3	●	2
D13/32	.4060	.875	3.000	.500	3	●	1
D7/16	.4380	.875	3.000	.500	3	●	1
D15/32	.4690	1.000	3.500	.500	3	●	2
D1/2	.5000	1.000	3.500	.500	3	●	2
D9/16	.5630	1.000	3.500	.625	3	●	1
D5/8	.6250	1.125	4.250	.625	3	●	2
D3/4	.7500	1.250	5.500	.750	3	●	1

MS4SC

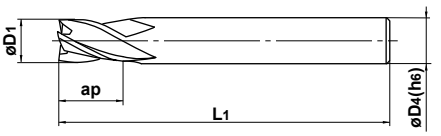
End mill, Short cut length, 4 flute

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

0 - 0.020					
4≤D4≤6	8≤D4≤10	D4=12			
0 - 0.008	0 - 0.009	0 - 0.011			

h6

● 4 flute end mill for general use.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS4SCD0100	1	1.5	40	4	4	★	1
D0150	1.5	2.3	40	4	4	★	1
D0200	2	3	40	4	4	★	1
D0250	2.5	3.8	40	4	4	★	1
D0300	3	4.5	50	6	4	★	1
D0400	4	6	50	6	4	★	1
D0500	5	7.5	50	6	4	★	1
D0600	6	9	50	6	4	★	2
D0800	8	12	60	8	4	★	2
D1000	10	15	70	10	4	★	2
D1200	12	18	75	12	4	★	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

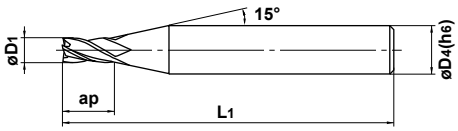
CUTTING CONDITIONS ➤ I229

MS4MC

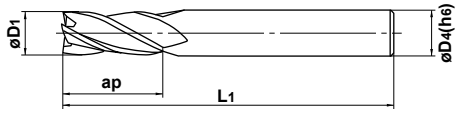
End mill, Medium cut length, 4 flute

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
◎	◎	○		○	○		

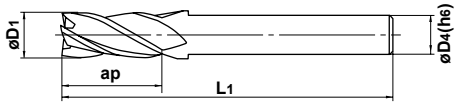




Type 1



Type 2



Type 3

D1≤12	D1>12				
0 - 0.020	0 - 0.030				
4≤D4≤6	8≤D4≤10	12≤D4≤16	D4=20		
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013		

h6

● 4 flute end mill for general use.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS4MCD0100	1	2.5	40	4	4	●	1
D0150	1.5	3.8	40	4	4	●	1
D0200	2	5	40	4	4	●	1
D0250	2.5	6.3	40	4	4	●	1
D0300	3	7.5	50	6	4	●	1
D0350	3.5	9	50	6	4	★	1
D0400	4	10	50	6	4	●	1
D0450	4.5	11.5	50	6	4	★	1
D0500	5	12.5	50	6	4	●	1
D0550	5.5	14	50	6	4	★	1
D0600	6	15	50	6	4	●	2
D0650	6.5	16.5	60	8	4	★	1
D0700	7	17.5	60	8	4	★	1
D0750	7.5	19	60	8	4	★	1
D0800	8	20	60	8	4	●	2
D0850	8.5	21.5	70	10	4	★	1
D0900	9	22.5	70	10	4	★	1
D0950	9.5	24	70	10	4	★	1
D1000	10	25	70	10	4	●	2
D1100	11	27.5	75	12	4	★	1
D1200	12	30	90	12	4	●	2
D1400	14	35	90	12	4	★	3
D1600	16	40	100	16	4	★	2
D1800	18	45	100	16	4	★	3
D2000	20	50	110	20	4	★	2

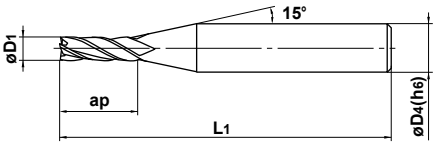
MS4JC

End mill, Semi long cut length, 4 flute

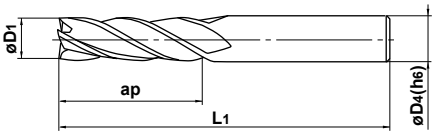


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





Type 1



Type 2

0 - 0.020					
4≤D4≤6	8≤D4≤10	D4=12			
0 - 0.008	0 - 0.009	0 - 0.011			

h6

●4 flute end mill for general use.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS4JCD0100	1	4	40	4	4	●	1
D0150	1.5	6	40	4	4	●	1
D0200	2	8	40	4	4	●	1
D0250	2.5	10	50	4	4	●	1
D0300	3	12	50	6	4	●	1
D0400	4	16	50	6	4	●	1
D0500	5	20	60	6	4	●	1
D0600	6	24	60	6	4	●	2
D0800	8	32	70	8	4	●	2
D1000	10	40	90	10	4	●	2
D1200	12	48	110	12	4	●	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

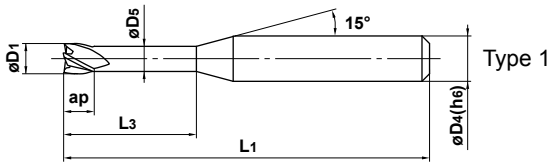
CUTTING CONDITIONS ➤I230

MS4XL

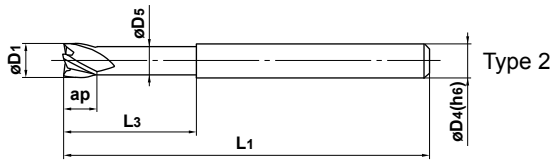
End mill, Short cut length, 4 flute, Long neck

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

0 - 0.020					
4≤D4≤6	8≤D4≤10				
0 - 0.008	0 - 0.009				

h6

● 4 flute long neck end mill.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS4XLD0100N040	1	1	4	0.94	50	4	4	★	1
D0100N060	1	1	6	0.94	50	4	4	★	1
D0100N080	1	1	8	0.94	50	4	4	★	1
D0100N100	1	1	10	0.94	50	4	4	★	1
D0100N120	1	1	12	0.94	50	4	4	★	1
D0100N160	1	1	16	0.94	60	4	4	★	1
D0110N060	1.1	1.1	6	1.04	50	4	4	★	1
D0110N100	1.1	1.1	10	1.04	50	4	4	★	1
D0110N160	1.1	1.1	16	1.04	60	4	4	★	1
D0120N060	1.2	1.2	6	1.14	50	4	4	★	1
D0120N080	1.2	1.2	8	1.14	50	4	4	★	1
D0120N100	1.2	1.2	10	1.14	50	4	4	★	1
D0120N120	1.2	1.2	12	1.14	50	4	4	★	1
D0120N160	1.2	1.2	16	1.14	60	4	4	★	1
D0130N060	1.3	1.3	6	1.24	50	4	4	★	1
D0130N120	1.3	1.3	12	1.24	50	4	4	★	1
D0130N180	1.3	1.3	18	1.24	60	4	4	★	1
D0140N060	1.4	1.4	6	1.34	50	4	4	★	1
D0140N080	1.4	1.4	8	1.34	50	4	4	★	1
D0140N100	1.4	1.4	10	1.34	50	4	4	★	1
D0140N120	1.4	1.4	12	1.34	50	4	4	★	1
D0140N140	1.4	1.4	14	1.34	60	4	4	★	1
D0140N160	1.4	1.4	16	1.34	60	4	4	★	1
D0140N220	1.4	1.4	22	1.34	60	4	4	★	1
D0150N060	1.5	1.5	6	1.44	50	4	4	★	1
D0150N080	1.5	1.5	8	1.44	50	4	4	★	1
D0150N100	1.5	1.5	10	1.44	50	4	4	★	1
D0150N120	1.5	1.5	12	1.44	50	4	4	★	1
D0150N140	1.5	1.5	14	1.44	60	4	4	★	1
D0150N160	1.5	1.5	16	1.44	60	4	4	★	1
D0150N180	1.5	1.5	18	1.44	60	4	4	★	1

CUTTING CONDITIONS ➤ I222

MS4XL

End mill, Short cut length, 4 flute, Long neck

Unit : mm

Order Number	Dia. D_1	Length of Cut ap	Neck Length L_3	Neck Dia. D_5	Overall Length L_1	Shank Dia. D_4	No. of Flutes	Stock	Type
MS4XLD0150N200	1.5	1.5	20	1.44	60	4	4	★	1
D0160N060	1.6	1.6	6	1.54	50	4	4	★	1
D0160N080	1.6	1.6	8	1.54	50	4	4	★	1
D0160N100	1.6	1.6	10	1.54	50	4	4	★	1
D0160N120	1.6	1.6	12	1.54	50	4	4	★	1
D0160N140	1.6	1.6	14	1.54	60	4	4	★	1
D0160N160	1.6	1.6	16	1.54	60	4	4	★	1
D0160N180	1.6	1.6	18	1.54	60	4	4	★	1
D0160N200	1.6	1.6	20	1.54	60	4	4	★	1
D0160N260	1.6	1.6	26	1.54	70	4	4	★	1
D0170N060	1.7	1.7	6	1.64	50	4	4	★	1
D0170N140	1.7	1.7	14	1.64	60	4	4	★	1
D0170N240	1.7	1.7	24	1.64	70	4	4	★	1
D0180N060	1.8	1.8	6	1.74	50	4	4	★	1
D0180N080	1.8	1.8	8	1.74	50	4	4	★	1
D0180N100	1.8	1.8	10	1.74	50	4	4	★	1
D0180N120	1.8	1.8	12	1.74	50	4	4	★	1
D0180N140	1.8	1.8	14	1.74	60	4	4	★	1
D0180N160	1.8	1.8	16	1.74	60	4	4	★	1
D0180N180	1.8	1.8	18	1.74	60	4	4	★	1
D0180N200	1.8	1.8	20	1.74	60	4	4	★	1
D0180N250	1.8	1.8	25	1.74	70	4	4	★	1
D0190N060	1.9	1.9	6	1.84	50	4	4	★	1
D0190N160	1.9	1.9	16	1.84	60	4	4	★	1
D0190N280	1.9	1.9	28	1.84	70	4	4	★	1
D0200N060	2	2	6	1.9	50	4	4	★	1
D0200N080	2	2	8	1.9	50	4	4	★	1
D0200N100	2	2	10	1.9	50	4	4	★	1
D0200N120	2	2	12	1.9	50	4	4	★	1
D0200N140	2	2	14	1.9	60	4	4	★	1
D0200N160	2	2	16	1.9	60	4	4	★	1
D0200N180	2	2	18	1.9	60	4	4	★	1
D0200N200	2	2	20	1.9	60	4	4	★	1
D0200N250	2	2	25	1.9	70	4	4	★	1
D0200N300	2	2	30	1.9	70	4	4	★	1
D0250N080	2.5	2.5	8	2.4	50	4	4	★	1
D0250N120	2.5	2.5	12	2.4	50	4	4	★	1
D0250N160	2.5	2.5	16	2.4	60	4	4	★	1
D0250N200	2.5	2.5	20	2.4	60	4	4	★	1
D0250N250	2.5	2.5	25	2.4	70	4	4	★	1
D0300N080	3	3	8	2.9	50	6	4	★	1
D0300N120	3	3	12	2.9	50	6	4	★	1
D0300N160	3	3	16	2.9	60	6	4	★	1
D0300N200	3	3	20	2.9	60	6	4	★	1
D0300N250	3	3	25	2.9	70	6	4	★	1
D0300N300	3	3	30	2.9	70	6	4	★	1
D0350N150	3.5	3.5	15	3.4	60	6	4	★	1
D0350N250	3.5	3.5	25	3.4	70	6	4	★	1
D0350N350	3.5	3.5	35	3.4	80	6	4	★	1
D0400N120	4	4	12	3.9	50	6	4	★	1
D0400N160	4	4	16	3.9	60	6	4	★	1

★ : Inventory maintained in Japan.

Unit : mm

Order Number	Dia. D_1	Length of Cut ap	Neck Length L_3	Neck Dia. D_5	Overall Length L_1	Shank Dia. D_4	No. of Flutes	Stock	Type
MS4XLD0400N200	4	4	20	3.9	60	6	4	★	1
D0400N250	4	4	25	3.9	70	6	4	★	1
D0400N300	4	4	30	3.9	70	6	4	★	1
D0400N350	4	4	35	3.9	80	6	4	★	1
D0400N400	4	4	40	3.9	90	6	4	★	1
D0400N450	4	4	45	3.9	90	6	4	★	1
D0400N500	4	4	50	3.9	100	6	4	★	1
D0500N160	5	5	16	4.9	60	6	4	★	1
D0500N250	5	5	25	4.9	70	6	4	★	1
D0500N350	5	5	35	4.9	80	6	4	★	1
D0500N500	5	5	50	4.9	110	6	4	★	1
D0600N200	6	6	20	5.85	80	6	4	★	2
D0600N300	6	6	30	5.85	90	6	4	★	2
D0600N400	6	6	40	5.85	100	6	4	★	2
D0600N500	6	6	50	5.85	110	6	4	★	2
D0800N300	8	8	30	7.85	90	8	4	★	2
D0800N500	8	8	50	7.85	110	8	4	★	2
D0800N700	8	8	70	7.85	130	8	4	★	2
D1000N400	10	10	40	9.7	100	10	4	★	2
D1000N600	10	10	60	9.7	120	10	4	★	2
D1000N800	10	10	80	9.7	140	10	4	★	2

MS4XL – Inch sizes

Square, 4 flute, Long neck





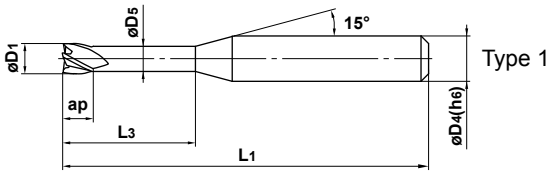




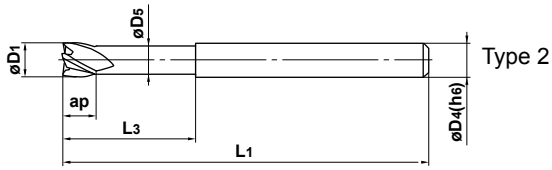



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





Type 1



Type 2

0 -.0008"					
D4=.1250"	D4=.1875"	D4=.2500"			
0 -.00024"	0 -.00031"	0 -.00035"			

h6

● 4 flute, long neck, square end mill for general purpose.

Unit : inch

Order Number	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS4XLD1/16N0375	.0625	.0625	.3750	.0601	2.0	.1250	4	●	1
D1/16N0500	.0625	.0625	.5000	.0601	2.0	.1250	4	●	1
D1/16N0750	.0625	.0625	.7500	.0601	2.0	.1250	4	●	1
D3/32N0562	.0938	.0938	.5625	.0898	2.0	.1250	4	●	1
D3/32N0750	.0938	.0938	.7500	.0898	2.0	.1250	4	●	1
D3/32N1125	.0938	.0938	1.1250	.0898	2.5	.1250	4	●	1
D1/8N0750	.1250	.1250	.7500	.1211	2.0	.1250	4	●	2
D3/16N1125	.1875	.1875	1.1250	.1836	2.5	.1875	4	●	2
D1/4N1500	.2500	.2500	1.5000	.2441	3.0	.2500	4	●	2

● : Inventory maintained.

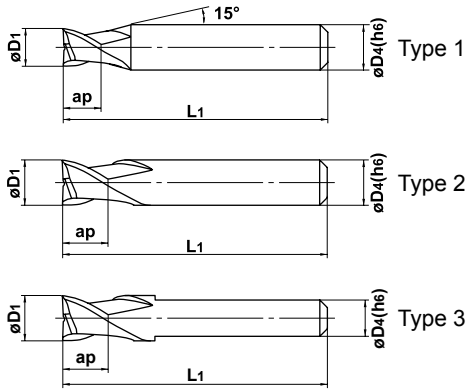
CUTTING CONDITIONS ➤ I224

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
◎	◎	○		○	○		





h6	0 -0.020					
	4≤D4≤6	7≤D4≤10				
	0 -0.008	0 -0.009				

● 2 flute end mill.

Overall length 35mm

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS2ESD0300L35S04	3	3	35	4	2	●	1
D0350L35S04	3.5	3.5	35	4	2	●	1
D0400L35S04	4	4	35	4	2	●	2
D0500L35S05	5	5	35	5	2	●	2
D0500L35S06	5	5	35	6	2	●	1
D0600L35S05	6	6	35	5	2	●	3
D0600L35S06	6	6	35	6	2	●	2
D0700L35S07	7	6	35	7	2	●	2
D0800L35S07	8	6	35	7	2	●	3
D0800L35S08	8	6	35	8	2	●	2
D1000L35S07	10	6	35	7	2	●	3
D1000L35S10	10	6	35	10	2	●	2
D1200L35S10	12	6	35	10	2	●	3

Overall length 45mm

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS2ESD0300L45S04	3	3	45	4	2	●	1
D0350L45S04	3.5	3.5	45	4	2	●	1
D0400L45S04	4	4	45	4	2	●	2
D0500L45S06	5	5	45	6	2	●	1
D0600L45S06	6	6	45	6	2	●	2
D0700L45S07	7	7	45	7	2	●	2
D0800L45S07	8	8	45	7	2	●	3
D0800L45S08	8	8	45	8	2	●	2
D1000L45S07	10	10	45	7	2	●	3
D1000L45S10	10	10	45	10	2	●	2
D1200L45S10	12	12	45	10	2	●	3

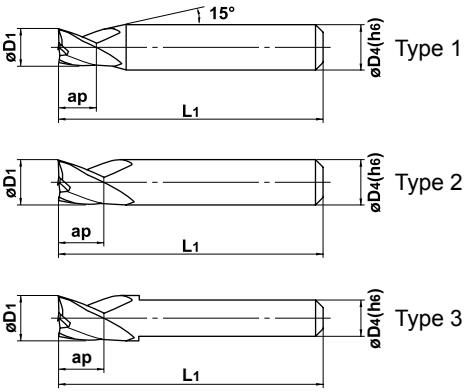
MSTAR END MILLS

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
◎	◎	○		○	○		





0 - 0.020					
4≤D4≤6	7≤D4≤10				
0 - 0.008	0 - 0.009				

h6

● 3 flute end mill.

Overall length 35mm

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS3ESD0300L35S04	3	3	35	4	3	●	1
D0350L35S04	3.5	3.5	35	4	3	●	1
D0400L35S04	4	4	35	4	3	●	2
D0500L35S05	5	5	35	5	3	●	2
D0500L35S06	5	5	35	6	3	●	1
D0600L35S05	6	6	35	5	3	●	3
D0600L35S06	6	6	35	6	3	●	2
D0700L35S07	7	6	35	7	3	●	2
D0800L35S07	8	6	35	7	3	●	3
D0800L35S08	8	6	35	8	3	●	2
D1000L35S07	10	6	35	7	3	●	3
D1000L35S10	10	6	35	10	3	●	2
D1200L35S10	12	6	35	10	3	●	3

Overall length 45mm

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS3ESD0300L45S04	3	3	45	4	3	●	1
D0350L45S04	3.5	3.5	45	4	3	●	1
D0400L45S04	4	4	45	4	3	●	2
D0500L45S06	5	5	45	6	3	●	1
D0600L45S06	6	6	45	6	3	●	2
D0700L45S07	7	7	45	7	3	●	2
D0800L45S07	8	8	45	7	3	●	3
D0800L45S08	8	8	45	8	3	●	2
D1000L45S07	10	10	45	7	3	●	3
D1000L45S10	10	10	45	10	3	●	2
D1200L45S10	12	12	45	10	3	●	3

● : Inventory maintained.

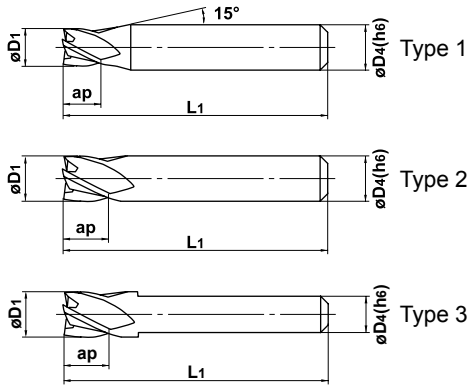
CUTTING CONDITIONS ➤ I231

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
◎	◎	○		○	○		





D1≤12	D1>12				
0 - 0.020	0 - 0.030				
4≤D4≤6	7≤D4≤10				
0 - 0.008	0 - 0.009				

h6

●4 flute end mill.

Overall length 35mm

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS4ECD0300L35S04	3	3	35	4	4	●	1
D0350L35S04	3.5	3.5	35	4	4	●	1
D0400L35S04	4	4	35	4	4	●	2
D0500L35S05	5	5	35	5	4	●	2
D0500L35S06	5	5	35	6	4	●	1
D0600L35S05	6	6	35	5	4	●	3
D0600L35S06	6	6	35	6	4	●	2
D0700L35S07	7	6	35	7	4	●	2
D0800L35S07	8	6	35	7	4	●	3
D0800L35S08	8	6	35	8	4	●	2
D1000L35S07	10	6	35	7	4	●	3
D1000L35S10	10	6	35	10	4	●	2
D1200L35S10	12	6	35	10	4	●	3

Overall length 45mm

Unit : mm

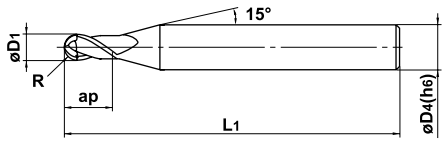
Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS4ECD0300L45S04	3	3	45	4	4	●	1
D0350L45S04	3.5	3.5	45	4	4	●	1
D0400L45S04	4	4	45	4	4	●	2
D0500L45S06	5	5	45	6	4	●	1
D0600L45S06	6	6	45	6	4	●	2
D0700L45S07	7	7	45	7	4	●	2
D0800L45S07	8	8	45	7	4	●	3
D0800L45S08	8	8	45	8	4	●	2
D1000L45S07	10	10	45	7	4	●	3
D1000L45S10	10	10	45	10	4	●	2
D1200L45S10	12	12	45	10	4	●	3
D1400L45S10	14	14	45	10	4	●	3

MS2SB

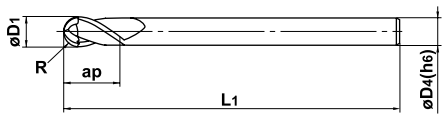
Ball nose end mill, Short cut length, 2 flute

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						
	±0.01					
	0 - 0.020					
h6	4≤D4≤6	8≤D4≤10	D4=12			
	0 - 0.008	0 - 0.009	0 - 0.011			

● 2 flute ball nose end mill for general use.

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS2SBR0010S04	0.1	0.2	0.3	45	4	2	●	1
R0010S06	0.1	0.2	0.3	50	6	2	●	1
R0015S04	0.15	0.3	0.5	45	4	2	●	1
R0015S06	0.15	0.3	0.5	50	6	2	●	1
R0020S04	0.2	0.4	0.6	45	4	2	●	1
R0020S06	0.2	0.4	0.6	50	6	2	●	1
R0025S04	0.25	0.5	0.8	45	4	2	●	1
R0025S06	0.25	0.5	0.8	50	6	2	●	1
R0030S04	0.3	0.6	0.9	45	4	2	●	1
R0030S06	0.3	0.6	0.9	50	6	2	●	1
R0035S04	0.35	0.7	1.1	45	4	2	●	1
R0040S04	0.4	0.8	1.2	45	4	2	●	1
R0040S06	0.4	0.8	1.2	50	6	2	●	1
R0045S04	0.45	0.9	1.4	45	4	2	●	1
R0050S04	0.5	1	1.5	45	4	2	●	1
R0050S06	0.5	1	1.5	50	6	2	●	1
R0060S04	0.6	1.2	1.8	45	4	2	●	1
R0060S06	0.6	1.2	1.8	50	6	2	●	1
R0070S04	0.7	1.4	2.1	45	4	2	●	1
R0070S06	0.7	1.4	2.1	50	6	2	●	1
R0075S04	0.75	1.5	2.3	45	4	2	●	1
R0075S06	0.75	1.5	2.3	50	6	2	●	1
R0080S04	0.8	1.6	2.4	45	4	2	●	1
R0080S06	0.8	1.6	2.4	50	6	2	●	1
R0090S04	0.9	1.8	2.7	45	4	2	●	1
R0090S06	0.9	1.8	2.7	50	6	2	●	1
R0100S04	1	2	3	50	4	2	●	1
R0100S06	1	2	3	50	6	2	●	1
R0125S04	1.25	2.5	3.8	50	4	2	●	1
R0125S06	1.25	2.5	3.8	50	6	2	●	1
R0150S06	1.5	3	4.5	70	6	2	●	1

● : Inventory maintained.

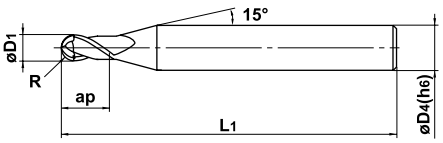
Order Number	Radius of Ball Nose **R**	Dia. **D_1**	Length of Cut **ap**	Overall Length **L_1**	Shank Dia. **D_4**	No. of Flutes	Stock	Type
MS2SBR0200S06	2	4	6	70	6	2	●	1
R0250S06	2.5	5	7.5	80	6	2	●	1
R0300S06	3	6	9	80	6	2	●	2
R0400S08	4	8	12	90	8	2	●	2
R0500S10	5	10	15	100	10	2	●	2
R0600S12	6	12	18	110	12	2	●	2

MS2MB

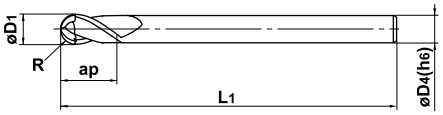
Ball nose end mill, Medium cut length, 2 flute

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						
	±0.01					
	0 - 0.020					
h6	D4=3	4≤D4≤6	8≤D4≤10	D4=12		
	0 - 0.006	0 - 0.008	0 - 0.009	0 - 0.011		

● 2 flute ball nose end mill for general use.

Unit : mm

Order Number	Radius of Ball Nose **R**	Dia. **D1**	Length of Cut **ap**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
MS2MBR0025	0.25	0.5	1	45	4	2	●	1
R0030	0.3	0.6	1.2	45	4	2	●	1
R0040	0.4	0.8	1.6	45	4	2	●	1
R0050	0.5	1	2.5	45	4	2	●	1
R0060	0.6	1.2	2.5	45	4	2	●	1
R0070	0.7	1.4	3	45	4	2	●	1
R0075	0.75	1.5	4	45	4	2	●	1
R0080	0.8	1.6	4	45	4	2	●	1
R0090	0.9	1.8	5	45	4	2	●	1
R0100	1	2	6	50	4	2	●	1
R0125	1.25	2.5	6	50	4	2	●	1
R0150S03	1.5	3	8	70	3	2	★	2
R0150	1.5	3	8	70	6	2	●	1
R0175	1.75	3.5	8	70	6	2	●	1
R0200S04	2	4	8	70	4	2	★	2
R0200	2	4	8	70	6	2	●	1
R0250	2.5	5	12	80	6	2	●	1
R0300	3	6	12	80	6	2	●	2
R0400	4	8	14	90	8	2	●	2
R0500	5	10	18	100	10	2	●	2
R0600	6	12	22	110	12	2	●	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

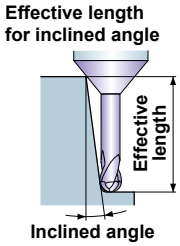
CUTTING CONDITIONS ➤ I232

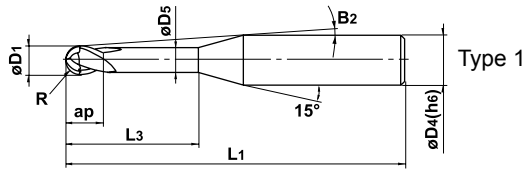
MS2XLB

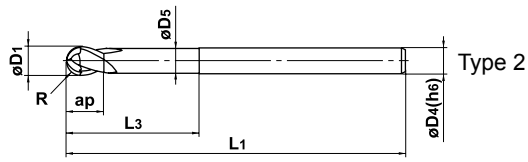
Ball nose end mill, Short cut length, 2 flute, Long neck

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				
	±0.01			
	0 - 0.020			
h6	4≤D4≤6			
	0 - 0.008			

● 2 flute long neck ball nose end mill.

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	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
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
R0010N008S06	0.1	0.2	0.2	0.8	0.17	14.1°	50	6	2	●	1	0.8	0.8	0.9	1
R0010N010	0.1	0.2	0.2	1	0.17	13.3°	50	4	2	●	1	1	1.1	1.2	1.3
R0010N010S06	0.1	0.2	0.2	1	0.17	13.8°	50	6	2	★	1	1	1.1	1.2	1.3
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
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
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
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
R0010N018	0.1	0.2	0.2	1.75	0.17	12.2°	50	4	2	★	1	1.8	1.9	2	2.2
R0010N018S06	0.1	0.2	0.2	1.75	0.17	13.1°	50	6	2	★	1	1.8	1.9	2	2.2
R0010N020	0.1	0.2	0.2	2	0.17	11.9°	50	4	2	★	1	2.1	2.2	2.3	2.5
R0010N020S06	0.1	0.2	0.2	2	0.17	12.8°	50	6	2	★	1	2.1	2.2	2.3	2.5
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
R0010N030	0.1	0.2	0.2	3	0.17	10.7°	50	4	2	★	1	3.1	3.2	3.5	3.7
R0015N008S06	0.15	0.3	0.3	0.8	0.27	14.1°	50	6	2	●	1	0.8	0.8	0.9	1
R0015N010	0.15	0.3	0.3	1	0.27	13.3°	50	4	2	●	1	1	1.1	1.2	1.3
R0015N010S06	0.15	0.3	0.3	1	0.27	13.9°	50	6	2	★	1	1	1.1	1.2	1.3
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
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
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
R0015N020	0.15	0.3	0.3	2	0.27	11.9°	50	4	2	●	1	2.1	2.2	2.3	2.5
R0015N020S06	0.15	0.3	0.3	2	0.27	12.8°	50	6	2	★	1	2.1	2.2	2.3	2.5
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
R0015N030	0.15	0.3	0.3	3	0.27	10.7°	50	4	2	★	1	3.1	3.2	3.5	3.7
R0015N040	0.15	0.3	0.3	4	0.27	9.7°	50	4	2	★	1	4.2	4.3	4.6	5
R0020N010	0.2	0.4	0.4	1	0.36	13.4°	50	4	2	●	1	1	1	1.1	1.2
R0020N010S06	0.2	0.4	0.4	1	0.36	13.9°	50	6	2	★	1	1	1	1.1	1.2
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
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
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

MSTAR END MILLS

MS2XLB

Ball nose end mill, Short cut length, 2 flute, Long neck

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	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
R0020N020S06	0.2	0.4	0.4	2	0.36	12.8°	50	6	2	●	1	2	2.1	2.3	2.5
R0020N025	0.2	0.4	0.4	2.5	0.36	11.2°	50	4	2	★	1	2.6	2.7	2.9	3.1
R0020N025S06	0.2	0.4	0.4	2.5	0.36	12.4°	50	6	2	★	1	2.6	2.7	2.9	3.1
R0020N030	0.2	0.4	0.4	3	0.36	10.7°	50	4	2	●	1	3.1	3.2	3.4	3.7
R0020N030S06	0.2	0.4	0.4	3	0.36	11.9°	50	6	2	★	1	3.1	3.2	3.4	3.7
R0020N035	0.2	0.4	0.4	3.5	0.36	10.2°	50	4	2	★	1	3.6	3.7	4	4.3
R0020N040	0.2	0.4	0.4	4	0.36	9.7°	50	4	2	★	1	4.1	4.3	4.6	4.9
R0020N045	0.2	0.4	0.4	4.5	0.36	9.3°	50	4	2	★	1	4.7	4.8	5.2	5.6
R0020N050	0.2	0.4	0.4	5	0.36	8.9°	50	4	2	★	1	5.2	5.3	5.7	6.2
R0020N055	0.2	0.4	0.4	5.5	0.36	8.5°	50	4	2	★	1	5.7	5.9	6.3	6.8
R0020N060	0.2	0.4	0.4	6	0.36	8.2°	50	4	2	★	1	6.2	6.4	6.9	7.4
R0025N015	0.25	0.5	0.5	1.5	0.46	12.6°	50	4	2	★	1	1.5	1.6	1.7	1.8
R0025N015S06	0.25	0.5	0.5	1.5	0.46	13.4°	50	6	2	●	1	1.5	1.6	1.7	1.8
R0025N020	0.25	0.5	0.5	2	0.46	11.9°	50	4	2	●	1	2	2.1	2.3	2.4
R0025N020S06	0.25	0.5	0.5	2	0.46	12.9°	50	6	2	★	1	2	2.1	2.3	2.4
R0025N025	0.25	0.5	0.5	2.5	0.46	11.2°	50	4	2	★	1	2.6	2.7	2.9	3.1
R0025N025S06	0.25	0.5	0.5	2.5	0.46	12.4°	50	6	2	●	1	2.6	2.7	2.9	3.1
R0025N030	0.25	0.5	0.5	3	0.46	10.6°	50	4	2	★	1	3.1	3.2	3.4	3.7
R0025N030S06	0.25	0.5	0.5	3	0.46	11.9°	50	6	2	★	1	3.1	3.2	3.4	3.7
R0025N035	0.25	0.5	0.5	3.5	0.46	10.1°	50	4	2	★	1	3.6	3.7	4	4.3
R0025N035S06	0.25	0.5	0.5	3.5	0.46	11.5°	50	6	2	★	1	3.6	3.7	4	4.3
R0025N040	0.25	0.5	0.5	4	0.46	9.6°	50	4	2	●	1	4.1	4.3	4.6	4.9
R0025N040S06	0.25	0.5	0.5	4	0.46	11.1°	50	6	2	★	1	4.1	4.3	4.6	4.9
R0025N045	0.25	0.5	0.5	4.5	0.46	9.2°	50	4	2	★	1	4.6	4.8	5.2	5.6
R0025N045S06	0.25	0.5	0.5	4.5	0.46	10.7°	50	6	2	★	1	4.6	4.8	5.2	5.6
R0025N050	0.25	0.5	0.5	5	0.46	8.8°	50	4	2	★	1	5.2	5.3	5.7	6.2
R0025N050S06	0.25	0.5	0.5	5	0.46	10.4°	50	6	2	★	1	5.2	5.3	5.7	6.2
R0025N055	0.25	0.5	0.5	5.5	0.46	8.4°	50	4	2	★	1	5.7	5.9	6.3	6.8
R0025N055S06	0.25	0.5	0.5	5.5	0.46	10.1°	50	6	2	★	1	5.7	5.9	6.3	6.8
R0025N060	0.25	0.5	0.5	6	0.46	8.1°	50	4	2	●	1	6.2	6.4	6.9	7.4
R0025N060S06	0.25	0.5	0.5	6	0.46	9.7°	50	6	2	★	1	6.2	6.4	6.9	7.4
R0025N070	0.25	0.5	0.5	7	0.46	7.5°	50	4	2	★	1	7.2	7.5	8	8.7
R0025N070S06	0.25	0.5	0.5	7	0.46	9.2°	50	6	2	★	1	7.2	7.5	8	8.7
R0025N080	0.25	0.5	0.5	8	0.46	7°	50	4	2	●	1	8.3	8.5	9.2	9.9
R0025N080S06	0.25	0.5	0.5	8	0.46	8.7°	50	6	2	★	1	8.3	8.5	9.2	9.9
R0025N100	0.25	0.5	0.5	10	0.46	6.2°	50	4	2	●	1	10.3	10.7	11.5	12.4
R0025N100S06	0.25	0.5	0.5	10	0.46	7.8°	50	6	2	★	1	10.3	10.7	11.5	12.4
R0030N018S06	0.3	0.6	0.6	1.8	0.56	13°	50	6	2	●	1	1.9	1.9	2.1	2.3
R0030N020	0.3	0.6	0.6	2	0.56	11.8°	50	4	2	●	1	2.1	2.2	2.3	2.5
R0030N020S06	0.3	0.6	0.6	2	0.56	12.8°	50	6	2	★	1	2.1	2.2	2.3	2.5
R0030N025	0.3	0.6	0.6	2.5	0.56	11.1°	50	4	2	★	1	2.6	2.7	2.9	3.1
R0030N025S06	0.3	0.6	0.6	2.5	0.56	12.3°	50	6	2	★	1	2.6	2.7	2.9	3.1
R0030N030	0.3	0.6	0.6	3	0.56	10.5°	50	4	2	★	1	3.1	3.3	3.5	3.8
R0030N030S06	0.3	0.6	0.6	3	0.56	11.8°	50	6	2	●	1	3.1	3.3	3.5	3.8
R0030N035	0.3	0.6	0.6	3.5	0.56	10°	50	4	2	★	1	3.6	3.8	4.1	4.4
R0030N035S06	0.3	0.6	0.6	3.5	0.56	11.4°	50	6	2	★	1	3.6	3.8	4.1	4.4
R0030N040	0.3	0.6	0.6	4	0.56	9.5°	50	4	2	●	1	4.2	4.3	4.6	5
R0030N040S06	0.3	0.6	0.6	4	0.56	11°	50	6	2	★	1	4.2	4.3	4.6	5
R0030N045	0.3	0.6	0.6	4.5	0.56	9.1°	50	4	2	★	1	4.7	4.9	5.2	5.6
R0030N045S06	0.3	0.6	0.6	4.5	0.56	10.6°	50	6	2	★	1	4.7	4.9	5.2	5.6
R0030N050	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	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	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
R0030N060	0.3	0.6	0.6	6	0.56	8°	50	4	2	●	1	6.3	6.5	6.9	7.5
R0030N060S06	0.3	0.6	0.6	6	0.56	9.7°	50	6	2	★	1	6.3	6.5	6.9	7.5
R0030N070	0.3	0.6	0.6	7	0.56	7.4°	50	4	2	★	1	7.3	7.5	8.1	8.7
R0030N080	0.3	0.6	0.6	8	0.56	6.9°	50	4	2	●	1	8.3	8.6	9.2	10
R0030N080S06	0.3	0.6	0.6	8	0.56	8.6°	50	6	2	★	1	8.3	8.6	9.2	10
R0030N090	0.3	0.6	0.6	9	0.56	6.4°	50	4	2	★	1	9.4	9.7	10.4	11.2
R0030N100	0.3	0.6	0.6	10	0.56	6°	50	4	2	●	1	10.4	10.8	11.5	12.5
R0030N100S06	0.3	0.6	0.6	10	0.56	7.8°	50	6	2	★	1	10.4	10.8	11.5	12.5
R0030N110	0.3	0.6	0.6	11	0.56	5.7°	50	4	2	★	1	11.4	11.8	12.7	13.7
R0030N120	0.3	0.6	0.6	12	0.56	5.4°	50	4	2	★	1	12.5	12.9	13.8	15
R0040N020	0.4	0.8	0.8	2	0.76	11.7°	50	4	2	●	1	2.1	2.2	2.3	2.5
R0040N020S06	0.4	0.8	0.8	2	0.76	12.8°	50	6	2	★	1	2.1	2.2	2.3	2.5
R0040N024S06	0.4	0.8	0.8	2.4	0.76	12.4°	50	6	2	●	1	2.5	2.6	2.8	3
R0040N030	0.4	0.8	0.8	3	0.76	10.4°	50	4	2	★	1	3.1	3.3	3.5	3.7
R0040N030S06	0.4	0.8	0.8	3	0.76	11.8°	50	6	2	★	1	3.1	3.3	3.5	3.7
R0040N040	0.4	0.8	0.8	4	0.76	9.4°	50	4	2	●	1	4.2	4.3	4.6	5
R0040N040S06	0.4	0.8	0.8	4	0.76	11°	50	6	2	●	1	4.2	4.3	4.6	5
R0040N050	0.4	0.8	0.8	5	0.76	8.5°	50	4	2	★	1	5.2	5.4	5.8	6.2
R0040N060	0.4	0.8	0.8	6	0.76	7.8°	50	4	2	●	1	6.3	6.5	6.9	7.5
R0040N060S06	0.4	0.8	0.8	6	0.76	9.6°	50	6	2	★	1	6.3	6.5	6.9	7.5
R0040N070	0.4	0.8	0.8	7	0.76	7.2°	50	4	2	★	1	7.3	7.5	8.1	8.7
R0040N080	0.4	0.8	0.8	8	0.76	6.7°	50	4	2	●	1	8.3	8.6	9.2	10
R0040N080S06	0.4	0.8	0.8	8	0.76	8.5°	50	6	2	★	1	8.3	8.6	9.2	10
R0040N100	0.4	0.8	0.8	10	0.76	5.9°	50	4	2	●	1	10.4	10.8	11.5	12.4
R0040N100S06	0.4	0.8	0.8	10	0.76	7.7°	50	6	2	★	1	10.4	10.8	11.5	12.4
R0040N120	0.4	0.8	0.8	12	0.76	5.2°	50	4	2	★	1	12.5	12.9	13.8	14.9
R0050N030	0.5	1	1	3	0.94	10.1°	50	4	2	●	1	3.2	3.3	3.6	3.9
R0050N030S06	0.5	1	1	3	0.94	11.6°	50	6	2	●	1	3.2	3.3	3.6	3.9
R0050N040	0.5	1	1	4	0.94	9.1°	50	4	2	●	1	4.2	4.4	4.8	5.2
R0050N040S06	0.5	1	1	4	0.94	10.8°	50	6	2	★	1	4.2	4.4	4.8	5.2
R0050N050	0.5	1	1	5	0.94	8.2°	50	4	2	★	1	5.3	5.5	6	6.4
R0050N050S06	0.5	1	1	5	0.94	10.1°	50	6	2	●	1	5.3	5.5	6	6.4
R0050N060	0.5	1	1	6	0.94	7.5°	50	4	2	●	1	6.3	6.6	7.1	7.7
R0050N060S06	0.5	1	1	6	0.94	9.4°	50	6	2	★	1	6.3	6.6	7.1	7.7
R0050N070	0.5	1	1	7	0.94	6.9°	50	4	2	★	1	7.4	7.7	8.3	8.9
R0050N080	0.5	1	1	8	0.94	6.4°	50	4	2	●	1	8.4	8.8	9.4	10.2
R0050N080S06	0.5	1	1	8	0.94	8.3°	50	6	2	★	1	8.4	8.8	9.4	10.2
R0050N090	0.5	1	1	9	0.94	6°	50	4	2	★	1	9.5	9.9	10.6	11.4
R0050N100	0.5	1	1	10	0.94	5.6°	50	4	2	●	1	10.5	10.9	11.7	12.6
R0050N100S06	0.5	1	1	10	0.94	7.5°	50	6	2	★	1	10.5	10.9	11.7	12.6
R0050N120	0.5	1	1	12	0.94	5°	50	4	2	●	1	12.6	13.1	14	15.1
R0050N120S06	0.5	1	1	12	0.94	6.8°	55	6	2	★	1	12.6	13.1	14	15.1
R0050N140	0.5	1	1	14	0.94	4.5°	50	4	2	●	1	14.7	15.2	16.3	17.6
R0050N160	0.5	1	1	16	0.94	4.1°	55	4	2	●	1	16.8	17.4	18.6	20.1
R0050N160S06	0.5	1	1	16	0.94	5.7°	60	6	2	★	1	16.8	17.4	18.6	20.1
R0050N180	0.5	1	1	18	0.94	3.7°	55	4	2	●	1	18.9	19.5	20.9	22.6
R0050N200	0.5	1	1	20	0.94	3.4°	55	4	2	●	1	20.9	21.6	23.2	25.1
R0050N200S06	0.5	1	1	20	0.94	5°	60	6	2	★	1	20.9	21.6	23.2	25.1
R0060N036S06	0.6	1.2	1.2	3.6	1.14	11.1°	50	6	2	●	1	3.8	4	4.3	4.7
R0060N060	0.6	1.2	1.2	6	1.14	7.3°	50	4	2	★	1	6.3	6.6	7.1	7.6
R0060N060S06	0.6	1.2	1.2	6	1.14	9.3°	50	6	2	●	1	6.3	6.6	7.1	7.6

CUTTING CONDITIONS ➤ I233

MS2XLB

Ball nose end mill, Short cut length, 2 flute, Long neck

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D_1	Length of Cut ap	Neck Length L_3	Neck Dia. D_5	Cutting Edge to Shank Angle B_2	Overall Length L_1	Shank Dia. D_4	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
R0060N080S06	0.6	1.2	1.2	8	1.14	8.2°	50	6	2	★	1	8.4	8.8	9.4	10.1
R0060N100	0.6	1.2	1.2	10	1.14	5.4°	50	4	2	★	1	10.5	10.9	11.7	12.6
R0060N100S06	0.6	1.2	1.2	10	1.14	7.4°	50	6	2	★	1	10.5	10.9	11.7	12.6
R0060N120	0.6	1.2	1.2	12	1.14	4.8°	50	4	2	●	1	12.6	13.1	14	15.1
R0060N120S06	0.6	1.2	1.2	12	1.14	6.7°	55	6	2	★	1	12.6	13.1	14	15.1
R0060N140	0.6	1.2	1.2	14	1.14	4.3°	50	4	2	★	1	14.7	15.2	16.3	17.6
R0060N160	0.6	1.2	1.2	16	1.14	3.9°	55	4	2	★	1	16.8	17.3	18.6	20.1
R0060N160S06	0.6	1.2	1.2	16	1.14	5.6°	60	6	2	★	1	16.8	17.3	18.6	20.1
R0060N180	0.6	1.2	1.2	18	1.14	3.5°	55	4	2	★	1	18.8	19.5	20.9	22.6
R0060N240	0.6	1.2	1.2	24	1.14	2.8°	65	4	2	★	1	25.1	25.9	27.8	*
R0070N080	0.7	1.4	1.4	8	1.34	6°	50	4	2	●	1	8.4	8.8	9.4	10.1
R0070N120	0.7	1.4	1.4	12	1.34	4.6°	50	4	2	●	1	12.6	13.1	14	15.1
R0070N160	0.7	1.4	1.4	16	1.34	3.7°	55	4	2	●	1	16.8	17.3	18.6	20.1
R0075N045S06	0.75	1.5	1.5	4.5	1.44	10.2°	50	6	2	●	1	4.7	5	5.4	5.7
R0075N060	0.75	1.5	1.5	6	1.44	7°	50	4	2	●	1	6.3	6.6	7.1	7.6
R0075N060S06	0.75	1.5	1.5	6	1.44	9.2°	50	6	2	★	1	6.3	6.6	7.1	7.6
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
R0075N080	0.75	1.5	1.5	8	1.44	5.9°	50	4	2	●	1	8.4	8.8	9.4	10.1
R0075N080S06	0.75	1.5	1.5	8	1.44	8.1°	50	6	2	★	1	8.4	8.8	9.4	10.1
R0075N100	0.75	1.5	1.5	10	1.44	5.1°	50	4	2	●	1	10.5	10.9	11.7	12.6
R0075N100S06	0.75	1.5	1.5	10	1.44	7.2°	50	6	2	★	1	10.5	10.9	11.7	12.6
R0075N120	0.75	1.5	1.5	12	1.44	4.4°	50	4	2	●	1	12.6	13.1	14	15.1
R0075N120S06	0.75	1.5	1.5	12	1.44	6.5°	55	6	2	★	1	12.6	13.1	14	15.1
R0075N140	0.75	1.5	1.5	14	1.44	4°	50	4	2	●	1	14.7	15.2	16.3	17.6
R0075N140S06	0.75	1.5	1.5	14	1.44	5.9°	55	6	2	★	1	14.7	15.2	16.3	17.6
R0075N160	0.75	1.5	1.5	16	1.44	3.6°	55	4	2	●	1	16.8	17.3	18.6	20
R0075N160S06	0.75	1.5	1.5	16	1.44	5.4°	60	6	2	★	1	16.8	17.3	18.6	20
R0075N180	0.75	1.5	1.5	18	1.44	3.3°	55	4	2	●	1	18.8	19.5	20.9	22.5
R0075N200	0.75	1.5	1.5	20	1.44	3°	55	4	2	●	1	20.9	21.6	23.2	*
R0075N200S06	0.75	1.5	1.5	20	1.44	4.6°	60	6	2	★	1	20.9	21.6	23.2	25
R0075N220	0.75	1.5	1.5	22	1.44	2.8°	60	4	2	★	1	23	23.8	25.5	*
R0075N300	0.75	1.5	1.5	30	1.44	2.1°	70	4	2	★	1	31.2	32.3	34.7	*
R0080N080	0.8	1.6	1.6	8	1.54	5.8°	50	4	2	●	1	8.4	8.8	9.4	10.1
R0080N120	0.8	1.6	1.6	12	1.54	4.3°	50	4	2	●	1	12.6	13.1	14	15.1
R0080N160	0.8	1.6	1.6	16	1.54	3.5°	55	4	2	●	1	16.8	17.3	18.6	20
R0080N200	0.8	1.6	1.6	20	1.54	2.9°	55	4	2	●	1	20.9	21.6	23.2	*
R0090N080	0.9	1.8	1.8	8	1.74	5.5°	50	4	2	●	1	8.4	8.8	9.4	10.1
R0090N120	0.9	1.8	1.8	12	1.74	4.1°	50	4	2	●	1	12.6	13	14	15
R0090N160	0.9	1.8	1.8	16	1.74	3.3°	55	4	2	●	1	16.8	17.3	18.6	20
R0090N200	0.9	1.8	1.8	20	1.74	2.7°	55	4	2	●	1	20.9	21.6	23.2	*
R0100N040	1	2	2	4	1.9	8.2°	50	4	2	●	1	4.1	4.3	4.6	4.9
R0100N040S06	1	2	2	4	1.9	10.6°	50	6	2	★	1	4.1	4.3	4.6	4.9
R0100N060	1	2	2	6	1.9	6.4°	50	4	2	●	1	6.2	6.5	6.9	7.4
R0100N060S06	1	2	2	6	1.9	9°	50	6	2	●	1	6.2	6.5	6.9	7.4
R0100N080	1	2	2	8	1.9	5.3°	50	4	2	●	1	8.3	8.7	9.2	9.9
R0100N080S06	1	2	2	8	1.9	7.8°	50	6	2	★	1	8.3	8.7	9.2	9.9
R0100N100	1	2	2	10	1.9	4.5°	50	4	2	●	1	10.4	10.8	11.5	12.4
R0100N100S06	1	2	2	10	1.9	6.9°	50	6	2	●	1	10.4	10.8	11.5	12.4
R0100N120	1	2	2	12	1.9	3.9°	50	4	2	●	1	12.5	12.9	13.8	14.9
R0100N120S06	1	2	2	12	1.9	6.1°	55	6	2	★	1	12.5	12.9	13.8	14.9
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	Radius of Ball Nose R	Dia. D_1	Length of Cut ap	Neck Length L_3	Neck Dia. D_5	Cutting Edge to Shank Angle B_2	Overall Length L_1	Shank Dia. D_4	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
R0100N160	1	2	2	16	1.9	3.1°	55	4	2	●	1	16.7	17.2	18.4	19.9
R0100N160S06	1	2	2	16	1.9	5.1°	60	6	2	★	1	16.7	17.2	18.4	19.9
R0100N180	1	2	2	18	1.9	2.8°	55	4	2	●	1	18.7	19.4	20.7	*
R0100N180S06	1	2	2	18	1.9	4.7°	60	6	2	★	1	18.7	19.4	20.7	22.3
R0100N200	1	2	2	20	1.9	2.5°	60	4	2	●	1	20.8	21.5	23	*
R0100N200S06	1	2	2	20	1.9	4.3°	60	6	2	★	1	20.8	21.5	23	24.8
R0100N220	1	2	2	22	1.9	2.3°	60	4	2	●	1	22.9	23.6	25.3	*
R0100N250	1	2	2	25	1.9	2.1°	65	4	2	●	1	26	26.8	28.8	*
R0100N250S06	1	2	2	25	1.9	3.7°	65	6	2	★	1	26	26.8	28.8	31
R0100N300	1	2	2	30	1.9	1.8°	70	4	2	●	1	31.1	32.2	*	*
R0100N300S06	1	2	2	30	1.9	3.2°	70	6	2	★	1	31.1	32.2	34.5	37.3
R0100N350	1	2	2	35	1.9	1.6°	70	4	2	★	1	36.3	37.5	*	*
R0100N350S06	1	2	2	35	1.9	2.8°	80	6	2	★	1	36.3	37.5	40.3	*
R0125N060S06	1.25	2.5	2.5	6	2.4	8.6°	50	6	2	★	1	6.2	6.5	6.9	7.4
R0125N075S06	1.25	2.5	2.5	7.5	2.4	7.7°	50	6	2	●	1	7.8	8.1	8.6	9.2
R0125N100S06	1.25	2.5	2.5	10	2.4	6.5°	50	6	2	★	1	10.4	10.8	11.5	12.3
R0125N125S06	1.25	2.5	2.5	12.5	2.4	5.6°	50	6	2	●	1	13	13.5	14.4	15.4
R0125N160S06	1.25	2.5	2.5	16	2.4	4.7°	60	6	2	★	1	16.7	17.2	18.4	19.8
R0125N200S06	1.25	2.5	2.5	20	2.4	4°	60	6	2	★	1	20.8	21.5	23	24.8
R0125N250S06	1.25	2.5	2.5	25	2.4	3.3°	65	6	2	★	1	26	26.8	28.7	31
R0125N300S06	1.25	2.5	2.5	30	2.4	2.9°	70	6	2	★	1	31.1	32.2	34.5	*
R0125N350S06	1.25	2.5	2.5	35	2.4	2.5°	80	6	2	★	1	36.3	37.5	40.2	*
R0150N080	1.5	3	3	8	2.9	7°	60	6	2	●	1	8.3	8.6	9.2	9.8
R0150N100	1.5	3	3	10	2.9	6°	60	6	2	●	1	10.4	10.8	11.5	12.3
R0150N120	1.5	3	3	12	2.9	5.3°	60	6	2	●	1	12.5	12.9	13.8	14.8
R0150N140	1.5	3	3	14	2.9	4.7°	60	6	2	★	1	14.6	15	16.1	17.3
R0150N160	1.5	3	3	16	2.9	4.3°	60	6	2	●	1	16.6	17.2	18.4	19.7
R0150N200	1.5	3	3	20	2.9	3.6°	70	6	2	●	1	20.8	21.5	23	24.7
R0150N250	1.5	3	3	25	2.9	3°	70	6	2	●	1	26	26.8	28.7	*
R0150N300	1.5	3	3	30	2.9	2.6°	70	6	2	●	1	31.1	32.2	34.5	*
R0150N350	1.5	3	3	35	2.9	2.2°	80	6	2	●	1	36.3	37.5	40.2	*
R0150N400	1.5	3	3	40	2.9	2°	90	6	2	★	1	41.5	42.9	*	*
R0200N100	2	4	4	10	3.9	4.8°	70	6	2	●	1	10.4	10.7	11.4	12.2
R0200N120	2	4	4	12	3.9	4.1°	70	6	2	●	1	12.5	12.9	13.7	14.6
R0200N140	2	4	4	14	3.9	3.6°	70	6	2	★	1	14.6	15	16	17.1
R0200N160	2	4	4	16	3.9	3.2°	70	6	2	●	1	16.6	17.1	18.3	19.6
R0200N200	2	4	4	20	3.9	2.7°	70	6	2	●	1	20.8	21.4	22.9	*
R0200N250	2	4	4	25	3.9	2.2°	70	6	2	●	1	25.9	26.8	28.6	*
R0200N300	2	4	4	30	3.9	1.8°	70	6	2	●	1	31.1	32.1	*	*
R0200N350	2	4	4	35	3.9	1.6°	80	6	2	●	1	36.3	37.5	*	*
R0200N400	2	4	4	40	3.9	1.4°	90	6	2	●	1	41.4	42.8	*	*
R0200N450	2	4	4	45	3.9	1.3°	90	6	2	●	1	46.6	48.2	*	*
R0200N500	2	4	4	50	3.9	1.2°	100	6	2	●	1	51.8	53.5	*	*
R0250N200	2.5	5	5	20	4.9	1.5°	70	6	2	●	1	20.7	21.4	*	*
R0250N250	2.5	5	5	25	4.9	1.2°	70	6	2	●	1	25.9	26.7	*	*
R0250N300	2.5	5	5	30	4.9	1°	80	6	2	●	1	31.1	*	*	*
R0250N350	2.5	5	5	35	4.9	0.9°	80	6	2	●	1	36.3	*	*	*
R0300N300	3	6	6	30	5.85	—	80	6	2	●	2	*	*	*	*
R0300N500	3	6	6	50	5.85	—	120	6	2	●	2	*	*	*	*

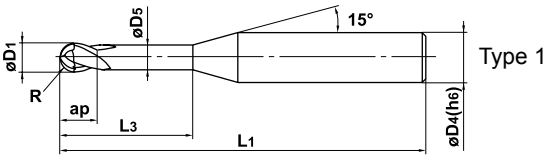
* No interference

MS2XLB – Inch sizes

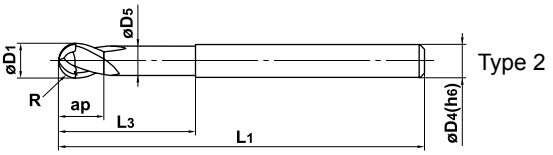
Ball nose, 2 flute, Long neck

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					
	±.0004"				
	0 - .0008"				
h6	D4=.1250"	D4=.1875"	D4=.2500"		
	0 - .00024"	0 - .00031"	0 - .00035"		

●2 flute, long neck, ball nose end mill for general purpose.

Unit : inch

Order Number	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS2XLBD1/64N0094	.0078	.0156	.0156	.0938	.0144	2.0	.1250	2	●	1
D1/64N0125	.0078	.0156	.0156	.1250	.0144	2.0	.1250	2	●	1
D1/64N0187	.0078	.0156	.0156	.1875	.0144	2.0	.1250	2	●	1
D1/32N0187	.0156	.0313	.0313	.1875	.0301	2.0	.1250	2	●	1
D1/32N0250	.0156	.0313	.0313	.2500	.0301	2.0	.1250	2	●	1
D1/32N0375	.0156	.0313	.0313	.3750	.0301	2.0	.1250	2	●	1
D1/16N0375	.0313	.0625	.0625	.3750	.0601	2.0	.1250	2	●	1
D1/16N0500	.0313	.0625	.0625	.5000	.0601	2.0	.1250	2	●	1
D1/16N0750	.0313	.0625	.0625	.7500	.0601	2.0	.1250	2	●	1
D3/32N0562	.0469	.0938	.0938	.5625	.0898	2.0	.1250	2	●	1
D3/32N0750	.0469	.0938	.0938	.7500	.0898	2.0	.1250	2	●	1
D3/32N1125	.0469	.0938	.0938	1.1250	.0898	2.5	.1250	2	●	1
D1/8N0750	.0625	.1250	.1250	.7500	.1211	2.0	.1250	2	●	2
D3/16N1125	.0938	.1875	.1875	1.1250	.1836	2.5	.1875	2	●	2
D1/4N1500	.1250	.2500	.2500	1.5000	.2441	3.0	.2500	2	●	2

● : Inventory maintained.

CUTTING CONDITIONS ➤ I234

MS4XLB – Inch sizes

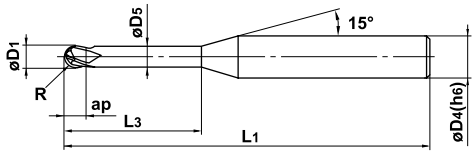
Ball nose, 4 flute, Long neck

UWC MS 20° 30°

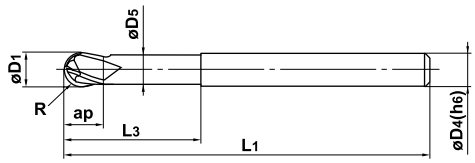
D1<3/16 D1=1/4

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				
±.0004"				
0 - .0008"				
D4=.1250"	D4=.1875"	D4=.2500"		
h6 0 - .00024"	0 - .00031"	0 - .00035"		

● 4 flute, long neck, ball nose end mill for general purpose.

Unit : inch

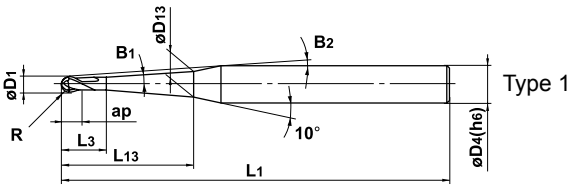
Order Number	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS4XLBD1/16N0375	.0313	.0625	.0625	.3750	.0601	2.0	.1250	4	●	1
D1/16N0500	.0313	.0625	.0625	.5000	.0601	2.0	.1250	4	●	1
D1/16N0750	.0313	.0625	.0625	.7500	.0601	2.0	.1250	4	●	1
D3/32N0562	.0469	.0938	.0938	.5625	.0898	2.0	.1250	4	●	1
D3/32N0750	.0469	.0938	.0938	.7500	.0898	2.0	.1250	4	●	1
D3/32N1125	.0469	.0938	.0938	1.1250	.0898	2.5	.1250	4	●	1
D1/8N0750	.0625	.1250	.1250	.7500	.1211	2.0	.1250	4	●	2
D3/16N1125	.0938	.1875	.1875	1.1250	.1836	2.5	.1875	4	●	2
D1/4N1500	.1250	.2500	.2500	1.5000	.2441	3.0	.2500	4	●	2

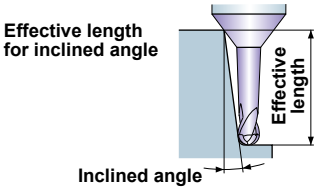
MS2XB

Ball nose end mill, 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
◎	◎	○		○	○		







R	h6	
±0.01		
0 - 0.020	4≤D4≤6	D4=8
0 - 0.008	0 - 0.009	

● 2 flute taper neck ball nose end mill.

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D1	Taper Angle One Side B1	Length of Cut ap	Neck Length L13	Length of Straight Neck L3	Cutting Edge to Shank Angle B2	Neck Dia. D13	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type	Effective length for inclined angle 30'	1°	2°	3°
MS2XBR0010T0030L015	0.1	0.2	30'	0.2	1.5	0.6	8.8°	0.19	50	4	2	★	1	1.7	1.8	2.0	2.3
R0010T0030L020	0.1	0.2	30'	0.2	2	0.6	8.5°	0.20	50	4	2	★	1	2.2	2.4	2.6	3.0
R0010T0100L015	0.1	0.2	1°	0.2	1.5	0.6	8.8°	0.21	50	4	2	★	1	—	1.8	2.0	2.2
R0010T0100L020	0.1	0.2	1°	0.2	2	0.6	8.5°	0.22	50	4	2	★	1	—	2.3	2.5	2.9
R0010T0130L015	0.1	0.2	1°30'	0.2	1.5	0.6	8.9°	0.22	50	4	2	★	1	—	—	1.9	2.2
R0010T0130L020	0.1	0.2	1°30'	0.2	2	0.6	8.6°	0.25	50	4	2	★	1	—	—	2.4	2.8
R0010T0200L015	0.1	0.2	2°	0.2	1.5	0.6	8.9°	0.24	50	4	2	★	1	—	—	1.8	2.1
R0010T0200L020	0.1	0.2	2°	0.2	2	0.6	8.6°	0.27	50	4	2	★	1	—	—	2.3	2.6
R0010T0300L015	0.1	0.2	3°	0.2	1.5	0.6	9.0°	0.27	50	4	2	★	1	—	—	—	1.9
R0010T0300L020	0.1	0.2	3°	0.2	2	0.6	8.7°	0.32	50	4	2	★	1	—	—	—	2.4
R0010T0500L020	0.1	0.2	5°	0.2	2	0.6	9.0°	0.42	50	4	2	★	1	—	—	—	—
R0015T0030L030	0.15	0.3	30'	0.3	3	0.7	7.9°	0.32	50	4	2	★	1	3.2	3.4	3.8	4.3
R0015T0100L030	0.15	0.3	1°	0.3	3	0.7	7.9°	0.36	50	4	2	★	1	—	3.3	3.7	4.2
R0015T0130L030	0.15	0.3	1°30'	0.3	3	0.7	8.0°	0.40	50	4	2	★	1	—	—	3.5	4.0
R0015T0200L030	0.15	0.3	2°	0.3	3	0.7	8.1°	0.44	50	4	2	★	1	—	—	3.3	3.8
R0015T0300L030	0.15	0.3	3°	0.3	3	0.7	8.2°	0.52	50	4	2	★	1	—	—	—	3.4
R0015T0500L030	0.15	0.3	5°	0.3	3	0.7	8.6°	0.68	50	4	2	★	1	—	—	—	—
R0020T0030L020	0.2	0.4	30'	0.4	2	1.2	8.4°	0.38	50	4	2	★	1	2.3	2.4	2.7	3.0
R0020T0030L030	0.2	0.4	30'	0.4	3	1.2	7.8°	0.40	50	4	2	★	1	3.3	3.5	3.9	4.4
R0020T0030L040	0.2	0.4	30'	0.4	4	1.2	7.3°	0.41	50	4	2	★	1	4.3	4.5	5.1	5.7
R0020T0030L050	0.2	0.4	30'	0.4	5	1.2	6.8°	0.43	50	4	2	★	1	5.3	5.6	6.2	7.1
R0020T0100L020	0.2	0.4	1°	0.4	2	1.2	8.4°	0.39	50	4	2	★	1	—	2.3	2.6	3.0
R0020T0100L030	0.2	0.4	1°	0.4	3	1.2	7.9°	0.43	50	4	2	★	1	—	3.3	3.7	4.2
R0020T0100L040	0.2	0.4	1°	0.4	4	1.2	7.4°	0.46	50	4	2	★	1	—	4.3	4.9	5.5
R0020T0100L050	0.2	0.4	1°	0.4	5	1.2	6.9°	0.50	50	4	2	★	1	—	5.3	6.0	6.8
R0020T0130L020	0.2	0.4	1°30'	0.4	2	1.2	8.5°	0.41	50	4	2	★	1	—	—	2.5	2.9
R0020T0130L030	0.2	0.4	1°30'	0.4	3	1.2	7.9°	0.46	50	4	2	★	1	—	—	3.6	4.1
R0020T0130L040	0.2	0.4	1°30'	0.4	4	1.2	7.5°	0.51	50	4	2	★	1	—	—	4.7	5.3
R0020T0130L050	0.2	0.4	1°30'	0.4	5	1.2	7.0°	0.56	50	4	2	★	1	—	—	5.7	6.5
R0020T0200L020	0.2	0.4	2°	0.4	2	1.2	8.5°	0.42	50	4	2	★	1	—	—	2.5	2.8
R0020T0200L030	0.2	0.4	2°	0.4	3	1.2	8.0°	0.49	50	4	2	★	1	—	—	3.5	4.0

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D1	Taper Angle One Side B1	Length of Cut ap	Neck Length L13	Length of Straight Neck L3	Cutting Edge to Shank Angle B2	Neck Dia. D13	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type	Effective length for inclined angle 30'	1°	2°	3°
MS2XBR0020T0200L040	0.2	0.4	2°	0.4	4	1.2	7.5°	0.56	50	4	2	★	1	—	—	4.5	5.1
R0020T0200L050	0.2	0.4	2°	0.4	5	1.2	7.1°	0.63	50	4	2	★	1	—	—	5.5	6.2
R0025T0030L030	0.25	0.5	30'	0.5	3	1.5	7.8°	0.49	50	4	2	★	1	3.3	3.5	3.9	4.4
R0025T0030L050	0.25	0.5	30'	0.5	5	1.5	6.8°	0.53	50	4	2	★	1	5.3	5.6	6.2	7.1
R0025T0100L030	0.25	0.5	1°	0.5	3	1.5	7.8°	0.52	50	4	2	★	1	—	3.4	3.8	4.3
R0025T0100L050	0.25	0.5	1°	0.5	5	1.5	6.9°	0.59	50	4	2	★	1	—	5.4	6.0	6.8
R0025T0130L030	0.25	0.5	1°30'	0.5	3	1.5	7.9°	0.54	50	4	2	★	1	—	—	3.7	4.1
R0025T0130L050	0.25	0.5	1°30'	0.5	5	1.5	7.0°	0.65	50	4	2	★	1	—	—	5.8	6.6
R0025T0200L030	0.25	0.5	2°	0.5	3	1.5	7.9°	0.57	50	4	2	★	1	—	—	3.5	4.0
R0025T0200L050	0.25	0.5	2°	0.5	5	1.5	7.1°	0.71	50	4	2	★	1	—	—	5.5	6.3
R0030T0030L050	0.3	0.6	30'	0.6	5	1.6	6.8°	0.62	50	4	2	★	1	5.3	5.6	6.2	7.1
R0030T0030L080	0.3	0.6	30'	0.6	8	1.6	5.7°	0.68	50	4	2	★	1	8.3	8.7	9.8	11.1
R0030T0100L050	0.3	0.6	1°	0.6	5	1.6	6.8°	0.68	50	4	2	★	1	—	5.4	6.0	6.8
R0030T0100L080	0.3	0.6	1°	0.6	8	1.6	5.8°	0.79	50	4	2	★	1	—	8.4	9.4	10.7
R0030T0100L100	0.3	0.6	1°	0.6	10	1.6	5.2°	0.86	50	4	2	★	1	—	10.4	11.6	13.2
R0030T0100L120	0.3	0.6	1°	0.6	12	1.6	4.8°	0.93	50	4	2	★	1	—	12.4	13.9	15.8
R0030T0100L150	0.3	0.6	1°	0.6	15	1.6	4.2°	1.03	50	4	2	★	1	—	15.4	17.2	19.6
R0030T0130L050	0.3	0.6	1°30'	0.6	5	1.6	6.9°	0.74	50	4	2	★	1	—	—	5.8	6.6
R0030T0130L080	0.3	0.6	1°30'	0.6	8	1.6	5.9°	0.90	50	4	2	★	1	—	—	9.0	10.2
R0030T0200L060	0.3	0.6	2°	0.6	6	1.6	6.6°	0.87	50	4	2	★	1	—	—	6.6	7.4
R0030T0200L080	0.3	0.6	2°	0.6	8	1.6	6.0°	1.01	50	4	2	★	1	—	—	8.6	9.7
R0040T0030L080	0.4	0.8	30'	0.8	8	1.8	5.5°	0.87	50	4	2	★	1	8.3	8.7	9.8	11.1
R0040T0030L120	0.4	0.8	30'	0.8	12	1.8	4.5°	0.94	60	4	2	★	1	12.3	13.0	14.5	16.5
R0040T0100L080	0.4	0.8	1°	0.8	8	1.8	5.6°	0.98	50	4	2	★	1	—	8.4	9.4	10.7
R0040T0100L120	0.4	0.8	1°	0.8	12	1.8	4.6°	1.12	60	4	2	★	1	—	12.4	13.9	15.8
R0040T0130L080	0.4	0.8	1°30'	0.8	8	1.8	5.8°	1.09	50	4	2	★	1	—	—	9.0	10.2
R0040T0130L120	0.4	0.8	1°30'	0.8	12	1.8	4.8°	1.30	60	4	2	★	1	—	—	13.2	15.0
R0040T0200L080	0.4	0.8	2°	0.8	8	1.8	5.9°	1.20	60	4	2	★	1	—	—	8.6	9.7
R0040T0300L120	0.4	0.8	3°	0.8	12	1.8	5.2°	1.83	60	4	2	★	1	—	—	—	12.8
R0050T0030L100	0.5	1	30'	1	10	2.5	6.1°	1.08	60	6	2	●	1	10.4	10.9	12.2	13.9
R0050T0030L150	0.5	1	30'	1	15	2.5	5.1°	1.16	60	6	2	★	1	15.4	16.2	18.2	20.7
R0050T0030L200	0.5	1	30'	1	20	2.5	4.4°	1.25	70	6	2	●	1	20.4	21.5	24.1	27.4
R0050T0030L250	0.5	1	30'	1	25	2.5	3.8°	1.34	70	6	2	★	1	25.4	26.8	30.0	34.2
R0050T0030L300	0.5	1	30'	1	30	2.5	3.4°	1.42	70	6	2	●	1	30.4	32.0	35.9	41.0
R0050T0100L100	0.5	1	1°	1	10	2.5	6.2°	1.21	60	6	2	★	1	—	10.5	11.8	13.4
R0050T0100L150	0.5	1	1°	1	15	2.5	5.2°	1.38	60	6	2	●	1	—	15.5	17.4	19.8
R0050T0100L200	0.5	1	1°	1	20	2.5	4.5°	1.56	70	6	2	★	1	—	20.5	23.0	26.2
R0050T0100L250	0.5	1	1°	1	25	2.5	3.9°	1.73	70	6	2	●	1	—	25.5	28.6	32.6
R0050T0100L300	0.5	1	1°	1	30	2.5	3.5°	1.91	70	6	2	★	1	—	30.5	34.2	39.0
R0050T0100L350	0.5	1	1°	1	35	2.5	3.2°	2.08	80	6	2	●	1	—	35.5	39.8	45.4
R0050T0130L100	0.5	1	1°30'	1	10	2.5	6.3°	1.34	60	6	2	●	1	—	—	11.3	12.8
R0050T0130L150	0.5	1	1°30'	1	15	2.5	5.3°	1.60	60	6	2	★	1	—	—	16.6	18.9
R0050T0130L200	0.5	1	1°30'	1	20	2.5	4.6°	1.86	70	6	2	●	1	—	—	21.9	24.9
R0050T0200L150	0.5	1	2°	1	15	2.5	5.4°	1.82	60	6	2	★	1	—	—	15.8	18.0
R0050T0200L200	0.5	1	2°	1	20	2.5	4.7°	2.17	70	6	2	●	1	—	—	20.8	23.7
R0050T0300L200	0.5	1	3°	1	20	2.5	5.0°	2.78	70	6	2	★	1	—	—	—	21.2
R0050T0300L400	0.5	1	3°	1	40	2.5	3.4°	4.88	80	6	2	●	1	—	—	—	41.2
R0050T0500L200	0.5	1	5°	1	20	2.5	5.7°	4.01	70	6	2	★	1	—	—	—	—
R0060T0030L120	0.6	1.2	30'	1.2	12	2.7	5.6°	1.31	60	6	2	★	1	12.4	13.1	14.6	16.6
R0060T0030L240	0.6	1.2	30'	1.2	24	2.7	3.8°	1.52	70	6	2	★	1	24.4	25.7	28.8	32.8
R0060T0100L120	0.6	1.2	1°	1.2	12	2.7	5.7°	1.47	60	6	2	★	1	—	12.5	14.0	15.9

CUTTING CONDITIONS ➤ I235

MS2XB

Ball nose end mill, 2 flute, Taper neck

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D1	Taper Angle One Side B1	Length of Cut ap	Neck Length L13	Length of Straight Neck L3	Cutting Edge to Shank Angle B2	Neck Dia. D13	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type	Effective length for inclined angle 30'	1°	2°	3°
MS2XBR0060T0100L240	0.6	1.2	1°	1.2	24	2.7	3.9°	1.89	70	6	2	★	1	—	24.5	27.5	31.3
R0060T0130L120	0.6	1.2	1°30'	1.2	12	2.7	5.8°	1.63	60	6	2	★	1	—	—	13.4	15.2
R0060T0130L240	0.6	1.2	1°30'	1.2	24	2.7	4.1°	2.26	70	6	2	★	1	—	—	26.2	29.8
R0060T0200L120	0.6	1.2	2°	1.2	12	2.7	5.9°	1.79	60	6	2	★	1	—	—	12.8	14.6
R0060T0200L240	0.6	1.2	2°	1.2	24	2.7	4.2°	2.63	70	6	2	★	1	—	—	24.8	28.3
R0075T0030L100	0.75	1.5	30'	1.5	10	3	5.9°	1.57	60	6	2	●	1	10.4	10.9	12.2	13.8
R0075T0030L150	0.75	1.5	30'	1.5	15	3	4.9°	1.65	60	6	2	★	1	15.4	16.2	18.1	20.6
R0075T0030L300	0.75	1.5	30'	1.5	30	3	3.2°	1.92	70	6	2	●	1	30.4	32.0	35.9	40.9
R0075T0100L100	0.75	1.5	1°	1.5	10	3	6.0°	1.69	60	6	2	★	1	—	10.5	11.8	13.3
R0075T0100L150	0.75	1.5	1°	1.5	15	3	5.0°	1.86	60	6	2	●	1	—	15.5	17.4	19.7
R0075T0100L200	0.75	1.5	1°	1.5	20	3	4.2°	2.04	70	6	2	★	1	—	20.5	23.0	26.1
R0075T0100L300	0.75	1.5	1°	1.5	30	3	3.3°	2.39	70	6	2	●	1	—	30.5	34.2	39.0
R0075T0130L100	0.75	1.5	1°30'	1.5	10	3	6.1°	1.81	60	6	2	★	1	—	—	11.3	12.8
R0075T0130L150	0.75	1.5	1°30'	1.5	15	3	5.1°	2.07	60	6	2	●	1	—	—	16.6	18.9
R0075T0130L300	0.75	1.5	1°30'	1.5	30	3	3.4°	2.86	70	6	2	●	1	—	—	32.5	37.0
R0075T0200L100	0.75	1.5	2°	1.5	10	3	6.2°	1.93	60	6	2	★	1	—	—	10.9	12.3
R0075T0200L150	0.75	1.5	2°	1.5	15	3	5.2°	2.28	60	6	2	●	1	—	—	15.9	18.0
R0075T0200L300	0.75	1.5	2°	1.5	30	3	3.5°	3.33	70	6	2	★	1	—	—	30.9	35.1
R0100T0030L200	1	2	30'	2	20	4	3.9°	2.18	60	6	2	★	1	20.7	21.7	24.3	27.6
R0100T0030L300	1	2	30'	2	30	4	2.9°	2.36	70	6	2	●	1	30.7	32.3	36.2	*
R0100T0030L400	1	2	30'	2	40	4	2.4°	2.53	80	6	2	★	1	40.7	42.8	48.0	*
R0100T0100L200	1	2	1°	2	20	4	4.0°	2.46	60	6	2	●	1	—	20.8	23.3	26.4
R0100T0100L250	1	2	1°	2	25	4	3.4°	2.64	60	6	2	★	1	—	25.8	28.9	32.9
R0100T0100L300	1	2	1°	2	30	4	3.0°	2.81	70	6	2	★	1	—	30.8	34.5	39.3
R0100T0100L350	1	2	1°	2	35	4	2.7°	2.99	80	6	2	●	1	—	35.8	40.1	*
R0100T0100L400	1	2	1°	2	40	4	2.5°	3.16	80	6	2	★	1	—	40.8	45.8	*
R0100T0100L500	1	2	1°	2	50	4	2.1°	3.51	90	6	2	●	1	—	50.8	57.0	*
R0100T0130L200	1	2	1°30'	2	20	4	4.1°	2.74	60	6	2	★	1	—	—	22.3	25.3
R0100T0130L300	1	2	1°30'	2	30	4	3.1°	3.27	70	6	2	●	1	—	—	32.9	37.4
R0100T0130L400	1	2	1°30'	2	40	4	2.6°	3.79	80	6	2	★	1	—	—	43.5	*
R0100T0200L300	1	2	2°	2	30	4	3.3°	3.72	70	6	2	★	1	—	—	31.3	35.5
R0100T0200L400	1	2	2°	2	40	4	2.7°	4.42	80	6	2	●	1	—	—	41.3	*
R0100T0300L300	1	2	3°	2	30	4	3.5°	4.63	70	6	2	●	1	—	—	—	31.8
R0100T0300L400	1	2	3°	2	40	4	2.9°	5.68	80	6	2	★	1	—	—	—	*
R0100T0500L200	1	2	5°	2	20	4	5.1°	4.70	60	6	2	●	1	—	—	—	—
R0100T0500L380	1	2	5°	2	38	4	4.6°	7.85	80	8	2	★	1	—	—	—	—
R0150T0030L300	1.5	3	30'	3	30	6	2.4°	3.32	70	6	2	●	1	30.7	32.3	36.2	*
R0150T0030L400	1.5	3	30'	3	40	6	1.9°	3.50	80	6	2	★	1	40.7	42.9	*	*
R0150T0030L500	1.5	3	30'	3	50	6	1.6°	3.67	90	6	2	●	1	50.7	53.4	*	*
R0150T0100L300	1.5	3	1°	3	30	6	2.5°	3.74	70	6	2	★	1	—	31.0	34.7	*
R0150T0100L400	1.5	3	1°	3	40	6	2.0°	4.09	80	6	2	●	1	—	41.0	45.9	*
R0150T0100L500	1.5	3	1°	3	50	6	1.7°	4.44	90	6	2	★	1	—	51.0	*	*
R0150T0130L300	1.5	3	1°30'	3	30	6	2.6°	4.16	70	6	2	●	1	—	—	33.1	*
R0150T0130L400	1.5	3	1°30'	3	40	6	2.1°	4.69	80	6	2	★	1	—	—	43.8	*
R0150T0130L500	1.5	3	1°30'	3	50	6	1.7°	5.21	90	6	2	●	1	—	—	*	*
R0150T0200L300	1.5	3	2°	3	30	6	2.7°	4.58	70	6	2	★	1	—	—	31.6	*
R0150T0200L480	1.5	3	2°	3	48	6	1.9°	5.84	90	8	2	●	1	—	—	*	*
R0150T0300L300	1.5	3	3°	3	30	6	2.9°	5.42	70	6	2	★	1	—	—	—	*
R0150T0300L500	1.5	3	3°	3	50	6	2.9°	7.52	90	6	2	●	1	—	—	—	*
R0200T0030L600	2	4	30'	4	60	7	1.0°	4.83	110	6	2	★	1	60.8	64.0	*	*
R0200T0100L600	2	4	1°	4	60	7	1.0°	5.76	110	6	2	●	1	—	61.1	*	*

* No interference

● : Inventory maintained. ★ : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ I235

MS2MRB

Corner radius end mill, Medium cut length, 2 flute





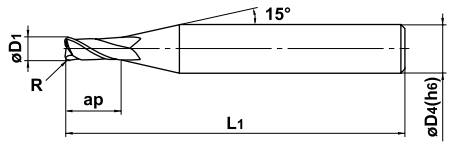




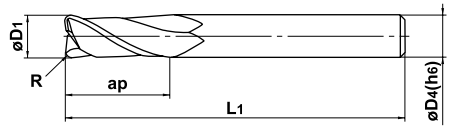


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





Type 1



Type 2

0 - 0.020					
4≤D4≤6	8≤D4≤10	D4=12			
0 - 0.008	0 - 0.009	0 - 0.011			

h6

● 2 flute corner radius end mill for general use.

Unit : mm

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS2MRBD0100R010	1	0.1	2	40	4	2	★	1
D0100R020	1	0.2	2	40	4	2	●	1
D0100R030	1	0.3	2	40	4	2	●	1
D0150R010	1.5	0.1	3	40	4	2	★	1
D0150R020	1.5	0.2	3	40	4	2	●	1
D0150R030	1.5	0.3	3	40	4	2	●	1
D0150R050	1.5	0.5	3	40	4	2	●	1
D0200R010	2	0.1	4	40	4	2	★	1
D0200R020	2	0.2	4	40	4	2	●	1
D0200R030	2	0.3	4	40	4	2	●	1
D0200R050	2	0.5	4	40	4	2	●	1
D0250R010	2.5	0.1	5	40	4	2	★	1
D0250R020	2.5	0.2	5	40	4	2	●	1
D0250R030	2.5	0.3	5	40	4	2	●	1
D0250R050	2.5	0.5	5	40	4	2	●	1
D0300R010	3	0.1	6	50	6	2	★	1
D0300R020	3	0.2	6	50	6	2	●	1
D0300R030	3	0.3	6	50	6	2	●	1
D0300R050	3	0.5	6	50	6	2	●	1
D0300R100	3	1	6	50	6	2	●	1
D0400R010	4	0.1	8	50	6	2	★	1
D0400R020	4	0.2	8	50	6	2	●	1
D0400R030	4	0.3	8	50	6	2	●	1
D0400R050	4	0.5	8	50	6	2	●	1
D0400R100	4	1	8	50	6	2	●	1
D0500R010	5	0.1	10	50	6	2	★	1
D0500R020	5	0.2	10	50	6	2	●	1
D0500R030	5	0.3	10	50	6	2	●	1
D0500R050	5	0.5	10	50	6	2	●	1
D0500R100	5	1	10	50	6	2	●	1
D0600R010	6	0.1	12	50	6	2	★	2

CUTTING CONDITIONS ➤ I216

MS2MRB

Corner radius end mill, Medium cut length, 2 flute

Unit : mm

Order Number	Dia. D_1	Corner Radius R	Length of Cut ap	Overall Length L_1	Shank Dia. D_4	No. of Flutes	Stock	Type
MS2MRBD0600R020	6	0.2	12	50	6	2	●	2
D0600R030	6	0.3	12	50	6	2	●	2
D0600R050	6	0.5	12	50	6	2	●	2
D0600R100	6	1	12	50	6	2	●	2
D0600R150	6	1.5	12	50	6	2	●	2
D0600R200	6	2	12	50	6	2	●	2
D0800R020	8	0.2	16	60	8	2	★	2
D0800R030	8	0.3	16	60	8	2	★	2
D0800R050	8	0.5	16	60	8	2	★	2
D0800R100	8	1	16	60	8	2	★	2
D0800R150	8	1.5	16	60	8	2	★	2
D0800R200	8	2	16	60	8	2	★	2
D0800R250	8	2.5	16	60	8	2	★	2
D0800R300	8	3	16	60	8	2	★	2
D1000R020	10	0.2	20	70	10	2	★	2
D1000R030	10	0.3	20	70	10	2	★	2
D1000R050	10	0.5	20	70	10	2	★	2
D1000R100	10	1	20	70	10	2	★	2
D1000R150	10	1.5	20	70	10	2	★	2
D1000R200	10	2	20	70	10	2	★	2
D1000R250	10	2.5	20	70	10	2	★	2
D1000R300	10	3	20	70	10	2	★	2
D1200R020	12	0.2	24	75	12	2	★	2
D1200R030	12	0.3	24	75	12	2	★	2
D1200R050	12	0.5	24	75	12	2	★	2
D1200R100	12	1	24	75	12	2	★	2
D1200R150	12	1.5	24	75	12	2	★	2
D1200R200	12	2	24	75	12	2	★	2
D1200R250	12	2.5	24	75	12	2	★	2
D1200R300	12	3	24	75	12	2	★	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ I216

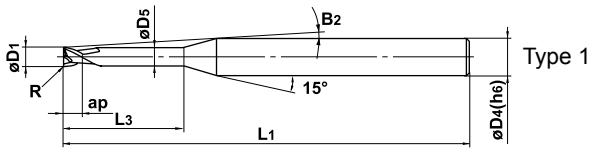
MS2XLRB

Corner radius end mill, Short cut length, 2 flute, Long neck

UWC MS 30° D1<3 D1≥3

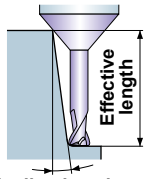
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		

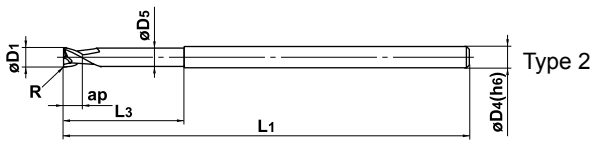




Type 1

Effective length for inclined angle





Type 2

0 - 0.020			
D4=6			
0 - 0.008			

h6

● 2 flute long neck corner radius end mill.

Unit : mm

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Neck Length L3	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	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
D0100R010N050	1	0.1	1	5	0.94	9.8°	60	6	2	●	1	5.3	5.6	6.0	6.5
D0200R010N040	2	0.1	2	4	1.90	9.9°	60	6	2	●	1	4.2	4.4	4.8	5.2
D0200R010N100	2	0.1	2	10	1.90	6.5°	60	6	2	●	1	10.5	10.9	11.7	12.6
D0200R030N040	2	0.3	2	4	1.90	10°	60	6	2	●	1	4.2	4.4	4.7	5.1
D0200R030N100	2	0.3	2	10	1.90	6.6°	60	6	2	●	1	10.5	10.8	11.6	12.6
D0300R010N060	3	0.1	3	6	2.90	7.4°	50	6	2	●	1	6.3	6.6	7.1	7.6
D0300R010N150	3	0.1	3	15	2.90	4.2°	60	6	2	●	1	15.7	16.2	17.4	18.8
D0300R030N060	3	0.3	3	6	2.90	7.5°	50	6	2	●	1	6.3	6.6	7.0	7.6
D0300R030N150	3	0.3	3	15	2.90	4.2°	60	6	2	●	1	15.7	16.2	17.4	18.8
D0400R010N080	4	0.1	4	8	3.90	4.9°	50	6	2	●	1	8.4	8.7	9.4	10.1
D0400R010N200	4	0.1	4	20	3.90	2.5°	60	6	2	●	1	20.8	21.6	23.2	*
D0400R030N080	4	0.3	4	8	3.90	5°	50	6	2	●	1	8.4	8.7	9.3	10.1
D0400R030N200	4	0.3	4	20	3.90	2.5°	60	6	2	●	1	20.8	21.5	23.1	*
D0400R050N080	4	0.5	4	8	3.90	5°	50	6	2	●	1	8.4	8.7	9.3	10.0
D0400R050N200	4	0.5	4	20	3.90	2.5°	60	6	2	●	1	20.8	21.5	23.1	*
D0600R010N120	6	0.1	6	12	5.85	—	50	6	2	●	1	*	*	*	*
D0600R010N300	6	0.1	6	30	5.85	—	70	6	2	●	1	*	*	*	*
D0600R030N120	6	0.3	6	12	5.85	—	50	6	2	●	1	*	*	*	*
D0600R030N300	6	0.3	6	30	5.85	—	70	6	2	●	1	*	*	*	*
D0600R050N120	6	0.5	6	12	5.85	—	50	6	2	●	2	*	*	*	*
D0600R050N300	6	0.5	6	30	5.85	—	70	6	2	●	2	*	*	*	*

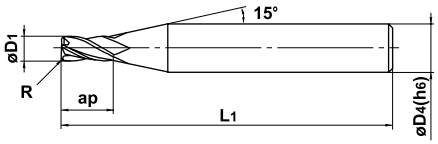
* No interference

MS4MRB

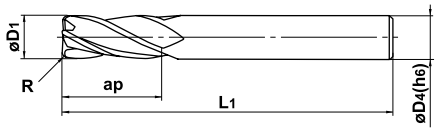
Corner radius end mill, Medium cut length, 4 flute

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

h6

D1≤12	D1>12				
0 - 0.020	0 - 0.030				
D4=6	8≤D4≤10	12≤D4≤16	D4=20		
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013		

● 4 flute corner radius end mill for general use.

Unit : mm

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS4MRBD0300R010	3	0.1	8	45	6	4	★	1
D0300R020	3	0.2	8	45	6	4	★	1
D0300R030	3	0.3	8	45	6	4	★	1
D0300R050	3	0.5	8	45	6	4	★	1
D0300R100	3	1	8	45	6	4	★	1
D0400R010	4	0.1	11	45	6	4	★	1
D0400R020	4	0.2	11	45	6	4	★	1
D0400R030	4	0.3	11	45	6	4	★	1
D0400R050	4	0.5	11	45	6	4	★	1
D0400R100	4	1	11	45	6	4	★	1
D0500R010	5	0.1	13	50	6	4	★	1
D0500R020	5	0.2	13	50	6	4	★	1
D0500R030	5	0.3	13	50	6	4	★	1
D0500R050	5	0.5	13	50	6	4	★	1
D0500R100	5	1	13	50	6	4	★	1
D0600R010	6	0.1	13	50	6	4	★	2
D0600R020	6	0.2	13	50	6	4	★	2
D0600R030	6	0.3	13	50	6	4	★	2
D0600R050	6	0.5	13	50	6	4	★	2
D0600R100	6	1	13	50	6	4	★	2
D0600R150	6	1.5	13	50	6	4	★	2
D0600R200	6	2	13	50	6	4	★	2
D0800R020	8	0.2	19	60	8	4	★	2
D0800R030	8	0.3	19	60	8	4	★	2
D0800R050	8	0.5	19	60	8	4	★	2
D0800R100	8	1	19	60	8	4	★	2
D0800R150	8	1.5	19	60	8	4	★	2
D0800R200	8	2	19	60	8	4	★	2
D0800R250	8	2.5	19	60	8	4	★	2
D0800R300	8	3	19	60	8	4	★	2
D1000R020	10	0.2	22	70	10	4	★	2

★ : Inventory maintained in Japan.

Unit : mm

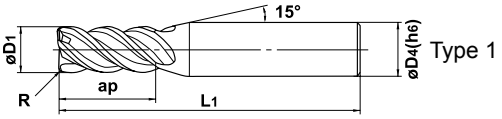
Order Number	Dia. **D1**	Corner Radius **R**	Length of Cut **ap**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
MS4MRBD1000R030	10	0.3	22	70	10	4	★	2
D1000R050	10	0.5	22	70	10	4	★	2
D1000R100	10	1	22	70	10	4	★	2
D1000R150	10	1.5	22	70	10	4	★	2
D1000R200	10	2	22	70	10	4	★	2
D1000R250	10	2.5	22	70	10	4	★	2
D1000R300	10	3	22	70	10	4	★	2
D1200R020	12	0.2	26	75	12	4	★	2
D1200R030	12	0.3	26	75	12	4	★	2
D1200R050	12	0.5	26	75	12	4	★	2
D1200R100	12	1	26	75	12	4	★	2
D1200R150	12	1.5	26	75	12	4	★	2
D1200R200	12	2	26	75	12	4	★	2
D1200R250	12	2.5	26	75	12	4	★	2
D1200R300	12	3	26	75	12	4	★	2
D1600R050	16	0.5	32	90	16	4	★	2
D1600R100	16	1	32	90	16	4	★	2
D1600R150	16	1.5	32	90	16	4	★	2
D1600R200	16	2	32	90	16	4	★	2
D1600R250	16	2.5	32	90	16	4	★	2
D1600R300	16	3	32	90	16	4	★	2
D2000R050	20	0.5	38	100	20	4	★	2
D2000R100	20	1	38	100	20	4	★	2
D2000R150	20	1.5	38	100	20	4	★	2
D2000R200	20	2	38	100	20	4	★	2
D2000R250	20	2.5	38	100	20	4	★	2
D2000R300	20	3	38	100	20	4	★	2

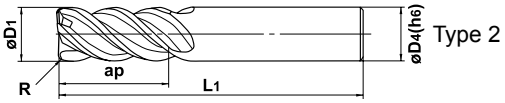
MSMHDRB

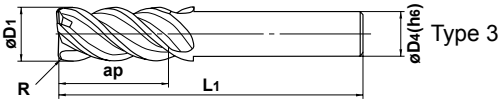
High power, Corner radius, Medium cut length, 4 flute

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
◎	◎	◎		◎	◎		









D1≤12	D1>12				
0 - 0.020	0 - 0.030				
4≤D4≤6	8≤D4≤10	12≤D4≤16	D4=20		
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013		

h6

● 4 flute high power corner radius end mill.

Unit : mm

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MSMHDRBD0200R020	2	0.2	4	45	4	4	★	1
D0200R030	2	0.3	4	45	4	4	★	1
D0300R020	3	0.2	8	45	6	4	★	1
D0300R030	3	0.3	8	45	6	4	★	1
D0300R050	3	0.5	8	45	6	4	★	1
D0400R020	4	0.2	11	45	6	4	★	1
D0400R030	4	0.3	11	45	6	4	★	1
D0400R050	4	0.5	11	45	6	4	★	1
D0500R020	5	0.2	13	50	6	4	★	1
D0500R030	5	0.3	13	50	6	4	★	1
D0500R050	5	0.5	13	50	6	4	★	1
D0500R100	5	1	13	50	6	4	★	1
D0600R030	6	0.3	13	50	6	4	★	2
D0600R050	6	0.5	13	50	6	4	★	2
D0600R100	6	1	13	50	6	4	★	2
D0800R030	8	0.3	19	60	8	4	★	2
D0800R050	8	0.5	19	60	8	4	★	2
D0800R100	8	1	19	60	8	4	★	2
D0800R150	8	1.5	19	60	8	4	★	2
D1000R030	10	0.3	22	70	10	4	★	2
D1000R050	10	0.5	22	70	10	4	★	2
D1000R100	10	1	22	70	10	4	★	2
D1000R150	10	1.5	22	70	10	4	★	2
D1000R200	10	2	22	70	10	4	★	2
D1200R050S10	12	0.5	26	75	10	4	★	3
D1200R100S10	12	1	26	75	10	4	★	3
D1200R150S10	12	1.5	26	75	10	4	★	3
D1200R200S10	12	2	26	75	10	4	★	3
D1200R300S10	12	3	26	75	10	4	★	3
D1200R050	12	0.5	26	75	12	4	★	2
D1200R100	12	1	26	75	12	4	★	2

★ : Inventory maintained in Japan.

Unit : mm

Order Number	Dia. D_1	Corner Radius R	Length of Cut ap	Overall Length L_1	Shank Dia. D_4	No. of Flutes	Stock	Type
MSMHDRBD1200R150	12	1.5	26	75	12	4	★	2
D1200R200	12	2	26	75	12	4	★	2
D1200R300	12	3	26	75	12	4	★	2
D1600R100	16	1	35	90	16	4	★	2
D1600R150	16	1.5	35	90	16	4	★	2
D1600R200	16	2	35	90	16	4	★	2
D1600R300	16	3	35	90	16	4	★	2
NEW **D1600R500**	16	5	35	90	16	4	★	2
D1800R100	18	1	40	100	16	4	★	3
D1800R150	18	1.5	40	100	16	4	★	3
D1800R200	18	2	40	100	16	4	★	3
D1800R300	18	3	40	100	16	4	★	3
D2000R100	20	1	45	110	20	4	★	2
D2000R150	20	1.5	45	110	20	4	★	2
D2000R200	20	2	45	110	20	4	★	2
D2000R300	20	3	45	110	20	4	★	2
NEW **D2000R500**	20	5	45	110	20	4	★	2
NEW **D2000R635**	20	6.35	45	110	20	4	★	2

MS2MT

Taper end mill, Medium cut length, 2 flute





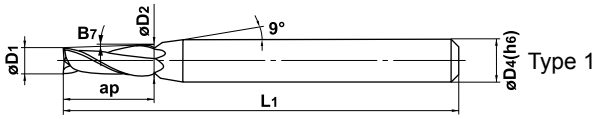


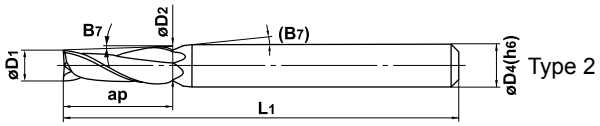


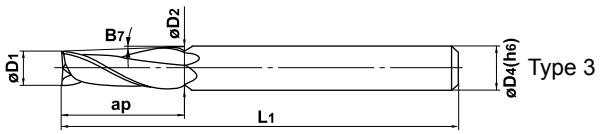



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		









D1<0.5	D1≥0.5			
0 - 0.020	0 - 0.030			
±5'				
4≤D4≤6	8≤D4≤10	12≤D4≤16		
0 - 0.008	0 - 0.009	0 - 0.011		

● 2 flute taper end mill for general use.

Unit : mm

Order Number	Small Mill Dia. D1	Taper Angle One Side B7	Length of Cut ap	Large Mill Dia. D2	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS2MTD0020T0030	0.2	30'	0.8	0.21	45	4	2	★	1
D0020T0100	0.2	1°	0.8	0.23	45	4	2	★	1
D0020T0130	0.2	1° 30'	0.8	0.24	45	4	2	★	1
D0020T0200	0.2	2°	0.8	0.26	45	4	2	★	1
D0020T0300	0.2	3°	0.8	0.28	45	4	2	★	1
D0020T0400	0.2	4°	0.8	0.31	45	4	2	★	1
D0020T0500	0.2	5°	0.8	0.34	45	4	2	★	1
D0020T0700	0.2	7°	0.8	0.4	45	4	2	★	1
D0020T1000	0.2	10°	0.8	0.48	45	4	2	★	2
D0030T0030	0.3	30'	1.2	0.32	45	4	2	★	1
D0030T0100	0.3	1°	1.2	0.34	45	4	2	★	1
D0030T0130	0.3	1° 30'	1.2	0.36	45	4	2	★	1
D0030T0200	0.3	2°	1.2	0.38	45	4	2	★	1
D0030T0300	0.3	3°	1.2	0.43	45	4	2	★	1
D0030T0400	0.3	4°	1.2	0.47	45	4	2	★	1
D0030T0500	0.3	5°	1.2	0.51	45	4	2	★	1
D0030T0700	0.3	7°	1.2	0.59	45	4	2	★	1
D0030T1000	0.3	10°	1.2	0.72	45	4	2	★	2
D0040T0030	0.4	30'	1.6	0.43	45	4	2	★	1
D0040T0100	0.4	1°	1.6	0.46	45	4	2	★	1
D0040T0130	0.4	1° 30'	1.6	0.48	45	4	2	★	1
D0040T0200	0.4	2°	1.6	0.51	45	4	2	★	1
D0040T0300	0.4	3°	1.6	0.57	45	4	2	★	1
D0040T0400	0.4	4°	1.6	0.62	45	4	2	★	1
D0040T0500	0.4	5°	1.6	0.68	45	4	2	★	1
D0040T0700	0.4	7°	1.6	0.79	45	4	2	★	1
D0040T1000	0.4	10°	1.6	0.96	45	4	2	★	2
D0050T0030	0.5	30'	2	0.53	45	4	2	★	1
D0050T0100	0.5	1°	2	0.57	45	4	2	★	1
D0050T0130	0.5	1° 30'	2	0.6	45	4	2	★	1
D0050T0200	0.5	2°	2	0.64	45	4	2	★	1

★ : Inventory maintained in Japan.

Unit : mm

Order Number	Small Mill Dia. D_1	Taper Angle One Side B_7	Length of Cut ap	Large Mill Dia. D_2	Overall Length L_1	Shank Dia. D_4	No. of Flutes	Stock	Type
MS2MTD0050T0300	0.5	3°	2	0.71	45	4	2	★	1
D0050T0400	0.5	4°	2	0.78	45	4	2	★	1
D0050T0500	0.5	5°	2	0.85	45	4	2	★	1
D0050T0700	0.5	7°	2	0.99	45	4	2	★	1
D0050T1000	0.5	10°	2	1.21	45	4	2	★	2
D0060T0030	0.6	30'	2	0.63	45	4	2	★	1
D0060T0100	0.6	1°	2	0.67	45	4	2	★	1
D0060T0130	0.6	1° 30'	2	0.7	45	4	2	★	1
D0060T0200	0.6	2°	2	0.74	45	4	2	★	1
D0060T0230	0.6	2° 30'	2	0.77	45	4	2	★	1
D0060T0300	0.6	3°	2	0.81	45	4	2	★	1
D0060T0400	0.6	4°	2	0.88	45	4	2	★	1
D0060T0500	0.6	5°	2	0.95	45	4	2	★	1
D0060T0700	0.6	7°	2	1.09	45	4	2	★	1
D0060T1000	0.6	10°	2	1.31	45	4	2	★	2
D0070T0030	0.7	30'	2	0.73	45	4	2	★	1
D0070T0100	0.7	1°	2	0.77	45	4	2	★	1
D0070T0130	0.7	1° 30'	2	0.8	45	4	2	★	1
D0070T0200	0.7	2°	2	0.84	45	4	2	★	1
D0070T0300	0.7	3°	2	0.91	45	4	2	★	1
D0070T0400	0.7	4°	2	0.98	45	4	2	★	1
D0070T0500	0.7	5°	2	1.05	45	4	2	★	1
D0070T0700	0.7	7°	2	1.19	45	4	2	★	1
D0070T1000	0.7	10°	2	1.41	45	4	2	★	2
D0080T0030	0.8	30'	3	0.85	45	4	2	★	1
D0080T0100	0.8	1°	3	0.9	45	4	2	★	1
D0080T0130	0.8	1° 30'	3	0.96	45	4	2	★	1
D0080T0200	0.8	2°	3	1.01	45	4	2	★	1
D0080T0230	0.8	2° 30'	3	1.06	45	4	2	★	1
D0080T0300	0.8	3°	3	1.11	45	4	2	★	1
D0080T0400	0.8	4°	3	1.22	45	4	2	★	1
D0080T0500	0.8	5°	3	1.32	45	4	2	★	1
D0080T0700	0.8	7°	3	1.54	45	4	2	★	1
D0080T1000	0.8	10°	3	1.86	45	4	2	★	2
D0090T0030	0.9	30'	3	0.95	45	4	2	★	1
D0090T0100	0.9	1°	3	1	45	4	2	★	1
D0090T0130	0.9	1° 30'	3	1.06	45	4	2	★	1
D0090T0200	0.9	2°	3	1.11	45	4	2	★	1
D0090T0300	0.9	3°	3	1.21	45	4	2	★	1
D0090T0400	0.9	4°	3	1.32	45	4	2	★	1
D0090T0500	0.9	5°	3	1.42	45	4	2	★	1
D0090T0700	0.9	7°	3	1.64	45	4	2	★	1
D0090T1000	0.9	10°	3	1.96	45	4	2	★	2
D0100T0030	1	30'	4	1.07	45	4	2	★	1
D0100T0100	1	1°	4	1.14	45	4	2	★	1
D0100T0130	1	1° 30'	4	1.21	45	4	2	★	1
D0100T0200	1	2°	4	1.28	45	4	2	★	1
D0100T0230	1	2° 30'	4	1.35	45	4	2	★	1
D0100T0300	1	3°	4	1.42	45	4	2	★	1
D0100T0400	1	4°	4	1.56	45	4	2	★	1
D0100T0500	1	5°	4	1.7	45	4	2	★	1

MS2MT

Taper end mill, Medium cut length, 2 flute

Unit : mm

Order Number	Small Mill Dia. D_1	Taper Angle One Side B_7	Length of Cut ap	Large Mill Dia. D_2	Overall Length L_1	Shank Dia. D_4	No. of Flutes	Stock	Type
MS2MTD0100T0700	1	7°	4	1.98	45	4	2	★	1
D0100T1000	1	10°	4	2.41	45	4	2	★	2
D0150T0030	1.5	30'	5	1.59	45	4	2	★	1
D0150T0100	1.5	1°	5	1.67	45	4	2	★	1
D0150T0130	1.5	1° 30'	5	1.76	45	4	2	★	1
D0150T0200	1.5	2°	5	1.85	45	4	2	★	1
D0150T0230	1.5	2° 30'	5	1.94	45	4	2	★	1
D0150T0300	1.5	3°	5	2.02	45	4	2	★	1
D0150T0400	1.5	4°	5	2.2	45	4	2	★	1
D0150T0500	1.5	5°	5	2.37	45	4	2	★	1
D0150T0700	1.5	7°	5	2.73	45	4	2	★	1
D0150T1000	1.5	10°	5	3.26	45	4	2	★	2
D0200T0030	2	30'	6	2.1	45	4	2	★	1
D0200T0100	2	1°	6	2.21	45	4	2	★	1
D0200T0130	2	1° 30'	6	2.31	45	4	2	★	1
D0200T0200	2	2°	6	2.42	45	4	2	★	1
D0200T0230	2	2° 30'	6	2.52	45	4	2	★	1
D0200T0300	2	3°	6	2.63	45	4	2	★	1
D0200T0400	2	4°	6	2.84	45	4	2	★	1
D0200T0500	2	5°	6	3.05	45	4	2	★	1
D0200T0700	2	7°	6	3.47	45	4	2	★	2
D0200T1000	2	10°	6	4.12	50	6	2	★	2
D0250T0030	2.5	30'	8	2.64	45	4	2	★	1
D0250T0100	2.5	1°	8	2.78	45	4	2	★	1
D0250T0130	2.5	1° 30'	8	2.92	45	4	2	★	1
D0250T0200	2.5	2°	8	3.06	45	4	2	★	1
D0250T0230	2.5	2° 30'	8	3.2	45	4	2	★	1
D0250T0300	2.5	3°	8	3.34	45	4	2	★	1
D0250T0400	2.5	4°	8	3.62	45	4	2	★	2
D0250T0500	2.5	5°	8	3.9	45	4	2	★	2
D0250T0700	2.5	7°	8	4.46	50	4	2	★	3
D0250T1000	2.5	10°	8	5.32	50	6	2	★	2
D0300T0030	3	30'	10	3.17	50	6	2	★	1
D0300T0100	3	1°	10	3.35	50	6	2	★	1
D0300T0130	3	1° 30'	10	3.52	50	6	2	★	1
D0300T0200	3	2°	10	3.7	50	6	2	★	1
D0300T0300	3	3°	10	4.05	50	6	2	★	1
D0300T0400	3	4°	10	4.4	50	6	2	★	1
D0300T0500	3	5°	10	4.75	50	6	2	★	1
D0300T0700	3	7°	10	5.46	50	6	2	★	2
D0300T1000	3	10°	10	6.53	50	6	2	★	3
D0400T0030	4	30'	15	4.26	50	6	2	★	1
D0400T0100	4	1°	15	4.52	50	6	2	★	1
D0400T0130	4	1° 30'	15	4.79	50	6	2	★	1
D0400T0200	4	2°	15	5.05	50	6	2	★	1
D0400T0300	4	3°	15	5.57	50	6	2	★	1
D0400T0400	4	4°	15	6.1	55	6	2	★	3
D0400T0500	4	5°	15	6.62	55	6	2	★	3
D0400T0700	4	7°	15	7.68	55	6	2	★	3
D0400T1000	4	10°	15	9.29	60	8	2	★	3
D0500T0030	5	30'	20	5.35	55	6	2	★	1

★ : Inventory maintained in Japan.

Unit : mm

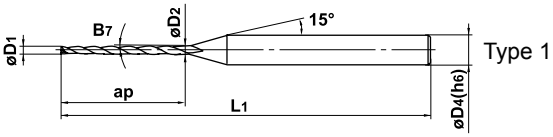
Order Number	Small Mill Dia. **D1**	Taper Angle One Side **B7**	Length of Cut **ap**	Large Mill Dia. **D2**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
MS2MTD0500T0100	5	1°	20	5.7	55	6	2	★	1
D0500T0130	5	1° 30'	20	6.05	55	6	2	★	3
D0500T0200	5	2°	20	6.4	55	6	2	★	3
D0500T0300	5	3°	20	7.1	55	6	2	★	3
D0500T0400	5	4°	20	7.8	60	6	2	★	3
D0500T0500	5	5°	20	8.5	60	8	2	★	3
D0500T0700	5	7°	20	9.91	70	10	2	★	2
D0500T1000	5	10°	20	12.05	80	12	2	★	3
D0600T0030	6	30'	20	6.35	60	6	2	★	3
D0600T0100	6	1°	20	6.7	60	6	2	★	3
D0600T0130	6	1° 30'	20	7.05	60	6	2	★	3
D0600T0200	6	2°	20	7.4	60	6	2	★	3
D0600T0300	6	3°	20	8.1	65	8	2	★	3
D0600T0500	6	5°	20	9.5	70	8	2	★	3
D0800T0030	8	30'	25	8.44	70	8	2	★	3
D0800T0100	8	1°	25	8.87	70	8	2	★	3
D0800T0130	8	1° 30'	25	9.31	70	8	2	★	3
D0800T0200	8	2°	25	9.75	70	8	2	★	3
D0800T0300	8	3°	25	10.62	75	10	2	★	3
D0800T0500	8	5°	25	12.37	95	12	2	★	3
D1000T0030	10	30'	35	10.61	90	10	2	★	3
D1000T0100	10	1°	35	11.22	90	10	2	★	3
D1000T0130	10	1° 30'	35	11.83	90	10	2	★	3
D1000T0200	10	2°	35	12.44	95	12	2	★	3
D1000T0300	10	3°	35	13.67	95	12	2	★	3
D1000T0500	10	5°	35	16.12	95	16	2	★	3

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

	D1<0.5	D1≥0.5				
	0 - 0.020	0 - 0.040				
	±5'					
h6	D4=3	4≤D4≤6				
	0 - 0.006	0 - 0.008				

● 4 flute taper end mill for rib milling.

Unit : mm

Order Number	Small Mill Dia. D1	Taper Angle One Side B7	Length of Cut ap	Large Mill Dia. D2	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS4LTD0020T0030L02	0.2	30'	2	0.23	40	3	4	★	1
D0020T0100L02	0.2	1°	2	0.27	40	3	4	★	1
D0020T0130L02	0.2	1° 30'	2	0.3	40	3	4	★	1
D0020T0200L02	0.2	2°	2	0.34	40	3	4	★	1
D0030T0030L03	0.3	30'	3	0.35	40	3	4	★	1
D0030T0100L03	0.3	1°	3	0.4	40	3	4	★	1
D0030T0130L03	0.3	1° 30'	3	0.46	40	3	4	★	1
D0030T0200L03	0.3	2°	3	0.51	40	3	4	★	1
D0040T0030L04	0.4	30'	4	0.47	40	3	4	★	1
D0040T0100L04	0.4	1°	4	0.54	40	3	4	★	1
D0040T0130L04	0.4	1° 30'	4	0.61	40	3	4	★	1
D0040T0200L04	0.4	2°	4	0.68	40	3	4	★	1
D0050T0030L04	0.5	30'	4	0.57	40	3	4	●	1
D0050T0030L06	0.5	30'	6	0.6	40	3	4	●	1
D0050T0100L04	0.5	1°	4	0.64	40	3	4	●	1
D0050T0100L06	0.5	1°	6	0.71	40	3	4	●	1
D0050T0130L04	0.5	1° 30'	4	0.71	40	3	4	●	1
D0050T0130L06	0.5	1° 30'	6	0.81	40	3	4	●	1
D0050T0200L04	0.5	2°	4	0.78	40	3	4	★	1
D0050T0200L06	0.5	2°	6	0.92	40	3	4	★	1
D0060T0030L04	0.6	30'	4	0.67	40	3	4	★	1
D0060T0030L06	0.6	30'	6	0.7	40	3	4	★	1
D0060T0100L04	0.6	1°	4	0.74	40	3	4	★	1
D0060T0100L06	0.6	1°	6	0.81	40	3	4	★	1
D0060T0130L04	0.6	1° 30'	4	0.81	40	3	4	★	1
D0060T0130L06	0.6	1° 30'	6	0.91	40	3	4	★	1
D0060T0200L04	0.6	2°	4	0.88	40	3	4	★	1
D0060T0200L06	0.6	2°	6	1.02	40	3	4	★	1
D0070T0030L06	0.7	30'	6	0.8	40	3	4	★	1
D0070T0030L08	0.7	30'	8	0.84	45	3	4	★	1
D0070T0100L06	0.7	1°	6	0.91	40	3	4	★	1

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

Order Number	Small Mill Dia. D_1	Taper Angle One Side B_7	Length of Cut ap	Large Mill Dia. D_2	Overall Length L_1	Shank Dia. D_4	No. of Flutes	Stock	Type
MS4LTD0070T0100L08	0.7	1°	8	0.98	45	3	4	★	1
D0070T0130L06	0.7	1° 30'	6	1.01	40	3	4	★	1
D0070T0130L08	0.7	1° 30'	8	1.12	45	3	4	★	1
D0070T0200L06	0.7	2°	6	1.12	40	3	4	★	1
D0070T0200L08	0.7	2°	8	1.26	45	3	4	★	1
D0080T0015L04	0.8	15'	4	0.83	45	4	4	★	1
D0080T0015L06	0.8	15'	6	0.85	45	4	4	★	1
D0080T0015L08	0.8	15'	8	0.87	45	4	4	★	1
D0080T0015L10	0.8	15'	10	0.89	45	4	4	★	1
D0080T0030L04	0.8	30'	4	0.87	45	4	4	★	1
D0080T0030L06	0.8	30'	6	0.9	45	4	4	●	1
D0080T0030L08	0.8	30'	8	0.94	45	4	4	●	1
D0080T0030L10	0.8	30'	10	0.97	45	4	4	●	1
D0080T0030L12	0.8	30'	12	1.01	50	4	4	●	1
D0080T0100L04	0.8	1°	4	0.94	45	4	4	★	1
D0080T0100L06	0.8	1°	6	1.01	45	4	4	●	1
D0080T0100L08	0.8	1°	8	1.08	45	4	4	●	1
D0080T0100L10	0.8	1°	10	1.15	45	4	4	●	1
D0080T0100L12	0.8	1°	12	1.22	50	4	4	●	1
D0080T0130L04	0.8	1° 30'	4	1.01	45	4	4	★	1
D0080T0130L06	0.8	1° 30'	6	1.11	45	4	4	★	1
D0080T0130L08	0.8	1° 30'	8	1.22	45	4	4	★	1
D0080T0130L10	0.8	1° 30'	10	1.32	45	4	4	★	1
D0080T0130L12	0.8	1° 30'	12	1.43	50	4	4	★	1
D0080T0200L04	0.8	2°	4	1.08	45	4	4	★	1
D0080T0200L06	0.8	2°	6	1.22	45	4	4	★	1
D0080T0200L08	0.8	2°	8	1.36	45	4	4	★	1
D0080T0200L10	0.8	2°	10	1.5	45	4	4	★	1
D0080T0200L12	0.8	2°	12	1.64	50	4	4	★	1
D0100T0015L06	1	15'	6	1.05	45	4	4	★	1
D0100T0015L08	1	15'	8	1.07	45	4	4	★	1
D0100T0015L10	1	15'	10	1.09	45	4	4	★	1
D0100T0015L12	1	15'	12	1.1	50	4	4	★	1
D0100T0030L06	1	30'	6	1.1	45	4	4	●	1
D0100T0030L08	1	30'	8	1.14	45	4	4	●	1
D0100T0030L10	1	30'	10	1.17	45	4	4	●	1
D0100T0030L12	1	30'	12	1.21	50	4	4	●	1
D0100T0100L06	1	1°	6	1.21	45	4	4	●	1
D0100T0100L08	1	1°	8	1.28	45	4	4	●	1
D0100T0100L10	1	1°	10	1.35	45	4	4	●	1
D0100T0100L12	1	1°	12	1.42	50	4	4	●	1
D0100T0100L16	1	1°	16	1.56	55	4	4	●	1
D0100T0130L06	1	1° 30'	6	1.31	45	4	4	●	1
D0100T0130L08	1	1° 30'	8	1.42	45	4	4	●	1
D0100T0130L10	1	1° 30'	10	1.52	45	4	4	●	1
D0100T0130L12	1	1° 30'	12	1.63	50	4	4	●	1
D0100T0130L16	1	1° 30'	16	1.84	55	4	4	●	1
D0100T0200L06	1	2°	6	1.42	45	4	4	★	1
D0100T0200L08	1	2°	8	1.56	45	4	4	★	1
D0100T0200L10	1	2°	10	1.7	45	4	4	★	1
D0100T0200L12	1	2°	12	1.84	50	4	4	★	1

MS4LT

Taper end mill, Long cut length, 4 flute

Unit : mm

Order Number	Small Mill Dia. D_1	Taper Angle One Side B_7	Length of Cut ap	Large Mill Dia. D_2	Overall Length L_1	Shank Dia. D_4	No. of Flutes	Stock	Type
MS4LTD0100T0200L16	1	2°	16	2.12	55	4	4	★	1
D0120T0015L06	1.2	15'	6	1.25	45	4	4	★	1
D0120T0015L10	1.2	15'	10	1.29	45	4	4	★	1
D0120T0015L12	1.2	15'	12	1.3	50	4	4	★	1
D0120T0015L16	1.2	15'	16	1.34	55	4	4	★	1
D0120T0030L06	1.2	30'	6	1.3	45	4	4	★	1
D0120T0030L10	1.2	30'	10	1.37	45	4	4	★	1
D0120T0030L12	1.2	30'	12	1.41	50	4	4	★	1
D0120T0030L16	1.2	30'	16	1.48	55	4	4	★	1
D0120T0100L06	1.2	1°	6	1.41	45	4	4	★	1
D0120T0100L10	1.2	1°	10	1.55	45	4	4	★	1
D0120T0100L12	1.2	1°	12	1.62	50	4	4	★	1
D0120T0100L16	1.2	1°	16	1.76	55	4	4	★	1
D0120T0100L20	1.2	1°	20	1.9	55	4	4	★	1
D0120T0130L06	1.2	1° 30'	6	1.51	45	4	4	★	1
D0120T0130L10	1.2	1° 30'	10	1.72	45	4	4	★	1
D0120T0130L12	1.2	1° 30'	12	1.83	50	4	4	★	1
D0120T0130L16	1.2	1° 30'	16	2.04	55	4	4	★	1
D0120T0130L20	1.2	1° 30'	20	2.25	55	4	4	★	1
D0120T0200L06	1.2	2°	6	1.62	45	4	4	★	1
D0120T0200L10	1.2	2°	10	1.9	45	4	4	★	1
D0120T0200L12	1.2	2°	12	2.04	50	4	4	★	1
D0120T0200L16	1.2	2°	16	2.32	55	4	4	★	1
D0120T0200L20	1.2	2°	20	2.6	55	4	4	★	1
D0130T0030L12	1.3	30'	12	1.51	50	4	4	★	1
D0130T0100L12	1.3	1°	12	1.72	50	4	4	★	1
D0130T0130L12	1.3	1° 30'	12	1.93	50	4	4	★	1
D0130T0200L12	1.3	2°	12	2.14	50	4	4	★	1
D0140T0030L12	1.4	30'	12	1.61	50	4	4	★	1
D0140T0100L12	1.4	1°	12	1.82	50	4	4	★	1
D0140T0130L12	1.4	1° 30'	12	2.03	50	4	4	★	1
D0140T0200L12	1.4	2°	12	2.24	50	4	4	★	1
D0150T0015L06	1.5	15'	6	1.55	45	4	4	★	1
D0150T0015L08	1.5	15'	8	1.57	45	4	4	★	1
D0150T0015L10	1.5	15'	10	1.59	45	4	4	★	1
D0150T0015L12	1.5	15'	12	1.6	50	4	4	★	1
D0150T0015L16	1.5	15'	16	1.64	55	4	4	★	1
D0150T0015L20	1.5	15'	20	1.67	55	4	4	★	1
D0150T0030L06	1.5	30'	6	1.6	45	4	4	★	1
D0150T0030L08	1.5	30'	8	1.64	45	4	4	★	1
D0150T0030L10	1.5	30'	10	1.67	45	4	4	●	1
D0150T0030L12	1.5	30'	12	1.71	50	4	4	★	1
D0150T0030L16	1.5	30'	16	1.78	55	4	4	●	1
D0150T0030L20	1.5	30'	20	1.85	55	4	4	★	1
D0150T0100L06	1.5	1°	6	1.71	45	4	4	★	1
D0150T0100L08	1.5	1°	8	1.78	45	4	4	★	1
D0150T0100L10	1.5	1°	10	1.85	45	4	4	●	1
D0150T0100L12	1.5	1°	12	1.92	50	4	4	★	1
D0150T0100L16	1.5	1°	16	2.06	55	4	4	●	1
D0150T0100L20	1.5	1°	20	2.2	55	4	4	★	1
D0150T0100L25	1.5	1°	25	2.37	60	4	4	★	1

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

Order Number	Small Mill Dia. D_1	Taper Angle One Side B_7	Length of Cut ap	Large Mill Dia. D_2	Overall Length L_1	Shank Dia. D_4	No. of Flutes	Stock	Type
MS4LTD0150T0130L06	1.5	1° 30'	6	1.81	45	4	4	★	1
D0150T0130L08	1.5	1° 30'	8	1.92	45	4	4	★	1
D0150T0130L10	1.5	1° 30'	10	2.02	45	4	4	★	1
D0150T0130L12	1.5	1° 30'	12	2.13	50	4	4	★	1
D0150T0130L16	1.5	1° 30'	16	2.34	55	4	4	★	1
D0150T0130L20	1.5	1° 30'	20	2.55	55	4	4	★	1
D0150T0130L25	1.5	1° 30'	25	2.81	60	4	4	★	1
D0150T0200L06	1.5	2°	6	1.92	45	4	4	★	1
D0150T0200L08	1.5	2°	8	2.06	45	4	4	★	1
D0150T0200L10	1.5	2°	10	2.2	45	4	4	★	1
D0150T0200L12	1.5	2°	12	2.34	50	4	4	★	1
D0150T0200L16	1.5	2°	16	2.62	55	4	4	★	1
D0150T0200L20	1.5	2°	20	2.9	55	4	4	★	1
D0150T0200L25	1.5	2°	25	3.25	60	4	4	★	1
D0160T0030L08	1.6	30'	8	1.74	45	4	4	★	1
D0160T0030L12	1.6	30'	12	1.81	50	4	4	★	1
D0160T0030L16	1.6	30'	16	1.88	55	4	4	★	1
D0160T0030L20	1.6	30'	20	1.95	55	4	4	★	1
D0160T0100L08	1.6	1°	8	1.88	45	4	4	★	1
D0160T0100L12	1.6	1°	12	2.02	50	4	4	★	1
D0160T0100L16	1.6	1°	16	2.16	55	4	4	★	1
D0160T0100L20	1.6	1°	20	2.3	55	4	4	★	1
D0160T0130L08	1.6	1° 30'	8	2.02	45	4	4	★	1
D0160T0130L12	1.6	1° 30'	12	2.23	50	4	4	★	1
D0160T0130L16	1.6	1° 30'	16	2.44	55	4	4	★	1
D0160T0130L20	1.6	1° 30'	20	2.65	55	4	4	★	1
D0160T0200L08	1.6	2°	8	2.16	45	4	4	★	1
D0160T0200L12	1.6	2°	12	2.44	50	4	4	★	1
D0160T0200L16	1.6	2°	16	2.72	55	4	4	★	1
D0160T0200L20	1.6	2°	20	3	55	4	4	★	1
D0180T0015L08	1.8	15'	8	1.87	45	4	4	★	1
D0180T0015L16	1.8	15'	16	1.94	55	4	4	★	1
D0180T0015L24	1.8	15'	24	2.01	60	4	4	★	1
D0180T0030L08	1.8	30'	8	1.94	45	4	4	★	1
D0180T0030L16	1.8	30'	16	2.08	55	4	4	★	1
D0180T0030L24	1.8	30'	24	2.22	60	4	4	★	1
D0180T0100L08	1.8	1°	8	2.08	45	4	4	★	1
D0180T0100L16	1.8	1°	16	2.36	55	4	4	★	1
D0180T0100L24	1.8	1°	24	2.64	60	4	4	★	1
D0180T0130L08	1.8	1° 30'	8	2.22	45	4	4	★	1
D0180T0130L16	1.8	1° 30'	16	2.64	55	4	4	★	1
D0180T0130L24	1.8	1° 30'	24	3.06	60	4	4	★	1
D0180T0200L08	1.8	2°	8	2.36	45	4	4	★	1
D0180T0200L16	1.8	2°	16	2.92	55	4	4	★	1
D0180T0200L24	2	2°	24	3.48	60	4	4	★	1
D0200T0015L08	2	15'	8	2.07	45	4	4	★	1
D0200T0015L10	2	15'	10	2.09	45	4	4	★	1
D0200T0015L12	2	15'	12	2.1	50	4	4	★	1
D0200T0015L16	2	15'	16	2.14	55	4	4	★	1
D0200T0015L20	2	15'	20	2.17	55	4	4	★	1
D0200T0015L25	2	15'	25	2.22	60	4	4	★	1

MSTAR END MILLS

MS4LT

Taper end mill, Long cut length, 4 flute

Unit : mm

Order Number	Small Mill Dia. D_1	Taper Angle One Side. B_7	Length of Cut ap	Large Mill Dia. D_2	Overall Length L_1	Shank Dia. D_4	No. of Flutes	Stock	Type
MS4LTD0200T0030L08	2	30'	8	2.14	45	4	4	★	1
D0200T0030L10	2	30'	10	2.17	45	4	4	●	1
D0200T0030L12	2	30'	12	2.21	50	4	4	★	1
D0200T0030L16	2	30'	16	2.28	55	4	4	★	1
D0200T0030L20	2	30'	20	2.35	55	4	4	●	1
D0200T0030L25	2	30'	25	2.44	60	4	4	★	1
D0200T0030L30	2	30'	30	2.52	65	4	4	★	1
D0200T0100L08	2	1°	8	2.28	45	4	4	★	1
D0200T0100L10	2	1°	10	2.35	45	4	4	●	1
D0200T0100L12	2	1°	12	2.42	50	4	4	★	1
D0200T0100L16	2	1°	16	2.56	55	4	4	●	1
D0200T0100L20	2	1°	20	2.7	55	4	4	●	1
D0200T0100L25	2	1°	25	2.87	60	4	4	★	1
D0200T0100L30	2	1°	30	3.05	65	4	4	★	1
D0200T0130L08	2	1° 30'	8	2.42	45	4	4	★	1
D0200T0130L10	2	1° 30'	10	2.52	45	4	4	●	1
D0200T0130L12	2	1° 30'	12	2.63	50	4	4	★	1
D0200T0130L16	2	1° 30'	16	2.84	55	4	4	●	1
D0200T0130L20	2	1° 30'	20	3.05	55	4	4	●	1
D0200T0130L25	2	1° 30'	25	3.31	60	4	4	★	1
D0200T0130L30	2	1° 30'	30	3.57	65	4	4	★	1
D0200T0200L08	2	2°	8	2.56	45	4	4	★	1
D0200T0200L10	2	2°	10	2.7	45	4	4	★	1
D0200T0200L12	2	2°	12	2.84	50	4	4	★	1
D0200T0200L16	2	2°	16	3.12	55	4	4	★	1
D0200T0200L20	2	2°	20	3.4	55	4	4	★	1
D0200T0200L25	2	2°	25	3.75	60	4	4	★	1
D0200T0200L30	2	2°	30	4.1	65	6	4	★	1
D0200T0300L12	2	3°	12	3.26	50	4	4	★	1
D0200T0300L16	2	3°	16	3.68	55	4	4	★	1
D0200T0300L20	2	3°	20	4.1	55	6	4	★	1
D0200T0300L25	2	3°	25	4.62	60	6	4	★	1
D0200T0300L30	2	3°	30	5.14	65	6	4	★	1
D0250T0030L10	2.5	30'	10	2.67	45	4	4	★	1
D0250T0030L16	2.5	30'	16	2.78	50	4	4	★	1
D0250T0030L20	2.5	30'	20	2.85	55	4	4	★	1
D0250T0030L25	2.5	30'	25	2.94	60	4	4	★	1
D0250T0030L30	2.5	30'	30	3.02	65	4	4	★	1
D0250T0100L10	2.5	1°	10	2.85	45	4	4	★	1
D0250T0100L16	2.5	1°	16	3.06	50	4	4	★	1
D0250T0100L20	2.5	1°	20	3.2	55	4	4	★	1
D0250T0100L25	2.5	1°	25	3.37	60	4	4	★	1
D0250T0100L30	2.5	1°	30	3.55	65	4	4	★	1
D0250T0130L10	2.5	1° 30'	10	3.02	45	4	4	★	1
D0250T0130L16	2.5	1° 30'	16	3.34	50	4	4	★	1
D0250T0130L20	2.5	1° 30'	20	3.55	55	4	4	★	1
D0250T0130L25	2.5	1° 30'	25	3.81	60	4	4	★	1
D0250T0130L30	2.5	1° 30'	30	4.07	65	6	4	★	1
D0250T0200L10	2.5	2°	10	3.2	45	4	4	★	1
D0250T0200L16	2.5	2°	16	3.62	50	4	4	★	1
D0250T0200L20	2.5	2°	20	3.9	55	4	4	★	1

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

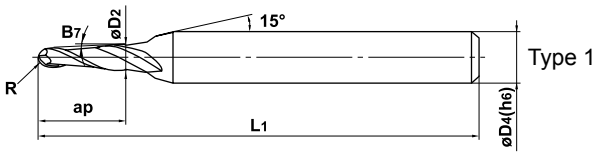
Order Number	Small Mill Dia. **D_1**	Taper Angle One Side. **B_7**	Length of Cut **ap**	Large Mill Dia. **D_2**	Overall Length **L_1**	Shank Dia. **D_4**	No. of Flutes	Stock	Type
MS4LTD0250T0200L25	2.5	2°	25	4.25	60	6	4	★	1
D0250T0200L30	2.5	2°	30	4.6	65	6	4	★	1
D0300T0030L25	3	30'	25	3.44	65	6	4	★	1
D0300T0030L40	3	30'	40	3.7	80	6	4	★	1
D0300T0100L25	3	1°	25	3.87	65	6	4	★	1
D0300T0100L40	3	1°	40	4.4	80	6	4	★	1
D0300T0130L25	3	1° 30'	25	4.31	65	6	4	★	1
D0300T0130L40	3	1° 30'	40	5.09	80	6	4	★	1
D0300T0200L25	3	2°	25	4.75	65	6	4	★	1
D0300T0200L40	3	2°	40	5.79	80	6	4	★	1

MS2MTB

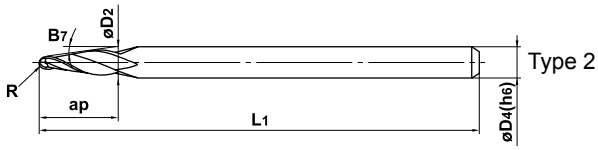
Ball nose taper end mill, Medium cut length, 2 flute

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					
	±0.01				
	±5'				
h6	4≤D4≤6				
	0 - 0.008				

● 2 flute taper ball nose end mill.

Unit : mm

Order Number	Radius of Ball Nose **R**	Taper Angle One Side **B7**	Length of Cut **ap**	Large Mill Dia. **D2**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
MS2MTBR0020T0300	0.2	3°	3	0.69	40	4	2	●	1
R0020T0500	0.2	5°	3	0.89	40	4	2	●	1
R0020T0700	0.2	7°	3	1.09	40	4	2	●	1
R0020T1000	0.2	10°	3	1.39	40	4	2	●	1
R0030T0300	0.3	3°	3	0.88	40	4	2	●	1
R0030T0500	0.3	5°	3	1.07	40	4	2	●	1
R0030T0700	0.3	7°	3	1.27	40	4	2	●	1
R0030T1000	0.3	10°	3	1.56	40	4	2	●	1
R0050T0030	0.5	30'	3	1.04	40	4	2	●	1
R0050T0100	0.5	1°	3	1.09	40	4	2	●	1
R0050T0130	0.5	1° 30'	3	1.13	40	4	2	●	1
R0050T0200	0.5	2°	3	1.18	40	4	2	●	1
R0050T0300	0.5	3°	3	1.26	40	4	2	●	1
R0050T0500	0.5	5°	3	1.44	40	4	2	●	1
R0050T0700	0.5	7°	6	2.36	45	4	2	●	1
R0075T0030	0.75	30'	6	1.59	40	4	2	●	1
R0075T0100	0.75	1°	6	1.68	40	4	2	●	1
R0075T0130	0.75	1° 30'	6	1.78	40	4	2	●	1
R0075T0200	0.75	2°	6	1.87	40	4	2	●	1
R0075T0300	0.75	3°	6	2.05	40	4	2	●	1
R0075T0700	0.75	7°	6	2.8	40	4	2	●	1
R0100T0030	1	30'	8	2.12	45	4	2	●	1
R0100T0100	1	1°	8	2.24	45	4	2	●	1
R0100T0130	1	1° 30'	8	2.37	45	4	2	●	1
R0100T0200	1	2°	8	2.49	45	4	2	●	1
R0100T0300	1	3°	8	2.74	45	4	2	●	1
R0100T0400	1	4°	8	2.98	45	4	2	●	1
R0100T0500	1	5°	8	3.23	45	4	2	●	1
R0100T0700	1	7°	8	3.73	50	6	2	●	1
R0125T0030	1.25	30'	10	2.65	45	4	2	●	1
R0125T0100	1.25	1°	10	2.81	45	4	2	●	1

● : Inventory maintained.

Unit : mm

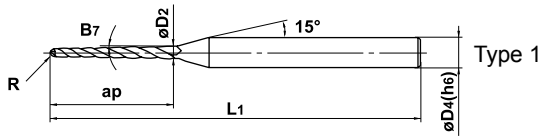
Order Number	Radius of Ball Nose **R**	Taper Angle One Side **B7**	Length of Cut **ap**	Large Mill Dia. **D2**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
MS2MTBR0125T0130	1.25	1° 30'	10	2.96	45	4	2	●	1
R0125T0200	1.25	2°	10	3.11	45	4	2	●	1
R0125T0300	1.25	3°	10	3.42	45	4	2	●	1
R0125T0400	1.25	4°	10	3.73	50	6	2	●	1
R0125T0500	1.25	5°	10	4.04	50	6	2	●	1
R0125T0700	1.25	7°	14.5	5.77	60	6	2	●	2
R0150T0700	1.5	7°	12.5	5.72	60	6	2	●	2

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						
	±0.03					
	±5'					
h6	4≤D4≤6					
	0 - 0.008					

● 4 flute taper ball nose end mill for rib milling.

Unit : mm

Order Number	Radius of Ball Nose R	Taper Angle One Side B7	Length of Cut ap	Large Mill Dia. D2	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
MS4LTBR0030T0030L04	0.3	30'	4	0.66	45	4	4	★	1
R0030T0030L06	0.3	30'	6	0.70	45	4	4	★	1
R0030T0100L04	0.3	1°	4	0.73	45	4	4	★	1
R0030T0100L06	0.3	1°	6	0.80	45	4	4	★	1
R0030T0130L04	0.3	1° 30'	4	0.79	45	4	4	★	1
R0030T0130L06	0.3	1° 30'	6	0.90	45	4	4	★	1
R0030T0200L04	0.3	2°	4	0.86	45	4	4	★	1
R0030T0200L06	0.3	2°	6	1.00	45	4	4	★	1
R0040T0030L06	0.4	30'	6	0.90	50	4	4	★	1
R0040T0030L08	0.4	30'	8	0.93	50	4	4	★	1
R0040T0030L10	0.4	30'	10	0.97	50	4	4	★	1
R0040T0100L06	0.4	1°	6	1.00	50	4	4	★	1
R0040T0100L08	0.4	1°	8	1.07	50	4	4	★	1
R0040T0100L10	0.4	1°	10	1.14	50	4	4	★	1
R0040T0130L06	0.4	1° 30'	6	1.09	50	4	4	★	1
R0040T0130L08	0.4	1° 30'	8	1.20	50	4	4	★	1
R0040T0130L10	0.4	1° 30'	10	1.30	50	4	4	★	1
R0040T0200L06	0.4	2°	6	1.19	50	4	4	★	1
R0040T0200L08	0.4	2°	8	1.33	50	4	4	★	1
R0040T0200L10	0.4	2°	10	1.47	50	4	4	★	1
R0050T0030L08	0.5	30'	8	1.13	50	4	4	★	1
R0050T0030L10	0.5	30'	10	1.17	50	4	4	★	1
R0050T0030L12	0.5	30'	12	1.20	50	4	4	★	1
R0050T0030L16	0.5	30'	16	1.27	55	4	4	★	1
R0050T0100L08	0.5	1°	8	1.26	50	4	4	★	1
R0050T0100L10	0.5	1°	10	1.33	50	4	4	★	1
R0050T0100L12	0.5	1°	12	1.40	50	4	4	★	1
R0050T0100L16	0.5	1°	16	1.54	55	4	4	★	1
R0050T0130L08	0.5	1° 30'	8	1.39	50	4	4	★	1
R0050T0130L10	0.5	1° 30'	10	1.50	50	4	4	★	1
R0050T0130L12	0.5	1° 30'	12	1.60	50	4	4	★	1

★ : Inventory maintained in Japan.

Unit : mm

Order Number	Radius of Ball Nose **R**	Taper Angle One Side **B7**	Length of Cut **ap**	Large Mill Dia. **D2**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
MS4LTBR0050T0130L16	0.5	1° 30'	16	1.81	55	4	4	★	1
R0050T0200L08	0.5	2°	8	1.52	50	4	4	★	1
R0050T0200L10	0.5	2°	10	1.66	50	4	4	★	1
R0050T0200L12	0.5	2°	12	1.80	50	4	4	★	1
R0050T0200L16	0.5	2°	16	2.08	55	4	4	★	1
R0060T0030L08	0.6	30'	8	1.33	50	4	4	★	1
R0060T0030L10	0.6	30'	10	1.36	50	4	4	★	1
R0060T0030L12	0.6	30'	12	1.40	50	4	4	★	1
R0060T0030L16	0.6	30'	16	1.47	55	4	4	★	1
R0060T0100L08	0.6	1°	8	1.46	50	4	4	★	1
R0060T0100L10	0.6	1°	10	1.53	50	4	4	★	1
R0060T0100L12	0.6	1°	12	1.60	50	4	4	★	1
R0060T0100L16	0.6	1°	16	1.74	55	4	4	★	1
R0060T0130L08	0.6	1° 30'	8	1.59	50	4	4	★	1
R0060T0130L10	0.6	1° 30'	10	1.69	50	4	4	★	1
R0060T0130L12	0.6	1° 30'	12	1.80	50	4	4	★	1
R0060T0130L16	0.6	1° 30'	16	2.01	55	4	4	★	1
R0060T0200L08	0.6	2°	8	1.72	50	4	4	★	1
R0060T0200L10	0.6	2°	10	1.86	50	4	4	★	1
R0060T0200L12	0.6	2°	12	2.00	50	4	4	★	1
R0060T0200L16	0.6	2°	16	2.28	55	4	4	★	1
R0075T0030L08	0.75	30'	8	1.63	50	4	4	★	1
R0075T0030L10	0.75	30'	10	1.66	50	4	4	★	1
R0075T0030L12	0.75	30'	12	1.70	50	4	4	★	1
R0075T0030L16	0.75	30'	16	1.77	55	4	4	★	1
R0075T0030L20	0.75	30'	20	1.84	60	4	4	★	1
R0075T0100L08	0.75	1°	8	1.75	50	4	4	★	1
R0075T0100L10	0.75	1°	10	1.82	50	4	4	★	1
R0075T0100L12	0.75	1°	12	1.89	50	4	4	★	1
R0075T0100L16	0.75	1°	16	2.03	55	4	4	★	1
R0075T0100L20	0.75	1°	20	2.17	60	4	4	★	1
R0075T0130L08	0.75	1° 30'	8	1.88	50	4	4	★	1
R0075T0130L10	0.75	1° 30'	10	1.98	50	4	4	★	1
R0075T0130L12	0.75	1° 30'	12	2.09	50	4	4	★	1
R0075T0130L16	0.75	1° 30'	16	2.30	55	4	4	★	1
R0075T0130L20	0.75	1° 30'	20	2.51	60	4	4	★	1
R0075T0200L08	0.75	2°	8	2.01	50	4	4	★	1
R0075T0200L10	0.75	2°	10	2.15	50	4	4	★	1
R0075T0200L12	0.75	2°	12	2.29	50	4	4	★	1
R0075T0200L16	0.75	2°	16	2.57	55	4	4	★	1
R0075T0200L20	0.75	2°	20	2.84	60	4	4	★	1
R0090T0030L08	0.9	30'	8	1.92	50	4	4	★	1
R0090T0030L10	0.9	30'	10	1.96	50	4	4	★	1
R0090T0030L12	0.9	30'	12	1.99	50	4	4	★	1
R0090T0030L16	0.9	30'	16	2.06	55	4	4	★	1
R0090T0030L20	0.9	30'	20	2.13	60	4	4	★	1
R0090T0100L08	0.9	1°	8	2.05	50	4	4	★	1
R0090T0100L10	0.9	1°	10	2.12	50	4	4	★	1
R0090T0100L12	0.9	1°	12	2.19	50	4	4	★	1
R0090T0100L16	0.9	1°	16	2.33	55	4	4	★	1
R0090T0100L20	0.9	1°	20	2.47	60	4	4	★	1

MS4LTB

Ball nose, 4 flute, Taper, For rib milling

Unit : mm

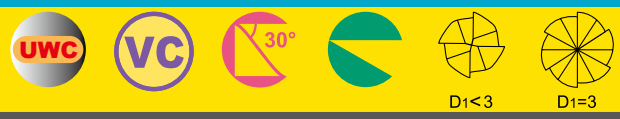
Order Number	Radius of Ball Nose R	Taper Angle One Side B_7	Length of Cut ap	Large Mill Dia. D_2	Overall Length L_1	Shank Dia. D_4	No. of Flutes	Stock	Type
MS4LTBR0090T0130L08	0.9	1° 30'	8	2.17	50	4	4	★	1
R0090T0130L10	0.9	1° 30'	10	2.28	50	4	4	★	1
R0090T0130L12	0.9	1° 30'	12	2.38	50	4	4	★	1
R0090T0130L16	0.9	1° 30'	16	2.59	55	4	4	★	1
R0090T0130L20	0.9	1° 30'	20	2.80	60	4	4	★	1
R0090T0200L08	0.9	2°	8	2.30	50	4	4	★	1
R0090T0200L10	0.9	2°	10	2.44	50	4	4	★	1
R0090T0200L12	0.9	2°	12	2.58	50	4	4	★	1
R0090T0200L16	0.9	2°	16	2.86	55	4	4	★	1
R0090T0200L20	0.9	2°	20	3.13	60	4	4	★	1
R0100T0030L10	1	30'	10	2.16	50	4	4	★	1
R0100T0030L12	1	30'	12	2.19	50	4	4	★	1
R0100T0030L16	1	30'	16	2.26	55	4	4	★	1
R0100T0030L20	1	30'	20	2.33	60	4	4	★	1
R0100T0030L25	1	30'	25	2.42	65	4	4	★	1
R0100T0030L30	1	30'	30	2.51	65	4	4	★	1
R0100T0100L10	1	1°	10	2.31	50	4	4	★	1
R0100T0100L12	1	1°	12	2.38	50	4	4	★	1
R0100T0100L16	1	1°	16	2.52	55	4	4	★	1
R0100T0100L20	1	1°	20	2.66	60	4	4	★	1
R0100T0100L25	1	1°	25	2.84	65	4	4	★	1
R0100T0100L30	1	1°	30	3.01	65	4	4	★	1
R0100T0130L10	1	1° 30'	10	2.47	50	4	4	★	1
R0100T0130L12	1	1° 30'	12	2.58	50	4	4	★	1
R0100T0130L16	1	1° 30'	16	2.79	55	4	4	★	1
R0100T0130L20	1	1° 30'	20	3.00	60	4	4	★	1
R0100T0130L25	1	1° 30'	25	3.26	65	6	4	★	1
R0100T0130L30	1	1° 30'	30	3.52	65	6	4	★	1
R0100T0200L10	1	2°	10	2.63	50	4	4	★	1
R0100T0200L12	1	2°	12	2.77	50	4	4	★	1
R0100T0200L16	1	2°	16	3.05	55	4	4	★	1
R0100T0200L20	1	2°	20	3.33	60	4	4	★	1
R0100T0200L25	1	2°	25	3.68	65	6	4	★	1
R0100T0200L30	1	2°	30	4.03	65	6	4	★	1

★ : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ I241

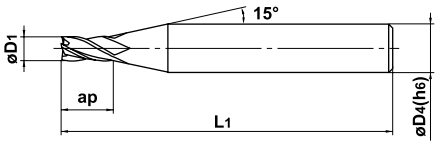
VCMDSC

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 - 0.020					
D4=6					
0 - 0.008					

h6

● 4—6 flute end mill with sharp corner geometry for hardened steel milling.

Unit : mm

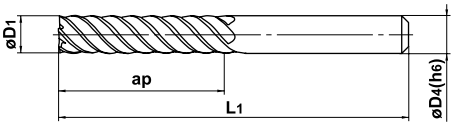
Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VCMDSCD0050	0.5	1	45	6	4	★	1
D0100	1	2.5	45	6	4	★	1
D0150	1.5	4	45	6	4	★	1
D0200	2	6	45	6	4	★	1
D0250	2.5	8	45	6	4	★	1
D0300	3	8	45	6	6	★	1

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

D1≤12	D1>12				
0 - 0.020	0 - 0.030				
D4=6	8≤D4≤10	12≤D4≤16	20≤D4≤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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VCLDD0600	6	26	70	6	6	★	1
D0800	8	36	90	8	6	★	1
D1000	10	46	100	10	6	★	1
D1200	12	56	110	12	6	★	1
D1600	16	66	130	16	6	★	1
D2000	20	76	140	20	6	★	1
D2500	25	92	180	25	6	★	1

★ : Inventory maintained in Japan.

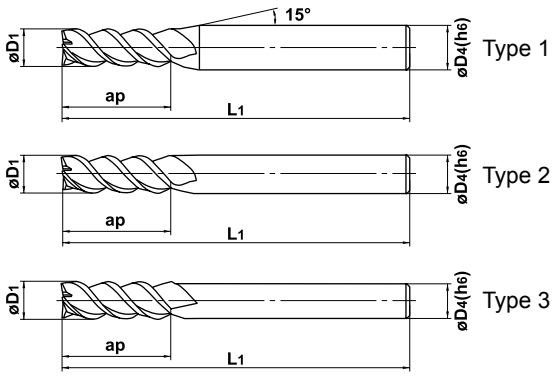
CUTTING CONDITIONS ➤ I243

VCMH

End mill, Medium cut length, 3—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
○	◎	○		◎	◎		





D1≤12	D1>12				
0 - 0.020	0 - 0.030				
D4=6	8≤D4≤10	12≤D4≤16	20≤D4≤25		
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013		

h6

● 3—4 flute end mill for milling difficult-to-cut and soft materials.

Unit : mm

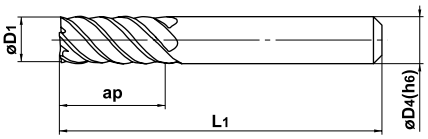
Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VCMHD0300	3	8	45	6	3	★	1
D0400	4	11	45	6	3	★	1
D0500	5	13	50	6	3	★	1
D0600	6	13	50	6	3	★	2
D0700	7	16	60	8	3	★	1
D0800	8	19	60	8	3	★	2
D0900	9	19	70	10	3	★	1
D1000	10	22	70	10	3	★	2
D1100	11	22	75	12	3	★	1
D1200	12	26	75	12	3	★	2
D1300	13	26	75	12	3	★	3
D1400	14	26	75	12	3	★	3
D1500	15	30	80	16	3	★	1
D1600	16	32	90	16	3	★	2
D1800	18	32	90	16	3	★	3
D2000	20	38	100	20	4	★	2
D2500	25	45	120	25	4	★	2

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

D1≤12	D1>12				
0 - 0.02	0 - 0.03				
D4=6	8≤D4≤10	12≤D4≤16	20≤D4≤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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VC6MHD0600	6	13	50	6	6	★	1
D0800	8	19	60	8	6	★	1
D1000	10	22	70	10	6	★	1
D1200	12	26	75	12	6	★	1
D1600	16	32	90	16	6	★	1
D2000	20	38	100	20	6	★	1
D2500	25	45	120	25	6	★	1

★ : Inventory maintained in Japan.

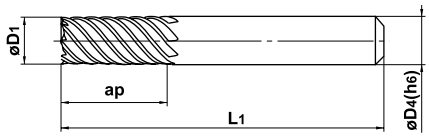
CUTTING CONDITIONS ➤ I245

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

h6	0 - 0.03					
	20≤D4≤25					
	0 - 0.013					

● 8 flute end mill for milling difficult-to-cut and soft materials.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VC8MHD2000	20	38	100	20	8	★	1
D2500	25	45	120	25	8	★	1

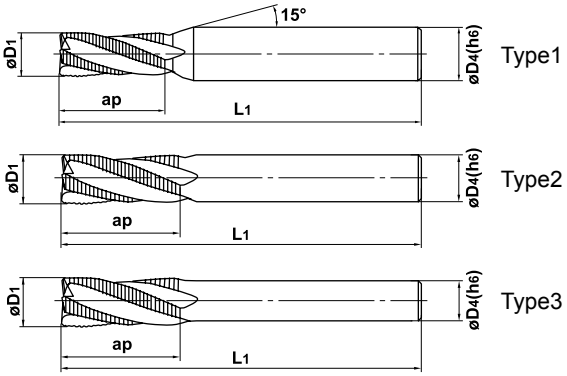
VCSFPR

Roughing end mill, Short cut length, 3—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	D4=6	8≤D4≤10	12≤D4≤16	D4=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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VCSFPRD0300	3	6	50	6	3	★	1
D0400	4	8	50	6	3	★	1
D0500	5	10	50	6	3	●	1
D0600	6	12	50	6	3	●	2
D0700	7	17	60	8	3	●	1
D0800	8	17	60	8	4	●	2
D0900	9	22	70	10	4	●	1
D1000S08	10	22	90	8	4	★	3
D1000	10	22	70	10	4	●	2
D1200S10	12	27	100	10	4	★	3
D1200	12	27	75	12	4	●	2
D1400	14	27	75	12	4	●	3
D1600	16	33	90	16	4	●	2
D1800	18	33	90	16	4	●	3
D2000	20	38	100	20	4	●	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

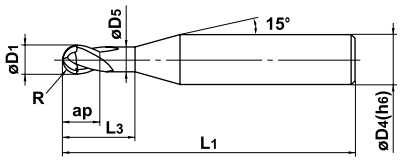
CUTTING CONDITIONS ➤ I246

VC2ESB

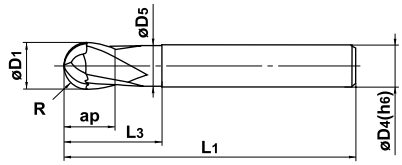
Ball nose, Extra short cut length, 2 flute

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						
	±0.01					
	0 - 0.020					
h6	4≤D4≤6	8≤D4≤10	D4=12			
	0 - 0.008	0 - 0.009	0 - 0.011			

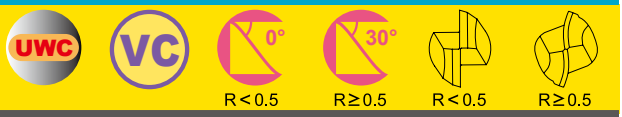
● The optimal series for milling in compact machining center.

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VC2ESBR0015N006	0.15	0.3	0.3	0.6	0.27	30	4	2	●	1
R0020N008	0.2	0.4	0.4	0.8	0.36	30	4	2	●	1
R0030N012	0.3	0.6	0.6	1.2	0.56	30	4	2	●	1
R0040N016	0.4	0.8	0.8	1.6	0.76	30	4	2	●	1
R0050	0.5	1	1	—	—	30	4	2	●	1
R0050N025	0.5	1	1	2.5	0.94	30	4	2	●	1
R0075	0.75	1.5	1.5	—	—	30	4	2	●	1
R0075N040	0.75	1.5	1.5	4	1.44	30	4	2	●	1
R0100	1	2	2	—	—	40	6	2	●	1
R0100N060	1	2	2	6	1.9	40	6	2	●	1
R0150	1.5	3	3	—	—	40	6	2	●	1
R0150N080	1.5	3	3	8	2.9	40	6	2	●	1
R0200	2	4	4	—	—	40	6	2	●	1
R0200N080	2	4	4	8	3.9	40	6	2	●	1
R0250	2.5	5	5	—	—	40	6	2	●	1
R0250N120	2.5	5	5	12	4.9	40	6	2	●	1
R0300	3	6	6	—	—	40	6	2	●	2
R0300N130	3	6	6	13	5.85	40	6	2	●	2
R0350	3.5	7	7	—	—	50	6	2	●	1
R0400	4	8	8	—	—	50	6	2	●	2
R0500	5	10	10	—	—	60	10	2	●	2
R0600	6	12	12	—	—	65	12	2	●	2

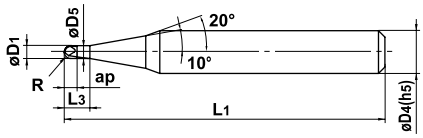
VC2PSB MIRACLE NOVA

Ball nose, Short cut length, 2 flute, High precision

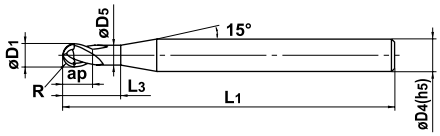


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎		○	○		

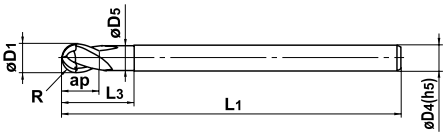




Type 1



Type 2



Type 3

R						
	±0.005					
	0 - 0.01					
h5	D4=6	8≤D4≤10	D4=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	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VC2PSBR0005	0.05	0.1	0.2	—	—	50	6	2	●	1
R0010	0.1	0.2	0.2	0.5	0.17	50	6	2	●	1
R0015	0.15	0.3	0.3	0.8	0.27	50	6	2	●	1
R0020	0.2	0.4	0.4	1	0.36	50	6	2	●	1
R0025	0.25	0.5	0.5	1.3	0.46	50	6	2	●	1
R0030	0.3	0.6	0.6	1.5	0.56	50	6	2	●	1
R0035	0.35	0.7	0.7	1.8	0.66	50	6	2	●	1
R0040	0.4	0.8	0.8	2	0.76	50	6	2	●	1
R0045	0.45	0.9	0.9	2.3	0.86	50	6	2	●	1
R0050	0.5	1	1.5	2.5	0.94	50	6	2	●	2
R0060	0.6	1.2	1.8	3	1.14	50	6	2	★	2
R0070	0.7	1.4	2.1	3.5	1.34	50	6	2	★	2
R0075	0.75	1.5	2.3	3.8	1.44	50	6	2	●	2
R0080	0.8	1.6	2.4	4	1.54	50	6	2	★	2
R0090	0.9	1.8	2.7	4.5	1.74	50	6	2	★	2
R0100	1	2	3	5	1.90	50	6	2	●	2
R0150	1.5	3	4.5	7.5	2.90	70	6	2	●	2
R0200	2	4	6	10	3.90	70	6	2	●	2
R0250	2.5	5	7.5	12.5	4.90	80	6	2	●	2
R0300	3	6	9	15	5.85	80	6	2	●	3
R0400	4	8	12	20	7.85	90	8	2	●	3
R0500	5	10	15	25	9.70	100	10	2	●	3
R0600	6	12	18	30	11.70	110	12	2	●	3

● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.

CUTTING CONDITIONS ➤ I248

VC2PSBP MIRACLE NOVA

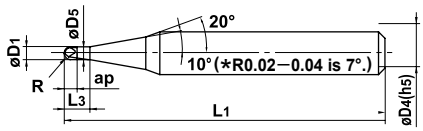
Ball nose, Short cut length, 2 flute, Ultra high precision

UWC VC 0° R<0.5 30° R≥0.5 R<0.5 R≥0.5

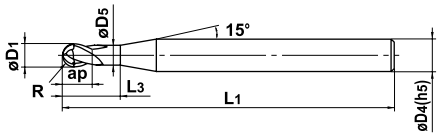
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎		○	○		



Inspection reports regarding the R accuracy of the VC2PSBP are supplied with the tool.

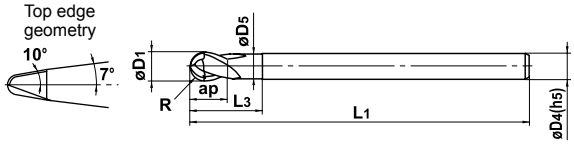


Type 1



Type 2

R0.02−0.04 Top edge geometry



Type 3

R				
±0.002				
0 - 0.01				
D4=6	8≤D4≤10	D4=12		
h5 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	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VC2PSBPR0002	0.02	—	0.06	—	—	50	6	2	□	1
R0003	0.03	—	0.09	—	—	50	6	2	□	1
R0004	0.04	—	0.12	—	—	50	6	2	□	1
R0005	0.05	0.1	0.2	—	—	50	6	2	★	1
R0010	0.1	0.2	0.2	0.5	0.17	50	6	2	★	1
R0015	0.15	0.3	0.3	0.8	0.27	50	6	2	★	1
R0020	0.2	0.4	0.4	1	0.36	50	6	2	★	1
R0025	0.25	0.5	0.5	1.3	0.46	50	6	2	★	1
R0030	0.3	0.6	0.6	1.5	0.56	50	6	2	★	1
R0035	0.35	0.7	0.7	1.8	0.66	50	6	2	★	1
R0040	0.4	0.8	0.8	2	0.76	50	6	2	★	1
R0045	0.45	0.9	0.9	2.3	0.86	50	6	2	★	1
R0050	0.5	1	1.5	2.5	0.94	50	6	2	★	2
R0060	0.6	1.2	1.8	3	1.14	50	6	2	★	2
R0070	0.7	1.4	2.1	3.5	1.34	50	6	2	★	2
R0075	0.75	1.5	2.3	3.8	1.44	50	6	2	★	2
R0080	0.8	1.6	2.4	4	1.54	50	6	2	★	2
R0090	0.9	1.8	2.7	4.5	1.74	50	6	2	★	2
R0100	1	2	3	5	1.9	50	6	2	★	2
R0150	1.5	3	4.5	7.5	2.9	70	6	2	★	2
R0200	2	4	6	10	3.9	70	6	2	★	2
R0250	2.5	5	7.5	12.5	4.9	80	6	2	★	2
R0300	3	6	9	15	5.85	80	6	2	★	3
R0400	4	8	12	20	7.85	90	8	2	★	3
R0500	5	10	15	25	9.7	100	10	2	★	3
R0600	6	12	18	30	11.7	110	12	2	★	3

(Inspection reports with VC2PSBP.)

ULTRA HIGH PRECISION [±0.002mm]

CUTTING CONDITIONS ➤ I248

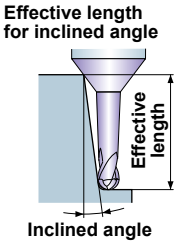
MIRACLE END MILLS

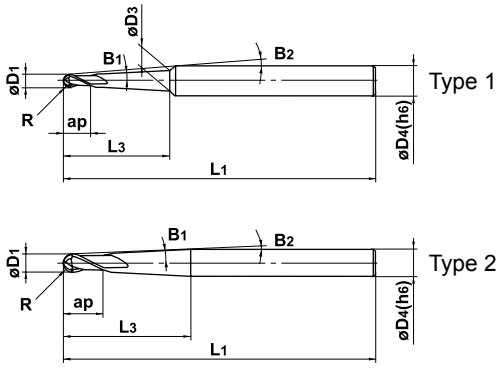
VCXB

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
○	◎	◎	○	○	○		







R			
±0.01			
0 - 0.020			
D4=6	8≤D4≤10	12≤D4≤16	
h6	0 - 0.008	0 - 0.009	0 - 0.011

● Ball nose end mill with taper neck.

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D1	Taper Angle One Side B1	Length of Cut ap	Neck Length L3	Cutting Edge to Shank Angle B2	Neck Dia. D3	Overall Length L1	Shank Dia. D4	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
R0050T0100L021	0.5	1	1°	2	21	5.4°	1.56	60	6	2	●	1	21.2	22.3	23.5
R0050T0100L026	0.5	1	1°	2	26	4.6°	1.73	70	6	2	●	1	26.2	27.6	29.1
R0050T0130	0.5	1	1° 30'	2	23	5.1°	1.97	60	6	2	●	1	—	23.9	25.2
R0050T0300	0.5	1	3°	2	42	3.4°	5.08	80	6	2	●	1	—	—	42.4
R0050T0500	0.5	1	5°	2	23	5.8°	4.46	60	6	2	●	1	—	—	—
R0100T0100L021	1	2	1°	4	21	4.6°	2.43	50	6	2	●	1	21.3	22.4	23.6
R0100T0100L031	1	2	1°	4	31	3.4°	2.78	60	6	2	●	1	31.3	33	34.8
R0100T0100L041	1	2	1°	4	41	2.7°	3.13	70	6	2	●	1	41.3	43.5	*
R0100T0130	1	2	1° 30'	4	23	4.4°	2.8	60	6	2	●	1	—	24.1	25.4
R0100T0300	1	2	3°	4	41	2.9°	5.71	80	6	2	●	1	—	—	*
R0100T0500	1	2	5°	4	23	4.9°	5.02	60	6	2	●	1	—	—	—
R0150T0100L031	1.5	3	1°	6	31	2.7°	3.71	60	6	2	●	1	31.4	33	*
R0150T0100L041	1.5	3	1°	6	41	2.1°	4.06	70	6	2	●	1	41.4	43.5	*
R0150T0100L051	1.5	3	1°	6	51	1.7°	4.41	80	6	2	●	1	51.4	*	*
R0150T0130	1.5	3	1° 30'	6	52	1.7°	5.21	90	6	2	●	1	—	*	*
R0150T0300	1.5	3	3°	6	32	2.8°	5.56	70	6	2	●	1	—	—	*
R0200T0100L036	2	4	1°	8	36	1.7°	4.81	70	6	2	●	1	36.5	*	*
R0200T0100L046	2	4	1°	8	46	1.3°	5.16	80	6	2	●	1	46.5	*	*
R0200T0100L060	2	4	1°	8	60	1°	5.65	90	6	2	●	1	60.5	*	*
R0200T0130	2	4	1° 30'	8	49	1.3°	5.95	90	6	2	●	1	—	*	*
R0200T0300	2	4	3°	8	28	2.2°	—	70	6	2	●	2	—	—	*
R0250T0100L036	2.5	5	1°	10	36	0.9°	5.71	80	6	2	●	1	*	*	*
R0250T0100L065	2.5	5	1°	10	65	1.4°	6.72	110	8	2	●	1	65.6	*	*
R0250T0130	2.5	5	1° 30'	10	61	1.5°	7.42	110	8	2	★	1	—	*	*
R0250T0300	2.5	5	3°	10	41	2.3°	—	90	8	2	★	2	—	—	*
R0300T0100L051	3	6	1°	12	51	1.2°	7.11	90	8	2	●	1	51.8	*	*
R0300T0100L065	3	6	1°	12	65	1°	7.6	110	8	2	●	1	65.8	*	*
R0300T0100L092	3	6	1°	12	92	1.3°	8.54	140	10	2	●	1	92.8	*	*
R0300T0130	3	6	1° 30'	12	53	1.2°	7.85	110	8	2	●	1	—	*	*
R0300T0300	3	6	3°	12	34	1.9°	—	90	8	2	●	2	—	—	*

* No interference

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D_1	Taper Angle One Side B_1	Length of Cut ap	Neck Length L_3	Cutting Edge to Shank Angle B_2	Neck Dia. D_3	Overall Length L_1	Shank Dia. D_4	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	*	*	*
R0400T0100L092	4	8	1°	14	92	1.3°	10.47	140	12	2	★	1	92.8	*	*
R0400T0130	4	8	1° 30'	14	55	1.2°	9.85	120	10	2	★	1	—	*	*
R0400T0300	4	8	3°	14	36	1.8°	—	100	10	2	★	2	—	—	*
R0500T0100L070	5	10	1°	18	70	0.9°	11.76	130	12	2	★	1	*	*	*
R0500T0100L100	5	10	1°	18	100	1.8°	12.8	160	16	2	★	1	100.7	*	*
R0500T0130	5	10	1° 30'	18	59	1.1°	—	130	12	2	★	2	—	*	*
R0500T0300	5	10	3°	18	40	1.7°	—	110	12	2	★	2	—	—	*
R0600T0100L070	6	12	1°	22	70	1.8°	13.62	140	16	2	★	1	70.9	*	*
R0600T0100L100	6	12	1°	22	100	1.2°	14.66	160	16	2	★	1	100.9	*	*
R0600T0130	6	12	1° 30'	22	83	1.5°	15.08	160	16	2	★	1	—	*	*
R0600T0300	6	12	3°	22	63	2.1°	—	140	16	2	★	2	—	—	*

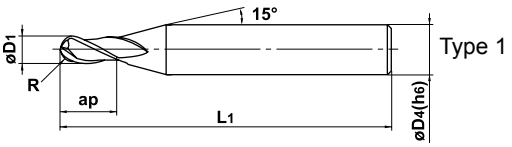
* No interference

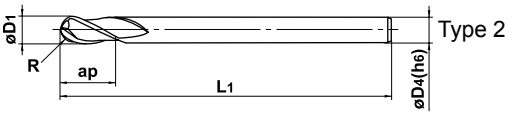
VC3MB

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
○	◎	◎	○	○	○		







R≤6	R≥8				
±0.01	±0.02				
D1≤12	D1>12				
0 - 0.020	0 - 0.030				
D4=6	8≤D4≤10	12≤D4≤16	D4=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	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VC3MBR0100	1	2	6	60	6	3	●	1
R0150	1.5	3	8	70	6	3	●	1
R0200	2	4	8	70	6	3	●	1
R0250	2.5	5	12	80	6	3	●	1
R0300	3	6	12	80	6	3	●	2
R0400	4	8	14	90	8	3	●	2
R0500	5	10	18	100	10	3	●	2
R0600	6	12	22	110	12	3	●	2
R0800	8	16	30	140	16	3	●	2
R1000	10	20	38	160	20	3	●	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

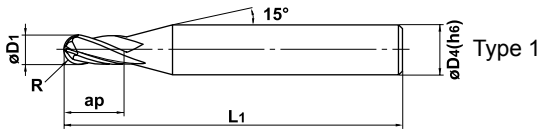
CUTTING CONDITIONS ➤ I250

VC4MB

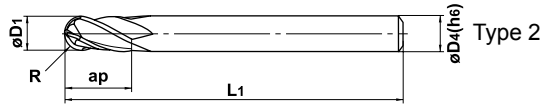
Ball nose, Medium cut length, 4 flute

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
○	◎	◎	◎	○	○		

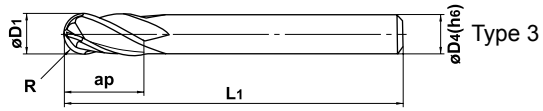




Type 1



Type 2



Type 3

R					
R≤6	R≥7				
±0.01	±0.02				
D1≤12	D1>12				
0 - 0.020	0 - 0.030				
D4=6	8≤D4≤10	12≤D4≤16	D4=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	Radius of Ball Nose **R**	Dia. **D1**	Length of Cut **ap**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
VC4MBR0050	0.5	1	2.5	50	6	4	●	1
R0075	0.75	1.5	4	50	6	4	●	1
R0100	1	2	6	60	6	4	●	1
R0150	1.5	3	8	70	6	4	●	1
R0200	2	4	8	70	6	4	●	1
R0250	2.5	5	12	80	6	4	●	1
R0300	3	6	12	80	6	4	●	2
R0400	4	8	14	90	8	4	●	2
R0500	5	10	18	100	10	4	●	2
R0600	6	12	22	110	12	4	●	2
R0700	7	14	26	120	12	4	★	3
R0800	8	16	30	140	16	4	●	2
R0900	9	18	34	140	16	4	★	3
R1000	10	20	38	160	20	4	★	2

MIRACLE END MILLS

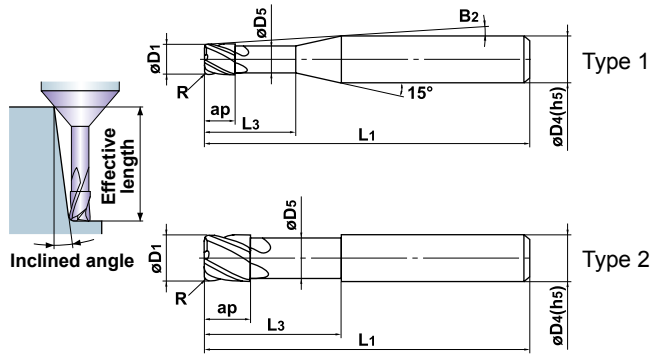
VCPSRB MIRACLE ORBIT

Corner radius, Short cut length, 2-4 flute, High precision type

UWC VC 30° D1≤1.5 D1≥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
◎	◎	◎	◎	○	○		





R				
	±0.01			
h5	0 - 0.01			
	D4=6	8≤D4≤10	D4=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	Dia. D1	Corner Radius R	Length of Cut ap	Neck Length L3	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	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
D0060N02R01	0.6	0.1	0.6	2	0.56	12.6°	50	6	2	★	1	2.1	2.2	2.3	2.6
D0060N02R02	0.6	0.2	0.6	2	0.56	12.7°	50	6	2	★	1	2.1	2.2	2.2	2.5
D0060N04R01	0.6	0.1	0.6	4	0.56	10.9°	50	6	2	★	1	4.2	4.4	4.7	5.1
D0060N04R02	0.6	0.2	0.6	4	0.56	11°	50	6	2	★	1	4.2	4.3	4.7	5
D0080N04R005	0.8	0.05	0.8	4	0.76	10.7°	50	6	2	★	1	4.2	4.4	4.7	5.1
D0080N04R01	0.8	0.1	0.8	4	0.76	10.8°	50	6	2	★	1	4.2	4.4	4.7	5.1
D0080N04R02	0.8	0.2	0.8	4	0.76	10.8°	50	6	2	★	1	4.2	4.3	4.7	5
D0080N04R03	0.8	0.3	0.8	4	0.76	10.9°	50	6	2	★	1	4.2	4.3	4.6	5
D0080N06R01	0.8	0.1	0.8	6	0.76	9.4°	50	6	2	★	1	6.3	6.5	7	7.5
D0080N06R02	0.8	0.2	0.8	6	0.76	9.5°	50	6	2	★	1	6.3	6.5	7	7.5
D0080N06R03	0.8	0.3	0.8	6	0.76	9.5°	50	6	2	★	1	6.3	6.5	6.9	7.5
D0080N08R03	0.8	0.3	0.8	8	0.76	8.5°	50	6	2	★	1	8.3	8.6	9.2	10
D0100N04R005	1	0.05	1	4	0.94	10.5°	50	6	2	★	1	4.2	4.5	4.8	5.3
D0100N04R01	1	0.1	1	4	0.94	10.5°	50	6	2	★	1	4.2	4.5	4.8	5.3
D0100N04R02	1	0.2	1	4	0.94	10.6°	50	6	2	★	1	4.2	4.5	4.7	5.3
D0100N04R03	1	0.3	1	4	0.94	10.6°	50	6	2	★	1	4.2	4.5	4.6	5.2
D0100N04R04	1	0.4	1	4	0.94	10.7°	50	6	2	★	1	4.2	4.5	4.4	5.2
D0100N06R01	1	0.1	1	6	0.94	9.2°	50	6	2	★	1	6.4	6.7	7.2	7.8
D0100N06R02	1	0.2	1	6	0.94	9.2°	50	6	2	★	1	6.4	6.7	7.2	7.7
D0100N06R03	1	0.3	1	6	0.94	9.3°	50	6	2	★	1	6.3	6.6	7.2	7.7
D0100N06R04	1	0.4	1	6	0.94	9.4°	50	6	2	★	1	6.3	6.6	7.1	7.7
D0100N10R03	1	0.3	1	10	0.94	7.4°	50	6	2	★	1	10.5	10.9	11.8	12.7
D0100N10R04	1	0.4	1	10	0.94	7.4°	50	6	2	★	1	10.5	10.9	11.7	12.7
D0120N06R05	1.2	0.5	1.2	6	1.14	9.3°	50	6	2	★	1	6.3	6.6	7.1	7.7
D0120N10R05	1.2	0.5	1.2	10	1.14	7.3°	50	6	2	★	1	10.5	10.9	11.7	12.6
D0120N15R05	1.2	0.5	1.2	15	1.14	5.8°	50	6	2	★	1	15.7	16.3	17.5	18.9
D0150N04R01	1.5	0.1	1.5	4	1.44	10.2°	50	6	2	★	1	4.2	4.5	4.8	5.3
D0150N04R02	1.5	0.2	1.5	4	1.44	10.2°	50	6	2	★	1	4.2	4.5	4.7	5.3
D0150N04R03	1.5	0.3	1.5	4	1.44	10.3°	50	6	2	★	1	4.2	4.5	4.6	5.2
D0150N04R05	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.

Unit : mm

Order Number	Dia. D_1	Corner Radius R	Length of Cut ap	Neck Length L_3	Neck Dia. D_5	Cutting Edge to Shank Angle B_2	Overall Length L_1	Shank Dia. D_4	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
D0150N06R02	1.5	0.2	1.5	6	1.44	8.9°	50	6	2	★	1	6.4	6.7	7.2	7.7
D0150N06R03	1.5	0.3	1.5	6	1.44	8.9°	50	6	2	★	1	6.3	6.6	7.2	7.7
D0150N06R05	1.5	0.5	1.5	6	1.44	9°	50	6	2	●	1	6.3	6.6	7.1	7.7
D0150N10R01	1.5	0.1	1.5	10	1.44	6.9°	50	6	2	★	1	10.6	11	11.8	12.7
D0150N10R02	1.5	0.2	1.5	10	1.44	7°	50	6	2	★	1	10.5	11	11.8	12.7
D0150N10R03	1.5	0.3	1.5	10	1.44	7°	50	6	2	★	1	10.5	10.9	11.8	12.7
D0150N10R05	1.5	0.5	1.5	10	1.44	7.1°	50	6	2	●	1	10.5	10.9	11.7	12.6
D0150N15R01	1.5	0.1	1.5	15	1.44	5.5°	50	6	2	★	1	15.8	16.3	17.5	18.9
D0150N15R02	1.5	0.2	1.5	15	1.44	5.5°	50	6	2	★	1	15.8	16.3	17.5	18.9
D0150N15R03	1.5	0.3	1.5	15	1.44	5.5°	50	6	2	★	1	15.7	16.3	17.5	18.9
D0150N15R05	1.5	0.5	1.5	15	1.44	5.7°	50	6	2	★	1	15.7	16.3	17.4	18.6
D0150N20R03	1.5	0.3	1.5	20	1.44	4.7°	60	6	2	★	1	20.9	21.6	22.9	24.5
D0150N20R05	1.5	0.5	1.5	20	1.44	4.8°	60	6	2	★	1	20.9	21.5	22.8	24.2
D0200N06R01	2	0.1	2	6	1.9	9.4°	50	6	4	★	1	6.3	6.6	6.9	7.5
D0200N06R02	2	0.2	2	6	1.9	9.7°	50	6	4	★	1	6.3	6.6	6.8	7.4
D0200N06R03	2	0.3	2	6	1.9	10°	50	6	4	★	1	6.3	6.6	6.7	7.4
D0200N06R05	2	0.5	2	6	1.9	10.3°	50	6	4	●	1	6.3	6.5	6.5	7.4
D0200N10R01	2	0.1	2	10	1.9	7.6°	50	6	4	★	1	10.5	10.9	11.4	12
D0200N10R02	2	0.2	2	10	1.9	7.7°	50	6	4	★	1	10.5	10.8	11.2	12
D0200N10R03	2	0.3	2	10	1.9	7.8°	50	6	4	★	1	10.5	10.8	11.1	11.9
D0200N10R05	2	0.5	2	10	1.9	8°	50	6	4	●	1	10.5	10.8	10.9	11.9
D0200N15R01	2	0.1	2	15	1.9	5.9°	50	6	4	★	1	15.7	16.1	16.8	17.5
D0200N15R02	2	0.2	2	15	1.9	5.9°	50	6	4	★	1	15.7	16.1	16.7	17.5
D0200N15R03	2	0.3	2	15	1.9	6°	50	6	4	★	1	15.7	16.1	16.6	17.4
D0200N15R05	2	0.5	2	15	1.9	6.1°	50	6	4	●	1	15.6	16.1	16.3	17.4
D0200N20R03	2	0.3	2	20	1.9	4.8°	60	6	4	★	1	20.8	21.4	21.9	22.9
D0200N20R05	2	0.5	2	20	1.9	4.9°	60	6	4	★	1	20.8	21.4	21.7	22.9
D0200N25R03	2	0.3	2	25	1.9	4°	60	6	4	★	1	26	26.6	27.5	28.3
D0200N25R05	2	0.5	2	25	1.9	4°	60	6	4	★	1	26	26.6	27	28.2
D0250N08R01	2.5	0.1	2.5	8	2.4	8.6°	50	6	4	★	1	8.4	8.7	9.2	9.9
D0250N08R02	2.5	0.2	2.5	8	2.4	8.7°	50	6	4	★	1	8.4	8.7	9	9.9
D0250N08R03	2.5	0.3	2.5	8	2.4	8.8°	50	6	4	★	1	8.4	8.7	8.9	9.9
D0250N08R05	2.5	0.5	2.5	8	2.4	9°	50	6	4	★	1	8.4	8.7	8.7	9.9
D0250N08R10	2.5	1	2.5	8	2.4	9.4°	50	6	4	●	1	8.3	8.7	8.2	9.9
D0250N15R03	2.5	0.3	2.5	15	2.4	5.5°	50	6	4	★	1	15.7	16.1	16.6	17.5
D0250N15R05	2.5	0.5	2.5	15	2.4	5.6°	50	6	4	★	1	15.6	16.1	16.3	17.5
D0250N15R10	2.5	1	2.5	15	2.4	5.7°	50	6	4	●	1	15.6	16.1	15.8	17.5
D0300N10R01	3	0.1	3	10	2.9	6.6°	60	6	4	★	1	10.5	10.9	11.4	12.3
D0300N10R02	3	0.2	3	10	2.9	6.6°	60	6	4	★	1	10.5	10.8	11.2	12.3
D0300N10R03	3	0.3	3	10	2.9	6.6°	60	6	4	★	1	10.5	10.8	11.1	12.3
D0300N10R05	3	0.5	3	10	2.9	6.7°	60	6	4	●	1	10.5	10.8	10.9	12.4
D0300N10R10	3	1	3	10	2.9	7°	60	6	4	●	1	10.4	10.8	10.4	12.4
D0300N15R01	3	0.1	3	15	2.9	4.8°	60	6	4	★	1	15.7	16.1	16.8	17.7
D0300N15R02	3	0.2	3	15	2.9	4.8°	60	6	4	★	1	15.7	16.1	16.7	17.8
D0300N15R03	3	0.3	3	15	2.9	4.8°	60	6	4	★	1	15.7	16.1	16.6	17.8
D0300N15R05	3	0.5	3	15	2.9	4.8°	60	6	4	●	1	15.6	16.1	16.3	17.8
D0300N15R10	3	1	3	15	2.9	5°	60	6	4	●	1	15.6	16.1	15.8	17.8
D0300N20R01	3	0.1	3	20	2.9	3.7°	60	6	4	★	1	20.8	21.4	22.1	23.1
D0300N20R02	3	0.2	3	20	2.9	3.7°	60	6	4	★	1	20.8	21.4	22	23.1
D0300N20R03	3	0.3	3	20	2.9	3.8°	60	6	4	★	1	20.8	21.4	21.9	23.2
D0300N20R05	3	0.5	3	20	2.9	3.8°	60	6	4	●	1	20.8	21.4	21.7	23.2

MIRACLE END MILLS

VCPSRB MIRACLE ORBIT

Corner radius, Short cut length, 2-4 flute, High precision type

Unit : mm

Order Number	Dia. D_1	Corner Radius R	Length of Cut ap	Neck Length L_3	Neck Dia. D_5	Cutting Edge to Shank Angle B_2	Overall Length L_1	Shank Dia. D_4	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
D0300N30R03	3	0.3	3	30	2.9	2.6°	70	6	4	★	1	31.1	31.8	32.5	*
D0300N30R05	3	0.5	3	30	2.9	2.6°	70	6	4	★	1	31.1	31.8	32.2	*
D0400N12R01	4	0.1	4	12	3.9	3.8°	60	6	4	★	1	12.5	13	13.5	15.1
D0400N12R02	4	0.2	4	12	3.9	3.8°	60	6	4	★	1	12.5	13	13.4	15.2
D0400N12R03	4	0.3	4	12	3.9	3.8°	60	6	4	★	1	12.5	13	13.3	15.2
D0400N12R05	4	0.5	4	12	3.9	3.9°	60	6	4	●	1	12.5	13	13.1	15.3
D0400N12R10	4	1	4	12	3.9	4°	60	6	4	●	1	12.5	12.9	12.6	15.3
D0400N20R01	4	0.1	4	20	3.9	2.5°	60	6	4	★	1	20.8	21.4	22.1	*
D0400N20R02	4	0.2	4	20	3.9	2.5°	60	6	4	★	1	20.8	21.4	22	*
D0400N20R03	4	0.3	4	20	3.9	2.5°	60	6	4	★	1	20.8	21.4	21.9	*
D0400N20R05	4	0.5	4	20	3.9	2.5°	60	6	4	●	1	20.8	21.4	21.7	*
D0400N20R10	4	1	4	20	3.9	2.6°	60	6	4	●	1	20.8	21.3	21.2	*
D0400N30R03	4	0.3	4	30	3.9	1.8°	70	6	4	★	1	31.1	31.8	*	*
D0400N30R05	4	0.5	4	30	3.9	1.8°	70	6	4	●	1	31.1	31.8	*	*
D0400N30R10	4	1	4	30	3.9	1.8°	70	6	4	●	1	31.1	31.8	*	*
D0500N15R05	5	0.5	5	15	4.9	1.6°	60	6	4	★	1	15.6	16.1	*	*
D0500N15R10	5	1	5	15	4.9	1.6°	60	6	4	★	1	15.6	16.1	*	*
D0500N30R05	5	0.5	5	30	4.9	0.9°	70	6	4	★	1	31.1	*	*	*
D0500N30R10	5	1	5	30	4.9	0.9°	70	6	4	★	1	31.1	*	*	*
D0600N18R01	6	0.1	6	18	5.85	—	70	6	4	★	2	*	*	*	*
D0600N18R02	6	0.2	6	18	5.85	—	70	6	4	★	2	*	*	*	*
D0600N18R03	6	0.3	6	18	5.85	—	70	6	4	★	2	*	*	*	*
D0600N18R05	6	0.5	6	18	5.85	—	70	6	4	●	2	*	*	*	*
D0600N18R10	6	1	6	18	5.85	—	70	6	4	●	2	*	*	*	*
D0600N18R20	6	2	6	18	5.85	—	70	6	4	●	2	*	*	*	*
D0600N41R05	6	0.5	6	41	5.85	—	90	6	4	★	2	*	*	*	*
D0600N50R10	6	1	6	50	5.85	—	90	6	4	★	2	*	*	*	*
D0800N24R01	8	0.1	8	24	7.85	—	90	8	4	★	2	*	*	*	*
D0800N24R02	8	0.2	8	24	7.85	—	90	8	4	★	2	*	*	*	*
D0800N24R03	8	0.3	8	24	7.85	—	90	8	4	★	2	*	*	*	*
D0800N24R05	8	0.5	8	24	7.85	—	90	8	4	●	2	*	*	*	*
D0800N24R10	8	1	8	24	7.85	—	90	8	4	●	2	*	*	*	*
D0800N24R20	8	2	8	24	7.85	—	90	8	4	●	2	*	*	*	*
D0800N24R30	8	3	8	24	7.85	—	90	8	4	●	2	*	*	*	*
D0800N50R10	8	1	8	50	7.85	—	90	8	4	★	2	*	*	*	*
D0800N50R30	8	3	8	50	7.85	—	90	8	4	★	2	*	*	*	*
D1000N30R03	10	0.3	10	30	9.7	—	100	10	4	★	2	*	*	*	*
D1000N30R05	10	0.5	10	30	9.7	—	100	10	4	●	2	*	*	*	*
D1000N30R10	10	1	10	30	9.7	—	100	10	4	●	2	*	*	*	*
D1000N30R20	10	2	10	30	9.7	—	100	10	4	●	2	*	*	*	*
D1000N30R30	10	3	10	30	9.7	—	100	10	4	●	2	*	*	*	*
D1000N30R40	10	4	10	30	9.7	—	100	10	4	●	2	*	*	*	*
D1000N50R10	10	1	10	50	9.7	—	100	10	4	★	2	*	*	*	*
D1000N50R30	10	3	10	50	9.7	—	100	10	4	★	2	*	*	*	*
D1200N36R03	12	0.3	12	36	11.7	—	110	12	4	★	2	*	*	*	*
D1200N36R05	12	0.5	12	36	11.7	—	110	12	4	●	2	*	*	*	*
D1200N36R10	12	1	12	36	11.7	—	110	12	4	●	2	*	*	*	*
D1200N36R20	12	2	12	36	11.7	—	110	12	4	●	2	*	*	*	*
D1200N36R30	12	3	12	36	11.7	—	110	12	4	●	2	*	*	*	*
D1200N36R40	12	4	12	36	11.7	—	110	12	4	●	2	*	*	*	*
D1200N36R50	12	5	12	36	11.7	—	110	12	4	●	2	*	*	*	*

* No interference

● : Inventory maintained. ★ : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ I252

VCPSRB MIRACLE ORBIT

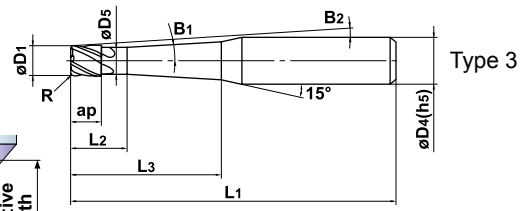
Corner radius, Short cut length, 2-4 flute, Taper neck, High precision

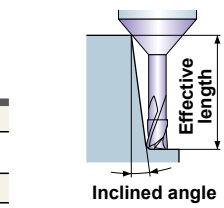
UWC VC 30° D1=1.5 D1≥2

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					
	±0.01				
	0 - 0.01				
h5	D4=6	8≤D4≤10	12≤D4≤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	Dia. D1	Corner Radius R	Taper Angle One Side B1	Length of Cut ap	Neck Length L3	Under Shank Length L2	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	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
D0150N03L10R05	1.5	0.5	1° 30'	1.5	10	3	1.44	7.2°	50	6	2	●	3	—	11.3	12.2
D0200N04L10R05	2	0.5	1° 30'	2	10	4	1.9	6.7°	60	6	4	●	3	—	11.5	12.4
D0200N04L15R05	2	0.5	1° 30'	2	15	4	1.9	5.3°	60	6	4	●	3	—	16.7	18
D0250N05L12R10	2.5	1	1° 30'	2.5	12	5	2.4	5.6°	60	6	4	●	3	—	14.2	15.3
D0250N05L20R10	2.5	1	1° 30'	2.5	20	5	2.4	4°	60	6	4	●	3	—	22.5	24.2
D0300N06L15R05	3	0.5	1° 30'	3	15	6	2.9	4.4°	60	6	4	●	3	—	16.9	18.2
D0300N06L20R05	3	0.5	1° 30'	3	20	6	2.9	3.6°	60	6	4	●	3	—	22.1	23.8
D0300N06L15R10	3	1	1° 30'	3	15	6	2.9	4.4°	60	6	4	●	3	—	17.4	18.7
D0300N06L20R10	3	1	1° 30'	3	20	6	2.9	3.6°	60	6	4	●	3	—	22.6	24.4
D0400N08L20R10	4	1	1° 30'	4	20	8	3.9	2.6°	60	6	4	●	3	—	22.8	*
D0400N08L30R10	4	1	1° 30'	4	30	8	3.9	1.9°	70	6	4	●	3	—	*	*
D0500N08L40R05	5	0.5	1°	5	40	8	4.9	2°	90	8	4	★	3	41.2	*	*
D0500N08L60R05	5	0.5	1°	5	60	8	4.9	1.4°	110	8	4	★	3	61.2	*	*
D0500N08L40R10	5	1	1°	5	40	8	4.9	2°	90	8	4	★	3	41.7	*	*
D0500N08L60R10	5	1	1°	5	60	8	4.9	1.4°	110	8	4	★	3	61.7	*	*
D0600N08L40R20	6	2	1°	6	40	8	5.85	1.4°	70	8	4	●	3	42.8	*	*
D0600N08L60R20	6	2	1°	6	60	8	5.85	1°	100	8	4	★	3	*	*	*
D0800N10L53R20	8	2	1°	8	53	10	7.85	1.1°	90	10	4	●	3	55.9	*	*
D0800N10L70R20	8	2	1°	8	70	10	7.85	1.6°	130	12	4	★	3	72.9	*	*
D1000N12L55R30	10	3	1°	10	55	12	9.7	1.1°	100	12	4	●	3	59.4	*	*
D1000N12L70R30	10	3	1°	10	70	12	9.7	0.9°	130	12	4	★	3	*	*	*
D1200N24L70R30	12	3	1°	12	70	24	11.7	1.6°	130	16	4	★	3	75.2	*	*

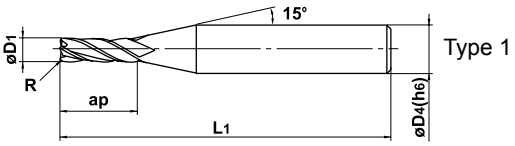
* No interference

VC4JRB

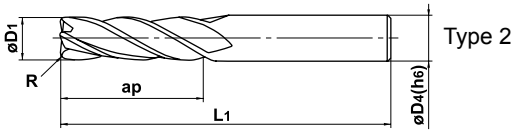
Corner radius end mill, Semi long cut length, 4 flute

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

D1≤12	D1>12				
0 - 0.020	0 - 0.030				
D4=6	8≤D4≤10	12≤D4≤16	D4=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	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VC4JRBD0300R0030	3	0.3	12	50	6	4	★	1
D0400R0030	4	0.3	15	50	6	4	★	1
D0400R0050	4	0.5	15	50	6	4	★	1
D0500R0030	5	0.3	20	60	6	4	★	1
D0500R0050	5	0.5	20	60	6	4	★	1
D0600R0030	6	0.3	20	60	6	4	★	2
D0600R0050	6	0.5	20	60	6	4	★	2
D0600R0100	6	1	20	60	6	4	★	2
D0800R0030	8	0.3	25	70	8	4	★	2
D0800R0050	8	0.5	25	70	8	4	★	2
D0800R0100	8	1	25	70	8	4	★	2
D0800R0150	8	1.5	25	70	8	4	★	2
D0800R0200	8	2	25	70	8	4	★	2
D1000R0030	10	0.3	30	90	10	4	★	2
D1000R0050	10	0.5	30	90	10	4	★	2
D1000R0100	10	1	30	90	10	4	★	2
D1000R0150	10	1.5	30	90	10	4	★	2
D1000R0200	10	2	30	90	10	4	★	2
D1200R0050	12	0.5	30	90	12	4	★	2
D1200R0100	12	1	30	90	12	4	★	2
D1200R0150	12	1.5	30	90	12	4	★	2
D1200R0200	12	2	30	90	12	4	★	2
D1600R0050	16	0.5	50	110	16	4	★	2
D1600R0100	16	1	50	110	16	4	★	2
D1600R0150	16	1.5	50	110	16	4	★	2
D1600R0200	16	2	50	110	16	4	★	2
D2000R0050	20	0.5	55	110	20	4	★	2
D2000R0100	20	1	55	110	20	4	★	2
D2000R0150	20	1.5	55	110	20	4	★	2
D2000R0200	20	2	55	110	20	4	★	2

★ : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ I254

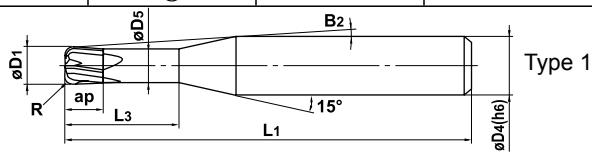
VCHFRB

High feed corner radius, 4 flute

UWC VC 20° D1≤5 10° D1≥6

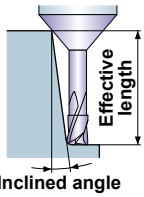
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎	○		○		

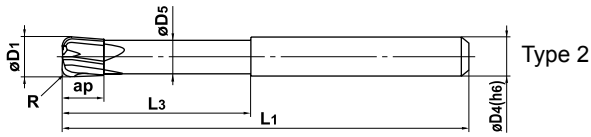




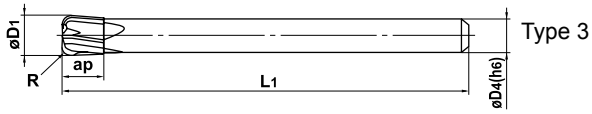
Type 1

Effective length for inclined angle





Type 2



Type 3

R		
±0.015		
D1≤12	D1>12	
0 - 0.02	0 - 0.03	
h6	D4=6	8≤D4≤10	12≤D4≤16
	0 - 0.008	0 - 0.009	0 - 0.011

● Suitable for high feed and efficient machining of die & mold.

Unit : mm

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Neck Length L3	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type	Effective length for inclined angle 30'	1°	2°	3°
VCHFRB D0200R050N06	2	0.5	2	6	1.9	8.7°	50	6	4	★	1	6.2	6.5	6.9	7.5
D0200R050N10	2	0.5	2	10	1.9	6.7°	70	6	4	★	1	10.4	10.8	11.5	12.4
D0300R075N09	3	0.75	3	9	2.9	6.2°	50	6	4	★	1	9.4	9.7	10.4	11.1
D0300R075N15	3	0.75	3	15	2.9	4.3°	70	6	4	★	1	15.6	16.1	17.3	18.6
D0400R100N12	4	1	4	12	3.9	3.9°	50	6	4	★	1	12.4	12.8	13.7	14.7
D0400R100N20	4	1	4	20	3.9	2.6°	70	6	4	★	1	20.7	21.4	22.9	*
D0500R120N15	5	1.2	5	15	4.9	1.9°	70	6	4	★	1	15.5	16	*	*
D0600R150N18	6	1.5	6	18	5.85	—	50	6	4	★	2	*	*	*	*
D0600R150N30	6	1.5	6	30	5.85	—	90	6	4	★	2	*	*	*	*
D0700R150A050	7	1.5	7	—	—	—	50	6	4	★	3	*	*	*	*
D0700R150A080	7	1.5	7	—	—	—	80	6	4	★	3	*	*	*	*
D0800R200N24	8	2	8	24	7.85	—	60	8	4	★	2	*	*	*	*
D0800R200N40	8	2	8	40	7.85	—	90	8	4	★	2	*	*	*	*
D0900R200A065	9	2	9	—	—	—	65	8	4	★	3	*	*	*	*
D0900R200A100	9	2	9	—	—	—	100	8	4	★	3	*	*	*	*
D1000R200N30	10	2	10	30	9.7	—	70	10	4	★	2	*	*	*	*
D1000R200N50	10	2	10	50	9.7	—	100	10	4	★	2	*	*	*	*
D1100R200A070	11	2	11	—	—	—	70	10	4	★	3	*	*	*	*
D1100R200A110	11	2	11	—	—	—	110	10	4	★	3	*	*	*	*
D1200R300N36	12	3	12	36	11.7	—	75	12	4	★	2	*	*	*	*
D1200R300N60	12	3	12	60	11.7	—	110	12	4	★	2	*	*	*	*
D1300R300A075	13	3	13	—	—	—	75	12	4	★	3	*	*	*	*
D1300R300A120	13	3	13	—	—	—	120	12	4	★	3	*	*	*	*
D1600R300N80	16	3	16	80	15.5	—	140	16	4	★	2	*	*	*	*

* No interference

VCHFRB

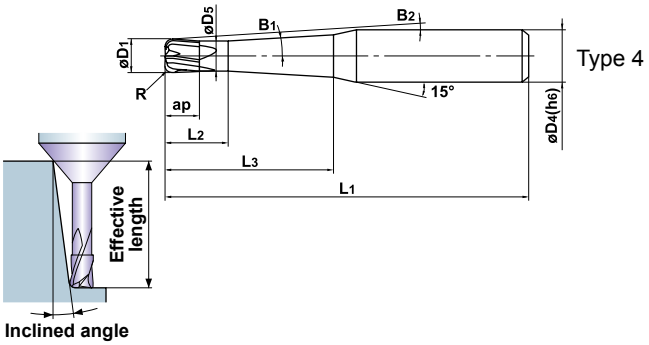
High feed corner radius, taper neck, 4 flute

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		
±0.015		
D1≤12	D1>12	
0 - 0.02	0 - 0.03	
D4=6	8≤D4≤10	12≤D4≤16
0 - 0.008	0 - 0.009	0 - 0.011

● Suitable for high feed and efficient machining of die & mold.

Unit : mm

Order Number	Dia. D1	Corner Radius R	Taper Angle One Side B1	Length of Cut ap	Neck Length L3	Length of Straight Neck L2	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	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
D0200R050N16	2	0.5	1°	2	16	4	1.9	5°	70	6	4	★	4	16.9	18.2	19.6
D0200R050N20	2	0.5	1°	2	20	4	1.9	4.3°	70	6	4	★	4	20.9	22.5	24.3
D0300R075N18	3	0.75	1°	3	18	6	2.9	3.8°	80	6	4	★	4	19.3	20.7	22.3
D0300R075N24	3	0.75	1°	3	24	6	2.9	3°	80	6	4	★	4	25.3	27.2	*
D0300R075N30	3	0.75	1°	3	30	6	2.9	2.6°	80	6	4	★	4	31.3	33.6	*
D0400R100N24	4	1	1°	4	24	8	3.9	2.2°	90	6	4	★	4	25.7	27.6	*
D0400R100N32	4	1	1°	4	32	8	3.9	1.7°	90	6	4	★	4	33.7	*	*
D0400R100N40	4	1	1°	4	40	8	3.9	1.4°	90	6	4	★	4	41.7	*	*
D0500R120N30	5	1.2	1°	5	30	8	4.9	1°	90	6	4	★	4	*	*	*
D0500R120N40	5	1.2	1°	5	40	8	4.9	2°	90	8	4	★	4	41.9	*	*
D0500R120N50	5	1.2	1°	5	50	8	4.9	1.7°	110	8	4	★	4	51.9	*	*
D0600R150N50	6	1.5	1°	6	50	16	5.85	1.2°	110	8	4	★	4	52.9	*	*
D0600R150N67	6	1.5	1°	6	67	16	5.85	0.9°	130	8	4	★	4	*	*	*
D0800R200N70	8	2	1°	8	70	18	7.85	0.9°	120	10	4	★	4	*	*	*
D0800R200N90	8	2	1°	8	90	18	7.85	1.3°	150	12	4	★	4	93.5	*	*
D1000R200N80	10	2	1°	10	80	20	9.7	2°	140	16	4	★	4	83.9	*	*
D1000R200N110	10	2	1°	10	110	20	9.7	1.5°	160	16	4	★	4	113.9	*	*
D1200R300N110	12	3	1°	12	110	24	11.7	1.1°	160	16	4	★	4	115.2	*	*

* No interference

● : Inventory maintained. ★ : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ I255

VCHFRB – Inch sizes

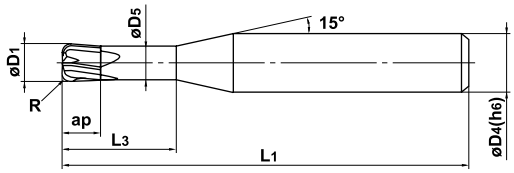
High feed corner radius, 4 flute

UWC VC 20° 10°

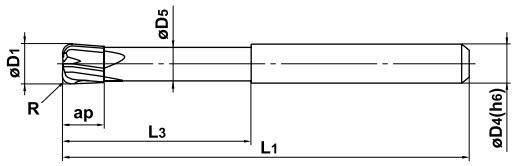
D1≤3/16 D1≥1/4

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					
	±.0006"				
	0 -.0008"				
h6	.250≤D4≤.375"	D4=.500"			
	0 -.00035"	0 -.00043"			

● Suitable for high feed and efficient machining of die & mold.

Unit : inch

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VCHFRBD1/8N3DR0.03	.125	.030	.125	.375	.1191	2.250	.250	4	●	1
D1/8N5DR0.03	.125	.030	.125	.625	.1191	2.250	.250	4	●	1
D3/16N3DR0.05	.188	.050	.188	.563	.1796	2.250	.250	4	●	1
D3/16N5DR0.05	.188	.050	.188	.938	.1796	2.250	.250	4	●	1
D1/4N3DR0.06	.250	.060	.250	.750	.2421	3.000	.250	4	●	2
D1/4N5DR0.06	.250	.060	.250	1.250	.2421	3.000	.250	4	●	2
D3/8N3DR0.08	.375	.080	.375	1.125	.3612	4.000	.375	4	●	2
D3/8N5DR0.08	.375	.080	.375	1.875	.3612	4.000	.375	4	●	2
D1/2N3DR0.12	.500	.120	.500	1.500	.4843	5.000	.500	4	●	2

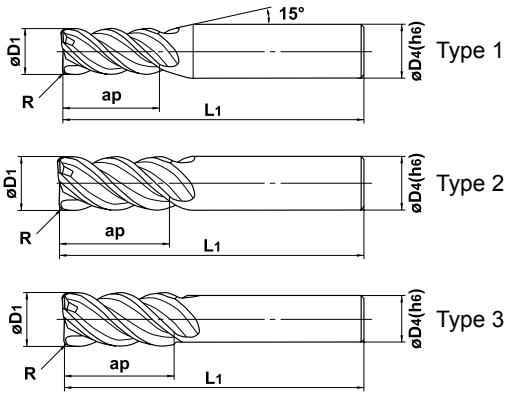
MIRACLE END MILLS

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
○	◎	◎	○	◎	◎		





D1≤12	D1>12				
0 - 0.02	0 - 0.03				
4≤D4≤6	8≤D4≤10	12≤D4≤16	20≤D4≤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	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VCMHDRBD0200R020S04	2	0.2	6	40	4	4	★	1
D0200R030S04	2	0.3	6	40	4	4	★	1
D0300R020S06	3	0.2	8	50	6	4	★	1
D0300R030S06	3	0.3	8	50	6	4	★	1
D0300R050S06	3	0.5	8	50	6	4	★	1
D0400R020S06	4	0.2	11	50	6	4	★	1
D0400R030S06	4	0.3	11	50	6	4	★	1
D0400R050S06	4	0.5	11	50	6	4	★	1
D0500R020S06	5	0.2	13	60	6	4	★	1
D0500R030S06	5	0.3	13	60	6	4	★	1
D0500R050S06	5	0.5	13	60	6	4	★	1
D0500R100S06	5	1	13	60	6	4	★	1
D0600R030S06	6	0.3	13	60	6	4	★	2
D0600R050S06	6	0.5	13	60	6	4	★	2
D0600R100S06	6	1	13	60	6	4	★	2
D0800R030S08	8	0.3	19	70	8	4	★	2
D0800R050S08	8	0.5	19	70	8	4	★	2
D0800R100S08	8	1	19	70	8	4	★	2
D0800R150S08	8	1.5	19	70	8	4	★	2
D1000R030S08	10	0.3	22	90	8	4	★	3
D1000R050S08	10	0.5	22	90	8	4	★	3
D1000R100S08	10	1	22	90	8	4	★	3
D1000R150S08	10	1.5	22	90	8	4	★	3
D1000R200S08	10	2	22	90	8	4	★	3
D1000R030S10	10	0.3	22	90	10	4	★	2
D1000R050S10	10	0.5	22	90	10	4	★	2
D1000R100S10	10	1	22	90	10	4	★	2
D1000R150S10	10	1.5	22	90	10	4	★	2
D1000R200S10	10	2	22	90	10	4	★	2
D1200R050S10	12	0.5	26	90	10	4	★	3
D1200R100S10	12	1	26	90	10	4	★	3

★ : Inventory maintained in Japan.

Unit : mm

Order Number	Dia. **D1**	Corner Radius **R**	Length of Cut **ap**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
VCMHDRB D1200R150S10	12	1.5	26	90	10	4	★	3
D1200R200S10	12	2	26	90	10	4	★	3
D1200R300S10	12	3	26	90	10	4	★	3
D1200R050S12	12	0.5	26	90	12	4	★	2
D1200R100S12	12	1	26	90	12	4	★	2
D1200R150S12	12	1.5	26	90	12	4	★	2
D1200R200S12	12	2	26	90	12	4	★	2
D1200R300S12	12	3	26	90	12	4	★	2
D1600R100S16	16	1	32	110	16	4	★	2
D1600R150S16	16	1.5	32	110	16	4	★	2
D1600R200S16	16	2	32	110	16	4	★	2
D1600R300S16	16	3	32	110	16	4	★	2
D1800R100S16	18	1	32	110	16	4	★	3
D1800R150S16	18	1.5	32	110	16	4	★	3
D1800R200S16	18	2	32	110	16	4	★	3
D1800R300S16	18	3	32	110	16	4	★	3
D2000R100S20	20	1	38	110	20	4	★	2
D2000R150S20	20	1.5	38	110	20	4	★	2
D2000R200S20	20	2	38	110	20	4	★	2
D2000R300S20	20	3	38	110	20	4	★	2
D2200R100S20	22	1	38	140	20	4	★	3
D2200R150S20	22	1.5	38	140	20	4	★	3
D2200R200S20	22	2	38	140	20	4	★	3
D2200R300S20	22	3	38	140	20	4	★	3
D2500R100S25	25	1	45	140	25	4	★	2
D2500R150S25	25	1.5	45	140	25	4	★	2
D2500R200S25	25	2	45	140	25	4	★	2
D2500R300S25	25	3	45	140	25	4	★	2

VC4STB

Ball nose taper end mill, Short cut length, 4 flute





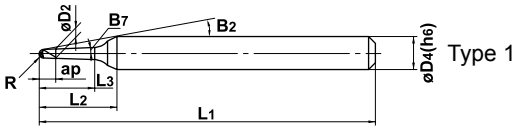




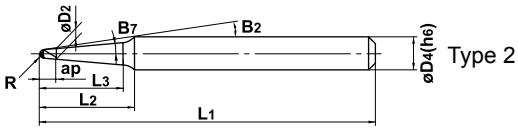


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎	○	○		

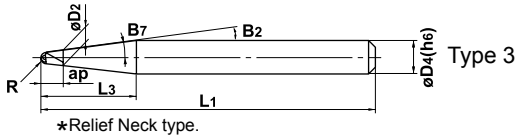




Type 1



Type 2



Type 3

★Relief Neck type.

R						
	±0.01					
h6	D4=6	8≤D4≤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	Radius of Ball Nose R	Taper Angle One Side B7	Length of Cut ap	Neck Length L3	Under Shank Length L2	Large Mill Dia. D2	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VC4STBR0030T0130N05	0.3	1° 30'	1	5	9.0	0.64	17.2°	60	6	4	●	1
R0030T0200N05	0.3	2°	1	5	9.0	0.65	17.2°	60	6	4	★	1
R0030T0500N05	0.3	5°	1	5	8.8	0.70	17.6°	60	6	4	●	1
R0030T1000N15	0.3	10°	1	15	—	0.90	10.4°	60	6	4	●	3
R0040T0130N10	0.4	1° 30'	2	10	14.0	0.88	10.8°	60	6	4	★	1
R0040T0130N15	0.4	1° 30'	2	15	19.0	0.88	8.0°	60	6	4	★	1
R0040T0200N10	0.4	2°	2	10	14.0	0.91	10.8°	60	6	4	★	1
R0040T0500N10	0.4	5°	2	10	13.5	1.08	11.2°	60	6	4	★	1
R0040T0700N10	0.4	7°	7	10	12.2	2.43	12.4°	60	6	4	★	2
R0040T1000N15	0.4	10°	3	15	—	1.73	10.1°	60	6	4	★	3
R0050T0130N10	0.5	1° 30'	2	10	14.0	1.08	10.5°	60	6	4	●	1
R0050T0130N15	0.5	1° 30'	2	15	19.0	1.08	7.7°	60	6	4	★	1
R0050T0130N20	0.5	1° 30'	2	20	24.0	1.08	6.1°	60	6	4	★	1
R0050T0200N10	0.5	2°	2	10	14.0	1.11	10.5°	60	6	4	●	1
R0050T0200N15	0.5	2°	2	15	18.9	1.11	7.8°	60	6	4	●	1
R0050T0200N20	0.5	2°	3	20	24.0	1.11	6.1°	60	6	4	★	1
R0050T0500N10	0.5	5°	3	10	13.6	1.44	10.8°	60	6	4	●	1
R0050T0500N15	0.5	5°	3	15	17.2	1.44	8.5°	60	6	4	●	2
R0050T0500N20	0.5	5°	3	20	21.8	1.44	6.7°	60	6	4	●	2
R0050T0700N10	0.5	7°	7	10	12.1	2.60	12.2°	60	6	4	●	2
R0050T0700N15	0.5	7°	7	15	16.6	2.60	8.9°	60	6	4	●	2
R0050T0700N20	0.5	7°	7	20	—	2.60	7.3°	60	6	4	●	3
R0050T1000N14	0.5	10°	3	14	—	1.90	10.5°	60	6	4	●	3
R0075T0200N10	0.75	2°	3	10	14.0	1.66	9.6°	60	6	4	●	1
R0075T0500N15	0.75	5°	3	15	17.0	1.90	7.9°	60	6	4	●	2
R0100T0130N10	1	1° 30'	4	10	13.5	2.16	9.1°	60	6	4	●	1
R0100T0130N15	1	1° 30'	4	15	18.5	2.16	6.5°	60	6	4	●	1
R0100T0130N20	1	1° 30'	4	20	23.5	2.16	5.1°	60	6	4	●	1
R0100T0200N06	1	2°	4	6	8.7	2.20	14.4°	60	6	4	●	2
R0100T0200N10	1	2°	4	10	13.8	2.20	8.9°	60	6	4	●	1
R0100T0200N15	1	2°	4	15	17.5	2.20	6.9°	60	6	4	●	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

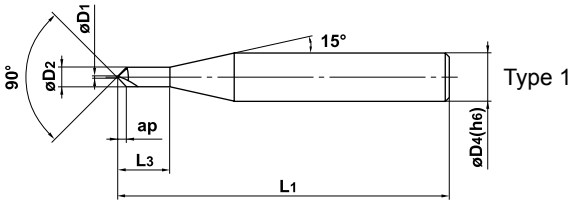
Order Number	Radius of Ball Nose **R**	Taper Angle One Side **B7**	Length of Cut **ap**	Neck Length **L3**	Under Shank Length **L2**	Large Mill Dia. **D2**	Cutting Edge to Shank Angle **B2**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
VC4STBR0100T0500N10	1	5°	4	10	12.2	2.50	10.1°	60	6	4	●	2
R0100T0500N15	1	5°	4	15	16.8	2.50	7.2°	60	6	4	●	2
R0100T0500N23	1	5°	4	23	—	2.50	5.2°	60	6	4	●	3
R0100T0700N17	1	7°	7	17	—	3.49	7.1°	60	6	4	●	3
R0100T1000N12	1	10°	4	12	—	3.10	10.3°	60	6	4	●	3
R0125T0500N15	1.25	5°	4	15	16.5	2.99	6.6°	60	6	4	●	2
R0150T0130N15	1.5	1° 30'	4	15	17.3	3.13	5.4°	60	6	4	●	2
R0150T0130N20	1.5	1° 30'	4	20	22.2	3.13	4.2°	60	6	4	●	2
R0150T0300N15	1.5	3°	4	15	16.9	3.27	5.6°	60	6	4	●	2
R0150T0500N10	1.5	5°	4	10	11.7	3.50	8.3°	60	6	4	●	2
R0150T0500N18	1.5	5°	4	18	—	3.50	5.2°	60	6	4	●	3
R0175T0500N15	1.75	5°	4	15	—	3.91	5.4°	60	6	4	●	3
R0200T0130N15	2	1° 30'	5	15	16.8	4.16	3.9°	60	6	4	●	2
R0200T0130N20	2	1° 30'	5	20	21.6	4.16	3.0°	60	6	4	●	2
R0200T0300N21	2	3°	4	21	—	4.22	3.1°	60	6	4	●	3
R0200T0500N13	2	5°	4	13	—	4.40	5.2°	60	6	4	●	3
R0200T0700N18	2	7°	7	18	—	5.26	7.1°	60	8	4	●	3
R0300T0130N15	3	1° 30'	6	15	16.8	6.16	4.2°	90	8	4	●	2
R0300T0130N20	3	1° 30'	6	20	21.7	6.16	3.1°	90	8	4	●	2
R0300T0300N22	3	3°	6	22	—	6.32	3.1°	90	8	4	●	3
R0400T0130N15	4	1° 30'	8	15	16.9	8.21	4.4°	90	10	4	★	2
R0400T0300N22	4	3°	8	22	—	8.43	3.2°	90	10	4	★	3

VC2C

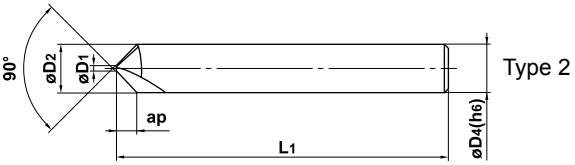
Chamfer cutter, 2 flute

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					
D4=6	8≤D4≤10	D4=12			
h6 0 - 0.008	h6 0 - 0.009	h6 0 - 0.011			

● Chamfer cutter for machining hardened steels and difficult-to-cut materials.

Unit : mm

Order Number	Dia. D2	Small Mill Dia. D1	Length of Cut ap	Neck Length L3	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VC2CD0200	2	0.3	0.85	6	50	6	2	★	1
D0400	4	0.3	1.85	12	50	6	2	★	1
D0600	6	0.3	2.85	—	50	6	2	★	2
D0800	8	0.4	3.8	—	60	8	2	★	2
D1000	10	0.5	4.75	—	70	10	2	★	2
D1200	12	0.5	5.75	—	75	12	2	★	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

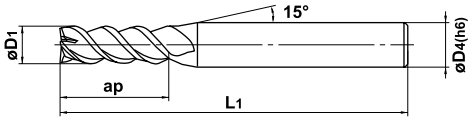
CUTTING CONDITIONS ➤ I260

VQMHZV NEW

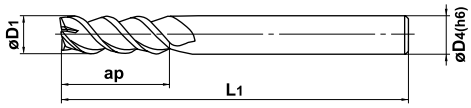
End mill, Medium cut length, 3 flute for drilling and slotting

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
◎	○			◎	◎		

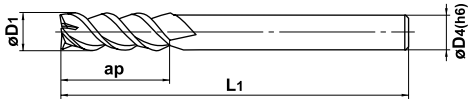




Type1



Type2



Type3

h6

D1≤12	D1>12				
0 - 0.02	0 - 0.03				
4≤D4≤6	8≤D4≤10	12≤D4≤16	D4=20		
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013		

- 3 flute end mill for slotting and shoulder milling.
- Featuring irregular helical geometry for reduced vibration.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VQMHZVD0100	1	2	45	4	3	●	1
D0110	1.1	2.2	45	4	3	★	1
D0120	1.2	2.4	45	4	3	★	1
D0130	1.3	2.6	45	4	3	★	1
D0140	1.4	2.8	45	4	3	★	1
D0150	1.5	3	45	4	3	●	1
D0160	1.6	3.2	45	4	3	★	1
D0170	1.7	3.4	45	4	3	★	1
D0180	1.8	3.6	45	4	3	★	1
D0190	1.9	3.8	45	4	3	★	1
D0200	2	4	50	6	3	●	1
D0210	2.1	4.2	50	6	3	★	1
D0220	2.2	4.4	50	6	3	★	1
D0230	2.3	4.6	50	6	3	★	1
D0240	2.4	4.8	50	6	3	★	1
D0250	2.5	5	50	6	3	●	1
D0260	2.6	5.2	50	6	3	★	1
D0270	2.7	5.4	50	6	3	★	1
D0280	2.8	5.6	50	6	3	★	1
D0290	2.9	5.8	50	6	3	★	1
D0300	3	6	50	6	3	●	1
D0310	3.1	7	50	6	3	★	1
D0320	3.2	7	50	6	3	★	1
D0330	3.3	7	50	6	3	★	1
D0340	3.4	7	50	6	3	★	1
D0350	3.5	8	50	6	3	●	1
D0360	3.6	8	50	6	3	★	1
D0370	3.7	8	50	6	3	★	1
D0380	3.8	8	50	6	3	★	1
D0390	3.9	8	50	6	3	★	1
D0400	4	8	50	6	3	●	1

CUTTING CONDITIONS ➤ I261

SMART MIRACLE END MILLS

VQMHZV NEW

End mill, Medium cut length, 3 flute for drilling and slotting

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VQMHZVD0450	4.5	10	50	6	3	●	1
D0500	5	10	50	6	3	●	1
D0550	5.5	13	50	6	3	●	1
D0600	6	13	60	6	3	●	2
D0650	6.5	16	60	8	3	●	1
D0700	7	16	60	8	3	●	1
D0750	7.5	16	60	8	3	●	1
D0800	8	19	70	8	3	●	2
D0850	8.5	19	70	10	3	●	1
D0900	9	19	70	10	3	●	1
D0950	9.5	19	70	10	3	●	1
D1000	10	22	80	10	3	●	2
D1100	11	22	80	12	3	●	1
D1200	12	26	90	12	3	●	2
D1300	13	26	90	12	3	★	3
D1400	14	26	90	12	3	★	3
D1500	15	26	110	16	3	★	1
D1600	16	30	110	16	3	★	2
D2000	20	32	140	20	3	★	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ I261

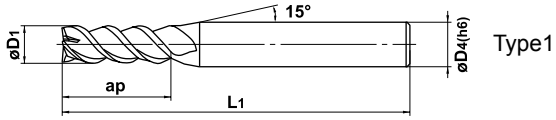
VQMHZV - Inch sizes

NEW

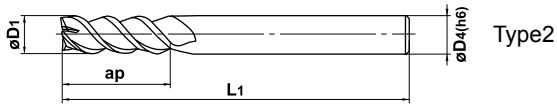
End mill, Medium cut length, 3 flute for drilling and slotting

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

D1<.5000"	D1=.5000"				
0 - .0008"	0 - .0012"				
.250"≤D4≤.375"	D4=.500"				
0 - .00035"	0 - .00043"				

h6

- 3 flute end mill for slotting and shoulder milling.
- Featuring irregular helical geometry for reduced vibration.

Unit : inch

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VQMHZVD1/16	.0625	.1250	2.0	.2500	3	●	1
D5/64	.0781	.1560	2.0	.2500	3	●	1
D3/32	.0938	.1880	2.0	.2500	3	●	1
D7/64	.1094	.2500	2.0	.2500	3	●	1
D1/8	.1250	.3130	2.0	.2500	3	●	1
D5/32	.1563	.3750	2.0	.2500	3	●	1
D3/16	.1875	.4375	2.0	.2500	3	●	1
D1/4	.2500	.6250	2.5	.2500	3	●	2
D5/16	.3125	.7500	2.75	.3125	3	●	2
D11/32	.3438	.7500	3.0	.3750	3	●	1
D3/8	.3750	.8750	3.0	.3750	3	●	2
D1/2	.5000	1.1250	3.5	.5000	3	●	2

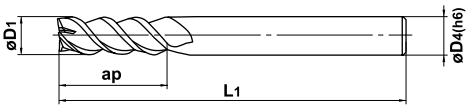
SMART MIRACLE END MILLS

VQMHZVOH NEW

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

D1≤12	D1=16				
0 - 0.02	0 - 0.03				
4≤D4≤6	8≤D4≤10	12≤D4≤16			
0 - 0.008	0 - 0.009	0 - 0.011			

h6

- 3 flute end mill for slotting and shoulder milling.
- Due to the through coolant it is possible vertical feed and pocket machine.
- Featuring irregular helical geometry for reduced vibration.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VQMHZVOHD0600	6	13	60	6	3	●	1
D0800	8	19	70	8	3	●	1
D1000	10	22	80	10	3	●	1
D1200	12	26	90	12	3	●	1
D1600	16	30	110	16	3	★	1

● : Inventory maintained. ★ : Inventory maintained in Japan.

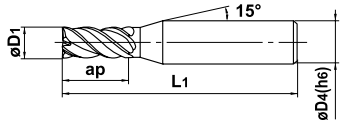
CUTTING CONDITIONS ➤ I265

VQMHV NEW

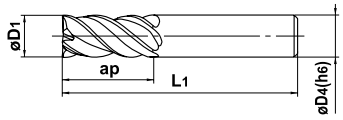
End mill, Medium cut length, 4 flute, Irregular helix flutes

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
◎	○			◎	◎		

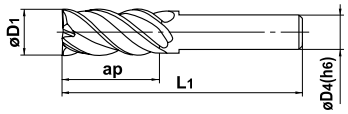




Type1



Type2



Type3

h6

D1≤12	D1>12				
0 - 0.02	0 - 0.03				
4≤D4≤6	8≤D4≤10	12≤D4≤16	20≤D4≤25		
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013		

● SMART MIRACLE irregular helix end mills for reduced vibration and for delivering a stable performance on difficult-to-cut materials and long overhang applications.

Unit : mm

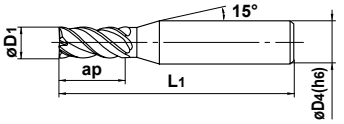
Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VQMHVD0200	2	4	45	4	4	●	1
D0250	2.5	5	45	4	4	●	1
D0300	3	8	45	6	4	●	1
D0350	3.5	8	45	6	4	●	1
D0400	4	11	45	6	4	●	1
D0500	5	13	50	6	4	●	1
D0600	6	13	50	6	4	●	2
D0700	7	19	60	8	4	●	1
D0800	8	19	60	8	4	●	2
D0900	9	22	70	10	4	●	1
D1000	10	22	70	10	4	●	2
D1100	11	26	75	12	4	●	1
D1200	12	26	75	12	4	●	2
D1300	13	26	75	12	4	★	3
D1400	14	30	90	16	4	★	1
D1600	16	35	90	16	4	★	2
D1800	18	40	100	16	4	★	3
D2000	20	45	110	20	4	★	2
D2500	25	55	125	25	4	★	2

VQMHV - Inch sizes NEW

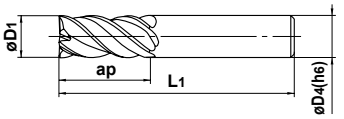
End mill, Medium cut length, 4 flute, Irregular helix flutes

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

h6

D1<.5000"	D1=.5000"				
0 - .0008"	0 - .0012"				
.250"≤D4≤.375"	D4=.500"				
0 - .00035"	0 - .00043"				

- SMART MIRACLE irregular helix end mills for reduced vibration and for delivering a stable performance on difficult-to-cut materials and long overhang applications.

Unit : inch

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VQMHVD1/8	.1250	.3130	2.0	.2500	4	●	1
D3/16	.1875	.4375	2.0	.2500	4	●	1
D1/4	.2500	.6250	2.5	.2500	4	●	2
D5/16	.3125	.7500	2.75	.3125	4	●	2
D3/8	.3750	.8750	3.0	.3750	4	●	2
D1/2	.5000	1.1250	3.5	.5000	4	●	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

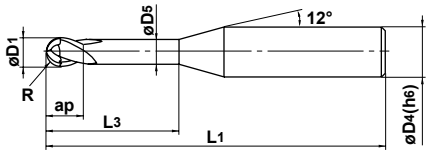
CUTTING CONDITIONS ➤ I269

VQ4SVB NEW

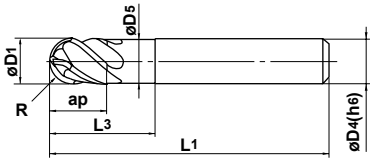
Ball nose, Short cut length, 4 flute, Irregular helix flutes

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
○	○			◎	◎	○	





Type1



Type2

R						
	±0.01					
	D1≤12					
	0 - 0.02					
h6	D4=6	8≤D4≤10	D4=20			
	0 - 0.008	0 - 0.009	0 - 0.011			

- SMART MIRACLE irregular helix end mills for reduced vibration and delivering a stable performance on difficult-to-cut materials such as inconel.

Unit : mm

Order Number	Radius of Ball Nose **R**	Dia. **D1**	Length of Cut **ap**	Neck Length **L3**	Neck Dia. **D5**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
VQ4SVBR0100	1	2	3	5	1.9	50	6	4	●	1
R0150	1.5	3	4.5	7.5	2.9	50	6	4	●	1
R0200	2	4	6	10	3.9	50	6	4	●	1
R0250	2.5	5	7.5	12.5	4.9	50	6	4	●	1
R0300	3	6	9	15	5.85	50	6	4	●	2
R0400	4	8	12	20	7.85	60	8	4	★	2
R0500	5	10	15	25	9.7	70	10	4	★	2
R0600	6	12	18	30	11.7	75	12	4	★	2

SMART MIRACLE END MILLS

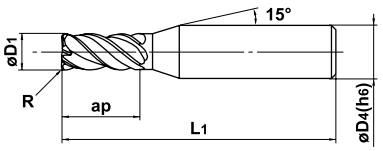
VQMHVRB NEW

Corner radius, End mill, Medium cut length, 4 flute, Irregular helix flutes

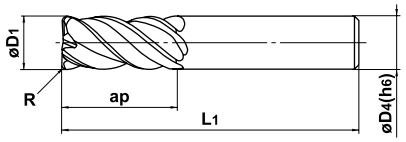
UWC VQ 37° 40°

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



Type2

R						
	±0.015					
	D1≤12	D1>12				
	0 - 0.02	0 - 0.03				
h6	4≤D4≤6	8≤D4≤10	12≤D4≤16	D4=20		
	0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013		

- SMART MIRACLE irregular helix end mills for reduced vibration and for delivering a stable performance on difficult-to-cut materials and long overhang applications.

Unit : mm

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VQMHVRBD0200R020	2	0.2	4	45	4	4	●	1
D0200R030	2	0.3	4	45	4	4	●	1
D0300R020	3	0.2	8	45	6	4	●	1
D0300R030	3	0.3	8	45	6	4	●	1
D0300R050	3	0.5	8	45	6	4	●	1
D0400R020	4	0.2	11	45	6	4	●	1
D0400R030	4	0.3	11	45	6	4	●	1
D0400R050	4	0.5	11	45	6	4	●	1
D0500R020	5	0.2	13	50	6	4	●	1
D0500R030	5	0.3	13	50	6	4	●	1
D0500R050	5	0.5	13	50	6	4	●	1
D0500R100	5	1	13	50	6	4	●	1
D0600R030	6	0.3	13	50	6	4	●	2
D0600R050	6	0.5	13	50	6	4	●	2
D0600R100	6	1	13	50	6	4	●	2
D0800R030	8	0.3	19	60	8	4	●	2
D0800R050	8	0.5	19	60	8	4	●	2
D0800R100	8	1	19	60	8	4	●	2
D0800R150	8	1.5	19	60	8	4	●	2
D1000R030	10	0.3	22	70	10	4	●	2
D1000R050	10	0.5	22	70	10	4	●	2
D1000R100	10	1	22	70	10	4	●	2
D1000R150	10	1.5	22	70	10	4	●	2
D1000R200	10	2	22	70	10	4	●	2
D1200R050	12	0.5	26	75	12	4	●	2
D1200R100	12	1	26	75	12	4	●	2
D1200R150	12	1.5	26	75	12	4	●	2
D1200R200	12	2	26	75	12	4	●	2
D1200R250	12	2.5	26	75	12	4	●	2
D1200R300	12	3	26	75	12	4	●	2
D1600R100	16	1	35	90	16	4	★	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

Unit : mm

Order Number	Dia. D_1	Corner Radius R	Length of Cut ap	Overall Length L_1	Shank Dia. D_4	No. of Flutes	Stock	Type
VQMHVRBD1600R150	16	1.5	35	90	16	4	★	2
D1600R200	16	2	35	90	16	4	★	2
D1600R250	16	2.5	35	90	16	4	★	2
D1600R300	16	3	35	90	16	4	★	2
D1600R400	16	4	35	90	16	4	★	2
D1600R500	16	5	35	90	16	4	★	2
D2000R100	20	1	45	110	20	4	★	2
D2000R150	20	1.5	45	110	20	4	★	2
D2000R200	20	2	45	110	20	4	★	2
D2000R250	20	2.5	45	110	20	4	★	2
D2000R300	20	3	45	110	20	4	★	2
D2000R400	20	4	45	110	20	4	★	2
D2000R500	20	5	45	110	20	4	★	2
D2000R635	20	6.35	45	110	20	4	★	2

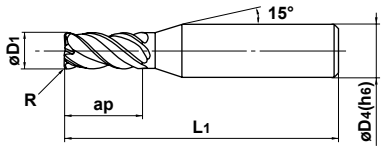
VQMHVRB - Inch sizes

NEW

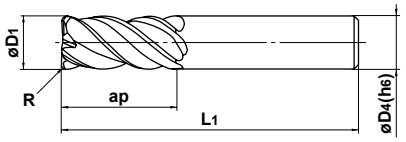
Corner radius end mill, Medium cut length, 4 flute, Irregular helix flutes

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
◎	○			◎	◎		





Type1



Type2

R						
±.0006"						
D1<.5000"	D1=.5000"					
0 - .0008"	0 - .0012"					
.250"≤D4≤.375"	D4=.500"					
h6						
0 - .00035"	0 - .00043"					

- SMART MIRACLE irregular helix end mills for reduced vibration and for delivering a stable performance on difficult-to-cut materials and long overhang applications.

Unit : mm

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VQMHVRBD1/8R008	.1250	.0080	.3130	2.0	.2500	4	●	1
D1/8R010	.1250	.0100	.3130	2.0	.2500	4	●	1
D3/16R010	.1875	.0100	.4375	2.0	.2500	4	●	1
D3/16R015	.1875	.0150	.4375	2.0	.2500	4	●	1
D3/16R020	.1875	.0200	.4375	2.0	.2500	4	●	1
D3/16R030	.1875	.0300	.4375	2.0	.2500	4	●	1
D1/4R008	.2500	.0080	.6250	2.5	.2500	4	●	2
D1/4R010	.2500	.0100	.6250	2.5	.2500	4	●	2
D1/4R015	.2500	.0150	.6250	2.5	.2500	4	●	2
D1/4R020	.2500	.0200	.6250	2.5	.2500	4	●	2
D1/4R030	.2500	.0300	.6250	2.5	.2500	4	●	2
D5/16R010	.3125	.0100	.7500	2.75	.3125	4	●	2
D5/16R015	.3125	.0150	.7500	2.75	.3125	4	●	2
D5/16R020	.3125	.0200	.7500	2.75	.3125	4	●	2
D5/16R030	.3125	.0300	.7500	2.75	.3125	4	●	2
D5/16R060	.3125	.0600	.7500	2.75	.3125	4	●	2
D3/8R010	.3750	.0100	.8750	3.0	.3750	4	●	2
D3/8R015	.3750	.0150	.8750	3.0	.3750	4	●	2
D3/8R020	.3750	.0200	.8750	3.0	.3750	4	●	2
D3/8R030	.3750	.0300	.8750	3.0	.3750	4	●	2
D3/8R040	.3750	.0400	.8750	3.0	.3750	4	●	2
D3/8R060	.3750	.0600	.8750	3.0	.3750	4	●	2
D3/8R090	.3750	.0900	.8750	3.0	.3750	4	●	2
D1/2R010	.5000	.0100	1.1250	3.5	.5000	4	●	2
D1/2R015	.5000	.0150	1.1250	3.5	.5000	4	●	2
D1/2R020	.5000	.0200	1.1250	3.5	.5000	4	●	2
D1/2R030	.5000	.0300	1.1250	3.5	.5000	4	●	2
D1/2R060	.5000	.0600	1.1250	3.5	.5000	4	●	2
D1/2R090	.5000	.0900	1.1250	3.5	.5000	4	●	2
D1/2R120	.5000	.1200	1.1250	3.5	.5000	4	●	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

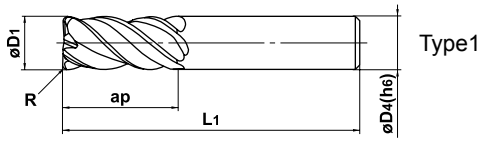
CUTTING CONDITIONS ➤ I269

VQMHVRBF NEW

Corner radius end mill, Medium cut length, 4 flute, 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						
	±0.015					
	D1≤12	D1>12				
	0 - 0.02	0 - 0.03				
h6	D4=6	8≤D4≤10	12≤D4≤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	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VQMHVRBFD0600R030	6	0.3	13	50	6	4	●	1
D0600R050	6	0.5	13	50	6	4	●	1
D0600R100	6	1	13	50	6	4	●	1
D0800R050	8	0.5	19	60	8	4	●	1
D0800R100	8	1	19	60	8	4	●	1
D1000R030	10	0.3	22	70	10	4	●	1
D1000R050	10	0.5	22	70	10	4	●	1
D1000R100	10	1	22	70	10	4	●	1
D1000R200	10	2	22	70	10	4	●	1
D1200R100	12	1	26	75	12	4	●	1
D1200R200	12	2	26	75	12	4	●	1
D1200R300	12	3	26	75	12	4	●	1
D1600R100	16	1	35	90	16	4	★	1
D1600R200	16	2	35	90	16	4	★	1

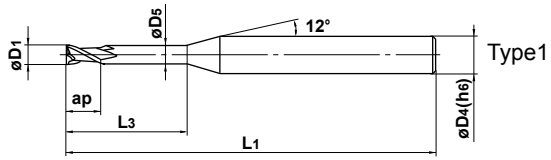
Memo

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
○	◎	◎	◎				





h6	0 - 0.020					
	4≤D4≤6					
	0 - 0.008					

● 2 flute long neck end mill for high-speed machining of hardened steels.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VF2XLD0010N005	0.1	0.15	0.5	0.085	45	4	2	★	1
D0020N006	0.2	0.3	0.6	0.17	45	4	2	★	1
D0020N010	0.2	0.3	1	0.17	45	4	2	★	1
D0020N015	0.2	0.3	1.5	0.17	45	4	2	★	1
D0030N010	0.3	0.5	1	0.27	45	4	2	★	1
D0030N020	0.3	0.5	2	0.27	45	4	2	★	1
D0030N030	0.3	0.5	3	0.27	45	4	2	★	1
D0040N010	0.4	0.6	1	0.36	45	4	2	★	1
D0040N020	0.4	0.6	2	0.36	45	4	2	★	1
D0040N040	0.4	0.6	4	0.36	45	4	2	★	1
D0050N020	0.5	0.8	2	0.46	45	4	2	★	1
D0050N040	0.5	0.8	4	0.46	45	4	2	★	1
D0050N060	0.5	0.8	6	0.46	45	4	2	★	1
D0060N020	0.6	0.9	2	0.56	45	4	2	★	1
D0060N040	0.6	0.9	4	0.56	45	4	2	★	1
D0060N060	0.6	0.9	6	0.56	45	4	2	★	1
D0080N040	0.8	1.2	4	0.76	45	4	2	★	1
D0080N060	0.8	1.2	6	0.76	45	4	2	★	1
D0080N080	0.8	1.2	8	0.76	50	4	2	★	1
D0080N100	0.8	1.2	10	0.76	50	4	2	★	1
D0100N040	1	1.5	4	0.94	50	4	2	★	1
D0100N060	1	1.5	6	0.94	50	4	2	★	1
D0100N080	1	1.5	8	0.94	50	4	2	★	1
D0100N100	1	1.5	10	0.94	50	4	2	★	1
D0100N120	1	1.5	12	0.94	50	4	2	★	1
D0150N060	1.5	2.3	6	1.44	50	4	2	★	1
D0150N080	1.5	2.3	8	1.44	50	4	2	★	1
D0150N100	1.5	2.3	10	1.44	50	4	2	★	1
D0150N120	1.5	2.3	12	1.44	50	4	2	★	1
D0150N160	1.5	2.3	16	1.44	60	4	2	★	1
D0200N060	2	3	6	1.9	50	4	2	★	1

★ : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ I273

VF2XL

End mill, 2 flute, Long neck

Unit : mm

Order Number	Dia. **D_1**	Length of Cut **ap**	Neck Length **L_3**	Neck Dia. **D_5**	Overall Length **L_1**	Shank Dia. **D_4**	No. of Flutes	Stock	Type
VF2XLD0200N080	2	3	8	1.9	50	4	2	★	1
D0200N100	2	3	10	1.9	50	4	2	★	1
D0200N120	2	3	12	1.9	50	4	2	★	1
D0200N160	2	3	16	1.9	60	4	2	★	1
D0200N200	2	3	20	1.9	60	4	2	★	1
D0300N120	3	4.5	12	2.9	50	6	2	★	1
D0300N160	3	4.5	16	2.9	60	6	2	★	1
D0300N200	3	4.5	20	2.9	60	6	2	★	1

★ : Inventory maintained in Japan.

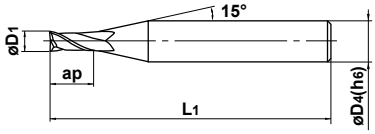
CUTTING CONDITIONS ➤ I273

VF2MV

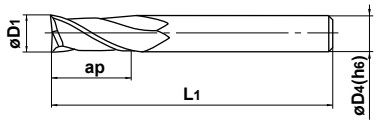
End mill, Medium cut length, 2 flute, Irregular helix flutes

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

h6						
	0 - 0.020					
	4≤D4≤6					
	0 - 0.008					

● An irregular helix 2 flute square end mill suitable for high-speed machining of hardened steel.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VF2MVD0050	0.5	1.3	40	4	2	★	1
D0100	1	2.5	40	4	2	★	1
D0150	1.5	3.8	40	4	2	★	1
D0200	2	5	40	4	2	★	1
D0250	2.5	6.3	40	4	2	★	1
D0300	3	7.5	50	6	2	★	1
D0400	4	10	50	6	2	★	1
D0500	5	12.5	50	6	2	★	1
D0600	6	15	50	6	2	★	2

IMPACT MIRACLE END MILLS

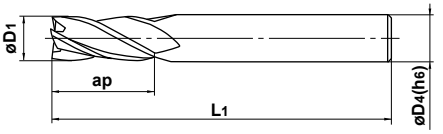
VF4MV

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

h6

D1≤12	D1>12				
0 - 0.020	0 - 0.030				
D4=6	8≤D4≤10	12≤D4≤16	D4=20		
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013		

● An irregular helix 4 flute square end mill suitable for high-speed machining of hardened steel.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VF4MVD0600	6	15	50	6	4	●	1
D0800	8	20	60	8	4	★	1
D1000	10	25	70	10	4	★	1
D1200	12	30	90	12	4	★	1
D1600	16	40	100	16	4	★	1
D2000	20	50	110	20	4	★	1

● : Inventory maintained. ★ : Inventory maintained in Japan.

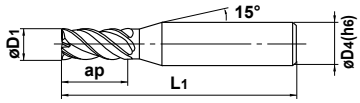
CUTTING CONDITIONS ➤ I275

VFMHV

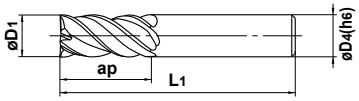
End mill, Medium cut length, 4 flute, Irregular helix flutes

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
○	○	○		◎	◎		

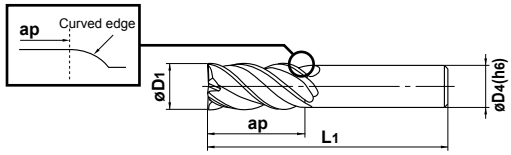




Type1



Type2



Type3

D1≤12	D1>12			
0 - 0.02	0 - 0.03			
4≤D4≤6	8≤D4≤10	12≤D4≤16	D4=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

h6

● Impact Miracle end mill with irregular helix flutes ensures stable machining of difficult-to-cut materials and with long overhangs.

Unit : mm

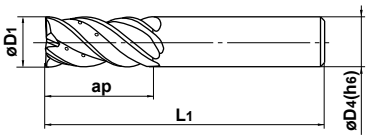
Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VFMHVD0200	2	4	45	4	4	★	1
D0250	2.5	5	45	4	4	★	1
D0300	3	8	45	6	4	●	1
D0350	3.5	8	45	6	4	●	1
D0400	4	11	45	6	4	●	1
D0500	5	13	50	6	4	★	1
D0600	6	13	50	6	4	★	2
D0600A070	6	13	70	6	4	★	2
D0700	7	19	60	8	4	★	1
D0800	8	19	60	8	4	★	2
D0800A080	8	19	80	8	4	★	2
D0900	9	22	70	10	4	★	1
D1000A100S08	10	22	100	8	4	★	3
D1000	10	22	70	10	4	★	2
D1000A100	10	22	100	10	4	★	2
D1100	11	26	100	10	4	★	3
D1200A110S10	12	26	110	10	4	★	3
D1200	12	26	75	12	4	★	2
D1200A110	12	26	110	12	4	★	2
D1300	13	26	110	12	4	★	3
D1400A130S12	14	32	130	12	4	★	3
D1600	16	35	90	16	4	★	2
D1800A150S16	18	42	150	16	4	★	3
D2000	20	45	110	20	4	★	2

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
				◎	◎		





h6	0 - 0.03					
	D4=16	D4=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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VFMHVCHD1600	16	35	90	16	4	★	1
D2000	20	45	110	20	4	★	1

● : Inventory maintained. ★ : Inventory maintained in Japan.

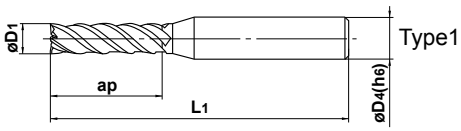
CUTTING CONDITIONS ➤ I301

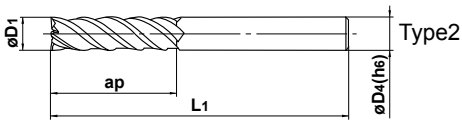
VFJHV

End mill, Semi long 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
○	○	○		◎	◎		







D1≤12	D1>12				
0 - 0.02	0 - 0.03				
D4=6	8≤D4≤10	12≤D4≤16	D4=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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VFJHVD0200	2	8	60	6	4	●	1
D0300	3	12	60	6	4	●	1
D0400	4	16	60	6	4	●	1
D0500	5	20	60	6	4	★	1
D0600	6	24	60	6	4	★	2
D0800	8	28	80	8	4	★	2
D1000	10	35	90	10	4	★	2
D1200	12	40	100	12	4	★	2
D1600	16	55	125	16	4	★	2
D2000	20	60	140	20	4	★	2

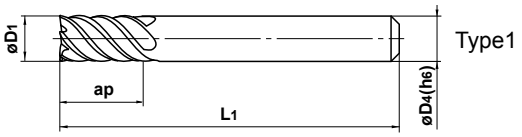
IMPACT MIRACLE END MILLS

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
○	○	○		◎	◎		





h6

D1≤12	D1>12				
0 - 0.02	0 - 0.03				
D4=6	8≤D4≤10	12≤D4≤16	D4=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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VF6MHVD0600	6	13	50	6	6	★	1
D0800	8	19	60	8	6	★	1
D1000	10	22	70	10	6	★	1
D1200	12	26	75	12	6	★	1
D1600	16	32	90	16	6	★	1
D2000	20	38	100	20	6	★	1

● : Inventory maintained. ★ : Inventory maintained in Japan.

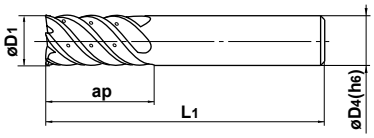
CUTTING CONDITIONS ➤ I278

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

D1≤12	D1>12				
0 - 0.020	0 - 0.030				
D4=10	**D4=12**	**D4=16**	**D4=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

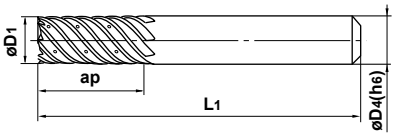
Order Number	Dia. **D1**	Length of Cut **ap**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
NEW **VF6MHVCHD1000**	10	22	70	10	6	●	1
NEW **D1200**	12	26	75	12	6	●	1
D1600	16	32	90	16	6	★	1
D2000	20	38	100	20	6	★	1

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

0 - 0.03					
D4=16	D4=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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VF8MHVCHD1600	16	32	90	16	8	★	1
D2000	20	38	100	20	8	★	1

★ : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ I302

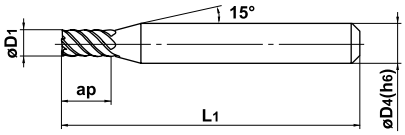
VFSD

End mill, Short cut length, For hardened materials

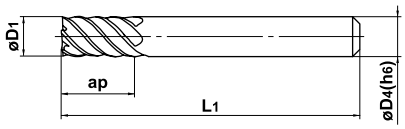
UWC VF 30° 45° D1<3 D1≥3 D1<3 D1≥3

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

0 - 0.02					
D4=6	8≤D4≤10	D4=12			
0 - 0.008	0 - 0.009	0 - 0.011			

h6

● End mills with Impact Miracle coating for high hardness materials.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VFSDD0100	1	2	45	6	4	★	1
D0150	1.5	3	45	6	4	★	1
D0200	2	4	45	6	4	★	1
D0250	2.5	5	45	6	4	★	1
D0300	3	6	45	6	6	★	1
D0350	3.5	7	45	6	6	★	1
D0400	4	8	45	6	6	★	1
D0500	5	10	50	6	6	★	1
D0600	6	12	50	6	6	★	2
D0800	8	16	60	8	6	★	2
D1000	10	20	70	10	6	★	2
D1200	12	24	75	12	6	★	2

IMPACT MIRACLE END MILLS

VFMD

End mill, Medium cut length, For hardened materials







D1<3

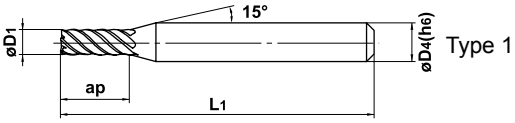

D1≥3


D1<3

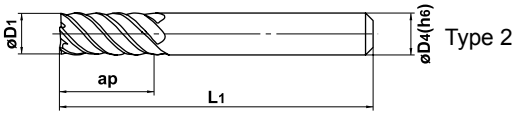
D1≥3

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
○	◎	◎	◎				

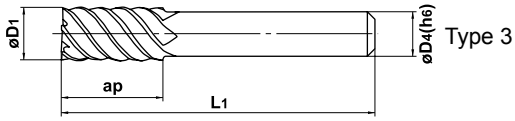




Type 1



Type 2



Type 3



D1≤12	D1>12				
0 - 0.02	0 - 0.03				
D4=6	**8≤D4≤10**	**12≤D4≤16**	**20≤D4≤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	Dia. **D1**	Length of Cut **ap**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
VFMDD0100	1	3.5	60	6	4	★	1
D0150	1.5	5	60	6	4	★	1
D0200	2	7	60	6	4	★	1
D0250	2.5	8	60	6	4	★	1
D0300	3	10	60	6	6	★	1
D0400	4	12	60	6	6	★	1
D0500	5	15	60	6	6	★	1
D0600	6	15	60	6	6	★	2
D0800	8	20	75	8	6	★	2
D1000	10	25	80	10	6	★	2
D1200	12	30	100	12	6	★	2
D1400	14	35	105	12	6	★	3
D1500	15	40	110	16	6	★	1
D1600	16	40	110	16	6	★	2
D1800	18	40	120	16	6	★	3
D2000	20	45	125	20	6	★	2
D2200	22	45	135	20	6	★	3
D2500	25	60	160	25	6	★	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ I279

VFMD– Inch sizes

NEW

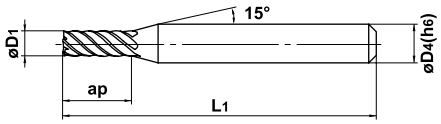
End mill, Medium cut length, For hardened materials

UWC VF 30° 45°

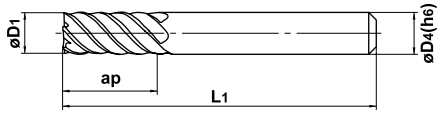
D1 < 1/8 | 1/8 ≤ D1 | D1 < 1/8 | D1 ≤ 1/8

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

D1<.5000"	D1=.5000"				
0 - .0008"	0 - .0012"				
.250≤D4≤.375	D4=.500				
0 - .00035"	0 - .00043"				

● End mills with Impact Miracle coating for high hardness materials.

Unit : inch

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VFMD D1/32	.0313	.0938	2.5	.2500	4	●	1
D1/16	.0625	.1875	2.5	.2500	4	●	1
D3/32	.0938	.2813	2.5	.2500	4	●	1
D1/8	.1250	.3750	2.5	.2500	6	●	1
D5/32	.1563	.5000	2.5	.2500	6	●	1
D3/16	.1875	.5630	2.5	.2500	6	●	1
D1/4	.2500	.5630	3.5	.2500	6	●	2
D5/16	.3125	.6875	4.0	.3125	6	●	2
D3/8	.3750	.8125	4.0	.3750	6	●	2
D1/2	.5000	1.0938	4.5	.5000	6	●	2

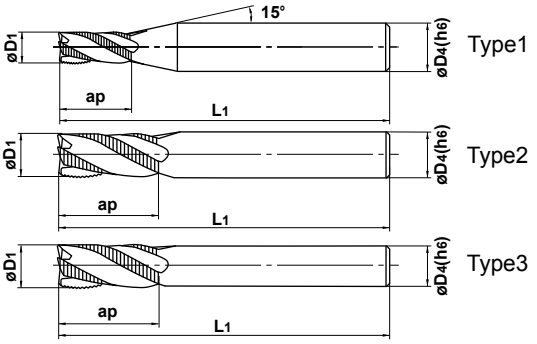
VFSFPR

Roughing end mill, Short cut length, 3—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

D4=6	8≤D4≤10	12≤D4≤16	D4=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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VFSFPRD0300	3	6	50	6	3	★	1
D0400	4	8	50	6	3	★	1
D0500	5	10	50	6	3	★	1
D0600	6	12	50	6	3	★	2
D0700	7	17	60	8	3	★	1
D0800	8	17	60	8	4	★	2
D0900	9	22	70	10	4	★	1
D1000S08	10	22	90	8	4	★	3
D1000	10	22	70	10	4	★	2
D1200S10	12	27	100	10	4	★	3
D1200	12	27	75	12	4	★	2
D1400	14	27	75	12	4	★	3
D1600	16	33	90	16	4	★	2
D1800	18	33	90	16	4	★	3
D2000	20	38	100	20	4	★	2

★ : Inventory maintained in Japan.

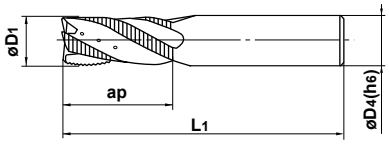
CUTTING CONDITIONS ➤ I281

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	D4=16	D4=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	Dia. **D1**	Length of Cut **ap**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
VFSFPRCHD1600	16	33	90	16	4	★	1
D2000	20	38	100	20	4	★	1

VF6SVRCH

Roughing end mill, Short cut length, 6 flute, Irregular helix flutes, with multiple internal through coolant holes



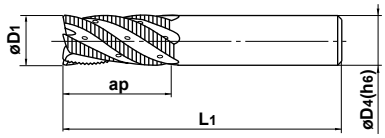






Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
				◎	◎		





Type1

h6

D4=16	D4=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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VF6SVRCHD1600	16	33	90	16	6	★	1
D2000	20	38	100	20	6	★	1

★ : Inventory maintained in Japan.

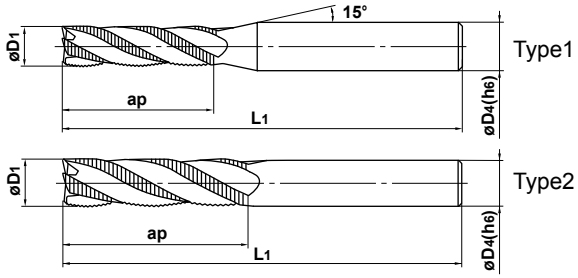
CUTTING CONDITIONS ➤ I303

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

D4=6	8≤D4≤10	12≤D4≤16	D4=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

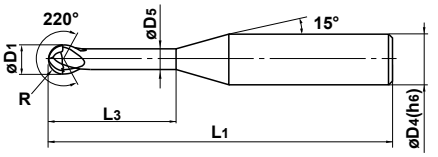
Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VFMFPRD0500	5	15	60	6	4	★	1
D0600	6	17	60	6	4	★	2
D0700	7	22	75	8	4	★	1
D0800	8	28	75	8	4	★	2
D0900	9	28	100	10	4	★	1
D1000	10	34	100	10	4	★	2
D1200	12	40	110	12	4	★	2
D1600	16	48	125	16	4	★	2
D2000	20	57	140	20	4	★	2

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						
	±0.01					
h6	D4=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	Radius of Ball Nose **R**	Dia. **D1**	Neck Length **L3**	Neck Dia. **D5**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
VF2WBR0100N060	1	2	6	1.6	60	6	2	★	1
R0150N080	1.5	3	8	2.4	60	6	2	★	1
R0200N100	2	4	10	3.2	60	6	2	★	1
R0300N120	3	6	12	4.8	80	6	2	★	1

★ : Inventory maintained in Japan.

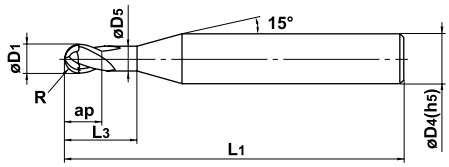
CUTTING CONDITIONS ➤ I283

VF2SSB

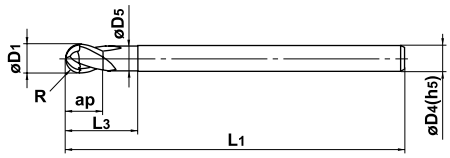
Ball nose, Short cut length, 2 flute, For hardened materials

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						
	±0.005					
	0 - 0.01					
h5	D4=6	8≤D4≤10	D4=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	Radius of Ball Nose **R**	Dia. **D1**	Length of Cut **ap**	Neck Length **L3**	Neck Dia. **D5**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
VF2SSBR0050	0.5	1	1	2	0.94	40	6	2	★	1
R0075	0.75	1.5	1.5	3	1.44	40	6	2	★	1
R0100	1	2	2	4	1.9	45	6	2	★	1
R0150	1.5	3	3	6	2.9	45	6	2	★	1
R0200	2	4	4	8	3.9	45	6	2	★	1
R0250	2.5	5	5	10	4.9	50	6	2	★	1
R0300	3	6	6	12	5.85	50	6	2	★	2
R0400	4	8	8	14	7.85	60	8	2	★	2
R0500	5	10	10	18	9.7	70	10	2	★	2
R0600	6	12	12	22	11.7	75	12	2	★	2

IMPACT MIRACLE END MILLS

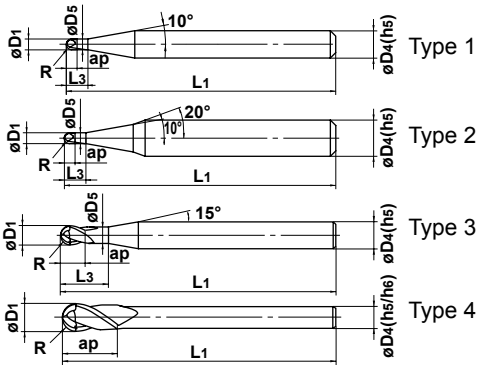
VF2SB

Ball nose, Short cut length, 2 flute, For hardened materials

UWC VF 0° R<0.3 30° R≥0.3 R<0.3 R≥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	R≤6	R>6				
	±0.005	±0.010				
	D1≤12	D1>12				
	0 - 0.01	0 - 0.02				
h5 D4≤12	D4=3	4≤D4≤6	8≤D4≤10	D4=12		
	0 - 0.004	0 - 0.005	0 - 0.006	0 - 0.008		
h6 D4>12	D4=16	D4=20				
	0 - 0.011	0 - 0.013				

● 2 flute ball nose end mills with Impact Miracle coating for high hardness materials.

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VF2SBR0010S04	0.1	0.2	0.2	0.4	0.17	45	4	2	★	1
R0010S06	0.1	0.2	0.2	0.4	0.17	50	6	2	★	2
R0015S04	0.15	0.3	0.3	0.6	0.27	45	4	2	★	1
R0015S06	0.15	0.3	0.3	0.6	0.27	50	6	2	★	2
R0020S04	0.2	0.4	0.4	0.8	0.36	45	4	2	★	1
R0020S06	0.2	0.4	0.4	0.8	0.36	50	6	2	★	2
R0030S04	0.3	0.6	0.6	1.2	0.56	45	4	2	★	3
R0030S06	0.3	0.6	0.6	1.2	0.56	50	6	2	★	3
R0040S04	0.4	0.8	0.8	1.6	0.76	45	4	2	★	3
R0040S06	0.4	0.8	0.8	1.6	0.76	50	6	2	★	3
R0050S04	0.5	1	1	2	0.94	45	4	2	★	3
R0050S06	0.5	1	1	2	0.94	50	6	2	★	3
R0060S04	0.6	1.2	1.2	2.4	1.14	45	4	2	★	3
R0060S06	0.6	1.2	1.2	2.4	1.14	50	6	2	★	3
R0070S04	0.7	1.4	1.4	2.8	1.34	45	4	2	★	3
R0070S06	0.7	1.4	1.4	2.8	1.34	50	6	2	★	3
R0075S04	0.75	1.5	1.5	3	1.44	45	4	2	★	3
R0075S06	0.75	1.5	1.5	3	1.44	50	6	2	★	3
R0080S04	0.8	1.6	1.6	3.2	1.54	45	4	2	★	3
R0080S06	0.8	1.6	1.6	3.2	1.54	50	6	2	★	3
R0090S04	0.9	1.8	1.8	3.6	1.74	45	4	2	★	3
R0090S06	0.9	1.8	1.8	3.6	1.74	50	6	2	★	3
R0100S04	1	2	2	4	1.9	50	4	2	★	3
R0100S06	1	2	2	4	1.9	60	6	2	★	3
R0125S06	1.25	2.5	2.5	5	2.4	60	6	2	★	3
R0150S03	1.5	3	3	—	—	60	3	2	★	4
R0150S06	1.5	3	3	6	2.9	70	6	2	★	3
R0200S04	2	4	4	—	—	60	4	2	★	4
R0200S06	2	4	4	8	3.9	70	6	2	★	3
R0250S06	2.5	5	5	10	4.9	80	6	2	★	3
R0300S06	3	6	12	—	—	80	6	2	★	4

★ : Inventory maintained in Japan.

Unit : mm

Order Number	Radius of Ball Nose **R**	Dia. **D_1**	Length of Cut **ap**	Neck Length **L_3**	Neck Dia. **D_5**	Overall Length **L_1**	Shank Dia. **D_4**	No. of Flutes	Stock	Type
VF2SBR0400S08	4	8	14	—	—	90	8	2	★	4
R0500S10	5	10	18	—	—	100	10	2	★	4
R0600S12	6	12	22	—	—	110	12	2	★	4
R0800S16	8	16	30	—	—	140	16	2	★	4
R1000S20	10	20	38	—	—	160	20	2	★	4

IMPACT MIRACLE END MILLS

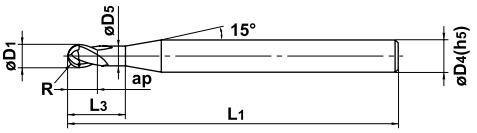
VF2SB - Inch sizes

NEW

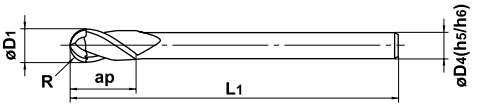
Ball nose, Short cut length, 2 flute, For hardened materials

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						
	±.0002"					
	D1<.5000"	D1=.5000"				
	0 - 0.0004"	0 - 0.0008"				
h5	.250"≤D4≤.375"	D4=.500"				
	0 - .00024"	0 - 0.00043"				
h6	.250"≤D4≤.375"	D4=.500"				
	0 - .00024"	0 - 0.00043"				

● 2 flute ball nose end mills with Impact Miracle coating for high hardness materials.

Unit : inch

Order Number	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VF2SBD1/32	.0156	.0313	.0313	.0625	.0296	2.5	.2500	2	●	1
D1/16	.0313	.0625	.0625	.1250	.0601	2.5	.2500	2	●	1
D3/32	.0469	.0938	.0938	.1875	.0898	2.5	.2500	2	●	1
D1/8	.0625	.1250	.1250	.2500	.1211	3.0	.2500	2	●	1
D3/16	.0938	.1875	.1875	.3750	.1835	3.0	.2500	2	●	1
D1/4	.1250	.2500	.5000	–	–	3.5	.2500	2	●	2
D5/16	.1563	.3125	.6250	–	–	4.0	.3130	2	●	2
D3/8	.1875	.3750	.7500	–	–	4.0	.3750	2	●	2
D1/2	.2500	.5000	1.0000	–	–	4.5	.5000	2	●	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

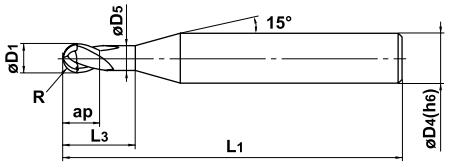
CUTTING CONDITIONS ➤ I285

VF2SDB

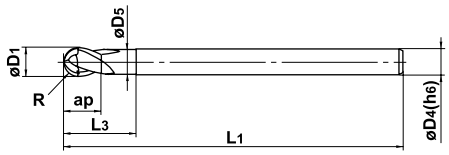
Ball nose, Short cut length, 2 flute, Strong geometry

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						
R≤6.5	R>6.5					
±0.01	±0.02					
D1≤12	D1>12					
0 - 0.02	0 - 0.03					
D4=3	4≤D4≤6	8≤D4≤10	12≤D4≤16	D4=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	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VF2SDBR0050	0.5	1	1	2	0.94	45	4	2	★	1
R0100S04	1	2	2	4	1.9	50	4	2	★	1
R0100	1	2	2	4	1.9	60	6	2	★	1
R0150S03	1.5	3	3	6	2.9	60	3	2	★	2
R0150	1.5	3	3	6	2.9	70	6	2	★	1
R0200S04	2	4	4	8	3.9	60	4	2	★	2
R0200	2	4	4	8	3.9	70	6	2	★	1
R0250	2.5	5	5	10	4.9	80	6	2	★	1
R0300	3	6	12	22	5.85	80	6	2	★	2
R0400	4	8	14	27	7.85	90	8	2	★	2
R0500	5	10	18	31	9.7	100	10	2	★	2
R0600	6	12	22	35	11.7	110	12	2	★	2
R0800	8	16	30	50	15.5	140	16	2	★	2
R1000	10	20	38	58	19.5	160	20	2	★	2

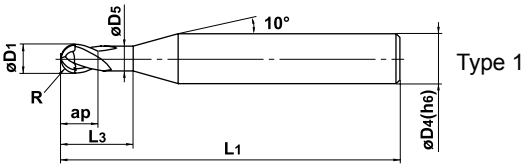
IMPACT MIRACLE END MILLS

VF2SDBL

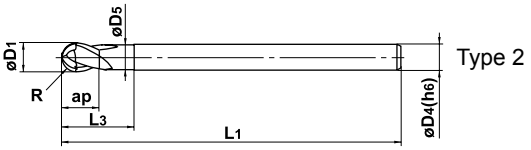
Ball nose, Short cut length, 2 flute, Strong geometry, Long shank

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						
R≤6.5	R>6.5					
±0.01	±0.02					
D1≤12	D1>12					
0 - 0.02	0 - 0.03					
D4=6	8≤D4≤10	12≤D4≤16	D4=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	Radius of Ball Nose **R**	Dia. **D1**	Length of Cut **ap**	Neck Length **L3**	Neck Dia. **D5**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
VF2SDBLR0050	0.5	1	1	2	0.94	60	6	2	★	1
R0100	1	2	2	4	1.9	80	6	2	★	1
R0150	1.5	3	3	6	2.9	90	6	2	★	1
R0200	2	4	4	8	3.9	90	6	2	★	1
R0250	2.5	5	5	10	4.9	110	8	2	★	1
R0300	3	6	12	22	5.85	120	6	2	★	2
R0400	4	8	14	27	7.85	130	8	2	★	2
R0500	5	10	18	31	9.7	140	10	2	★	2
R0600	6	12	22	35	11.7	140	12	2	★	2
R0800	8	16	30	50	15.5	200	16	2	★	2
R1000	10	20	38	58	19.5	200	20	2	★	2

★ : Inventory maintained in Japan.

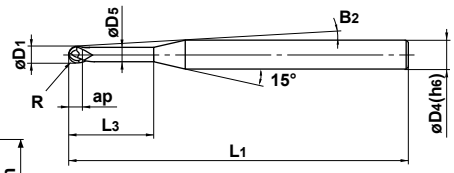
CUTTING CONDITIONS ➤ I286

VF2XLBS

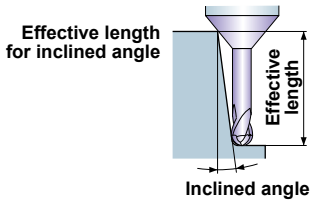
Ball nose, Long neck, 2 flute, Short shank

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
○	◎	◎	◎		○		





Type1



R			
	±0.007		
	0 - 0.02		
h6	D4=4		
	0 - 0.008		

- 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	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	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
R0020N020	0.2	0.4	0.32	2	0.36	11.9°	40	4	2	★	1	2.0	2.1	2.3	2.5
R0020N030	0.2	0.4	0.32	3	0.36	10.7°	40	4	2	★	1	3.1	3.2	3.4	3.7
R0020N040	0.2	0.4	0.32	4	0.36	9.7°	40	4	2	★	1	4.1	4.3	4.6	4.9
R0025N040	0.25	0.5	0.4	4	0.46	9.6°	40	4	2	★	1	4.1	4.3	4.6	4.9
R0025N060	0.25	0.5	0.4	6	0.46	8.1°	40	4	2	★	1	6.2	6.4	6.9	7.4
R0030N020	0.3	0.6	0.48	2	0.56	11.8°	40	4	2	★	1	2.1	2.2	2.3	2.5
R0030N030	0.3	0.6	0.48	3	0.56	10.5°	40	4	2	★	1	3.1	3.3	3.5	3.8
R0030N040	0.3	0.6	0.48	4	0.56	9.5°	40	4	2	★	1	4.2	4.3	4.6	5.0
R0030N060	0.3	0.6	0.48	6	0.56	8.0°	40	4	2	★	1	6.3	6.5	6.9	7.5
R0040N040	0.4	0.8	0.64	4	0.76	9.4°	40	4	2	★	1	4.2	4.3	4.6	5.0
R0040N060	0.4	0.8	0.64	6	0.76	7.8°	40	4	2	★	1	6.3	6.5	6.9	7.5
R0050N030	0.5	1	0.8	3	0.94	10.1°	40	4	2	★	1	3.2	3.3	3.6	3.9
R0050N040	0.5	1	0.8	4	0.94	9.1°	40	4	2	★	1	4.2	4.4	4.8	5.2
R0050N060	0.5	1	0.8	6	0.94	7.5°	40	4	2	★	1	6.3	6.6	7.1	7.7
R0050N080	0.5	1	0.8	8	0.94	6.4°	40	4	2	★	1	8.4	8.8	9.4	10.2
R0100N060	1	2	1.6	6	1.9	6.4°	40	4	2	★	1	6.2	6.5	6.9	7.4
R0100N080	1	2	1.6	8	1.9	5.3°	40	4	2	★	1	8.3	8.7	9.2	9.9
R0100N100	1	2	1.6	10	1.9	4.5°	40	4	2	★	1	10.4	10.8	11.5	12.4

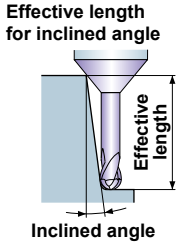
IMPACT MIRACLE END MILLS

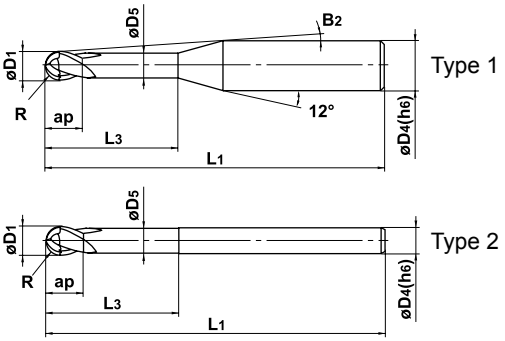
VF2XLB

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	R≤1	R>1			
	±0.007	±0.010			
	0 - 0.02				
h6	4≤D4≤6				
	0 - 0.008				

● 2 flute long neck ball nose end mills with Impact Miracle coating for high hardness materials.

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	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
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
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
R0010N010S04	0.1	0.2	0.16	1	0.17	10.9°	50	4	2	★	1	1.0	1.1	1.2	1.3
R0010N010S06	0.1	0.2	0.16	1	0.17	11.3°	50	6	2	★	1	1.0	1.1	1.2	1.3
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
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
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
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
R0010N020S04	0.1	0.2	0.16	2	0.17	10°	50	4	2	★	1	2.1	2.2	2.4	2.6
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
R0015N010S04	0.15	0.3	0.24	1	0.27	11°	50	4	2	★	1	1.0	1.1	1.2	1.3
R0015N010S06	0.15	0.3	0.24	1	0.27	11.3°	50	6	2	★	1	1.0	1.1	1.2	1.3
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
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
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
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
R0015N020S04	0.15	0.3	0.24	2	0.27	9.9°	50	4	2	★	1	2.1	2.2	2.4	2.6
R0015N020S06	0.15	0.3	0.24	2	0.27	10.6°	50	6	2	★	1	2.1	2.2	2.4	2.6
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
R0015N030S04	0.15	0.3	0.24	3	0.27	9.1°	50	4	2	★	1	3.1	3.2	3.6	3.9
R0015N040S04	0.15	0.3	0.24	4	0.27	8.4°	50	4	2	★	1	4.2	4.3	4.8	5.3
R0020N010S04	0.2	0.4	0.32	1	0.36	11°	50	4	2	★	1	1.0	1.0	1.1	1.2
R0020N010S06	0.2	0.4	0.32	1	0.36	11.3°	50	6	2	★	1	1.0	1.0	1.1	1.2
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
R0020N015S06	0.2	0.4	0.32	1.5	0.36	11°	50	6	2	★	1	1.5	1.6	1.7	1.9
R0020N020S04	0.2	0.4	0.32	2	0.36	10°	50	4	2	★	1	2.0	2.1	2.3	2.6
R0020N020S06	0.2	0.4	0.32	2	0.36	10.6°	50	6	2	★	1	2.0	2.1	2.3	2.6
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
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
R0020N030S04	0.2	0.4	0.32	3	0.36	9.1°	50	4	2	★	1	3.1	3.2	3.5	3.9

★ : Inventory maintained in Japan.

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D_1	Length of Cut ap	Neck Length L_3	Neck Dia. D_5	Cutting Edge to Shank Angle B_2	Overall Length L_1	Shank Dia. D_4	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
R0020N040S04	0.2	0.4	0.32	4	0.36	8.4°	50	4	2	★	1	4.1	4.3	4.7	5.2
R0020N050S04	0.2	0.4	0.32	5	0.36	7.8°	50	4	2	★	1	5.2	5.4	5.9	6.6
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
R0025N015S06	0.25	0.5	0.4	1.5	0.46	11°	50	6	2	★	1	1.5	1.6	1.7	1.9
R0025N020S04	0.25	0.5	0.4	2	0.46	10°	50	4	2	★	1	2.0	2.1	2.3	2.6
R0025N020S06	0.25	0.5	0.4	2	0.46	10.6°	50	6	2	★	1	2.0	2.1	2.3	2.6
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
R0025N030S04	0.25	0.5	0.4	3	0.46	9.1°	50	4	2	★	1	3.1	3.2	3.5	3.9
R0025N030S06	0.25	0.5	0.4	3	0.46	10°	50	6	2	★	1	3.1	3.2	3.5	3.9
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
R0025N040S04	0.25	0.5	0.4	4	0.46	8.3°	50	4	2	★	1	4.1	4.3	4.7	5.2
R0025N040S06	0.25	0.5	0.4	4	0.46	9.4°	50	6	2	★	1	4.1	4.3	4.7	5.2
R0025N050S04	0.25	0.5	0.4	5	0.46	7.7°	50	4	2	★	1	5.2	5.4	5.9	6.5
R0025N050S06	0.25	0.5	0.4	5	0.46	8.9°	50	6	2	★	1	5.2	5.4	5.9	6.5
R0025N060S04	0.25	0.5	0.4	6	0.46	7.2°	50	4	2	★	1	6.2	6.5	7.1	7.9
R0025N060S06	0.25	0.5	0.4	6	0.46	8.4°	60	6	2	★	1	6.2	6.5	7.1	7.9
R0030N020S04	0.3	0.6	0.48	2	0.56	9.9°	50	4	2	★	1	2.1	2.2	2.4	2.6
R0030N020S06	0.3	0.6	0.48	2	0.56	10.6°	50	6	2	★	1	2.1	2.2	2.4	2.6
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
R0030N030S04	0.3	0.6	0.48	3	0.56	9°	50	4	2	★	1	3.1	3.3	3.6	3.9
R0030N030S06	0.3	0.6	0.48	3	0.56	9.9°	50	6	2	★	1	3.1	3.3	3.6	3.9
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
R0030N040S04	0.3	0.6	0.48	4	0.56	8.3°	50	4	2	★	1	4.2	4.4	4.8	5.2
R0030N040S06	0.3	0.6	0.48	4	0.56	9.3°	50	6	2	★	1	4.2	4.4	4.8	5.2
R0030N050S04	0.3	0.6	0.48	5	0.56	7.6°	50	4	2	★	1	5.2	5.4	6.0	6.6
R0030N050S06	0.3	0.6	0.48	5	0.56	8.8°	50	6	2	★	1	5.2	5.4	6.0	6.6
R0030N060S04	0.3	0.6	0.48	6	0.56	7.1°	50	4	2	★	1	6.3	6.5	7.1	7.9
R0030N060S06	0.3	0.6	0.48	6	0.56	8.4°	50	6	2	★	1	6.3	6.5	7.1	7.9
R0030N070S04	0.3	0.6	0.48	7	0.56	6.6°	50	4	2	★	1	7.3	7.6	8.3	9.2
R0030N080S04	0.3	0.6	0.48	8	0.56	6.2°	50	4	2	★	1	8.3	8.7	9.5	10.6
R0030N080S06	0.3	0.6	0.48	8	0.56	7.6°	60	6	2	★	1	8.3	8.7	9.5	10.6
R0040N020S04	0.4	0.8	0.64	2	0.76	9.9°	50	4	2	★	1	2.1	2.2	2.3	2.6
R0040N020S06	0.4	0.8	0.64	2	0.76	10.6°	50	6	2	★	1	2.1	2.2	2.3	2.6
R0040N030S04	0.4	0.8	0.64	3	0.76	8.9°	50	4	2	★	1	3.1	3.3	3.5	3.9
R0040N030S06	0.4	0.8	0.64	3	0.76	9.9°	50	6	2	★	1	3.1	3.3	3.5	3.9
R0040N040S04	0.4	0.8	0.64	4	0.76	8.2°	50	4	2	★	1	4.2	4.3	4.7	5.2
R0040N040S06	0.4	0.8	0.64	4	0.76	9.3°	50	6	2	★	1	4.2	4.3	4.7	5.2
R0040N050S04	0.4	0.8	0.64	5	0.76	7.5°	50	4	2	★	1	5.2	5.4	5.9	6.5
R0040N060S04	0.4	0.8	0.64	6	0.76	7°	50	4	2	★	1	6.3	6.5	7.1	7.9
R0040N060S06	0.4	0.8	0.64	6	0.76	8.3°	50	6	2	★	1	6.3	6.5	7.1	7.9
R0040N070S04	0.4	0.8	0.64	7	0.76	6.5°	50	4	2	★	1	7.3	7.6	8.3	9.2
R0040N080S04	0.4	0.8	0.64	8	0.76	6.1°	50	4	2	★	1	8.3	8.7	9.5	10.5
R0040N080S06	0.4	0.8	0.64	8	0.76	7.5°	50	6	2	★	1	8.3	8.7	9.5	10.5
R0040N100S04	0.4	0.8	0.64	10	0.76	5.4°	50	4	2	★	1	10.4	10.9	11.9	13.2
R0040N100S06	0.4	0.8	0.64	10	0.76	6.8°	60	6	2	★	1	10.4	10.9	11.9	13.2
R0050N030S04	0.5	1	0.8	3	0.94	8.8°	50	4	2	★	1	3.2	3.3	3.6	4.0
R0050N030S06	0.5	1	0.8	3	0.94	9.8°	50	6	2	★	1	3.2	3.3	3.6	4.0
R0050N040S04	0.5	1	0.8	4	0.94	8°	50	4	2	★	1	4.2	4.4	4.8	5.3
R0050N040S06	0.5	1	0.8	4	0.94	9.2°	50	6	2	★	1	4.2	4.4	4.8	5.3
R0050N050S04	0.5	1	0.8	5	0.94	7.3°	50	4	2	★	1	5.3	5.5	6.0	6.7

IMPACT MIRACLE END MILLS

VF2XLB

Ball nose, Long neck, 2 flute, For hardened materials

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D_1	Length of Cut ap	Neck Length L_3	Neck Dia. D_5	Cutting Edge to Shank Angle B_2	Overall Length L_1	Shank Dia. D_4	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
R0050N060S04	0.5	1	0.8	6	0.94	6.8°	50	4	2	★	1	6.3	6.6	7.2	8.0
R0050N060S06	0.5	1	0.8	6	0.94	8.2°	50	6	2	★	1	6.3	6.6	7.2	8.0
R0050N070S04	0.5	1	0.8	7	0.94	6.3°	50	4	2	★	1	7.4	7.7	8.4	9.3
R0050N080S04	0.5	1	0.8	8	0.94	5.9°	50	4	2	★	1	8.4	8.8	9.6	10.6
R0050N080S06	0.5	1	0.8	8	0.94	7.4°	50	6	2	★	1	8.4	8.8	9.6	10.6
R0050N090S04	0.5	1	0.8	9	0.94	5.5°	50	4	2	★	1	9.5	9.9	10.8	12.0
R0050N100S04	0.5	1	0.8	10	0.94	5.2°	50	4	2	★	1	10.5	11.0	12.0	13.3
R0050N100S06	0.5	1	0.8	10	0.94	6.7°	50	6	2	★	1	10.5	11.0	12.0	13.3
R0050N120S04	0.5	1	0.8	12	0.94	4.6°	50	4	2	★	1	12.6	13.2	14.4	15.9
R0050N120S06	0.5	1	0.8	12	0.94	6.1°	60	6	2	★	1	12.6	13.2	14.4	15.9
R0050N140S04	0.5	1	0.8	14	0.94	4.2°	60	4	2	★	1	14.7	15.3	16.8	18.6
R0050N160S04	0.5	1	0.8	16	0.94	3.8°	60	4	2	★	1	16.8	17.5	19.2	21.3
R0050N160S06	0.5	1	0.8	16	0.94	5.3°	70	6	2	★	1	16.8	17.5	19.2	21.3
R0050N180S04	0.5	1	0.8	18	0.94	3.5°	60	4	2	★	1	18.9	19.7	21.6	23.9
R0050N200S04	0.5	1	0.8	20	0.94	3.3°	60	4	2	★	1	21.0	21.9	24.0	26.6
R0050N200S06	0.5	1	0.8	20	0.94	4.6°	70	6	2	★	1	21.0	21.9	24.0	26.6
R0060N060S04	0.6	1.2	0.96	6	1.14	6.6°	50	4	2	★	1	6.3	6.6	7.2	8.0
R0060N060S06	0.6	1.2	0.96	6	1.14	8.1°	50	6	2	★	1	6.3	6.6	7.2	8.0
R0060N080S04	0.6	1.2	0.96	8	1.14	5.7°	50	4	2	★	1	8.4	8.8	9.6	10.6
R0060N080S06	0.6	1.2	0.96	8	1.14	7.3°	50	6	2	★	1	8.4	8.8	9.6	10.6
R0060N100S04	0.6	1.2	0.96	10	1.14	5°	50	4	2	★	1	10.5	11.0	12.0	13.3
R0060N100S06	0.6	1.2	0.96	10	1.14	6.6°	50	6	2	★	1	10.5	11.0	12.0	13.3
R0060N120S04	0.6	1.2	0.96	12	1.14	4.5°	50	4	2	★	1	12.6	13.2	14.4	15.9
R0060N120S06	0.6	1.2	0.96	12	1.14	6°	50	6	2	★	1	12.6	13.2	14.4	15.9
R0060N140S04	0.6	1.2	0.96	14	1.14	4°	60	4	2	★	1	14.7	15.3	16.8	18.6
R0060N160S04	0.6	1.2	0.96	16	1.14	3.7°	60	4	2	★	1	16.8	17.5	19.2	21.2
R0060N160S06	0.6	1.2	0.96	16	1.14	5.2°	70	6	2	★	1	16.8	17.5	19.2	21.2
R0070N080S04	0.7	1.4	1.12	8	1.34	5.5°	50	4	2	★	1	8.4	8.8	9.6	10.6
R0070N120S04	0.7	1.4	1.12	12	1.34	4.3°	50	4	2	★	1	12.6	13.1	14.4	15.9
R0070N160S04	0.7	1.4	1.12	16	1.34	3.5°	60	4	2	★	1	16.8	17.5	19.2	21.2
R0075N060S04	0.75	1.5	1.2	6	1.44	6.3°	50	4	2	★	1	6.3	6.6	7.2	7.9
R0075N060S06	0.75	1.5	1.2	6	1.44	8°	50	6	2	★	1	6.3	6.6	7.2	7.9
R0075N080S04	0.75	1.5	1.2	8	1.44	5.4°	50	4	2	★	1	8.4	8.8	9.6	10.6
R0075N080S06	0.75	1.5	1.2	8	1.44	7.2°	50	6	2	★	1	8.4	8.8	9.6	10.6
R0075N100S04	0.75	1.5	1.2	10	1.44	4.7°	50	4	2	★	1	10.5	11.0	12.0	13.2
R0075N100S06	0.75	1.5	1.2	10	1.44	6.5°	50	6	2	★	1	10.5	11.0	12.0	13.2
R0075N120S04	0.75	1.5	1.2	12	1.44	4.2°	50	4	2	★	1	12.6	13.1	14.4	15.9
R0075N120S06	0.75	1.5	1.2	12	1.44	5.9°	50	6	2	★	1	12.6	13.1	14.4	15.9
R0075N140S04	0.75	1.5	1.2	14	1.44	3.8°	50	4	2	★	1	14.7	15.3	16.8	18.5
R0075N140S06	0.75	1.5	1.2	14	1.44	5.4°	50	6	2	★	1	14.7	15.3	16.8	18.5
R0075N160S04	0.75	1.5	1.2	16	1.44	3.4°	60	4	2	★	1	16.8	17.5	19.2	21.2
R0075N160S06	0.75	1.5	1.2	16	1.44	5°	60	6	2	★	1	16.8	17.5	19.2	21.2
R0075N180S04	0.75	1.5	1.2	18	1.44	3.1°	60	4	2	★	1	18.9	19.7	21.6	23.8
R0075N200S04	0.75	1.5	1.2	20	1.44	2.9°	60	4	2	★	1	21.0	21.9	23.9	*
R0075N200S06	0.75	1.5	1.2	20	1.44	4.3°	70	6	2	★	1	21.0	21.9	23.9	26.5
R0080N080S04	0.8	1.6	1.28	8	1.54	5.3°	50	4	2	★	1	8.4	8.8	9.6	10.5
R0080N120S04	0.8	1.6	1.28	12	1.54	4.1°	50	4	2	★	1	12.6	13.1	14.4	15.9
R0080N160S04	0.8	1.6	1.28	16	1.54	3.3°	60	4	2	★	1	16.8	17.5	19.1	21.2
R0080N200S04	0.8	1.6	1.28	20	1.54	2.8°	60	4	2	★	1	21.0	21.9	23.9	*
R0090N080S04	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

★ : Inventory maintained in Japan.

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D_1	Length of Cut ap	Neck Length L_3	Neck Dia. D_5	Cutting Edge to Shank Angle B_2	Overall Length L_1	Shank Dia. D_4	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
R0090N160S04	0.9	1.8	1.44	16	1.74	3.1°	60	4	2	★	1	16.8	17.5	19.1	21.1
R0090N200S04	0.9	1.8	1.44	20	1.74	2.6°	60	4	2	★	1	20.9	21.8	23.9	*
R0100N060S04	1	2	1.6	6	1.9	5.8°	50	4	2	★	1	6.2	6.5	7.0	7.7
R0100N060S06	1	2	1.6	6	1.9	7.9°	50	6	2	★	1	6.2	6.5	7.0	7.7
R0100N080S04	1	2	1.6	8	1.9	4.9°	50	4	2	★	1	8.3	8.7	9.4	10.4
R0100N080S06	1	2	1.6	8	1.9	6.9°	50	6	2	★	1	8.3	8.7	9.4	10.4
R0100N100S04	1	2	1.6	10	1.9	4.2°	50	4	2	★	1	10.4	10.9	11.8	13.0
R0100N100S06	1	2	1.6	10	1.9	6.2°	50	6	2	★	1	10.4	10.9	11.8	13.0
R0100N120S04	1	2	1.6	12	1.9	3.7°	50	4	2	★	1	12.5	13.0	14.2	15.7
R0100N120S06	1	2	1.6	12	1.9	5.6°	50	6	2	★	1	12.5	13.0	14.2	15.7
R0100N140S04	1	2	1.6	14	1.9	3.3°	50	4	2	★	1	14.6	15.2	16.6	18.3
R0100N140S06	1	2	1.6	14	1.9	5.1°	50	6	2	★	1	14.6	15.2	16.6	18.3
R0100N160S04	1	2	1.6	16	1.9	2.9°	60	4	2	★	1	16.7	17.4	19.0	*
R0100N160S06	1	2	1.6	16	1.9	4.7°	60	6	2	★	1	16.7	17.4	19.0	21.0
R0100N180S04	1	2	1.6	18	1.9	2.7°	60	4	2	★	1	18.8	19.6	21.4	*
R0100N180S06	1	2	1.6	18	1.9	4.4°	60	6	2	★	1	18.8	19.6	21.4	23.6
R0100N200S04	1	2	1.6	20	1.9	2.5°	60	4	2	★	1	20.9	21.8	23.8	*
R0100N200S06	1	2	1.6	20	1.9	4.1°	60	6	2	★	1	20.9	21.8	23.8	26.3
R0100N220S04	1	2	1.6	22	1.9	2.3°	60	4	2	★	1	22.9	23.9	26.2	*
R0100N250S04	1	2	1.6	25	1.9	2°	70	4	2	★	1	26.1	27.2	*	*
R0100N250S06	1	2	1.6	25	1.9	3.5°	70	6	2	★	1	26.1	27.2	29.8	32.9
R0100N300S04	1	2	1.6	30	1.9	1.7°	70	4	2	★	1	31.3	32.6	*	*
R0100N300S06	1	2	1.6	30	1.9	3°	80	6	2	★	1	31.3	32.6	35.8	*
R0100N350S04	1	2	1.6	35	1.9	1.5°	80	4	2	★	1	36.5	38.1	*	*
R0125N100S06	1.25	2.5	2	10	2.4	5.9°	60	6	2	★	1	10.4	10.8	11.8	12.9
R0125N150S06	1.25	2.5	2	15	2.4	4.6°	60	6	2	★	1	15.6	16.3	17.8	19.6
R0125N200S06	1.25	2.5	2	20	2.4	3.7°	70	6	2	★	1	20.8	21.7	23.8	26.2
R0125N250S06	1.25	2.5	2	25	2.4	3.2°	70	6	2	★	1	26.1	27.2	29.7	32.9
R0125N300S06	1.25	2.5	2	30	2.4	2.8°	80	6	2	★	1	31.3	32.6	35.7	*
R0125N350S06	1.25	2.5	2	35	2.4	2.4°	80	6	2	★	1	36.5	38.1	41.7	*
R0150N080S06	1.5	3	2.4	8	2.9	6.3°	60	6	2	★	1	8.3	8.6	9.3	10.2
R0150N100S06	1.5	3	2.4	10	2.9	5.5°	60	6	2	★	1	10.4	10.8	11.7	12.9
R0150N120S06	1.5	3	2.4	12	2.9	4.9°	60	6	2	★	1	12.5	13.0	14.1	15.5
R0150N140S06	1.5	3	2.4	14	2.9	4.4°	60	6	2	★	1	14.6	15.2	16.5	18.2
R0150N160S06	1.5	3	2.4	16	2.9	4°	60	6	2	★	1	16.7	17.3	18.9	20.8
R0150N200S06	1.5	3	2.4	20	2.9	3.4°	70	6	2	★	1	20.8	21.7	23.7	26.1
R0150N250S06	1.5	3	2.4	25	2.9	2.8°	70	6	2	★	1	26.1	27.2	29.7	*
R0150N300S06	1.5	3	2.4	30	2.9	2.5°	70	6	2	★	1	31.3	32.6	35.7	*
R0150N350S06	1.5	3	2.4	35	2.9	2.2°	80	6	2	★	1	36.5	38.0	41.7	*
R0150N400S06	1.5	3	2.4	40	2.9	1.9°	90	6	2	★	1	41.7	43.5	*	*
R0175N160S06	1.75	3.5	2.8	16	3.4	3.6°	60	6	2	★	1	16.7	17.3	18.9	20.8
R0175N200S06	1.75	3.5	2.8	20	3.4	3°	70	6	2	★	1	20.8	21.7	23.7	*
R0175N250S06	1.75	3.5	2.8	25	3.4	2.5°	70	6	2	★	1	26.0	27.1	29.6	*
R0175N300S06	1.75	3.5	2.8	30	3.4	2.1°	80	6	2	★	1	31.3	32.6	35.6	*
R0175N350S06	1.75	3.5	2.8	35	3.4	1.9°	80	6	2	★	1	36.5	38.0	*	*
R0175N400S06	1.75	3.5	2.8	40	3.4	1.7°	90	6	2	★	1	41.7	43.5	*	*
R0200N100S06	2	4	3.2	10	3.9	4.5°	70	6	2	★	1	10.4	10.8	11.6	12.7
R0200N120S06	2	4	3.2	12	3.9	3.9°	70	6	2	★	1	12.5	12.9	14.0	15.4
R0200N140S06	2	4	3.2	14	3.9	3.4°	70	6	2	★	1	14.6	15.1	16.4	18.0
R0200N160S06	2	4	3.2	16	3.9	3.1°	70	6	2	★	1	16.6	17.3	18.8	20.7

* No interference

CUTTING CONDITIONS ➤ I288

VF2XLB

Ball nose, Long neck, 2 flute, For hardened materials

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	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	*
R0200N250S06	2	4	3.2	25	3.9	2.1°	70	6	2	★	1	26.0	27.1	29.6	*
R0200N300S06	2	4	3.2	30	3.9	1.8°	70	6	2	★	1	31.2	32.6	*	*
R0200N350S06	2	4	3.2	35	3.9	1.6°	80	6	2	★	1	36.5	38.0	*	*
R0200N400S06	2	4	3.2	40	3.9	1.4°	90	6	2	★	1	41.7	43.5	*	*
R0200N450S06	2	4	3.2	45	3.9	1.2°	90	6	2	★	1	46.9	48.9	*	*
R0200N500S06	2	4	3.2	50	3.9	1.1°	100	6	2	★	1	52.1	54.3	*	*
R0250N200S06	2.5	5	4	20	4.9	1.5°	70	6	2	★	1	20.8	21.6	*	*
R0250N250S06	2.5	5	4	25	4.9	1.2°	70	6	2	★	1	26.0	27.1	*	*
R0250N300S06	2.5	5	4	30	4.9	1°	80	6	2	★	1	31.2	*	*	*
R0250N350S06	2.5	5	4	35	4.9	0.9°	80	6	2	★	1	36.4	*	*	*
R0300N300S06	3	6	4.8	30	5.85	—	80	6	2	★	2	*	*	*	*
R0300N400S06	3	6	4.8	40	5.85	—	90	6	2	★	2	*	*	*	*
R0300N500S06	3	6	4.8	50	5.85	—	100	6	2	★	2	*	*	*	*

* No interference

● : Inventory maintained. ★ : Inventory maintained in Japan.

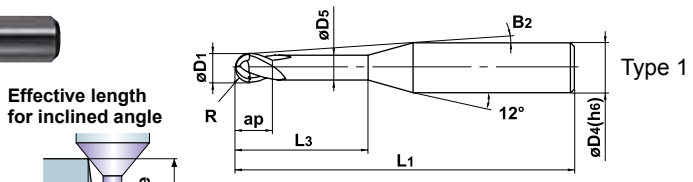
CUTTING CONDITIONS ➤ I288

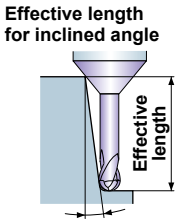
VF2XLB – Inch sizes NEW

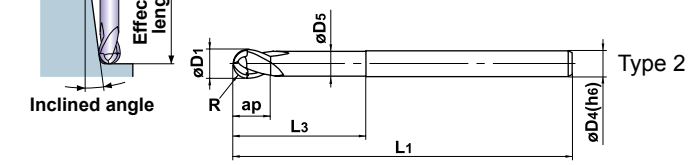
Ball nose, Long neck, 2 flute, For hardened materials

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				
±0.002"				
0 - 0.0008"				
D4=.25				
h6 0 - 0.00035"				

● 2 flute long neck ball nose end mills with Impact Miracle coating for high hardness materials.

Unit : inch

Order Number	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	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
D1/32N6D	.0156	.0313	.0313	.1875	.0296	9.1°	2.5	.2500	2	●	1	.197	.205	.221	.244
D1/16N4D	.0313	.0625	.0625	.2500	.0601	8.0°	2.5	.2500	2	●	1	.264	.276	.299	.331
D1/16N6D	.0313	.0625	.0625	.3750	.0601	6.8°	2.5	.2500	2	●	1	.394	.409	.449	.496
D3/32N4D	.0469	.0938	.0938	.3750	.0898	6.4°	2.5	.2500	2	●	1	.390	.406	.441	.484
D3/32N6D	.0469	.0938	.0938	.5625	.0898	5.1°	2.5	.2500	2	●	1	.587	.610	.665	.736
D1/8N4D	.0625	.1250	.1250	.5000	.1211	4.9°	3.0	.2500	2	●	1	.520	.539	.591	.646
D1/8N6D	.0625	.1250	.1250	.7500	.1211	3.7°	3.0	.2500	2	●	1	.780	.815	.886	.980
D3/16N4D	.0938	.1875	.1875	.7500	.1835	2.3°	3.0	.2500	2	●	1	.780	.811	.882	*
D3/16N6D	.0938	.1875	.1875	1.1250	.1835	1.6°	3.0	.2500	2	●	1	1.169	1.221	*	*
D1/4N4D	.1250	.2500	.2500	1.0000	.2441	–	3.5	.2500	2	●	2	*	*	*	*
D1/4N6D	.1250	.2500	.2500	1.5000	.2441	–	3.5	.2500	2	●	2	*	*	*	*

* No interference

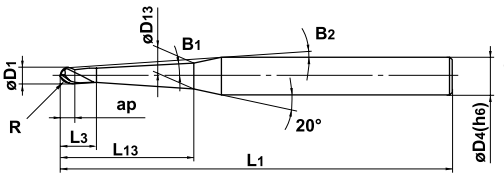
IMPACT MIRACLE END MILLS

VF3XB

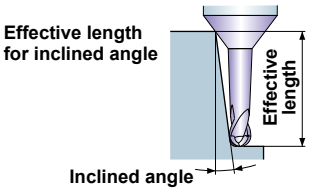
Ball nose, 3 flute, Taper neck

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
○	◎	◎	◎	○	○		





R						
	±0.01					
	0 - 0.02					
h6	4≤D4≤6	D4=8				
	0 - 0.008	0 - 0.009				



● 3 flute ball end mill, high rigidity taper neck type.

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D1	Taper Angle One Side B1	Length of Cut ap	Neck Length L13	Length of Neck Ext. L3	Cutting Edge to Shank Angle B2	Neck Dia. D13	Overall Length L1	Shank Dia. D4	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
R0040T0024L008	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
R0040T0024L012	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
R0040T0054L008	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
R0040T0054L012	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
R0040T0054L016	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
R0050T0024L008	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
R0050T0024L010	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
R0050T0024L012	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
R0050T0024L016	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
R0050T0024L020	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
R0050T0024L025	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
R0050T0024L030	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
R0050T0024L035	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
R0050T0054L008	0.5	1	0.9°	0.8	8	2.3	9.7°	1.12	60	6	3	★	1	—	8.6	9.1	9.6
R0050T0054L012	0.5	1	0.9°	0.8	12	2.3	7.7°	1.24	60	6	3	★	1	—	12.6	13.3	14.1
R0050T0054L016	0.5	1	0.9°	0.8	16	2.3	6.4°	1.37	70	6	3	★	1	—	16.7	17.6	18.5
R0050T0054L020	0.5	1	0.9°	0.8	20	2.3	5.5°	1.50	70	6	3	★	1	—	20.7	21.8	23.0
R0050T0054L025	0.5	1	0.9°	0.8	25	2.3	4.7°	1.65	70	6	3	★	1	—	25.7	27.1	28.6
R0050T0054L030	0.5	1	0.9°	0.8	30	2.3	4.0°	1.81	80	6	3	★	1	—	30.8	32.4	34.2
R0050T0054L035	0.5	1	0.9°	0.8	35	2.3	3.6°	1.97	80	6	3	★	1	—	35.8	37.7	39.8
R0050T0054L040	0.5	1	0.9°	0.8	40	2.3	3.2°	2.12	80	6	3	★	1	—	40.8	43.0	45.4
R0050T0054L050	0.5	1	0.9°	0.8	50	2.3	2.7°	2.44	110	6	3	★	1	—	50.9	53.6	*
R0050T0054L060	0.5	1	0.9°	0.8	60	2.3	2.3°	2.75	110	6	3	★	1	—	60.9	64.1	*
R0050T0054L070	0.5	1	0.9°	0.8	70	2.3	2.0°	3.07	110	6	3	★	1	—	71.0	74.7	*
R0050T0130L012	0.5	1	1.5°	0.8	12	2.3	7.9°	1.45	60	6	3	★	1	—	—	13.0	13.7
R0050T0130L016	0.5	1	1.5°	0.8	16	2.3	6.5°	1.66	70	6	3	★	1	—	—	17.1	18.0
R0050T0130L020	0.5	1	1.5°	0.8	20	2.3	5.6°	1.87	70	6	3	★	1	—	—	21.2	22.4
R0050T0130L025	0.5	1	1.5°	0.8	25	2.3	4.8°	2.13	70	6	3	★	1	—	—	26.3	27.8
R0050T0130L030	0.5	1	1.5°	0.8	30	2.3	4.1°	2.39	80	6	3	★	1	—	—	31.5	33.2
R0050T0130L035	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 in Japan.

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D_1	Taper Angle One Side B_1	Length of Cut ap	Neck Length L_{13}	Length of Neck Ext. L_3	Cutting Edge to Shank Angle B_2	Neck Dia. D_{13}	Overall Length L_1	Shank Dia. D_4	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
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
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
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
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
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
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
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
R0075T0130L015	0.75	1.5	1.5°	1.3	15	2.8	6.4°	2.08	60	6	3	★	1	—	—	16.1	17.0
R0075T0130L020	0.75	1.5	1.5°	1.3	20	2.8	5.2°	2.34	70	6	3	★	1	—	—	21.2	22.4
R0075T0130L030	0.75	1.5	1.5°	1.3	30	2.8	3.8°	2.86	80	6	3	★	1	—	—	31.5	33.2
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
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
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
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
R0100T0024L035	1	2	0.4°	1.6	35	3.6	2.9°	2.34	80	6	3	★	1	35.8	36.7	38.6	*
R0100T0024L040	1	2	0.4°	1.6	40	3.6	2.6°	2.41	80	6	3	★	1	40.8	41.9	44.0	*
R0100T0054L020	1	2	0.9°	1.6	20	3.6	4.7°	2.42	70	6	3	★	1	—	20.8	21.9	23.0
R0100T0054L025	1	2	0.9°	1.6	25	3.6	4.0°	2.57	70	6	3	★	1	—	25.8	27.2	28.6
R0100T0054L030	1	2	0.9°	1.6	30	3.6	3.4°	2.73	80	6	3	★	1	—	30.9	32.5	34.2
R0100T0054L035	1	2	0.9°	1.6	35	3.6	3.0°	2.89	80	6	3	★	1	—	35.9	37.7	39.8
R0100T0054L040	1	2	0.9°	1.6	40	3.6	2.7°	3.04	80	6	3	★	1	—	40.9	43.0	*
R0100T0054L050	1	2	0.9°	1.6	50	3.6	2.2°	3.36	110	6	3	★	1	—	51.0	53.6	*
R0100T0054L060	1	2	0.9°	1.6	60	3.6	1.9°	3.67	110	6	3	★	1	—	61.0	*	*
R0100T0054L070	1	2	0.9°	1.6	70	3.6	1.6°	3.99	110	6	3	★	1	—	71.1	*	*
R0100T0130L025	1	2	1.5°	1.6	25	3.6	4.1°	3.02	70	6	3	★	1	—	—	26.4	27.9
R0100T0130L030	1	2	1.5°	1.6	30	3.6	3.5°	3.28	80	6	3	★	1	—	—	31.6	33.3
R0100T0130L035	1	2	1.5°	1.6	35	3.6	3.1°	3.54	80	6	3	★	1	—	—	36.7	38.7
R0100T0130L040	1	2	1.5°	1.6	40	3.6	2.7°	3.81	80	6	3	★	1	—	—	41.8	*
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
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
R0125T0054L040	1.25	2.5	0.9°	2	40	4.5	2.4°	3.52	80	6	3	★	1	—	40.9	43.1	*
R0125T0130L020	1.25	2.5	1.5°	2	20	4.5	4.4°	3.21	60	6	3	★	1	—	—	21.4	22.5
R0125T0130L030	1.25	2.5	1.5°	2	30	4.5	3.1°	3.74	80	6	3	★	1	—	—	31.6	33.3
R0125T0130L040	1.25	2.5	1.5°	2	40	4.5	2.5°	4.26	80	6	3	★	1	—	—	41.9	*
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
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
R0150T0024L030	1.5	3	0.4°	2	30	5	2.7°	3.25	80	6	3	★	1	30.8	31.6	33.2	*
R0150T0024L040	1.5	3	0.4°	2	40	5	2.1°	3.39	80	6	3	★	1	40.9	41.9	44.0	*
R0150T0024L050	1.5	3	0.4°	2	50	5	1.7°	3.53	100	6	3	★	1	50.9	52.2	*	*
R0150T0054L020	1.5	3	0.9°	2	20	5	3.8°	3.37	60	6	3	★	1	—	20.9	21.9	23.0
R0150T0054L030	1.5	3	0.9°	2	30	5	2.7°	3.69	80	6	3	★	1	—	30.9	32.5	*
R0150T0054L040	1.5	3	0.9°	2	40	5	2.1°	4.00	80	6	3	★	1	—	41.0	43.1	*
R0150T0054L050	1.5	3	0.9°	2	50	5	1.7°	4.31	100	6	3	★	1	—	51.0	*	*
R0150T0054L060	1.5	3	0.9°	2	60	5	2.3°	4.63	110	8	3	★	1	—	61.1	64.2	*
R0150T0054L070	1.5	3	0.9°	2	70	5	2.0°	4.94	120	8	3	★	1	—	71.1	74.8	*
R0150T0130L040	1.5	3	1.5°	2	40	5	2.2°	4.73	80	6	3	★	1	—	—	41.9	*
R0150T0130L050	1.5	3	1.5°	2	50	5	2.8°	5.26	110	8	3	★	1	—	—	52.2	*
R0150T0130L060	1.5	3	1.5°	2	60	5	2.4°	5.78	110	8	3	★	1	—	—	62.4	*
R0150T0130L070	1.5	3	1.5°	2	70	5	2.1°	6.30	120	8	3	★	1	—	—	72.7	*
R0200T0054L030	2	4	0.9°	3	30	6	3.5°	4.65	90	8	3	★	1	—	30.9	32.5	34.2

* No interference

CUTTING CONDITIONS ➤ I290

VF3XB

Ball nose, 3 flute, Taper neck

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D1	Taper Angle One Side B1	Length of Cut ap	Neck Length L13	Length of Neck Ext. L3	Cutting Edge to Shank Angle B2	Neck Dia. D13	Overall Length L1	Shank Dia. D4	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	*
R0200T0054L050	2	4	0.9°	3	50	6	2.2°	5.28	110	8	3	★	1	—	51.0	53.6	*
R0200T0054L060	2	4	0.9°	3	60	6	1.9°	5.60	110	8	3	★	1	—	61.1	*	*
R0250T0054L035	2.5	5	0.9°	3.5	35	6.5	2.4°	5.80	90	8	3	★	1	—	35.9	37.7	*
R0250T0054L040	2.5	5	0.9°	3.5	40	6.5	2.2°	5.95	90	8	3	★	1	—	41.0	43.0	*
R0250T0054L050	2.5	5	0.9°	3.5	50	6.5	1.8°	6.27	110	8	3	★	1	—	51.0	*	*
R0250T0054L060	2.5	5	0.9°	3.5	60	6.5	1.5°	6.58	110	8	3	★	1	—	61.1	*	*

* No interference

★ : Inventory maintained in Japan.

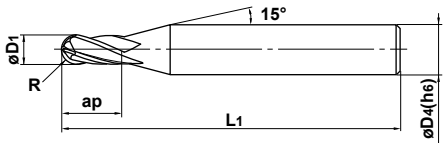
CUTTING CONDITIONS ➤ I290

VF4MB

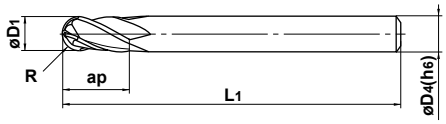
Ball nose, Medium cut length, 4 flute

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						
	±0.01					
	0 - 0.020					
h6	D4=6	8≤D4≤10	D4=20			
	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	Radius of Ball Nose **R**	Dia. **D1**	Length of Cut **ap**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
VF4MBR0050	0.5	1	2.5	50	6	4	★	1
R0100	1	2	6	60	6	4	★	1
R0150	1.5	3	8	70	6	4	★	1
R0200	2	4	8	70	6	4	★	1
R0250	2.5	5	12	80	6	4	★	1
R0300	3	6	12	80	6	4	★	2
R0400	4	8	14	90	8	4	★	2
R0500	5	10	18	100	10	4	★	2
R0600	6	12	22	110	12	4	★	2

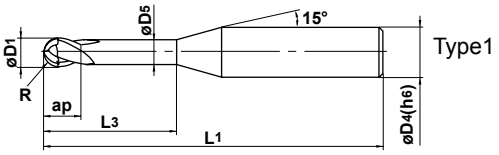
IMPACT MIRACLE END MILLS

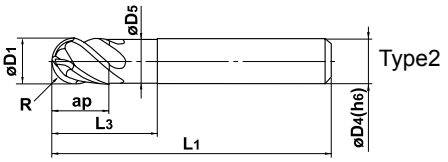
VF4SVB

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					
R≤6	R>6				
±0.01	±0.02				
D1≤12	D1>12				
0 - 0.02	0 - 0.03				
D4=6	8≤D4≤10	12≤D4≤16	D4=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	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
NEW **VF4SVBR0100**	1	2	3	5	1.9	50	6	4	●	1
NEW **R0150**	1.5	3	4.5	7.5	2.9	50	6	4	●	1
NEW **R0200**	2	4	6	10	3.9	50	6	4	●	1
NEW **R0250**	2.5	5	7.5	12.5	4.9	50	6	4	●	1
R0300	3	6	9	15	5.85	50	6	4	●	2
R0400	4	8	12	20	7.85	60	8	4	★	2
R0500	5	10	15	25	9.7	70	10	4	★	2
R0600	6	12	18	30	11.7	75	12	4	★	2
R0800	8	16	24	40	15.5	90	16	4	★	2
R1000	10	20	30	50	19.5	100	20	4	★	2

● : Inventory maintained. ★ : Inventory maintained in Japan.

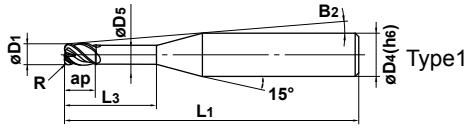
CUTTING CONDITIONS ➤ I293

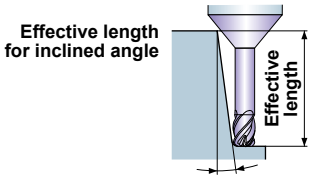
VFHVRB

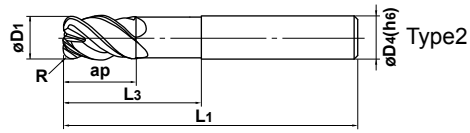
4 flute, Corner radius, Short cut length, Irregular helix flutes

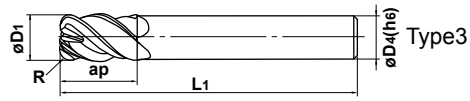
Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎	◎	○	○		











R	D1≤10	D1>10	
	±0.007	±0.01	
	D1≤12	D1>12	
	0 - 0.02	0 - 0.03	
h6	D4=6	8≤D4≤10	12≤D4≤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	Dia. D1	Corner R R	Length of Cut ap	Neck Length L3	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	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
D0100R02N006	1	0.2	1	6	0.94	9.2°	60	6	4	★	1	6.4	6.7	7.2	7.7
D0100R02N008	1	0.2	1	8	0.94	8.2°	60	6	4	★	1	8.5	8.8	9.5	10.2
D0100R02N010	1	0.2	1	10	0.94	7.4°	60	6	4	★	1	10.5	11	11.8	12.7
D0100R02N015	1	0.2	1	15	0.94	5.9°	60	6	4	★	1	15.8	16.3	17.5	18.9
D0100R02N020	1	0.2	1	20	0.94	4.9°	80	6	4	★	1	20.9	21.7	23.3	25.1
D0150R03N004	1.5	0.3	1.5	4	1.44	10.3°	60	6	4	★	1	4.2	4.5	4.6	5.2
D0150R03N006	1.5	0.3	1.5	6	1.44	8.9°	60	6	4	★	1	6.3	6.6	7.2	7.7
D0150R03N010	1.5	0.3	1.5	10	1.44	7°	60	6	4	★	1	10.5	10.9	11.8	12.7
D0150R03N015	1.5	0.3	1.5	15	1.44	5.5°	60	6	4	★	1	15.7	16.3	17.5	18.9
D0150R03N020	1.5	0.3	1.5	20	1.44	4.6°	80	6	4	★	1	20.9	21.6	23.3	25.1
D0150R03N025	1.5	0.3	1.5	25	1.44	3.9°	80	6	4	★	1	26.1	27	29	31.3
D0150R03N030	1.5	0.3	1.5	30	1.44	3.4°	80	6	4	★	1	31.3	32.3	34.7	37.5
D0200R05N006	2	0.5	2	6	1.9	8.7°	60	6	4	●	1	6.3	6.5	7	7.5
D0200R05N010	2	0.5	2	10	1.9	6.7°	60	6	4	●	1	10.5	10.8	11.6	12.5
D0200R05N015	2	0.5	2	15	1.9	5.2°	60	6	4	★	1	15.6	16.2	17.4	18.7
D0200R05N020	2	0.5	2	20	1.9	4.3°	80	6	4	★	1	20.8	21.5	23.1	24.9
D0200R05N025	2	0.5	2	25	1.9	3.6°	80	6	4	★	1	26	26.9	28.9	31.2
D0200R05N030	2	0.5	2	30	1.9	3.1°	80	6	4	★	1	31.2	32.2	34.6	37.4
D0200R05N035	2	0.5	2	35	1.9	2.8°	90	6	4	★	1	36.3	37.6	40.4	*
D0200R05N040	2	0.5	2	40	1.9	2.5°	90	6	4	★	1	41.5	42.9	46.1	*
D0300R05N010	3	0.5	3	10	2.9	5.6°	60	6	4	★	1	10.5	10.8	11.6	12.5
D0300R05N015	3	0.5	3	15	2.9	4.3°	60	6	4	★	1	15.6	16.2	17.4	18.7
D0300R05N020	3	0.5	3	20	2.9	3.4°	80	6	4	★	1	20.8	21.5	23.1	24.9
D0300R05N030	3	0.5	3	30	2.9	2.5°	80	6	4	★	1	31.2	32.2	34.6	*
D0300R08N010	3	0.8	3	10	2.9	5.7°	60	6	4	●	1	10.4	10.8	11.6	12.4
D0300R08N015	3	0.8	3	15	2.9	4.3°	60	6	4	●	1	15.6	16.2	17.3	18.7
D0300R08N020	3	0.8	3	20	2.9	3.5°	80	6	4	★	1	20.8	21.5	23.1	24.9
D0300R08N030	3	0.8	3	30	2.9	2.5°	80	6	4	●	1	31.1	32.2	34.6	*
D0300R08N040	3	0.8	3	40	2.9	2°	90	6	4	★	1	41.5	42.9	*	*
D0300R08N050	3	0.8	3	50	2.9	1.6°	90	6	4	★	1	51.8	53.6	*	*
D0400R05N012	4	0.5	4	12	3.9	3.8°	60	6	4	★	1	12.5	13	13.9	15

* No interference

CUTTING CONDITIONS ➤ I294

IMPACT MIRACLE END MILLS

VFHVRB

4 flute, Corner radius, Short cut length, Irregular helix flutes

Unit : mm

Order Number	Dia. D_1	Corner R R	Length of Cut ap	Neck Length L_3	Neck Dia. D_5	Cutting Edge to Shank Angle B_2	Overall Length L_1	Shank Dia. D_4	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	*
D0400R05N030	4	0.5	4	30	3.9	1.8°	80	6	4	★	1	31.2	32.2	*	*
D0400R05N048	4	0.5	4	48	3.9	1.2°	90	6	4	★	1	49.8	51.5	*	*
D0400R10N012	4	1	4	12	3.9	3.9°	60	6	4	●	1	12.5	12.9	13.8	14.9
D0400R10N020	4	1	4	20	3.9	2.5°	80	6	4	●	1	20.8	21.5	23	*
D0400R10N030	4	1	4	30	3.9	1.8°	80	6	4	★	1	31.1	32.2	*	*
D0600R05N018	6	0.5	9	18	5.85	—	60	6	4	★	2	*	*	*	*
D0600R05N030	6	0.5	9	30	5.85	—	80	6	4	★	2	*	*	*	*
D0600R10N018	6	1	9	18	5.85	—	60	6	4	★	2	*	*	*	*
D0600R10N030	6	1	9	30	5.85	—	80	6	4	★	2	*	*	*	*
D0600R10N054	6	1	9	54	5.85	—	90	6	4	★	2	*	*	*	*
D0600R15N018	6	1.5	9	18	5.85	—	60	6	4	★	2	*	*	*	*
D0600R15N030	6	1.5	9	30	5.85	—	80	6	4	●	2	*	*	*	*
D0600R15N042	6	1.5	9	42	5.85	—	90	6	4	●	2	*	*	*	*
D0600R15N054	6	1.5	9	54	5.85	—	90	6	4	★	2	*	*	*	*
D0600R20N018	6	2	9	18	5.85	—	60	6	4	★	2	*	*	*	*
D0600R20N030	6	2	9	30	5.85	—	80	6	4	★	2	*	*	*	*
D0700R15	7	1.5	11	—	—	—	80	6	4	★	3	*	*	*	*
D0800R05N024	8	0.5	12	24	7.85	—	60	8	4	★	2	*	*	*	*
D0800R05N040	8	0.5	12	40	7.85	—	100	8	4	★	2	*	*	*	*
D0800R10N024	8	1	12	24	7.85	—	60	8	4	★	2	*	*	*	*
D0800R10N040	8	1	12	40	7.85	—	100	8	4	★	2	*	*	*	*
D0800R20N024	8	2	12	24	7.85	—	60	8	4	●	2	*	*	*	*
D0800R20N040	8	2	12	40	7.85	—	100	8	4	●	2	*	*	*	*
D0800R20N056	8	2	12	56	7.85	—	120	8	4	●	2	*	*	*	*
D0800R20N072	8	2	12	72	7.85	—	120	8	4	●	2	*	*	*	*
D0900R20	9	2	13.5	—	—	—	100	8	4	★	3	*	*	*	*
D1000R05N030	10	0.5	15	30	9.7	—	70	10	4	★	2	*	*	*	*
D1000R05N050	10	0.5	15	50	9.7	—	110	10	4	★	2	*	*	*	*
D1000R10N030	10	1	15	30	9.7	—	70	10	4	★	2	*	*	*	*
D1000R10N050	10	1	15	50	9.7	—	110	10	4	★	2	*	*	*	*
D1000R20N030	10	2	15	30	9.7	—	70	10	4	★	2	*	*	*	*
D1000R20N050	10	2	15	50	9.7	—	110	10	4	★	2	*	*	*	*
D1000R20N070	10	2	15	70	9.7	—	150	10	4	★	2	*	*	*	*
D1000R20N090	10	2	15	90	9.7	—	150	10	4	★	2	*	*	*	*
D1100R20	11	2	16.5	—	—	—	110	10	4	★	3	*	*	*	*
D1200R05N036	12	0.5	18	36	11.7	—	80	12	4	★	2	*	*	*	*
D1200R05N060	12	0.5	18	60	11.7	—	120	12	4	★	2	*	*	*	*
D1200R10N036	12	1	18	36	11.7	—	80	12	4	★	2	*	*	*	*
D1200R10N060	12	1	18	60	11.7	—	120	12	4	★	2	*	*	*	*
D1200R20N036	12	2	18	36	11.7	—	80	12	4	★	2	*	*	*	*
D1200R20N060	12	2	18	60	11.7	—	120	12	4	★	2	*	*	*	*
D1200R20N084	12	2	18	84	11.7	—	160	12	4	★	2	*	*	*	*
D1200R20N108	12	2	18	108	11.7	—	160	12	4	★	2	*	*	*	*
D1200R30N036	12	3	18	36	11.7	—	80	12	4	★	2	*	*	*	*
D1200R30N060	12	3	18	60	11.7	—	120	12	4	●	2	*	*	*	*
D1300R30	13	3	19.5	—	—	—	120	12	4	★	3	*	*	*	*
D1600R05N042	16	0.5	24	42	15.5	—	100	16	4	★	2	*	*	*	*
D1600R20N042	16	2	24	42	15.5	—	100	16	4	★	2	*	*	*	*
D1600R30N042	16	3	24	42	15.5	—	100	16	4	★	2	*	*	*	*
D1600R30N080	16	3	24	80	15.5	—	140	16	4	★	2	*	*	*	*
D1600R30N120	16	3	24	120	15.5	—	175	16	4	★	2	*	*	*	*

* No interference

● : Inventory maintained. ★ : Inventory maintained in Japan.

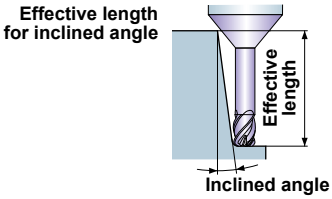
CUTTING CONDITIONS ➤ I294

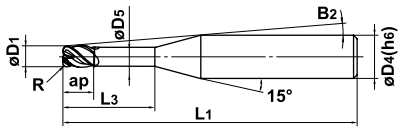
VFHVRB – Inch sizes

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	.250"≤D4≤.375"	D4=.500"
	0 - .00035	0 - .00043

● Impact Miracle corner radius end mill for high feed and efficient machining.

Unit : inch

Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Neck Length L3	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Effective length for inclined angle 30'	1°	2°	3°
VFHVRBD1/8N3DR0.03	.125	.030	.125	.375	.1211	6.1°	2.25	.250	4	●	9.9	10.3	11	11.9
D1/8N5DR0.03	.125	.030	.125	.625	.1211	4.3°	2.25	.250	4	●	16.5	17.1	18.3	19.8
D3/16N3DR0.05	.188	.050	.188	.563	.1835	2.9°	2.25	.250	4	●	14.9	15.4	16.4	*
D3/16N5DR0.05	.188	.050	.188	.938	.1835	1.8°	2.25	.250	4	●	24.7	25.6	*	*
D1/4N3DR0.06	.250	.060	.375	.750	.2441	–	2.25	.250	4	●	*	*	*	*
D1/4N5DR0.06	.250	.060	.375	1.250	.2441	–	3.00	.250	4	●	*	*	*	*
D5/16N3DR0.08	.313	.080	.469	.938	.3066	–	3.00	.313	4	●	*	*	*	*
D5/16N5DR0.08	.313	.080	.469	1.563	.3066	–	4.00	.313	4	●	*	*	*	*
D3/8N3DR0.08	.375	.080	.563	1.125	.3691	–	3.00	.375	4	●	*	*	*	*
D3/8N5DR0.08	.375	.080	.563	1.875	.3691	–	4.00	.375	4	●	*	*	*	*
D1/2N3DR0.12	.500	.120	.750	1.500	.4882	–	4.00	.500	4	●	*	*	*	*
D1/2N5DR0.12	.500	.120	.750	2.500	.4822	–	5.00	.500	4	●	*	*	*	*

* No interference

IMPACT MIRACLE vibration control end mills

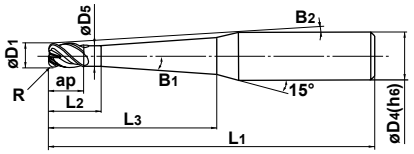
VFHVRB NEW

4 flute, Corner radius, Short cut length, Irregular helix flutes

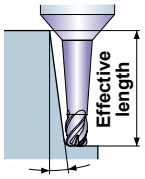
Carbon Steel, Alloy Steel (<30HRC)	Pre-Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎	◎	○	○		

Taper neck type





Effective length for inclined angle



R	D1≤10	D1>10				
	±0.007	±0.01				
	D1≤12					
	0 - 0.02					
h6	D4=6	8≤D4≤10	12≤D4≤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	Dia. D1	Corner R R	Taper Angle One Side B1	Length of Cut ap	Neck Length L3	Length of Straight Neck L2	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	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
D010R02N010T09	1	0.2	0.9°	1	10	2.5	0.94	7.5°	60	6	4	★	—	10.6	11.4	12.3
D010R02N015T09	1	0.2	0.9°	1	15	2.5	0.94	6.1°	60	6	4	★	—	15.6	16.8	18.1
D010R02N020T09	1	0.2	0.9°	1	20	2.5	0.94	5.1°	80	6	4	★	—	20.6	22.1	23.9
D010R02N025T09	1	0.2	0.9°	1	25	2.5	0.94	4.4°	80	6	4	★	—	25.6	27.5	29.7
D010R02N030T09	1	0.2	0.9°	1	30	2.5	0.94	3.8°	80	6	4	★	—	30.6	32.9	35.5
D010R02N035T09	1	0.2	0.9°	1	35	2.5	0.94	3.4°	90	6	4	★	—	35.6	38.3	41.3
D010R02N040T09	1	0.2	0.9°	1	40	2.5	0.94	3.1°	90	6	4	★	—	40.6	43.6	47.2
D010R02N045T09	1	0.2	0.9°	1	45	2.5	0.94	2.8°	90	6	4	★	—	45.6	49	*
D010R02N050T09	1	0.2	0.9°	1	50	2.5	0.94	2.6°	90	6	4	★	—	50.6	54.4	*
D015R03N010T09	1.5	0.3	0.9°	1.5	10	3	1.44	7.1°	60	6	4	★	—	10.6	11.4	12.3
D015R03N015T09	1.5	0.3	0.9°	1.5	15	3	1.44	5.7°	60	6	4	★	—	15.6	16.8	18.1
D015R03N020T09	1.5	0.3	0.9°	1.5	20	3	1.44	4.7°	80	6	4	★	—	20.6	22.2	23.9
D015R03N030T09	1.5	0.3	0.9°	1.5	30	3	1.44	3.5°	80	6	4	★	—	30.6	32.9	35.6
D015R03N040T09	1.5	0.3	0.9°	1.5	40	3	1.44	2.8°	90	6	4	★	—	40.6	43.7	*
D015R03N050T09	1.5	0.3	0.9°	1.5	50	3	1.44	2.4°	90	6	4	★	—	50.6	54.4	*
D020R05N015T04	2	0.5	0.4°	2	15	4	1.9	5.2°	60	6	4	★	15.6	16.2	17.4	18.7
D020R05N020T04	2	0.5	0.4°	2	20	4	1.9	4.3°	80	6	4	★	20.6	21.3	22.9	24.7
D020R05N025T04	2	0.5	0.4°	2	25	4	1.9	3.6°	80	6	4	★	25.6	26.5	28.5	30.8
D020R05N030T04	2	0.5	0.4°	2	30	4	1.9	3.2°	80	6	4	★	30.6	31.7	34	36.8
D020R05N035T04	2	0.5	0.4°	2	35	4	1.9	2.8°	80	6	4	★	35.6	36.9	39.6	*
D020R05N040T04	2	0.5	0.4°	2	40	4	1.9	2.5°	80	6	4	★	40.6	42	45.2	*
D020R05N020T09	2	0.5	0.9°	2	20	4	1.9	4.4°	80	6	4	★	—	20.8	22.3	24.1
D020R05N025T09	2	0.5	0.9°	2	25	4	1.9	3.7°	90	6	4	★	—	25.8	27.7	29.9
D020R05N030T09	2	0.5	0.9°	2	30	4	1.9	3.2°	90	6	4	★	—	30.8	33	35.7
D020R05N035T09	2	0.5	0.9°	2	35	4	1.9	2.9°	90	6	4	★	—	35.8	38.4	*
D020R05N040T09	2	0.5	0.9°	2	40	4	1.9	2.6°	90	6	4	★	—	40.8	43.8	*
D020R05N045T09	2	0.5	0.9°	2	45	4	1.9	2.3°	90	6	4	★	—	45.8	49.2	*
D020R05N050T09	2	0.5	0.9°	2	50	4	1.9	2.2°	100	6	4	★	—	50.8	54.5	*
D020R05N055T09	2	0.5	0.9°	2	55	4	1.9	2°	100	6	4	★	—	55.8	59.9	*
D020R05N060T09	2	0.5	0.9°	2	60	4	1.9	1.8°	100	6	4	★	—	60.8	*	*

* No interference

★ : Inventory maintained in Japan.

Unit : mm

Order Number	Dia. D_1	Corner R R	Taper Angle One Side B_1	Length of Cut ap	Neck Length L_3	Length of Straight Neck L_2	Neck Dia. D_5	Cutting Edge to Shank Angle B_2	Overall Length L_1	Shank Dia. D_4	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
D030R08N025T09	3	0.8	0.9°	3	25	6	2.9	3°	80	6	4	★	—	25.9	27.8	30
D030R08N030T09	3	0.8	0.9°	3	30	6	2.9	2.6°	80	6	4	★	—	30.9	33.1	*
D030R08N040T09	3	0.8	0.9°	3	40	6	2.9	2°	90	6	4	★	—	40.9	43.9	*
D030R08N050T09	3	0.8	0.9°	3	50	6	2.9	1.7°	90	6	4	★	—	50.9	*	*
D030R08N060T09	3	0.8	0.9°	3	60	6	2.9	1.4°	100	6	4	★	—	60.9	*	*
D040R10N025T04	4	1	0.4°	4	25	7	3.9	2.1°	80	6	4	★	25.7	26.6	28.5	*
D040R10N030T04	4	1	0.4°	4	30	7	3.9	1.8°	80	6	4	★	30.7	31.8	*	*
D040R10N035T04	4	1	0.4°	4	35	7	3.9	1.6°	80	6	4	★	35.7	36.9	*	*
D040R10N040T04	4	1	0.4°	4	40	7	3.9	1.4°	80	6	4	★	40.7	42.1	*	*
D040R10N045T04	4	1	0.4°	4	45	7	3.9	1.3°	90	6	4	★	45.7	47.3	*	*
D040R10N050T04	4	1	0.4°	4	50	7	3.9	1.2°	90	6	4	★	50.7	52.5	*	*
D040R10N025T09	4	1	0.9°	4	25	7	3.9	2.2°	90	6	4	★	—	25.9	27.8	*
D040R10N030T09	4	1	0.9°	4	30	7	3.9	1.9°	90	6	4	★	—	30.9	*	*
D040R10N040T09	4	1	0.9°	4	40	7	3.9	1.4°	100	6	4	★	—	40.9	*	*
D040R10N050T09	4	1	0.9°	4	50	7	3.9	1.2°	100	6	4	★	—	50.9	*	*
D040R10N060T09	4	1	0.9°	4	60	7	3.9	1°	100	6	4	★	—	60.9	*	*
D060R15N040T09	6	1.5	0.9°	9	40	12	5.85	1.4°	110	8	4	★	—	41.4	*	*
D060R15N050T09	6	1.5	0.9°	9	50	12	5.85	1.2°	110	8	4	★	—	51.4	*	*
D060R15N060T09	6	1.5	0.9°	9	60	12	5.85	1°	110	8	4	★	—	61.4	*	*
D060R15N070T09	6	1.5	0.9°	9	70	12	5.85	0.9°	110	8	4	★	—	*	*	*
D080R20N060T09	8	2	0.9°	12	60	15	7.85	1°	150	10	4	★	—	61.5	*	*
D080R20N080T09	8	2	0.9°	12	80	15	7.85	0.8°	150	10	4	★	—	*	*	*
D100R20N080T09	10	2	0.9°	15	80	18	9.7	2°	130	16	4	★	—	82	88	*
D100R20N120T09	10	2	0.9°	15	120	18	9.7	1.4°	180	16	4	★	—	122	*	*
D120R20N080T09	12	2	0.9°	18	80	21	11.7	1.4°	130	16	4	★	—	82.2	*	*
D120R20N120T09	12	2	0.9°	18	120	21	11.7	1°	180	16	4	★	—	122.2	*	*

* No interference

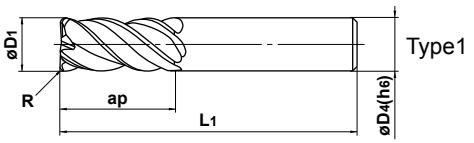
IMPACT MIRACLE END MILLS

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						
	±0.015					
	D1≤12	D1>12				
	0 - 0.02	0 - 0.03				
h6	D4=6	8≤D4≤10	12≤D4≤16	D4=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	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VFMHVRBD0600R050	6	0.5	13	50	6	4	★	1
D0600R100	6	1	13	50	6	4	★	1
D0800R050	8	0.5	19	60	8	4	★	1
D0800R100	8	1	19	60	8	4	★	1
D1000R050	10	0.5	22	70	10	4	★	1
D1000R100	10	1	22	70	10	4	★	1
D1000R200	10	2	22	70	10	4	★	1
D1200R050	12	0.5	26	75	12	4	★	1
D1200R100	12	1	26	75	12	4	★	1
D1200R200	12	2	26	75	12	4	★	1
D1600R100	16	1	35	90	16	4	★	1
D1600R200	16	2	35	90	16	4	★	1
D1600R300	16	3	35	90	16	4	★	1
NEW **D1600R500**	16	5	35	90	16	4	★	1
D2000R100	20	1	45	110	20	4	★	1
D2000R200	20	2	45	110	20	4	★	1
D2000R300	20	3	45	110	20	4	★	1
D2000R400	20	4	45	110	20	4	★	1
NEW **D2000R500**	20	5	45	110	20	4	★	1
NEW **D2000R635**	20	6.35	45	110	20	4	★	1

★ : Inventory maintained in Japan.

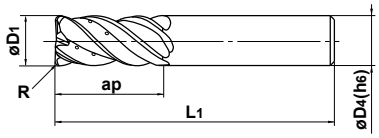
CUTTING CONDITIONS ➤ I276

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						
	±0.015					
	0 - 0.03					
h6	D4=16	D4=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	Dia. **D1**	Corner Radius **R**	Length of Cut **ap**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
VFMHVRBCHD1600R100	16	1	35	90	16	4	★	1
D1600R300	16	3	35	90	16	4	★	1
D2000R100	20	1	45	110	20	4	★	1
D2000R300	20	3	45	110	20	4	★	1

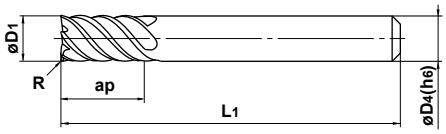
IMPACT MIRACLE END MILLS

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						
	±0.015					
D1≤12	D1>12					
0 - 0.02	0 - 0.03					
h6	D4=6	8≤D4≤10	12≤D4≤16	D4=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	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
VF6MHVRBD0600R050	6	0.5	13	50	6	6	★	1
D0600R100	6	1	13	50	6	6	★	1
D0800R050	8	0.5	19	60	8	6	★	1
D0800R100	8	1	19	60	8	6	★	1
D1000R050	10	0.5	22	70	10	6	★	1
D1000R100	10	1	22	70	10	6	★	1
D1200R050	12	0.5	26	75	12	6	★	1
D1200R100	12	1	26	75	12	6	★	1
D1600R100	16	1	32	90	16	6	★	1
D1600R200	16	2	32	90	16	6	★	1
D2000R100	20	1	38	100	20	6	★	1
D2000R200	20	2	38	100	20	6	★	1

● : Inventory maintained. ★ : Inventory maintained in Japan.

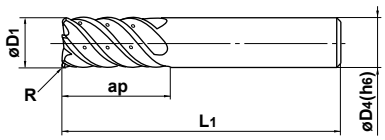
CUTTING CONDITIONS ➤ I278

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						
	±0.015					
D1≤12	D1>12					
h6	0 - 0.02	0 - 0.03				
	D4=10	D4=12	D4=16	D4=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

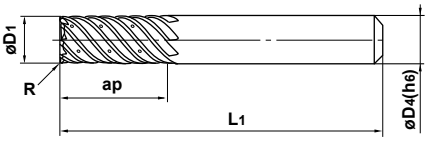
Order Number	Dia. D1	Corner Radius R	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
NEW **VF6MHVRBCHD1000R050**	10	0.5	22	70	10	6	●	1
NEW **D1000R100**	10	1	22	70	10	6	●	1
NEW **D1200R050**	12	0.5	26	75	12	6	●	1
NEW **D1200R100**	12	1	26	75	12	6	●	1
D1600R100	16	1	32	90	16	6	★	1
D1600R300	16	3	32	90	16	6	★	1
D2000R100	20	1	38	100	20	6	★	1
D2000R300	20	3	38	100	20	6	★	1

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						
	±0.015					
	0 - 0.03					
h6	D4=16	D4=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	Dia. **D1**	Corner Radius **R**	Length of Cut **ap**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
VF8MHVRBCHD1600R100	16	1	32	90	16	8	★	1
D1600R300	16	3	32	90	16	8	★	1
D2000R100	20	1	38	100	20	8	★	1
D2000R300	20	3	38	100	20	8	★	1

● : Inventory maintained. ★ : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ I302

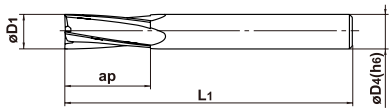
DFC4JC NEW

End mill, Semi long cutting length, 4 flute, For CFRP

CFRP

◎





Type1

h6	6≤D1≤12					
	0 - 0.03					
	D4=6	8≤D4≤10	D4=12			
	0 - 0.008	0 - 0.009	0 - 0.011			

● 4 flute end mill with original CVD diamond coating for CFRP machining.

Unit : mm

Order Number	Dia. **D1**	Length of Cut **ap**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
DFC4JCD0600	6	20	70	6	4	●	1
D0800	8	30	80	8	4	●	1
D1000	10	30	90	10	4	●	1
D1200	12	30	100	12	4	●	1

Note) Please contact Mitsubishi Materials for geometries and through coolant types that are non-standard.

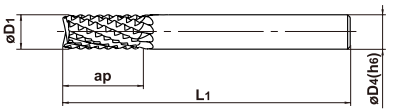
CUTTING CONDITIONS ➤ I304

DFCJRT NEW

Cross-nick type end mill , Semi long cutting length, For CFRP

CFRP
◎





Type1

h6

D4=6	8≤D4≤10	D4=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	Dia. **D1**	Length of Cut **ap**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
DFCJRTD0600	6	20	70	6	10	●	1
D0800	8	30	80	8	10	●	1
D1000	10	30	90	10	12	●	1
D1200	12	30	100	12	12	●	1

Note) Please contact Mitsubishi Materials for geometries and through coolant types that are non-standard.

● : Inventory maintained. ★ : Inventory maintained in Japan.

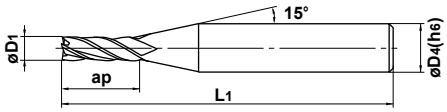
CUTTING CONDITIONS ➤ I304

DF4JC

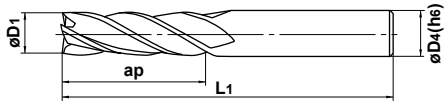
End mill, Semi long cut length, 4 flute, For graphite

Aluminum Alloy	Graphite	GFRP CFRP	Machineable Ceramics
○	◎	○	○





Type1



Type2

0 - 0.02					
D4=6	8≤D4≤10	D4=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	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
DF4JCD0300	3	12	60	6	4	★	1
D0400	4	16	60	6	4	★	1
D0600	6	24	60	6	4	★	2
D0800	8	28	70	8	4	★	2
D1000	10	35	90	10	4	★	2
D1200	12	36	110	12	4	★	2

CUTTING CONDITIONS ➤ I305

DIAMOND COATED END MILLS

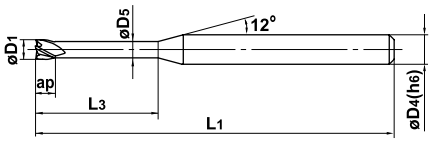
DF4XL

End mill, Long neck, 4 flute, For graphite

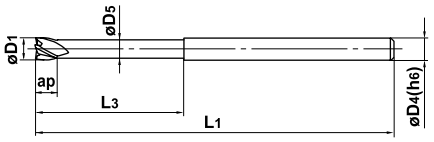
UWC DF 30° D1<3 D1≥3

Aluminum Alloy	Graphite	GFRP CFRP	Machineable Ceramics
○	◎	○	○





Type1



Type2

0 - 0.02					
4≤D4≤6	8≤D4≤10	D4=12			
0 - 0.008	0 - 0.009	0 - 0.011			

h6

● 4 flute long neck end mill with original diamond coating for graphite machining.

Unit : mm

Order Number	Dia. **D1**	Length of Cut **ap**	Neck Length **L3**	Neck Dia. **D5**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
DF4XLD0100N060	1	1.5	6	0.94	50	4	4	★	1
D0100N080	1	1.5	8	0.94	50	4	4	★	1
D0100N100	1	1.5	10	0.94	50	4	4	★	1
D0150N100	1.5	2.3	10	1.44	60	4	4	★	1
D0150N160	1.5	2.3	16	1.44	60	4	4	★	1
D0200N100	2	3	10	1.9	60	4	4	★	1
D0200N160	2	3	16	1.9	60	4	4	★	1
D0200N200	2	3	20	1.9	60	4	4	★	1
D0300N160	3	4.5	16	2.9	70	4	4	★	1
D0300N200	3	4.5	20	2.9	70	4	4	★	1
D0300N300	3	4.5	30	2.9	70	4	4	★	1
D0400N200	4	6	20	3.9	80	4	4	★	2
D0400N400	4	6	40	3.9	80	4	4	★	2
D0600N300	6	9	30	5.85	70	6	4	★	2
D0800N300	8	12	30	7.85	90	8	4	★	2
D1000N300	10	15	30	9.7	90	10	4	★	2
D1200N300	12	18	30	11.7	110	12	4	★	2

★ : Inventory maintained in Japan.

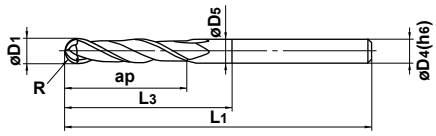
CUTTING CONDITIONS ➤ I306

DF2MB

Ball nose, Medium cut length, 2 flute, For graphite

Aluminum Alloy	Graphite	GFRP CFRP	Machineable Ceramics
○	◎	○	○





Type1

R						
	±0.01					
h6	D4=6	8≤D4≤10	D4=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	Radius of Ball Nose **R**	Dia. **D1**	Length of Cut **ap**	Neck Length **L3**	Neck Dia. **D5**	Overall Length **L1**	Shank Dia. **D4**	No. of Flutes	Stock	Type
DF2MBR0300A100	3	6	30	50	5.85	100	6	2	★	1
R0300A150	3	6	30	50	5.85	150	6	2	★	1
R0400A110	4	8	40	60	7.85	110	8	2	★	1
R0400A150	4	8	40	60	7.85	150	8	2	★	1
R0500A120	5	10	50	70	9.7	120	10	2	★	1
R0500A180	5	10	50	70	9.7	180	10	2	★	1
R0600A130	6	12	55	75	11.7	130	12	2	★	1
R0600A200	6	12	55	75	11.7	200	12	2	★	1

DIAMOND COATED END MILLS

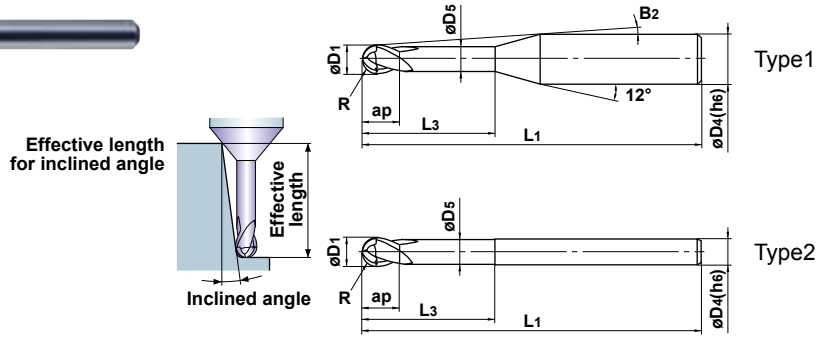
DF2XLB

Ball nose, 2 flute, Long neck, For graphite

UWC DF 30°

Aluminum Alloy	Graphite	GFRP CFRP	Machineable Ceramics
○	◎	○	○





R			
	±0.01		
h6	D4=4		
	0 - 0.008		

● 2 flute long neck ball nose end mill with original diamond coating for graphite machining.

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type	Effective length for inclined angle 30'	1°	2°	3°
DF2XLBR0020N010	0.2	0.4	0.6	1	0.36	11°	50	4	2	★	1	1	1	1.1	1.2
R0020N020	0.2	0.4	0.6	2	0.36	10°	50	4	2	★	1	2	2.1	2.3	2.6
R0020N030	0.2	0.4	0.6	3	0.36	9.1°	50	4	2	★	1	3.1	3.2	3.5	3.9
R0020N040	0.2	0.4	0.6	4	0.36	8.4°	60	4	2	★	1	4.1	4.3	4.7	5.2
R0020N080	0.2	0.4	0.6	8	0.36	6.4°	60	4	2	★	1	8.3	8.7	9.5	10.5
R0020N120	0.2	0.4	0.6	12	0.36	5.1°	60	4	2	★	1	12.5	13	14.3	15.8
R0025N040	0.25	0.5	0.6	4	0.46	8.3°	60	4	2	★	1	4.1	4.3	4.7	5.2
R0030N020	0.3	0.6	0.9	2	0.56	9.9°	60	4	2	★	1	2.1	2.2	2.4	2.6
R0030N040	0.3	0.6	0.9	4	0.56	8.3°	60	4	2	★	1	4.2	4.4	4.8	5.2
R0030N060	0.3	0.6	0.9	6	0.56	7.1°	60	4	2	★	1	6.3	6.5	7.1	7.9
R0030N100	0.3	0.6	0.9	10	0.56	5.5°	60	4	2	★	1	10.4	10.9	11.9	13.2
R0030N160	0.3	0.6	0.9	16	0.56	4.1°	60	4	2	★	1	16.7	17.4	19.1	21.2
R0040N060	0.4	0.8	1.2	6	0.76	7°	60	4	2	★	1	6.3	6.5	7.1	7.9
R0040N080	0.4	0.8	1.2	8	0.76	6.1°	60	4	2	★	1	8.3	8.7	9.5	10.5
R0050N040	0.5	1	1.5	4	0.94	8°	60	4	2	★	1	4.2	4.4	4.8	5.3
R0050N060	0.5	1	1.5	6	0.94	6.8°	60	4	2	★	1	6.3	6.6	7.2	8
R0050N080	0.5	1	1.5	8	0.94	5.9°	60	4	2	★	1	8.4	8.8	9.6	10.6
R0050N100	0.5	1	1.5	10	0.94	5.2°	60	4	2	★	1	10.5	11	12	13.3
R0050N120	0.5	1	1.5	12	0.94	4.6°	60	4	2	★	1	12.6	13.2	14.4	15.9
R0050N200	0.5	1	1.5	20	0.94	3.3°	80	4	2	★	1	21	21.9	24	26.6
R0050N300	0.5	1	1.5	30	0.94	2.4°	80	4	2	★	1	31.4	32.8	36	*
R0050N400	0.5	1	1.5	40	0.94	1.9°	80	4	2	★	1	41.8	43.7	*	*
R0075N080	0.75	1.5	2.3	8	1.44	5.4°	60	4	2	★	1	8.4	8.8	9.6	10.6
R0075N100	0.75	1.5	2.3	10	1.44	4.7°	60	4	2	★	1	10.5	11	12	13.2
R0075N160	0.75	1.5	2.3	16	1.44	3.4°	80	4	2	★	1	16.8	17.5	19.2	21.2
R0075N300	0.75	1.5	2.3	30	1.44	2.1°	80	4	2	★	1	31.4	32.8	35.9	*
R0100N080	1	2	3	8	1.9	4.9°	60	4	2	★	1	8.3	8.7	9.4	10.4
R0100N100	1	2	3	10	1.9	4.2°	60	4	2	★	1	10.4	10.9	11.8	13
R0100N120	1	2	3	12	1.9	3.7°	60	4	2	★	1	12.5	13	14.2	15.7
R0100N160	1	2	3	16	1.9	2.9°	80	4	2	★	1	16.7	17.4	19	*
R0100N200	1	2	3	20	1.9	2.5°	80	4	2	★	1	20.9	21.8	23.8	*

* No interference

★ : Inventory maintained in Japan.

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type	Effective length for inclined angle 30'	1°	2°	3°
DF2XLBR0100N250	1	2	3	25	1.9	2°	80	4	2	★	1	26	27.2	*	*
R0100N400	1	2	3	40	1.9	1.4°	100	4	2	★	1	41.5	43.5	*	*
R0100N600	1	2	3	60	1.9	0.9°	100	4	2	★	1	62.6	*	*	*
R0150N160	1.5	3	4.5	16	2.9	1.7°	80	4	2	★	1	16.7	17.3	*	*
R0150N250	1.5	3	4.5	25	2.9	1.2°	80	4	2	★	1	26.1	27.2	*	*
R0150N400	1.5	3	4.5	40	2.9	0.7°	100	4	2	★	1	41.7	*	*	*
R0150N600	1.5	3	4.5	60	2.9	0.5°	100	4	2	★	1	*	*	*	*
R0200N200	2	4	6	20	3.9	—	80	4	2	★	2	*	*	*	*
R0200N300	2	4	6	30	3.9	—	80	4	2	★	2	*	*	*	*
R0200N400	2	4	6	40	3.9	—	100	4	2	★	2	*	*	*	*
R0200N600	2	4	6	60	3.9	—	100	4	2	★	2	*	*	*	*

* No interference

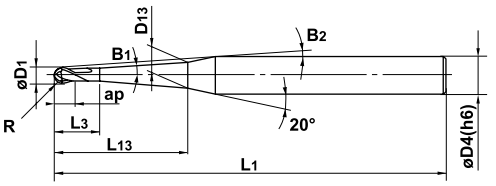
DIAMOND COATED END MILLS

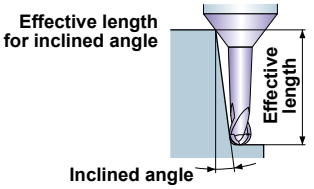
DF3XB

Ball nose, 3 flute, Taper neck, For graphite

Aluminum Alloy	Graphite	GFRP CFRP	Machineable Ceramics
○	◎	○	○







R						
	±0.01					
h6	D4=6					
	0 - 0.008					

● 3 flute taper neck ball nose end mill with original diamond coating for graphite machining.

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D1	Taper Angle One Side B1	Length of Cut ap	Neck Length L13	Length of Straight Neck L3	Cutting Edge to Shank Angle B2	Neck Dia. D13	Overall Length L1	Shank Dia. D4	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°	0.94	100	6	3	★	1	30.4	32.1	32.8	34.6
R0050L040	0.5	1	0.5°	1.5	40	3	3.2°	0.94	100	6	3	★	1	40.4	41.4	43.6	46
R0050L050	0.5	1	0.5°	1.5	50	3	2.6°	0.94	100	6	3	★	1	50.4	51.7	54.4	*
R0100L040	1	2	0.5°	3	40	5	2.6°	1.9	100	6	3	★	1	40.7	41.7	43.9	*
R0100L060	1	2	0.5°	3	60	5	1.8°	1.9	130	6	3	★	1	60.7	62.2	*	*
R0100L080	1	2	0.5°	3	80	5	1.4°	1.9	130	6	3	★	1	80.7	82.7	*	*
R0150L060	1.5	3	0.5°	4.5	60	7.5	1.4°	2.9	130	6	3	★	1	60.8	62.2	*	*
R0150L080	1.5	3	0.5°	4.5	80	7.5	1.1°	2.9	130	6	3	★	1	80.8	82.8	*	*
R0200L100	2	4	0.5°	6	100	9	0.6°	3.9	160	6	3	★	1	100.8	*	*	*

* No interference

★ : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ I309

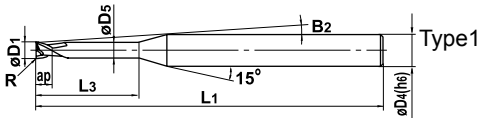
DFPSRB

Corner radius end mill, Short cut length, 2-4 flute, High precision, For graphite

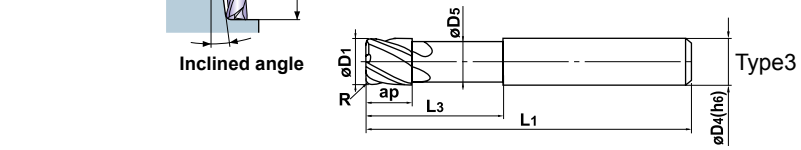
UWC DF 30° D1≤1.5 D1≥2

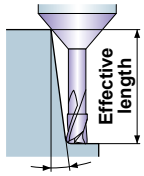
Aluminum Alloy	Graphite	GFRP CFRP	Machineable Ceramics
○	◎	○	○











R				
	±0.01			
	0 - 0.02			
h6	4≤D4≤6	8≤D4≤10	D4=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	Dia. D1	Corner R R	Length of Cut ap	Neck Length L3	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	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
D0050R010N05	0.5	0.1	0.75	5	0.46	8.7	60	4	2	★	1	5.2	5.4	5.7	6.2
D0050R010N06	0.5	0.1	0.75	6	0.46	8	60	4	2	★	1	6.2	6.4	6.9	7.5
D0050R010N10	0.5	0.1	0.75	10	0.46	6.1	60	4	2	★	1	10.3	10.7	11.5	12.4
D0050R010N15	0.5	0.1	0.75	15	0.46	4.7	60	4	2	★	1	15.5	16	17.2	18.6
D0080R010N06	0.8	0.1	1	6	0.76	7.7	60	4	2	★	1	6.2	6.4	6.9	7.5
D0080R010N08	0.8	0.1	1	8	0.76	6.6	60	4	2	★	1	8.3	8.6	9.2	9.9
D0100R010N08	1	0.1	1.5	8	0.94	6.3	60	4	2	★	1	8.5	8.8	9.5	10.2
D0100R010N12	1	0.1	1.5	12	0.94	4.9	60	4	2	★	1	12.6	13.1	14.1	15.2
D0100R020N08	1	0.2	1.5	8	0.94	6.3	60	4	2	★	1	8.5	8.8	9.5	10.2
D0100R020N12	1	0.2	1.5	12	0.94	4.9	60	4	2	★	1	12.6	13.1	14.1	15.2
D0100R020N16	1	0.2	1.5	16	0.94	4	70	4	2	★	1	16.8	17.4	18.7	20.2
D0100R020N20	1	0.2	1.5	20	0.94	3.4	70	4	2	★	1	20.9	21.7	23.3	25.1
D0100R020N30	1	0.2	1.5	30	0.94	2.5	70	4	2	★	1	31.3	32.4	34.8	*
D0150R020N10	1.5	0.2	2.3	10	1.44	4.9	70	4	2	★	1	10.5	11	11.8	12.7
D0150R020N20	1.5	0.2	2.3	20	1.44	2.9	70	4	2	★	1	20.9	21.7	23.3	*
D0200R020N12	2	0.2	3	12	1.9	3.7	70	4	4	★	2	12.5	13	14	15.1
D0200R020N16	2	0.2	3	16	1.9	2.9	70	4	4	★	2	16.7	17.3	18.6	*
D0200R020N20	2	0.2	3	20	1.9	2.5	80	4	4	★	2	20.8	21.5	23.2	*
D0200R020N30	2	0.2	3	30	1.9	1.7	80	4	4	★	2	31.2	32.2	*	*
D0200R020N40	2	0.2	3	40	1.9	1.4	80	4	4	★	2	41.5	42.9	*	*
D0300R020N20	3	0.2	4.5	20	2.9	1.4	80	4	4	★	2	20.8	21.5	*	*
D0300R020N40	3	0.2	4.5	40	2.9	0.7	80	4	4	★	2	41.5	*	*	*
D0300R050N20	3	0.5	4.5	20	2.9	1.4	80	4	4	★	2	20.8	21.5	*	*
D0400R020N20	4	0.2	6	20	3.9	—	80	4	4	★	3	*	*	*	*
D0400R020N40	4	0.2	6	40	3.9	—	80	4	4	★	3	*	*	*	*
D0400R050N20	4	0.5	6	20	3.9	—	80	4	4	★	3	*	*	*	*
D0400R050N40	4	0.5	6	40	3.9	—	80	4	4	★	3	*	*	*	*
D0600R050N30	6	0.5	9	30	5.85	—	90	6	4	★	3	*	*	*	*

* No interference

DFPSRB

Corner radius end mill, Short cut length, 2-4 flute, High precision, For graphite

Unit : mm

Order Number	Dia. D_1	Corner R R	Length of Cut ap	Neck Length L_3	Neck Dia. D_5	Cutting Edge to Shank Angle B_2	Overall Length L_1	Shank Dia. D_4	No. of Flutes	Stock	Type	Effective length for inclined angle 30'	1°	2°	3°
DFPSRBD0600R100N30	6	1	9	30	5.85	—	90	6	4	★	3	*	*	*	*
D0800R050N30	8	0.5	12	30	7.85	—	90	8	4	★	3	*	*	*	*
D0800R100N30	8	1	12	30	7.85	—	90	8	4	★	3	*	*	*	*
D1000R050N40	10	0.5	15	40	9.7	—	130	10	4	★	3	*	*	*	*
D1000R100N40	10	1	15	40	9.7	—	130	10	4	★	3	*	*	*	*
D1200R050N40	12	0.5	18	40	11.7	—	130	12	4	★	3	*	*	*	*

* No interference

★ : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ I310

Memo

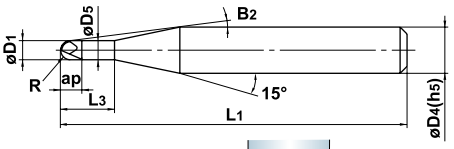
CBN END MILLS

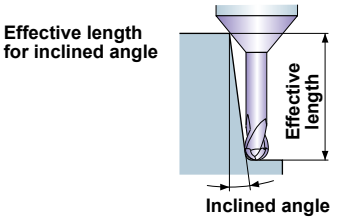
CBN2XLB

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					
±0.005					
0 - 0.010					
4≤D4≤6					
h5 0 - 0.005					

● Solid CBN ball nose. A wide variation of neck lengths available.

Unit : mm

Order Number	Radius of Ball Nose R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	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
R0020N010S06	0.2	0.4	0.3	1	0.36	13.9°	51	6	2	★	1	1	1	1.1	1.2
R0020N016S04	0.2	0.4	0.3	1.6	0.36	12.4°	51	4	2	★	1	1.6	1.7	1.8	2
R0020N016S06	0.2	0.4	0.3	1.6	0.36	13.3°	51	6	2	★	1	1.6	1.7	1.8	2
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
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
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
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
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
* R0040N010S06	0.4	0.8	0.5	1	0.76	14.1°	62	6	2	★	1	1	1	1.1	1.2
R0040N020S04	0.4	0.8	0.6	2	0.76	11.8°	51	4	2	★	1	2	2.1	2.3	2.4
R0040N020S06	0.4	0.8	0.6	2	0.76	12.9°	51	6	2	★	1	2	2.1	2.3	2.4
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
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
* R0050N011S06	0.5	1	0.6	1.1	0.94	14.1°	62	6	2	★	1	1.1	1.1	1.2	1.2
R0050N025S04	0.5	1	0.8	2.5	0.94	11°	51	4	2	★	1	2.6	2.7	2.8	3
R0050N025S06	0.5	1	0.8	2.5	0.94	12.3°	51	6	2	●	1	2.6	2.7	2.8	3
R0050N040S04	0.5	1	0.8	4	0.94	9.3°	51	4	2	★	1	4.1	4.3	4.6	4.9
R0050N040S06	0.5	1	0.8	4	0.94	11°	51	6	2	●	1	4.1	4.3	4.6	4.9
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
R0075N038S06	0.75	1.5	1.1	3.8	1.44	11°	52	6	2	★	1	3.9	4.1	4.3	4.6
R0075N060S04	0.75	1.5	1.1	6	1.44	7.1°	52	4	2	★	1	6.2	6.4	6.8	7.3
R0075N060S06	0.75	1.5	1.1	6	1.44	9.3°	52	6	2	★	1	6.2	6.4	6.8	7.3
R0100N017S06	1	2	1.2	1.7	1.9	13.6°	62	6	2	★	1	1.7	1.7	1.8	1.9
R0100N050S04	1	2	1.5	5	1.9	7.3°	52	4	2	★	1	5.1	5.3	5.6	6
R0100N050S06	1	2	1.5	5	1.9	9.8°	52	6	2	★	1	5.1	5.3	5.6	6
R0100N080S04	1	2	1.5	8	1.9	5.3°	52	4	2	★	1	8.2	8.5	9	9.7
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.

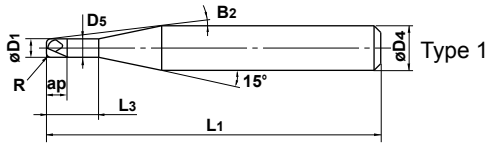
CUTTING CONDITIONS ➤ I311

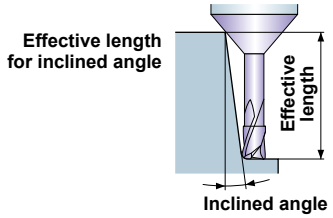
CBN2XLRB

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
○	◎	◎	◎				







R						
	±0.005					
	0 - 0.010					

● CBN long neck radius end mill. A wide variation of neck lengths available.

Unit : mm

Order Number	Corner R R	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Cutting Edge to Shank Angle B2	Overall Length L1	Shank Dia. D4	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
D0050R005N03	0.05	0.5	0.3	3	0.46	10.4°	51	4	2	★	1	3.1	3.2	3.5	3.7
D0050R010N02	0.1	0.5	0.3	2	0.46	11.7°	51	4	2	★	1	2.1	2.1	2.3	2.5
D0050R010N03	0.1	0.5	0.3	3	0.46	10.5°	51	4	2	★	1	3.1	3.2	3.4	3.7
D0100R005N03	0.05	1	0.6	3	0.94	9.7°	51	4	2	★	1	3.2	3.4	3.7	4
D0100R005N05	0.05	1	0.6	5	0.94	7.9°	51	4	2	★	1	5.3	5.6	6	6.5
D0100R010N03	0.1	1	0.6	3	0.94	9.7°	51	4	2	★	1	3.2	3.4	3.6	4
D0100R010N05	0.1	1	0.6	5	0.94	8°	51	4	2	★	1	5.3	5.6	6	6.5
D0100R020N03	0.2	1	0.6	3	0.94	9.8°	51	4	2	★	1	3.2	3.4	3.5	4
D0100R020N05	0.2	1	0.6	5	0.94	8°	51	4	2	★	1	5.3	5.6	6	6.5
D0100R030N03	0.3	1	0.6	3	0.94	9.9°	51	4	2	★	1	3.2	3.4	3.4	4
D0100R030N05	0.3	1	0.6	5	0.94	8.1°	51	4	2	★	1	5.3	5.6	6	6.5
D0150R010N05	0.1	1.5	0.9	5	1.44	7.3°	52	4	2	★	1	5.3	5.6	6	6.5
D0150R010N08	0.1	1.5	0.9	8	1.44	5.6°	52	4	2	★	1	8.5	8.8	9.5	10.2
D0150R020N05	0.2	1.5	0.9	5	1.44	7.3°	52	4	2	★	1	5.3	5.6	6	6.5
D0150R020N08	0.2	1.5	0.9	8	1.44	5.6°	52	4	2	★	1	8.5	8.8	9.5	10.2
D0150R030N05	0.3	1.5	0.9	5	1.44	7.4°	52	4	2	★	1	5.3	5.6	6	6.5
D0150R030N08	0.3	1.5	0.9	8	1.44	5.7°	52	4	2	★	1	8.5	8.8	9.5	10.2
D0200R010N06	0.1	2	1.2	6	1.9	5.9°	52	4	2	★	1	6.3	6.6	7.1	7.6
D0200R010N10	0.1	2	1.2	10	1.9	4.2°	52	4	2	★	1	10.5	10.9	11.7	12.6
D0200R020N06	0.2	2	1.2	6	1.9	5.9°	52	4	2	★	1	6.3	6.6	7.1	7.6
D0200R020N10	0.2	2	1.2	10	1.9	4.2°	52	4	2	★	1	10.5	10.9	11.7	12.6
D0200R030N06	0.3	2	1.2	6	1.9	6°	52	4	2	★	1	6.3	6.6	7	7.6
D0200R030N10	0.3	2	1.2	10	1.9	4.2°	52	4	2	★	1	10.5	10.8	11.6	12.6
D0200R050N06	0.5	2	1.2	6	1.9	6.1°	52	4	2	★	1	6.3	6.5	7	7.5
D0200R050N10	0.5	2	1.2	10	1.9	4.3°	52	4	2	★	1	10.5	10.8	11.6	12.5

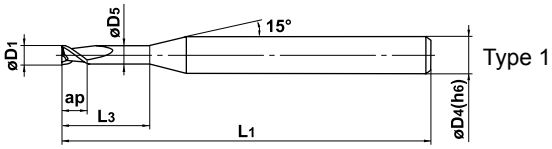
UNCOATED CARBIDE END MILLS

C2SA

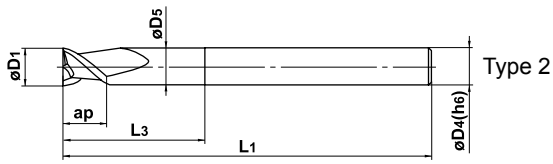
2 flute, Short cut length, Relieved neck

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

D1≤12	D1>12				
0 - 0.020	0 - 0.030				
D4=6	8≤D4≤10	12≤D4≤16	D4=20		
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013		

h6

● High efficiency machining for aluminum alloys.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
C2SAD0300N120	3	6	12	2.7	60	6	2	★	1
D0400N120	4	6	12	3.7	60	6	2	★	1
D0500N150	5	8	15	4.7	60	6	2	★	1
D0600N160	6	8	16	5.7	75	6	2	★	2
D0800N200	8	10	20	7.4	75	8	2	★	2
D1000N300	10	12	30	9.4	75	10	2	★	2
D1000N350	10	12	35	9.4	100	10	2	★	2
D1200N300	12	15	30	11.4	75	12	2	★	2
D1200N350	12	15	35	11.4	100	12	2	★	2
D1200N400	12	15	40	11.4	125	12	2	★	2
D1600N300	16	15	30	15.4	75	16	2	★	2
D1600N400	16	15	40	15.4	100	16	2	★	2
D1600N450	16	15	45	15.4	125	16	2	★	2
D2000N400	20	20	40	19	100	20	2	★	2
D2000N500	20	20	50	19	125	20	2	★	2

★ : Inventory maintained in Japan.

CUTTING CONDITIONS ➤ I313

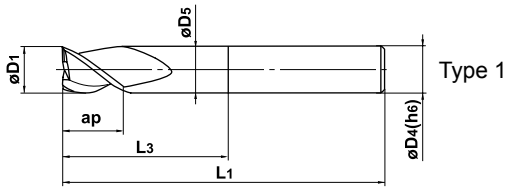
C3SA

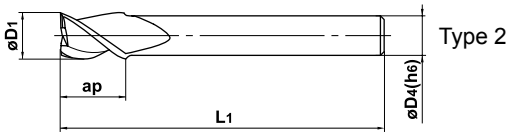
3 flute, Short cut length, Relieved neck

UWC 37.5° Type 1 Type 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
						○	◎







D1≤12	D1>12				
0 - 0.020	0 - 0.030				
8≤D4≤10	12≤D4≤16	20≤D4≤25			
0 - 0.009	0 - 0.011	0 - 0.013			

h6

● High efficiency machining for aluminum alloys.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
C3SAD1000A100S08	10	12	—	—	100	8	3	★	2
D1000N300	10	12	30	9.4	75	10	3	★	1
D1000N350	10	12	35	9.4	100	10	3	★	1
D1200A150S10	12	15	—	—	150	10	3	★	2
D1200N300	12	15	30	11.4	75	12	3	★	1
D1200N350	12	15	35	11.4	100	12	3	★	1
D1200N400	12	15	40	11.4	125	12	3	★	1
D1600A200S14	16	15	—	—	200	14	3	★	2
D1600N300	16	15	30	15.4	75	16	3	★	1
D1600N400	16	15	40	15.4	100	16	3	★	1
D1600N450	16	15	45	15.4	125	16	3	★	1
D1700A150S16	17	18	—	—	150	16	3	★	2
D1800A200S16	18	18	—	—	200	16	3	★	2
D2000A200S18	20	20	—	—	200	18	3	★	2
D2000N400	20	20	40	19	100	20	3	★	1
D2000N600	20	20	60	19	125	20	3	★	1
D2000N850	20	20	85	19	150	20	3	★	1
D2500N500	25	20	50	24	100	25	3	★	1
D2500N650	25	20	65	24	125	25	3	★	1
D2500N900	25	20	90	24	150	25	3	★	1
D2600A200S25	26	20	—	—	200	25	3	★	2

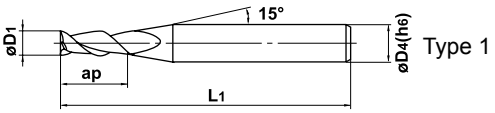
UNCOATED CARBIDE END MILLS

C2MHA

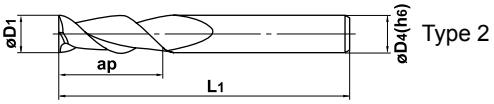
2 flute, Medium cut length, Relieved neck

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
							◎

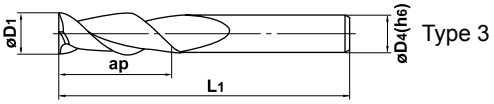




Type 1



Type 2



Type 3

D1≤12	D1>12				
0 - 0.020	0 - 0.030				
D4=6	8≤D4≤10	12≤D4≤16	20≤D4≤25		
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013		

h6

● High efficiency machining for aluminum alloys.

Unit : mm

Order Number	Dia. D1	Length of Cut ap	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
C2MHAD0300	3	9	60	6	2	★	1
D0400	4	12	60	6	2	★	1
D0500	5	15	60	6	2	★	1
D0600	6	18	60	6	2	★	2
D0800	8	20	75	8	2	★	2
D1000	10	25	75	10	2	★	2
D1200	12	25	75	12	2	★	2
D1400	14	32	75	12	2	★	3
D1600	16	32	100	16	2	★	2
D2000	20	38	125	20	2	★	2
D2500	25	38	125	25	2	★	2

★ : Inventory maintained in Japan.

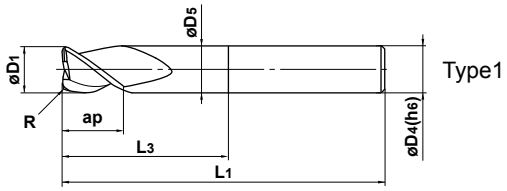
CUTTING CONDITIONS ➤ I314

C3SARB

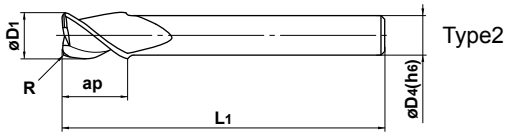
Corner radius, Short cut length, 3 flute, For aluminum alloy

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
						○	◎





Type1



Type2

h6						
D1≤12	D1>12					
0 - 0.020	0 - 0.030					
12≤D4≤16	20≤D4≤25					
0 - 0.011	0 - 0.013					

● High efficiency machining for aluminium alloys.

Unit : mm

Order Number	Dia. D1	Corner R R	Length of Cut ap	Neck Length L3	Neck Dia. D5	Overall Length L1	Shank Dia. D4	No. of Flutes	Stock	Type
C3SARBD1200N0300R100	12	1	15	30	11.4	75	12	3	★	1
D1200N0300R320	12	3.2	15	30	11.4	75	12	3	★	1
D1200N0400R100	12	1	15	40	11.4	125	12	3	★	1
D1200N0400R320	12	3.2	15	40	11.4	125	12	3	★	1
D1600N0450R100	16	1	15	45	15.4	125	16	3	★	1
D1600N0450R320	16	3.2	15	45	15.4	125	16	3	★	1
D1600N0700R100	16	1	15	70	15.4	150	16	3	★	1
D1600N0700R320	16	3.2	15	70	15.4	150	16	3	★	1
D1800R100	18	1	18	—	—	150	16	3	★	2
D1800R320	18	3.2	18	—	—	150	16	3	★	2
D2000N0600R100	20	1	20	60	18.0	125	20	3	★	1
D2000N0600R320	20	3.2	20	60	18.0	125	20	3	★	1
D2000N0600R400	20	4	20	60	18.0	125	20	3	★	1
D2000N0850R100	20	1	20	85	18.0	150	20	3	★	1
D2000N0850R320	20	3.2	20	85	18.0	150	20	3	★	1
D2000N0850R400	20	4	20	85	18.0	150	20	3	★	1
D2500N0650R320	25	3.2	20	65	23.0	125	25	3	★	1
D2500N0650R400	25	4	20	65	23.0	125	25	3	★	1
D2500N0650R500	25	5	20	65	23.0	125	25	3	★	1
D2500N0900R320	25	3.2	20	90	23.0	150	25	3	★	1
D2500N0900R400	25	4	20	90	23.0	150	25	3	★	1
D2500N0900R500	25	5	20	90	23.0	150	25	3	★	1

APPLICATION CHART

Square End Mill, Corner Radius End Mill

DS2SS (➔I014), DS2MS (➔I015), DS2LS (➔I016), DS3SC (➔I017), DS3MC (➔I018), DS4SC (➔I019), DS4MC (➔I020), DS4LC (➔I021), DS4MC...CB (➔I029), DS4LC...CB (➔I030), DS2SRB (➔I031), DS2MRB (➔I032), DS4SRB (➔I033), DS4MRB (➔I034)

				.016"—.125"	.141"—.250"	.281"—.500"	.563"—.750"	.750"—1.250"	Slotting-max D.O.C.
	MATERIAL	HRC / BHN	SFM *	IPT	IPT	IPT	IPT	IPT	
STEELS	Carbon Steel	150—250 BHN	160—500	.0002—.0005	.0008—.0015	.0015—.003	.002—.003	.003—.005	.3—.5D
	Steel Alloys	—45 HRC	130—350	.0002—.0005	.0008—.0015	.0015—.003	.002—.003	.003	.3—.5D
	Steel Alloys	45—55 HRC	100—160	.0001—.0004	.0005—.001	.001—.002	.002	.003	.05—.2D
STAINLESS STEELS	300	140—185 BHN	100—300	.0001—.0005	.0008—.0015	.0015—.003	.002—.003	.003—.004	.3—.5D
	400	180—200 BHN	125—350	.0001—.0005	.0008—.0015	.0015—.003	.002—.003	.003—.004	.3—.5D
	Heat Resistant	32—43 HRC	100—300	.0001—.0004	.0005—.001	.001—.002	.002	.002	.05—.2D
CAST IRON	Gray Cast Iron	180—260 BHN	150—550	.0002—.0005	.0008—.0015	.0015—.003	.002—.003	.003—.005	.3—.5D
	Ductile Cast Iron	220—260 BHN	150—550	.0002—.0005	.0008—.0015	.0015—.003	.002—.003	.003—.005	.3—.5D
NON-FERROUS	Aluminum Alloys	180—220 BHN	300—1000	.0002—.0005	.001—.002	.002—.003	.003—.004	.004—.005	.5—1D
	Copper Alloys	60—120 BHN	200—500	.0002—.0005	.0008—.0015	.0015—.003	.002—.003	.003—.005	.3—.5D
	Plastics	—	300—1500	.0002—.0005	.001—.002	.002—.003	.003—.004	.004—.005	.5—1D
Ti	Titanium	300—350 BHN	70—300	.0003—.0006	.0006—.001	.001—.003	.003—.004	.004—.007	.3—.5D

STAINLESS STEEL Square End Mill, Corner Radius End Mill

DS3MHH60 (➔I027), DS6MHH60 (➔I028), DS3SH...SS (➔I038), DS3MH...SS (➔I039), DS5MH...SS (➔I040), DS5LH...SS (➔I041), DS3SHRB...SS (➔I044), DS3MHRB...SS (➔I045), DS5SHRB...SS (➔I046), DS5MHRB...SS (➔I047), DS3MHHRB (➔I048), DS6MHHRB (➔I049)

				.125"	.141"—.250"	.281"—.500"	.563"—.750"	.750"	Slotting-max D.O.C.
	MATERIAL	HRC / BHN	SFM *	IPT	IPT	IPT	IPT	IPT	
STAINLESS STEELS	304 316	130—190 BHN	150—300	.0005	.0008—.0015	.0015—.003	.002—.003	.003	.3—.5D
	405 410 430	180—200 BHN	200—500	.0005	.0008—.0015	.0015—.003	.002—.003	.003	.3—.5D
	405 410 430	30—37 HRC	130—500	.0005	.0008—.0015	.0015—.003	.002—.003	.003	.3—.5D
	PH	35—42 HRC	150—200	.0004	.0005—.001	.001—.002	.002	.002	.05—.2D

ALUMINUM Square End Mill, Corner Radius End Mill

DS2SRB...A (➔I035), DS2SRB...NA (➔I036), DS3MHR...A (➔I037)

				.141"—.250"	.281"—.500"	.563"—.750"	.750"—1"	Slotting-max D.O.C.
	MATERIAL	HRC / BHN	SFM *	IPT	IPT	IPT	IPT	
ALUMINUM	Aluminum Cast	40—100 BHN	700—1500	.001—.002	.002—.003	.003—.004	.004—.006	.5—1D
	Aluminum Alloys <5% silicon	40—100 BHN	700—1500	.001—.002	.002—.003	.003—.004	.004—.006	.5—1D
	Aluminum Alloys >5% silicon	60—120 BHN	450—1000	.001—.002	.002—.003	.003—.004	.004—.006	.5—1D

* 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 (➔I022), DS2LB (➔I023), DS3SB (➔I024), DS4SB (➔I025), DS4LB (➔I026)

	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—.25D
	Steel Alloys	—45 HRC	160—750	.0001—.0004	.001—.0012	.0012—.003	.003—.005	.005—.006	.1—.25D
	Steel Alloys	45—55 HRC	160—600	.0001—.0004	.0008—.0012	.0012—.003	.003—.004	.004—.005	.1—.25D
STAINLESS STEELS	400	180—200 BHN	160—750	.0001—.0004	.001—.0012	.0012—.003	.003—.005	.005—.006	.1—.25D
	Heat Resistant	32—43 HRC	150—400	.0001—.0004	.0008—.0012	.0012—.003	.003—.004	.004—.005	.1—.25D
CAST IRON	Gray Cast Iron	180—260 BHN	160—900	.0001—.0005	.001—.0015	.0015—.003	.003—.005	.005—.006	.1—.25D
	Ductile Cast Iron	220—260 BHN	160—900	.0001—.0005	.001—.0015	.0015—.003	.003—.005	.005—.006	.1—.25D
NON-FERROUS	Aluminum Alloys	180—220 BHN	300—1500	.0001—.0008	.001—.002	.0015—.004	.004—.006	.006—.008	.2—.5D
	Copper Alloys	60—120 BHN	160—900	.0001—.0005	.001—.0015	.0015—.003	.003—.005	.005—.006	.1—.25D
	Plastics	—	300—1500	.0001—.0008	.001—.002	.0015—.004	.004—.006	.006—.008	.2—.5D
Ti	Titanium	300—350 BHN	100—300	.0001—.0004	.0008—.0012	.0012—.003	.003—.004	.004—.005	.1—.25D

STAINLESS STEEL Ball Nose End Mill

DS3SHB...SS (➔I042), DS3MHB...SS (➔I043)

	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—.25D
	405 410 430	180—200 BHN	200—600	.0003—.0004	.001—.0012	.0012—.003	.003—.005	.005—.006	.1—.25D
	405 410 430	30—37 HRC	130—500	.0003—.0004	.001—.0012	.0012—.003	.003—.005	.005—.006	.1—.25D
	PH	35—42 HRC	150—350	.0003—.0004	.0008—.0012	.0012—.003	.003—.004	.004—.005	.1—.25D

* 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%.

CUTTING CONDITIONS

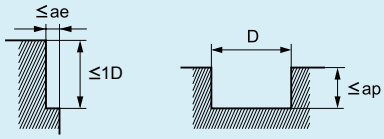
End mill, Short cut length, 2 flute **MS2SS**

End mill, Medium cut length, 2 flute **MS2MS**

Corner radius end mill, Medium cut length, 2 flute **MS2MRB**

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.			
Dia. (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



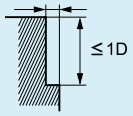
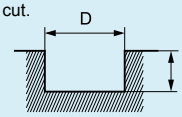
D:Dia.

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.

MS2SS ➤ I050
MS2MS ➤ I051
MS2MRB ➤ I091

MS2MD

Medium cut length, 2 flute, Strong geometry type

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.			
Dia. (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. D:Dia.							

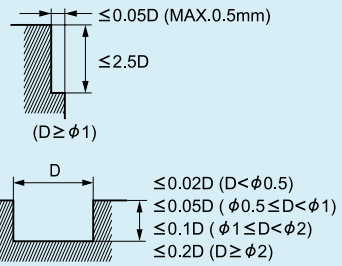
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) When drilling, please set the feed rate at 1/3 or below of the above value.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

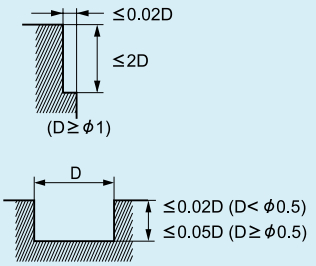
MS2JS

End mill, Semi long cut length, 2 flute

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.		
Dia. (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.

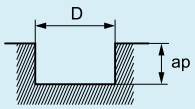
D:Dia.

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.

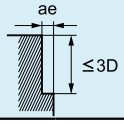
MS2JS ➤ I054

MS2LS
End mill, Long cut length, 2 flute

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.			
Dia. (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)
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	 D:Dia.							

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.			
Dia. (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)
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	 D:Dia.							

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

Work material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.			
Dia. (mm)	Neck length (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
	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.			
Dia. (mm)	Neck length (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
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.

MS2XL ➤ I056

MS2XL6

End mill, Short cut length, 2 flute, 6mm shank

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.			
Dia. (mm)	Neck length (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.

MS4XL

End mill, Short cut length, 4 flute, Long neck

Work material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.			
Dia. (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

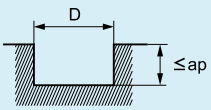
Work material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.			
Dia. (mm)	Neck length (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
3.5	**15**	20000	3000	118.1	0.6
	25	11000	1600	63.0	0.15
	35	5500	800	31.5	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

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 ➤ I071

MS2XL – Inch sizes

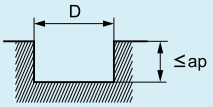
Square, 2 flute, Long neck

Work material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.		
Dia (inch)	Neck length (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		 D:Dia.		

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

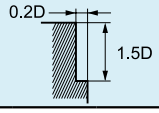
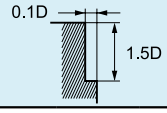
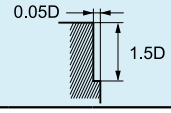
Work material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.		
Dia (inch)	Neck length (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)
.0156	**.3750**	40000	121.0	.0028
	.5000	30000	68.0	.0016
	.7500	10000	14.2	.0008
.0313	**.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		 D:Dia.		

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

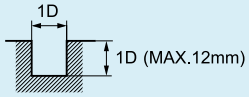
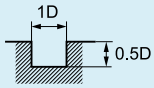
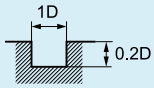
MSMHD
High power, Medium cut length, 4 flute

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.		
Dia. (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															

D:Dia.

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.		
Dia. (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															

D:Dia.

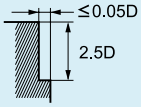
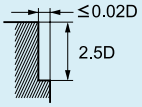
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

MSSHD ➤ I062
MSMHD ➤ I063

MSJHD

High power, Semi long cut length, 4 flute

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.		
Dia. (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															

D:Dia.

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.

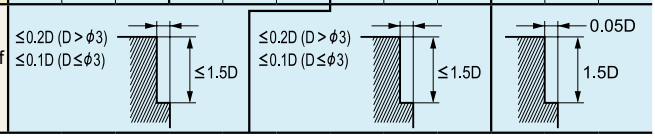
MSMHZD

End mill, Medium cut length, 3 flute for drilling and slotting

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.		
Dia. (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

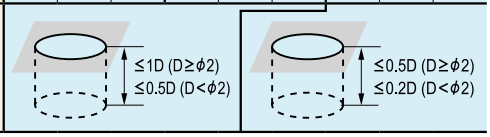


D:Dia.

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.		
Dia. (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

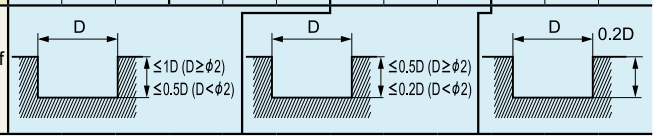


D:Dia.

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.		
Dia. (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



D:Dia.

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.

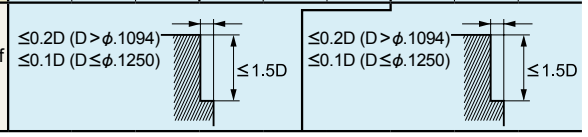
MSMHZD – Inch sizes

End mill, Medium cut length, 3 flute for drilling and slotting

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.		
Dia. (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

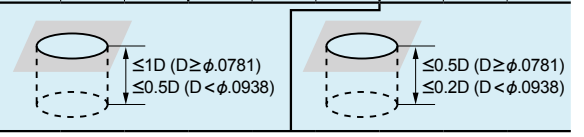


D:Dia.

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.		
Dia. (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

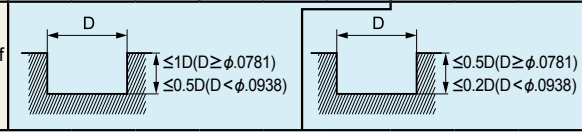


D:Dia.

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.		
Dia. (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



D:Dia.

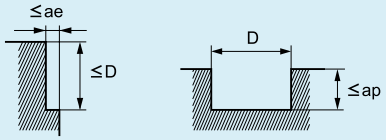
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

MS4SC
End mill, Short cut length, 4 flute

MS4MC
End mill, Medium cut length, 4 flute

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.			
Dia. (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



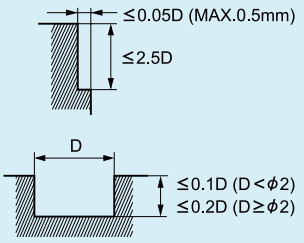
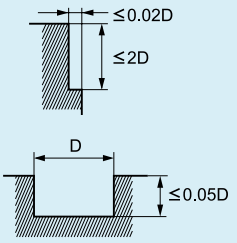
D:Dia.

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.

MS4SC ➤ I068
MS4MC ➤ I069

MS4JC

End mill, Semi long cut length, 4 flute

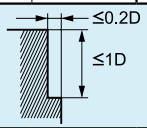
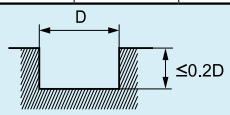
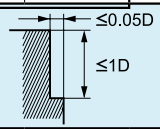
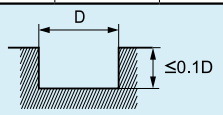
Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.		
Dia. (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												

D:Dia.

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.

MS2ES
End mill, 2 flute, For Swiss type lathes

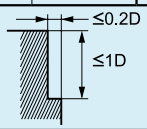
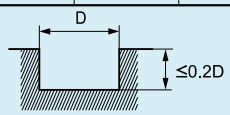
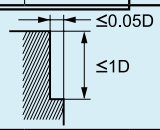
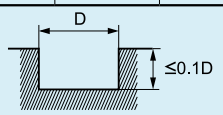
MS3ES
End mill, 3 flute, For Swiss type lathes

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.		
Dia. (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	 						 					

D:Dia.

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

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.		
Dia. (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	 						 					

D:Dia.

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.

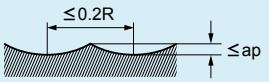
MS2ES ➤ I075
MS3ES ➤ I076
MS4EC ➤ I077

CUTTING CONDITIONS

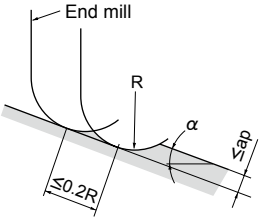
Ball nose end mill, Short cut length, 2 flute **MS2SB**

Ball nose end mill, Medium cut length, 2 flute **MS2MB**

Ball nose taper end mill, Medium cut length, 2 flute **MS2MTB**

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.						
R (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	 R:Radius													

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.



SOLID END MILLS

MS2SB ➤ I078
MS2MB ➤ I080
MS2MTB ➤ I108

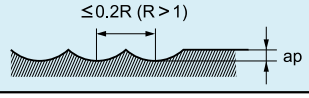
MS2XLB

Ball nose end mill, Short cut length, 2 flute, Long neck

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.			
R (mm)	Neck length (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.			
R (mm)	Neck length (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



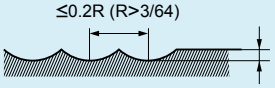
R:Radius

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.

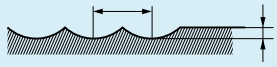
MS2XLB - Inch sizes
Ball nose, 2 flute, Long neck

MS4XLB - Inch sizes
Ball nose, 4 flute, Long neck

MS2XLB

Work material		Hardened steel (45—55HRC) AISI H13 etc.		
R (inch)	Neck length (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		≤0.1R (R≤3/64) ≤0.2R (R>3/64)  ≤ap R:Radius		

MS4XLB

Work material		Hardened steel (45—55HRC) AISI H13 etc.		
R (inch)	Neck length (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)
.0313	.3750	40000	151.2	.0028
	.5000	30000	113.4	.0016
	.7500	10000	37.8	.0008
.0156	.5625	40000	189.0	.003
	.7500	20000	94.4	.002
	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		≤0.1R (R≤3/64) ≤0.2R (R>3/64)  ≤ap R:Radius		

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 ➤ I086
MS4XLB ➤ I087

MS2XB

Ball nose end mill, 2 flute, Taper neck

Work material				Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.		
R (mm)	Taper angle one side	Neck length (mm)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
R0.1	30'	1.5	0.005	30000	300	11.8
	30'	2	0.005			
	1°	1.5	0.005			
	1°	2	0.005			
	2°	1.5	0.01			
	2°	2	0.01			
	3°	1.5	0.01			
	3°	2	0.01			
	5°	2	0.01			
R0.15	30'	3	0.005	30000	300	11.8
	1°	3	0.005			
	2°	3	0.01			
	3°	3	0.01			
	5°	3	0.01			
R0.2	30'	2	0.02	30000	300	11.8
	30'	5	0.01			
	1°	2	0.02			
	1°	5	0.01			
	1°	2	0.02			
	2°	5	0.01			
R0.25	30'	3	0.03	30000	300	11.8
	30'	5	0.02			
	1°	3	0.03			
	1°	5	0.02			
	2°	3	0.03			
	2°	5	0.02			
R0.3	30'	5	0.03	30000	400	15.7
	30'	8	0.02			
	1°	5	0.03			
	1°	10	0.02			
	1°	15	0.01			
	2°	6	0.03			
	2°	8	0.02			
R0.4	30'	8	0.05	30000	500	19.7
	30'	12	0.04			
	1°	8	0.05			
	1°	12	0.04			
	2°	8	0.08			
	3°	12	0.06			

Work material				Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.		
R (mm)	Taper angle one side	Neck length (mm)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
R0.5	30'	10	0.05	22000	530	20.9
	30'	20	0.02			
	30'	30	0.005			
	1°	10	0.05			
	1°	20	0.02			
	1°	35	0.005			
	2°	20	0.03			
	3°	40	0.05			
	5°	20	0.05			
R0.6	30'	12	0.05	22000	600	23.6
	30'	24	0.02			
	1°	12	0.05			
	1°	24	0.02			
	2°	12	0.06			
	2°	24	0.03			
R0.75	30'	10	0.1	20000	700	27.6
	30'	30	0.02			
	1°	10	0.1			
	1°	30	0.05			
	2°	30	0.1			
R1	30'	20	0.05	18000	1000	39.4
	30'	30	0.03			
	30'	40	0.02			
	1°	20	0.05			
	1°	40	0.03			
	1°	50	0.02			
	2°	40	0.1			
	3°	40	0.1			
	5°	38.2	0.1			
R1.5	30'	30	0.1	16000	1300	51.2
	30'	50	0.03			
	1°	30	0.1			
	1°	50	0.03			
	2°	48.9	0.1			
	3°	50	0.1			
R2	30'	60	0.1	14000	1100	43.3
	1°	60	0.1			

Depth of cut	
	≤0.1R(R<0.5) ≤0.2R(R≥0.5) ap R:Radius

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.

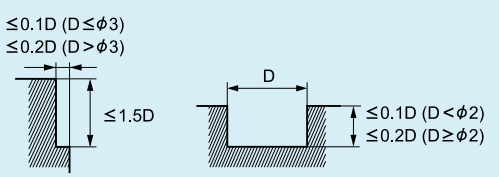
MS2XLRB

Corner radius end mill, Short cut length, 2 flute, Long neck

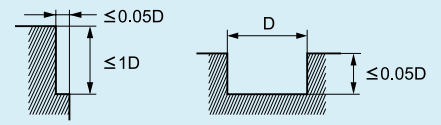
Work material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.		
Dia. (mm)	Neck length (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		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	(2D)	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		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	(5D)	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

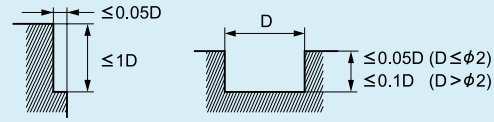
(Neck length=2D)



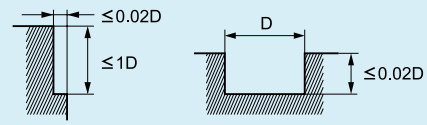
(Neck length=5D)



(Neck length=2D)



(Neck length=5D)



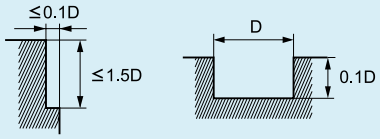
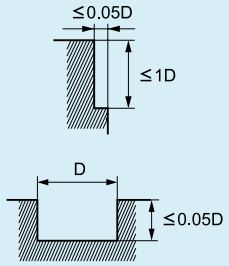
D:Dia.

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.

MS2XLRB ➤ I093

MS4MRB

Corner radius end mill, Medium cut length, 4 flute

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.		
Dia. (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												

D:Dia.

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

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.		
Dia. (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	≤0.2D, ≤1.5D						≤0.1D, ≤1.5D			≤0.05D, ≤1.5D					

D:Dia.

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.		
Dia. (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	D, ≤1D (MAX. 12mm)						D, ≤0.5D			D, ≤0.2D					

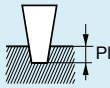
D:Dia.

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.

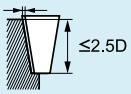
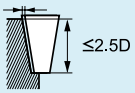
MS2MT

Taper end mill, Medium cut length, 2 flute

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.			
Small Mill Dia. (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)
0.2	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.		
Small Mill Dia. (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)
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	≤0.05D  ≤2.5D						≤0.03D  ≤2.5D		

D: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

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.			
Small mill dia. (mm)	R (mm)	Length 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)
0.2	—	**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.

MS4LT ➤ I102

MS4LTB

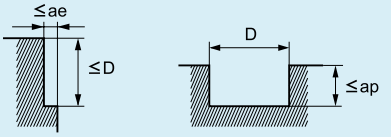
Ball nose, 4 flute, Taper, For rib milling

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.			
R (mm)	Length 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)
R0.3	**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.

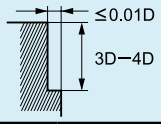
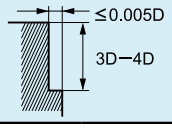
VCMDSC

End mill, Medium cut length, 4—6 flute

Work material	Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.			
Dia. (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	 D:Dia.							

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.

VCLD
End mill, Long cut length, 6 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.			Hardened steel (62—70HRC) AISI W1, AISI M2 etc.		
Dia. (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												

D:Dia.

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.

VCMH

End mill, Medium cut length, 3—4 flute, High helix angle

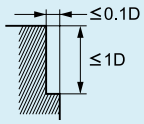
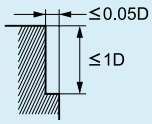
Work material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45—55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
Dia. (mm)	Revolution (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	≤0.2D ≤1.5D D ≤0.5D (D≤ϕ18) ≤0.3D (D>ϕ18)						≤0.05D ≤1D D ≤0.05D					

D:Dia.

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

VC8MH
End mill, Medium cut length, 8 flute, High helix angle

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.		
Dia. (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												

D:Dia.

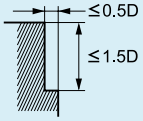
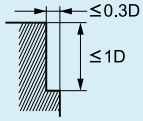
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VC6MH ➤ I116
VC8MH ➤ I117

VCSFPR

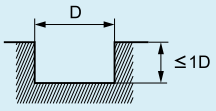
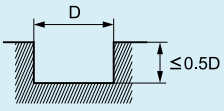
Roughing end mill, Short cut length, 3—4 flute

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.		
Dia. (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															

D:Dia.

Slotting

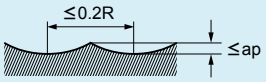
Work material	Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45—55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
Dia. (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															

D:Dia.

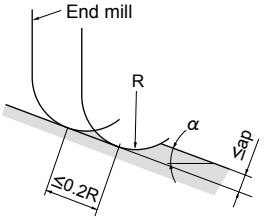
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VC2ESB

Ball nose, Extra short cut length, 2 flute

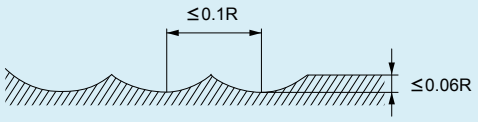
Work material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.							Hardened steel (45—55HRC) AISI H13 etc.						
R (mm)	α≦15°			α>15°			Depth of cut ap (mm)	α≦15°			α>15°			Depth of cut ap (mm)
	Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed			Revolution (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	 R:Radius													

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.

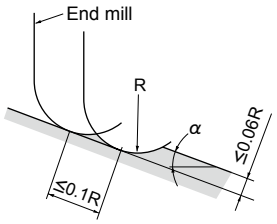


VC2PSBP MIRACLE NOVA
Ball nose, Short cut length, Ultra high precision

VC2PSB MIRACLE NOVA
Ball nose, Short cut length, 2 flute, High precision

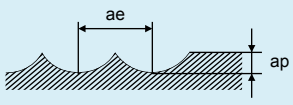
Work material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.						Hardened steel (45—55HRC) AISI H13 etc.					
R (mm)	α≤15°			α>15°			α≤15°			α>15°		
	Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed		Revolution (min^{-1})	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	 R:Radius											

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.



VC2PSBP ➤ I121
VC2PSB ➤ I120

VCXB
Ball nose, 2 flute, Taper neck

Work material					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Hardened steel (45—55HRC) AISI H13 etc.		
R (mm)	Taper angle one side	Neck length (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.

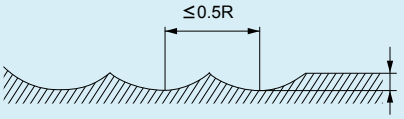
VC3MB

Ball nose end mill, Medium cut length, 3 flute

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.					
R (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

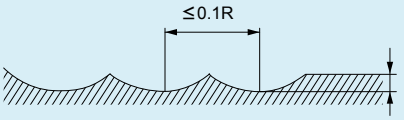


R:Radius

Finishing

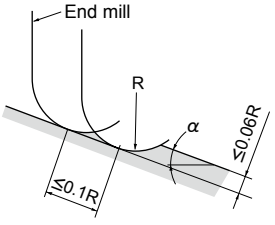
Work material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.						Hardened steel (45−55HRC) AISI H13 etc.					
R (mm)	α≤15°			α>15°			α≤15°			α>15°		
	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (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



R:Radius

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

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.						
R (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	≤0.2R, ≤ap R:Radius													

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

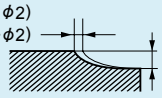
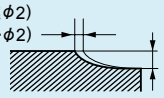
Work material		Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Hardened steel (45—55HRC) AISI H13 etc.			Hardened steel (55—62HRC) AISI D2 etc.		
Dia. (mm)	Neck length (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	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		≤0.2R (D≤ϕ2) ≤0.4R (D>ϕ2) ≤0.1mm (D≤ϕ1.5) ≤0.2mm (D=ϕ2 to ϕ5) ≤0.5mm (D≥ϕ6)			≤0.1R (D≤ϕ2) ≤0.2R (D>ϕ2) ≤0.05mm (D≤ϕ1.5) ≤0.1mm (D=ϕ2 to ϕ5) ≤0.3mm (D≥ϕ6)					

D:Dia.

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 ➤ I126

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.		
Dia. (mm)	Taper angle one side	Neck length (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			≤0.2R (D≤ϕ2) ≤0.4R (D>ϕ2)  ≤0.1mm(D≤ϕ1.5) ≤0.2mm(D= ϕ2 to ϕ5) ≤0.5mm(D≥ϕ6)						≤0.1R (D≤ϕ2) ≤0.2R (D>ϕ2)  ≤0.05mm(D≤ϕ1.5) ≤0.1mm(D= ϕ2 to ϕ5) ≤0.3mm(D≥ϕ6)		

D:Dia.

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

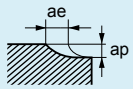
Corner radius end mill, Semi long cut length, 4 flute

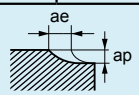
Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.		
Dia. (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	≤0.05D (MAX. 0.5mm) ≤2.5D D ≤0.3D (MAX. 3mm)									≤0.02D (MAX. 0.3mm) ≤2D D ≤0.05D (MAX. 0.5mm)		

D:Dia.

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

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.				
Dia. (mm)	R (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.				
Dia. (mm)	R (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											

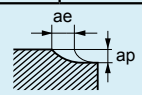
Coefficients respective of tool overhang

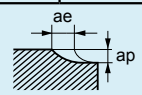
Type	Overhang	Revolution	Feed rate	Depth of cut ap
Straight	L/D≤5	100%	100%	100%
	L/D=6	90%	80%	80%
	L/D=7	80%	70%	70%
Taper neck	L/D=6	100%	100%	100%
	L/D=8	90%	80%	80%
	L/D≥10	80%	70%	70%

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

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.				
Dia. (inch)	R (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.				
Dia. (inch)	R (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

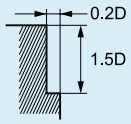
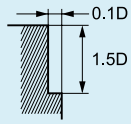
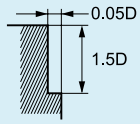
Type	Overhang	Revolution	Feed rate	Depth of cut ap
Straight	L/D≤5	100%	100%	100%
	L/D=6	90%	80%	80%
	L/D=7	80%	70%	70%
Taper neck	L/D=6	100%	100%	100%
	L/D=8	90%	80%	80%
	L/D≥10	80%	70%	70%

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

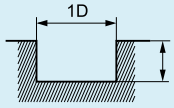
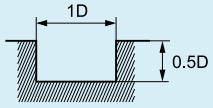
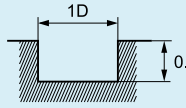
Corner radius end mill, Medium cut length, 4 flute, High helix angle

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.		
Dia. (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															

D:Dia.

Slotting

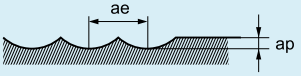
Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
Dia. (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															

D:Dia.

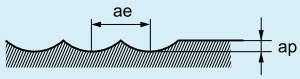
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VC4STB

Ball nose taper end mill, Short cut length, 4 flute

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.				
R (mm)	Taper angle one side (°)	Neck length (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.

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.				
R (mm)	Taper angle one side (°)	Neck length (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.

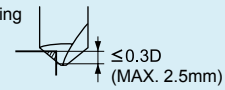
VC2C

Chamfer cutter, 2 flute

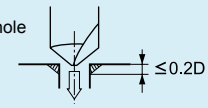
Work material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.		
Dia. (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

Chamfering



Chamfering of hole



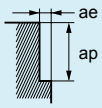
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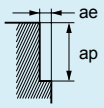
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VQMHZV

End mill, Medium cut length, 3 flute for drilling and slotting

Shoulder milling

Work material	Carbon steel (—30HRC) AISI 1035, AISI 1050, ASTM 283					Alloy steel, Pre-hardened steel (30—45HRC) AISI H13, AISI 4140, AISI P21					Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.				
Dia. (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	32000	720	28.3	1.5	0.2	25000	530	20.9	1.5	0.2	19000	430	16.9	1.5	0.2
1.5	28000	1300	51.2	2.25	0.3	21000	630	24.8	2.25	0.3	18000	540	21.3	2.25	0.3
2	24000	1800	70.9	3	0.6	19000	860	33.9	3	0.6	16000	620	24.4	3	0.6
3	16000	1900	74.8	4.5	0.9	13000	940	37.0	4.5	0.9	11000	660	26.0	4.5	0.9
4	12000	2000	78.7	6	1.2	9500	940	37.0	6	1.2	8000	670	26.4	6	1.2
5	9500	1900	74.8	7.5	1.5	7600	960	37.8	7.5	1.5	6400	670	26.4	7.5	1.5
6	8000	1900	74.8	9	1.8	6400	960	37.8	9	1.8	5300	830	32.7	9	1.8
8	6000	1900	74.8	12	2.4	4800	1000	39.4	12	2.4	4000	900	35.4	12	2.4
10	4800	1700	66.9	15	3	3800	910	35.8	15	3	3200	960	37.8	15	3
12	4000	1400	55.1	18	3.6	3200	860	33.9	18	3.6	2700	890	35.0	18	3.6
16	3000	1200	47.2	24	4.8	2400	720	28.3	24	4.8	2000	720	28.3	24	4.8
20	2400	970	38.2	30	6	1900	570	22.4	30	6	1600	580	22.8	30	6
Depth of cut															

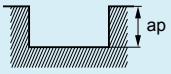
Work material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700 etc.					Heat resistant alloy Inconel718 etc.				
Dia. (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
1	16000	340	13.4	1.5	0.1	13000	160	6.3	1.5	0.05
1.5	14000	420	16.5	2.25	0.15	8500	170	6.7	2.25	0.08
2	12000	540	21.3	3	0.4	6400	170	6.7	3	0.2
3	8000	580	22.8	4.5	0.6	4200	180	7.1	4.5	0.3
4	6000	590	23.2	6	0.8	3200	180	7.1	6	0.4
5	4800	600	23.6	7.5	1	2500	180	7.1	7.5	0.5
6	4000	600	23.6	9	1.2	2100	190	7.5	9	0.6
8	3000	630	24.8	12	1.6	1600	190	7.5	12	0.8
10	2400	580	22.8	15	2	1300	220	8.7	15	1
12	2000	540	21.3	18	2.4	1100	210	8.3	18	1.2
16	1500	450	17.7	24	3.2	800	150	5.9	24	1.6
20	1200	360	14.2	30	4	640	120	4.7	30	2
Depth of cut										

1) Effective cutting of stainless steel, titanium alloy, and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
2) Higher feeds and speeds can be used for smaller depth of cut.
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.

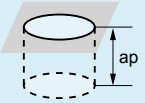
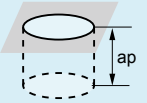
VQMHZV

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 (30−45HRC) AISI H13, AISI 4140, AISI P21				Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.				Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700 etc.				Heat resistant alloy Inconel718 etc.			
Dia. (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)	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	32000	380	15.0	0.5	25000	150	5.9	0.5	19000	100	3.9	0.5	14000	80	3.1	0.3	9500	60	2.4	0.2
1.5	28000	590	23.2	0.75	21000	250	9.8	0.75	18000	220	8.7	0.75	12000	140	5.5	0.45	6400	80	3.1	0.3
2	24000	940	37.0	2	19000	460	18.1	2	16000	480	18.9	2	9500	230	9.1	1	4800	100	3.9	0.6
3	16000	1100	43.3	3	13000	550	21.7	3	11000	500	19.7	3	6400	270	10.6	1.5	3200	120	4.7	0.9
4	12000	1400	55.1	4	9500	680	26.8	4	8000	530	20.9	4	4800	350	13.8	2	2400	130	5.1	1.2
5	9500	1400	55.1	5	7600	680	26.8	5	6400	540	21.3	5	3800	340	13.4	2.5	1900	130	5.1	1.5
6	8000	1400	55.1	6	6400	770	30.3	6	5300	560	22.0	6	3200	380	15.0	3	1600	130	5.1	1.8
8	6000	1300	51.2	8	4800	720	28.3	8	4000	600	23.6	8	2400	360	14.2	4	1200	140	5.5	2.4
10	4800	1200	47.2	10	3800	630	24.8	10	3200	670	26.4	10	1900	310	12.2	5	950	160	6.3	3
12	4000	960	37.8	12	3200	580	22.8	12	2700	650	25.6	12	1600	290	11.4	6	800	150	5.9	3.6
16	3000	810	31.9	12	2400	500	19.7	12	2000	480	18.9	12	1200	250	9.8	8	600	120	4.7	4.8
20	2400	650	25.6	12	1900	400	15.7	12	1600	380	15.0	12	950	200	7.9	10	480	90	3.5	6
Depth of cut																				

Drilling

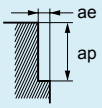
Work material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283					Alloy steel, Pre-hardened steel (30−45HRC) AISI H13, AISI 4140, AISI P21					Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.					Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700 etc.				
Dia. (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Hole Depth ap (mm)	Step (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Hole Depth ap (mm)	Step (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Hole Depth ap (mm)	Step (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Hole Depth ap (mm)	Step (mm)
1	20000	160	6.3	0.5	0.1	16000	100	3.9	0.5	0.1	16000	50	2.0	0.5	0.05	9500	30	1.2	0.5	0.05
1.5	18000	270	10.6	0.75	0.3	13000	120	4.7	0.75	0.3	13000	80	3.1	0.75	0.1	7400	40	1.6	0.75	0.1
2	16000	480	18.9	2	0.5	11000	200	7.9	2	0.4	9500	90	3.5	1	0.1	6400	60	2.4	1	0.1
3	11000	660	26.0	3	1	7400	270	10.6	3	0.6	6400	100	3.9	1.5	0.2	4200	60	2.4	1.5	0.2
4	8000	800	31.5	4	2	5600	340	13.4	4	0.8	4800	100	3.9	2	0.4	3200	60	2.4	2	0.4
5	6400	960	37.8	5	2.5	4500	410	16.1	5	1	3800	100	3.9	2.5	0.5	2500	60	2.4	2.5	0.5
6	5300	950	37.4	6	3	3700	440	17.3	6	1.2	3200	100	3.9	3	0.6	2100	60	2.4	3	0.6
8	4000	720	28.3	8	4	2800	340	13.4	8	1.6	2400	70	2.8	4	0.6	1600	50	2.0	4	0.6
10	3200	580	22.8	10	5	2200	260	10.2	10	2.5	1900	60	2.4	5	0.6	1300	40	1.6	5	0.6
12	2700	490	19.3	12	5	1900	230	9.1	12	3	1600	50	2.0	6	0.6	1100	30	1.2	6	0.6
16	2000	360	14.2	16	5	1400	170	6.7	16	4	1200	40	1.6	8	0.6	800	20	0.8	8	0.6
20	1600	290	11.4	20	5	1100	130	5.1	20	5	950	30	1.2	10	0.6	640	20	0.8	10	0.6
Hole depth																				

1) Effective cutting of stainless steel, titanium alloy, and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
2) Higher feeds and speeds can be used for smaller depth of cut.
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.

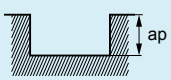
VQMHZV - Inch sizes

End mill, Medium cut length, 3 flute for drilling and slotting

Shoulder milling

Work material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283				Alloy steel, Pre-hardened steel (30−45HRC) AISI H13, AISI 4140, AISI P21				Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.				Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700 etc.				Heat resistant alloy Inconel718 etc.			
Dia. (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)	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)
.0625	26000	55.3	.094	.013	20000	26	.094	.013	18000	23.4	.094	.013	13000	16.9	.094	.0063	8000	6.61	.094	.0031
.0781	24000	70.9	.12	.023	19000	33.7	.12	.023	16000	24.6	.12	.023	12000	21.3	.12	.016	6400	6.8	.12	.0078
.0938	20000	70.9	.14	.028	16000	34	.14	.028	13000	24.6	.14	.028	10000	21.3	.14	.019	5300	6.89	.14	.0094
.1094	17000	72.3	.16	.033	14000	34.7	.16	.033	11000	24.7	.16	.033	8600	21.3	.16	.022	4600	7.06	.16	.011
.1250	15000	76.2	.19	.038	12000	36.9	.19	.038	10000	26	.19	.038	7500	23	.19	.025	4000	7.09	.19	.013
.1563	12000	78	.23	.047	9600	37.4	.23	.047	8000	26.5	.23	.047	6000	23.4	.23	.031	3200	7.18	.23	.016
.1875	10000	74.4	.28	.056	8000	37.8	.28	.056	6700	26.5	.28	.056	5000	23.6	.28	.038	2700	7.33	.28	.019
.2500	7500	74.4	.38	.075	6000	39	.38	.075	5000	35.4	.38	.075	3800	24.7	.38	.05	2000	7.56	.38	.025
.3125	6000	74.4	.47	.094	4800	39.7	.47	.094	4000	35.4	.47	.094	3000	24.8	.47	.063	1600	7.56	.47	.031
.3438	5500	71.5	.52	.1	4400	37.9	.52	.1	3600	36.1	.52	.1	2700	23.3	.52	.069	1500	7.97	.52	.034
.3750	5000	67.9	.56	.11	4000	36.9	.56	.11	3300	37	.56	.11	2500	23	.56	.075	1300	7.98	.56	.038
.5000	3800	56.1	.75	.15	3000	32.6	.75	.15	2500	32.5	.75	.15	1900	20.6	.75	.1	1000	7.56	.75	.05
Depth of cut																				

Slotting

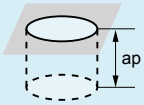
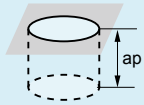
Work material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283			Alloy steel, Pre-hardened steel (30−45HRC) AISI H13, AISI 4140, AISI P21			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.			Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700 etc.			Heat resistant alloy Inconel718 etc.		
Dia. (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)
.0625	26000	27.6	.031	20000	11.8	.031	18000	10.6	.031	11000	6.5	.019	6000	3.54	.013
.0781	24000	36.9	.078	19000	18	.078	16000	18.9	.078	9600	9.07	.039	4800	3.97	.023
.0938	20000	37.8	.094	16000	18.9	.094	13000	19.2	.094	8000	9.45	.047	4000	4.25	.028
.1094	17000	40.2	.11	14000	19.8	.11	11000	19.5	.11	6900	9.78	.055	3400	4.42	.033
.1250	15000	44.3	.13	12000	22.7	.13	10000	20.1	.13	6000	11.3	.063	3000	4.61	.038
.1563	12000	56.7	.16	9600	26.1	.16	8000	20.8	.16	4800	13	.078	2400	4.99	.047
.1875	10000	56.7	.19	8000	26.9	.19	6700	21.4	.19	4000	13.7	.094	2000	5.1	.056
.2500	7500	55.8	.25	6000	29.8	.25	5000	21.9	.25	3000	14.9	.13	1500	5.31	.075
.3125	6000	49.6	.31	4800	28.3	.31	4000	23.6	.31	2400	14.2	.16	1200	5.67	.094
.3438	5500	48.7	.34	4400	27	.34	3600	24.2	.34	2200	13.5	.17	1100	5.85	.1
.3750	5000	46.1	.38	4000	25.5	.38	3300	25.3	.38	2000	12.8	.19	1000	6.14	.11
.5000	3800	35.9	.5	3000	22.3	.5	2500	23.6	.5	1500	11.2	.25	750	5.67	.15
Depth of cut															

1) Effective cutting of stainless steel, titanium alloy, and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
2) Higher feeds and speeds can be used for smaller depth of cut.
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.

VQMHZV - Inch sizes

End mill, Medium cut length, 3 flute for drilling and slotting

Drilling

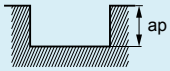
Work material	Carbon steel (—30HRC) AISI 1035, AISI 1050, ASTM 283				Alloy steel, Pre-hardened steel (30—45HRC) AISI H13, AISI 4140, AISI P21				Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.				Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700 etc.			
Dia. (inch)	Revolution (min^{-1})	Feed rate (IPM)	Hole Depth ap (inch)	Step (inch)	Revolution (min^{-1})	Feed rate (IPM)	Hole Depth ap (inch)	Step (inch)	Revolution (min^{-1})	Feed rate (IPM)	Hole Depth ap (inch)	Step (inch)	Revolution (min^{-1})	Feed rate (IPM)	Hole Depth ap (inch)	Step (inch)
.0625	18000	12.8	.031	.013	12000	5.2	.031	.013	12000	3.31	.031	.004	7000	1.93	.031	.004
.0781	16000	18.9	.078	.02	11000	7.8	.078	.016	9600	3.4	.039	.004	6400	2.27	.039	.004
.0938	13000	20.5	.094	.023	9400	8.88	.094	.019	8000	3.46	.047	.006	5300	2.3	.047	.006
.1094	11000	21.7	.11	.033	8000	9.45	.11	.022	6900	3.53	.055	.008	4600	2.35	.055	.008
.1250	10000	27.6	.13	.044	7000	11	.13	.025	6000	4.02	.063	.008	4000	2.68	.063	.008
.1563	8000	31.5	.16	.078	5600	13.2	.16	.031	4800	3.78	.078	.016	3200	2.52	.078	.016
.1875	6700	34.3	.19	.094	4700	14.8	.19	.038	4000	3.78	.094	.020	2700	2.44	.094	.020
.2500	5000	35.4	.25	.13	3500	16.5	.25	.05	3000	3.54	.13	.024	2000	2.36	.13	.024
.3125	4000	28.3	.31	.16	2800	13.2	.31	.063	2400	2.83	.16	.024	1600	1.89	.16	.024
.3438	3600	25.5	.34	.17	2600	12.3	.34	.069	2200	2.6	.17	.024	1500	1.77	.17	.024
.3750	3300	23.4	.38	.19	2300	10.9	.38	.094	2000	2.36	.19	.024	1300	1.54	.19	.024
.5000	2500	17.7	.5	.2	1800	8.5	.5	.13	1500	1.77	.25	.024	1000	1.18	.25	.024
Hole depth																

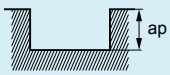
1) Effective cutting of stainless steel, and titanium alloy can be achieved with the use of water-soluble cutting fluid.
2) Higher feeds and speeds can be used for smaller depth of cut.
3) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

VQMHZVOH

End mill, Medium cut length, 3 flute for drilling and slotting with coolant holes

Slotting

Work material	Carbon steel, Alloy steel, Mild Steel AISI 1045, AISI 4140, AISI 1010 etc.				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340 etc.				Austenitic stainless steel, Ferritic, Precipitation hardeningstainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			
Dia. (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)
6	8000	1400	55.1	6	6400	770	30.3	6	5300	560	22.0	6
8	6000	1300	51.2	8	4800	720	28.3	8	4000	600	23.6	8
10	4800	1200	47.2	10	3800	630	24.8	10	3200	670	26.4	10
12	4000	960	37.8	12	3200	580	22.8	12	2700	650	25.6	12
16	3000	810	31.9	12	2400	500	19.7	12	2000	480	18.9	12
Depth of cut												

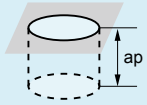
Work material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy S17400, S17700 etc.				Copper, Copper alloys				Heat resistant alloy Inconel718 etc.			
Dia. (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)
6	3200	380	15.0	3	9500	1700	66.9	6	1600	130	5.1	1.8
8	2400	360	14.2	4	7200	1500	59.1	8	1200	140	5.5	2.4
10	1900	310	12.2	5	5700	1400	55.1	10	950	160	6.3	3
12	1600	290	11.4	6	4800	1200	47.2	12	800	150	5.9	3.6
16	1200	250	9.8	8	3600	970	38.2	12	600	120	4.7	4.8
Depth of cut												

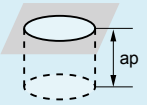
1) Effective cutting of stainless steel, titanium alloy, and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
2) Higher feeds and speeds can be used for smaller depth of cut.
3) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

VQMHZVOH

End mill, Medium cut length, 3 flute for drilling and slotting with coolant holes

Plunging

Work material	Carbon steel, Alloy steel, Mild Steel AISI 1045, AISI 4140, AISI 1010 etc.					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340 etc.					Austenitic stainless steel, Ferritic, Precipitation hardeningstainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.				
Dia. (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Drilled Depth ap (mm)	Step (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Drilled Depth ap (mm)	Step (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Drilled Depth ap (mm)	Step (mm)
6	5300	950	37.4	9	3	3700	440	17.3	9	1.2	3200	100	3.9	6	0.6
8	4000	720	28.3	12	4	2800	340	13.4	12	1.6	2400	70	2.8	8	0.6
10	3200	580	22.8	15	5	2200	260	10.2	15	2.5	1900	60	2.4	10	0.6
12	2700	490	19.3	18	5	1900	230	9.1	18	3	1600	50	2.0	12	0.6
16	2000	360	14.2	24	5	1400	170	6.7	24	4	1200	40	1.6	16	0.6
Depth of cut															

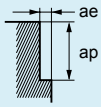
Work material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy S17400, S17700 etc.					Copper, Copper alloys				
Dia. (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Drilled Depth ap (mm)	Step (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Drilled Depth ap (mm)	Step (mm)
6	2100	60	2.4	6	0.6	6400	1200	47.2	9	3
8	1600	50	2.0	8	0.6	4800	860	33.9	12	4
10	1300	40	1.6	10	0.6	3800	680	26.8	15	5
12	1100	30	1.2	12	0.6	3200	580	22.8	18	5
16	800	20	0.8	16	0.6	2400	430	16.9	24	5
Depth of cut										

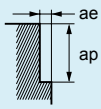
1) Effective cutting of stainless steel, titanium alloy, and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
2) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

VQMHV
End mill, Medium cut length, 4 flute, Irregular helix flutes

VQMHVRB
Coner 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 (30−45HRC) AISI H13, AISI 4140, AISI P21					Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.				
Dia. (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)
2	24000	2400	94.5	3	0.6	19000	1100	43.3	3	0.6	16000	830	32.7	3	0.6
3	16000	2600	102.4	4.5	0.9	13000	1200	47.2	4.5	0.9	11000	880	34.6	4.5	0.9
4	12000	2600	102.4	6	1.2	9500	1300	51.2	6	1.2	8000	900	35.4	6	1.2
5	9500	2500	98.4	7.5	1.5	7600	1300	51.2	7.5	1.5	6400	900	35.4	7.5	1.5
6	8000	2600	102.4	9	1.8	6400	1300	51.2	9	1.8	5300	1100	43.3	9	1.8
8	6000	2500	98.4	12	2.4	4800	1300	51.2	12	2.4	4000	1200	47.2	12	2.4
10	4800	2300	90.6	15	3	3800	1200	47.2	15	3	3200	1300	51.2	15	3
12	4000	1900	74.8	18	3.6	3200	1200	47.2	18	3.6	2700	1200	47.2	18	3.6
16	3000	1600	63.0	24	4.8	2400	960	37.8	24	4.8	2000	960	37.8	24	4.8
20	2400	1300	51.2	30	6	1900	760	29.9	30	6	1600	770	30.3	30	6
25	1900	1100	43.3	37.5	7.5	1500	600	23.6	37.5	7.5	1300	620	24.4	37.5	7.5
Depth of cut															

Work material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700 etc.					Copper, Copper alloys					Heat resistant alloy Inconel718 etc.				
Dia. (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)
2	12000	720	28.3	3	0.4	29000	2900	114.2	3	0.6	6400	230	9.1	3	0.2
3	8000	770	30.3	4.5	0.6	19000	3000	118.1	4.5	0.9	4200	240	9.4	4.5	0.3
4	6000	790	31.1	6	0.8	14000	3100	122.0	6	1.2	3200	240	9.4	6	0.4
5	4800	810	31.9	7.5	1	11000	2900	114.2	7.5	1.5	2500	240	9.4	7.5	0.5
6	4000	800	31.5	9	1.2	9500	3000	118.1	9	1.8	2100	250	9.8	9	0.6
8	3000	840	33.1	12	1.6	7200	3000	118.1	12	2.4	1600	260	10.2	12	0.8
10	2400	770	30.3	15	2	5700	2700	106.3	15	3	1300	290	11.4	15	1
12	2000	720	28.3	18	2.4	4800	2300	90.6	18	3.6	1100	280	11.0	18	1.2
16	1500	600	23.6	24	3.2	3600	1900	74.8	24	4.8	800	200	7.9	24	1.6
20	1200	480	18.9	30	4	2900	1600	63.0	30	6	640	160	6.3	30	2
25	950	380	15.0	37.5	5	2300	1300	51.2	37.5	7.5	510	130	5.1	37.5	2.5
Depth of cut															

1) Effective cutting of stainless steel, titanium alloy and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
2) Higher feeds and speeds can be used for smaller depth of cut.
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 ➤ I143
VQMHVRB ➤ I146

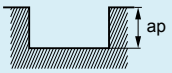
VQMHV

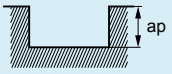
End mill, Medium cut length, 4 flute, Irregular helix flutes

VQMHVRB

Coner 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 (30—45HRC) AISI H13, AISI 4140, AISI P21				Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.			
Dia. (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)
2	24000	1200	47.2	2	19000	610	24.0	2	16000	640	25.2	2
3	16000	1500	59.1	3	13000	730	28.7	3	11000	660	26.0	3
4	12000	1900	74.8	4	9500	910	35.8	4	8000	700	27.6	4
5	9500	1900	74.8	5	7600	910	35.8	5	6400	720	28.3	5
6	8000	1900	74.8	6	6400	1000	39.4	6	5300	740	29.1	6
8	6000	1700	66.9	8	4800	960	37.8	8	4000	800	31.5	8
10	4800	1500	59.1	10	3800	840	33.1	10	3200	900	35.4	10
12	4000	1300	51.2	12	3200	770	30.3	12	2700	860	33.9	12
16	3000	1100	43.3	12	2400	670	26.4	12	2000	640	25.2	12
20	2400	860	33.9	12	1900	530	20.9	12	1600	510	20.1	12
25	1900	760	29.9	12	1500	420	16.5	12	1300	420	16.5	12
Depth of cut												

Work material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700 etc.				Copper, Copper alloys				Heat resistant alloy Inconel718 etc.			
Dia. (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)
2	9500	300	11.8	1	29000	1500	59.1	2	4800	130	5.1	0.6
3	6400	360	14.2	1.5	19000	1700	66.9	3	3200	150	5.9	0.9
4	4800	460	18.1	2	14000	2200	86.6	4	2400	170	6.7	1.2
5	3800	460	18.1	2.5	11000	2200	86.6	5	1900	170	6.7	1.5
6	3200	510	20.1	3	9500	2300	90.6	6	1600	180	7.1	1.8
8	2400	480	18.9	4	7200	2000	78.7	8	1200	190	7.5	2.4
10	1900	420	16.5	5	5700	1800	70.9	10	950	210	8.3	3
12	1600	380	15.0	6	4800	1500	59.1	12	800	200	7.9	3.6
16	1200	340	13.4	8	3600	1300	51.2	12	600	150	5.9	4.8
20	950	270	10.6	10	2900	1000	39.4	12	480	120	4.7	6
25	760	210	8.3	12	2300	920	36.2	12	380	100	3.9	7.5
Depth of cut												

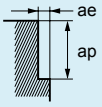
1) Effective cutting of stainless steel, titanium alloy and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
2) Higher feeds and speeds can be used for smaller depth of cut.
3) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

VQMHV ➤ I139
VQMHVRB ➤ I146

VQMHV - Inch sizes
End mill, Medium cut length, 4 flute, Irregular helix flutes

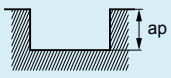
VQMHVRB - Inch sizes
Coner radius end mill, Medium cut length, 4 flute, Irregular helix flutes

Shoulder milling

Work material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283				Alloy steel, Pre-hardened steel (30−45HRC) AISI H13, AISI 4140, AISI P21				Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.				Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700 etc.				Heat resistant alloy Inconel718 etc.			
Dia. (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)	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)
.1250	15000	102	.19	.038	12000	49.1	.19	.038	10000	34.6	.19	.038	7500	30.7	.19	.025	4000	9.45	.19	.013
.1875	10000	99.2	.28	.056	8000	50.4	.28	.056	6700	35.3	.28	.056	5000	31.5	.28	.038	2700	9.78	.28	.019
.2500	7500	99.2	.38	.075	6000	52	.38	.075	5000	47.2	.38	.075	3800	32.9	.38	.05	2000	10.1	.38	.025
.3125	6000	99.2	.47	.094	4800	52.9	.47	.094	4000	47.2	.47	.094	3000	33.1	.47	.063	1600	10.1	.47	.031
.3750	5000	90.6	.56	.11	4000	49.1	.56	.11	3300	49.4	.56	.11	2500	30.7	.56	.075	1300	10.6	.56	.038
.5000	3800	74.8	.75	.15	3000	43.5	.75	.15	2500	43.3	.75	.15	1900	27.5	.75	.1	1000	10.1	.75	.05
Depth of cut																				

1) Effective cutting of stainless steel, titanium alloy and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
2) Higher feeds and speeds can be used for smaller depth of cut.
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.

Slotting

Work material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283			Alloy steel, Pre-hardened steel (30−45HRC) AISI H13, AISI 4140, AISI P21			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.			Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700 etc.			Heat resistant alloy Inconel718 etc.		
Dia. (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)	Revolution (min^{-1})	Feed rate (IPM)	Depth of cut ap (inch)
.1250	15000	59.1	.13	12000	30.2	.13	10000	26.8	.13	6000	15.1	.063	3000	6.14	.038
.1875	10000	75.6	.19	8000	35.9	.19	6700	28.5	.19	4000	18.3	.094	2000	6.8	.056
.2500	7500	74.4	.25	6000	39.7	.25	5000	29.1	.25	3000	19.8	.13	1500	7.09	.075
.3125	6000	66.1	.31	4800	37.8	.31	4000	31.5	.31	2400	18.9	.16	1200	7.56	.094
.3750	5000	61.4	.38	4000	34	.38	3300	33.8	.38	2000	17	.19	1000	8.19	.11
.5000	3800	47.9	.5	3000	29.8	.5	2500	31.5	.5	1500	14.9	.25	750	7.56	.15
Depth of cut															

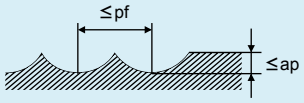
1) Effective cutting of stainless steel, titanium alloy and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
2) Higher feeds and speeds can be used for smaller depth of cut.
3) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

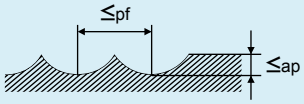
VQMHV ➤ I144
VQMHVRB ➤ I148

VQ4SVB

Ball nose, Short cut length, 4 flute, Variable curve

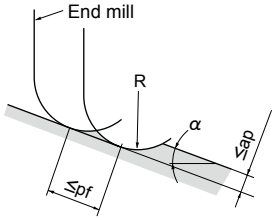
Shoulder milling(Slotting)

Work material	Carbon steel, Alloy steel, Mild Steel, Pre-hardened steel AISI 1045, AISI 4140, AISI 1010, AISI P21, AISI P20, AISI 4340 etc.								Austenitic stainless steel, Titanium alloy, Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy Ferritic, Precipitation hardeningstainless steel AISI 304, AISI 306, Ti-6Al-4V, S17400, S17700, AISI 431, AISI 420 etc.							
R (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		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 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
Depth of cut																

Work material	Copper, Copper alloys								Heat resistant alloy Inconel718 etc.							
R (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		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 1	40000	8000	315.0	38000	4500	177.2	0.17	0.5	9600	960	37.8	6400	510	20.1	0.08	0.2
R 1.5	38000	9100	358.3	25000	3800	149.6	0.25	0.75	6400	640	25.2	4200	340	13.4	0.13	0.3
R 2	29000	7000	275.6	19000	3300	129.9	0.33	1	4800	580	22.8	3200	260	10.2	0.17	0.4
R 2.5	23000	6400	252.0	15000	3100	122.0	0.42	1.25	3800	530	20.9	2500	250	9.8	0.21	0.5
R 3	19000	5700	224.4	13000	2600	102.4	0.5	1.5	3200	500	19.7	2100	210	8.3	0.25	0.6
R 4	14000	5000	196.9	9600	2300	90.6	0.8	2	2400	430	16.9	1600	190	7.5	0.4	0.8
R 5	12000	5100	200.8	7700	2200	86.6	1	2.5	2000	420	16.5	1300	180	7.1	0.5	1
R 6	9600	4800	189.0	6400	2200	86.6	1.2	3	1700	350	13.8	1100	150	5.9	0.6	1.2
Depth of cut																

R:Radius

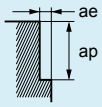
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end 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.
4) α is the inclination of the machined surface.

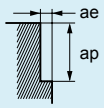


VQMHVRBF

Corner radius end mill, Medium cut length, 4 flute, Irregular helix flutes (for finish cutting)

Shoulder milling

Work material	Carbon steel, Alloy steel, Mild Steel AISI 1045, AISI 4140, AISI 1010 etc.					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340 etc.					Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy S17400, S17700 etc.				
Dia. (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)
6	8000	2600	102.3	9	0.3	6400	1300	51.1	9	0.3	4000	800	31.4	9	0.3
8	6000	2500	98.4	12	0.4	4800	1300	51.1	12	0.4	3000	840	33.0	12	0.4
10	4800	2300	90.5	15	0.5	3800	1200	47.2	15	0.5	2400	770	30.3	15	0.5
12	4000	1900	74.8	18	0.6	3200	1200	47.2	18	0.6	2000	720	28.3	18	0.6
16	3000	1600	62.9	24	0.8	2400	960	37.7	24	0.8	1500	600	23.6	24	0.8
Depth of cut															

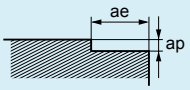
Work material	Copper, Copper alloys					Heat resistant alloy Inconel718 etc.				
Dia. (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
6	9500	3000	118.1	9	0.3	2100	250	9.8	9	0.18
8	7200	3000	118.1	12	0.4	1600	260	10.2	12	0.24
10	5700	2700	106.2	15	0.5	1300	290	11.4	15	0.3
12	4800	2300	90.5	18	0.6	1100	280	11.0	18	0.36
16	3600	1900	74.8	24	0.8	800	200	7.8	24	0.48
Depth of cut										

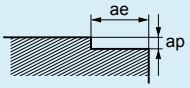
1) Effective cutting of stainless steel, titanium alloy, and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) The irregular helix flute end mill has a larger effect on controlling vibration 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.

VQMHVRBF

Corner radius end mill, Medium cut length, 4 flute, Irregular helix flutes (for finish cutting)

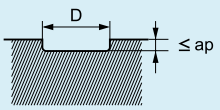
Face milling

Work material	Carbon steel, Alloy steel, Mild Steel AISI 1045, AISI 4140, AISI 1010 etc.					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340 etc.					Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy S17400, S17700 etc.				
Dia. (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)
6	5800	1400	55.1	0.3	4.8	4800	770	30.3	0.3	4.8	2900	460	18.1	0.3	4.8
8	4400	1200	47.2	0.4	6.4	3600	720	28.3	0.4	6.4	2200	440	17.3	0.4	6.4
10	3500	1100	43.3	0.5	8	2900	640	25.2	0.5	8	1800	400	15.7	0.5	8
12	2900	930	36.6	0.6	9.6	2400	580	22.8	0.6	9.6	1500	360	14.2	0.6	9.6
16	2200	790	31.1	0.8	12.8	1800	500	19.7	0.8	12.8	1100	310	12.2	0.8	12.8
Depth of cut															

Work material	Copper, Copper alloys					Heat resistant alloy Inconel718 etc.				
Dia. (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)
6	6900	1700	66.9	0.3	4.8	1600	180	7.1	0.18	4.8
8	5200	1500	59.1	0.4	6.4	1200	190	7.5	0.24	6.4
10	4100	1300	51.2	0.5	8	950	210	8.3	0.3	8
12	3400	1100	43.3	0.6	9.6	800	200	7.9	0.36	9.6
16	2600	940	37.0	0.8	12.8	600	150	5.9	0.48	12.8
Depth of cut										

1) Effective cutting of stainless steel, titanium alloy, and heat-resistant alloy can be achieved with the use of water-soluble cutting fluid.
2) Higher feeds and speeds can be used for smaller depth of cut.
3) 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

Work material		Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.			
Dia. (mm)	Neck length (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		 D:Dia.							

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.

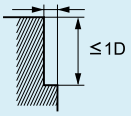
VF2MV

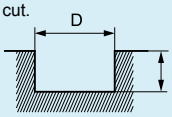
End mill, Medium cut length, 2 flute, Irregular helix flutes

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.			
Dia. (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.

D:Dia.

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.

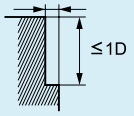
VF4MV

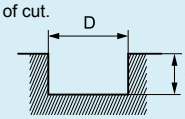
End mill, Medium cut length, 4 flute, Irregular helix flutes

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.			
Dia. (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.





≤Please refer to the list above for depth of cut.

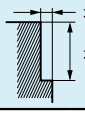
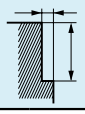
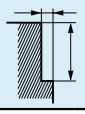
D:Dia.

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.

VFMHV
Medium cut length, Irregular helix flutes

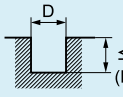
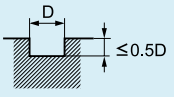
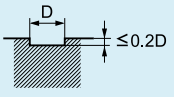
VFMHVRB
Corner radius end mill, Medium cut length, 4 flute, Irregular helix flutes

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.		
Dia. (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	 ≤0.2D ≤1.5D						 ≤0.1D ≤1.5D			 ≤0.05D ≤1.5D					

D:Dia.

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.		
Dia. (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	 D ≤1D (MAX. 12mm)						 D ≤0.5D			 D ≤0.2D					

D:Dia.

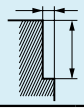
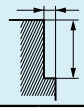
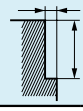
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. 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.

VFMHV ➤ I155 VFMHVRB ➤ I192

VFJHV

End mill, Semi long cut length, 4 flute, Irregular helix flutes

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.		
Dia. (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	 ≤0.1D ≤2.5D						 ≤0.05D ≤2.5D						 ≤0.02D ≤2.5D		

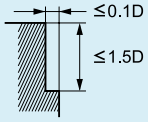
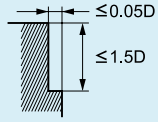
D:Dia.

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

VF6MHVRB
Corner radius, Medium cut length, 6 flute, Irregular helix flutes

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.		
Dia. (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									

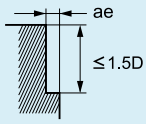
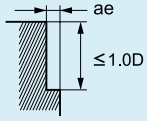
D:Dia.

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 ➤ I158
VF6MHVRB ➤ I194

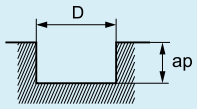
VFSD
End mill, Short cut length, For hardened materials

VFMD
End mill, Medium cut length, For hardened materials

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.			
Dia. (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												

D:Dia.

Slot milling with small diameter tools

Work material	Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.			
Dia. (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								

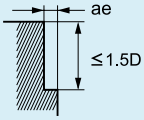
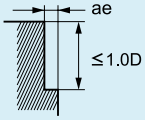
D:Dia.

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.

VFSD ➤ I161
VFMD ➤ I162

VFMD – Inch sizes

End mill, Medium cut length, For hardened materials

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.			
Dia. (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												

D:Dia.

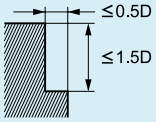
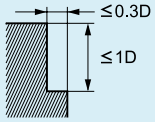
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VFMD ➤ I163

VFSFPR

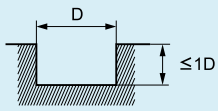
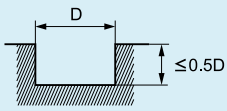
Roughing end mill, Short cut length, 3—4 flute

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.		
Dia. (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															

D:Dia.

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.		
Dia. (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															

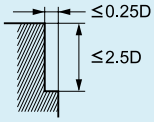
D:Dia.

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.

VFMFPR

Roughing end mill, Medium cut length, 4 flute

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.		
Dia. (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	 D:Dia.														

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 cut length, 2 flute

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.			
R (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	≤0.05R (R=1) ≤0.1R (R>1) ≤Please refer to the list above for depth of cut. R:Radius															

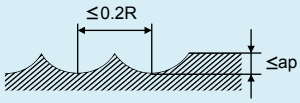
1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is especially effective.
2) If the depth of cut is smaller than this table, feed rate can be increased.

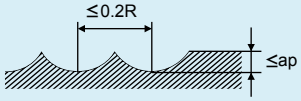
VF2SSB

Ball nose, Short cut length, 2 flute, For hardened materials

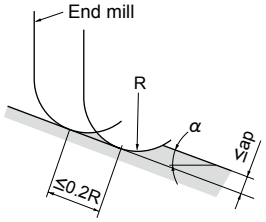
VF2SB

Ball nose, Short cut length, 2 flute, For hardened materials

Work material	Hardened steel (45—55HRC) AISI H13 etc.							Hardened steel (55—62HRC) AISI D2 etc.						
R (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	 R:Radius													

Work material	Hardened steel (62—70HRC) AISI W1, AISI M2 etc.						
R (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	 R:Radius						

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.

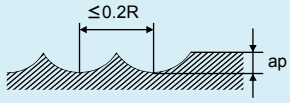


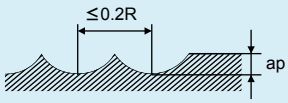
SOLID END MILLS

VF2SSB ➤ I169
VF2SB ➤ I170

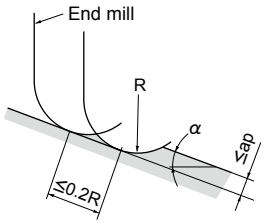
VF2SB – Inch sizes

Ball nose, Short cut length, 2 flute, For hardened materials

Work material	Hardened steel(45—55HRC) AISI H13 etc.							Hardened steel (55—62HRC) AISI D2 etc.						
R (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	 R:Radius													

Work material	Hardened steel (62—70HRC) AISI W1, AISI M2 etc.						
R (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.



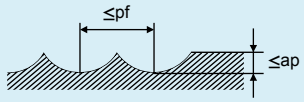
VF2SDB

Ball nose, Short cut length, 2 flute, Strong geometry

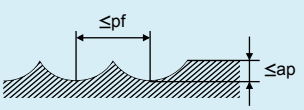
VF2SDBL

Ball nose, Short cut length, 2 flute, Strong geometry, Long shank

Overhang below 5D (D is end mill diameter)

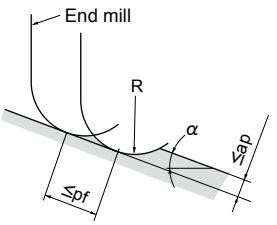
Work material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1—10, AISI P21 etc.								Hardened steel (45—55HRC) AISI H13 etc.							
R (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Pick feed pf (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Pick feed pf (mm)
	Revolution (min^{-1})	Table feed (mm/min)	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																

∗1: Shank Dia. = 6 mm, ∗2: Shank Dia. = 3 mm, ∗3: Shank Dia. = 4 mm

Work material	Hardened steel (55—62HRC) AISI D2 etc.							
R (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: Shank Dia. = 6 mm, ∗2: Shank Dia. = 3 mm, ∗3: Shank Dia. = 4 mm

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.



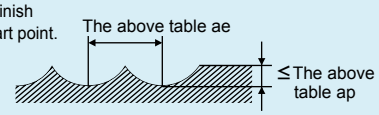
SOLID END MILLS

VF2SDB ➤ I173
VF2SDBL ➤ I174

VF2SDB
Ball nose, Short cut length, 2 flute, Strong geometry

VF2SDBL
Ball nose, Short cut length, 2 flute, Strong geometry, Long shank

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				
R (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)

VF2SDB ➤ I173
VF2SDBL ➤ I174

VF2XLBS

Ball nose, Long neck, 2 flute, Short shank

VF2XLB

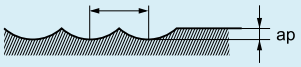
Ball nose, Long neck, 2 flute, For hardened materials

Work material		Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.			
R (mm)	Neck length (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

Work material		Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.			
R (mm)	Neck length (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 0.75	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

≤0.1R (R≤1)
≤0.2R (R>1)



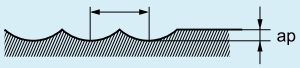
R:Radius

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.

VF2XLBS ➤ I175
VF2XLB ➤ I176

VF2XLB – Inch sizes

Ball nose, Long neck, 2 flute, For hardened materials

Work material		Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.			
R (inch)	Neck length (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		≤0.1R (R≤.0469) ≤0.2R (R>.0469)  R:Radius							

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

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.			
R (mm)	Taper angle one side	Neck length (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.

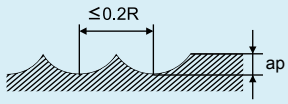
VF3XB ➤ I182

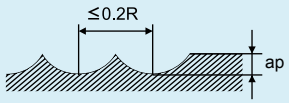
Work material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.				Hardened steel (45−55HRC) AISI H13 etc.				Hardened steel (55−62HRC) AISI D2 etc.			
R (mm)	Taper angle one side	Neck length (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.

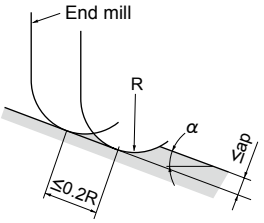
VF4MB

Ball nose, Medium cut length, 4 flute

Work material	Hardened steel (45—55HRC) AISI H13 etc.							Hardened steel (55—62HRC) AISI D2 etc.						
R (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	 R:Radius													

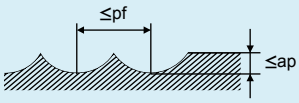
Work material	Hardened steel (62—70HRC) AISI W1, AISI M2 etc.						
R (mm)	α≤15°			α>15°			Depth of cut ap (mm)
	Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed		
		(mm/min)	(IPM)		(mm/min)	(IPM)	
R0.5	40000	4700	185.0	32000	1700	66.9	0.03
R1	24000	5000	196.9	16000	1200	47.2	0.06
R1.5	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	 R:Radius						

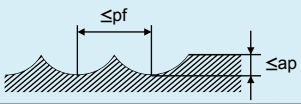
1) α is the inclination of the machined surface.
2) If the depth of cut is smaller than this table, feed rate can be increased.
3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.



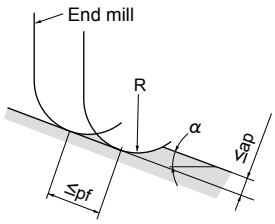
VF4SVB

Ball nose, Short cut length, 4 flute, Variable curve

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.							
R (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	 R:Radius															

Work material	Heat resistant alloy Inconel718 etc.							
R (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	 R:Radius							

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.



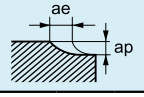
VFHVRB

4 flute, Corner radius, Short cut length, Irregular helix flutes

High feed conditions

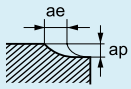
Work material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.					Hardened steel (45−55HRC) AISI H13 etc.					Hardened steel (55−62HRC) AISI D2 etc.				
Dia. (mm)	R (mm)	Neck length (mm)	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.

High feed conditions

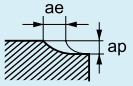
Work material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.					Hardened steel (45−55HRC) AISI H13 etc.					Hardened steel (55−62HRC) AISI D2 etc.				
Dia. (mm)	R (mm)	Neck length (mm)	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.

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4 flute, Corner radius, Short cut length, Irregular helix flutes

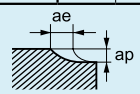
High depth of cut conditions

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.				
Dia. (mm)	R (mm)	Neck length (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 ➤ I187

High depth of cut conditions

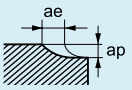
Work material			Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI 35, AISI P20 etc.					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1—10, AISI P21 etc.					Hardened steel (45—55HRC) AISI H13 etc.					Hardened steel (55—62HRC) AISI D2 etc.				
Dia. (mm)	R (mm)	Neck length (mm)	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.

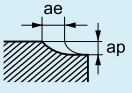
VFHVRB – Inch sizes

4 flute, Corner radius, Short cut length, Irregular helix flutes

High feed conditions

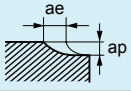
Work material			Carbon Steel, Cast Iron, Alloy Steel (−30HRC) AISI 1049, AISI 30, AISI P20					Alloy steel, Tool steel, Pre-haedened steel AIAI H13, AISI W1-10, AISI P21					Hardened Steel (45−55HRC) AISI H13					Hardened Steel (55−62HRC) AISI D2				
Dia. (inch)	R (inch)	Neck Length (inch)	Revolution (min^{-1})	Table feed		Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed		Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed		Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed		Depth of cut ap (inch)	Width of cut ae (inch)
				(mm/min)	(IPM)				(mm/min)	(IPM)				(mm/min)	(IPM)				(mm/min)	(IPM)		
0.125	**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
0.125	**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
0.188	**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
0.188	**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
0.250	**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
0.250	**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
0.313	**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
0.313	**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
0.375	**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
0.375	**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
0.500	**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
0.500	**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				
Dia. (inch)	R (inch)	Neck Length (inch)	Revolution (min^{-1})	Table feed		Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed		Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed		Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed		Depth of cut ap (inch)	Width of cut ae (inch)
				(mm/min)	(IPM)				(mm/min)	(IPM)				(mm/min)	(IPM)				(mm/min)	(IPM)		
0.125	**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
0.125	**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
0.188	**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
0.188	**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
0.250	**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
0.250	**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
0.313	**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
0.313	**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
0.375	**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
0.375	**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
0.500	**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
0.500	**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.

Taper neck type

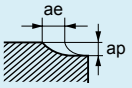
Work material				Carbon Steel, Cast Iron, Alloy Steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21					Hardened Steel (45−55HRC) AISI H13					Hardened Steel (55−62HRC) AISI D2				
Dia. (inch)	R (inch)	Taper angle one side	Neck Length (inch)	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 moulds, 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				
Dia. (mm)	R (mm)	Taper angle one side	Neck Length (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 moulds, 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.

VFMHVCH

End mill, Medium cut length, 4 flute, Irregular helix flutes, with multiple internal through coolant holes

VFMHVRBCH

Corner radius end mill, Medium cut length, 4 flute, Irregular helix flutes, with multiple internal through coolant holes

Shoulder milling

Work material	Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
Dia. (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	≤0.1D 0.5D—1.5D			≤0.05D 0.5D—1.5D		

D:Dia.

Slotting

Work material	Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.		
Dia. (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	1400	170	6.7
20	1100	130	5.1
Depth of cut	D 0.5D—1.5D		

D:Dia.

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.

VF6MHVCH

End mill, Medium cut length, 6 flute, Irregular helix flutes with multiple internal through coolant holes

VF6MHVRBCH

Corner radius end mill, Medium cut length, 6 flute, Irregular helix flutes, with multiple internal through coolant holes

Shoulder milling

Work material	Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
Dia. (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	≤0.1D 0.5D—1.5D			≤0.05D 0.5D—1.5D		

D:Dia.

Trochoidal milling

Work material	Austenitic Stainless Steel Titanium alloy AISI 304, AISI 316, Ti-6Al-4V etc.		
Dia. (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	1.5D≤ ≤0.1D 0.5D—1.5D		

D:Dia.

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.

VFMHVCH	➤ I156	VF6MHVCH	➤ I159
VFMHVRBCH	➤ I193	VF6MHVRBCH	➤ I195

VF8MHVCH

End mill, Medium cut length, 8 flute, Irregular helix flutes with multiple internal through coolant holes

VF8MHVRBCH

Corner radius end mill, Medium cut length, 8 flute, Irregular helix flutes, with multiple internal through coolant holes

Shoulder milling

Work material	Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
Dia. (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	≤0.08D 0.5D—1.5D			≤0.05D 0.5D—1.5D		

D:Dia.

Trochoidal milling

Work material	Austenitic Stainless Steel Titanium alloy AISI 304, AISI 316, Ti-6Al-4V etc.		
Dia. (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	3000	1400	55.1
20	2400	1200	47.2
Depth of cut	1.5D≤ ≤0.08D 0.5D—1.5D		

D:Dia.

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.

VFSFPRCH

Roughing end mill, Short cut length, 4 flute, with multiple internal through coolant holes

Shoulder milling

Work material	Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
Dia. (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	≤0.5D 0.5D—1.5D			≤0.3D 0.5D—1.0D		

D:Dia.

Slotting

Work material	Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.		
Dia. (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	800	100	3.9
20	600	80	3.1
Depth of cut	D 0.5D—1.0D		

D:Dia.

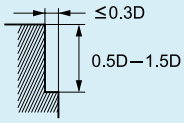
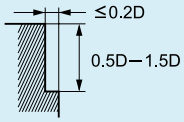
1) If the depth of cut is shallow, the revolution and feed rate can be increased.
2) If the rigidity of the machine or the workpiece installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.
3) For shoulder milling, climb cutting is recommended.

VF8MHVCH ➤ I160
VF8MHVRBCH ➤ I196
VFSFPRCH ➤ I165

VF6SVRCH

Roughing end mill, Short cut length, 6 flute, Irregular helix flutes, with multiple internal through coolant holes

Shoulder milling

Work material	Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
Dia. (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						

D:Dia.

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.

DFC4JC

End mill, Semi long cut length, 4 flute, For CFRP

Work material	CFRP		
Dia. (mm)	Revolution (min^{-1})	Table feed	
		(mm/min)	(IPM)
6	11000	950	37.4
8	8000	780	30.7
10	6400	700	27.6
12	5300	650	25.6

DFCJRT

Cross-nick type end mill , Semi long cut length, For CFRP

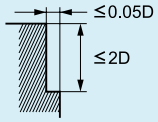
Work material	CFRP		
Dia. (mm)	Revolution (min^{-1})	Table feed	
		(mm/min)	(IPM)
6	11000	1200	47.2
8	8000	1000	39.4
10	6400	900	35.4
12	5300	850	33.4

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 0.8D1, we recommend reducing the feed rate.
4) Please take precautions against dust.

DFC4JC ➤ I197
DFCJRT ➤ I198

DF4JC

End mill, Semi long cut length, 4 flute, For graphite

Work material	Graphite		
Dia. (mm)	Revolution (min^{-1})	Table feed	
		(mm/min)	(IPM)
3	22000	2500	98.4
4	18000	2900	114.2
6	14000	3200	126.0
8	10500	2900	114.2
10	8700	2600	102.4
12	7200	2200	86.6
Depth of cut	 D:Dia.		

1) When high machining accuracy is needed, or the workpiece becomes chipped, we recommend lowering the feed rate.
2) Use a milling machine dedicated for graphite.
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.

DF4XL

End mill, Long neck, 4 flute, For graphite

Shoulder milling

Work material		Graphite		
Dia. (mm)	Neck length (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
1	6	30000	1300	51.2
	8	25000	1000	39.4
	10	22000	700	27.6
1.5	10	25000	1200	47.2
	16	18000	800	31.5
2	10	22000	1500	59.1
	16	19000	1100	43.3
	20	16000	800	31.5
3	16	21000	1900	74.8
	20	18000	1500	59.1
	30	14000	1000	39.4
4	20	18000	2400	94.5
	40	13000	1500	59.1
6	30	14000	3200	126.0
8	30	10500	2900	114.2
10	30	8700	2600	102.4
12	30	7200	2200	86.6
Depth of cut		≤0.05D (D<ϕ4) ≤0.1D (ϕ4≤D) ≤D D:Dia.		

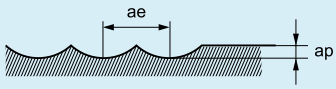
Slotting

Work material		Graphite			
Dia. (mm)	Neck length (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)
1	6	30000	1000	39.4	0.1
	8	25000	700	27.6	0.08
	10	22000	500	19.7	0.06
1.5	10	25000	1100	43.3	0.14
	16	18000	600	23.6	0.1
2	10	22000	1200	47.2	0.2
	16	19000	800	31.5	0.16
	20	16000	600	23.6	0.12
3	16	21000	1400	55.1	0.3
	20	18000	1100	43.3	0.25
	30	14000	700	27.6	0.2
4	20	18000	1800	70.9	0.5
	40	13000	900	35.4	0.4
6	30	14000	2300	90.6	1.2
8	30	10500	2000	78.7	2
10	30	8700	1900	74.8	3
12	30	7200	1700	66.9	4
Depth of cut		D ap D:Dia.			

1) When high machining accuracy is needed, or the workpiece becomes chipped, we recommend lowering the feed rate.
2) Use a milling machine dedicated for graphite.
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.

DF2MB

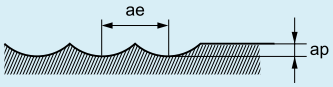
Ball nose, Medium cut length, 2 flute, For graphite

Work material		Graphite				
R (mm)	Overall length (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
R3	**100**	10000—16000	1200—2100	47.2—82.7	0.6	1.5
	150	6000—10000	600—1200	23.6—47.2	0.4	1.2
R4	**110**	9000—12000	1500—2200	59.1—86.6	0.8	2
	150	5000— 9000	700—1500	27.6—59.1	0.6	1.6
R5	**120**	7500—10000	1700—2400	66.9—94.5	1	2.5
	180	5000— 7500	1000—1700	39.4—66.9	0.8	2
R6	**130**	6000— 8000	1300—1900	51.2—74.8	1.2	3
	200	4000— 6000	800—1300	31.5—51.2	1	2.5
Depth of cut						

1) When high machining accuracy is needed, or the workpiece becomes chipped, we recommend lowering the feed rate.
2) Use a milling machine dedicated for graphite.
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.

DF2XLB

Ball nose, 2 flute, Long neck, For graphite

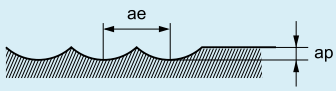
Work material		Graphite				
R (mm)	Neck length (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
R0.2	1	40000	1500	59.1	0.05	0.15
	2	40000	1500	59.1	0.05	0.12
	3	40000	1300	51.2	0.04	0.12
	4	40000	1300	51.2	0.04	0.1
	8	30000	800	31.5	0.03	0.1
	12	20000	450	17.7	0.03	0.08
R0.25	4	40000	1500	59.1	0.05	0.15
R0.3	2	40000	1800	70.9	0.07	0.2
	4	40000	1500	59.1	0.06	0.18
	6	40000	1500	59.1	0.06	0.15
	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
	8	40000	1700	66.9	0.08	0.15
R0.5	4	40000	2500	98.4	0.12	0.3
	6	40000	2500	98.4	0.1	0.3
	8	40000	2000	78.7	0.1	0.25
	10	40000	2000	78.7	0.1	0.2
	12	40000	2000	78.7	0.1	0.2
	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
R0.75	8	40000	2800	110.2	0.15	0.45
	10	40000	2800	110.2	0.15	0.45
	16	35000	2000	78.7	0.15	0.3
	30	27000	1000	39.4	0.1	0.3
R1	8	40000	3000	118.1	0.23	0.7
	10	40000	3000	118.1	0.2	0.6
	12	35000	2500	98.4	0.2	0.6
	16	30000	2000	78.7	0.2	0.5
	20	30000	2000	78.7	0.2	0.5
	25	25000	1500	59.1	0.18	0.45
	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
	25	20000	2000	78.7	0.25	0.75
	40	16000	1500	59.1	0.2	0.6
	60	14000	1000	39.4	0.17	0.45
R2	20	21000	3000	129.9	0.5	1.5
	30	15000	2000	78.7	0.4	1.2
	40	13000	1600	63.0	0.35	1
	60	12000	1400	55.1	0.3	0.9
Depth of cut						

1) When high machining accuracy is needed, or the workpiece becomes chipped, we recommend lowering the feed rate.
2) Use a milling machine dedicated for graphite.
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.

DF2XLB ➤ I202

DF3XB

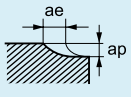
Ball nose, 3 flute, Taper neck, For graphite

Work material		Graphite				
R (mm)	Neck length (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
R0.5	**30**	20000	1100	43.3	0.05	0.13
	40	15000	750	29.5	0.04	0.11
	50	12000	500	19.7	0.03	0.1
R1	**40**	20000	1800	70.9	0.13	0.4
	60	15000	900	35.4	0.09	0.27
	80	12000	600	23.6	0.07	0.2
R1.5	**60**	14000	1700	66.9	0.15	0.45
	80	12000	1200	47.2	0.12	0.35
R2	**100**	10000	1100	43.3	0.2	0.5
Depth of cut						

1) When high machining accuracy is needed, or the workpiece becomes chipped, we recommend lowering the feed rate.
2) Use a milling machine dedicated for graphite.
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.

DFPSRB

Corner radius end mill, Short cut length, 2-4 flute, High precision, For graphite

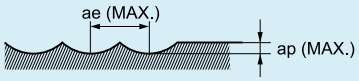
Work material			Graphite				
Dia. (mm)	R (mm)	Neck length (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
0.5	0.1	4	30000	1100	43.3	0.05	0.23
	0.1	5	28000	960	37.8	0.05	0.23
	0.1	6	25000	850	33.5	0.05	0.23
	0.1	10	22000	600	23.6	0.04	0.21
	0.1	15	20000	500	19.7	0.03	0.18
0.8	0.1	6	28000	1300	51.2	0.08	0.45
	0.1	8	22000	900	35.4	0.08	0.45
1	0.1	8	25000	1500	59.1	0.1	0.6
	0.1	12	22000	1300	51.2	0.1	0.6
	0.2	8	25000	1500	59.1	0.1	0.45
	0.2	12	22000	1300	51.2	0.1	0.45
	0.2	16	18000	1000	39.4	0.08	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	25000	2100	82.7	0.15	0.8
	0.2	20	18000	1400	55.1	0.15	0.8
2	0.2	12	22000	3000	118.1	0.2	1.2
	0.2	16	19000	2500	98.4	0.2	1.2
	0.2	20	16000	2000	78.7	0.2	1.2
	0.2	30	13000	1600	63.0	0.16	1
	0.2	40	11000	1200	47.2	0.14	0.8
3	0.2	20	18000	3000	118.1	0.3	2
	0.2	40	12000	1800	70.9	0.25	1.7
	0.5	20	18000	3000	118.1	0.3	1.5
4	0.2	20	18000	4200	165.4	0.4	2.7
	0.2	40	13000	2800	110.2	0.4	2.7
	0.5	20	18000	4200	165.4	0.4	2.3
	0.5	40	13000	2800	110.2	0.4	2.3
6	0.5	30	14000	4600	181.1	0.6	3.8
	1	30	14000	4600	181.1	0.6	3
8	0.5	30	10500	4000	157.5	0.8	5.3
	1	30	10500	4000	157.5	0.8	4.5
10	0.5	40	8700	3500	137.8	1	6.8
	1	40	8700	3500	137.8	1	6
12	0.5	40	7200	3000	118.1	1.2	8
Depth of cut							

1) When high machining accuracy is needed, or the workpiece becomes chipped, we recommend lowering the feed rate.
2) Use a milling machine dedicated for graphite.
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.

DFPSRB ➤ I205

CBN2XLB

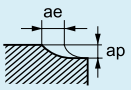
Ball nose, Short cut length, 2 flute, Long neck

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.				
R (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

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.				
Dia. (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															

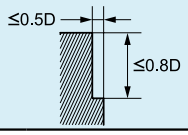
1) If the depth of cut is smaller than this table, feed rate can be increased.
2) Oil mist coolant is recommended.
3) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

CBN2XLRB ➤ I209

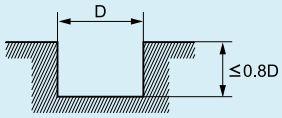
C2SA

2 flute, Short cut length, Relieved neck, For aluminum alloy

Shoulder milling

Work material	Aluminum alloy		
Dia. (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (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	 D:Dia.		

Slotting

Work material	Aluminum alloy		
Dia. (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (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	 D:Dia.		

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.

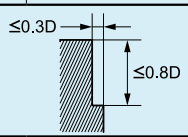
C3SA

3 flute, Short cut length, Relieved neck, For aluminum alloy

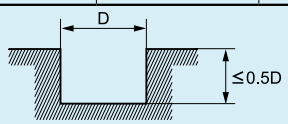
C3SARB

Corner radius, Short cut length, 3 flute, For aluminum alloy

Shoulder milling

Work material	Aluminum alloy		
Dia. (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (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	 D:Dia.		

Slotting

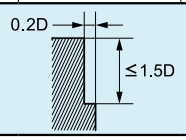
Work material	Aluminum alloy		
Dia. (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
12	13000	3200	126.0
16	10000	3200	126.0
18	9000	3000	118.1
20	8000	3000	118.1
25	6000	2800	110.2
Depth of cut	 D:Dia.		

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.

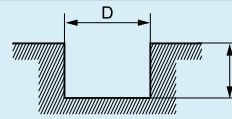
C2MHA

2 flute, Medium cut length, Relieved neck, For aluminum alloy

Shoulder milling

Work material	Aluminum alloy		
Dia. (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (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	 D:Dia.		

Slotting

Work material	Aluminum alloy		
Dia. (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (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	 D:Dia.		

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.

C2MHA ➤ I212

Memo

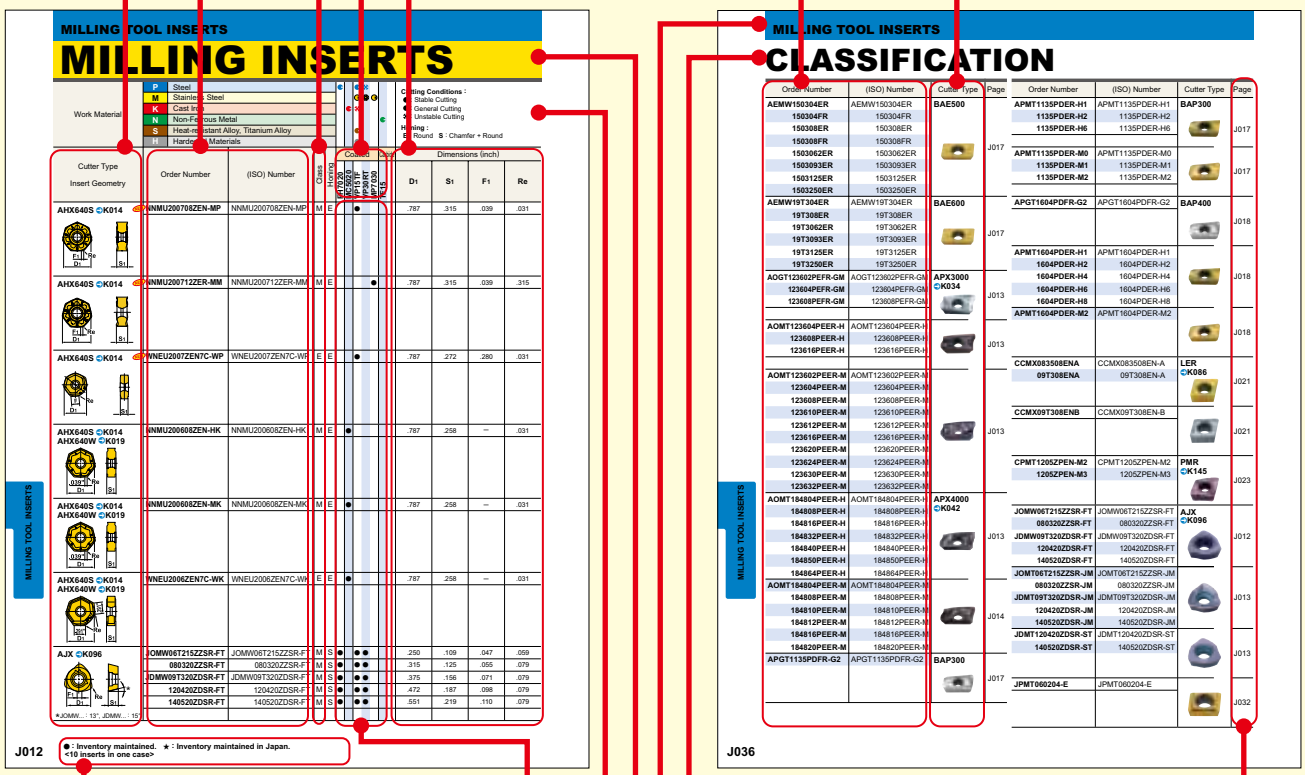
GUIDE TO MILLING TOOL INSERTS

●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) J006
CERMET J008
CEMENTED CARBIDE J009
CBN(SINTERED CBN) J010
PCD(SINTERED DIAMOND) J011

STANDARD MILLING INSERTS
ROTATING INSERTS J012
CBN AND PCD J034

CLASSIFICATION J036

IDENTIFICATION

ISO CODES FOR MILLING

Symbol	Insert Shape
O	Octagonal
S	Square
T	Triangular
C	Rhombic 80°
M	Rhombic 86°
A	Parallelogram 85°
R	Round
X	Special Design
W	Wiper

① Insert Shape

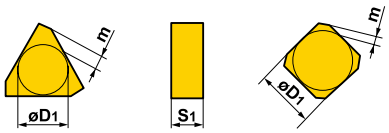
Symbol	Relief Angle
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Other
X	Other

Major Relief Angle

② Relief Angle

	①	②	③	④
INCH	S	E	E	R
METRIC	S	E	E	R

③ Tolerance Class



Class	D1 (I.C.)	Tolerance of I.C.	m	S1
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

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

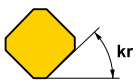
⑥ Insert Thickness

E	Round
F	Sharp
T	Chamfer
S	Chamfer+Hone
X	Round(small)
Z	Chamfer

⑨ Cutting Edge Condition

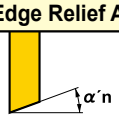
⑤	⑥			⑨				
4	2	A	F	E	R	1	-	JS
12	03	A	F	E	R	1	-	JS
		⑦	⑧		⑩	⑪		⑫

⑦ Cutting Edge Angle



A	45°
E	75°
P	90°

⑧ Wiper Edge Relief Angle

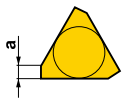


D	15°
E	20°
F	25°

⑩ Cutting Direction

L	Left
N	Neutral
R	Right

⑪ Width of Wiper Edge



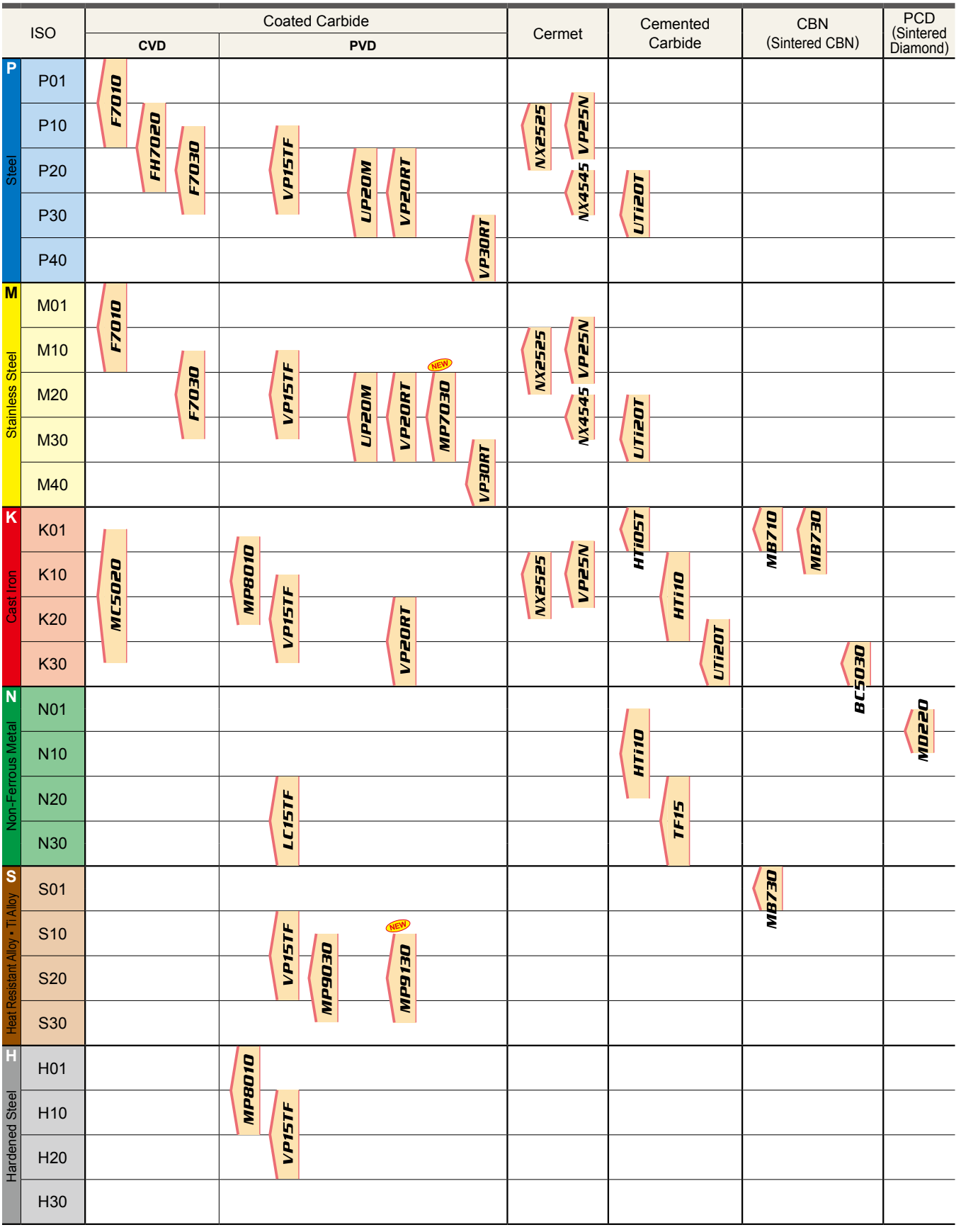
1	.055
2	.094

⑫ Molded Chipbreaker for Milling



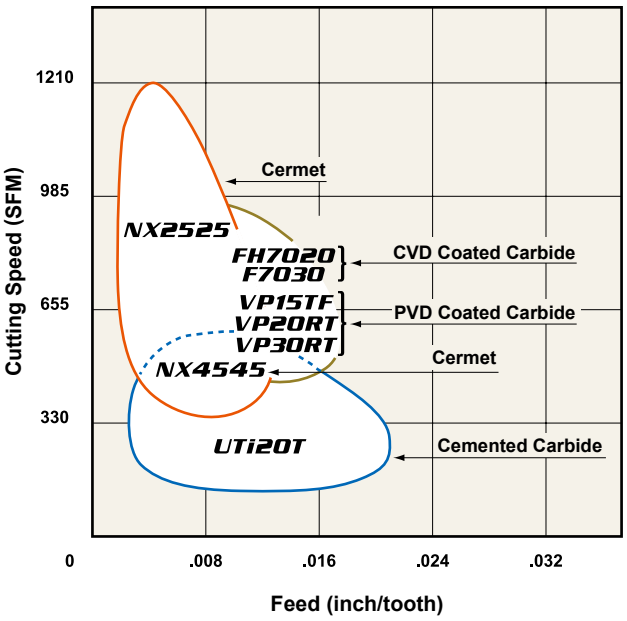
GRADES FOR MILLING

INDEXABLE INSERT GRADES FOR MILLING

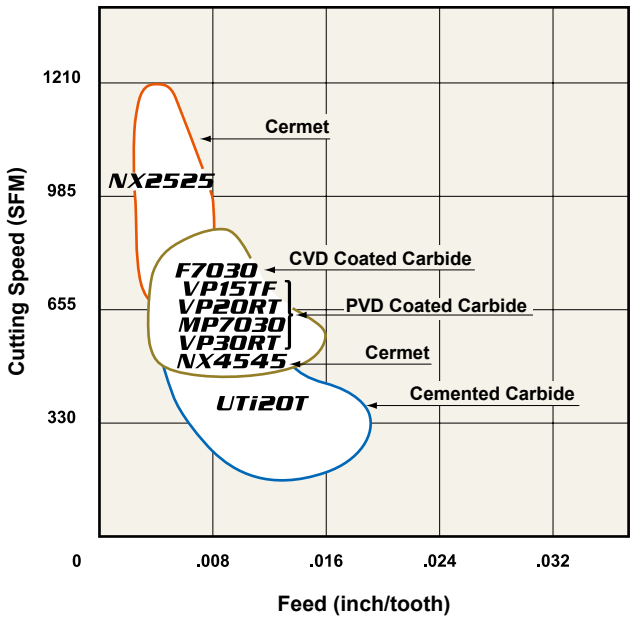


MILLING APPLICATION RANGE

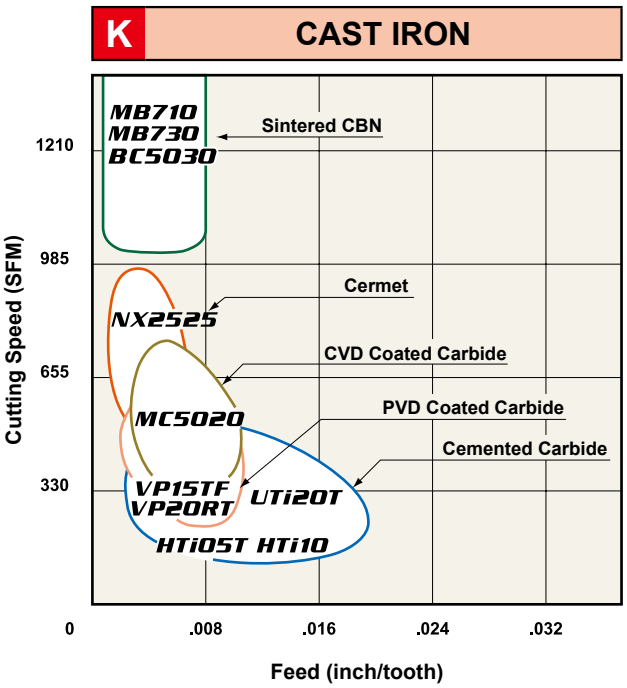
P STEEL



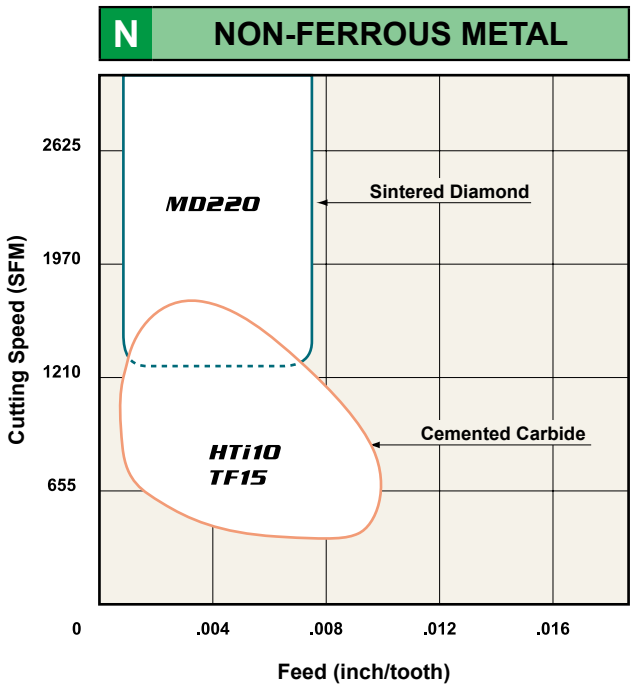
M STAINLESS STEEL



K CAST IRON



N NON-FERROUS METAL



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	F7010	755 (490 — 985)	P01	F7010
		F7030	655 (490 — 820)	P10	FH7020, F7030, VP15TF, UP20M, VP20RT
		VP15TF	575 (400 — 750)	P20	
		VP30RT	575 (400 — 750)	P30	VP30RT
		UP20M	390 (330 — 490)	P40	
M	Stainless Steel	F7010	755 (490 — 985)	M01	F7010
		F7030	655 (490 — 820)	M10	F7030, VP15TF, UP20M, VP20RT, NEW MP7030
		MP7030	490 (330 — 655)	M20	
		VP15TF	490 (330 — 655)	M30	VP30RT
		VP30RT	490 (330 — 655)	M40	
		UP20M	390 (330 — 490)		
K	Cast Iron	MC5020	590 (330 — 820)	K01	MC5020
		F5010	655 (490 — 820)	K10	VP15TF
		F5020	490 (330 — 655)	K20	VP20RT
		VP15TF	490 (330 — 655)	K30	
N	Aluminum Alloy	LC15TF	1000 (200 — 3000)	N10	
				N20	LC15TF
				N30	
S	Heat Resistant Alloy Ti Alloy	VP15TF	100 (65 — 130)	S01	
		MP9030	131 (82 — 197)	S10	VP15TF, MP9030, NEW MP9130
		MP9130	131 (82 — 197)	S20	
				S30	
H	Hardened Materials	VP15TF	80 (50 — 110)	H01	MP8010
				H10	VP15TF
				H20	
				H30	

GRADE CHARACTERISTICS

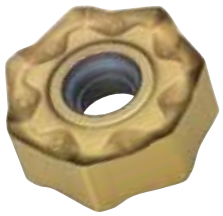
Grade	Substrate		Coating Layer	
	Hardness (HRA)	T.R.S (GPa)	Composition	Thickness
MC5020	91.0	2.2	TiCN-Al_2O_3-Ti Compound	Thick
F7010	89.0	2.6	TiCN-Al_2O_3-TiN	Thin
FH7020	88.8	2.8	TiCN-Al_2O_3-Ti Compound	Thick
F7030	88.8	2.8	TiCN-Al_2O_3-TiN	Thin
MP7030	90.5	2.5	(Al,Ti)N-Ti Compound	Thin
MP8010	93.5	2.3	(Al,Ti, Si)N	Thin
MP9030	90.5	2.5	(Al,Ti)N-Ti Compound	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

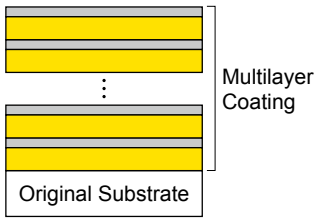
For Machining of Stainless Steel

NEW

MP7030



MP7030 is Multilayer coating basede 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

NEW

MP9130



An new and enhanced super fine cemented carbide substrate has increased toughness whilst 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	Substrate			
	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	UTi20T
				P20	
				P30	
M	Stainless Steel	**UTi20T**	390 (165 — 590)	M10	UTi20T
				M20	
				M30	
K	Cast Iron	**HTi10**	330 (165 — 490)	K10	HTi10
				K20	UTi20T
		UTi20T	390 (165 — 590)	K30	
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
	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	MB710 MB730	−.012	−.020	Dry
	Pearilitic				

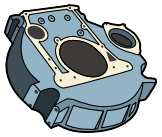
ROUGHING

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.

PCD (SINTERED DIAMOND)

- **Suitable for non-ferrous metals cutting such as aluminum alloy.**
- **Suitable for extremely high speed finishing.**



Micro-Structure of **MD220**

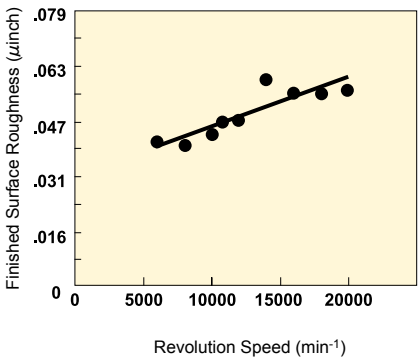
GRADE FEATURES

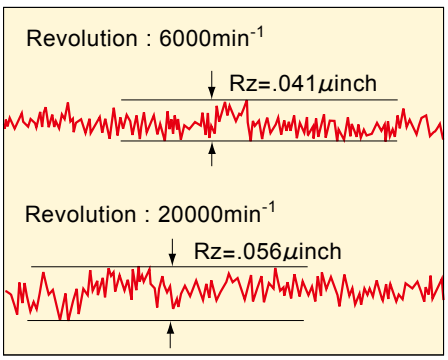
Grade	Features
MD220	Excellent in the balance between wear resistance and fracutre resistance. A wide range of tooling application.

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>

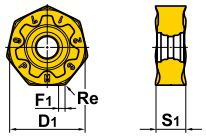
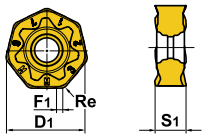
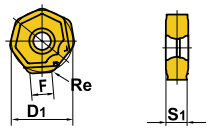
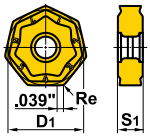
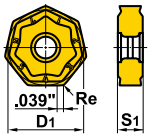
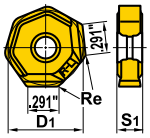
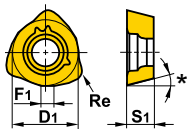
Workpiece : Aluminum Alloy
Insert : NP-GDCW1240PDFR2
Grade : MD220
Tool : V10000R0406D
Feed : .008inch/tooth
Depth of Cut : .020inch
Width of Cut : 3.150inch
Dry Cutiing

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					Carbide	Dimensions (inch)			
					FH7020	MC5020	VP15TF	VP30RT	MP7030	TF15	D1	S1	F1	Re
AHX640S ➲K014	NEW **NNMU200708ZEN-MP**	NNMU200708ZEN-MP	M	E			●				.787	.315	.039	.031
														
AHX640S ➲K014	NEW **NNMU200712ZER-MM**	NNMU200712ZER-MM	M	E					●		.787	.315	.039	.315
														
AHX640S ➲K014	NEW **WNEU2007ZEN7C-WP**	WNEU2007ZEN7C-WP	E	E			●				.787	.272	.280	.031
														
AHX640S ➲K014 **AHX640W ➲K019**	**NNMU200608ZEN-HK**	NNMU200608ZEN-HK	M	E		●					.787	.258	–	.031
														
AHX640S ➲K014 **AHX640W ➲K019**	**NNMU200608ZEN-MK**	NNMU200608ZEN-MK	M	E		●					.787	.258	–	.031
														
AHX640S ➲K014 **AHX640W ➲K019**	**WNEU2006ZEN7C-WK**	WNEU2006ZEN7C-WK	E	E		●					.787	.258	–	.031
														
AJX ➲K096	**JOMW06T215ZZSR-FT**	JOMW06T215ZZSR-FT	M	S	●		●	●			.250	.109	.047	.059
	**080320ZZSR-FT**	080320ZZSR-FT	M	S	●		●	●			.315	.125	.055	.079
	JDMW09T320ZDSR-FT	JDMW09T320ZDSR-FT	M	S	●		●	●			.375	.156	.071	.079
	120420ZDSR-FT	120420ZDSR-FT	M	S	●		●	●			.472	.187	.098	.079
	140520ZDSR-FT	140520ZDSR-FT	M	S	●		●	●			.551	.219	.110	.079

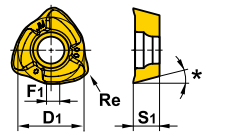
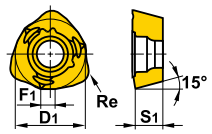
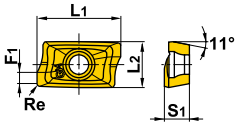
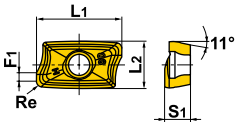
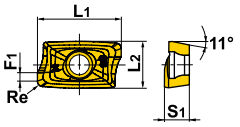
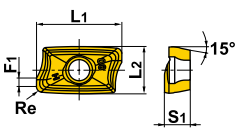
✱JOMW... : 13°, JDMW... : 15°

● : 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

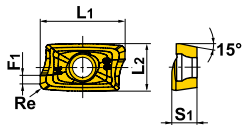
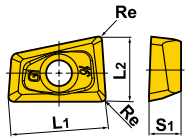
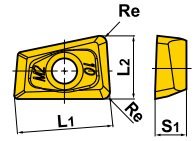
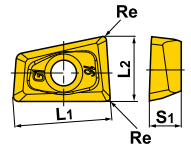
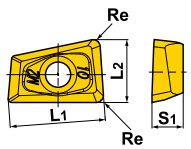
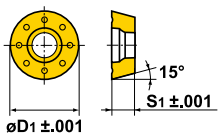
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated					Carbide	Dimensions (inch)					
					FH7020	MC5020	VP15TF	VP20RT	VP30RT	TF15	L1	L2	D1	S1	F1	Re
AJX ➲K096	**JOMT06T215ZZSR-JM**	JOMT06T215ZZSR-JM	M	S	●		●		●		–	–	.250	.109	.047	.059
	**080320ZZSR-JM**	080320ZZSR-JM	M	S	●		●		●		–	–	.315	.125	.055	.079
	JDMT09T320ZDSR-JM	JDMT09T320ZDSR-JM	M	S	●		●		●		–	–	.375	.156	.071	.079
	120420ZDSR-JM	120420ZDSR-JM	M	S	●		●		●		–	–	.472	.187	.098	.079
	140520ZDSR-JM	140520ZDSR-JM	M	S	●		●		●		–	–	.551	.219	.110	.079
✱JOMW... : 13°, JDMW... : 15°																
AJX ➲K096	**JDMT120420ZDSR-ST**	JDMT120420ZDSR-ST	M	S	●		●		●		–	–	.472	.187	.098	.079
	**140520ZDSR-ST**	140520ZDSR-ST	M	S	●		●		●		–	–	.551	.219	.110	.079
APX3000 ➲K034	**AOGT123602PEFR-GM**	AOGT123602PEFR-GM	G	F						●	.472	.260	–	.142	.071	.008
	**123604PEFR-GM**	123604PEFR-GM	G	F						●	.472	.260	–	.142	.063	.016
	123608PEFR-GM	123608PEFR-GM	G	F						●	.472	.260	–	.142	.047	.031
APX3000 ➲K034	**AOMT123604PEER-H**	AOMT123604PEER-H	M	E		●	●	●			.472	.260	–	.142	.063	.016
	**123608PEER-H**	123608PEER-H	M	E		●	●	●			.472	.260	–	.142	.047	.031
	123616PEER-H	123616PEER-H	M	E		●	●	●			.472	.260	–	.142	.016	.063
APX3000 ➲K034	**AOMT123602PEER-M**	AOMT123602PEER-M	M	E			●	●			.472	.260	–	.142	.071	.008
	**123604PEER-M**	123604PEER-M	M	E			●	●			.472	.260	–	.142	.063	.016
	123608PEER-M	123608PEER-M	M	E			●	●			.472	.260	–	.142	.047	.031
	123610PEER-M	123610PEER-M	M	E			★	★			.472	.260	–	.142	.039	.039
	123612PEER-M	123612PEER-M	M	E			●	●			.472	.260	–	.142	.031	.047
	123616PEER-M	123616PEER-M	M	E			●	●			.472	.260	–	.142	.016	.063
	123620PEER-M	123620PEER-M	M	E			●	●			.472	.260	–	.142	.016	.079
	123624PEER-M	123624PEER-M	M	E			●	●			.472	.260	–	.142	.016	.094
	123630PEER-M	123630PEER-M	M	E			●	●			.472	.260	–	.142	.016	.118
	123632PEER-M	123632PEER-M	M	E			●	●			.472	.260	–	.142	.016	.125
APX4000 ➲K042	**AOMT184804PEER-H**	AOMT184804PEER-H	M	E		●	●	●			.709	.354	–	.189	.071	.016
	**184808PEER-H**	184808PEER-H	M	E		●	●	●			.709	.354	–	.189	.055	.031
	184816PEER-H	184816PEER-H	M	E		●	●	●			.709	.354	–	.189	.016	.063
	184832PEER-H	184832PEER-H	M	E				●			.709	.354	–	.189	.016	.125
	184840PEER-H	184840PEER-H	M	E				●			.709	.354	–	.189	.016	.157
	184850PEER-H	184850PEER-H	M	E				●			.709	.354	–	.189	–	.197
	184864PEER-H	184864PEER-H	M	E				●			.709	.354	–	.189	–	.250

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)					
					VP15TF	VP20RT	VP30RT	MP8010	HTi10	L1	L2	D1	F1	S1	Re
APX4000 ➲K042 	**AOMT184804PEER-M**	AOMT184804PEER-M	M	E	●	●				.709	.354	–	.189	.189	.016
	184808PEER-M	184808PEER-M	M	E	●	●				.709	.354	–	.189	.189	.031
	184810PEER-M	184810PEER-M	M	E	★					.709	.354	–	.189	.189	.039
	184812PEER-M	184812PEER-M	M	E	●					.709	.354	–	.189	.189	.047
	184816PEER-M	184816PEER-M	M	E	●	●				.709	.354	–	.189	.189	.063
	184820PEER-M	184820PEER-M	M	E	★					.709	.354	–	.189	.189	.079
AQX ➲K088 	**QOGT0830R-G1**	QOGT0830R-G1	G	F ✱1	★				●	.350	.220	–	.120	.120	.016
	0934R-G1	0934R-G1	G	F					●	.401	.264	–	.134	.134	.016
	1443R-G1	1443R-G1	G	F					●	.528	.350	–	.169	.169	.016
	1651R-G1	1651R-G1	G	F ✱1	★				●	.650	.433	–	.200	.200	.016
	1959R-G1	1959R-G1	G	F					●	.768	.512	–	.232	.232	.016
AQX ➲K088 	**QOMT0830R-M2**	QOMT0830R-M2	M	E	●		●			.350	.220	–	.120	.120	.031
	0934R-M2	0934R-M2	M	E	●		●			.401	.264	–	.134	.134	.031
	1443R-M2	1443R-M2	M	E	●		●			.528	.350	–	.169	.169	.031
	1651R-M2	1651R-M2	M	E	●		●			.650	.433	–	.200	.200	.031
	1959R-M2	1959R-M2	M	E	●		●			.768	.512	–	.232	.232	.031
AQX (METRIC) ➲K089 	**QOGT0830R-G1**	QOGT0830R-G1	G	F ✱1	★				●	.350	.220	–	–	.120	.016
	1035R-G1	1035R-G1	G	F ✱1	★				★	.417	.276	–	–	.138	.016
	1342R-G1	1342R-G1	G	F ✱1	★				★	.516	.343	–	–	.165	.016
	1651R-G1	1651R-G1	G	F ✱1	★				●	.650	.433	–	–	.200	.016
	1856R-G1	1856R-G1	G	F ✱1	★				★	.709	.472	–	–	.220	.016
	2062R-G1	2062R-G1	G	F ✱1	★				★	.803	.535	–	–	.244	.016
	2576R-G1	2576R-G1	G	F ✱1	★				★	1.016	.677	–	–	.299	.016
AQX (METRIC) ➲K089 	**QOMT0830R-M2**	QOMT0830R-M2	M	E	●		●			.350	.220	–	–	.120	.031
	1035R-M2	1035R-M2	M	E	★		★			.417	.276	–	–	.138	.031
	1342R-M2	1342R-M2	M	E	★		★			.516	.343	–	–	.165	.031
	1651R-M2	1651R-M2	M	E	●		●			.650	.433	–	–	.200	.031
	1856R-M2	1856R-M2	M	E	★		★			.709	.472	–	–	.220	.031
	2062R-M2	2062R-M2	M	E	★		★			.803	.535	–	–	.244	.031
	2576R-M2	2576R-M2	M	E	★		★			1.016	.677	–	–	.299	.031
ARX (METRIC) ➲K108 	**RDMW0517M0E**	RDMW0517M0E	G	E	★			★		–	–	.197	–	.067	–
	0620M0E	0620M0E	G	E	★			★		–	–	.236	–	.078	–
	0724M0E	0724M0E	G	E	★			★		–	–	.276	–	.094	–

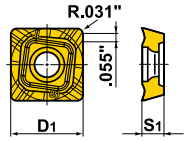
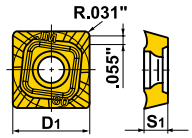
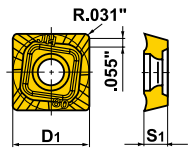
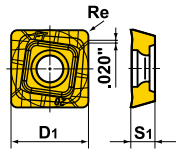
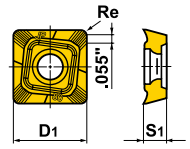
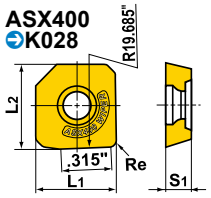
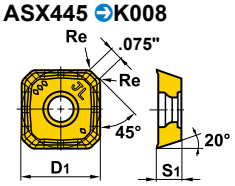
✱1 Grade VP15TF has “E” honing.

● : 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

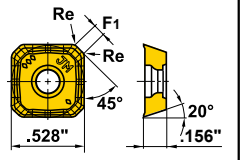
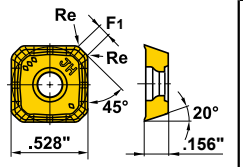
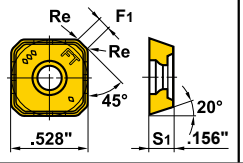
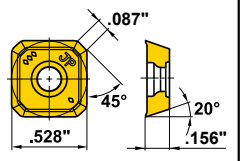
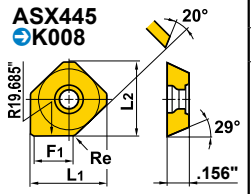
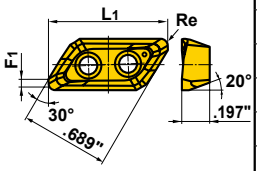
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated				Cermet		Carbide		Dimensions (inch)				
					F7010	F7030	MC5020	VP15TF	VP30RT	NX2525	NX4545	HTi05T	HT110	L_1	L_2	D_1	S_1	Re
ASX400 ➲K028 	**SOET12T308PEER-JL**	SOET12T308PEER-JL	E	E	●			●	●		●			–	–	.500	.156	–
ASX400 ➲K028  Right hand insert shown.	**SOMT12T308PEER-JM**	SOMT12T308PEER-JM	M	E	●	●	●	●	●		●			–	–	.500	.156	–
	12T308PEEL-JM	12T308PEEL-JM	M	E				★						–	–	.500	.156	–
ASX400 ➲K028 	**SOMT12T308PEER-JH**	SOMT12T308PEER-JH	M	E	●	●	●	●						–	–	.500	.156	–
ASX400 ➲K028 	**SOMT12T320PEER-FT**	SOMT12T320PEER-FT	M	E			●	●						–	–	.500	.156	.079
ASX400 ➲K028 	**SOGT12T308PEFR-JP**	SOGT12T308PEFR-JP	G	F								●		–	–	.500	.156	.031
ASX400 ➲K028 	**WOEW12T308PEER8C**	WOEW12T308PEER8C	E	E								●		.492	.520	–	.156	.031
	12T308PETR8C	12T308PETR8C	E	T						●				.492	.520	–	.156	.031
ASX445 ➲K008 	**SEET13T3AGEN-JL**	SEET13T3AGEN-JL	E	E	●			●	●		●			–	–	.528	.156	.059

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					Cermet		Coated Cermet	Carbide			Dimensions (inch)			
					F7010	F7030	MC5020	VP15TF	VP30RT	LC15TF	NX2525	NX4545	VP25N	HTi05T	HT110	TF15	L_1	L_2	F_1	Re
ASX445 ➲K008 	**SEMT13T3AGSN-JM**	SEMT13T3AGSN-JM	M	S	●	●	●	●	●			●					–	–	.075	.059
ASX445 ➲K008 	**SEMT13T3AGSN-JH**	SEMT13T3AGSN-JH	M	S		●	●	●	●								–	–	.075	.059
ASX445 ➲K008 	**SEMT13T3AGSN-FT**	SEMT13T3AGSN-FT	M	S			●										–	–	.075	.059
ASX445 ➲K008 	**SEGT13T3AGFN-JP**	SEGT13T3AGFN-JP	G	F										●			–	–	.087	–
ASX445 ➲K008 	**WEEW13T3AGER8C**	WEEW13T3AGER8C	E	E			●	●						●			.649	.654	.295	.059
	13T3AGTR8C	13T3AGTR8C	E	T							●		●				.649	.654	.295	.059
AXD4000 ➲K054 	**XDGX175004PDFR-GL**	XDGX175004PDFR-GL	G	F						★						●	.906	–	.067	.016
	175008PDFR-GL	175008PDFR-GL	G	F						★						●	.906	–	.051	.031
	175012PDFR-GL	175012PDFR-GL	G	F						★						●	.906	–	.035	.047
	175016PDFR-GL	175016PDFR-GL	G	F						★						●	.866	–	.055	.063
	175020PDFR-GL	175020PDFR-GL	G	F						★						●	.866	–	.039	.079
	175024PDFR-GL	175024PDFR-GL	G	F						★						●	.866	–	.024	.094
	175030PDFR-GL	175030PDFR-GL	G	F						★						●	.831	–	.031	.118
	175032PDFR-GL	175032PDFR-GL	G	F						★						●	.831	–	.024	.125
	175040PDFR-GL	175040PDFR-GL	G	F						★						●	.787	–	.031	.157
	175050PDFR-GL	175050PDFR-GL	G	F						★						●	.764	–	.016	.197

● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only. ▲ : This item to be discontinued within two years.
<10 inserts in one case>

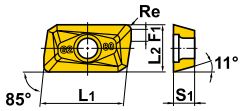
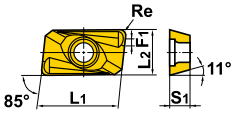
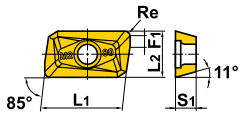
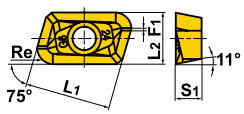
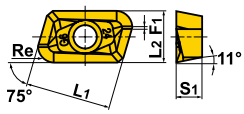
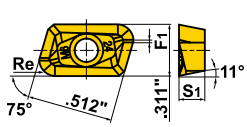
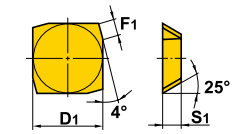
| Work Material | | |

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

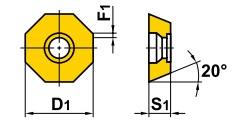
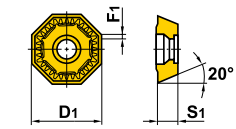
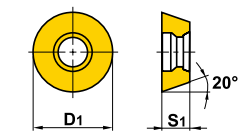
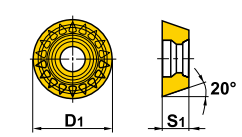
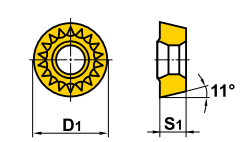
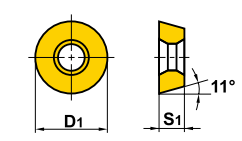
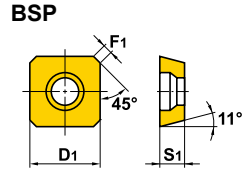
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated F7030	Coated VP15TF	Cermet NX4545	Carbide UTi20T	Carbide HT110	Dimensions (inch) L1	L2	D1	S1	F1	Re
BAP400 	**APGT1604PDFR-G2**	APGT1604PDFR-G2	G	F					●	.650	.375	–	.187	.055	.031
BAP400 	**APMT1604PDER-H1**	APMT1604PDER-H1	M	E	★			▲		.650	.375	–	.187	.067	.016
	1604PDER-H2	1604PDER-H2	M	E	●	●	●	▲	●	.650	.375	–	.187	.055	.031
	1604PDER-H4	1604PDER-H4	M	E	★					.650	.375	–	.187	.016	.063
	1604PDER-H6	1604PDER-H6	M	E	★					.650	.375	–	.187	.016	.094
	1604PDER-H8	1604PDER-H8	M	E	★			▲		.650	.375	–	.187	.016	.125
BAP400 	**APMT1604PDER-M2**	APMT1604PDER-M2	M	E	●	●	●			.650	.375	–	.187	.055	.031
BAP3500 	**XPGT13T3PDER-G1**	XPGT13T3PDER-G1	G	E		●				.512	.311	–	.156	.063	.016
	13T3PDER-G2	13T3PDER-G2	G	E		●				.512	.311	–	.156	.047	.031
	13T3PDER-G6	13T3PDER-G6	G	E		●				.512	.311	–	.156	.016	.094
	13T3PDER-G75	13T3PDER-G75	G	E		●				.512	.311	–	.156	.016	.118
	13T3PDER-G8	13T3PDER-G8	G	E		●				.512	.311	–	.156	.016	.125
BAP3500 	**XPGT13T3PDFR-G1**	XPGT13T3PDFR-G1	G	F					●	.512	.311	–	.156	.063	.016
	13T3PDFR-G2	13T3PDFR-G2	G	F					●	.512	.311	–	.156	.047	.031
	13T3PDFR-G6	13T3PDFR-G6	G	F					●	.512	.311	–	.156	.016	.094
	13T3PDFR-G75	13T3PDFR-G75	G	F					●	.512	.311	–	.156	.016	.118
	13T3PDFR-G8	13T3PDFR-G8	G	F					●	.512	.311	–	.156	.016	.125
BAP3500 	**XPMT13T3PDER-M1**	XPMT13T3PDER-M1	M	E	●	●				.512	.311	–	.156	.063	.016
	13T3PDER-M2	13T3PDER-M2	M	E	●	●				.512	.311	–	.156	.047	.031
	13T3PDER-M6	13T3PDER-M6	M	E	●	●				.512	.311	–	.156	.016	.094
	13T3PDER-M75	13T3PDER-M75	M	E	●	●				.512	.311	–	.156	.016	.118
	13T3PDER-M8	13T3PDER-M8	M	E	●	●				.512	.311	–	.156	.016	.125
BF407  Right hand insert shown.	**SFAN42ZFFR2**	SFAN1203ZFFR2	A	F					★	–	–	.500	.125	.094	–
	42ZFFL2	1203ZFFL2	A	F					★	–	–	.500	.125	.094	–
	SFCN42ZFFR2	SFCN1203ZFFR2	A	F					●	–	–	.500	.125	.094	–

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<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 **S** : Chamfer + Round
T : Chamfer

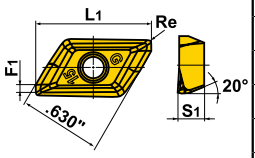
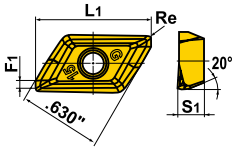
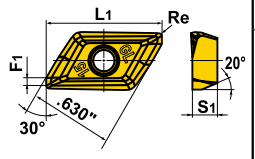
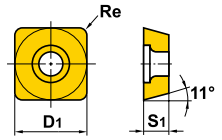
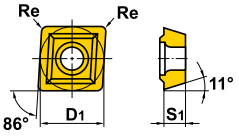
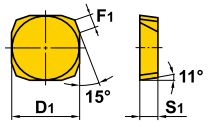
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated F7010	Coated F7030	Coated VP15TF	Coated AP20M	Coated UP20M	Coated Cermet NX2525	Coated Cermet NX4545	Carbide UTi20T	Dimensions (inch) D1	S1	F1
BOE ➲K116 	**OEMX12T3ETR1**	OEMX12T3ETR1	M	T						●			.500	.156	.039
	12T3ESR1	12T3ESR1	M	S		●							.500	.156	.039
	1705ETR1	1705ETR1	M	T	●		●				●		.669	.197	.055
	1705ESR1	1705ESR1	M	S		●							.669	.197	.055
BOE ➲K116 	**OEMX12T3EER1-JS**	OEMX12T3EER1-JS	M	E		★							.507	.156	.039
	12T3ETR1-JS	12T3ETR1-JS	M	T						●			.507	.156	.039
	1705EER1-JS	1705EER1-JS	M	E		★							.669	.197	.055
	1705ETR1-JS	1705ETR1-JS	M	T			●	★		●			.669	.197	.055
BOE ➲K116 	**REMX12T3TN**	REMX12T3TN	M	T				★				★	.500	.164	–
	1705EN	1705EN	M	E		●							.679	.205	–
	1705SN	1705SN	M	S		★							.679	.205	–
	1705TN	1705TN	M	T				★				★	.679	.205	–
BOE ➲K116 	**REMX12T3TN-JS**	REMX12T3TN-JS	M	T				★				★	.500	.164	–
	12T3EN-JS	REMX12T3EN-JS	M	E		●							.500	.164	–
	1705EN-JS	1705EN-JS	M	E		●							.679	.205	–
	1705TN-JS	1705TN-JS	M	T				★				★	.679	.205	–
BRP ➲K112 	**RPMT07T200E-JS**	RPMT07T200E-JS	M	E			●						.313	.109	–
	09T300E-JS	09T300E-JS	M	E			●						.375	.156	–
	120400E-JS	120400E-JS	M	E			●						.500	.188	–
	150600E-JS	150600E-JS	M	E			●						.625	.250	–
BRP ➲K112 	**RPMW07T200E**	RPMW07T200E	M	E			●						.313	.109	–
	09T300E	09T300E	M	E			●						.313	.156	–
	120400E	120400E	M	E	●		●						.500	.188	–
	150600E	150600E	M	E			●						.625	.250	–
BSP 	**SPMB1204APT**	SPMB1204APT	M	T					●			●	.500	.187	.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 **F** : Sharp

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	L1	D1	S1	F1	Re
BXD4000 ➲K068	**XDGT1550PDER-G04**	XDGT1550PDER-G04	G	E			●								.886	—	.197	.059	.016
	**1550PDER-G08**	1550PDER-G08	G	E			●								.886	—	.197	.043	.031
	1550PDER-G12	1550PDER-G12	G	E			★								.886	—	.197	.028	.047
	1550PDER-G16	1550PDER-G16	G	E			●								.886	—	.197	.016	.063
	1550PDER-G20	1550PDER-G20	G	E			●								.854	—	.197	.008	.079
	1550PDER-G30	1550PDER-G30	G	E			●								.787	—	.197	.024	.118
	1550PDER-G32	1550PDER-G32	G	E			●								.787	—	.197	.016	.125
	1550PDER-G40	1550PDER-G40	G	E			●								.748	—	.197	.020	.157
	1550PDER-G50	1550PDER-G50	G	E			●								.709	—	.197	.016	.197
BXD4000 ➲K068	**XDGT1550PDFR-G04**	XDGT1550PDFR-G04	G	F			★							●	.886	—	.197	.059	.016
	**1550PDFR-G08**	1550PDFR-G08	G	F			★							●	.886	—	.197	.043	.031
	1550PDFR-G12	1550PDFR-G12	G	F			★							★	.886	—	.197	.028	.047
	1550PDFR-G16	1550PDFR-G16	G	F			★							●	.886	—	.197	.016	.063
	1550PDFR-G20	1550PDFR-G20	G	F			★							●	.854	—	.197	.008	.079
	1550PDFR-G30	1550PDFR-G30	G	F			★							●	.787	—	.197	.024	.118
	1550PDFR-G32	1550PDFR-G32	G	F			★							●	.787	—	.197	.016	.125
	1550PDFR-G40	1550PDFR-G40	G	F			★							●	.748	—	.197	.020	.157
	1550PDFR-G50	1550PDFR-G50	G	F			★							●	.709	—	.197	.016	.197
BXD4000 ➲K068	**XDGT1550PDFR-GL04**	XDGT1550PDFR-GL04	G	F										●	.886	—	.197	.059	.016
	**1550PDFR-GL08**	1550PDFR-GL08	G	F										●	.886	—	.197	.043	.031
CFSP ➲K121	**SPMW321**	SPMW090304	M	E ✱1			●		★	★	★	★	★		—	.375	.125	—	.016
	**322**	090308	M	E ✱1			★		★	★	★	★	★		—	.375	.125	—	.031
	421	120304	M	E ✱1			●		●	★	★	●	●		—	.500	.125	—	.016
	422	120308	M	E ✱1			●		●	★	★	●	●		—	.500	.125	—	.031
ECMP ➲K120	**MPMM322**	MPMT090308	M	E			★					●			—	.375	.125	—	.031
	**432**	120408	M	E								●			—	.500	.1875	—	.031
FBP415	**SPEN42EEER1**	SPEN1203EEER1	E	E	●	●							★		—	.500	.125	.055	—
	**42EEEL1**	1203EEEL1	E	E		●							★		—	.500	.125	.055	—

Right hand insert shown.

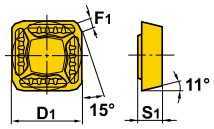
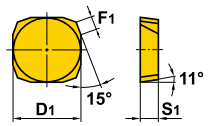
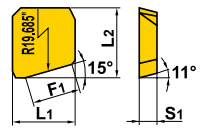
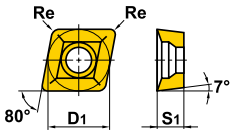
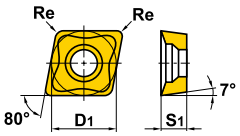
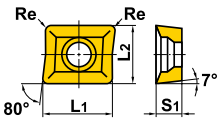
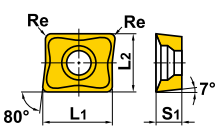
✱1 Grade NX2525 and NX4545 have "T" honing.

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : This item to be discontinued within two years.
<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

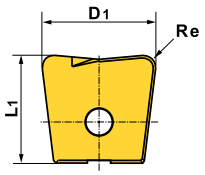
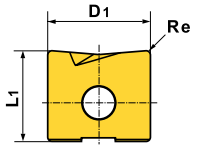
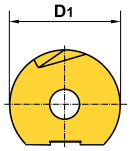
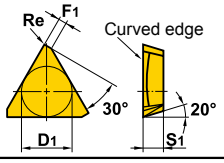
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated				Cermet	Carbide			Dimensions (inch)					
					F7030	MC5020	VP15TF	UP20M	NX2525	UTi20T	HTi05T	HT10	L1	L2	D1	S1	F1	Re
FBP415	**SPER42EEER-JS**	SPER1203EEER-JS	E	E		●							—	—	.500	.125	.055	—
																		
FBP415	**SPNN42EEER1**	SPNN1203EEER1	N	E		●						★	—	—	.500	.125	.055	—
	42EEEL1	1203EEEL1	N	E								★	—	—	.500	.125	.055	—
 Right hand insert shown.																		
FBP415	**WPC42EEER10C**	WPC42EEER10C	C	E							●		.500	.597	—	.125	.394	—
	42EEEL10C	42EEEL10C	C	E							★		.500	.597	—	.125	.394	—
 Right hand insert shown.																		
LER ➲K086	**CCMX083508ENA**	CCMX083508EN-A	M	E	★			●		▲			—	—	.313	.138	—	.031
	09T308ENA	09T308EN-A	M	E	●			● ●		▲			—	—	.375	.156	—	.031
																		
LER ➲K086	**CCMX09T308ENB**	CCMX09T308EN-B	M	E	★					▲			—	—	.375	.156	—	.031
																		
LER ➲K086	**ZCMX083508ERA**	ZCMX083508ER-A	M	E	★					▲			.409	.313	—	.137	—	.031
	09T308ERA	09T308ER-A	M	E	●			● ●	▲	▲			.472	.375	—	.156	—	.031
																		
LER ➲K086	**ZCMX09T308ERB**	ZCMX09T308ER-B	M	E	★			●		▲			.472	.375	—	.156	—	.031
																		

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	Cermet NX2525	Cermet NX4545	Carbide UTi20T	Carbide HTi10	Carbide APL05	Dimensions (inch) L1	D1	S1	F1	Re
MBD ➲K132 	**MBD0500021**	MBD0500021	D						●	.550	.500	–	–	.031
	0500041	0500041	D						●	.550	.500	–	–	.063
	0625021	0625021	D						●	.625	.625	–	–	.031
	0625041	0625041	D						●	.625	.625	–	–	.063
	0750021	0750021	D						●	.700	.750	–	–	.031
	0750041	0750041	D						●	.700	.750	–	–	.063
	1000021	1000021	D						●	.925	1.000	–	–	.031
	1000041	1000041	D						●	.925	1.000	–	–	.063
	1000081	1000081	D						●	.925	1.000	–	–	.125
MBF ➲K132 	**MBF0500021**	MBF0500021	F						●	.550	.500	–	–	.031
	0500041	0500041	F						●	.550	.500	–	–	.063
	0625021	0625021	F						●	.625	.625	–	–	.031
	0625041	0625041	F						●	.625	.625	–	–	.063
	0750021	0750021	F						●	.700	.750	–	–	.031
	0750041	0750041	F						●	.700	.750	–	–	.063
	1000021	1000021	F						●	.925	1.000	–	–	.031
	1000041	1000041	F						●	.925	1.000	–	–	.063
	1000081	1000081	F						●	.925	1.000	–	–	.125
MBN ➲K131 	**MBN0312001**	MBN0312001	N						●	–	.312	–	–	–
	0375001	0375001	N						●	–	.375	–	–	–
	0500001	0500001	N						●	–	.500	–	–	–
	0625001	0625001	N						●	–	.625	–	–	–
	0750001	0750001	N						●	–	.750	–	–	–
	1000001	1000001	N						●	–	1.000	–	–	–
	1250001	1250001	N						●	–	1.250	–	–	–
	M200001	M200001	N						●	–	.787	–	–	–
	M300001	M300001	N						●	–	1.181	–	–	–
NSE300 **For improved wall accuracy** 	**TECN32PEFR1W**	TECN1603PEFR1W	C	F			★			–	.375	.125	.055	.016
	32PEER1W	1603PEER1W	C	E			★			–	.375	.125	.055	.016
	32PETR1W	1603PETR1W	C	T	★	★	★			–	.375	.125	.055	.016

● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.
<10 inserts in one case>

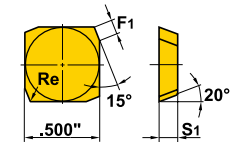
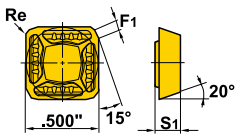
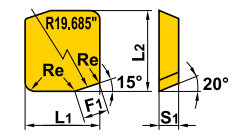
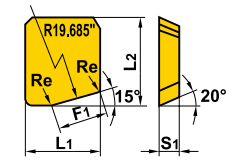
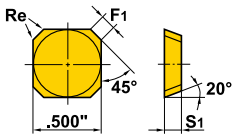
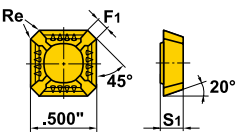
| Work Material | | |

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 **X** : Round (Small)

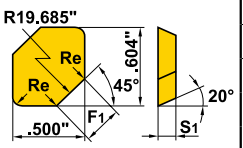
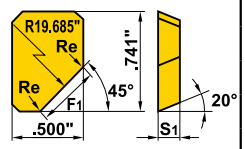
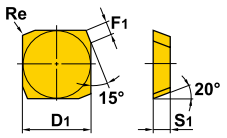
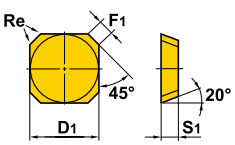
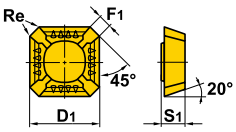
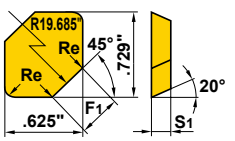
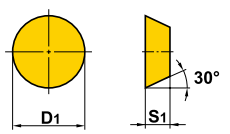
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated				Cermet		Carbide			Dimensions (inch)				
					F7010	F7030	MC5020	VP15TF	NX2525	NX4545	UTi20T	HTi05T	HT110	L_1	L_2	S_1	F_1	Re
SE415	**SEEN42EFFR1**	SEEN1203EFFR1	E	F									●	–	–	.125	.055	.039
	**42EFER1**	1203EFER1	E	E	●			●						–	–	.125	.055	.039
	42EFTR1	1203EFTR1	E	T					●	●				–	–	.125	.055	.039
	42EFSR1	1203EFSR1	E	S		★	★							–	–	.125	.055	.039
	SEKN42EFSR1	SEKN1203EFSR1	K	S		★								–	–	.125	.055	–
	42EFTR1	1203EFTR1	K	T							★			–	–	.125	.055	–
Right hand insert shown.	**42EFTR**	1203EFTR	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
	**42EFTR5C**	42EFTR5C	C	T					●					.500	.540	.125	.197	.039
SE415	**WEC42EFER10C**	WEC42EFER10C	C	E								★		.500	.590	.125	.394	.039
																		
SE445	**SECN42AFTN1**	SECN1203AFTN1	C	T						★				–	–	.125	.055	.039
	**SEEN42AFFN1**	SEEN1203AFFN1	E	F									●	–	–	.125	.055	.039
	42AFEN1	1203AFEN1	E	E				●						–	–	.125	.055	.039
	42AFTN1	1203AFTN1	E	T	●			●	●	●				–	–	.125	.055	.039
	42AFSN1	1203AFSN1	E	S		●	●	●						–	–	.125	.055	.039
	42AFXN1	1203AFXN1	E	X				●						–	–	.125	.055	.039
	SEKN42AFSN1	SEKN1203AFSN1	K	S		★								–	–	.125	.055	–
	42AFTN1	1203AFTN1	K	T							★			–	–	.125	.055	–
	42AFTN	1203AFTN	K	T						★				–	–	.125	.067	.039
SE445	**SEER42AFEN-JS**	SEER1203AFEN-JS	E	E	●	●	●	●						–	–	.125	.055	.039
	**42AFXN-JS**	1203AFXN-JS	E	X				●						–	–	.125	.055	.039

● : 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

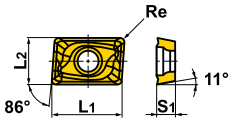
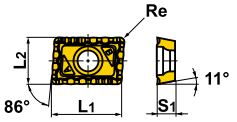
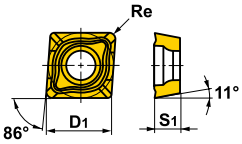
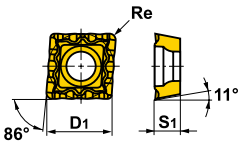
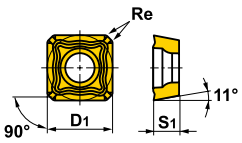
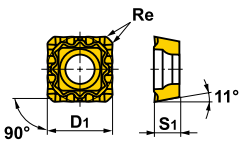
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated					Cermet		Carbide		Dimensions (inch)			
					F7010	F7030	MC5020	VP15TF	UP20M	NX2525	NX4545	UTi20T	HTi05T	D_1	S_1	F_1	Re
SE445 	**WEC42AFFR5C**	WEC1203AFFR5C	C	F									●	–	.125	.197	.039
	42AFER5C	1203AFER5C	C	E									●	–	.125	.197	.039
	42AFTR5C	1203AFTR5C	C	T						●				–	.125	.197	.039
SE445 	**WEC42AFER10C**	WEC42AFER10C	C	E									★	–	.125	.394	.039
SE515 	**SEEN53EFER1**	SEEN1504EFER1	E	E				★						.625	.187	.055	.039
SE545 	**SEEN53AFEN1**	SEEN1504AFEN1	E	E				●						.625	.187	.055	.039
	53AFTN1	1504AFTN1	E	T	●					●	●			.625	.187	.055	.039
	53AFSN1	1504AFSN1	E	S		●	●							.625	.187	.055	.039
	SEKN53AFSN1	SEKN1504AFSN1	K	S		★								.625	.187	.055	–
	53AFTN1	1504AFTN1	K	T								★		.625	.187	.055	–
SE545 	**SEER53AFEN-JS**	SEER1504AFEN-JS	E	E		★	★							.625	.187	.055	.039
SE545 	**WEC53AFER5C**	WEC53AFER5C	C	E									●	–	.187	.197	.039
	53AFTR5C	53AFTR5C	C	T						★				–	.187	.197	.039
SG20 	**RGEN2004EN**	RGEN2004M0EN	E	E	★									.787	.187	–	–
	2004SN	2004M0SN	E	S					★			★		.787	.187	–	–

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

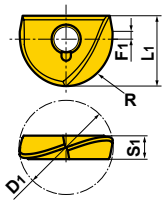
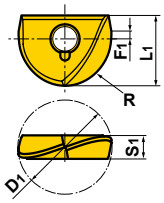
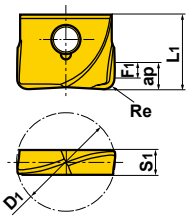
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated VP15TF	Coated VP20RT	Dimensions (inch) L1	L2	D1	S1	Re
SPX ➲K072 	**JPMX140412-JM**	JPMX140412-JM	M	E	●	●	.563	.500	–	.187	.047
	190412-JM	190412-JM	M	E	●	●	.750	.500	–	.187	.047
SPX ➲K072 	**JPMX140412-WH**	JPMX140412-WH	M	E	●	●	.563	.500	–	.187	.047
	190412-WH	190412-WH	M	E	●	●	.750	.500	–	.187	.047
SPX ➲K072 	**MPMX120412-JM**	MPMX120412-JM	M	E	●	●	–	–	.500	.187	.047
SPX ➲K072 	**MPMX120412-WH**	MPMX120412-WH	M	E	●	●	–	–	.500	.187	.047
SPX ➲K072 	**SPMX120408-JM**	SPMX120408-JM	M	E	●	●	–	–	.500	.187	.031
SPX ➲K072 	**SPMX120408-WH**	SPMX120408-WH	M	E	●	●	–	–	.500	.187	.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 :
F : Sharp

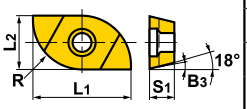
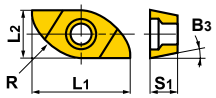
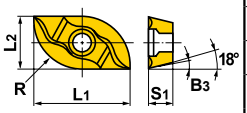
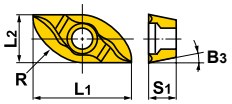
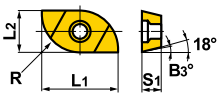
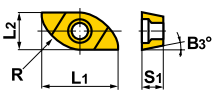
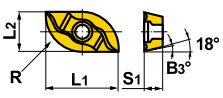
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated VP15TF	Coated MP8010	Dimensions (inch) L1	D1	S1	F1	Re	R
SRF ➲K122 	**SRFT0375**	SRFT0375	–	F	●	●	.335	.375	.102	.020	–	.1875
	0500	0500	–	F	●	●	.394	.500	.118	.020	–	.2500
	0625	0625	–	F	●	●	.472	.622	.158	.039	–	.3125
	0750	0750	–	F	●	●	.591	.750	.197	.039	–	.3750
	1000	1000	–	F	●	●	.728	1.000	.236	.039	–	.5000
	1250	1250	–	F	●	●	.925	1.250	.276	.039	–	.6250
SRF (METRIC) ➲K124 	**SRFT10**	SRFT10	–	F	★	★	.335	.394	.102	.020	–	.1969
	12	12	–	F	★	★	.394	.472	.118	.020	–	.2362
	16	16	–	F	★	★	.472	.630	.157	.039	–	.3150
	20	20	–	F	★	★	.591	.787	.197	.039	–	.3937
	25	25	–	F	★	★	.728	.984	.236	.039	–	.4921
	30	30	–	F	★	★	.886	1.181	.276	.039	–	.5906
	32	32	–	F	★	★	.925	1.260	.276	.039	–	.6299
SUF (METRIC) ➲K124 	NEW **SUFT10R05**	SUFT10R05	–	F	★	★	.335	.394	.102	.039	.0197	–
	NEW **10R10**	10R10	–	F	★	★	.335	.394	.102	.039	.0394	–
	NEW **10R20**	10R20	–	F	★	★	.335	.394	.102	.039	.0787	–
	NEW **12R05**	12R05	–	F	★	★	.394	.472	.118	.047	.0197	–
	NEW **12R10**	12R10	–	F	★	★	.394	.472	.118	.047	.0394	–
	NEW **12R20**	12R20	–	F	★	★	.394	.472	.118	.047	.0787	–
	NEW **12R30**	12R30	–	F	★	★	.394	.472	.118	.047	.1181	–
	NEW **16R05**	16R05	–	F	★	★	.472	.630	.157	.063	.0197	–
	NEW **16R10**	16R10	–	F	★	★	.472	.630	.157	.063	.0394	–
	NEW **16R15**	16R15	–	F	★	★	.472	.630	.157	.063	.0591	–
	NEW **16R20**	16R20	–	F	★	★	.472	.630	.157	.063	.0787	–
	NEW **16R30**	16R30	–	F	★	★	.472	.630	.157	.063	.1181	–
	20R05	20R05	–	F	★	★	.591	.787	.197	.079	.0197	
	20R10	20R10	–	F	★	★	.591	.787	.197	.079	.0394	–
	NEW **20R15**	20R15	–	F	★	★	.591	.787	.197	.079	.0591	–
	20R20	20R20	–	F	★	★	.591	.787	.197	.079	.0787	–
	20R30	20R30	–	F	★	★	.591	.787	.197	.079	.1181	–
	25R05	25R05	–	F	★	★	.728	.984	.236	.098	.0197	–
	25R10	25R10	–	F	★	★	.728	.984	.236	.098	.0394	–
	25R20	25R20	–	F	★	★	.728	.984	.236	.098	.0787	–
	25R30	25R30	–	F	★	★	.728	.984	.236	.098	.1181	–
	30R05	30R05	–	F	★	★	.886	1.181	.276	.118	.0197	–
	30R10	30R10	–	F	★	★	.886	1.181	.276	.118	.0394	–
	30R20	30R20	–	F	★	★	.886	1.181	.276	.118	.0787	–
	30R30	30R30	–	F	★	★	.886	1.181	.276	.118	.1181	–
	NEW **32R05**	32R05	–	F	★	★	.925	1.26	.276	.126	.0197	–
	NEW **32R10**	32R10	–	F	★	★	.925	1.26	.276	.126	.0394	–
	NEW **32R20**	32R20	–	F	★	★	.925	1.26	.276	.126	.0787	–

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

CCutting Conditions :
● : Stable Cutting
C : General Cutting
✠ : Unstable Cutting

Honing :
E : Round

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated VP15TF	Dimensions (inch) L1	L2	S1	R	B3
SRM2 ➲K135 	**SRM212C**	SRM212C	M	E	●	.748	.385	.169	.375	11
	216C	216C	M	E	●	.945	.512	.216	.500	11
	220C	220C	M	E	●	1.102	.638	.275	.625	11
SRM2 ➲K135 	**SRM212E**	SRM212E	M	E	●	.610	.315	.169	.375	11
	216E	216E	M	E	●	.807	.409	.216	.500	11
	220E	220E	M	E	●	.964	.520	.275	.625	11
SRM2 ➲K135 	**SRM210C-M**	SRM210C-M	M	E	●	.630	.323	.138	.313	10
	212C-M	212C-M	M	E	●	.748	.385	.169	.375	10
	216C-M	216C-M	M	E	●	.945	.512	.216	.500	10
	220C-M	220C-M	M	E	●	1.102	.638	.275	.625	10
SRM2 ➲K135 	**SRM210E-M**	SRM210E-M	M	E	●	.531	.258	.138	.313	9
	212E-M	212E-M	M	E	●	.610	.315	.169	.375	9
	216E-M	216E-M	M	E	●	.807	.409	.216	.500	9
	220E-M	220E-M	M	E	●	.964	.520	.275	.625	9
SRM2 (METRIC) ➲K137 	**SRG16C**	SRG16C	G	E	★	.630	.323	.138	.315	11
	20C	20C	G	E	★	.748	.402	.181	.394	10
	25C	25C	G	E	★	.945	.504	.217	.492	10
	30C	30C	G	E	★	1.102	.602	.276	.591	10
	32C	32C	G	E	★	1.102	.642	.276	.630	10
SRM2 (METRIC) ➲K137 	**SRG16E**	SRG16E	G	E	★	.531	.264	.138	.315	11
	20E	20E	G	E	★	.610	.335	.181	.394	9
	25E	25E	G	E	★	.807	.402	.217	.492	9
	30E	30E	G	E	★	.992	.480	.276	.591	9
	32E	32E	G	E	★	1.028	.516	.276	.630	9
SRM2 (METRIC) ➲K137 	**SRM16C-M**	SRM16C-M	M	E	★	.630	.323	.138	.315	11
	20C-M	20C-M	M	E	★	.748	.402	.181	.394	10
	25C-M	25C-M	M	E	★	.945	.504	.217	.492	10
	30C-M	30C-M	M	E	★	1.102	.602	.276	.591	10
	32C-M	32C-M	M	E	★	1.102	.642	.276	.630	10

● : 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

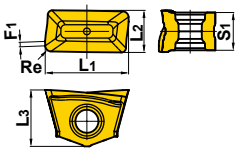
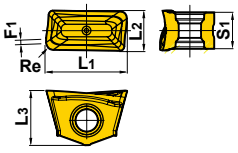
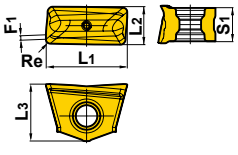
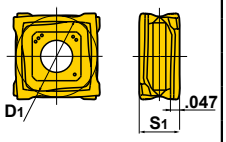
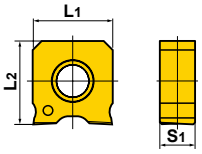
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated					Carbide	Dimensions (inch)						
					VP15TF	MP9030	MP9130	VP20RT	VP30RT	UP20M	UTi20T	L_1	L_2	S_1	F_1	Re	R	B_3
SRM2 (METRIC) ➲K137	**SRM16E-M**	SRM16E-M	M	E	★							.531	.264	.138	–	–	.315	11
	20E-M	20E-M	M	E	★							.610	.335	.181	–	–	.394	9
	25E-M	25E-M	M	E	★							.807	.402	.217	–	–	.492	9
	30E-M	30E-M	M	E	★							.992	.480	.276	–	–	.591	9
	32E-M	32E-M	M	E	★							1.028	.516	.276	–	–	.630	9
SRM2 40/50 (METRIC) ➲K141	**SRG40C**	SRG40C	G	E	★			★	★			1.417	.807	.315	–	–	.787	–
	50C	50C	G	E	★			★	★			1.575	1.024	.335	–	–	.984	–
SRM2 40/50 (METRIC) ➲K141	**SRG40E**	SRG40E	G	E	★			★	★			1.260	.654	.315	–	–	.787	–
	50E	50E	G	E	★			★	★			1.409	.787	.335	–	–	.984	–
TBE2	**SPMM432A**	SPMT120408-A	M	E						●	●	–	–	.187	–	–	–	–
VFX5 ➲K078	NEW **XNMU160708R-MS**	XNMU160708R-MS	M	E		●						.630	.276	.256	.039	.031	–	–
	NEW **160712R-MS**	160712R-MS	M	E		●						.630	.276	.256	.039	.047	–	–
	NEW **160716R-MS**	160716R-MS	M	E		●						.630	.276	.256	.039	.063	–	–
	NEW **160724R-MS**	160724R-MS	M	E		●						.630	.276	.256	.039	.094	–	–
	NEW **160732R-MS**	160732R-MS	M	E		●						.681	.276	.256	–	.126	–	–
	NEW **160740R-MS**	160740R-MS	M	E		●						.744	.276	.256	–	.157	–	–
VFX5 ➲K078	NEW **XNMU160708R-HS**	XNMU160708R-HS	M	E		●						.630	.276	.256	.039	.031	–	–
VFX5 ➲K078	NEW **XNMU160708R-LS**	XNMU160708R-LS	M	E			●					.630	.276	.256	.039	.031	–	–

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

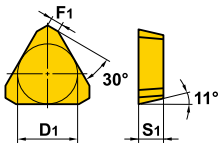
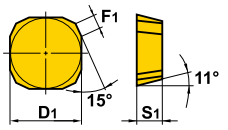
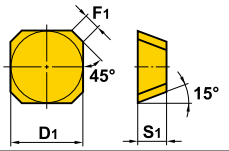
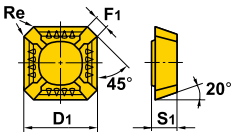
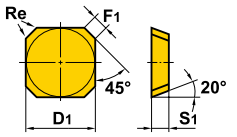
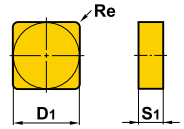
Cutting Conditions :
● : Stable Cutting
◐ : General Cutting
✱ : Unstable Cutting

Honing :
E : Round

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated				Dimensions (inch)						
					MC5020	VP15TF	MP9030	MP9130	L_1	L_2	L_3	D_1	S_1	F_1	Re
VFX6 ➲K082 	NEW **XNMU190912R-MS**	XNMU190912R-MS	M	E			●		.752	.374	.500	–	.335	.039	.047
	NEW **190916R-MS**	190916R-MS	M	E			●		.752	.374	.500	–	.335	.039	.063
	NEW **190924R-MS**	190924R-MS	M	E			●		.752	.374	.500	–	.335	.039	.094
	NEW **190932R-MS**	190932R-MS	M	E			●		.795	.374	.500	–	.335	–	.126
	NEW **190940R-MS**	190940R-MS	M	E			●		.858	.374	.500	–	.335	–	.157
	NEW **190950R-MS**	190950R-MS	M	E			●		.858	.374	.500	–	.335	–	.197
VFX6 ➲K082 	NEW **XNMU190912R-HS**	XNMU190912R-HS	M	E			●		.752	.374	.500	–	.335	.039	.047
VFX6 ➲K082 	NEW **XNMU190912R-LS**	XNMU190912R-LS	M	E				●	.752	.374	.500	–	.335	.039	.047
VOX400 ➲K023 	**SONX1206PER**	SONX1206PER	N	E	●	●			–	–	–	.500	.248	–	–
VOX400 ➲K023 	NEW **WOEX1206PER5C**	WOEX1206PER5C	N	E		●			.492	.513	–	–	.217	–	–

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

Work Material			Cutting Conditions : ● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting Honing : E : Round T : Chamfer
	P	Steel	
	M	Stainless Steel	
	K	Cast Iron	
	N	Non-Ferrous Metal	
	S	Heat-resistant Alloy, Titanium Alloy	
	H	Hardened Materials	

Cutter Type Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated					Cermet		Carbide		Dimensions (inch)			
					F7010	F7030	MC5020	VP15TF	UP20M	NX2525	NX4545	UTi20T	HTi10	D1	S1	F1	Re
Corner Angle 0° 11° Positive  Right hand insert shown.	**TPKN32PPR**	TPKN1603PPR	K	T ✱1	●			★	●	●	●	●	●	.375	.125	.047	–
	43PDR	2204PDR	K	T ✱1	●			●	●	●	●	●	●	.500	.187	.055	–
Corner Angle 15° 11° Positive  	**SPKN42EDR**	SPKN1203EDR	K	T ✱2	●	●	●			●		●	●	.500	.125	.055	–
	53EDR	1504EDR	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	–
	42AETN	1203AETN	K	T							★			.500	.125	.047	–
	53AETN	1504AETN	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
	433	120412	M	E			★			★		★	★	.500	.187	–	.047

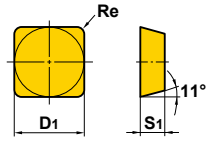
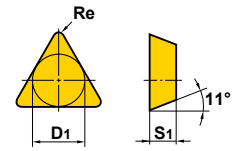
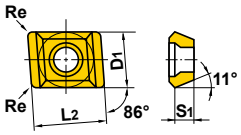
✱1 Grade F7010 and F7020 have “E” honing.
✱2 Grade HTi10 has “F” honing.

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 **T** : Chamfer

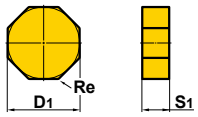
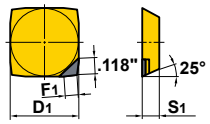
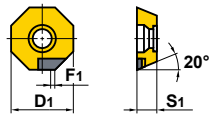
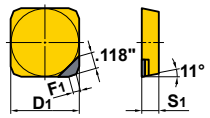
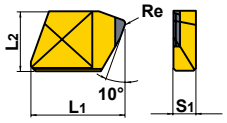
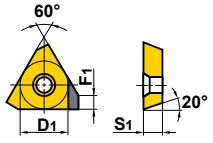
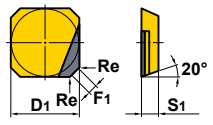
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Honing	Coated F7030	Coated MC5020	Coated VP15TF	Coated UP20M	Cermet NX2525	Carbide UTi20T	Carbide HTi10	L_2	D_1	S_1	Re
11° Positive 	**SPMN421**	SPMN120304	M	E ✱1			★			★	★	–	–	–	–
	421T	120304T	M	T					★			–	.500	.125	.016
	422	120308	M	E	★		●			●	●	–	.500	.125	.031
	423	120312	M	E ✱1	★		★			★	★	–	.500	.125	.047
	432	120408	M	E		★				★	★	–	.500	.187	.031
	433	120412	M	E		★				●		–	.500	.187	.047
	532	150408	M	E						★		–	–	–	–
11° Positive 	**TPMN321**	TPMN160304	M	E ✱2	★		●	★	★	●	●	–	.375	.125	.016
	322	160308	M	E ✱2	★		●	★	★	●	●	–	.375	.125	.031
	323	160312	M	E ✱1				★			●	–	.375	.125	.047
	431	220404	M	E ✱1						●		–	–	–	–
	432	220408	M	E ✱1	★		●	★		●	★	–	.500	.187	.031
	433	220412	M	E ✱1	★		★			●	●	–	.500	.187	.047
	**JPMT060204-E**	JPMT060204-E	M	E			★	★				.313	.256	.098	.016

✱1 Grade HTi10 has “F” honing.
✱2 Grade HTi10 has “F” honing, grade NX2525 has “T” honing.

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

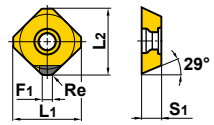
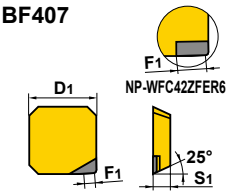
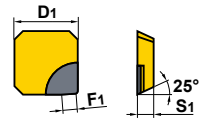
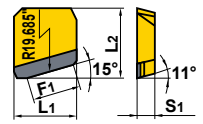
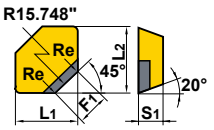
Memo

CBN AND PCD

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	CBN				PCD	Dimensions (inch)					
				MB710	MB730	MB835	BC5030	MD220	L_1	L_2	D_1	S_1	F_1	Re
AOX445 ➔K022 	**SL-ONEN120404ASN**	SL-ONEN120404ASN	E				★		–	–	.500	.187	–	.016
BF407 	**SFCN42ZFFR2**	SFCN1203ZFFR2	C					●	–	–	.500	.125	.094	–
BOE ➔K116 	**OEMX12T3ETR1**	OEMX12T3ETR1	M		●	●			–	–	.500	.156	.039	–
	12T3ETR5	12T3ETR5	M		●	●			–	–	.500	.156	.197	–
FBP415 	**SPEN42EETR1**	SPEN1203EETR1	E	★					–	–	.500	.125	.055	–
NF10000 	NEW **NP-GDCN2004PDSR3**	NP-GDCN2004PDSR3	C		★				.787	.500	–	.187	–	.031
PMF ➔K146 	**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_1	L_2	D_1	S_1	F_1	Re
ASX445 ➔**K008** 	**NP-WEEW13T3AGFR3C**	NP-WEEW13T3AGFR3C	E		●	.649	.651	–	.156	.130	.059
	13T3AGTR3C	13T3AGTR3C	E	●		.649	.651	–	.156	.130	.059
BF407 	**NP-WFC42ZFER2**	NP-WFC42ZFER2	C		●	–	–	.500	.125	.094	–
	42ZFER6	42ZFER6	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
	42AFTR5C	42AFTR5C	C	●		.500	.604	–	.125	.197	.039

CLASSIFICATION

Order Number	(ISO) Number	Cutter Type	Page
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150308ER	150308ER		
150308FR	150308FR		
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1503125ER	1503125ER		
1503250ER	1503250ER		
AEMW19T304ER	AEMW19T304ER	**BAE600**	J017
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19T3062ER	19T3062ER		
19T3093ER	19T3093ER		
19T3125ER	19T3125ER		
19T3250ER	19T3250ER		
AOGT123602PEFR-GM	AOGT123602PEFR-GM	**APX3000** ➲K034	J013
123604PEFR-GM	123604PEFR-GM		
123608PEFR-GM	123608PEFR-GM		
AOMT123604PEER-H	AOMT123604PEER-H		J013
123608PEER-H	123608PEER-H		
123616PEER-H	123616PEER-H		
AOMT123602PEER-M	AOMT123602PEER-M		J013
123604PEER-M	123604PEER-M		
123608PEER-M	123608PEER-M		
123610PEER-M	123610PEER-M		
123612PEER-M	123612PEER-M		
123616PEER-M	123616PEER-M		
123620PEER-M	123620PEER-M		
123624PEER-M	123624PEER-M		
123630PEER-M	123630PEER-M		
123632PEER-M	123632PEER-M		
AOMT184804PEER-H	AOMT184804PEER-H	**APX4000** ➲K042	J013
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184816PEER-H	184816PEER-H		
184832PEER-H	184832PEER-H		
184840PEER-H	184840PEER-H		
184850PEER-H	184850PEER-H		
184864PEER-H	184864PEER-H		
AOMT184804PEER-M	AOMT184804PEER-M		J014
184808PEER-M	184808PEER-M		
184810PEER-M	184810PEER-M		
184812PEER-M	184812PEER-M		
184816PEER-M	184816PEER-M		
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APGT1135PDFR-G2	APGT1135PDFR-G2	**BAP300**	J017

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1135PDER-H6	1135PDER-H6		
APMT1135PDER-M0	APMT1135PDER-M0		J017
1135PDER-M1	1135PDER-M1		
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APGT1604PDFR-G2	APGT1604PDFR-G2	**BAP400**	J018
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1604PDER-H4	1604PDER-H4		
1604PDER-H6	1604PDER-H6		
1604PDER-H8	1604PDER-H8		
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CCMX083508ENA	CCMX083508EN-A	**LER** ➲K086	J021
09T308ENA	09T308EN-A		
CCMX09T308ENB	CCMX09T308EN-B		J021
CPMT1205ZPEN-M2	CPMT1205ZPEN-M2	**PMR** ➲K145	J023
1205ZPEN-M3	1205ZPEN-M3		
JOMW06T215ZZSR-FT	JOMW06T215ZZSR-FT	**AJX** ➲K096	J012
080320ZZSR-FT	080320ZZSR-FT		
JDMW09T320ZDSR-FT	JDMW09T320ZDSR-FT		
120420ZDSR-FT	120420ZDSR-FT		
140520ZDSR-FT	140520ZDSR-FT		
JOMT06T215ZZSR-JM	JOMT06T215ZZSR-JM		J013
080320ZZSR-JM	080320ZZSR-JM		
JDMT09T320ZDSR-JM	JDMT09T320ZDSR-JM		
120420ZDSR-JM	120420ZDSR-JM		
140520ZDSR-JM	140520ZDSR-JM		
JDMT120420ZDSR-ST	JDMT120420ZDSR-ST		J013
140520ZDSR-ST	140520ZDSR-ST		
JPMT060204-E	JPMT060204-E		J032

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JPMX140412-WH	JPMX140412-WH		J026
190412-WH	190412-WH		
MBD0500021	MBD0500021	**MBD** ➔**K132**	J022
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0625021	0625021		
0625041	0625041		
0750021	0750021		
0750041	0750041		
1000021	1000021		
1000041	1000041		
1000081	1000081		
MBF0500021	MBF0500021	**MBF** ➔**K132**	J022
0500041	0500041		
0625021	0625021		
0625041	0625041		
0750021	0750021		
0750041	0750041		
1000021	1000021		
1000041	1000041		
1000081	1000081		
MBN0312001	MBN0312001	**MBN** ➔**K131**	J022
0375001	0375001		
0500001	0500001		
0625001	0625001		
0750001	0750001		
1000001	1000001		
1250001	1250001		
M200001	M200001		
M300001	M300001		
MPMM322	MPMT090308	**ECMP** ➔**K120**	J020
432	120408		
MPMX120412-JM	MPMX120412-JM	**SPX** ➔**K072**	J026
			
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NEW **NNMU200708ZEN-MP**	NNMU200708ZEN-MP	**AHX640S** ➔**K014**	J012
			
NEW **NNMU200712ZER-MM**	NNMU200712ZER-MM		J012
NEW **NP-GDCN2004PDSR3**	NP-GDCN2004PDSR3	**NF10000**	J034
			
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13T3AGTR3C	13T3AGTR3C		
NP-WFC42ZFER2	NP-WFC42ZFER2	**BF407**	J035
42ZFER6	42ZFER6		
OEMX12T3ETR1	OEMX12T3ETR1	**BOE** ➔**K116**	J019
12T3ESR1	12T3ESR1		
OEMX1705ETR1	OEMX1705ETR1		
1705ESR1	1705ESR1		
OEMX12T3EER1-JS	12T3EER1-JS		J019
12T3ETR1-JS	12T3ETR1-JS		
1705EER1-JS	1705EER1-JS		
1705ETR1-JS	1705ETR1-JS		
OEMX12T3ETR1	OEMX12T3ETR1		J034
12T3ETR5	12T3ETR5		
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1443R-G1	1443R-G1		
1651R-G1	1651R-G1		
1959R-G1	1959R-G1		
QOMT0830R-M2	QOMT0830R-M2		J014
0934R-M2	0934R-M2		
1443R-M2	1443R-M2		
1651R-M2	1651R-M2		
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1342R-G1	1342R-G1		
1651R-G1	1651R-G1		
1856R-G1	1856R-G1		
2062R-G1	2062R-G1		
2576R-G1	2576R-G1		
QOMT0830R-M2	QOMT0830R-M2		J014
1035R-M2	1035R-M2		
1342R-M2	1342R-M2		
1651R-M2	1651R-M2		
1856R-M2	1856R-M2		
2062R-M2	2062R-M2		
2576R-M2	2576R-M2		
RDMW0517M0E	RDMW0517M0E	**ARX(METRIC)** ➲**K108** 	J014
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0724M0E	0724M0E		
REMX12T3TN	REMX12T3TN	**BOE** ➲**K116** 	J019
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1705SN	1705SN		
1705TN	1705TN		
REMX12T3EN-JS	REMX12T3EN-JS		J019
12T3TN-JS	12T3TN-JS		
1705EN-JS	1705EN-JS		
1705TN-JS	1705TN-JS		
RGEN2004EN	RGEN2004M0EN	**SG20** 	J025
2004SN	2004M0SN		
RPMT07T200E-JS	RPMT07T200E-JS	**BRP** ➲**K112** 	J019
09T300E-JS	09T300E-JS		
120400E-JS	120400E-JS		
150600E-JS	150600E-JS		
RPMW07T200E	RPMW07T200E		J019
09T300E	09T300E		
120400E	120400E		
150600E	150600E		
SDEN42AEN	SDEN1203AEN	**Corner Angle 45° 15° Positive** 	J031
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42AETN	1203AETN		
SDKN53AETN	SDKN1504AETN	**Corner Angle 45° 15° Positive** 	J031

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42EFTR1	1203EFTR1		
42EFSR1	1203EFSR1		
SEKN42EFSR1	SEKN1203EFSR1		J024
42EFTR1	1203EFTR1		
42EFTR	1203EFTR		
SEER42EFER-JS	SEER1203EFER-JS		J024
SECN42AFTN1	SECN1203AFTN1	**SE445**	J024
SEEN42AFFN1	SEEN1203AFFN1		
42AFEN1	1203AFEN1		
42AFTN1	1203AFTN1		
42AFSN1	1203AFSN1		
42AFXN1	1203AFXN1		
SEKN42AFSN1	SEKN1203AFSN1		
42AFTN1	1203AFTN1		
42AFTN	1203AFTN		
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42AFXN-JS	1203AFXN-JS		
SECN42AFFR1	SECN1203AFFR1	**SE445** 	J034
SEEN53EFER1	SEEN1504EFER1	**SE515** 	J025
SEEN53AFEN1	SEEN1504AFEN1	**SE545**	J025
53AFTN1	1504AFTN1		
53AFSN1	1504AFSN1		
SEKN53AFSN1	SEKN1504AFSN1		
53AFTN1	1504AFTN1		
SEER53AFEN-JS	SEER1504AFEN-JS		J025
SEET13T3AGEN-JL	SEET13T3AGEN-JL	**ASX445** ➲**K008** 	J015
SEMT13T3AGSN-JM	SEMT13T3AGSN-JM		J016

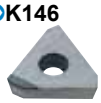
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SEGT13T3AGFN-JP	SEGT13T3AGFN-JP		J016
SEER43AFEN-JS	SEER1204AFEN-JS	**Corner Angle 45° 20° Positive** 	J031
SEKN42AGTN	SEKN1203AGTN	**Corner Angle 45° 20° Positive** 	J031
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42ZFFL2	1203ZFFL2		
SFCN42ZFFR2	SFCN1203ZFFR2		
SFCN42ZFFR2	SFCN1203ZFFR2		J034
SL-ONEN120404ASN	SL-ONEN120404ASN	**AOX445** ➲**K022** 	J034
SNMN432	SNMN120408	**Negative** 	J031
433	120412		
SOET12T308PEER-JL	SOET12T308PEER-JL	**ASX400** ➲**K028** 	J015
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12T308PEEL-JM	12T308PEEL-JM		
SOMT12T308PEER-JH	SOMT12T308PEER-JH		J015

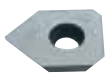
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SONX1206PER	SONX1206PER	**VOX400** ➲**K023** 	J030
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SPNN42EEER1	SPNN1203EEER1		
42EEEL1	1203EEEL1		
SPER42EEER-JS	SPER1203EEER-JS	**FBP415** 	J020
SPEN42EETR1	SPEN1203EETR1		J034
SPKN42EDR	SPKN1203EDR	**Corner Angle 15° 11° Positive** 	J031
53EDR	1504EDR		
SPMB1204APT	SPMB1204APT	**BSP** 	J019
SPMM432A	SPMT120408-A	**TBE** 	J029
SPMN421	SPMN120304	**11° Positive** 	J032
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422	120308		
423	120312		
432	120408		
433	120412		
532	150408		
SPMW321	SPMW090304	**CFSP** ➲**K121** 	J020
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421	120304		
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0500	0500		
0625	0625		
0750	0750		
1000	1000		
1250	1250		
SRFT10	SRFT10	**SRF(METRIC)** ➔**K124** 	J027
12	12		
16	16		
20	20		
25	25		
30	30		
32	32		
SRG40C	SRG40C	**SRM2 40/50** ➔**K141** 	J029
50C	50C		
SRG40E	SRG40E		J029
50E	50E		
SRG16C	SRG16C	**SRM2(METRIC)** ➔**K137** 	J028
20C	20C		
25C	25C		
30C	30C		
32C	32C		
SRG16E	SRG16E		J028
20E	20E		
25E	25E		
30E	30E		
32E	32E		
SRM212C	SRM212C	**SRM2** ➔**K135** 	J028
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220C	220C		
SRM212E	SRM212E		J028
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216C-M	216C-M		
220C-M	220C-M		
SRM210E-M	SRM210E-M		J028
212E-M	212E-M		
216E-M	216E-M		
220E-M	220E-M		
SRM16C-M	SRM16C-M	**SRM2(METRIC)** ➔**K137** 	J028
20C-M	20C-M		
25C-M	25C-M		
30C-M	30C-M		
32C-M	32C-M		
SRM16E-M	SRM16E-M		J028
20E-M	20E-M		
25E-M	25E-M		
30E-M	30E-M		
32E-M	32E-M		
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NEW **10R20**	10R20		
NEW **12R05**	12R05		
NEW **12R10**	12R10		
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NEW **12R30**	12R30		
NEW **16R05**	16R05		
NEW **16R10**	16R10		
NEW **16R15**	16R15		
NEW **16R20**	16R20		
NEW **16R30**	16R30		
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NEW **20R15**	20R15		
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30R05	30R05		
30R10	30R10		
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32PETR1W	1603PETR1W		
TEEN32PEFR1	TEEN1603PEFR1	**NSE300**	J023
32PEER1	1603PEER1		
32PETR1	1603PETR1		
32PESR1	1603PESR1		
TEER32PEER-JS	TEER1603PEER-JS		J023
TECN43PEFR1	TECN2204PEFR1	**NSE400** **SE400**	J023
43PEER1	2204PEER1		
43PETR1	2204PETR1		
TEEN43PEFR1	TEEN2204PEFR1		
43PEER1	2204PEER1		
43PETR1	2204PETR1		
43PESR1	2204PESR1		
TEKN43PEER1	TEKN2204PEER1		
43PESR1	2204PESR1		
43PETR1	2204PETR1		
43PETR	2204PETR		
TEER43PEER-JS	TEER2204PEER-JS		J023
TPEW1303ZPER2	TPEW1303ZPER2	**PMF** ➲**K146**	J023
			
TPEW1303ZPTR2	TPEW1303ZPTR2	**PMF** ➲**K146**	J034
			
TPKN32PPR	TPKN1603PPR	**Corner Angle 0° 11° Positive**	J031
43PDR	2204PDR		
TPMN321	TPMN160304	**11° Positive**	J032
322	160308		
323	160312		
431	220404		
432	220408		
433	220412		

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42EFTR5C	42EFTR5C		
WEC42EFER10C	WEC42EFER10C		J024
WEC42AFFR5C	WEC1203AFFR5C	**SE445**	J025
42AFER5C	1203AFER5C		
42AFTR5C	1203AFTR5C		
WEC42AFER10C	WEC42AFER10C		J025
WEC42AFFR5C	WEC42AFFR5C		J035
42AFTR5C	42AFTR5C		
WEC53AFER5C	WEC53AFER5C	**SE545**	J025
53AFTR5C	53AFTR5C		
WEEW13T3AGER8C	WEEW13T3AGER8C	**ASX445** ➲**K008**	J016
13T3AGTR8C	13T3AGTR8C		
WFC42ZFER2	WFC42ZFER2	**BF407**	J035
			
WNEU2006ZEN7C-WK	WNEU2006ZEN7C-WK	**AHX640S** ➲**K014** **AHX640W** ➲**K019**	J012
			
NEW **WNEU2007ZEN7C-WP**	WNEU2007ZEN7C-WP	**AHX640S** ➲**K014**	J012
			
WOEW12T308PEER8C	WOEW12T308PEER8C	**ASX400** ➲**K028**	J015
12T308PETR8C	12T308PETR8C		
NEW **WOEX1206PER5C**	WOEX1206PER5C	**VOX400** ➲**K023**	J030
			

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42EEEL10C	42EEEL10C		J021
WPC42EETR10C	WPC42EETR10C	**FBP415**	
			J035
XDGT1550PDER-G04	XDGT1550PDER-G04	**BXD4000** ➔**K068**	
1550PDER-G08	1550PDER-G08		
1550PDER-G12	1550PDER-G12		
1550PDER-G16	1550PDER-G16		
1550PDER-G20	1550PDER-G20		J020
1550PDER-G30	1550PDER-G30		
1550PDER-G32	1550PDER-G32		
1550PDER-G40	1550PDER-G40		
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1550PDFR-G08	1550PDFR-G08		
1550PDFR-G12	1550PDFR-G12		
1550PDFR-G16	1550PDFR-G16		
1550PDFR-G20	1550PDFR-G20		J020
1550PDFR-G30	1550PDFR-G30		
1550PDFR-G32	1550PDFR-G32		
1550PDFR-G40	1550PDFR-G40		
1550PDFR-G50	1550PDFR-G50		
XDGT1550PDFR-GL04	XDGT1550PDFR-GL04		
1550PDFR-GL08	1550PDFR-GL08		J020
XDGX175004PDFR-GL	XDGX175004PDFR-GL	**AXD4000** ➔**K054**	
175008PDFR-GL	175008PDFR-GL		
175012PDFR-GL	175012PDFR-GL		
175016PDFR-GL	175016PDFR-GL		
175020PDFR-GL	175020PDFR-GL		
175024PDFR-GL	175024PDFR-GL		J016
175030PDFR-GL	175030PDFR-GL		
175032PDFR-GL	175032PDFR-GL		
175040PDFR-GL	175040PDFR-GL		
175050PDFR-GL	175050PDFR-GL		
XDGX227008PDFR-GL	XDGX227008PDFR-GL	**AXD7000** ➔**K062**	
227016PDFR-GL	227016PDFR-GL		
227020PDFR-GL	227020PDFR-GL		
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227032PDFR-GL	227032PDFR-GL		
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227050PDFR-GL	227050PDFR-GL		

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NEW **160712R-MS**	160712R-MS		
NEW **160716R-MS**	160716R-MS		
NEW **160724R-MS**	160724R-MS		
NEW **160732R-MS**	160732R-MS		
NEW **160740R-MS**	160740R-MS		
NEW **XNMU160708R-HS**	XNMU160708R-HS		J029
NEW **XNMU160708R-LS**	XNMU160708R-LS		
XNMU190912R-MS	XNMU190912R-MS	**VFX6** ➔**K082**	
NEW **190916R-MS**	190916R-MS		
NEW **190924R-MS**	190924R-MS		
NEW **190932R-MS**	190932R-MS		
NEW **190940R-MS**	190940R-MS		
NEW **190950R-MS**	190950R-MS		
NEW **XNMU190912R-HS**	XNMU190912R-HS		J030
NEW **XNMU190912R-LS**	XNMU190912R-LS		
XPGT13T3PDER-G1	XPGT13T3PDER-G1	**BAP3500**	
13T3PDER-G2	13T3PDER-G2		
13T3PDER-G6	13T3PDER-G6		J018
13T3PDER-G75	13T3PDER-G75		
13T3PDER-G8	13T3PDER-G8		
XPGT13T3PDFR-G1	XPGT13T3PDFR-G1		
13T3PDFR-G2	13T3PDFR-G2		
13T3PDFR-G6	13T3PDFR-G6		J018
13T3PDFR-G75	13T3PDFR-G75		
13T3PDFR-G8	13T3PDFR-G8		
XPMT13T3PDER-M1	XPMT13T3PDER-M1		
13T3PDER-M2	13T3PDER-M2		
13T3PDER-M6	13T3PDER-M6		J018
13T3PDER-M75	13T3PDER-M75		
13T3PDER-M8	13T3PDER-M8		
ZCMX083508ERA	ZCMX083508ER-A	**LER** ➔**K086**	
09T308ERA	09T308ER-A		J021
ZCMX09T308ERB	ZCMX09T308ER-B		J021

Memo

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

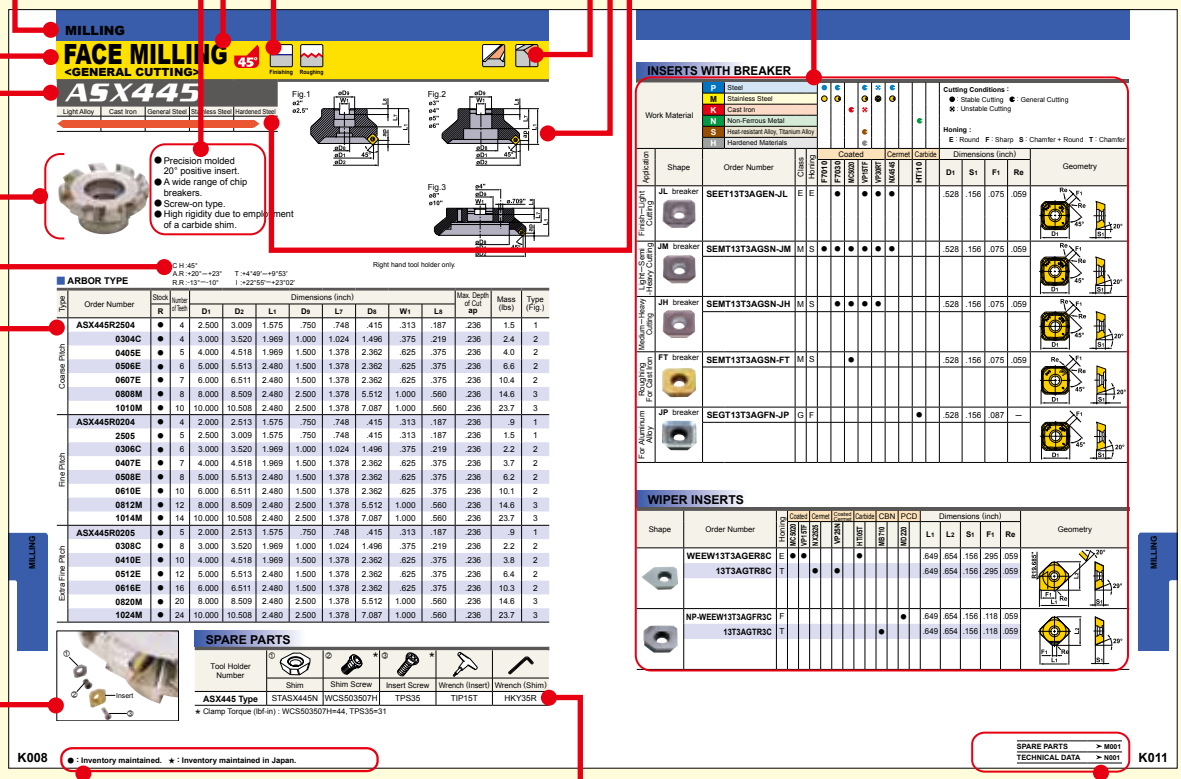
APPLICATION ICON
represents available machining applications, such as finishing and roughing.

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.

INSERT SEAT LOCATION

PRODUCT STANDARDS
indicates tool types, order numbers, stock status (per right/left hand), dimensions, etc.

CUTTING EDGE ANGLE FOR FACE MILLING

SPARE PARTS FOR FACE MILL
indicates part numbers of the applicable spare parts.

PAGE REFERENCE
·SPARE PARTS
·TECHNICAL DATA
indicates reference pages, including the above, on the right hand page of each double-page spread.

●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
- **ASX445** ····· K008
- **AHX640S** ····· K014
- **AHX640W** ····· K019
- **AOX445** ····· K022

●SHOULDER MILLING
- **VOX400** ····· K023
- **ASX400** ····· K028

●DEEP SHOULDER MILLING
- **APX4000** (Long Cutting Edge) ····· K050
- **SPX** ····· K072
- **VFX5** ····· K078
- **VFX6** ····· K082
- **LER** ····· K086

●MULTI FUNCTION MILLING
- **APX3000** ····· K034
- **APX4000** ····· K042
- **AXD4000** ····· K054
- **AXD7000** ····· K062
- **BXD4000** ····· K068
- **AQX** ····· K088
- **AJX** ····· K096
- **ARX** ····· K108
- **BRP** ····· K112
- **BOE** ····· K116
- **ECMP** ····· K120

●RADIUS MILLING
- **MBD/MBF** ····· K132

●CHAMFER MILLING
- **CFSP** ····· K121

●BALL NOSE END MILL
- **SRF** ····· K122
- **MBN** ····· K131
- **SRM2** ····· K135
- **SRM2 ϕ40/ϕ50** ····· K141

●VERTICAL FEED MILLING
- **PMC** ····· K143
- **PMR** ····· K145
- **PMF** ····· K146
- **LONG ARBORS** ····· K147

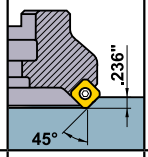
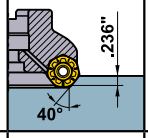
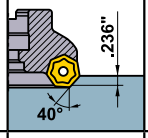
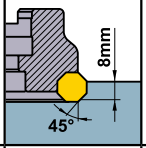
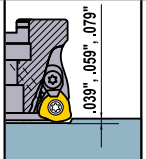
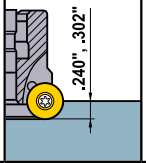
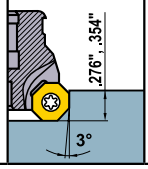
●SCREW-IN ARBORS ····· K148

*Arranged by Alphabetical order

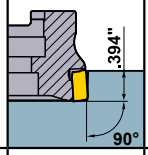
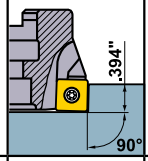
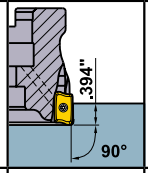
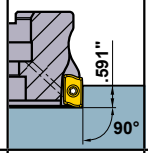
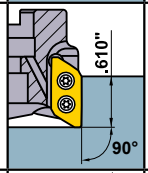
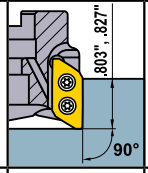
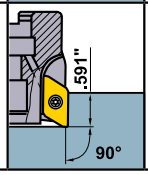
K014 **AHX640S**
K019 **AHX640W**
K096 **AJX**
K022 **AOX445**
K034 **APX3000**
K042 **APX4000**
K050 **APX4000** (Long Cutting Edge)
K088 **AQX**
K108 **ARX**
K028 **ASX400**
K008 **ASX445**
K054 **AXD4000**
K062 **AXD7000**
K116 **BOE**
K112 **BRP**
K068 **BXD4000**
K121 **CFSP**
K120 **ECMP**
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K146 **PMF**
K145 **PMR**
K148 **SCREW-IN ARBORS**
K072 **SPX**
K122 **SRF**
K135 **SRM2**
K141 **SRM2 ϕ40/ϕ50**
K078 **VFX5**
K082 **VFX6**
K023 **VOX400**

CLASSIFICATION (ARBOR TYPE)

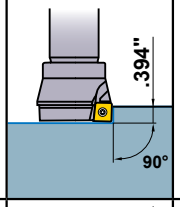
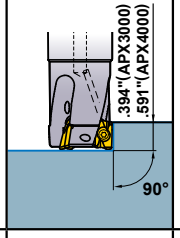
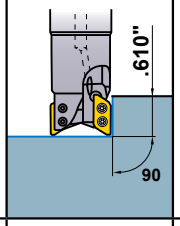
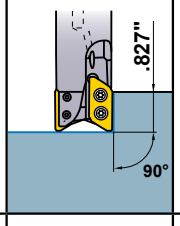
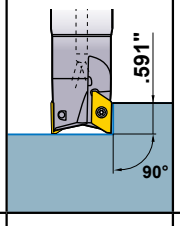
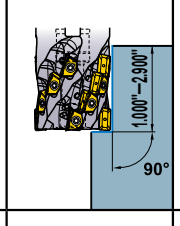
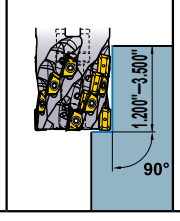
*Arranged by corner angle.

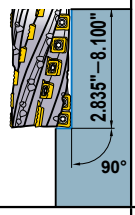
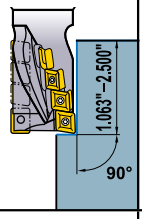
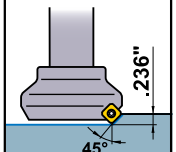
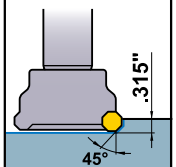
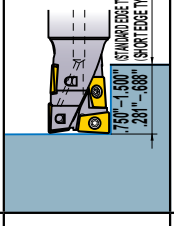
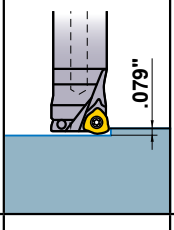
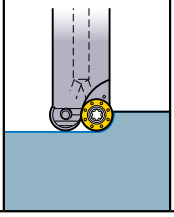
Cutting Mode	Corner Angle	Application	Product Name · Shape	Corner Angle, Max. Depth of Cut	Features	Cutter Dia.	Work Material: Light Alloy / Cast Iron / General Steel / Stainless Steel / Hardened Steel
Face Milling	45°	General Cutting	**ASX445** 		●Precision molded 20° positive insert. ●A wide range 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") ➲ K008
	40°	General Cutting	**AHX640S** NEW 		●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") ➲ K014
	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") ➲ K019
	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) ➲ K022
	—	Multi Functional Milling	**AJX** 		●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") ➲ K097
	—	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") ➲ K113
	—	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") ➲ K117

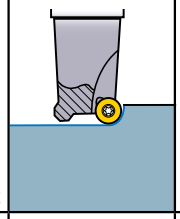
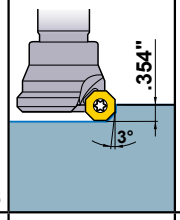
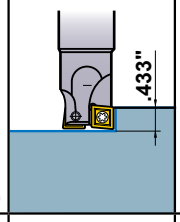
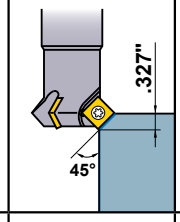
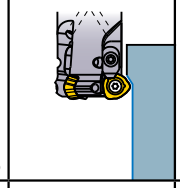
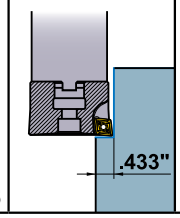
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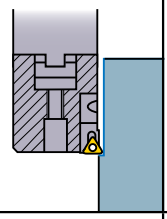
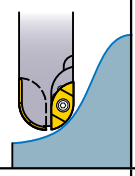
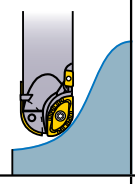
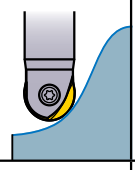
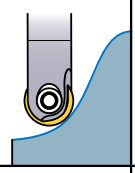
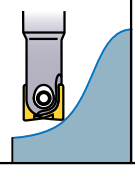
Cutting Mode	Corner Angle	Appli-cation	Product Name · Shape	Corner Angle, Max. Depth of Cut	Features	Cutter Dia.	Work Material: Light Alloy / Cast Iron / General Steel / Stainless Steel / Hardened Steel
Shoulder Milling	0°	For Cast Iron	**VOX400** 		●Vertical inserts with high strength cutting edge. ●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") ➲ K023
	0°	General Cutting	**ASX400** 		●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") ➲ K028
	0°	Multi Functional Milling	**APX3000** 		●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") ➲ K035
	0°	Multi Functional Milling	**APX4000** 		●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") ➲ K043
	0°	Multi Functional Milling	**AXD4000** 		●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") ➲ K055
	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") ➲ K062
	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") ➲ K069

CLASSIFICATION (SHANK TYPE)

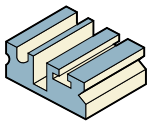
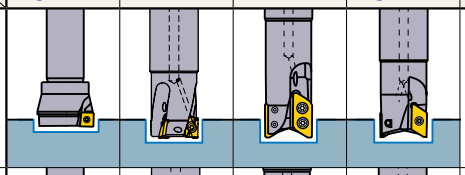
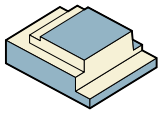
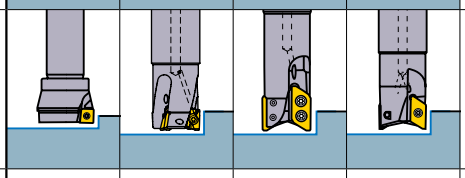
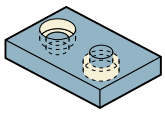
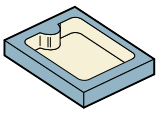
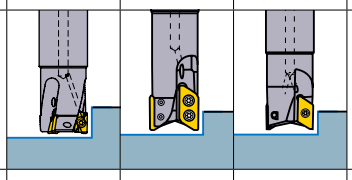
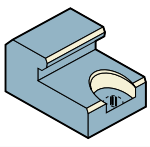
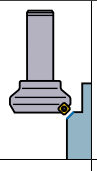
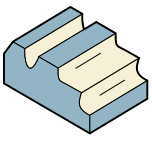
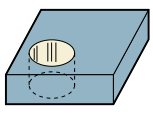
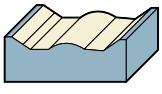
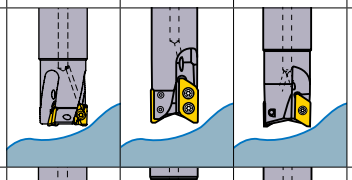
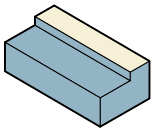
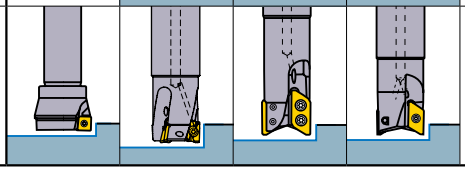
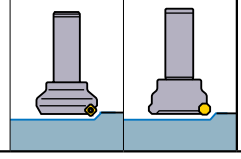
Product Name · Shape	Corner Angle, Max. Depth of Cut	Features
ASX400  K029		● Economical due to the use of 4 cutting edges. ● Low resistance due to the 3D design of the curved cutting edge. ● Curved cutting edge and high rigidity holder. ● Max. depth of cut .394". **ϕ1.250"—ϕ2.000"**
APX3000 **APX4000**  K034 K042		● 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 NEW  K054		● Air / coolant through. ● Low resistance inserts. ● High balance quality. ● Excellent wall accuracy. ● Multi functional milling. **ϕ1.000"—ϕ1.500"**
AXD7000  K062		● Air / coolant through. ● Low resistance inserts. ● High balance quality. ● Excellent wall accuracy. ● Multi functional milling. **ϕ1.250"—ϕ1.500"**
BXD4000  K068		● Air / coolant through. ● Low resistance inserts & high rigidity body. ● The Anti Fly Insert mechanism guarantees secure high-revolution milling. **ϕ1.000"—ϕ1.500"**
VFX5 NEW  K078		● Vertical inserts with high strength cutting edge. ● Screw-on type clamping. ● High efficiency milling of titanium alloys. **ϕ2.000"—ϕ3.000"**
VFX6  K082		● Vertical inserts with high strength cutting edge. ● Screw-on type clamping. ● High efficiency milling of titanium alloys. **ϕ2.000"—ϕ4.000"**

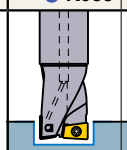
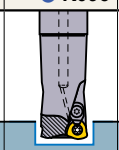
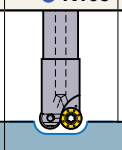
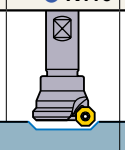
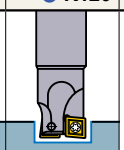
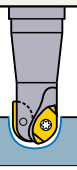
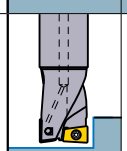
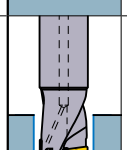
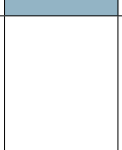
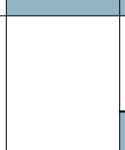
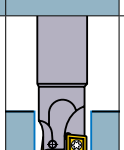
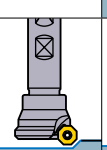
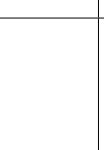
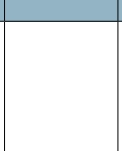
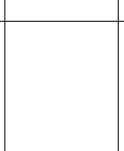
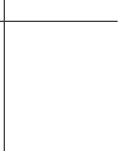
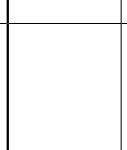
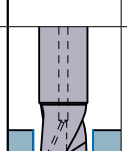
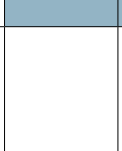
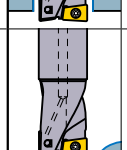
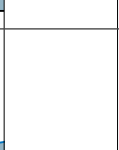
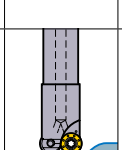
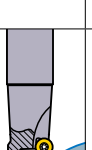
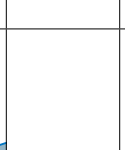
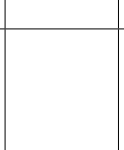
Product Name · Shape	Corner Angle, Max. Depth of Cut	Features
SPX  K072		● The wavy cutting edge helps to reduce cutting resistance. ● Suitable for heavy machining due to holder rigidity. **ϕ1.969"—ϕ2.000"**
LER  K086		● Different helical flute angles prevents chattering. ● Suitable for heavy cutting due to holder rigidity. **ϕ1.000"—ϕ2.000"**
ASX445  K009		● 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  K022		● 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  K088		● 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  K096		● 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"**
ARX  K108		● Precision M-class 15°positive insert. ● Effective for various machining applications. ● Air / coolant through. **ϕ10—ϕ25mm**

Product Name · Shape	Corner Angle, Max. Depth of Cut	Features
BRP  ➲ K112		● 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  ➲ K116		● 20°positive insert. ● Compatible with 8-corner use insert and round type insert. ● Multi functional milling. **ϕ1.250"–ϕ3.125"**
ECMP  ➲ K120		● 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  ➲ K121		● Excellent sharpness with 11°positive inserts. ● 45°chamfer series. **ϕ.313"–ϕ1.250"**
PMC  ➲ K143		● For undercutting trimmed part of press mould. ● 2 directional cutting with large overhang. **ϕ25–ϕ40mm**
PMR  ➲ K145		● 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  ➲ K146		● 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  ➲ K135		● 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")  ➲ K141		● Best for roughing of molds. ● Low resistance chipbreaker. ● Highly rigid body. **ϕ40, ϕ50 mm (ϕ1.575", ϕ1.969")**
SRF  ➲ K122		● 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  ➲ K131		● Insert with two edges. ● Simple clamp system with one clamp screw. ● Sharp cutting edge. **ϕ.312"–ϕ1.250"**
MBD  ➲ K132		● 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	ASX400	APX3000 APX4000	AXD4000 AXD7000	BXD4000	VFX5 VFX6	SPX	LER	ASX445	AOX445
									
	➲ K028	➲ K034 K042	➲ K054 K062	➲ K068	➲ K078 K082	➲ K072	➲ K086	➲ K009	➲ K022
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
										
	➲ K088	➲ K096	➲ K108	➲ K112	➲ K116	➲ K120	➲ K121	➲ K143 K145 K146	➲ K135 K141	➲ K122 K131 K132
										
										
										
										
										
										
										
										

MILLING

FACE MILLING 45°

<GENERAL CUTTING>

Finishing Roughing

ASX445

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel



- 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"

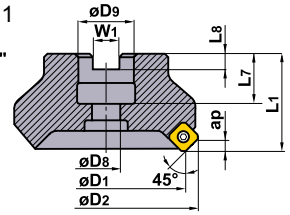


Fig.2
ø3"
ø4"
ø5"
ø6"

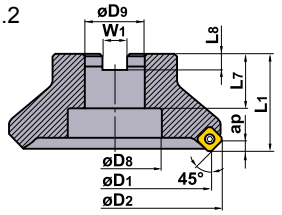
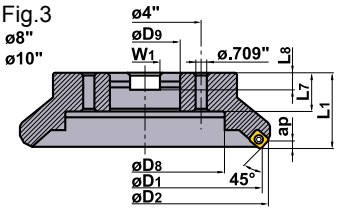


Fig.3
ø8"
ø10"

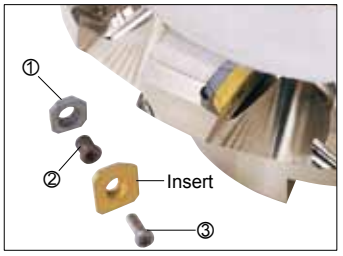


C H :45°
A.R :+20°—+23°
R.R :-13°—-10°
T :+4°49′—+9°53′
I :+22°55′—+23°02′

Right hand tool holder only.

ARBOR TYPE

Type	Order Number	Stock R	Number of Teeth	Dimensions (inch) D1	D2	L1	D9	L7	D8	W1	L8	Max. Depth of Cut ap	Mass (lbs)	Type (Fig.)
Coarse Pitch	**ASX445R2504**	●	4	2.500	3.009	1.575	.750	.748	.415	.313	.187	.236	1.5	1
	0304C	●	4	3.000	3.520	1.969	1.000	1.024	1.496	.375	.219	.236	2.4	2
	0405E	●	5	4.000	4.518	1.969	1.500	1.378	2.362	.625	.375	.236	4.0	2
	0506E	●	6	5.000	5.513	2.480	1.500	1.378	2.362	.625	.375	.236	6.6	2
	0607E	●	7	6.000	6.511	2.480	1.500	1.378	2.362	.625	.375	.236	10.4	2
	0808M	●	8	8.000	8.509	2.480	2.500	1.378	5.512	1.000	.560	.236	14.6	3
	1010M	●	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
	2505	●	5	2.500	3.009	1.575	.750	.748	.415	.313	.187	.236	1.5	1
	0306C	●	6	3.000	3.520	1.969	1.000	1.024	1.496	.375	.219	.236	2.2	2
	0407E	●	7	4.000	4.518	1.969	1.500	1.378	2.362	.625	.375	.236	3.7	2
	0508E	●	8	5.000	5.513	2.480	1.500	1.378	2.362	.625	.375	.236	6.2	2
	0610E	●	10	6.000	6.511	2.480	1.500	1.378	2.362	.625	.375	.236	10.1	2
	0812M	●	12	8.000	8.509	2.480	2.500	1.378	5.512	1.000	.560	.236	14.6	3
	1014M	●	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
	0308C	●	8	3.000	3.520	1.969	1.000	1.024	1.496	.375	.219	.236	2.2	2
	0410E	●	10	4.000	4.518	1.969	1.500	1.378	2.362	.625	.375	.236	3.8	2
	0512E	●	12	5.000	5.513	2.480	1.500	1.378	2.362	.625	.375	.236	6.4	2
	0616E	●	16	6.000	6.511	2.480	1.500	1.378	2.362	.625	.375	.236	10.3	2
	0820M	●	20	8.000	8.509	2.480	2.500	1.378	5.512	1.000	.560	.236	14.6	3
	1024M	●	24	10.000	10.508	2.480	2.500	1.378	7.087	1.000	.560	.236	23.7	3



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

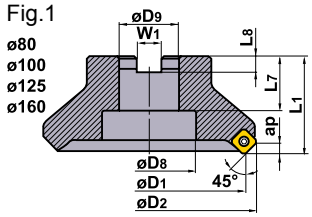


Fig.2

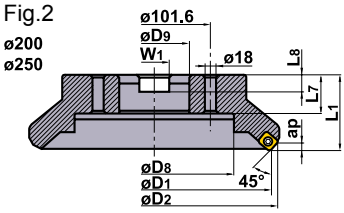
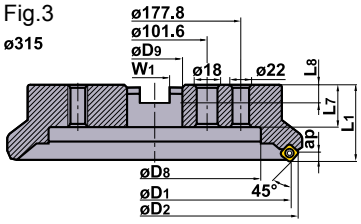


Fig.3



METRIC Standard

For inch arbors

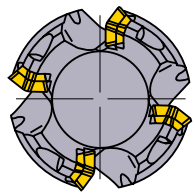
C H :45°
A.R :+20°—+23° T :+4°49′—+9°53′
R.R :-13°—-10° I :+22°55′—+23°02′

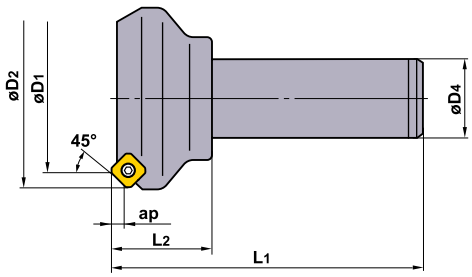
Right hand tool holder only.

ARBOR TYPE

Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) [inch] D1	D2	L1	D9	L7	D8	W1	L8	Max. Depth of Cut ap	Mass (kg)	Type (Fig.)
Coarse Pitch	**ASX445R08004C**	★	4	80	93.2	50	25.4 [1.0"]	26	38	9.5	6	6	1.1	1
	R10005D	★	5	100	113.2	50	31.75 [1.25"]	32	45	12.7	8	6	1.8	1
	R12506E	★	6	125	138.0	63	38.1 [1.5"]	35	60	15.9	10	6	2.9	1
	R16007F	★	7	160	173.0	63	50.8 [2.0"]	38	80	19.1	11	6	4.7	1
	R20008K	★	8	200	212.9	63	47.625 [1.875"]	35	140	25.4	14	6	7.9	2
	R25010K	★	10	250	262.9	63	47.625 [1.875"]	35	180	25.4	14	6	12.9	2
	R31514P	★	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
	R10007D	★	7	100	113.2	50	31.75 [1.25"]	32	45	12.7	8	6	1.7	1
	R12508E	★	8	125	138.0	63	38.1 [1.5"]	35	60	15.9	10	6	2.8	1
	R16010F	★	10	160	173.0	63	50.8 [2.0"]	38	80	19.1	11	6	4.6	1
	R20012K	★	12	200	212.9	63	47.625 [1.875"]	35	140	25.4	14	6	7.8	2
	R25014K	★	14	250	262.9	63	47.625 [1.875"]	35	180	25.4	14	6	12.8	2
	R31518P	★	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
	R10010D	★	10	100	113.2	50	31.75 [1.25"]	32	45	12.7	8	6	1.8	1
	R12512E	★	12	125	138.0	63	38.1 [1.5"]	35	60	15.9	10	6	2.9	1
	R16016F	★	16	160	173.0	63	50.8 [2.0"]	38	80	19.1	11	6	4.7	1
	R20020K	★	20	200	212.9	63	47.625 [1.875"]	35	140	25.4	14	6	7.8	2
	R25024K	★	24	250	262.9	63	47.625 [1.875"]	35	180	25.4	14	6	12.8	2
	R31528P	★	28	315	327.9	63	47.625 [1.875"]	40	245	25.4	14	6	21.8	3







METRIC Standard

Right hand tool holder only.

SHANK TYPE

Order Number	Stock R	Number of Teeth	Dimensions (mm) D1	D2	L1	D4	L2	Max. Depth of Cut ap (mm)
ASX445R503S32	★	3	50	63.0	125	32	40	6
634S32	★	4	63	75.9	125	32	40	6
804S32	★	4	80	93.2	125	32	40	6

MILLING

INSERTS ➤ K011
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

METRIC Standard

For metric arbors



ø50, ø63



Over ø80

Fig.1
ø50
ø63

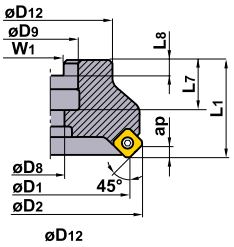


Fig.2
ø80
ø100

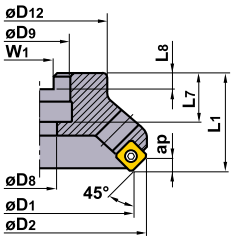


Fig.3
ø125

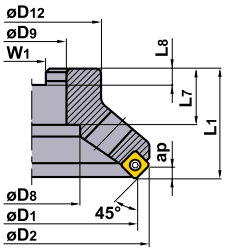


Fig.4
ø160

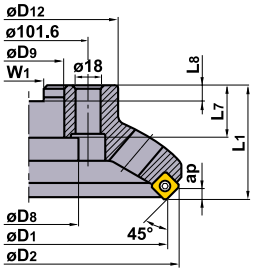
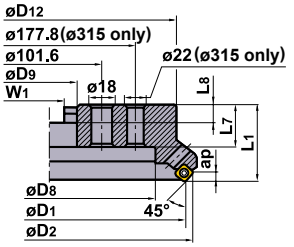


Fig.5
ø200
ø250
ø315



Right hand tool holder only.

C H :45°
A.R :+20° — +23° T :+4°49′ — +9°53′
R.R :-13° — -10° I :+22°55′ — +23°02′

ARBOR TYPE

Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) D1	D2	L1	D9	L7	D8	D12	W1	L8	Max. Depth of Cut ap	Mass (kg)	Type (Fig.)
Coarse Pitch	**ASX445-050A03R**	★	3	50	63.0	40	22	20	11	45	10.4	6.3	6	0.5	1
	-063A04R	★	4	63	75.9	40	22	20	11	50	10.4	6.3	6	0.7	1
	-080A04R	★	4	80	93.2	50	27	22	13.5	56	12.4	7	6	1.0	2
	-100A05R	★	5	100	113.2	50	32	25	17.5	70	14.4	8	6	1.6	2
	-125B06R	★	6	125	138.0	63	40	32	56	80	16.4	9	6	2.4	3
	-160C07R	★	7	160	173.0	63	40	29	56	100	16.4	9	6	3.9	4
	-200C08R	★	8	200	212.9	63	60	32	135	155	25.7	14	6	6.7	5
	-250C10R	★	10	250	262.9	63	60	32	174	200	25.7	14	6	10.5	5
	-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
	-063A05R	★	5	63	75.9	40	22	20	11	50	10.4	6.3	6	0.6	1
	-080A06R	★	6	80	93.2	50	27	22	13.5	56	12.4	7	6	0.9	2
	-100A07R	★	7	100	113.2	50	32	25	17.5	70	14.4	8	6	1.5	2
	-125B08R	★	8	125	138.0	63	40	32	56	80	16.4	9	6	2.3	3
	-160C10R	★	10	160	173.0	63	40	29	56	100	16.4	9	6	3.6	4
	-200C12R	★	12	200	212.9	63	60	32	135	155	25.7	14	6	5.8	5
	-250C14R	★	14	250	262.9	63	60	32	174	200	25.7	14	6	10.6	5
	-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
	-063A06R	★	6	63	75.9	40	22	20	11	50	10.4	6.3	6	0.6	1
	-080A08R	★	8	80	93.2	50	27	22	13.5	56	12.4	7	6	0.9	2
	-100A10R	★	10	100	113.2	50	32	25	17.5	70	14.4	8	6	1.5	2
	-125B12R	★	12	125	138.0	63	40	32	56	80	16.4	9	6	2.3	3
	-160C16R	★	16	160	173.0	63	40	29	56	100	16.4	9	6	3.6	4
	-200C20R	★	20	200	212.9	63	60	32	135	155	25.7	14	6	6.5	5
	-250C24R	★	24	250	262.9	63	60	32	174	200	25.7	14	6	10.3	5
	-315C28R	★	28	315	327.9	80	60	57	256.8	285	25.7	14	6	21.8	5

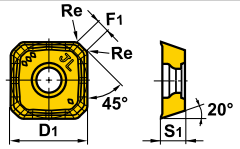
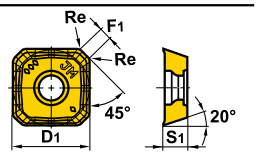
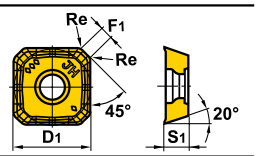
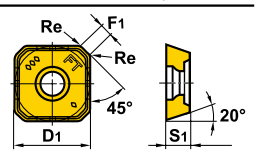
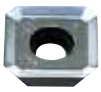
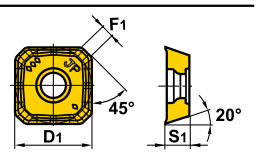
● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case> <1 insert in one case for CBN/PCD>

INSERTS WITH BREAKER

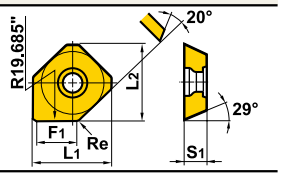
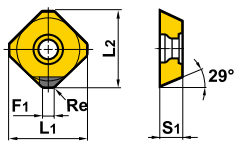
Work Material												
P	Steel	●	◐		◐	✣	◐					
M	Stainless Steel	○	◔		◔	✣	◔					
K	Cast Iron			◐	✣							
N	Non-Ferrous Metal									◐		
S	Heat-resistant Alloy, Titanium Alloy				◐							
H	Hardened Materials				◔							

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

Honing :
E : Round **F** : Sharp **S** : Chamfer + Round **T** : Chamfer

Application	Shape	Order Number	Class	Honing	Coated					Cermet		Carbide		Dimensions (inch)				Geometry
					F7010	F7030	MC5020	VP15TF	VP30RT	NX4545		HT10		D1	S1	F1	Re	
Finish—Light Cutting	**JL** breaker 	**SEET13T3AGEN-JL**	E	E		●		●	●	●				.528	.156	.075	.059	
Light—Semi -Heavy 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 Aluminum Alloy	**JP** breaker 	**SEGT13T3AGFN-JP**	G	F								●		.528	.156	.087	—	

WIPER INSERTS

Shape	Order Number	Honing	Coated		Cermet		Coated Cermet		Carbide		CBN		PCD		Dimensions (inch)					Geometry
			MC5020	VP15TF	NX2525		VP25N		HTi05T		MB710		MD220		L1	L2	S1	F1	Re	
	**WEEW13T3AGER8C**	E	●	●					●						.649	.654	.156	.295	.059	
	13T3AGTR8C	T			●		●								.649	.654	.156	.295	.059	
	**NP-WEEW13T3AGFR3C**	F												●	.649	.654	.156	.118	.059	
	13T3AGTR3C	T									●				.649	.654	.156	.118	.059	

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)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			VP15TF	820 (655—985)	.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**
			VP15TF	720 (560—885)	.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**
			VP15TF	460 (330—590)	.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	**VP15TF**	720 (560—885)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			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	Tensile Strength ≤450MPa	**MC5020**	655 (400—820)	—	—	.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**
N	Aluminum Alloy	—	**HTi10**	2130 (1000—3300)	.006 (.004—.008)	**JP**	.008 (.004—.012)	**JP**	.012 (.008—.016)	**JP**
S	Heat Resistant Alloy	—	**VP15TF**	130 (65—165)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
H	Heat-Treated Steel	40—55HRC	**VP15TF**	260 (195—330)	.004 (.002—.006)	**JL**	.006 (.004—.008)	**JM**	.008 (.004—.012)	**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

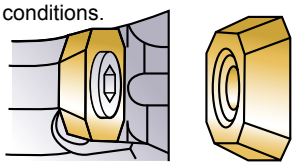


- Wiper inserts for the ASX445 are single-cornered.
- When installing the wiper insert, place the insert so that the cutting edge is located as shown.

FEATURES

STABLE, LONG TOOL LIFE, HIGH ACCURACY BODY

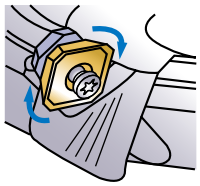
A carbide shim with Mitsubishi's proprietary Anti-Fly Insert (AFI) mechanism provides excellent insert location characteristics, permitting stable cutting even under high load conditions.



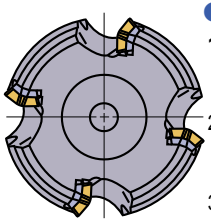
The cutter body is made from a special alloy that provides high strength at high temperature. A special surface treatment improves the corrosion resistance.



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.

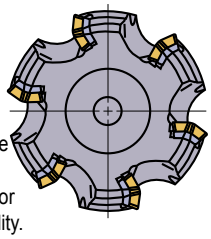


EFFECTIVE FOR VARIOUS MACHINING APPLICATIONS



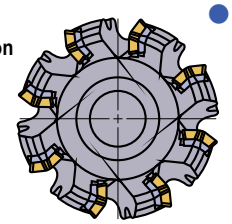
Coarse Pitch Type

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

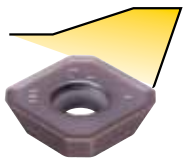
1. **The 1st recommendation type for cast iron, hardened steel and heat-resistant alloys.**
2. For shallow cutting with low feed rates and low-volume chip discharge.



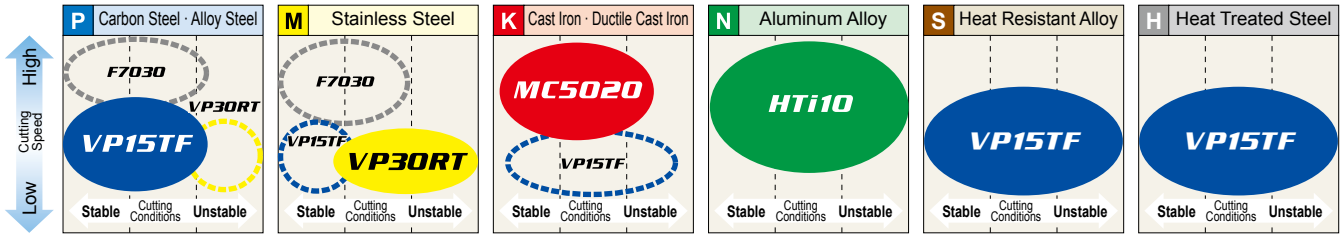
Extra Fine Pitch Type

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 and non ferrous metal. ②High feed cutting.**	**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

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel
	▬▬			

Fig.1 ø2.5" ø3"

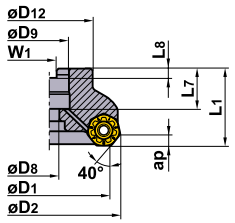


Fig.2 ø4" ø5" ø6"

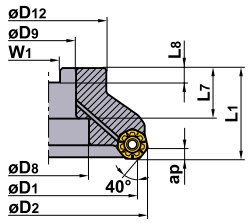
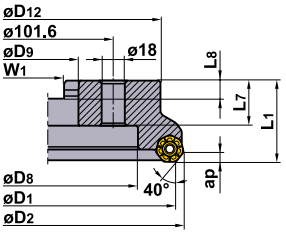


Fig.3 ø8"

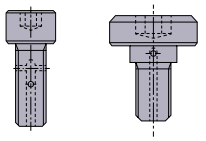




- Heptagonal double-sided insert.
- Economical 14 corner use.

Right hand tool holder only.

Cutter Diameter D1	Set Bolt	Geometry
ϕ2.5	HSCU37513H	①
ϕ3	62516H	
ϕ4	75016H	②
ϕ5	MBAU75016H	
ϕ6	100016H	
ϕ8	—	—



C H :40° T :+10° (When using the MK breaker insert.)
A.R :-6° T :+20° (When using the MP/MM breaker insert.)
R.R :-5° I :+9° — +10°

Type	Order Number	Stock R	Stock L	Coolant Thru *1	Number of Teeth	D1	D2	L1	D9	L7	D8	D12	W1	L8	Mass (lbs)	Max. Depth of Cut ap (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
	0304DA	●	□	Y	4	3	3.494	2.5	1.25	1.26	.669	2.88	.5	.281	3.7	.236	1	CS5015060T	TKY20T
	0405EA	●	□	Y	5	4	4.494	2.5	1.5	1.181	.787	3.81	.625	.375	6.4	.236	2	CS5015060T	TKY20T
	0506EA	●	□	Y	6	5	5.494	2.5	1.5	1.575	2.205	3.81	.625	.375	8.2	.236	2	CS5015060T	TKY20T
	0607FA	●	□	Y	7	6	6.494	2.5	2	1.693	3.228	4.88	.75	.437	11.7	.236	2	CS5015060T	TKY20T
	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
	0306DA	●	□	Y	6	3	3.494	2.5	1.25	1.26	.669	2.88	.5	.281	3.5	.236	1	CS5015060T	TKY20T
	0407EA	●	□	Y	7	4	4.494	2.5	1.5	1.181	.787	3.81	.625	.375	6.4	.236	2	CS5015060T	TKY20T
	0508EA	●	□	Y	8	5	5.494	2.5	1.5	1.575	2.205	3.81	.625	.375	7.9	.236	2	CS5015060T	TKY20T
	0610FA	●	□	Y	10	6	6.494	2.5	2	1.693	3.228	4.88	.75	.437	11.2	.236	2	CS5015060T	TKY20T
	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

● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.



Fig.1 ø63 ø80

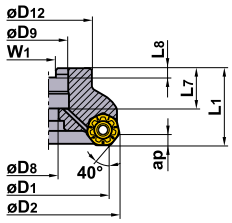


Fig.2 ø100 ø125 ø160

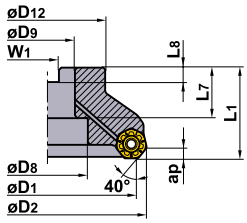
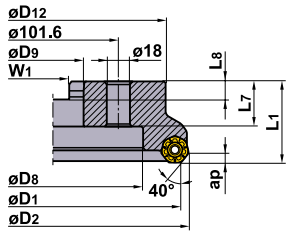


Fig.3 ø200



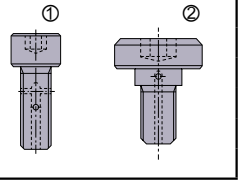
Right hand tool holder only.

METRIC Standard

For inch arbors

C H :40° T :+10° (When using the MK breaker insert.)
A.R :-6° T :+20° (When using the MP/MM breaker insert.)
R.R :-5° I :+9° ─ +10°

Cutter Diameter D1	Set Bolt	Geometry
ϕ63	HSC10030H	①
ϕ80	12035H	
ϕ100	MBA16033H	②
ϕ125	20040H	
ϕ160	24045H	
ϕ200	─	─



Type	Order Number	Stock R	Coolant Thru *1	Number of Teeth	D1	D2	L1	D9	L7	D8	D12	W1	L8	Mass (kg)	Max. Depth of Cut ap (mm)	Type (Fig.)	Clamp Screw *2	Wrench
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
	R10005DA	★	Y	5	100	112.6	50	31.75 [1.25"]	35	45	70	12.7	8	1.7	6	2	CS5015060T	TKY20T
	R12506EA	★	Y	6	125	137.6	63	38.1 [1.5"]	42	56	80	15.9	10	3.0	6	2	CS5015060T	TKY20T
	R16007FA	★	N	7	160	172.6	63	50.8 [2.0"]	43	72	100	19.1	11	4.9	6	2	CS5015060T	TKY20T
	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
	R10007DA	★	Y	7	100	112.6	50	31.75 [1.25"]	35	45	70	12.7	8	1.5	6	2	CS5015060T	TKY20T
	R12508EA	★	Y	8	125	137.6	63	38.1 [1.5"]	42	56	80	15.9	10	2.9	6	2	CS5015060T	TKY20T
	R16010FA	★	N	10	160	172.6	63	50.8 [2.0"]	43	72	100	19.1	11	4.7	6	2	CS5015060T	TKY20T
	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

INSERTS ➤ K017
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig.1 ø63 ø80

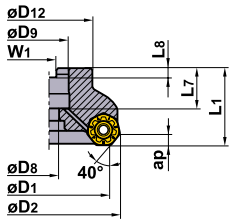


Fig.2 ø100 ø125

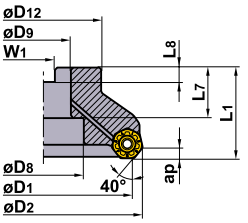


Fig.3 ø160

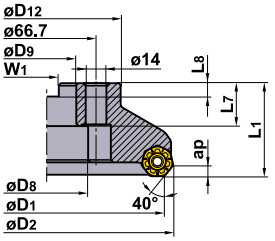
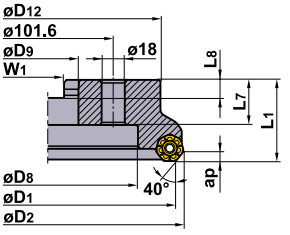


Fig.4 ø200



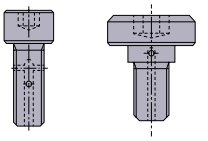
Right hand tool holder only.

METRIC Standard

For metric arbors

C H :40° T :+10° (When using the MK breaker insert.)
A.R :-6° T :+20° (When using the MP/MM breaker insert.)
R.R :-5° I :+9° ─ +10°

Cutter Diameter D1	Set Bolt	Geometry
ϕ63	HSC10030H	①
ϕ80	12035H	
ϕ100	MBA16033H	②
ϕ125	20040H	
ϕ160	─	─
ϕ200	─	─



Type	Order Number	Stock R	Coolant Thru *1	Number of Teeth	Dimensions (mm) D1	D2	L1	D9	L7	D8	D12	W1	L8	Mass (kg)	Max. Depth of Cut ap (mm)	Type (Fig.)	Clamp Screw *2	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
	-080A04AR	★	Y	4	80	92.6	50	27	23	13	56	12.4	7	1.1	6	1	CS5015060T	TKY20T
	-100B05AR	★	Y	5	100	112.6	50	32	32	45	78	14.4	8	1.7	6	2	CS5015060T	TKY20T
	-125B06AR	★	Y	6	125	137.6	63	40	42	56	89	16.4	9	3.1	6	2	CS5015060T	TKY20T
	-160C07NR	★	N	7	160	172.6	63	40	29	56	120	16.4	9	5.4	6	3	CS5015060T	TKY20T
	-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
	-080A06AR	★	Y	6	80	92.6	50	27	23	13	56	12.4	7	1.0	6	1	CS5015060T	TKY20T
	-100B07AR	★	Y	7	100	112.6	50	32	32	45	78	14.4	8	1.6	6	2	CS5015060T	TKY20T
	-125B08AR	★	Y	8	125	137.6	63	40	42	56	89	16.4	9	3.0	6	2	CS5015060T	TKY20T
	-160C10NR	★	N	10	160	172.6	63	40	29	56	120	16.4	9	5.2	6	3	CS5015060T	TKY20T
	-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

● : 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			●	.039" R.031" ø.787" .315"
For Stainless	MM Insert NEW	NNMU200712ZER-MM	M	E		●		.039" R.047" ø.787" .315"
Wiper Insert	WP Insert NEW	WNEU2007ZEN7C-WP	E	E			●	.280" R.031" ø.787" .272"

Application	Shape	Order Number	Class	Horning	Coated MC5020	Coated VP15TF	Geometry
For Cast Iron	MK Insert	NNMU200608ZEN-MK	M	E	●		.039" R.031" ø.787" .258"
For Cast Iron	HK Insert	NNMU200608ZEN-HK	M	E	●		.039" R.031" ø.787" .258"
For Cast Iron	WK Insert	WNEU2006ZEN7C-WK	E	E	●		.291" R.031" ø.787" .258"

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	**VP15TF**	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	**VP15TF**	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	**VP15TF**	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**	**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**	**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**	**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

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel
	▬			



- Heptagonal double-sided insert.
- Economical 14 corner use.
- Fine pitch design allows high feed milling.

Fig.1 ø3" ø4"

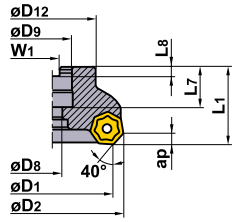


Fig.2 ø5" ø6"

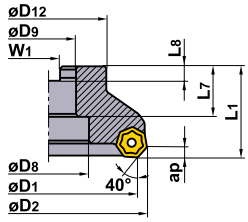


Fig.3 ø8" ø10"

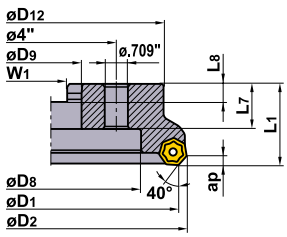
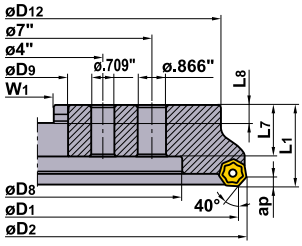


Fig.4 ø12"



C H :40°
A.R :-6° T :+10°
R.R :-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	D1	D2	L1	D9	L7	D8	D12	W1	L8	Max. Depth of Cut ap	Mass (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
	0410E	●	□	10	4.000	4.494	2.500	1.500	1.181	.787	3.799	.625	.375	.236	7.3	1
	0512E	●	□	12	5.000	5.494	2.500	1.500	1.378	2.362	3.799	.625	.375	.236	8.8	2
	0614F	●	□	14	6.000	6.494	2.500	2.000	1.496	3.150	4.724	.750	.437	.236	12.6	2
	0820M	●	□	20	8.000	8.494	2.500	2.500	1.378	5.512	6.890	1.000	.560	.236	19.6	3
	1024M	●	□	24	10.000	10.494	2.500	2.500	1.378	7.087	8.661	1.000	.560	.236	32.0	3
	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
	0414E	●	□	14	4.000	4.494	2.500	1.500	1.181	.787	3.799	.625	.375	.236	7.3	1
	0518E	●	□	18	5.000	5.494	2.500	1.500	1.378	2.362	3.799	.625	.375	.236	8.8	2
	0620F	●	□	20	6.000	6.494	2.500	2.000	1.496	3.150	4.724	.750	.437	.236	12.6	2
	0828M	●	□	28	8.000	8.494	2.500	2.500	1.378	5.512	6.890	1.000	.560	.236	19.6	3
	1036M	●	□	36	10.000	10.494	2.500	2.500	1.378	7.087	8.661	1.000	.560	.236	32.0	3
	1242M	●	□	42	12.000	12.494	2.500	2.500	1.575	9.646	11.220	1.000	.560	.236	49.2	4

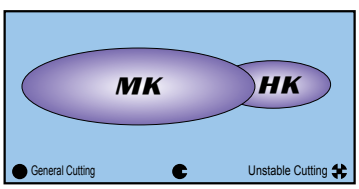
INSERTS

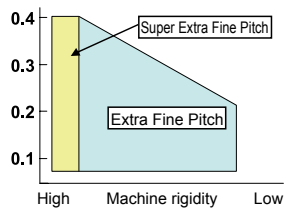
Shape	Order Number	Class	Honing	Coated MC5020	Geometry
MK breaker	**NNMU200608ZEN-MK**	M	E	●	.039" R.031" ø.787" .258"
HK breaker	**NNMU200608ZEN-HK**	M	E	●	.039" R.031" ø.787" .258"
Wiper	**WNEU2006ZEN7C-WK**	E	E	●	.291" .291" R.031" ø.787" .258"

● : Inventory maintained.
□ : Non stock, produced to order only.
<10 inserts in one case>

RECOMMENDED CUTTING CONDITIONS

Work Material		Tensile Strength	Grade	Cutting Speed (SFM)	Feed per Tooth (inch/tooth)
K	Gray Cast Iron	≤200MPa	MC5020	985 (820—1150)	.012 (.008—.016)
		250—350 MPa		720 (490—985)	.012 (.008—.016)
	Ductile Cast Iron	≤450MPa		655 (490—820)	.008 (.004—.012)
		500—800 MPa		555 (490—655)	.008 (.004—.012)





(Note) When the workpiece has poor clamping rigidity and the tool overhang is long, reduce the cutting speed and feed by 20—30%.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig.1 ø80

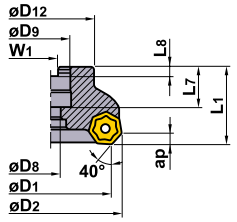


Fig.2 ø100 ø125 ø160

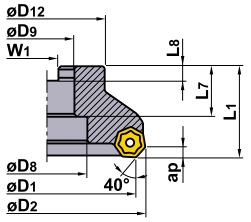


Fig.3 ø200 ø250

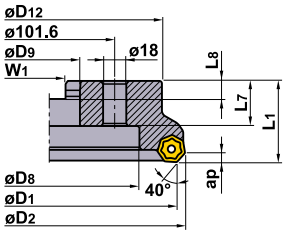
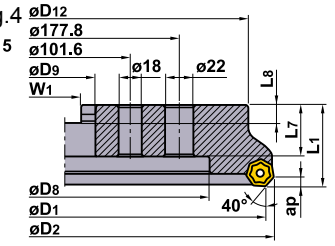


Fig.4 ø315



METRIC Standard

For inch arbors

C H :40°
A.R :-6°　　T :+10°
R.R :-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	D1	D2	L1	D9	L7	D8	D12	W1	L8	Max. Depth of Cut ap	Mass (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
	10010D	★	★	10	100	112.6	50	31.75 [1.25"]	32	45	70	12.7	8	6	2.1	2
	12512E	★	★	12	125	137.6	63	38.1 [1.5"]	35	56	80	15.9	10	6	3.5	2
	16016F	★	★	16	160	172.6	63	50.8 [2.0"]	38	72	100	19.1	11	6	5.6	2
	20020K	★	★	20	200	212.6	63	47.625 [1.875"]	35	140	175	25.4	14.22	6	9.0	3
	25024K	★	★	24	250	262.6	63	47.625 [1.875"]	35	180	220	25.4	14.22	6	14.4	3
	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
	10014D	★	★	14	100	112.6	50	31.75 [1.25"]	32	45	70	12.7	8	6	2.1	2
	12518E	★	★	18	125	137.6	63	38.1 [1.5"]	35	56	80	15.9	10	6	3.5	2
	16022F	★	★	22	160	172.6	63	50.8 [2.0"]	38	72	100	19.1	11	6	5.6	2
	20028K	★	★	28	200	212.6	63	47.625 [1.875"]	35	140	175	25.4	14.22	6	9.0	3
	25036K	★	★	36	250	262.6	63	47.625 [1.875"]	35	180	220	25.4	14.22	6	14.4	3
	31544P	★	★	44	315	327.6	63	47.625 [1.875"]	40	225	285	25.4	14.22	6	23.8	4



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

C H :40°
A.R :-6°　　T :+10°
R.R :-4°　　I :+9°—+10°　(T, I : When using the MK breaker insert)

Fig.1
ø80

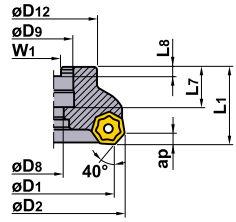


Fig.2
ø100
ø125

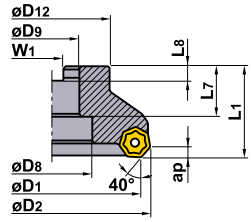


Fig.3
ø160

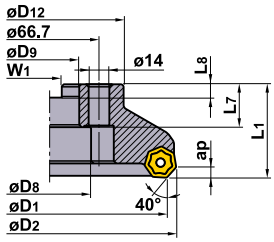
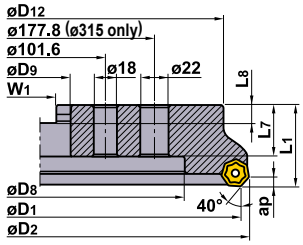


Fig.4
ø200
ø250
ø315



Right hand tool holder shown.

Type	Order Number	Stock R	Stock L	Number of Teeth	Dimensions (mm) D1	D2	L1	D9	L7	D8	D12	W1	L8	Max. Depth of Cut ap	Mass (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
	-100B10R/L	★	★	10	100	112.6	50	32	32	45	70	14.4	8	6	2.1	2
	-125B12R/L	★	★	12	125	137.6	63	40	32	56	80	16.4	9	6	3.1	2
	-160C16R/L	★	★	16	160	172.6	63	40	29	56	100	16.4	9	6	5.6	3
	-200C20R/L	★	★	20	200	212.6	63	60	32	135	155	25.7	14	6	8.0	4
	-250C24R/L	★	★	24	250	262.6	63	60	32	180	200	25.7	14	6	12.6	4
	-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
	-100B14R/L	★	★	14	100	112.6	50	32	32	45	70	14.4	8	6	2.1	2
	-125B18R/L	★	★	18	125	137.6	63	40	32	56	80	16.4	9	6	3.1	2
	-160C22R/L	★	★	22	160	172.6	63	40	29	56	100	16.4	9	6	5.6	3
	-200C28R/L	★	★	28	200	212.6	63	60	32	135	155	25.7	14	6	8.0	4
	-250C36R/L	★	★	36	250	262.6	63	60	32	180	200	25.7	14	6	12.6	4
	-315C44R/L	★	★	44	315	327.6	80	60	57	225	285	25.7	14	6	31.5	4

INSERTS ➤ K019
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

FACE MILLING 45°

<HIGH EFFICIENCY CUTTING FOR CAST IRON>

Finishing Roughing

AOX445

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel
	▬			



- 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

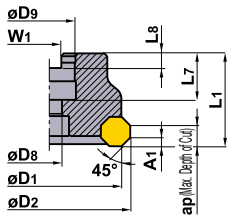


Fig.2 ø80 ø100 ø125 ø160

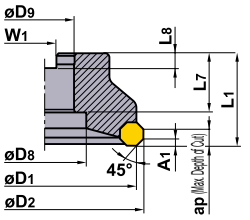
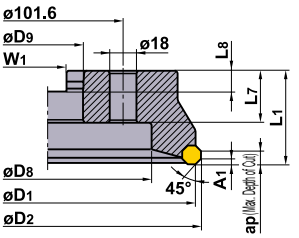


Fig.3 ø200



METRIC Standard

For inch arbors

C H :45°
A.R :-5°
R.R :-9°—-6°
T :-9°—-6°
I :-5°

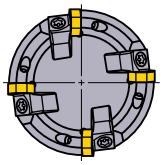
ARBOR TYPE

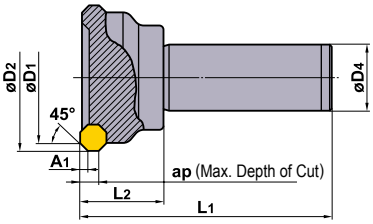
Right hand tool holder only.

Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) [inch] D1	D2	L1	D9	L7	D8	W1	L8	Mass (kg)	Max. Depth of Cut (mm) A1	ap	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
	R08006C	★	6	80	87.73	50	25.4 [1.0"]	26	38	9.5	6	1.1	3	8	11000	2
	R10008D	★	8	100	107.73	50	31.75 [1.25"]	32	45	12.7	8	2.4	3	8	9300	2
	R12510E	★	10	125	132.71	63	38.1 [1.5"]	35	60	15.9	10	2.9	3	8	8300	2
	R16012F	★	12	160	167.71	63	50.8 [2.0"]	38	80	19.1	11	4.6	3	8	7200	2

(Note) When machining with a depth of cut of over 3mm, 16 corners cannot be used.







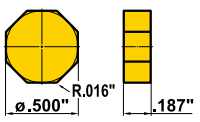
METRIC Standard

SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) D1	D2	L1	D4	L2	Mass (kg)	Max. Depth of Cut (mm) A1	ap	Max. Spindle Speed (min-1)
Coarse Pitch	**AOX445R503S32**	★	3	50	57.75	125	32	40	1.0	3	8	13000
	R634S32	★	4	63	70.75	125	32	40	1.3	3	8	12000

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>

0° Roughing

VOX400

Light Alloy	Cast Iron	Carbon Steel · Alloy Steel	Stainless Steel	Hardened Steel
	▬			

NEW



Fig.1

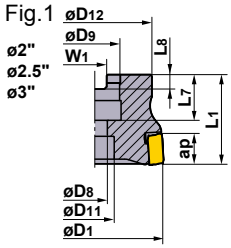


Fig.2

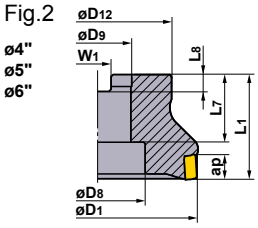
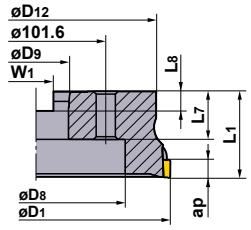


Fig.3

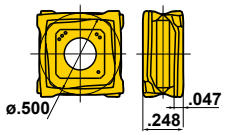


Right hand tool holder only.

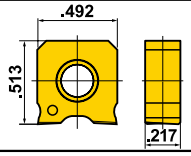
ARBOR TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions (inch)									Mass (lbs)	Max. Depth of Cut **ap** (inch)	Fig.
		R		D1	L1	D9	L7	D8	D11	D12	W1	L8			
Coarse Pitch	**VOX400UR0203C**	●	3	2.000	2.000	1.000	1.339	.539	.787	2.190	.375	.219	.8	.394	1
	2504C	●	4	2.500	2.000	1.000	1.339	.539	.787	2.190	.375	.219	1.7	.394	1
	0304C	●	4	3.000	2.000	1.000	1.339	.539	.787	2.190	.375	.219	2.2	.394	1
	0406E	●	6	4.000	2.000	1.500	1.024	2.205	—	3.810	.625	.375	4.3	.394	2
	0508E	●	8	5.000	2.000	1.500	1.024	2.205	—	3.810	.625	.375	6.0	.394	2
	0610F	●	10	6.000	2.500	2.000	1.024	3.228	—	4.880	.750	.437	10.2	.394	2
	0812M	●	12	8.000	2.500	2.500	1.378	5.512	—	6.890	1.000	.560	17.6	.394	3
	1016M	●	16	10.000	2.500	2.500	1.378	7.078	—	8.660	1.000	.560	29.4	.394	3
Fine Pitch	**VOX400UR0205C**	●	5	2.000	2.000	1.000	1.339	.539	.787	2.190	.375	.219	.8	.394	1
	2506C	●	6	2.500	2.000	1.000	1.339	.539	.787	2.190	.375	.219	1.7	.394	1
	0308C	●	8	3.000	2.000	1.000	1.339	.539	.787	2.190	.375	.219	2.2	.394	1
	0410E	●	10	4.000	2.000	1.500	1.024	2.205	—	3.810	.625	.375	4.3	.394	2
	0512E	●	12	5.000	2.000	1.500	1.024	2.205	—	3.810	.625	.375	6.0	.394	2
	0616F	●	16	6.000	2.500	2.000	1.024	3.228	—	4.880	.750	.437	10.2	.394	2
	0820M	●	20	8.000	2.500	2.500	1.378	5.512	—	6.890	1.000	.560	17.6	.394	3
	1024M	●	24	10.000	2.500	2.500	1.378	7.078	—	8.660	1.000	.560	29.4	.394	3
Extra Fine Pitch	**VOX400UR2508C**	●	8	2.500	2.000	1.000	1.024	.539	.787	2.190	.375	.219	1.5	.394	1
	0310C	●	10	3.000	2.000	1.000	1.024	.539	.787	2.190	.375	.219	2.0	.394	1
	0412E	●	12	4.000	2.000	1.500	1.024	2.205	—	3.810	.625	.375	4.1	.394	2
	0516E	●	16	5.000	2.000	1.500	1.024	2.205	—	3.810	.625	.375	5.6	.394	2
	0620F	●	20	6.000	2.500	2.000	1.024	3.228	—	4.880	.75	.437	9.8	.394	2
	0826M	●	26	8.000	2.500	2.500	1.378	5.512	—	6.890	1.000	.560	17.1	.394	3
	1034M	●	34	10.000	2.500	2.500	1.378	7.087	—	8.660	1.000	.560	28.7	.394	3

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



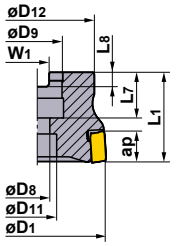
Fig.1


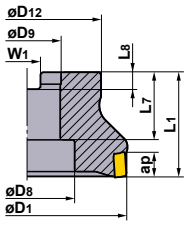
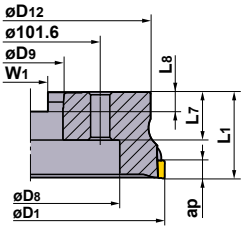
Fig.2


Fig.3


Right hand tool holder only.

METRIC Standard

For inch arbors

ARBOR TYPE

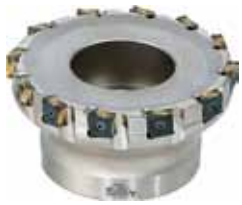
Type	Order Number	Stock	Number of Teeth	Dimensions (mm) [inch]									Mass (kg)	Max. Depth of Cut **ap** (mm)	Fig.
		R		D1	L1	D9	L7	D8	D11	D12	W1	L8			
Coarse Pitch	**VOX400R08004C**	★	4	80	50	25.4 [1.0"]	26	13	20	55	9.5	6	1.0	10	1
	R10006D	★	6	100	50	31.75 [1.25"]	32	45	—	70	12.7	8	1.5	10	2
	R12508E	★	8	125	63	38.1 [1.5"]	40	60	—	80	15.9	10	2.7	10	2
	R16010F	★	10	160	63	50.8 [2.0"]	43	80	—	120	19.1	11	5.3	10	2
	R20012K	★	12	200	63	47.625 [1.875"]	35	130	—	175	25.4	14.22	8.5	10	3
	R25016K	★	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
	R10010D	★	10	100	50	31.75 [1.25"]	32	45	—	70	12.7	8	1.5	10	2
	R12512E	★	12	125	63	38.1 [1.5"]	40	60	—	80	15.9	10	2.7	10	2
	R16016F	★	16	160	63	50.8 [2.0"]	43	80	—	120	19.1	11	5.3	10	2
	R20020K	★	20	200	63	47.625 [1.875"]	35	130	—	175	25.4	14.22	8.5	10	3
	R25024K	★	24	250	63	47.625 [1.875"]	35	180	—	220	25.4	14.22	13.3	10	3
Extra Fine Pitch (NEW)	**VOX400R08010C**	★	10	80	50	25.4 [1.0"]	26	13	20	55	9.5	6	1.0	10	1
	R10012D	★	12	100	50	31.75 [1.25"]	32	45	—	70	12.7	8	1.4	10	2
	R12516E	★	16	125	63	38.1 [1.5"]	40	60	—	80	15.9	10	2.6	10	2
	R16020F	★	20	160	63	50.8 [2.0"]	43	80	—	120	19.1	11	5.1	10	2
	R20026K	★	26	200	63	47.625 [1.875"]	35	130	—	175	25.4	14.22	8.2	10	3
	R25034K	★	34	250	63	47.625 [1.875"]	35	180	—	220	25.4	14.22	13.0	10	3

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

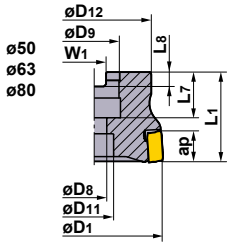


Fig.2

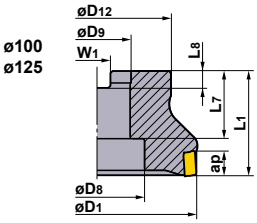
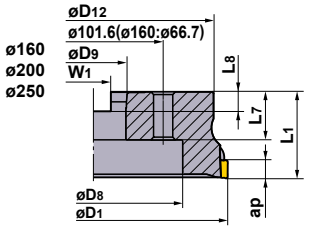


Fig.3



Right hand tool holder only.

ARBOR TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)									Mass (kg)	Max. Depth of Cut **ap** (mm)	Fig.
		R		D1	L1	D9	L7	D8	D11	D12	W1	L8			
Coarse Pitch	**VOX400-050A03R**	★	3	50	40	22	20	11	17	50	10.4	6.3	0.3	10	1
	-063A04R	★	4	63	40	22	20	11	17	50	10.4	6.3	0.6	10	1
	-080A04R	★	4	80	50	27	23	13	20	56	12.4	7	1	10	1
	-100B06R	★	6	100	50	32	32	45	—	78	14.4	8	1.7	10	2
	-125B08R	★	8	125	63	40	32	56	—	89	16.4	9	3	10	2
	-160C10R	★	10	160	63	40	29	56	—	120	16.4	9	5.4	10	3
	-200C12R	★	12	200	63	60	32	130	—	175	25.7	14.22	8.1	10	3
	-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	50	10.4	6.3	0.3	10	1
	-063A06R	★	6	63	40	22	20	11	17	50	10.4	6.3	0.6	10	1
	-080A08R	★	8	80	50	27	23	13	20	56	12.4	7	1	10	1
	-100B10R	★	10	100	50	32	32	45	—	78	14.4	8	1.7	10	2
	-125B12R	★	12	125	63	40	32	56	—	89	16.4	9	3	10	2
	-160C16R	★	16	160	63	40	29	56	—	120	16.4	9	5.4	10	3
	-200C20R	★	20	200	63	60	32	130	—	175	25.7	14.22	8.1	10	3
	-250C24R	★	24	250	63	60	32	180	—	210	25.7	14.22	11.8	10	3
Extra Fine Pitch	NEW **VOX400-063A08R**	★	8	63	40	22	20	11	17	50	10.4	6.3	0.5	10	1
	-080A10R	★	10	80	50	27	23	13	20	56	12.4	7	1.0	10	1
	-100B12R	★	12	100	50	32	32	45	—	78	14.4	8	1.6	10	2
	-125B16R	★	16	125	63	40	32	56	—	89	16.4	9	2.8	10	2
	-160C20R	★	20	160	63	40	29	56	—	120	16.4	9	5.2	10	3
	-200C26R	★	26	200	63	60	32	130	—	175	25.7	14.22	7.9	10	3
	-250C34R	★	34	250	63	60	32	180	—	210	25.7	14.22	11.5	10	3

INSERTS ➤ K023
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)	≤D_1	≤.394	.016(.012—.020)
			VP15TF	820(655—985)	≤D_1	≤.394	.016(.012—.020)
		≤350MPa	MC5020	720(490—985)	≤D_1	≤.394	.012(.008—.016)
			VP15TF	655(490—985)	≤D_1	≤.394	.012(.008—.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490—820)	≤D_1	≤.394	.012(.008—.016)
			VP15TF	555(490—655)	≤D_1	≤.394	.012(.008—.016)
		≤800MPa	MC5020	555(490—655)	≤D_1	≤.394	.008(.004—.012)
			VP15TF	490(330—655)	≤D_1	≤.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)	≤D_1	≤.394	.016(.012—.020)	≤D_1	≤.394	.016(.012—.020)
			VP15TF	820(655—985)	≤D_1	≤.394	.016(.012—.020)	≤D_1	≤.394	.016(.012—.020)
		≤350MPa	MC5020	720(490—985)	≤D_1	≤.394	.012(.008—.016)	≤D_1	≤.394	.012(.008—.016)
			VP15TF	655(490—985)	≤D_1	≤.394	.012(.008—.016)	≤D_1	≤.394	.012(.008—.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490—820)	≤0.8D_1	≤.394	.012(.008—.016)	≤0.6D_1	≤.394	.012(.008—.016)
			VP15TF	555(490—655)	≤0.8D_1	≤.394	.012(.008—.016)	≤0.6D_1	≤.394	.012(.008—.016)
		≤800MPa	MC5020	555(490—655)	≤0.8D_1	≤.394	.008(.004—.012)	≤0.6D_1	≤.394	.008(.004—.012)
			VP15TF	490(330—655)	≤0.8D_1	≤.394	.008(.004—.012)	≤0.6D_1	≤.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)	≤D_1	≤.394	.016(.012—.020)	≤D_1	≤.394	.016(.012—.020)
			VP15TF	820(655—985)	≤D_1	≤.394	.016(.012—.020)	≤D_1	≤.394	.016(.012—.020)
		≤350MPa	MC5020	720(490—985)	≤D_1	≤.394	.012(.008—.016)	≤D_1	≤.394	.012(.008—.016)
			VP15TF	655(490—985)	≤D_1	≤.394	.012(.008—.016)	≤D_1	≤.394	.012(.008—.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490—820)	≤0.5D_1	≤.394	.012(.008—.016)	≤0.4D_1	≤.394	.012(.008—.016)
			VP15TF	555(490—655)	≤0.5D_1	≤.394	.012(.008—.016)	≤0.4D_1	≤.394	.012(.008—.016)
		≤800MPa	MC5020	555(490—655)	≤0.5D_1	≤.394	.008(.004—.012)	≤0.4D_1	≤.394	.008(.004—.012)
			VP15TF	490(330—655)	≤0.5D_1	≤.394	.008(.004—.012)	≤0.4D_1	≤.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)	≤D_1	≤.394	.016(.012—.020)	≤D_1	≤.394	.016(.012—.020)
			VP15TF	820(655—985)	≤D_1	≤.394	.016(.012—.020)	≤D_1	≤.394	.016(.012—.020)
		≤350MPa	MC5020	720(490—985)	≤D_1	≤.394	.012(.008—.016)	≤D_1	≤.394	.012(.008—.016)
			VP15TF	655(490—985)	≤D_1	≤.394	.012(.008—.016)	≤D_1	≤.394	.012(.008—.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490—820)	≤0.3D_1	≤.394	.012(.008—.016)	≤0.2D_1	≤.394	.012(.008—.016)
			VP15TF	555(490—655)	≤0.3D_1	≤.394	.012(.008—.016)	≤0.2D_1	≤.394	.012(.008—.016)
		≤800MPa	MC5020	555(490—655)	≤0.3D_1	≤.394	.008(.004—.012)	≤0.2D_1	≤.394	.008(.004—.012)
			VP15TF	490(330—655)	≤0.3D_1	≤.394	.008(.004—.012)	≤0.2D_1	≤.394	.008(.004—.012)

- D_1 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)	≤D_1	≤.394	.016(.012－.020)	≤D_1	≤.394	.016(.012－.020)
			VP15TF	820(655－985)	≤D_1	≤.394	.016(.012－.020)	≤D_1	≤.394	.016(.012－.020)
		≤350MPa	MC5020	720(490－985)	≤D_1	≤.394	.012(.008－.016)	≤D_1	≤.394	.012(.008－.016)
			VP15TF	655(490－985)	≤D_1	≤.394	.012(.008－.016)	≤D_1	≤.394	.012(.008－.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490－820)	≤0.6D_1	≤.394	.012(.008－.016)	≤0.5D_1	≤.394	.012(.008－.016)
			VP15TF	555(490－655)	≤0.6D_1	≤.394	.012(.008－.016)	≤0.5D_1	≤.394	.012(.008－.016)
		≤800MPa	MC5020	555(490－655)	≤0.6D_1	≤.394	.008(.004－.012)	≤0.5D_1	≤.394	.008(.004－.012)
			VP15TF	490(330－655)	≤0.6D_1	≤.394	.008(.004－.012)	≤0.5D_1	≤.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)	≤D_1	≤.394	.016(.012－.020)	≤D_1	≤.394	.016(.012－.020)
			VP15TF	820(655－985)	≤D_1	≤.394	.016(.012－.020)	≤D_1	≤.394	.016(.012－.020)
		≤350MPa	MC5020	720(490－985)	≤D_1	≤.394	.012(.008－.016)	≤D_1	≤.394	.012(.008－.016)
			VP15TF	655(490－985)	≤D_1	≤.394	.012(.008－.016)	≤D_1	≤.394	.012(.008－.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490－820)	≤0.4D_1	≤.394	.012(.008－.016)	≤0.3D_1	≤.394	.012(.008－.016)
			VP15TF	555(490－655)	≤0.4D_1	≤.394	.012(.008－.016)	≤0.3D_1	≤.394	.012(.008－.016)
		≤800MPa	MC5020	555(490－655)	≤0.4D_1	≤.394	.008(.004－.012)	≤0.3D_1	≤.394	.008(.004－.012)
			VP15TF	490(330－655)	≤0.4D_1	≤.394	.008(.004－.012)	≤0.3D_1	≤.394	.008(.004－.012)

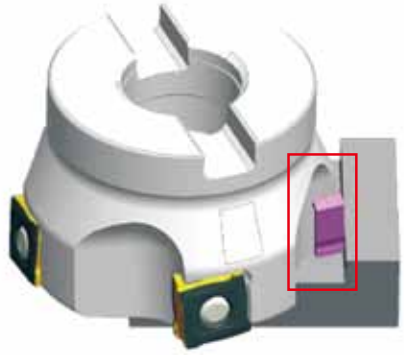
	Work Material	Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ6"			ϕ8", ϕ10"		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)	Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	MC5020	985(820－1150)	≤D_1	≤.394	.016(.012－.020)	≤D_1	≤.394	.016(.012－.020)
			VP15TF	820(655－985)	≤D_1	≤.394	.016(.012－.020)	≤D_1	≤.394	.016(.012－.020)
		≤350MPa	MC5020	720(490－985)	≤D_1	≤.394	.012(.008－.016)	≤D_1	≤.394	.012(.008－.016)
			VP15TF	655(490－985)	≤D_1	≤.394	.012(.008－.016)	≤D_1	≤.394	.012(.008－.016)
	Ductile Cast Iron	≤450MPa	MC5020	655(490－820)	≤0.25D_1	≤.394	.012(.008－.016)	≤0.15D_1	≤.394	.012(.008－.016)
			VP15TF	555(490－655)	≤0.25D_1	≤.394	.012(.008－.016)	≤0.15D_1	≤.394	.012(.008－.016)
		≤800MPa	MC5020	555(490－655)	≤0.25D_1	≤.394	.008(.004－.012)	≤0.15D_1	≤.394	.008(.004－.012)
			VP15TF	490(330－655)	≤0.25D_1	≤.394	.008(.004－.012)	≤0.15D_1	≤.394	.008(.004－.012)

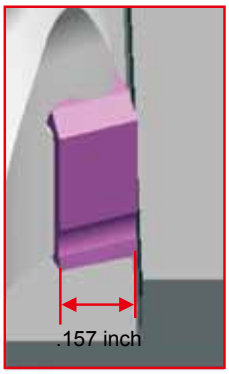
- D_1 is cutter diameter.
- When using wiper insert, please reduce the feed per tooth to half the normal rate.

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

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel



- 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.

C H :0°
A.R :+11° T :-9°—-11°
R.R :-9°—-11° I :+11°

Fig.1 ø2" ø2-1/2"

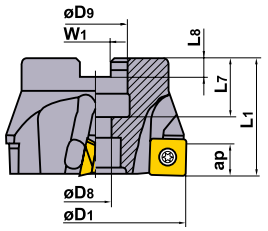


Fig.2 ø3" ø4" ø5" ø6"

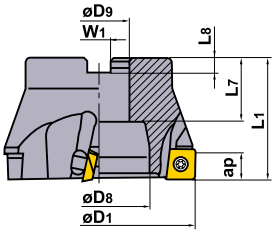
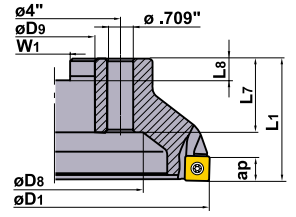


Fig.3 ø4" ø8" ø10"



Right hand tool holder only.

ARBOR TYPE

Type	Order Number	Stock R	Number of Teeth	Dimensions (inch) D1	L1	D9	L7	D8	W1	L8	Max. Depth of Cut ap	Mass (lbs)	Type (Fig.)
Coarse Pitch	**ASX400R0203**	●	3	2.000	1.575	.750	.748	.415	.313	.187	.394	.8	1
	2504	●	4	2.500	1.575	.750	.748	.415	.313	.187	.394	1.1	1
	0304C	●	4	3.000	1.969	1.000	1.024	1.496	.375	.219	.394	2.2	2
	0405E	●	5	4.000	1.969	1.500	1.378	2.362	.625	.375	.394	3.3	2
	0506E	●	6	5.000	2.480	1.500	1.378	2.362	.625	.375	.394	5.5	2
	0608E	●	8	6.000	2.480	1.500	1.378	2.362	.625	.375	.394	8.8	2
	0810M	●	10	8.000	2.480	2.500	1.378	5.315	1.000	.560	.394	15.0	3
	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
	2505	●	5	2.500	1.575	.750	.748	.415	.313	.187	.394	1.1	1
	0306C	●	6	3.000	1.969	1.000	1.024	1.496	.375	.219	.394	2.2	2
	0407E	●	7	4.000	1.969	1.500	1.378	2.362	.625	.375	.394	3.3	2
	0508E	●	8	5.000	2.480	1.500	1.378	2.362	.625	.375	.394	5.5	2
	0612E	●	12	6.000	2.480	1.500	1.378	2.362	.625	.375	.394	8.8	2
	0816M	●	16	8.000	2.480	2.500	1.378	5.315	1.000	.560	.394	15.0	3
	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
	2506	●	6	2.500	1.575	.750	.748	.415	.313	.187	.394	1.1	1
	0308C	●	8	3.000	1.969	1.000	1.024	1.496	.375	.219	.394	2.2	2
	0410E	●	10	4.000	1.969	1.500	1.378	2.362	.625	.375	.394	3.3	2
	0512E	●	12	5.000	2.480	1.500	1.378	2.362	.625	.375	.394	5.5	2
	0615E	●	15	6.000	2.480	1.500	1.378	2.362	.625	.375	.394	8.8	2
	0819M	●	19	8.000	2.480	2.500	1.378	5.315	1.000	.560	.394	15.0	3
	1022M	●	22	10.000	2.480	2.500	1.378	7.087	1.000	.560	.394	26.0	3

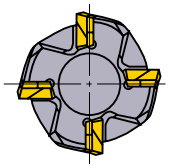
SPARE PARTS

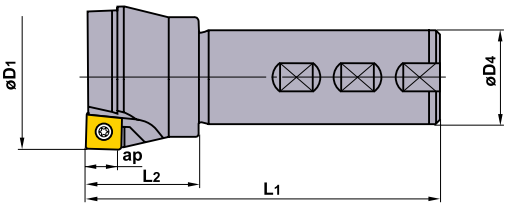
Tool Holder Number	Shim	Shim Screw *	Insert Screw *	Wrench (Insert)	Wrench (Shim)	Insert
ASX400R Type	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	SO○T12T3○○ PE○R-○○

* 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) D1	L1	D4	L2	ap	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-◌◌
243W20	●	3	1.500	4.750	1.250	1.500	.394	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	
324W20	●	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		F7010	F7030	MC5020	VP15TF	VP30RT	NX4545	HTi10
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

Application	Shape	Order Number	Class	Honing	Coated F7010	F7030	MC5020	VP15TF	VP30RT	Cermet NX4545		Carbide HTi10		Dimensions (inch) D1	S1	F1	Re	Geometry
Finish–Light Cutting	**JL** breaker	**SOET12T308PEER-JL**	E	E		●		●	●	●				.500	.156	.055	.031	
Light–Semi -Heavy 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	.020	.079	
For Aluminum Alloy	**JP** breaker	**SOGT12T308PEFR-JP**	G	F								●		.500	.156	.055	.031	

WIPER INSERTS

Shape	Order Number	Class	Honing	Carbide HTi05T		Cermet NX2525		Dimensions (inch) L1	L2	S1	F1	Re	Geometry
	WOEW12T308PEER8C	E	E	●				.492	.520	.156	.315	.031	
	12T308PETR8C	E	T			●		.492	.520	.156	.315	.031	

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig.1
ø80
ø100
ø125
ø160

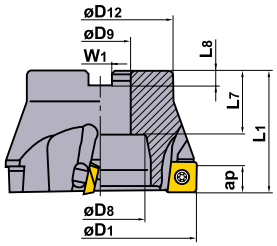
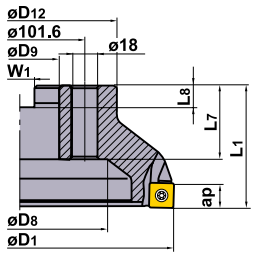


Fig.2
ø200
ø250



Right hand tool holder only.

METRIC Standard

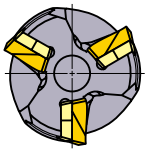
For inch arbors

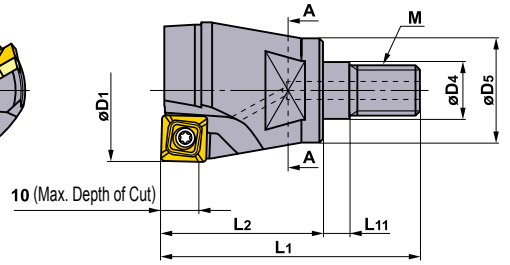
C H :0°
A.R :+11° T :-9°—-11°
R.R :-9°—-11° I :+11°

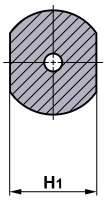
ARBOR TYPE

Type	Order Number	Stock R	Number of Teeth	D1	L1	D9	L7	D8	D12	W1	L8	Max. Depth of Cut ap	Mass (kg)	Type (Fig.)
Coarse Pitch	**ASX400R08004C**	★	4	80	50	25.4 [1.0"]	26	38	60	9.5	6	10	1.0	1
	R10005D	★	5	100	50	31.75 [1.25"]	32	45	70	12.7	8	10	1.5	1
	R12506E	★	6	125	63	38.1 [1.5"]	35	60	80	15.9	10	10	2.5	1
	R16008F	★	8	160	63	50.8 [2.0"]	38	90	100	19.1	11	10	4.0	1
	R20010K	★	10	200	63	47.625 [1.875"]	35	135	160	25.4	14.22	10	7.0	2
	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
	R10007D	★	7	100	50	31.75 [1.25"]	32	45	70	12.7	8	10	1.5	1
	R12508E	★	8	125	63	38.1 [1.5"]	35	60	80	15.9	10	10	2.5	1
	R16012F	★	12	160	63	50.8 [2.0"]	38	90	100	19.1	11	10	4.0	1
	R20016K	★	16	200	63	47.625 [1.875"]	35	135	160	25.4	14.22	10	7.0	2
	R25018K	★	18	250	63	47.625 [1.875"]	35	180	210	25.4	14.22	10	12.0	2









METRIC Standard

SCREW-IN TYPE

Right hand tool holder only.

Order Number	Stock R	*3 Coolant Thru	Number of Teeth	D1	D4	D5	L1	L2	L11	H1	M *2	Mass (kg)	Shim	Shim Screw *1	Insert Screw *1	Wrench (Insert)	Wrench (Shim)
ASX400R322AM1640	★	Y	2	32	17	29	63	40	6	24	M16	0.3	—	WCS503507H	TPS35	TIP15T	HKY35R
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

★ : Inventory maintained in Japan.



Fig.1
ø50
ø63

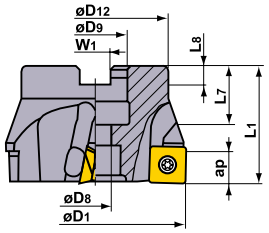


Fig.2
ø80
ø100
ø125

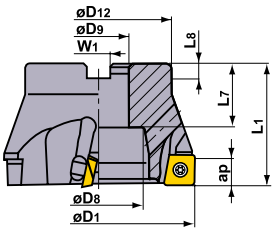


Fig.3
ø160

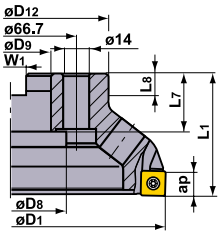
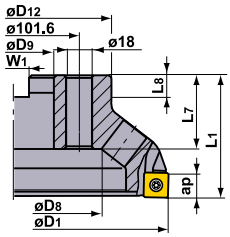


Fig.4
ø200
ø250



METRIC Standard

For metric arbors

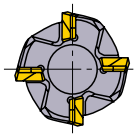
C H :0°
A.R :+11° T :-9°–-11°
R.R :-9°–-11° I :+11°

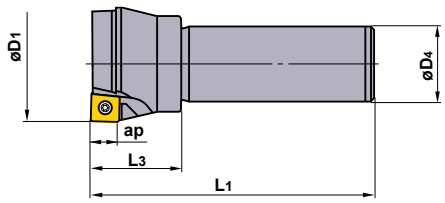
ARBOR TYPE

Right hand tool holder only.

Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) D1	L1	D9	L7	D8	D12	W1	L8	Max. Depth of Cut ap	Mass (kg)	Type (Fig.)
Coarse Pitch	**ASX400-050A03R**	★	3	50	40	22	20	11	41	10.4	6.3	10	0.3	1
	-063A04R	★	4	63	40	22	20	11	50	10.4	6.3	10	0.5	1
	-080B04R	★	4	80	50	27	29	38	60	12.4	7	10	0.9	2
	-100B05R	★	5	100	50	32	32	45	70	14.4	8	10	1.4	2
	-125B06R	★	6	125	63	40	32	60	80	16.4	9	10	2.3	2
	-160C08R	★	8	160	63	40	29	56	100	16.4	9	10	3.6	3
	-200C10R	★	10	200	63	60	32	135	160	25.7	14.22	10	6.3	4
	-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
	-063A05R	★	5	63	40	22	20	11	50	10.4	6.3	10	0.5	1
	-080B06R	★	6	80	50	27	29	38	60	12.4	7	10	0.9	2
	-100B07R	★	7	100	50	32	32	45	70	14.4	8	10	1.4	2
	-125B08R	★	8	125	63	40	32	60	80	16.4	9	10	2.2	2
	-160C12R	★	12	160	63	40	29	56	100	16.4	9	10	3.5	3
	-200C16R	★	16	200	63	60	32	135	160	25.7	14.22	10	6.2	4
	-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
	-063A06R	★	6	63	40	22	20	11	50	10.4	6.3	10	0.5	1
	-080B08R	★	8	80	50	27	29	38	60	12.4	7	10	0.9	2
	-100B10R	★	10	100	50	32	32	45	70	14.4	8	10	1.4	2
	-125B12R	★	12	125	63	40	32	60	80	16.4	9	10	2.1	2
	-160C15R	★	15	160	63	40	29	56	100	16.4	9	10	3.4	3
	-200C19R	★	19	200	63	60	32	135	160	25.7	14.22	10	6.2	4
	-250C22R	★	22	250	63	60	32	180	210	25.7	14.22	10	10.5	4







METRIC Standard

SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) D1	L1	D4	L3	ap	Shim	Shim Screw *	Insert Screw *	Wrench (Insert)	Wrench (Shim)	Insert
Coarse Pitch	**ASX400R403S32**	★	3	40	125	32	40	10	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	
	503S32	★	3	50	125	32	40	10	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	SO□T12T3□□ PE□R-□□
	634S32	★	4	63	125	32	40	10	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	
	804S32	★	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	
	635S32	★	5	63	125	32	40	10	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	SO□T12T3□□ PE□R-□□
	806S32	★	6	80	125	32	40	10	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	

* Clamp Torque (lbf-in) : WCS503507H=44, TPS35=31

SCREW-IN ARBORS ➤ K148
INSERTS ➤ K029
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)	Finish—Medium 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**
			VP15TF	820 (655—985)	.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**
			VP15TF	720 (560—885)	.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**
			VP15TF	460 (330—590)	.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	**VP15TF**	720 (560—885)	.006 (.003—.009)	**JL**	.007 (.004—.011)	**JM**	.008 (.004—.012)	**JH**
			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	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	Heat Resistant Alloy	—	**VP15TF**	130 (65—165)	.006 (.003—.008)	**JL**	.008 (.004—.012)	**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

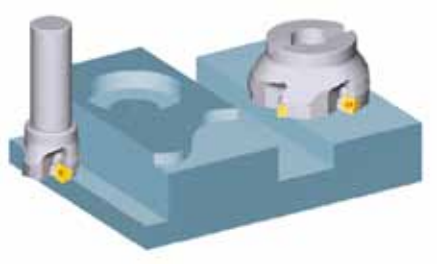


- Wiper inserts for the ASX400 are single-cornered.
- When installing the wiper insert, place the insert so that the small chamfer is located as shown.

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.



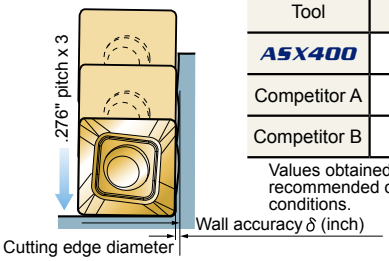
LOW RESISTANCE

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.



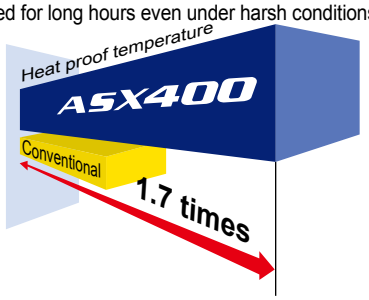
HIGH RELIABILITY

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.

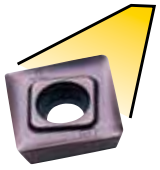
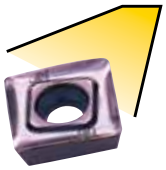
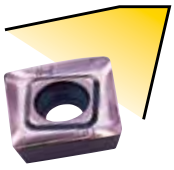
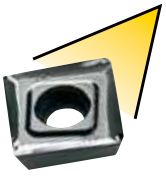


HIGH HEAT-RESISTANT BODY

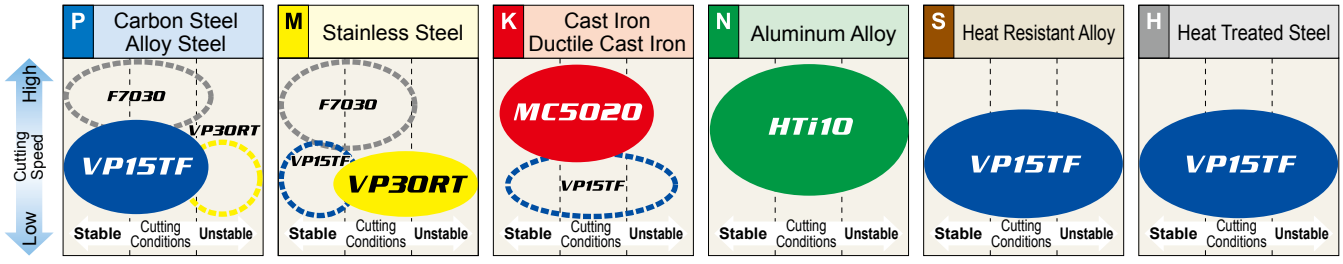
The cutter body is made from a special alloy that provides high strength at high temperatures. A special surface treatment improves the corrosion and friction resistance. The **ASX400** can be used for long hours even under harsh conditions.



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

0° Finishing Roughing

Including Flat faces

APX3000

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel



- 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

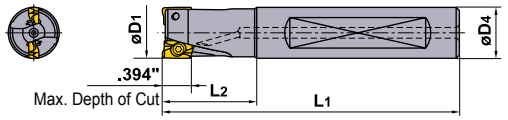


Fig.2

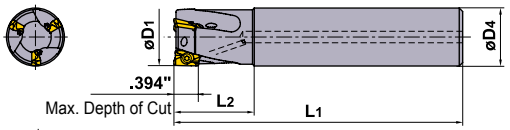


Fig.3

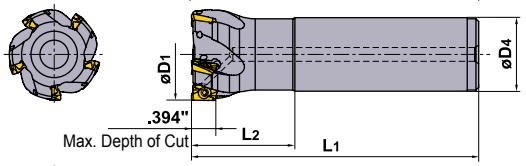
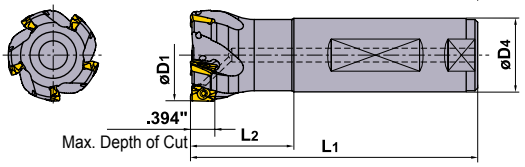


Fig.4



SHANK TYPE

Right hand tool holder only.

Type		Insert Corner Re	Order Number	Stock R	Number of Teeth	Dimensions(inch) D1	D4	L1	L2	Max. Ramping Angle α°	Type (Fig.)	Insert Screw *	Wrench	Anti-seize Lubricant
Standard	A Holders	.008 | .079	**APX3000UR081FA10SA**	●	1	.500	.625	3.250	1.120	6	1	TPS25	TIP07F	MK1KS
			081SA08SA	●	1	.500	.500	3.250	1.120	6	2	TPS25	TIP07F	MK1KS
			102FA10SA	●	2	.625	.625	3.625	1.190	16	1	TPS25	TIP07F	MK1KS
			102SA10SA	●	2	.625	.625	3.625	1.190	16	2	TPS25	TIP07F	MK1KS
			122FA12SA	●	2	.750	.750	4.375	1.380	9	1	TPS25	TIP07F	MK1KS
			122SA12SA	●	2	.750	.750	4.375	1.380	9	2	TPS25	TIP07F	MK1KS
			123FA12SA	●	3	.750	.750	4.375	1.380	9	1	TPS25	TIP07F	MK1KS
			123SA12SA	●	3	.750	.750	4.375	1.380	9	2	TPS25	TIP07F	MK1KS
			163FA12SA	●	3	1.000	.750	4.375	1.570	5	4	TPS25−1	TIP07F	MK1KS
			163SA12SA	●	3	1.000	.750	4.375	1.570	5	3	TPS25−1	TIP07F	MK1KS
			164FA12SA	●	4	1.000	.750	4.375	1.570	5	4	TPS25−1	TIP07F	MK1KS
			164SA12SA	●	4	1.000	.750	4.375	1.570	5	3	TPS25−1	TIP07F	MK1KS
			163FA16SA	●	3	1.000	1.000	4.750	1.570	5	1	TPS25−1	TIP07F	MK1KS
			163SA16SA	●	3	1.000	1.000	4.750	1.570	5	2	TPS25−1	TIP07F	MK1KS
			164FA16SA	●	4	1.000	1.000	4.750	1.570	5	1	TPS25−1	TIP07F	MK1KS
			164SA16SA	●	4	1.000	1.000	4.750	1.570	5	2	TPS25−1	TIP07F	MK1KS
			205FA20SA	●	5	1.250	1.250	5.125	1.970	3	1	TPS25−1	TIP07F	MK1KS
			205SA20SA	●	5	1.250	1.250	5.125	1.970	3	2	TPS25−1	TIP07F	MK1KS
			246FA20SA	●	6	1.500	1.250	5.125	1.970	2	4	TPS25−1	TIP07F	MK1KS
			246SA20SA	●	6	1.500	1.250	5.125	1.970	2	3	TPS25−1	TIP07F	MK1KS
	B Holders	.094 | .125	**APX3000UR081SA08SB**	●	1	.500	.500	3.250	1.120	6	2	TPS25	TIP07F	MK1KS
			102SA10SB	●	2	.625	.625	3.625	1.190	16	2	TPS25	TIP07F	MK1KS
			122SA12SB	●	2	.750	.750	4.375	1.380	9	2	TPS25	TIP07F	MK1KS
			123SA12SB	●	3	.750	.750	4.375	1.380	9	2	TPS25	TIP07F	MK1KS
			163SA12SB	●	3	1.000	.750	4.375	1.570	5	3	TPS25−1	TIP07F	MK1KS
			164SA12SB	●	4	1.000	.750	4.375	1.570	5	3	TPS25−1	TIP07F	MK1KS
			163SA16SB	●	3	1.000	1.000	4.750	1.570	5	2	TPS25−1	TIP07F	MK1KS
			164SA16SB	●	4	1.000	1.000	4.750	1.570	5	2	TPS25−1	TIP07F	MK1KS
			205SA20SB	●	5	1.250	1.250	5.125	1.970	3	2	TPS25−1	TIP07F	MK1KS
			246SA20SB	●	6	1.500	1.250	5.125	1.970	2	3	TPS25−1	TIP07F	MK1KS

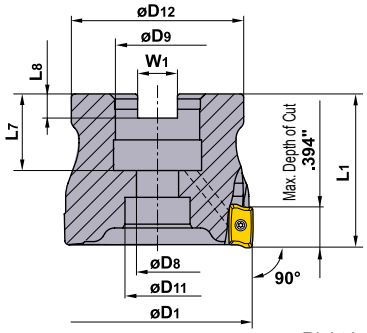
* Clamp Torque (lbf-in) : TPS25=8.9, TPS25−1=8.9

● : Inventory maintained.

Type		Insert Corner Re	Order Number	Stock R	Number of Teeth	Dimensions(inch) D1	D4	L1	L2	Max. Ramping Angle α°	Type (Fig.)	* Insert Screw	Wrench	Anti-seize Lubricant
Long	A Holders	.008 I .079	**APX3000UR122SA12LA**	●	2	.750	.750	7.250	1.380	9	2	TPS25	TIP07F	MK1KS
			162SA16LA	●	2	1.000	1.000	8.500	1.570	5	2	TPS25−1	TIP07F	MK1KS
			163SA16LA	●	3	1.000	1.000	8.500	1.570	5	2	TPS25−1	TIP07F	MK1KS
			203SA20LA	●	3	1.250	1.250	9.000	1.970	3	2	TPS25−1	TIP07F	MK1KS
			204SA20LA	●	4	1.250	1.250	9.000	1.970	3	2	TPS25−1	TIP07F	MK1KS
			243SA20LA	●	3	1.500	1.250	9.000	1.970	2	3	TPS25−1	TIP07F	MK1KS
			244SA20LA	●	4	1.500	1.250	9.000	1.970	2	3	TPS25−1	TIP07F	MK1KS
	B Holders	.094 I .125	**APX3000UR122SA12LB**	●	2	.750	.750	7.250	1.380	9	2	TPS25	TIP07F	MK1KS
			162SA16LB	●	2	1.000	1.000	8.500	1.570	5	2	TPS25−1	TIP07F	MK1KS
			163SA16LB	●	3	1.000	1.000	8.500	1.570	5	2	TPS25−1	TIP07F	MK1KS
			203SA20LB	●	3	1.250	1.250	9.000	1.970	3	2	TPS25−1	TIP07F	MK1KS
			204SA20LB	●	4	1.250	1.250	9.000	1.970	3	2	TPS25−1	TIP07F	MK1KS
			243SA20LB	●	3	1.500	1.250	9.000	1.970	2	3	TPS25−1	TIP07F	MK1KS
			244SA20LB	●	4	1.500	1.250	9.000	1.970	2	3	TPS25−1	TIP07F	MK1KS

* Clamp Torque (lbf-in) : TPS25=8.9, TPS25−1=8.9





C H :0°
A.R :+7°−+21° T :+15°−+27°
R.R :+15°−+27° I :+7°−+21°

ARBOR TYPE

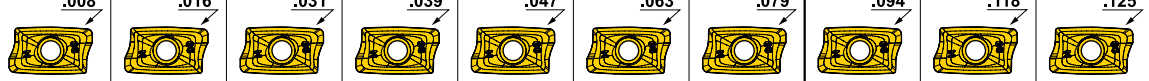
Right hand tool holder only.

Type	Insert Corner Re	Order Number	Stock R	Number of Teeth	Dimensions (inch) D1	L1	D9	L7	D8	D12	W1	L8	D11	Max. Ramping Angle α°	* 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	TPS25−1	TIP07F	MK1KS	HSCU37513H
		0207A	●	7	2.000	1.575	.750	.748	.415	1.811	.313	.187	.600	1	TPS25−1	TIP07F	MK1KS	HSCU37513H
		2506A	●	6	2.500	1.969	1.000	1.024	.539	2.360	.375	.219	.787	1	TPS25−1	TIP07F	MK1KS	HSCU50014H
		0306A	●	6	3.000	1.969	1.000	1.024	.539	2.756	.375	.219	.787	1	TPS25−1	TIP07F	MK1KS	HSCU50014H
		0309A	●	9	3.000	1.969	1.000	1.024	.539	2.756	.375	.219	.787	1	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	TPS25−1	TIP07F	MK1KS	HSCU37513H
		0207B	●	7	2.000	1.575	.750	.748	.415	1.811	.313	.187	.600	1	TPS25−1	TIP07F	MK1KS	HSCU37513H
		2506B	●	6	2.500	1.969	1.000	1.024	.539	2.360	.375	.219	.787	1	TPS25−1	TIP07F	MK1KS	HSCU50014H
		0306B	●	6	3.000	1.969	1.000	1.024	.539	2.756	.375	.219	.787	1	TPS25−1	TIP07F	MK1KS	HSCU50014H
		0309B	●	9	3.000	1.969	1.000	1.024	.539	2.756	.375	.219	.787	1	TPS25−1	TIP07F	MK1KS	HSCU50014H

* Clamp Torque (lbf-in) : TPS25−1=8.9

COMBINATION OF HOLDER AND INSERT CORNER RADIUS

Holder	**A** Holder							**B** Holder		
	APX3000UR○○○○○○A							**APX3000UR○○○○○○B**		
Insert Corner Radius (Re)	.008"	.016"	.031"	.039"	.047"	.063"	.079"	.094"	.118"	.125"



INSERTS ➤ K039
OPERATION GUIDANCE ➤ K053
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig.1

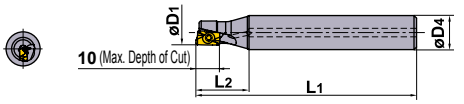


Fig.2

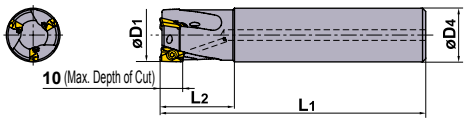
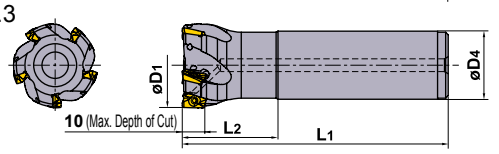


Fig.3



METRIC Standard

STRAIGHT SHANK TYPE (A Holders)

Right hand tool holder only.

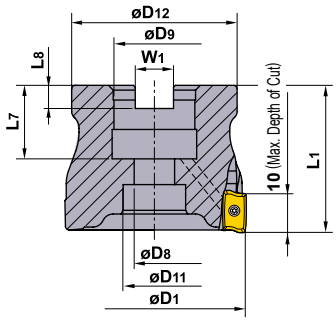
Type	Insert Corner Re (inch)	Order Number	Stock R	Number of Teeth	Dimensions (mm) D1	D4	L1	L2	Max. Ramping Angle α°	Type (Fig.)	* Insert Screw	Wrench	Anti-seize Lubricant	Insert
Standard	.008 – .079	APX3000R121SA16SA	★	1	12	16	85	25	6	1	TPS25	TIP07F	MK1KS	AOMT 1236◌◌ PEER-◌ AOGT 1236◌◌ PEFR-GM
		141SA16SA	★	1	14	16	85	25	6	1	TPS25	TIP07F	MK1KS	
		162SA16SA	★	2	16	16	85	25	15	2	TPS25	TIP07F	MK1KS	
		182SA16SA	★	2	18	16	85	25	11	3	TPS25	TIP07F	MK1KS	
		202SA20SA	★	2	20	20	100	30	9	2	TPS25	TIP07F	MK1KS	
		203SA20SA	★	3	20	20	100	30	9	2	TPS25	TIP07F	MK1KS	
		223SA20SA	★	3	22	20	115	30	7	3	TPS25−1	TIP07F	MK1KS	
		252SA25SA	★	2	25	25	115	35	6	2	TPS25−1	TIP07F	MK1KS	
		253SA25SA	★	3	25	25	115	35	6	2	TPS25−1	TIP07F	MK1KS	
		254SA25SA	★	4	25	25	115	35	6	2	TPS25−1	TIP07F	MK1KS	
		284SA25SA	★	4	28	25	115	35	4	3	TPS25−1	TIP07F	MK1KS	
		304SA32SA	★	4	30	32	125	45	4	2	TPS25−1	TIP07F	MK1KS	
		323SA32SA	★	3	32	32	125	45	3	2	TPS25−1	TIP07F	MK1KS	
		324SA32SA	★	4	32	32	125	45	3	2	TPS25−1	TIP07F	MK1KS	
		325SA32SA	★	5	32	32	125	45	3	2	TPS25−1	TIP07F	MK1KS	
		403SA32SA	★	3	40	32	125	45	2	3	TPS25−1	TIP07F	MK1KS	
		405SA32SA	★	5	40	32	125	45	2	3	TPS25−1	TIP07F	MK1KS	
		406SA32SA	★	6	40	32	125	45	2	3	TPS25−1	TIP07F	MK1KS	
		507SA32SA	★	7	50	32	125	45	1	3	TPS25−1	TIP07F	MK1KS	
		638SA32SA	★	8	63	32	125	45	1	3	TPS25−1	TIP07F	MK1KS	
Long	.008 – .079	APX3000R182SA16LA	★	2	18	16	120	25	11	3	TPS25	TIP07F	MK1KS	
		202SA20LA	★	2	20	20	150	60	9	2	TPS25	TIP07F	MK1KS	
		222SA20LA	★	2	22	20	150	30	7	3	TPS25−1	TIP07F	MK1KS	
		252SA25LA	★	2	25	25	170	70	6	2	TPS25−1	TIP07F	MK1KS	
		253SA25LA	★	3	25	25	170	70	6	2	TPS25−1	TIP07F	MK1KS	
		282SA25LA	★	2	28	25	170	35	4	3	TPS25−1	TIP07F	MK1KS	
		283SA25LA	★	3	28	25	170	35	4	3	TPS25−1	TIP07F	MK1KS	
		322SA32LA	★	2	32	32	190	90	3	2	TPS25−1	TIP07F	MK1KS	
		323SA32LA	★	3	32	32	190	90	3	2	TPS25−1	TIP07F	MK1KS	
		352SA32LA	★	2	35	32	190	45	3	3	TPS25−1	TIP07F	MK1KS	
		353SA32LA	★	3	35	32	190	45	3	3	TPS25−1	TIP07F	MK1KS	
Extra Long	.008 – .079	APX3000R182SA16ELA	★	2	18	16	180	25	11	3	TPS25	TIP07F	MK1KS	
		202SA20ELA	★	2	20	20	200	70	9	2	TPS25	TIP07F	MK1KS	
		222SA20ELA	★	2	22	20	200	30	7	3	TPS25−1	TIP07F	MK1KS	
		252SA25ELA	★	2	25	25	220	80	6	2	TPS25−1	TIP07F	MK1KS	
		253SA25ELA	★	3	25	25	220	80	6	2	TPS25−1	TIP07F	MK1KS	
		282SA25ELA	★	2	28	25	220	35	4	3	TPS25−1	TIP07F	MK1KS	
		283SA25ELA	★	3	28	25	220	35	4	3	TPS25−1	TIP07F	MK1KS	
		322SA32ELA	★	2	32	32	260	100	3	2	TPS25−1	TIP07F	MK1KS	
		323SA32ELA	★	3	32	32	260	100	3	2	TPS25−1	TIP07F	MK1KS	
		352SA32ELA	★	2	35	32	260	45	3	3	TPS25−1	TIP07F	MK1KS	
		353SA32ELA	★	3	35	32	260	45	3	3	TPS25−1	TIP07F	MK1KS	

(Note) When using inserts with corner radius Re≥.094"(2.4mm), B-Holders are required as shown on page K039.

*Clamp Torque (lbf-in) : TPS25=8.9, TPS25−1=8.9

★ : Inventory maintained in Japan.





METRIC Standard

For metric arbors

C H :0°
A.R :+7°—+21° T :+15°—+27°
R.R :+15°—+27° I :+7°—+21°

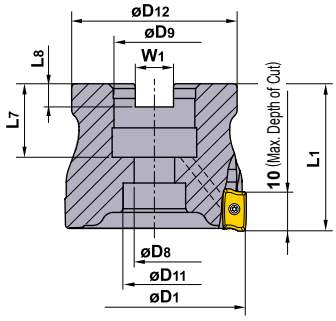
ARBOR TYPE (A Holders)

Right hand tool holder only.

Insert Corner Re (inch)	Order Number	Stock R	Number of Teeth	Dimensions (mm) D1	L1	D9	L7	D8	D12	W1	L8	D11	Max. Ramping Angle α°	* Insert Screw	Wrench	Anti-seize Lubricant	Coolant thru Set Bolt
.008 I .079	APX3000-032A05RA	★	5	32	40	16	18	9	30	8.4	5.6	14	3	TPS25—1	TIP07F	MK1KS	HSC08030H
	-040A06RA	★	6	40	40	16	18	9	34	8.4	5.6	14	2	TPS25—1	TIP07F	MK1KS	HSC08030H
	-050A07RA	★	7	50	40	22	20	11	45	10.4	6.3	17	2	TPS25—1	TIP07F	MK1KS	HSC10030H
	-063A08RA	★	8	63	40	22	20	11	55	10.4	6.3	17	1	TPS25—1	TIP07F	MK1KS	HSC10030H
	-080A09RA	★	9	80	50	27	23	13	70	12.4	7	20	1	TPS25—1	TIP07F	MK1KS	HSC12035H
	-100A11RA	★	11	100	63	32	26	17	80	14.4	8	26	0.5	TPS25—1	TIP07F	MK1KS	HSC16040H

(Note) When using inserts with corner radius Re≥.094"(2.4mm), B-Holders are required as shown on page K039.
* Clamp Torque (lbf-in) : TPS25—1=8.9





METRIC Standard

For inch arbors

C H :0°
A.R :+7°—+21° T :+15°—+27°
R.R :+15°—+27° I :+7°—+21°

ARBOR TYPE (A Holders)

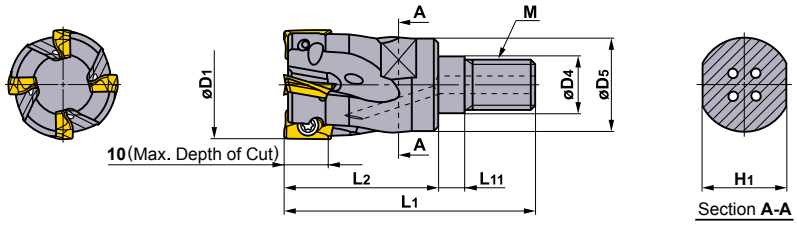
Right hand tool holder only.

Insert Corner Re (inch)	Order Number	Stock R	Number of Teeth	Dimensions (mm) [inch] D1	L1	D9	L7	D8	D12	W1	L8	D11	Max. Ramping Angle α°	* Insert Screw	Wrench	Anti-seize Lubricant	Coolant thru Set Bolt
.008 I .079	APX3000R08009CA	★	9	80	50	25.4 [1.0"]	26	13	70	9.5	6	20	1	TPS25—1	TIP07F	MK1KS	HSC12035H
	R10011DA	★	11	100	63	31.75 [1.25"]	32	17	80	12.7	8	26	0.5	TPS25—1	TIP07F	MK1KS	HSC16040H

(Note) When using inserts with corner radius Re≥.094"(2.4mm), B-Holders are required as shown on page K039.
* Clamp Torque (lbf-in) : TPS25—1=8.9

INSERTS ➤ K039
OPERATION GUIDANCE ➤ K053
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001





METRIC Standard

SCREW-IN TYPE (A Holders)

Right hand tool holder only.

Insert Corner Re (inch)	Order Number	Stock R	Number of Teeth	Dimensions (mm) D1	D4	D5	L1	L2	L11	H1	M*2	Mass (kg)	*1 Insert Screw	Wrench	Anti-seize Lubricant	Insert
.008 | .079	**APX3000R162M08A30**	★	2	16	8.5	13	48	30	6	10	M8	0.1	TPS25	TIP07F	MK1KS	AOMT 1236○○ PEER-○ AOGT 1236○○ PEFR-GM
	182M08A30	★	2	18	8.5	13	48	30	6	10	M8	0.1	TPS25	TIP07F	MK1KS	
	203M10A30	★	3	20	10.5	18	49	30	6	14	M10	0.1	TPS25	TIP07F	MK1KS	
	223M10A30	★	3	22	10.5	18	49	30	6	14	M10	0.1	TPS25−1	TIP07F	MK1KS	
	254M12A35	★	4	25	12.5	21	57	35	6	19	M12	0.2	TPS25−1	TIP07F	MK1KS	
	284M12A35	★	4	28	12.5	21	57	35	6	19	M12	0.2	TPS25−1	TIP07F	MK1KS	
	304M16A40	★	4	30	17	29	63	40	6	24	M16	0.3	TPS25−1	TIP07F	MK1KS	
	325M16A40	★	5	32	17	29	63	40	6	24	M16	0.3	TPS25−1	TIP07F	MK1KS	
	355M16A40	★	5	35	17	29	63	40	6	24	M16	0.3	TPS25−1	TIP07F	MK1KS	
	406M16A40	★	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

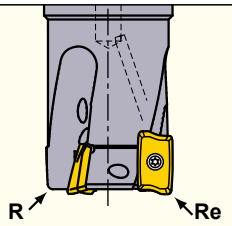
*2 Clamp Torque of the Head (lbf-ft) : M8=17.1, M10=33.8, M12=59.2, M16=66.7

(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.



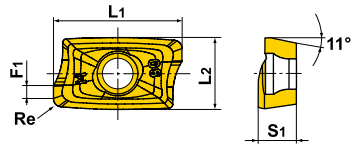
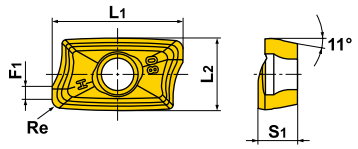
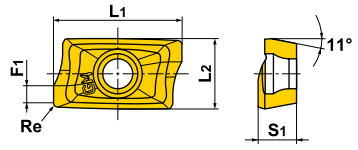
Re	R
.094"	.106" (B-Holder)
.118"	
.125"	

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>

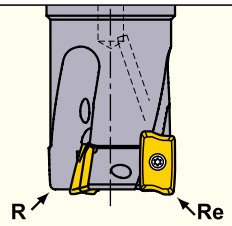
INSERTS

Shape	Order Number	Stock: Coated MC5020	Stock: Coated VP15TF	Stock: Coated VP20RT	Stock: Coated	Stock: Carbide TF15	Stock: Carbide	Dimensions (inch) L1	L2	S1	F1	Re	Geometry
General Use **M** breaker	**AOMT123602PEER-M**		●	●				.472	.260	.142	.071	.008	
	**123604PEER-M**		●	●				.472	.260	.142	.063	.016	
	123608PEER-M		●	●				.472	.260	.142	.047	.031	
	123610PEER-M		★	★				.472	.260	.142	.039	.039	
	123612PEER-M		●	●				.472	.260	.142	.031	.047	
	123616PEER-M		●	●				.472	.260	.142	.016	.063	
	123620PEER-M		●	●				.472	.260	.142	.016	.079	
	123624PEER-M		●	●				.472	.260	.142	.016	.094	
	123630PEER-M		●	●				.472	.260	.142	.016	.118	
	123632PEER-M		●	●				.472	.260	.142	.016	.125	
Strong Cutting Edge Type **H** breaker	**AOMT123604PEER-H**	●	●	●				.472	.260	.142	.063	.016	
	**123608PEER-H**	●	●	●				.472	.260	.142	.047	.031	
	123616PEER-H	●	●	●				.472	.260	.142	.016	.063	
Aluminum Alloy Machining **GM** breaker	**AOGT123602PEFR-GM**					●		.472	.260	.142	.071	.008	
	**123604PEFR-GM**					●		.472	.260	.142	.063	.016	
	123608PEFR-GM					●		.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.

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

MILLING

RECOMMENDED CUTTING CONDITIONS

CUTTING CONDITIONS FOR SHOULDER MILLING

	Work Material	Hardness	Insert Grade	Cutting Speed **vc** (SFM)	Width of Cut **ae** (inch)	ϕ.500" (ϕ12mm)		ϕ.625"−ϕ1.000" (ϕ16mm−ϕ25mm)		ϕ1.250"−ϕ3.000" (ϕ32mm−ϕ80mm)	
						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)
P	Mild Steel	≤180HB	**VP15TF VP20RT M breaker**	755 (600−900)	−.25D1	−.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
				720 (570−860)	−.5D1	−.078	.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
				590 (470−700)	−.75D1	−.157	.004	−.157	.006	−.118	.004
								.157−.394	.004	.118−.276	.003
	Carbon Steel Alloy Steel	180−350HB	**VP15TF M breaker**	590 (440−670)	−.25D1	−.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
				560 (440−670)	−.5D1	−.078	.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
				460 (395−525)	−.75D1	−.157	.004	−.157	.006	−.118	.004
								.157−.394	.004	.118−.276	.003
M	Stainless Steel	≤270HB	**VP20RT M breaker**	590 (470−700)	−.25D1	−.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	.003
				560 (440−670)	−.5D1	−.078	.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
				460 (395−525)	−.75D1	−.157	.004	−.157	.004	−.118	.004
								.157−.394	.003	.118−.276	.003
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020 H breaker**	820 (655−985)	−.25D1	−.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
			MC5020 H breaker	785 (625−950)	−.5D1	−.078	.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
			MC5020 H breaker	690 (525−850)	−.75D1	−.157	.004	−.157	.006	−.118	.004
								.157−.394	.004	.118−.276	.003
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MC5020 H breaker**	655 (490−820)	−.25D1	−.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
			MC5020 H breaker	620 (460−785)	−.5D1	−.078	.004	−.118	.008	−.118	.008
						.078−.197	.003	.118−.217	.006	.118−.217	.006
								.217−.315	.004	.217−.315	.004
								.315−.394	.003	.315−.394	.003
			MC5020 H breaker	555 (390−720)	−.75D1	−.157	.003	−.157	.004	−.118	.004
								.157−.394	.003	.118−.276	.003
N	Aluminum Alloy	−	**TF15 GM breaker**	1640 (655−3280)	−.25D1	−.157	.006	−.157	.010	−.157	.008
						.157−.276	.004	.157−.276	.006	.157−.276	.004
					−.5D1	−.157	.006	−.157	.008	−.157	.008
						.157−.276	.004	.157−.276	.004	.157−.276	.004
					−.75D1	−.197	.004	−.197	.006	−.197	.004
H	Hardened Steel	40−55HRC	**VP15TF H breaker**	295 (230−350)	−.25D1	−.157	.004	−.197	.006	−.197	.006
						.157−.276	.003	.197−.276	.004	.197−.276	.004
								.276−.335	.003		
				280 (200−330)	−.5D1	−.078	.004	−.118	.006	−.118	.006
						.078−.197	.003	.118−.217	.004		
				230 (180−270)	−.75D1	−.157	.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
· 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 insert is the first recommendation.

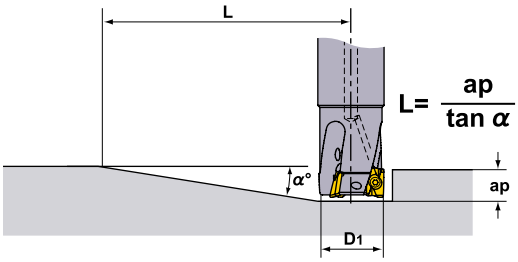
CUTTING CONDITIONS FOR SLOT MILLING

Work Material		Hardness	Insert Grade	Cutting Speed **vc** (SFM)	Width of Cut **ae** (inch)	**ϕ.500" (ϕ12mm)**		**ϕ.625"−ϕ1.000" (ϕ16mm−ϕ25mm)**		**ϕ1.250"−ϕ1.500" (ϕ32mm−ϕ40mm)**	
						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)
P	Mild Steel	≤180HB	**VP15TF VP20RT M breaker**	590 (470−700)	D_1	−.118	.004	−.157	.004	−.118	.004
								.157−.276	.003	.118−.197	.003
	Carbon Steel Alloy Steel	180−350HB	**VP15TF M breaker**	460 (395−525)	D_1	−.118	.004	−.157	.004	−.118	.004
								.157−.276	.003	.118−.197	.003
M	Stainless Steel	≤270HB	**VP20RT M breaker**	460 (395−525)	D_1	−.118	.004	−.157	.004	−.118	.004
								.157−.276	.003	.118−.197	.003
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020 H breaker**	460 (395−525)	D_1	−.118	.004	−.157	.004	−.118	.004
								.157−.276	.003	.118−.197	.003
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MC5020 H breaker**	330 (260−390)	D_1	−.118	.003	−.157	.004	−.118	.004
								.157−.276	.003	.118−.197	.003
N	Aluminum Alloy	−	**TF15 GM breaker**	1640 (655−3280)	D_1	−.197	.004	−.197	.008	−.197	.006
H	Hardened Steel	40−55HRC	**VP15TF H breaker**	230 (180−270)	D_1	−.118	.003	−.157	.003	−.118	.003

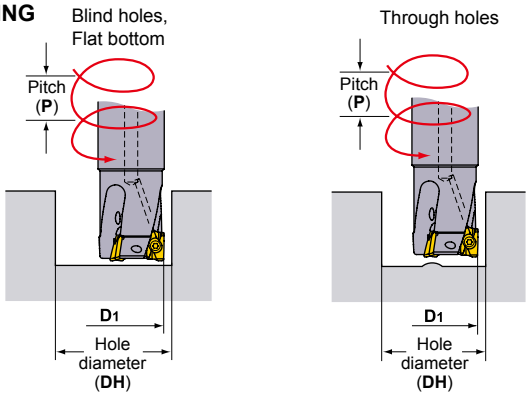
(Note 1) These cutting conditions are a guide to the standard shank type and the arbor type.
Please make adjustments according to the machining conditions.
(Note 2) Vibration is liable to occur in certain cases. Please reduce the depth of cut and / or reduce cutting conditions in the following cases.
· When using the long shank type
· 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 insert is the 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 **D1** (inch)	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
	Maximum Ramping Angle **α°**	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	3.8	0.92	.09	.87	.07	.63	.020
.625	16	1.4	1.17	.35	1.1	.27	.79	.079
.750	9	2.5	1.42	.19	1.35	.17	1.03	.079
1.000	5	4.5	1.92	.23	1.85	.19	1.58	.079
1.250	3	7.5	2.42	.17	2.35	.15	2.05	.079
1.500	2	11.3	2.92	.15	2.85	.13	2.56	.079
2.000	1	22.6	3.92	.07	3.85	.07	3.55	.079
2.500	1	22.6	4.92	.07	4.85	.07	4.56	.079
3.000	1	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 D_1) - (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

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel



Fig.1

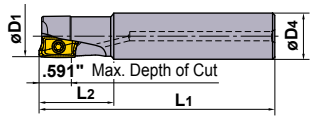


Fig.2

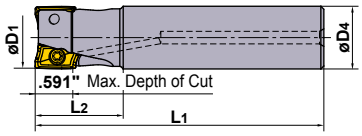


Fig.3

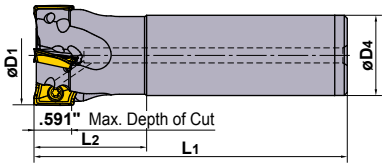


Fig.4

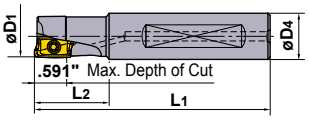


Fig.5

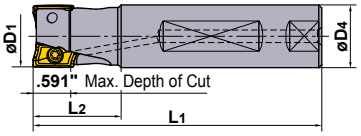
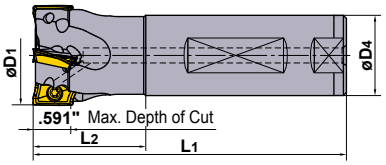


Fig.6



Right hand tool holder only.

•APX4000UR○○○SA○○ = Ground shank : See figure 1, 2 and 3.
•APX4000UR○○○FA○○ = Flat shank : See figure 4 and 5.

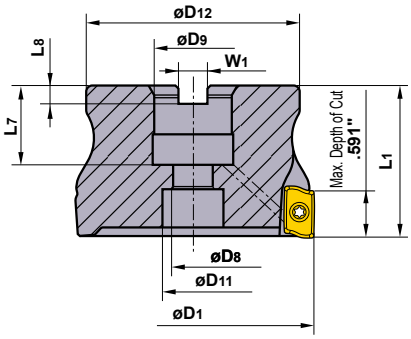
SHANK TYPE

Type		Insert Corner Re (inch)	Order Number	Stock R	Number of Teeth	Dimensions (inch) D1	D4	L1	L2	Max. Ramping Angle α°	Type (Fig.)	* Insert Screw	Wrench	Anti-seize Lubricant
Standard	A Holders	.016 | .079	**APX4000UR121FA12SA**	●	1	.750	.750	4.000	1.250	14	4	TPS4S	TIP15W	MK1KS
			121SA12SA	●	1	.750	.750	4.000	1.250	14	1	TPS4S	TIP15W	MK1KS
			162SA12SA	●	2	1.000	.750	4.000	1.250	11	3	TPS4	TIP15W	MK1KS
			162FA16SA	●	2	1.000	1.000	4.500	1.250	11	4	TPS4	TIP15W	MK1KS
			162SA16SA	●	2	1.000	1.000	4.500	1.250	11	2	TPS4	TIP15W	MK1KS
			202FA20SA	●	2	1.250	1.250	5.000	1.750	7	5	TPS4	TIP15W	MK1KS
			202SA20SA	●	2	1.250	1.250	5.000	1.750	7	2	TPS4	TIP15W	MK1KS
			203FA20SA	●	3	1.250	1.250	5.000	1.750	7	5	TPS4	TIP15W	MK1KS
			203SA20SA	●	3	1.250	1.250	5.000	1.750	7	2	TPS4	TIP15W	MK1KS
			243FA20SA	●	3	1.500	1.250	5.000	1.750	7	6	TPS43	TIP15W	MK1KS
			243SA20SA	●	3	1.500	1.250	5.000	1.750	7	3	TPS43	TIP15W	MK1KS
			244FA20SA	●	4	1.500	1.250	5.000	1.750	7	6	TPS43	TIP15W	MK1KS
			244SA20SA	●	4	1.500	1.250	5.000	1.750	7	3	TPS43	TIP15W	MK1KS
	B Holders	.125 | .157	**APX4000UR121FA12SB**	●	1	.750	.750	4.000	1.250	14	4	TPS4S	TIP15W	MK1KS
			162FA16SB	●	2	1.000	1.000	4.500	1.250	11	5	TPS4	TIP15W	MK1KS
			202FA20SB	●	2	1.250	1.250	5.000	1.750	7	5	TPS4	TIP15W	MK1KS
			203FA20SB	●	3	1.250	1.250	5.000	1.750	7	5	TPS4	TIP15W	MK1KS
			243FA20SB	●	3	1.500	1.250	5.000	1.750	7	6	TPS43	TIP15W	MK1KS
			244FA20SB	●	4	1.500	1.250	5.000	1.750	7	6	TPS43	TIP15W	MK1KS
Long	A Holders	.016 | .079	**APX4000UR162SA16LA**	●	2	1.000	1.000	8.500	1.250	11	2	TPS4	TIP15W	MK1KS
			202SA20LA	●	2	1.250	1.250	9.000	1.750	7	2	TPS4	TIP15W	MK1KS
			203SA20LA	●	3	1.250	1.250	9.000	1.750	7	2	TPS4	TIP15W	MK1KS
			243SA24LA	●	3	1.500	1.500	9.000	1.750	7	2	TPS43	TIP15W	MK1KS
			244SA24LA	●	4	1.500	1.500	9.000	1.750	7	2	TPS43	TIP15W	MK1KS
			243SA24ELA	●	3	1.500	1.500	14.000	1.750	7	2	TPS43	TIP15W	MK1KS
	B Holders	.125 | .157	**APX4000UR162SA16LB**	●	2	1.000	1.000	8.500	1.250	11	2	TPS4	TIP15W	MK1KS
			202SA20LB	●	2	1.250	1.250	9.000	1.750	7	2	TPS4	TIP15W	MK1KS
			203SA20LB	●	3	1.250	1.250	9.000	1.750	7	2	TPS4	TIP15W	MK1KS
			243SA24LB	●	3	1.500	1.500	9.000	1.750	7	2	TPS43	TIP15W	MK1KS
			244SA24LB	●	4	1.500	1.500	9.000	1.750	7	2	TPS43	TIP15W	MK1KS
			243SA24ELB	●	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 K047.
* Clamp Torque (lbf-in) : TPS4=31, TPS4S=31, TPS43=31

● : Inventory maintained.





C H :0°
A.R :+15°—+22° T :+21°—+28°
R.R :+21°—+28° I :+15°—+22°

ARBOR TYPE

Right hand tool holder only.

Type	Insert Corner Re (inch)	Order Number	Stock R	Number of Teeth	Dimensions (inch) D1	L1	D9	L7	D8	D12	W1	L8	D11	Max. Ramping Angle α°	* Insert Screw	Wrench	Anti-seize Lubricant	Coolant thru Set Bolt
A Holders	.016 I .079	**APX4000UR0204A**	●	4	2.000	1.625	.750	.748	.415	1.875	.313	.187	.600	4	TPS43	TIP15W	MK1KS	HSCU37513H
		0205A	●	5	2.000	1.625	.750	.748	.415	1.875	.313	.187	.600	4	TPS43	TIP15W	MK1KS	HSCU37513H
		2505CA	●	5	2.500	2.000	1.000	1.024	.539	2.375	.375	.219	.787	2	TPS43	TIP15W	MK1KS	HSCU50014H
		0306DA	●	6	3.000	2.500	1.250	1.260	.669	2.874	.500	.281	1.024	2	TPS43	TIP15W	MK1KS	HSCU62516H
		0307DA	●	7	3.000	2.500	1.250	1.260	.669	2.874	.500	.281	1.024	2	TPS43	TIP15W	MK1KS	HSCU62516H
		0408EA	●	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
		0205B	●	5	2.000	1.625	.750	.748	.415	1.875	.313	.187	.600	4	TPS43	TIP15W	MK1KS	HSCU37513H
		2505CB	●	5	2.500	2.000	1.000	1.024	.539	2.375	.375	.219	.787	2	TPS43	TIP15W	MK1KS	HSCU50014H
		0306DB	●	6	3.000	2.500	1.250	1.260	.669	2.874	.500	.281	1.024	2	TPS43	TIP15W	MK1KS	HSCU62516H
		0307DB	●	7	3.000	2.500	1.250	1.260	.669	2.874	.500	.281	1.024	2	TPS43	TIP15W	MK1KS	HSCU62516H
		0408EB	●	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 K047.
* Clamp Torque (lbf-in) : TPS43=31

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"

INSERTS	➤ K047
OPERATION GUIDANCE	➤ K053
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001



Fig.1

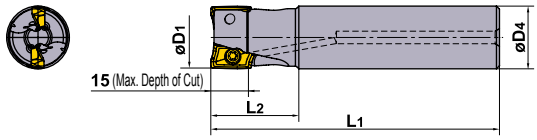
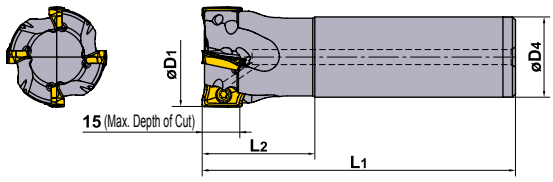


Fig.2



METRIC Standard

STRAIGHT SHANK TYPE (A Holders)

Right hand tool holder only.

Type	Insert Corner Re (inch)	Order Number	Stock R	Number of Teeth	Dimensions (mm) D1	D4	L1	L2	Max. Ramping Angle α°	Type (Fig.)	Insert Screw *	Wrench	Anti-seize Lubricant	Insert
Standard	.016 I .079	**APX4000R252SA25SA**	★	2	25	25	115	35	11	1	TPS4	TIP15W	MK1KS	AOMT 1848○○ PEER-○
		322SA32SA	★	2	32	32	125	45	7	1	TPS4	TIP15W	MK1KS	
		323SA32SA	★	3	32	32	125	45	7	1	TPS4	TIP15W	MK1KS	
		403SA32SA	★	3	40	32	125	45	6	2	TPS43	TIP15W	MK1KS	
		404SA32SA	★	4	40	32	125	45	6	2	TPS43	TIP15W	MK1KS	
		504SA32SA	★	4	50	32	125	45	4	2	TPS43	TIP15W	MK1KS	
		505SA32SA	★	5	50	32	125	45	4	2	TPS43	TIP15W	MK1KS	
		634SA32SA	★	4	63	32	125	45	3	2	TPS43	TIP15W	MK1KS	
		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	
		282SA25LA	★	2	28	25	170	35	9	2	TPS4	TIP15W	MK1KS	
		322SA32LA	★	2	32	32	190	45	7	1	TPS4	TIP15W	MK1KS	
		323SA32LA	★	3	32	32	190	45	7	1	TPS4	TIP15W	MK1KS	
		352SA32LA	★	2	35	32	190	45	6	2	TPS4	TIP15W	MK1KS	
		353SA32LA	★	3	35	32	190	45	6	2	TPS4	TIP15W	MK1KS	
		402SA32LA	★	2	40	32	190	45	6	2	TPS43	TIP15W	MK1KS	
		403SA32LA	★	3	40	32	190	45	6	2	TPS43	TIP15W	MK1KS	
		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	
		282SA25ELA	★	2	28	25	220	35	9	2	TPS4	TIP15W	MK1KS	
		322SA32ELA	★	2	32	32	260	100	7	1	TPS4	TIP15W	MK1KS	
		323SA32ELA	★	3	32	32	260	100	7	1	TPS4	TIP15W	MK1KS	
		352SA32ELA	★	2	35	32	260	45	6	2	TPS4	TIP15W	MK1KS	
		353SA32ELA	★	3	35	32	260	45	6	2	TPS4	TIP15W	MK1KS	
		402SA32ELA	★	2	40	32	260	45	6	2	TPS43	TIP15W	MK1KS	
		403SA32ELA	★	3	40	32	260	45	6	2	TPS43	TIP15W	MK1KS	
		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 K047.

* Clamp Torque (lbf-in) : TPS4=31, TPS43=31

★ : Inventory maintained in Japan.



Fig.1

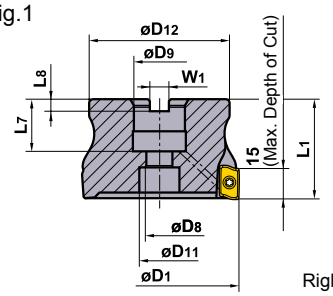
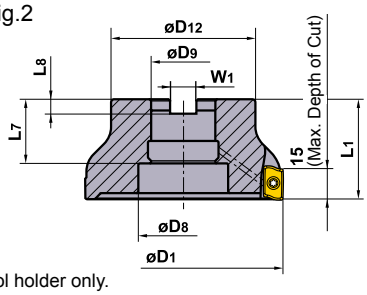


Fig.2



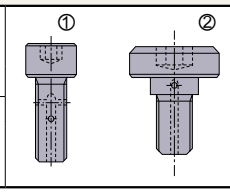
Right hand tool holder only.

METRIC Standard

For inch arbors

C H :0°
A.R :+15°—+22° T :+21°—+28°
R.R :+21°—+28° I :+15°—+22°

Cutter Diameter D1	Set Bolt	Geometry
ϕ80	HSC12035H	①
ϕ100	16040H	
ϕ125	MBA20040H	②
ϕ160	24045H	



ARBOR TYPE (A Holders)

Insert Corner Re (inch)	Order Number	Stock R	Number of Teeth	Dimensions (mm) [inch] D1	L1	D9	L7	D8	D12	W1	L8	D11	Mass (kg)	Max. Ramping Angle α°	Type (Fig.)	* Insert Screw	Wrench	Anti-seize Lubricant	Insert
.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-○
	R10008DA	★	8	100	63	31.75 [1.25"]	32	17	80	12.7	8	26	2.1	1.5	1	TPS43	TIP15W	MK1KS	
	R12509EA	★	9	125	63	38.1 [1.5"]	40	56	100	15.9	10	—	3.3	1	2	TPS43	TIP15W	MK1KS	
	R16010FA	★	10	160	63	50.8 [2.0"]	40	72	100	19.1	11	—	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 K047.
* Clamp Torque (lbf-in) : TPS43=31

INSERTS ➤ K047
OPERATION GUIDANCE ➤ K053
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig.1

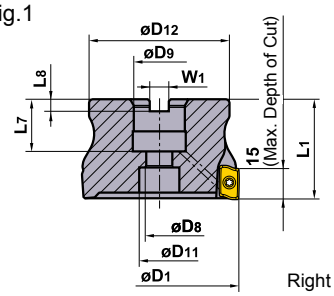
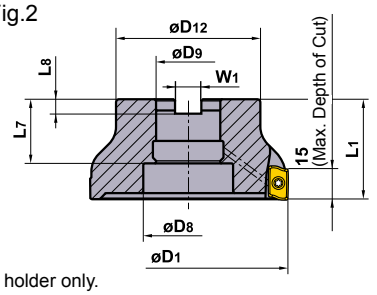
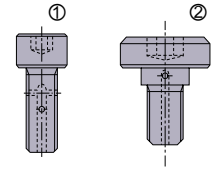


Fig.2



Right hand tool holder only.

Cutter Diameter D1	Set Bolt	Geometry
ϕ40	HSC08030H	①
ϕ50, ϕ63	10030H	①
ϕ80	12035H	①
ϕ100	16040H	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°

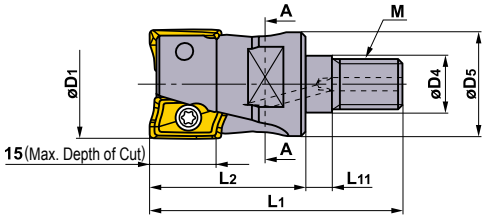
ARBOR TYPE (A Holders)

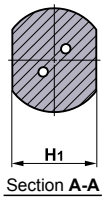
Insert Corner Re (inch)	Order Number	Stock R	Number of Teeth	Dimensions (mm) D1	L1	D9	L7	D8	D12	W1	L8	D11	Mass (kg)	Max. Ramping Angle α°	Type (Fig.)	* Insert Screw	Wrench	Anti-seize Lubricant	Insert
.016 I .079	APX4000-040A04RA	★	4	40	40	16	18	9	34	8.4	5.6	14	0.2	6	1	TPS43	TIP15W	MK1KS	AOMT 1848□□ PEER-□
	-050A05RA	★	5	50	40	22	20	11	45	10.4	6.3	17	0.3	4	1	TPS43	TIP15W	MK1KS	
	-063A06RA	★	6	63	40	22	20	11	50	10.4	6.3	17	0.5	3	1	TPS43	TIP15W	MK1KS	
	-080A07RA	★	7	80	50	27	23	13	60	12.4	7	20	1.2	2	1	TPS43	TIP15W	MK1KS	
	-100A08RA	★	8	100	50	32	25	17	70	14.4	8	27	2.1	1.5	1	TPS43	TIP15W	MK1KS	
	-125A09RA	★	9	125	63	40	40	56	90	16.4	9	—	3.3	1	2	TPS43	TIP15W	MK1KS	
	-160A10RA	★	10	160	63	40	40	72	100	16.4	9	—	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 K047.
∗ Clamp Torque (lbf-in) : TPS43=31









METRIC Standard

SCREW-IN TYPE (A Holders)

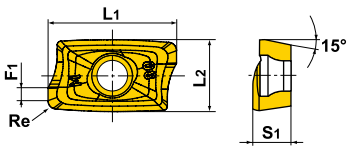
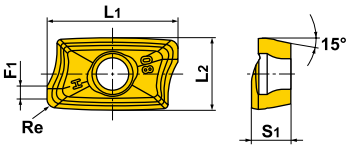
Right hand tool holder only.

Order Number	Stock R	Number of Teeth	Dimensions (mm) D1	D4	D5	L1	L2	L11	H1	M*2	Mass (kg)	*1 Insert Screw	Wrench	Anti-seize Lubricant	Insert
APX4000R252M12A35	★	2	25	12.5	23.5	57	35	6	19	M12	0.2	TPS4	TIP15W	MK1KS	AOMT 1848□□ PEER-□
282M12A35	★	2	28	12.5	23.5	57	35	6	19	M12	0.2	TPS4	TIP15W	MK1KS	
322M16A40	★	2	32	17	28.5	63	40	6	24	M16	0.3	TPS4	TIP15W	MK1KS	
323M16A40	★	3	32	17	28.5	63	40	6	24	M16	0.3	TPS4	TIP15W	MK1KS	
352M16A40	★	2	35	17	28.5	63	40	6	24	M16	0.3	TPS4	TIP15W	MK1KS	
353M16A40	★	3	35	17	28.5	63	40	6	24	M16	0.3	TPS4	TIP15W	MK1KS	
403M16A40	★	3	40	17	28.5	63	40	6	24	M16	0.3	TPS43	TIP15W	MK1KS	
404M16A40	★	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 K047.
∗1 Clamp Torque (lbf-in) : TPS4=31, TPS43=31
∗2 Clamp Torque of the Head (lbf-ft) : M12=59.2, M16=66.7

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

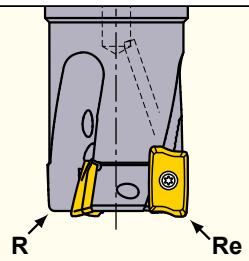
INSERTS

Shape	Order Number	Coated			Dimensions (inch)					Geometry
		MC5020	VP15TF	VP20RT	L_1	L_2	S_1	F_1	Re	
General Use **M** breaker	**AOMT184804PEER-M**		●	●	.709	.354	.189	.071	.016	
	184808PEER-M		●	●	.709	.354	.189	.055	.031	
	184810PEER-M		★		.709	.354	.189	.039	.039	
	184812PEER-M		●		.709	.354	.189	.031	.047	
	184816PEER-M		●	●	.709	.354	.189	.016	.063	
	184820PEER-M		★		.709	.354	.189	.016	.079	
Strong Cutting Edge Type **H** breaker	**AOMT184804PEER-H**	●	●	●	.709	.354	.189	.071	.016	
	184808PEER-H	●	●	●	.709	.354	.189	.055	.031	
	184816PEER-H	●	●	●	.709	.354	.189	.016	.063	
	184832PEER-H			●	.709	.354	.189	.016	.125	
	184840PEER-H			●	.709	.354	.189	.016	.157	
	184850PEER-H			●	.709	.354	.189	—	.197	
	184864PEER-H			●	.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.

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 ➤ K148
SPARE PARTS ➤ M001
OPERATION GUIDANCE ➤ K053
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

CUTTING CONDITIONS FOR SHOULDER 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)			
							ϕ.750" (ϕ20mm)	**ϕ1.000"–ϕ1.500" (ϕ25–ϕ40mm)**	**ϕ2.000"–ϕ3.000" (ϕ50–ϕ80mm)**	**ϕ4.000" (ϕ100mm)**
P	Mild Steel	≤180HB	**VP15TF VP20RT M breaker**	755 (600–900)	–.25D1	–.197	.006	.012	.012	.010
						.197–.295	.004	.010	.010	.008
						.295–.394	.003	.008	.008	.006
						.394–.492	–	.006	.006	.004
						.492–.591	–	.004	.004	.003
				720 (570–860)	–.5D1	–.197	.006	.012	.012	.010
						.197–.295	.004	.010	.010	.008
						.295–.394	.003	.008	.008	.006
						.394–.492	–	.006	.006	.004
						.492–.591	–	.004	.004	.003
				590 (470–700)	–.75D1	–.197	.004	.008	.008	.006
						.197–.394	–	.006	.006	.004
						.394–.591	–	.004	.004	.003
	Carbon Steel Alloy Steel	180–350HB	**VP15TF M breaker**	590 (440–670)	–.25D1	–.197	.006	.012	.012	.010
						.197–.295	.004	.010	.010	.008
						.295–.394	.003	.008	.008	.006
						.394–.492	–	.006	.006	.004
						.492–.591	–	.004	.004	.003
				560 (440–670)	–.5D1	–.197	.006	.012	.012	.010
						.197–.295	.004	.010	.010	.008
						.295–.394	.003	.008	.008	.006
						.394–.492	–	.006	.006	.004
						.492–.591	–	.004	.004	.003
				460 (395–525)	–.75D1	–.197	.004	.008	.008	.006
						.197–.394	–	.006	.006	.004
						.394–.591	–	.004	.004	.003
M	Stainless Steel	≤270HB	**VP20RT M breaker**	590 (470–700)	–.25D1	–.197	.006	.012	.010	.010
						.197–.295	.004	.010	.008	.008
						.295–.394	.003	.008	.006	.006
						.394–.492	–	.006	.004	.004
						.492–.591	–	.004	.003	.003
				560 (440–670)	–.5D1	–.197	.006	.012	.010	.010
						.197–.295	.004	.010	.008	.008
						.295–.394	.003	.008	.006	.006
						.394–.492	–	.006	.004	.004
						.492–.591	–	.004	.003	.003
				460 (395–525)	–.75D1	–.197	.004	.008	.006	.006
						.197–.394	–	.006	.004	.004
						.394–.591	–	.004	.003	.003
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020 H breaker**	820 (655–985)	–.25D1	–.197	.006	.012	.012	.010
						.197–.295	.004	.010	.010	.008
						.295–.394	.003	.008	.008	.006
						.394–.492	–	.006	.006	.004
						.492–.591	–	.004	.004	.003
			MC5020 H breaker	785 (625–950)	–.5D1	–.197	.006	.012	.012	.010
						.197–.295	.004	.010	.010	.008
						.295–.394	.003	.008	.008	.006
						.394–.492	–	.006	.006	.004
						.492–.591	–	.004	.004	.003
			MC5020 H breaker	690 (525–850)	–.75D1	–.197	.004	.008	.008	.006
						.197–.394	–	.006	.006	.004
						.394–.591	–	.004	.004	.003
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MC5020 H breaker**	655 (490–820)	–.25D1	–.197	.006	.010	.010	.010
						.197–.295	.004	.008	.008	.008
						.295–.394	.003	.006	.006	.006
						.394–.492	–	.004	.004	.004
						.492–.591	–	.003	.003	.003
			MC5020 H breaker	620 (460–785)	–.5D1	–.197	.006	.010	.010	.010
						.197–.295	.004	.008	.008	.008
						.295–.394	.003	.006	.006	.006
						.394–.492	–	.004	.004	.004
						.492–.591	–	.003	.003	.003
			MC5020 H breaker	555 (390–720)	–.75D1	–.197	.003	.008	.008	.006
						.197–.394	–	.006	.006	.004
						.394–.591	–	.004	.004	.003
S	Titanium Alloy	≤350HB	**VP20RT H breaker**	130 (100–200)	–.25D1	–.197	.006	.006	.004	.004
						.197–.295	.004	.004	.002	.002
						.295–.394	.002	.002	–	–
	Heat Resistant Alloy	–	**VP20RT H breaker**	100 (65–130)	–.25D1	–.079	.004	.004	.002	.002
H	Hardened Steel	40–55HRC	**VP15TF H breaker**	295 (230–350)	–.25D1	–.197	.004	.006	.006	.006
						.197–.295	.003	.004	.004	.004
						.295–.394	–	.003	.003	.003
				280 (200–330)	–.5D1	–.197	.004	.004	.004	.004
						.197–.295	.003	.003	.003	.003
				230 (180–270)	–.75D1	–.197	.003	.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
· 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 insert is the first recommendation.

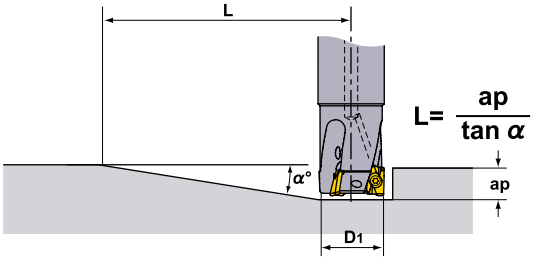
CUTTING CONDITIONS FOR SLOT MILLING

	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)			
							ϕ.750" (ϕ20mm)	**ϕ1.000"–ϕ1.500" (ϕ25–ϕ40mm)**	**ϕ2.000"–ϕ3.000" (ϕ50–ϕ80mm)**	**ϕ4.000" (ϕ100mm)**
P	Mild Steel	≤180HB	**VP15TF VP20RT M breaker**	590 (470–700)	D1	–.197	.006	.006	.006	.006
						.197–.295	.004	.004	.004	.004
						.295–.394	.003	.003	.003	.003
	Carbon Steel Alloy Steel	180–350HB	**VP15TF M breaker**	460 (395–525)	D1	–.197	.006	.006	.006	.006
						.197–.295	.004	.004	.004	.004
						.295–.394	.003	.003	.003	.003
M	Stainless Steel	≤270HB	**VP20RT M breaker**	460 (395–525)	D1	–.197	.006	.006	.006	.006
						.197–.295	.004	.004	.004	.004
						.295–.394	.003	.003	.003	.003
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020 H breaker**	690 (525–850)	D1	–.197	.006	.006	.006	.006
						.197–.295	.004	.004	.004	.004
						.295–.394	.003	.003	.003	.003
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MC5020 H breaker**	555 (390–720)	D1	–.197	.006	.006	.006	.006
						.197–.295	.004	.004	.004	.004
						.295–.394	.003	.003	.003	.003
S	Titanium Alloy	350HB	**VP20RT H breaker**	130 (100–200)	D1	–.197	.002	.002	.002	.002
	Heat Resistant Alloy	–	**VP20RT H breaker**	100 (65–130)	D1	–.040	.002	.002	.002	.002
H	Hardened Steel	40–55HRC	**VP15TF H breaker**	230 (180–270)	D1	–.197	.003	.003	.003	.003

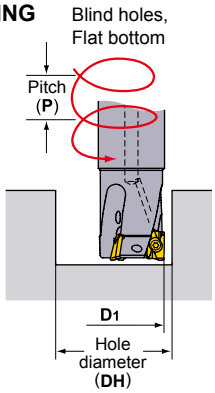
(Note 1) These cutting conditions are a guide to the standard shank type and the arbor type.
Please make adjustments according to the machining conditions.
(Note 2) Vibration is liable to occur in certain cases. Please reduce the depth of cut and / or reduce cutting conditions in the following cases.
· When using the long shank type
· 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 insert is the first recommendation.

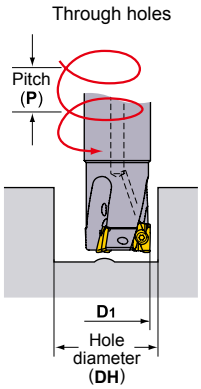
RAMPING/HELICAL CUTTING

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 **D1** (inch)	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
	Maximum Ramping Angle **α°**	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 D1) - (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

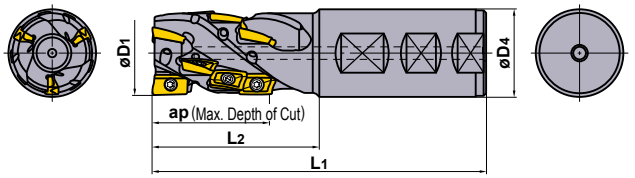
0° Roughing

APX4000

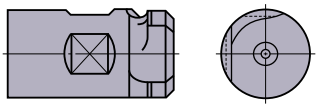
Light Alloy	Cast Iron	Carbon Steel Alloy Steel	Stainless Steel	Hardened Steel



LONG CUTTING EDGE



*1 Combination Type



LONG EDGE SHANK TYPE (A Holders)

Order Number	Stock	Number of Flutes	Total	Dimensions (inch)					*2			
	R			D1	D4	L1	L2	ap	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-○
2412WA24S35A	●	3	12	1.500	1.500	6.500	3.250	2.200	TPS43	TIP15W	MK1KS	
*1 3212WA32S35A	●	3	12	2.000	2.000	6.500	3.250	2.200	TPS43	TIP15W	MK1KS	
*1 3218WA32M53A	●	3	18	2.000	2.000	7.750	4.500	3.300	TPS43	TIP15W	MK1KS	

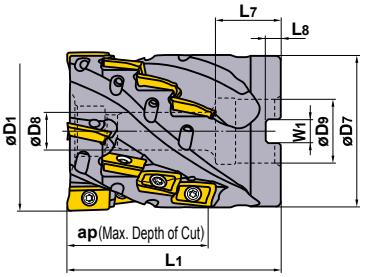
*2 Clamp Torque (lbf-in) : TPS43=31

(Note 1) When using inserts with corner radius Re≥.125" on the bottom, B-Holders or C-Holders are required as shown on page K047.

(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.

D1	Set Bolt	Geometry
ϕ2.000"	HSCUF37520	
ϕ2.500"	50028	

LONG EDGE SHELL TYPE (A Holders)

Order Number	Stock	Number of Flutes	Total	Dimensions (mm)									*			
	R			D1	L1	D9	L7	D8	D7	W1	L8	ap	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-○
2516CA22A	●	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 K047.

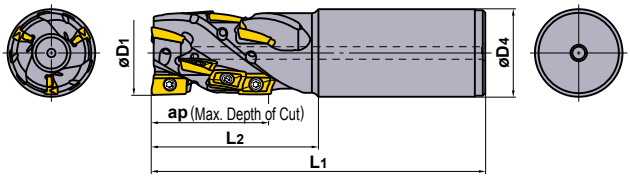
(Note 2) Only corner radius Re .016" and .031" can be used for the peripheral cutting edges expect the bottom cutting edge (the end cuttting edge).

(Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

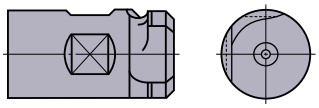
(Note 4) In case of internal coolant supply, please use a face mill arbor with through coolant channels. Regular center-thru or side-thru arbors can't be used.

● : Inventory maintained. ★ : Inventory maintained in Japan.





∗1 Combination Type



METRIC Standard

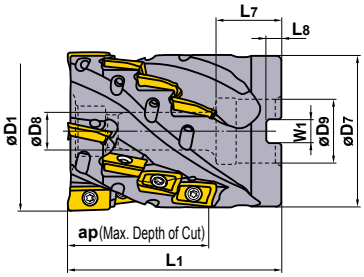
LONG EDGE SHANK TYPE (A Holders)

Order Number	Stock	Number of Flutes	Total	Dimensions (mm) [inch]					∗2			
	R			D1	D4	L1	L2	ap	Insert Screw	Wrench	Anti-seizure Lubricant	Insert
APX4KR4008SA42S056A	★	2	8	40	42	160	80	56	TPS43	TIP15W	MK1KS	AOMT1848 ○○PEER-○
4012SA42S056A	★	3	12	40	42	160	80	56	TPS43	TIP15W	MK1KS	
∗1 5012WA508S056A	★	3	12	50	50.8 [2.0"]	160	80	56	TPS43	TIP15W	MK1KS	
∗1 5018WA508M084A	★	3	18	50	50.8 [2.0"]	190	110	84	TPS43	TIP15W	MK1KS	

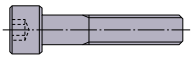
∗2 Clamp Torque (lbf-in) : TPS43=31

(Note 1) When using inserts with corner radius Re≥.125" on the bottom, B-Holders or C-Holders are required as shown on page K047.
(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.

D1	Set Bolt	Geometry
ϕ50mm	HSC10050	
ϕ63mm	12070	

The bore diameter (D9) 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			D1	L1	D9	L7	D8	D7	W1	L8	ap	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			D1	L1	D9	L7	D8	D7	W1	L8	ap	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-○
-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 K047.
(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.

INSERTS ➤ K047
OPERATION GUIDANCE ➤ K053
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS (Long Cutting edge Shank and Shell Type)

CUTTING CONDITIONS FOR SHOULDER 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)		
							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	**VP15TF M breaker**	655 (525–820)	–0.15D_1	– .787	.010	.010	.008
						–1.969	.008	.008	.006
						–3.150	–	–	.004
				525 (395–655)	–0.3D_1	– .787	.010	.010	.008
						–1.969	.008	.008	.006
						–3.150	–	–	.004
	Carbon Steel Alloy Steel	180–350HB	**VP15TF M breaker**	525 (395–655)	–0.15D_1	– .787	.010	.010	.008
						–1.969	.008	.008	.006
						–3.150	–	–	.004
				395 (330–460)	–0.3D_1	– .787	.010	.010	.008
						–1.969	.008	.008	.006
						–3.150	–	–	.004
M	Stainless Steel	≤270HB	**VP20RT M breaker**	525 (395–655)	–0.15D_1	– .394	.010	.010	.008
						–1.969	.008	.008	.006
						–3.150	–	–	.004
				395 (330–460)	–0.3D_1	– .394	.010	.010	.008
						–1.969	.008	.008	.006
						–3.150	–	–	.004
K	Cast Iron	Tensile Strength ≤350MPa	**MC5020 H breaker**	755 (590–920)	–0.15D_1	– .394	.012	.012	.010
						–1.969	.010	.010	.008
						–3.150	–	–	.006
			MC5020 H breaker	620 (460–790)	–0.3D_1	– .394	.010	.010	.010
						–1.969	.008	.008	.006
						–3.150	–	–	.004
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MC5020 H breaker**	620 (460–720)	–0.15D_1	– .394	.010	.010	.008
						–1.969	.008	.008	.006
						–3.150	–	–	.004
			MC5020 H breaker	560 (390–720)	–0.3D_1	– .394	.008	.008	.006
						–1.969	.006	.006	.004
						–3.150	–	–	.003
S	Titanium Alloy	≤350HB	**VP20RT H breaker**	130 (100–200)	–0.15D_1	– .787	.004	.004	–
						–1.969	.004	.004	–
	Heat-resistant Alloy	–	**VP20RT H breaker**	130 (65–130)	–0.15D_1	– .394	.003	.003	–

(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)		
							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	**VP15TF M breaker**	460 (395–460)	D_1	– .787	.008	.008	.006
						–1.969	.006	.006	–
	Carbon Steel Alloy Steel	180–350HB	**VP15TF M breaker**	330 (260–395)	D_1	– .787	.006	.006	.004
						–1.969	.004	.004	–
M	Stainless Steel	≤270HB	**VP20RT M breaker**	330 (260–395)	D_1	– .394	.004	.004	.003
K	Cast Iron	Tensile Strength ≤350MPa	**MC5020 H breaker**	620 (460–790)	D_1	– .394	.010	.010	.008
						–.1969	.008	.008	.006
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MC5020 H breaker**	560 (390–720)	D_1	– .394	.006	.006	.004
						–.1969	.004	.004	–
S	Titanium Alloy	≤350HB	**VP20RT H breaker**	130 (100–200)	D_1	–.1969	.003	.003	–
	Heat-resistant Alloy	–	**VP20RT H breaker**	100 (65–130)	D_1	– .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 **D1**(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 **D1**(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>

0° | Finishing | Roughing | Including Flat faces

AXD4000

Light Alloy	Cast Iron	Carbon Steel · Alloy Steel	Stainless Steel	Hardened Steel
◀				



Fig. 1

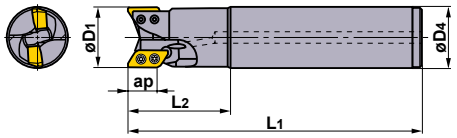
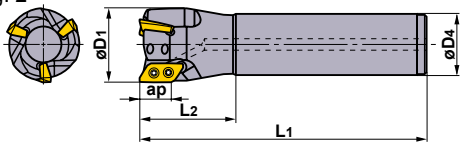


Fig. 2



SHANK TYPE

Right hand tool holder only.

Type	Insert Corner Re	Order Number	Stock R	Number of Teeth	Dimensions (inch) D1	L1	L2	D4	Max. Depth of Cut ap (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□□ PDFR-GL
		162SA16SA	●	2	1.000	6.000	2.000	1.000	.610	49000	1	TS3SB	TKY08D	MK1KS	
		162SA16LA	●	2	1.000	8.500	3.000	1.000	.610	49000	1	TS3SB	TKY08D	MK1KS	
		202SA20SA	●	2	1.250	6.000	2.000	1.250	.610	48000	1	TS3SB	TKY08D	MK1KS	
		202SA20LA	●	2	1.250	9.000	3.500	1.250	.610	48000	1	TS3SB	TKY08D	MK1KS	
		243SA20SA	●	3	1.500	6.000	2.000	1.250	.610	41000	2	TS3SB	TKY08D	MK1KS	
		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	
		162SA16SB	●	2	1.000	6.000	2.000	1.000	.583	49000	1	TS3SB	TKY08D	MK1KS	
		162SA16LB	●	2	1.000	8.500	3.000	1.000	.583	49000	1	TS3SB	TKY08D	MK1KS	
		202SA20SB	●	2	1.250	6.000	2.000	1.250	.583	48000	1	TS3SB	TKY08D	MK1KS	
		202SA20LB	●	2	1.250	9.000	3.500	1.250	.583	48000	1	TS3SB	TKY08D	MK1KS	
		243SA20SB	●	3	1.500	6.000	2.000	1.250	.583	41000	2	TS3SB	TKY08D	MK1KS	
		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 K060.
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 L1 and L2 dimension decreases.

∗ Clamp Torque (lbf-in) : TS3SB=13

● : Inventory maintained. □ : Non stock, produced to order only.

NEW



Fig. 1

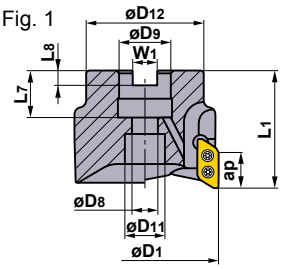
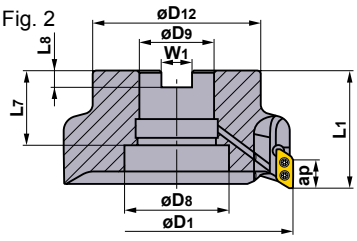
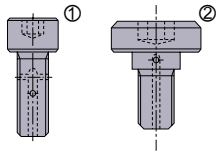


Fig. 2



Right hand tool holder only.

Cutter Diameter D1	Set Bolt	Geometry
ϕ1.5"	HSCU25014H	①
ϕ2"	37513H	
ϕ2.5"	50014H	
ϕ3"	62516H	
ϕ4"	75016H	
ϕ5"	MBAU75016H	②



C H :0°
A.R :+14°—15° T :+21°—+26°
R.R :+21°—+26° I :+14°—+15°

ARBOR TYPE

Type	Insert Corner Re	Order Number	Stock R	Number of Teeth	Dimensions (inch) D1	L1	D9	L7	D8	D12	W1	L8	D11	Mass (lbs)	Max. Depth of Cut ap (inch)	Max. Spindle Speed (min-1)	Type (Fig.)	Insert Screw	Wrench	Anti-seize Lubricant	Insert
A Holders	.016 – .125	AXD4000UR1502A	●	2	1.500	2.000	.500	.630	.276	1.440	.250	.156	.433	.6	.610	41000	1	TS3SB	TKY08D	MK1KS	XDGX1750□□ PDFR-GL
		1503A	●	3	1.500	2.000	.500	.630	.276	1.440	.250	.156	.433	.6	.610	41000	1	TS3SB	TKY08D	MK1KS	
		0202A	●	2	2.000	2.000	.750	.748	.413	1.750	.313	.187	.630	.9	.610	35000	1	TS3SB	TKY08D	MK1KS	
		0203A	●	3	2.000	2.000	.750	.748	.413	1.750	.313	.187	.630	.9	.610	35000	1	TS3SB	TKY08D	MK1KS	
		0204A	●	4	2.000	2.000	.750	.748	.413	1.750	.313	.187	.630	.9	.610	35000	1	TS3SB	TKY08D	MK1KS	
		2504CA	●	4	2.500	2.000	1.000	.984	.539	2.190	.375	.219	.787	1.4	.610	30000	1	TS3SB	TKY08D	MK1KS	
		0303DA	●	3	3.000	2.500	1.250	1.260	.669	2.880	.500	.281	1.024	2.9	.610	27000	1	TS3SB	TKY08D	MK1KS	
		0305DA	●	5	3.000	2.500	1.250	1.260	.669	2.880	.500	.281	1.024	2.9	.610	27000	1	TS3SB	TKY08D	MK1KS	
		0404EA	●	4	4.000	2.500	1.500	1.181	.787	3.810	.625	.375	1.181	5.5	.610	23000	1	TS3SB	TKY08D	MK1KS	
		0406EA	●	6	4.000	2.500	1.500	1.181	.787	3.810	.625	.375	1.181	5.5	.610	23000	1	TS3SB	TKY08D	MK1KS	
		0505EA	●	5	5.000	2.500	1.500	1.575	2.205	3.810	.625	.375	–	6.7	.610	20000	2	TS3SB	TKY08D	MK1KS	
		0507EA	●	7	5.000	2.500	1.500	1.575	2.205	3.810	.625	.375	–	6.7	.610	20000	2	TS3SB	TKY08D	MK1KS	
B Holders	.157 – .197	AXD4000UR1502B	□	2	1.500	2.000	.500	.630	.276	1.440	.250	.156	.433	.6	.583	41000	1	TS3SB	TKY08D	MK1KS	
		1503B	●	3	1.500	2.000	.500	.630	.276	1.440	.250	.156	.433	.6	.583	41000	1	TS3SB	TKY08D	MK1KS	
		0202B	□	2	2.000	2.000	.750	.748	.413	1.750	.313	.187	.630	.9	.583	35000	1	TS3SB	TKY08D	MK1KS	
		0203B	□	3	2.000	2.000	.750	.748	.413	1.750	.313	.187	.630	.9	.583	35000	1	TS3SB	TKY08D	MK1KS	
		0204B	●	4	2.000	2.000	.750	.748	.413	1.750	.313	.187	.630	.9	.583	35000	1	TS3SB	TKY08D	MK1KS	
		2504CB	□	4	2.500	2.000	1.000	.984	.539	2.190	.375	.219	.787	1.4	.583	30000	1	TS3SB	TKY08D	MK1KS	
		0303DB	□	3	3.000	2.500	1.250	1.260	.669	2.880	.500	.281	1.024	2.9	.583	27000	1	TS3SB	TKY08D	MK1KS	
		0305DB	●	5	3.000	2.500	1.250	1.260	.669	2.880	.500	.281	1.024	2.9	.583	27000	1	TS3SB	TKY08D	MK1KS	
		0404EB	□	4	4.000	2.500	1.500	1.181	.787	3.810	.625	.375	1.181	5.5	.583	23000	1	TS3SB	TKY08D	MK1KS	
		0406EB	□	6	4.000	2.500	1.500	1.181	.787	3.810	.625	.375	1.181	5.5	.583	23000	1	TS3SB	TKY08D	MK1KS	
		0505EB	□	5	5.000	2.500	1.500	1.575	2.205	3.810	.625	.375	–	6.7	.583	20000	2	TS3SB	TKY08D	MK1KS	
		0507EB	□	7	5.000	2.500	1.500	1.575	2.205	3.810	.625	.375	–	6.7	.583	20000	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 K060.
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 L1 dimension decreases.

✱ Clamp Torque (lbf-in) : TS3SB=13

INSERTS ➤ K059
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig. 1

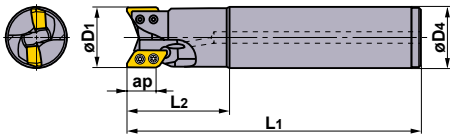
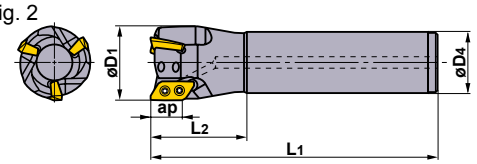


Fig. 2



METRIC Standard

SHANK TYPE

Right hand tool holder only.

Type	Insert Corner Re	Order Number	Stock R	Number of Teeth	Dimensions (mm) D1	L1	L2	D4	Max. Depth of Cut ap (mm)	Max. Spindle Speed (min-1)	Type (Fig.)	Clamp Screw	Wrench	Anti-seize Lubricant	Insert
A Holders	0.4 – 3.2	**AXD4000R252SA25SA**	★	2	25	125	50	25	15.5	49000	1	TS3SB	TKY08D	MK1KS	XDGX1750□□ PDFR-GL
		252SA25LA	★	2	25	170	80	25	15.5	49000	1	TS3SB	TKY08D	MK1KS	
		322SA32SA	★	2	32	150	50	32	15.5	48000	1	TS3SB	TKY08D	MK1KS	
		322SA32LA	★	2	32	200	80	32	15.5	48000	1	TS3SB	TKY08D	MK1KS	
		403SA32SA	★	3	40	150	50	32	15.5	41000	2	TS3SB	TKY08D	MK1KS	
		403SA42SA	★	3	40	170	80	42	15.5	41000	1	TS3SB	TKY08D	MK1KS	
B Holders	4.0 – 5.0	**AXD4000R252SA25SB**	★	2	25	125	50	25	14.8	49000	1	TS3SB	TKY08D	MK1KS	
		252SA25LB	★	2	25	170	80	25	14.8	49000	1	TS3SB	TKY08D	MK1KS	
		322SA32SB	★	2	32	150	50	32	14.8	48000	1	TS3SB	TKY08D	MK1KS	
		322SA32LB	★	2	32	200	80	32	14.8	48000	1	TS3SB	TKY08D	MK1KS	
		403SA32SB	★	3	40	150	50	32	14.8	41000	2	TS3SB	TKY08D	MK1KS	
		403SA42SB	★	3	40	170	80	42	14.8	41000	1	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 K060.
(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 L_1 and L_2 dimension decreases.
★ Clamp Torque (lbf-in) : TS3SB=13

★ : Inventory maintained in Japan.



Fig. 1

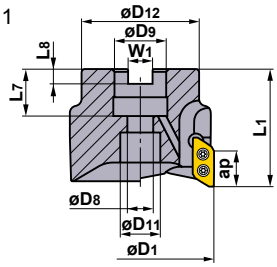
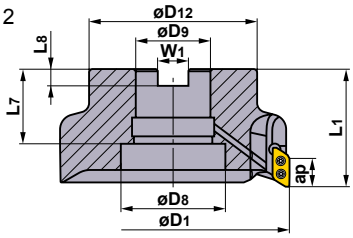


Fig. 2

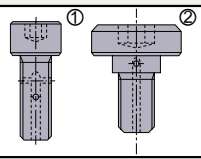


METRIC Standard

For inch arbors

Right hand tool holder only.

Cutter Diameter **D1**	Set Bolt	Geometry
ϕ80	12035H	①
ϕ100	16040H	
ϕ125	MBA20040H	②



ARBOR TYPE

C H :0°
A.R :+14°—15° T :+21°—+26°
R.R :+21°—+26° I :+14°—+15°

Type	Insert Corner Re	Order Number	Stock R	Number of Teeth	Dimensions (mm) [inch] D1	L1	D9	L7	D8	D12	W1	L8	D11	Mass (kg)	Max. Depth of Cut ap (mm)	Max. Spindle Speed (min-1)	Type (Fig.)	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□□ PDFR-GL
		R10006DA	★	6	100	63	31.75 [1.25"]	32	17	70	12.7	8	26	2.0	15.5	23000	1	TS3SB	TKY08D	MK1KS	
		R12507EA	★	7	125	63	38.1 [1.5"]	40	56	90	15.9	10	—	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	
		R10006DB	★	6	100	63	31.75 [1.25"]	32	17	70	12.7	8	26	2.0	14.8	23000	1	TS3SB	TKY08D	MK1KS	
		R12507EB	★	7	125	63	38.1 [1.5"]	40	56	90	15.9	10	—	2.8	14.8	20000	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 K060.
2. When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
3. Note for inserts with a corner radius of .063" and above, as corner radius increases the L_1 dimension decreases.

∗ Clamp Torque (lbf-in) : TS3SB=13



Fig. 1

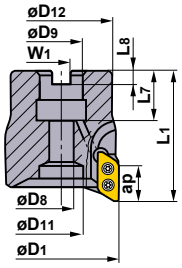


Fig. 2

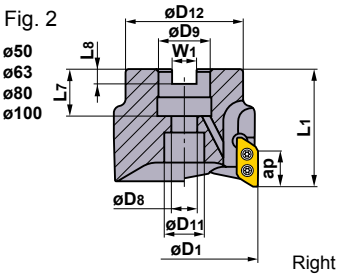
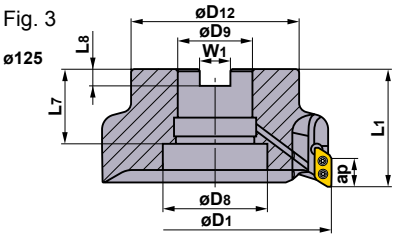
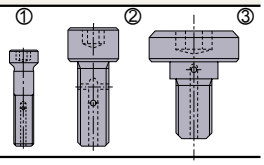


Fig. 3



Right hand tool holder only.

Cutter Diameter D1	Set Bolt	Geometry
ϕ40	HFF08043H	①
ϕ50, ϕ63	HSC10030H	②
ϕ80	12035H	②
ϕ100	16040H	②
ϕ125	MBA20040H	③



METRIC Standard

For metric arbors

C H :0°
A.R :+14°—15° T :+21°—+26°
R.R :+21°—+26° I :+14°—+15°

ARBOR TYPE

Type	Insert Corner Re	Order Number	Stock R	Number of Teeth	Dimensions (mm) D1	L1	D9	L7	D8	D12	W1	L8	D11	Mass (kg)	Max. Depth of Cut ap (mm)	Max. Spindle Speed (min-1)	Type (Fig.)	Clamp Screw	Wrench	Anti-seize Lubricant	Insert
A Holders	0.4 – 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□□□ PDFR-GL
		-040A03RA	★	3	40	50	16	18	8.5	34	8.4	5.6	12	0.3	15.5	41000	1	TS3SB	TKY08D	MK1KS	
		-050A02RA	★	2	50	50	22	20	11	45	10.4	6.3	17	0.4	15.5	35000	2	TS3SB	TKY08D	MK1KS	
		-050A04RA	★	4	50	50	22	20	11	45	10.4	6.3	17	0.4	15.5	35000	2	TS3SB	TKY08D	MK1KS	
		-063A05RA	★	5	63	50	22	20	11	50	10.4	6.3	17	0.6	15.5	30000	2	TS3SB	TKY08D	MK1KS	
		-080A05RA	★	5	80	50	27	23	13	60	12.4	7	20	1.0	15.5	27000	2	TS3SB	TKY08D	MK1KS	
		-100A06RA	★	6	100	63	32	26	17	70	14.4	8	26	2.0	15.5	23000	2	TS3SB	TKY08D	MK1KS	
		-125B07RA	★	7	125	63	40	40	56	90	16.4	9	—	2.8	15.5	20000	3	TS3SB	TKY08D	MK1KS	
B Holders	4.0 – 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	
		-040A03RB	★	3	40	50	16	18	8.5	34	8.4	5.6	12	0.3	14.8	41000	1	TS3SB	TKY08D	MK1KS	
		-050A02RB	★	2	50	50	22	20	11	45	10.4	6.3	17	0.4	14.8	35000	2	TS3SB	TKY08D	MK1KS	
		-050A04RB	★	4	50	50	22	20	11	45	10.4	6.3	17	0.4	14.8	35000	2	TS3SB	TKY08D	MK1KS	
		-063A05RB	★	5	63	50	22	20	11	50	10.4	6.3	17	0.6	14.8	30000	2	TS3SB	TKY08D	MK1KS	
		-080A05RB	★	5	80	50	27	23	13	60	12.4	7	20	1.0	14.8	27000	2	TS3SB	TKY08D	MK1KS	
		-100A06RB	★	6	100	63	32	26	17	70	14.4	8	26	2.0	14.8	23000	2	TS3SB	TKY08D	MK1KS	
		-125B07RB	★	7	125	63	40	40	56	90	16.4	9	—	2.8	14.8	20000	3	TS3SB	TKY08D	MK1KS	

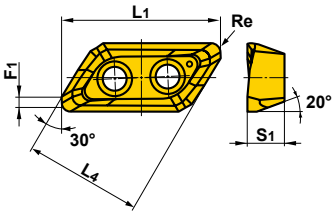
(Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating the tool read the operation guidance on page K060.
(Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
(Note 3) Note for insert with a corner radius of 1.6 and above, as corner radius increases the L1 dimension decreases.
★ Clamp Torque (N • m) : TS3SB=1.5

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

INSERTS

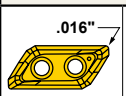
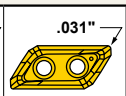
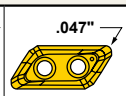
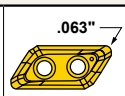
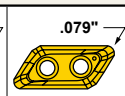
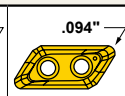
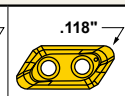
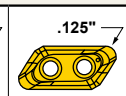
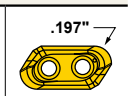
Work Material	N	Aluminum Alloy	✤				◔	

Cutting Conditions (Guide): ● :Stable Cutting ◔ :General Cutting ✤ :Unstable Cutting
Honing: **F** :Sharp

Shape	Order Number	Class	Honing	Stock: Coated LC15TF				Stock: Carbide TF15		Dimensions (inch) L1	L4	S1	F1	Re	Geometry
	**XDGX175004PDFR-GL**	G	F	★				●		.906	.689	.197	.067	.016	
	175008PDFR-GL	G	F	★				●		.906	.689	.197	.051	.031	
	175012PDFR-GL	G	F	★				●		.906	.689	.197	.035	.047	
	175016PDFR-GL	G	F	★				●		.866	.689	.197	.055	.063	
	175020PDFR-GL	G	F	★				●		.866	.689	.197	.039	.079	
	175024PDFR-GL	G	F	★				●		.866	.689	.197	.024	.094	
	175030PDFR-GL	G	F	★				●		.831	.689	.197	.031	.118	
	175032PDFR-GL	G	F	★				●		.831	.689	.197	.024	.125	
	175040PDFR-GL	G	F	★				●		.787	.689	.197	.031	.157	
	175050PDFR-GL	G	F	★				●		.764	.689	.197	.016	.197	

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 175004PDFR-GL	XDGX 175008PDFR-GL	XDGX 175012PDFR-GL	XDGX 175016PDFR-GL	XDGX 175020PDFR-GL	XDGX 175024PDFR-GL	XDGX 175030PDFR-GL	XDGX 175032PDFR-GL	XDGX 175040PDFR-GL	XDGX 175050PDFR-GL

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

SHOULDER MILLING

	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 **D1** **ϕ1.000"**	Cutting Edge Diameter **D1** **ϕ1.250"**	Cutting Edge Diameter **D1** **ϕ1.500"**	Cutting Edge Diameter **D1** **ϕ2.000"–ϕ5.000"**
N	Aluminum Alloy	**LC15TF TF15**	−0.25 D_1	3280 (655−9840)	−.197	.014	.014	.016	.016
					.197−.295	.013	.013	.015	.015
					.295−.393	.012	.012	.014	.014
					.393−.492	.011	.011	.013	.013
					.492−.571	.010	.010	.012	.012
			−0.5 D_1	3280 (655−9840)	−.197	.014	.014	.014	.016
					.197−.295	.013	.013	.013	.015
					.295−.393	.012	.012	.012	.014
					.393−.492	.010	.011	.011	.013
					.492−.571	.008	.010	.010	.012
			−0.75 D_1	3280 (655−9840)	−.197	.012	.012	.012	.014
					.197−.295	.011	.011	.011	.013
					.295−.393	.010	.010	.010	.012
					.393−.492	.009	.009	.009	.011
					.492−.571	.008	.008	.008	.010

SLOT MILLING

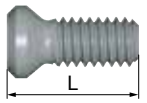
	Work Material	Insert Grade	Width of Cut **ae** (inch)	Cutting Speed **vc** (SFM)	Depth of Cut **ap** (inch)	Feed per Tooth (inch/tooth)			
						Cutting Edge Diameter **D1** **ϕ1.000"**	Cutting Edge Diameter **D1** **ϕ1.250"**	Cutting Edge Diameter **D1** **ϕ1.500"**	Cutting Edge Diameter **D1** **ϕ2.000"–ϕ5.000"**
N	Aluminum Alloy	**LC15TF TF15**	D_1	3280 (655−9840)	−.197	.010	.010	.012	.014
					.197−.295	.009	.009	.011	.013
					.295−.393	.008	.008	.010	.012
					.393−.492	−	.007	.009	.011
					.492−.571	−	.006	.008	.010

(Note 1) The above cutting conditions are determined based on high workpiece and machine rigidity, where no vibration occurred. If vibrations occur make adjustments according to the machining conditions.
(Note 2) Note, 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 **D1**(inch)	ø1.000"–ø5.000"
Clamp Screw Number	TS3SB
Overall Length **L**(inch)	.315
Clamp Torque (lbf-in)	13



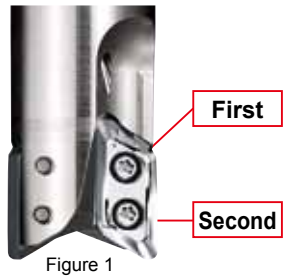


Figure 1

- 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 **D1**(inch)	ø1.000"	ø1.250"	ø1.500"	ø2.000"	ø2.500"	ø3.000"	ø4.000"	ø5.000"
Max. Allowable Spindle Speed (min^{-1})	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}.

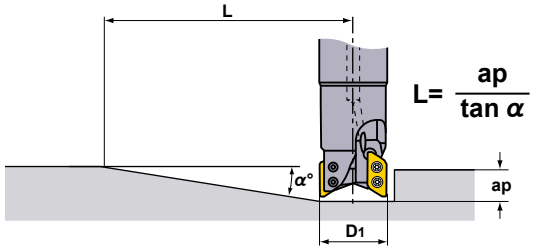
(Table 2) Maximum spindle speed when balancing with the arbor or milling chuck has not been achieved

Cutting Edge Diameter **D1**(inch)	ø1.000"	ø1.250"	ø1.500"	ø2.000"	ø2.500"	ø3.000"	ø4.000"	ø5.000"
Max. Spindle Speed (min^{-1})	12000	9500	7600	6000	4800	3800	3000	2400

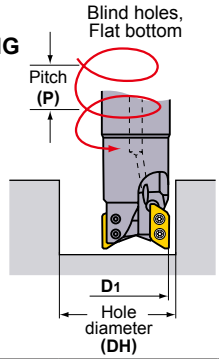
- When setting the spindle speed, take into consideration the maximum allowable spindle speed of the arbor or milling chuck.
- Use the specified set bolt when using the arbor type with through coolant.
- The inserts have sharp cutting edges and handling them with bare hands may cause injuries. Always wear safety gloves when handling the indexable inserts.

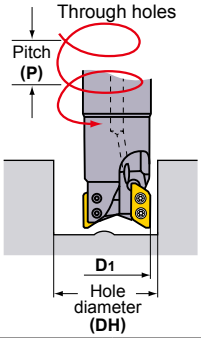
RAMPING/HELICAL CUTTING

RAMPING



HELICAL CUTTING





RAMPING/HELICAL CUTTING

Holder Type	Cutting Edge Diameter **D1** (inch)	Insert Corner Radius **Re** (inch)	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
			Maximum Ramping Angle **α°**	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	1.000	.016—.047	22.6	1.50	1.886 ✶2	.551	1.832	.551	1.267	.315
		.063—.094	22.1	1.54	1.791 ✶3	.512	1.766	.512	1.267	.315
		.118—.125	20.7	1.65	1.728 ✶4	.472	1.707	.472	1.267	.315
	1.250	.016—.047	15.6	2.20	2.386 ✶2	.551	2.331	.551	1.762	.433
		.063—.094	14.9	2.32	2.291 ✶3	.512	2.264	.512	1.762	.394
		.118—.125	14.0	2.48	2.228 ✶4	.472	2.203	.472	1.762	.394
	1.500	.016—.047	13.0	2.68	2.870 ✶2	.551	2.827	.551	2.262	.512
		.063—.094	12.3	2.83	2.776 ✶3	.512	2.760	.512	2.262	.512
		.118—.125	11.6	2.99	2.713 ✶4	.472	2.701	.472	2.262	.472
	2.000	.016—.047	8.7	4.02	3.870 ✶2	.551	3.827	.551	3.258	.551
		.063—.094	8.2	4.25	3.776 ✶3	.512	3.757	.512	3.257	.512
		.118—.125	7.6	4.61	3.713 ✶4	.472	3.696	.472	3.257	.472
	2.500	.016—.047	6.6	5.28	4.870 ✶2	.551	4.824	.551	4.259	.551
		.063—.094	6.1	5.75	4.776 ✶3	.512	4.756	.512	4.259	.512
		.118—.125	5.7	6.14	4.713 ✶4	.472	4.695	.472	4.258	.472
	3.000	.016—.047	5.3	6.61	5.870 ✶2	.551	5.824	.551	5.260	.551
		.063—.094	4.9	7.13	5.776 ✶3	.512	5.756	.512	5.260	.512
		.118—.125	4.5	7.76	5.713 ✶4	.472	5.746	.472	5.259	.472
	4.000	.016—.047	3.8	9.21	7.870 ✶2	.551	7.824	.551	7.261	.551
		.063—.094	3.5	10.00	7.776 ✶3	.512	7.755	.512	7.261	.512
		.118—.125	3.2	10.94	7.713 ✶4	.472	7.694	.472	7.260	.472
	5.000	.016—.047	2.9	12.05	9.870 ✶2	.551	9.823	.551	9.261	.551
		.063—.094	2.7	12.95	9.776 ✶3	.512	9.755	.512	9.261	.512
		.118—.125	2.5	14.02	9.713 ✶4	.472	9.693	.472	9.260	.472
B	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	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	10.7	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 ap / 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 D1) - (corner radius Re) - β} ×2

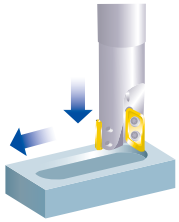
D1	β
1.0—1.25"	.010"
1.5—5.0"	.018"

MAX.DRILLING DEPTH

Holder Type	Insert Corner R **Re** (inch)	Max.Drilling Depth (inch)		
		Cutting Edge Diameter **D1** **ϕ1.000"**	Cutting Edge Diameter **D1** **ϕ1.250"**	Cutting Edge Diameter **D1** **ϕ1.500"—ϕ5.000"**
A	.016—.047	.205	.205	.209
	.063—.094	.181	.185	.189
	.118—.125	.146	.165	.173
B	.157	.106	.142	.150
	.197	.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.



MILLING

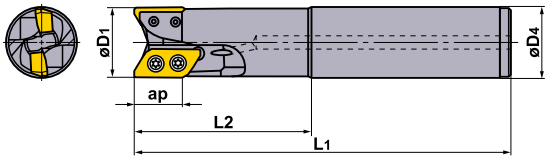
MULTI FUNCTIONAL MILLING
<CUTTING FOR ALUMINUM ALLOY>

0° | Finishing | Roughing | Including Flat faces

AXD7000

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel
●				





SHANK TYPE

Right hand tool holder only.

Type	Insert Corner Re	Order Number	Stock R	Number of Teeth	Dimensions (inch) D1	L1	L2	D4	Max. Depth of Cut ap	Ramping Angle α°	Max. Spindle Speed (min⁻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
		242SA24SA	●	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
		242SA24SB	●	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 K067.
(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 L1 dimension decreases.
* Clamp Torque (lbf-in) : TS4SB=31, TS4SBL=31



- Air / coolant through.
- Low resistance inserts.
- Excellent wall accuracy.
- High spindle speeds possible.
- Multi functional milling.

C H :0°
A.R :+11° T :+26°–+27°
R.R :+26°–+27° I :+11°

Fig.1

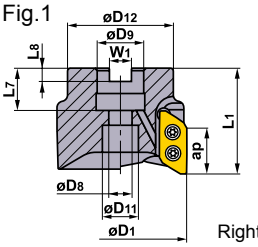
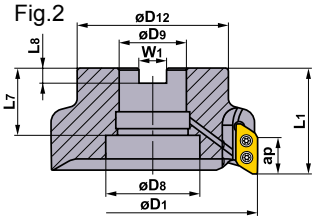
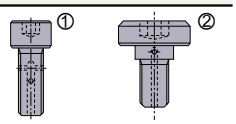


Fig.2



Right hand tool holder only.

Cutter Diameter D1	Coolant thru Set Bolt	Geometry
ϕ2"	HSCU37513H	①
ϕ3"	62516H	
ϕ4"	75016H	②
ϕ5"	MBAU75016H	



ARBOR TYPE

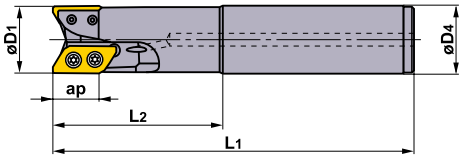
Type	Insert Corner Re	Order Number	Stock R	Number of Teeth	Dimensions (inch) D1	L1	D9	L7	D8	D12	W1	L8	D11	Mass (lbs)	Max. Depth of Cut ap	Ramping Angle α°	Max. Spindle Speed (min⁻¹)	Type (Fig.)	* Insert Screw	Wrench	Anti-seize Lubricant	Insert
A Holders	.031 – .125	**AXD7000UR0203A**	●	3	2.000	2.000	.750	.748	.415	1.875	.313	.187	.600	.9	.827	9	30000	1	TS4SBL	TKY15D	MK1KS	XDGX2270□□ PDFR-GL
		0303DA	●	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	
		0405EA	●	5	4.000	2.500	1.500	1.181	.787	3.810	.625	.375	1.181	5.4	.827	4	23000	1	TS4SBL	TKY15D	MK1KS	
		0506EA	●	6	5.000	2.500	1.500	1.575	2.205	3.810	.625	.375	1.181	6.6	.827	3	20000	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
		0303DB	●	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	
		0405EB	□	5	4.000	2.500	1.500	1.181	.787	3.810	.625	.375	1.181	5.4	.803	3	23000	1	TS4SBL	TKY15D	MK1KS	
		0506EB	□	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 K067.
(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 L1 dimension decreases.
* Clamp Torque (lbf-in) : TS4SBL=31

● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.







METRIC Standard

SHANK TYPE

Right hand tool holder only.

Type	Insert Corner Re	Order Number	Stock R	Number of Teeth	Dimensions (mm) D1	L1	L2	D4	Max. Depth of Cut ap	Ramping Angle α°	Max. Spindle Speed (min-1)	Insert Screw *	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
		R402SA42SA	★	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	
		R402SA42SB	★	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 K067.
(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 3.0 and above, as corner radius increases the L1 and L2 dimensions decreases.
* Clamp Torque (lbf-in) : TS4SB=31, TS4SBL=31



Fig.1

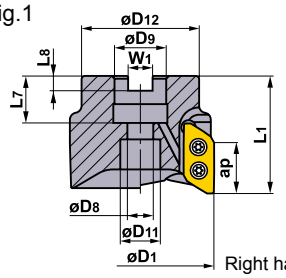
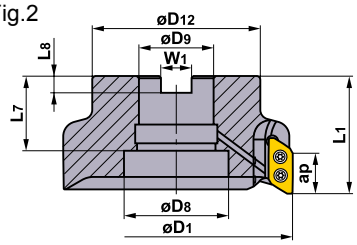
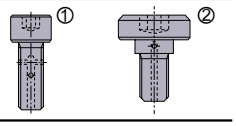


Fig.2



Right hand tool holder only.

Cutter Diameter D1	Set Bolt	Geometry
ϕ80	12035H	①
ϕ100	16040H	
ϕ125	MBA20040H	②



METRIC Standard

For inch arbors

C H :0°
A.R :+11°
R.R :+26°—+29°
T :+26°—+29°
I :+11°

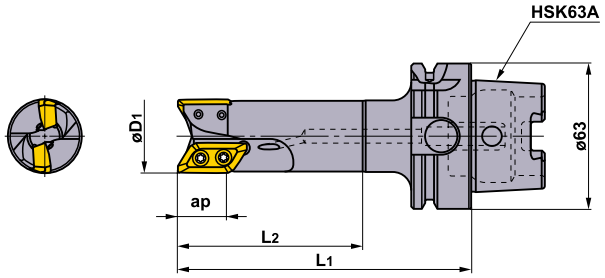
ARBOR TYPE

Type	Insert Corner Re	Order Number	Stock R	Number of Teeth	Dimensions (mm) [inch] D1	L1	D9	L7	D8	D12	W1	L8	D11	Mass (kg)	Max. Depth of Cut ap	Ramping Angle α°	Max. Spindle Speed (min-1)	Type (Fig.)	Insert Screw *	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
		R10005DA	★	5	100	63	31.75 [1.25"]	32	17	70	12.7	8	26	1.8	21	4	19000	1	TS4SBL	TKY15D	MK1KS	
		R12506EA	★	6	125	63	38.1 [1.5"]	40	56	90	15.9	10	–	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	
		R10005DB	★	5	100	63	31.75 [1.25"]	32	17	70	12.7	8	26	1.8	20.4	3	19000	1	TS4SBL	TKY15D	MK1KS	
		R12506EB	★	6	125	63	38.1 [1.5"]	40	56	90	15.9	10	–	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 K067.
(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 L1 dimension decreases.
* Clamp Torque (lbf-in) : TS4SBL=31

INSERTS ➤ K065
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001





METRIC Standard

HSK63A SHANK TYPE (A Holders)

Right hand tool holder only.

Type	Insert Corner Re	Order Number	Stock R	Number of Teeth	Dimensions (mm) D1	L1	L2	Max. Depth of Cut ap	Ramping Angle α°	Max. Spindle Speed (min-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
		04002A-H63A	★	2	40	132	85	21	13	36000	TS4SBL	TKY15D	MK1KS	
		05003A-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 K067.
(Note 2) Note for inserts with a corner radius of .118" and above, as corner radius increases the L1 and L2 dimensions decreases.
(Note 3) There is no data chip hole.
* Clamp Torque (lbf-in) : TS4SB=31, TS4SBL=31



Fig.1

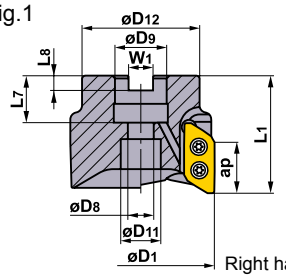
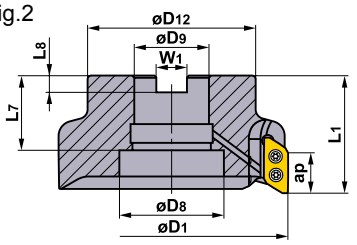
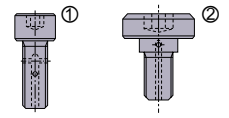


Fig.2



Right hand tool holder only.

Cutter Diameter D1	Set Bolt	Geometry
ϕ50, ϕ63	HSC10030H	①
ϕ80	12035H	
ϕ100	16040H	
ϕ125	MBA20040H	②



METRIC Standard

For metric arbors

C H :0°
A.R :+11° T :+26°—+29°
R.R :+26°—+29° I :+11°

ARBOR TYPE

Type	Insert Corner Re	Order Number	Stock R	Number of Teeth	Dimensions (mm) D1	L1	D9	L7	D8	D12	W1	L8	D11	Mass (kg)	Max. Depth of Cut ap	Ramping Angle α°	Max. Spindle Speed (min-1)	Type (Fig.)	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
		-063A03RA	★	3	63	50	22	20	11	45	10.4	6.3	17	0.5	21	7	25000	1	TS4SBL	TKY15D	MK1KS	
		-080A04RA	★	4	80	63	27	23	13	63	12.4	7	20	1.2	21	5	23000	1	TS4SBL	TKY15D	MK1KS	
		-100A05RA	★	5	100	63	32	26	17	70	14.4	8	26	1.8	21	4	19000	1	TS4SBL	TKY15D	MK1KS	
		-125B06RA	★	6	125	63	40	40	56	90	16.4	9	—	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	
		-063A03RB	★	3	63	50	22	20	11	45	10.4	6.3	17	0.5	20.4	6	25000	1	TS4SBL	TKY15D	MK1KS	
		-080A04RB	★	4	80	63	27	23	13	63	12.4	7	20	1.2	20.4	4	23000	1	TS4SBL	TKY15D	MK1KS	
		-100A05RB	★	5	100	63	32	26	17	70	14.4	8	26	1.8	20.4	3	19000	1	TS4SBL	TKY15D	MK1KS	
		-125B06RB	★	6	125	63	40	40	56	90	16.4	9	—	2.7	20.4	2	16000	2	TS4SBL	TKY15D	MK1KS	

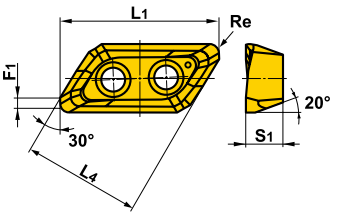
(Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating the tool read the operation guidance on page K067.
(Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
(Note 3) Note for inserts with a corner radius of 3.0 and above, as corner radius increases the L1 dimension decreases.
* Clamp Torque (lbf-in) : TS4SBL=31

● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only. <10 inserts in one case>

INSERTS

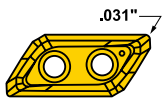
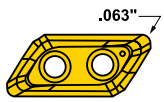
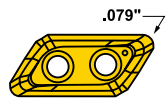
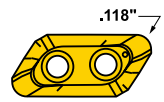
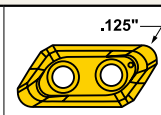
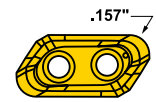
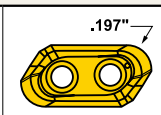
Work Material	N	Non-Ferrous Metal

Cutting Conditions : ● : Stable Cutting ◐ : General Cutting ❖ : Unstable Cutting
Honing : F : Sharp

Shape	Order Number	Class	Honing	Stock: Coated LC15TF	Stock: Carbide TF15	Dimensions (inch) L1	L4	S1	F1	Re	Geometry
	XDGX227008PDFR-GL	G	F	★	●	1.181	.886	.276	.079	.031	
	227016PDFR-GL	G	F	★	●	1.181	.886	.276	.047	.063	
	227020PDFR-GL	G	F	★	●	1.181	.886	.276	.031	.079	
	227024PDFR-GL	G	F	□	●	1.181	.886	.276	.016	.094	
	227030PDFR-GL	G	F	★	●	1.134	.886	.276	.031	.118	
	227032PDFR-GL	G	F	★	●	1.134	.886	.276	.024	.125	
	227040PDFR-GL	G	F	★	●	1.083	.886	.276	.035	.157	
	227050PDFR-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

SHOULDER MILLING

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 D1 ϕ1.250"	Cutting Edge Diameter D1 ϕ1.500"	Cutting Edge Diameter D1 ϕ2.000"–ϕ3.000"
N	Aluminum Alloy	LC15TF TF15	−0.25D1	3280 (655−9840)	−.197	.014	.016	.016
					.197−.394	.012	.014	.014
					.394−.591	.010	.012	.012
					.591−.787	.008	.010	.010
			−0.5D1	3280 (655−9840)	−.197	.014	.014	.016
					.197−.394	.012	.012	.014
					.394−.591	.010	.010	.012
					.591−.787	.008	.008	.010
			−0.75D1	3280 (655−9840)	−.197	.012	.012	.014
					.197−.394	.010	.010	.012
					.394−.591	.008	.008	.010
					.591−.787	.006	.006	.008

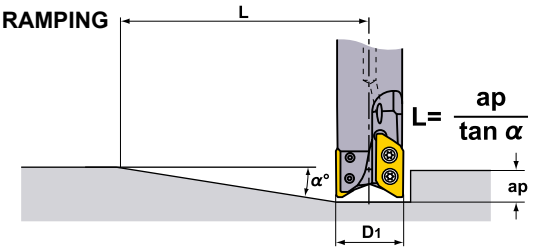
SLOT MILLING

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 D1 ϕ1.250"	Cutting Edge Diameter D1 ϕ1.500"	Cutting Edge Diameter D1 ϕ2.000"–ϕ3.000"
N	Aluminum Alloy	LC15TF TF15	D1	3280 (655−9840)	−.197	.010	.012	.014
					.197−.394	.008	.010	.012
					.394−.591	.006	.008	.010
					.591−.787	.004	.006	.008

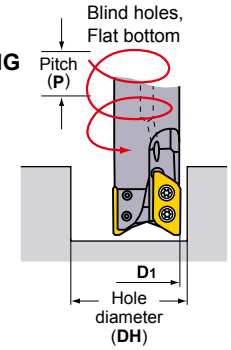
(Note 1) The above cutting conditions are determined based on high workpiece and machine rigidity, where no vibration occurred. If vibrations occur make adjustments according to the machining conditions.
(Note 2) Note, vibrations may occur in the following conditions.
- When using long tool overhang.
- 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.

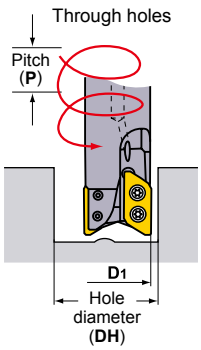
RAMPING/HELICAL CUTTING

● RAMPING



● HELICAL CUTTING





RAMPING/HELICAL CUTTING

Holder Type	Cutting Edge Diameter **D1** (inch)	Insert Corner Radius **Re** (inch)	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
			Maximum Ramping Angle **α°**	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	20.0	2.283	2.417	.787	2.276	.787	1.535	.315
		.063—.094	20.0	2.283	2.354 ✶2	.748	2.276	.748	1.535	.315
		.118—.125	19.3	2.362	2.244 ✶3	.669	2.193	.669	1.535	.315
	1.500	.031	14.1	3.307	2.902	.787	2.776	.787	2.047	.394
		.063—.094	14.1	3.307	2.839 ✶2	.748	2.776	.748	2.047	.394
		.118—.125	13.3	3.504	2.728 ✶3	.669	2.693	.669	2.047	.394
	2.000	.031	9.8	4.803	3.902	.787	3.768	.787	3.031	.551
		.063—.094	9.8	4.803	3.839 ✶2	.748	3.768	.748	3.031	.551
		.118—.125	9.1	5.197	3.728 ✶3	.669	3.689	.669	3.031	.472
	3.000	.031	5.3	8.937	5.902	.787	5.768	.787	5.000	.551
		.063—.094	5.3	8.937	5.839 ✶2	.748	5.768	.748	5.000	.551
		.118—.125	4.9	9.646	5.728 ✶3	.669	5.685	.669	5.000	.512
	4.000	.031	4.2	11.260	7.902	.787	7.768	.787	6.969	.669
		.063—.094	4.2	11.260	7.839 ✶2	.748	7.768	.748	6.969	.669
		.118—.125	3.8	12.480	7.728 ✶3	.669	7.685	.669	6.969	.591
	5.000	.031	2.5	18.937	9.902	.669	9.768	.630	9.016	.512
		.063—.094	2.5	18.937	9.839 ✶2	.630	9.768	.630	9.016	.512
		.118—.125	2.2	21.535	9.728 ✶3	.551	9.685	.551	9.016	.472
B	1.250	.157	18.0	2.480	2.165	.630	2.106	.630	1.535	.276
		.197	18.0	2.480	2.087	.591	2.071	.591	1.535	.276
	1.500	.157	11.0	4.134	3.902	.630	2.606	.630	2.047	.315
		.197	11.0	4.134	3.839	.591	2.567	.591	2.047	.315
	2.000	.157	8.0	5.748	3.650	.630	3.598	.630	3.031	.433
		.197	8.0	5.748	3.571	.591	3.563	.591	3.031	.433
	3.000	.157	4.0	11.496	5.650	.551	5.598	.551	5.000	.433
		.197	4.0	11.496	5.571	.551	5.563	.551	5.000	.433
	4.000	.157	3.0	15.354	7.650	.591	7.598	.591	6.969	.472
		.197	3.0	15.354	7.571	.551	7.559	.551	6.969	.472
	5.000	.157	2.0	23.031	9.650	.472	9.598	.472	9.016	.433
		.197	2.0	23.031	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 ap / 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 D1) - (corner radius Re) - β} ×2

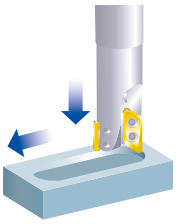
D1	β
1.25—1.5"	.010"
2.0—5.0"	.018"

MAX.DRILLING DEPTH

Holder Type	Insert Corner R **Re** (inch)	Max.Drilling Depth (inch)		
		Cutting Edge Diameter **D1** **ϕ1.250"**	Cutting Edge Diameter **D1** **ϕ1.500"**	Cutting Edge Diameter **D1** **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.

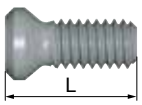
AXD7000 can be effectively used for pocket machining without the need for a prepared hole.



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 **D1**(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).

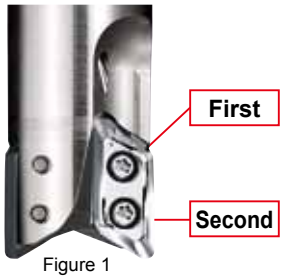


Figure 1

(Table 1) Maximum allowable spindle speed

Cutting Edge Diameter **D1**(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 **D1**(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>

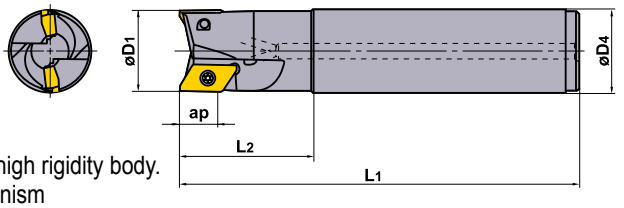
0° Finishing Roughing

Including Flat faces

BXD4000

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel





- 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	Insert Corner Re	Order Number	Stock R	Number of Teeth	Dimensions (inch) D1	L1	D4	L2	Max. Depth of Cut ap	Ramping Angle α°	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
		162SA16S	●	2	1.000	6.000	1.000	2.000	.591	20	12000	38000	TS4SL	TKY15W
		202SA20S	●	2	1.250	6.000	1.250	2.000	.591	13	9500	33000	TS4SL	TKY15W
		243SA20S	●	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
		162SA16SB	●	2	1.000	6.000	1.000	2.000	.591	20	12000	38000	TS4SL	TKY15W
		202SA20SB	●	2	1.250	6.000	1.250	2.000	.591	13	9500	33000	TS4SL	TKY15W
		243SA20SB	●	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

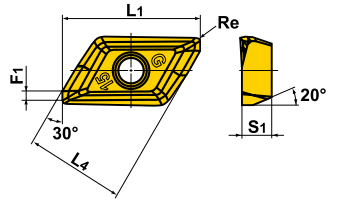
INSERTS WITH BREAKER

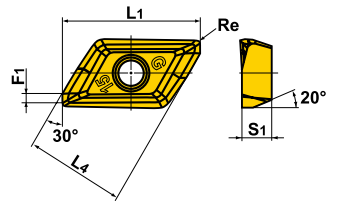
Work Material			Coated VP15TF	Coated LC15TF	Carbide TF15
	P	Steel	●		
	M	Stainless Steel	●		
	K	Cast Iron	✱	✱	✱
	N	Non-Ferrous Metal		✱	✱
	S	Heat-resistant Alloy, Titanium Alloy	●		

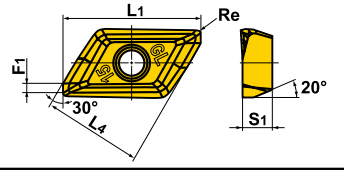
Cutting Conditions :
● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting

Honing :
E : Round **F** : Sharp

Shape	Order Number	Class	Honing	Coated VP15TF	Coated LC15TF	Carbide TF15	Dimensions (inch) L1	L4	S1	F1	Re	Geometry
G breaker	**XDGT1550PDFR-G04**	G	F		★	●	.866	.630	.197	.059	.016	
	1550PDFR-G08	G	F		★	●	.866	.630	.197	.043	.031	
	1550PDFR-G12	G	F		★	★	.866	.630	.197	.028	.047	
	1550PDFR-G16	G	F		★	●	.866	.630	.197	.016	.063	
	1550PDFR-G20	G	F		★	●	.854	.630	.197	.008	.079	
	1550PDFR-G30	G	F		★	●	.787	.630	.197	.024	.118	
	1550PDFR-G32	G	F		★	●	.787	.630	.197	.016	.125	
	1550PDFR-G40	G	F		★	●	.748	.630	.197	.020	.157	
	1550PDFR-G50	G	F		★	●	.709	.630	.197	.016	.197	
	XDGT1550PDER-G04	G	E	●			.866	.630	.197	.059	.016	
	1550PDER-G08	G	E	●			.866	.630	.197	.043	.031	
	1550PDER-G12	G	E	★			.866	.630	.197	.028	.047	
	1550PDER-G16	G	E	●			.866	.630	.197	.016	.063	
	1550PDER-G20	G	E	●			.854	.630	.197	.008	.079	
	1550PDER-G30	G	E	●			.787	.630	.197	.024	.118	
	1550PDER-G32	G	E	●			.787	.630	.197	.016	.125	
	1550PDER-G40	G	E	●			.748	.630	.197	.020	.157	
	1550PDER-G50	G	E	●			.709	.630	.197	.016	.197	
Lower Cutting Resistance Type	**XDGT1550PDFR-GL04**	G	F			●	.866	.630	.197	.059	.016	
	1550PDFR-GL08	G	F			●	.866	.630	.197	.043	.031	

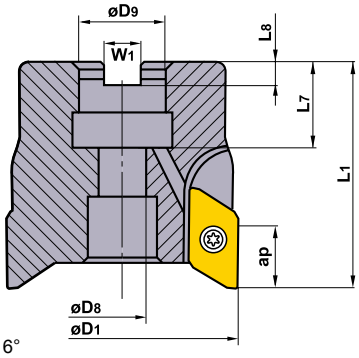






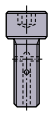
● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>





C H :0°
A.R :+15°
R.R :+13°—+16°
T :+13°—+16°
I :+15°

D1	Coolant thru Set Bolt
1.5	HSCU25014H
2	37513H
2.5	37513H
3	50014H
4	75016H



Right hand tool holder only.

ARBOR TYPE

Type	Insert Corner Re	Order Number	Stock R	Number of Teeth	Dimensions (inch) D1	L1	D9	L7	D8	W1	L8	Max. Depth of Cut ap	Ramping Angle α°	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
		0203	●	3	2.000	1.969	.750	.748	.415	.313	.187	.591	7	6000	24000	TS4SL	TKY15W
		0204	●	4	2.000	1.969	.750	.748	.415	.313	.187	.591	7	6000	24000	TS4SL	TKY15W
		2504	●	4	2.500	1.969	.750	.748	.415	.313	.187	.591	5	4800	21000	TS4SL	TKY15W
		0305	●	5	3.000	1.969	1.000	1.024	.539	.375	.219	.591	3	3800	19000	TS4SL	TKY15W
		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
		0203B	●	3	2.000	1.969	.750	.748	.415	.313	.187	.591	7	6000	24000	TS4SL	TKY15W
		0204B	●	4	2.000	1.969	.750	.748	.415	.313	.187	.591	7	6000	24000	TS4SL	TKY15W
		2504B	●	4	2.500	1.969	.750	.748	.415	.313	.187	.591	5	4800	21000	TS4SL	TKY15W
		0305B	●	5	3.000	1.969	1.000	1.024	.539	.375	.219	.591	3	3800	19000	TS4SL	TKY15W
		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

COMBINATION OF HOLDER AND INSERT CORNER RADIUS

Holder	~A Holder BXD4000R○○○○○○○A							~B Holder 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	Carbon Steel Alloy Steel	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

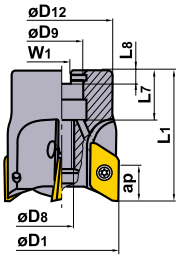


Fig.2
ø50
ø63
ø80
ø100

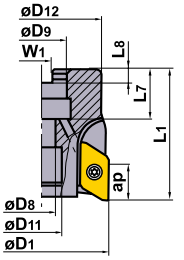
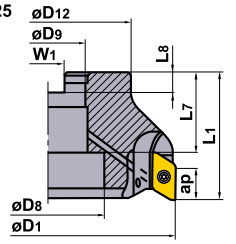
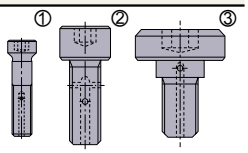


Fig.3
ø125



Right hand tool holder only.

Cutter Diameter **D1**	Set Bolt	Geometry
ϕ40	HFF08043H	①
ϕ50, ϕ63	HSC10030H	②
ϕ80	12035H	
ϕ100	16040H	
ϕ125	MBA20040H	③



METRIC Standard

For metric arbors

C H :0°
A.R :+10°—+15° T :+8°—+16°
R.R :+8°—+10° I :+11°—+15°

ARBOR TYPE

Type	Insert Corner Re	Order Number	Stock R	Number of Teeth	Dimensions (mm) D1	L1	D9	L7	D8	D12	W1	L8	D11	Mass (kg)	Max. Depth of Cut ap	Ramping Angle α°	Max. Spindle Speed (min-1)	Type (Fig.)	Insert Screw *	Wrench	Insert
A Holders	0.4 I 3.2	**BXD4000-040A03RA**	★	3	40	50	16	18	M8	32	8.4	5.6	—	0.3	15	9	29000	1	TS4SL	TKY15W	XDGT1550 PD□R-G□□
		-050A04RA	★	4	50	50	22	20	11	41	10.4	6.3	17	0.4	15	6	24000	2	TS4SL	TKY15W	
		-063A05RA	★	5	63	50	22	20	11	50	10.4	6.3	17	0.7	15	5	21000	2	TS4SL	TKY15W	
		-080A05RA	★	5	80	50	27	23	13	60	12.4	7	20	1.1	15	3	19000	2	TS4SL	TKY15W	XDGT1550 PD□R-GL□□
		-100A06RA	★	6	100	63	32	26	17	70	14.4	8	26	2.0	15	3	16000	2	TS4SL	TKY15W	
		-125B07RA	★	7	125	63	40	40	56	80	16.4	9	—	2.8	15	2	14000	3	TS4SL	TKY15W	
B Holders	4.0 I 5.0	**BXD4000-040A03RB**	★	3	40	50	16	18	M8	32	8.4	5.6	—	0.3	15	9	29000	1	TS4SL	TKY15W	
		-050A04RB	★	4	50	50	22	20	11	41	10.4	6.3	17	0.4	15	6	24000	2	TS4SL	TKY15W	
		-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□□
		-080A05RB	★	5	80	50	27	23	13	60	12.4	7	20	1.1	15	3	19000	2	TS4SL	TKY15W	
		-100A06RB	★	6	100	63	32	26	17	70	14.4	8	26	2.0	15	3	16000	2	TS4SL	TKY15W	
		-125B07RB	★	7	125	63	40	40	56	80	16.4	9	—	2.8	15	2	14000	3	TS4SL	TKY15W	

* Clamp Torque (lbf-in) : TS4SL=35

METRIC Standard

For inch arbors

ARBOR TYPE

Type	Insert Corner Re	Order Number	Stock R	Number of Teeth	Dimensions (mm) [inch] D1	L1	L7	L8	D8	W1	D9	D11	D12	Mass (kg)	Max. Depth of Cut ap	Ramping Angle α°	Max. Spindle Speed (min-1)	Type (Fig.)	Insert Screw *	Wrench	Insert
A Holders	0.4 I 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□□
		10006DA	★	6	100	63	32	8	17	12.7	31.75 [1.25"]	26	70	2.0	15	3	16000	2	TS4SL	TKY15W	
		12507EA	★	7	125	63	40	10	56	15.9	38.1 [1.5"]	—	80	2.8	15	2	14000	3	TS4SL	TKY15W	XDGT1550 PD□R-GL□□
B Holders	4.0 I 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	
		10006DB	★	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□□
		12507EB	★	7	125	50	40	10	56	15.9	38.1 [1.5"]	—	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.

* Clamp Torque (lbf-in) : TS4SL=35

★ : Inventory maintained in Japan.



Fig.1 Straight Shank

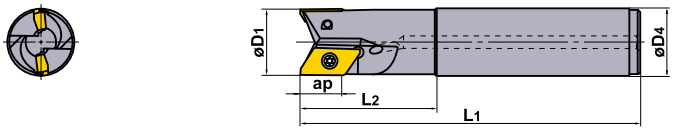
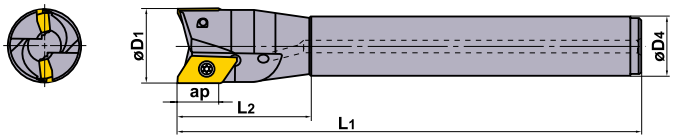


Fig.2 Offset Shank



METRIC Standard

SHANK TYPE

Right hand tool holder only.

Type	Insert Corner Re	Shank Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) D1	ap	L1	L2	D4	Ramping Angle α°	Max. Spindle Speed (min-1)	Type (Fig.)	* 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□□
			252SA25SA	★	2	25	15	125	50	25	20	38000	1	TS4SL	TKY15W	
			282SA25SA	★	2	28	15	125	50	25	17	35000	2	TS4SL	TKY15W	
			322SA32SA	★	2	32	15	150	50	32	13	33000	1	TS4SL	TKY15W	
			352SA32SA	★	2	35	15	150	50	32	11	31000	2	TS4SL	TKY15W	
			403SA32SA	★	3	40	15	170	80	32	9	29000	2	TS4SL	TKY15W	
			403SA42SA	★	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	
			322SA32LA	★	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	
			352SA32ELA	★	2	35	15	250	50	32	11	31000	2	TS4SL	TKY15W	
			403SA32ELA	★	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□□
			252SA25SB	★	2	25	15	125	50	25	20	38000	1	TS4SL	TKY15W	
			282SA25SB	★	2	28	15	125	50	25	17	35000	2	TS4SL	TKY15W	
			322SA32SB	★	2	32	15	150	50	32	13	33000	1	TS4SL	TKY15W	
			352SA32SB	★	2	35	15	150	50	32	11	31000	2	TS4SL	TKY15W	
			403SA32SB	★	3	40	15	170	80	32	9	29000	2	TS4SL	TKY15W	
			403SA42SB	★	3	40	15	170	80	42	9	29000	1	TS4SL	TKY15W	
		Long	BXD4000R252SA25LB	★	2	25	15	170	80	25	20	38000	1	TS4SL	TKY15W	
			322SA32LB	★	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	
			352SA32ELB	★	2	35	15	250	50	32	11	31000	2	TS4SL	TKY15W	
			403SA32ELB	★	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

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 D1(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 D1(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 ➤ K068
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

DEEP SHOULDER MILLING

Roughing

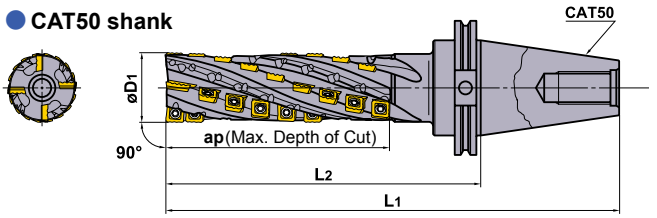
SPX

Light Alloy	Cast Iron	General Steel	Alloy Tool Steel	Hardened Steel

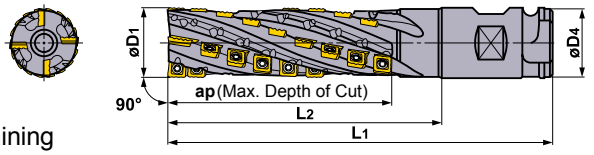


- The wavy cutting edge helps to reduce cutting resistance.
- Suitable for heavy machining due to holder rigidity.

CAT50 shank



Straight shank (Combination type)

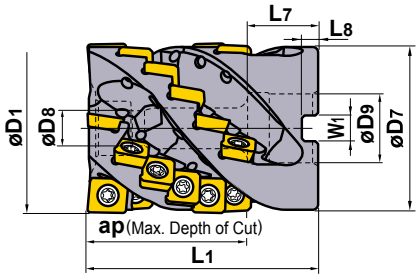


SHANK TYPE

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	D1	L1	D4	L2	ap	JPMX 190412-○○	MPMX 120412-○○	SPMX 120408-○○
CAT50 Shank	SPX4R3224CAT50NS	●	2	24	2.000	11.000	—	7.000	4.300	2	2	20
	4R3234CAT50NM	●	2	34	2.000	13.000	—	9.000	6.200	2	2	30
	4R3244CAT50NL	●	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
	4R05024WNS	●	2	24	1.969	8.661	2.000	5.512	4.331	2	2	20
	4R05034WNM	●	2	34	1.969	10.630	2.000	7.480	6.181	2	2	30
	4R05044WNL	●	2	44	1.969	12.598	2.000	9.449	8.071	2	2	40





Right hand tool holder only.

D1	Set Bolt	Geometry
ϕ2.500"	HSCUF50028	
ϕ3.000"	62528	

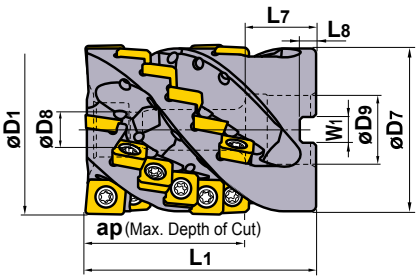
SHELL TYPE

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	D1	L1	D9	L7	D8	D7	W1	L8	ap	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
4UR0324DA22A	●	4	24	3.000	3.500	1.250	1.654	.669	2.874	.500	.281	2.280	2	2	20

(Note) 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.

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

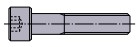




METRIC Standard

For inch arbors

Right hand tool holder only.

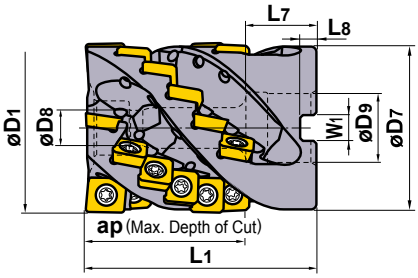
D1	Set Bolt	Geometry
ϕ63mm	HSC12070	
ϕ80mm	16065	

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	D1	L1	D9	L7	D8	D7	W1	L8	ap	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
4R08024DA058A	★	4	24	80	85	31.75 [1.250″]	38	17	76.8	12.7	8	58	2	2	20

(Note) 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.





METRIC Standard

For metric arbors

The bore diameter (D9) is equivalent to a metric size.

Right hand tool holder only.

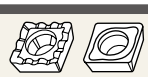
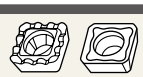
D1	Set Bolt	Geometry
ϕ63mm	HSC12070	
ϕ80mm	16065	

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	D1	L1	D9	L7	D8	D7	W1	L8	ap	JPMX 140412-○○	MPMX 120412-○○	SPMX 120408-○○
SPX4-063A24A058RA	★	4	24	63	85	27	28	13	60	12.4	7	58	2	2	20
-080A24A058RA	★	4	24	80	85	32	40	17	76.8	14.4	8	58	2	2	20

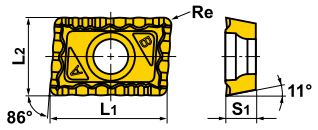
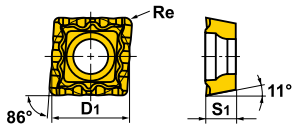
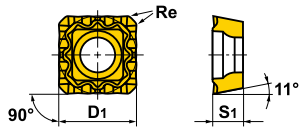
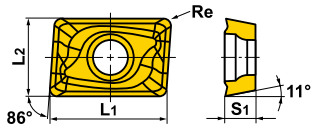
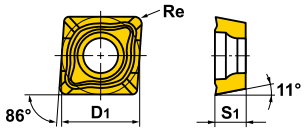
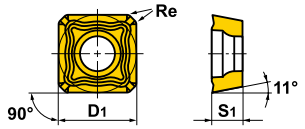
(Note) In case of internal coolant supply, please use a face mill arbor with through coolant channels. Regular center-thru or side-thru arbors can't be used.

SPARE PARTS

Holder	 * 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_1	L_2	D_1	S_1	Re	
Wavy Cutting Edge Type	Bottom Cutting Edge A		**JPMX190412-WH**	M	●	●			.750	.500	—	.187	.047	
			* **140412-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	
			* **140412-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	<4D_1	.006—.010
			VP15TF JM	395 (330—460)	<.394	<2D_1	.006—.010
	Carbon Steel Alloy Steel	180—350HB	**VP15TF WH**	260 (230—395)	<.197	<4D1	.006—.010
			VP15TF JM	260 (230—395)	<.394	<2D_1	.006—.010
	Alloy Tool Steel	≤300HB	**VP15TF WH**	260 (200—330)	<.197	<4D_1	.004—.008
			VP15TF JM	260 (200—330)	<.394	<2D_1	.004—.008
M	Stainless Steel	≤200HB	**VP20RT WH**	260 (230—395)	<.197	<4D_1	.004—.008
			VP20RT JM	260 (230—395)	<.394	<2D_1	.004—.008
K	Cast Iron	Tensile Strength ≤350MPa	**VP15TF WH**	330 (260—395)	<.197	<4D_1	.006—.016
			VP15TF JM	330 (260—395)	<.197	<4D_1	.004—.010
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF WH**	260 (200—330)	<.197	<4D_1	.006—.014
			VP15TF JM	260 (200—330)	<.197	<4D_1	.004—.008
S	Titanium Alloy	≤350HB	**VP20RT WH**	130 (115—165)	<.197	<4D_1	.003—.005
			VP20RT JM	130 (115—165)	<.394	<2D_1	.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)	D_1	<.394	.004—.010
			VP15TF JM	200 (165—395)	D_1	<.394	.004—.006
	Carbon Steel Alloy Steel	180—350HB	**VP15TF WH**	200 (165—330)	D_1	<.394	.004—.010
			VP15TF JM	200 (165—330)	D_1	<.394	.004—.006
	Alloy Tool Steel	≤300HB	**VP15TF WH**	165 (130—260)	D_1	<.394	.004—.010
			VP15TF JM	165 (130—260)	D_1	<.394	.004—.006
M	Stainless Steel	≤200HB	**VP20RT WH**	200 (165—395)	D_1	<.394	.004—.010
			VP20RT JM	200 (165—395)	D_1	<.394	.004—.006
K	Cast Iron	Tensile Strength ≤350MPa	**VP15TF WH**	165 (130—260)	D_1	<1.969	.006—.010
			VP15TF JM	165 (130—260)	D_1	<1.575	.004—.008
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF WH**	130 (115—260)	D_1	<1.575	.006—.010
			VP15TF JM	130 (115—260)	D_1	<1.181	.004—.008
S	Titanium Alloy	≤350HB	**VP20RT WH**	115 (100—165)	D_1	<.394	.003—.005
			VP20RT JM	115 (100—165)	D_1	<.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	<0.5D_1	.006—.012
				395 (330—460)	<.394	>0.5D_1	.006—.010
	Carbon Steel Alloy Steel	180—350HB	**VP15TF JM**	395 (260—425)	<.394	<0.5D_1	.006—.012
				330 (260—395)	<.394	>0.5D_1	.006—.010
	Alloy Tool Steel	≤300HB	**VP15TF JM**	330 (200—360)	<.394	<0.5D_1	.004—.010
				260 (200—330)	<.394	>0.5D_1	.004—.006
M	Stainless Steel	≤200HB	**VP20RT JM**	460 (330—490)	<.394	<0.5D_1	.004—.010
				395 (330—460)	<.394	>0.5D_1	.004—.008
K	Cast Iron	Tensile Strength ≤350MPa	**VP15TF WH**	395 (260—425)	<.394	<0.5D_1	.010—.016
				330 (260—395)	<.394	>0.5D_1	.010—.016
			VP15TF JM	395 (260—425)	<.394	<0.5D_1	.006—.012
				330 (260—395)	<.394	>0.5D_1	.006—.010
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF WH**	330 (200—360)	<.394	<0.5D_1	.008—.014
				260 (200—360)	<.394	>0.5D_1	.008—.014
			VP15TF JM	330 (200—395)	<.394	<0.5D_1	.006—.012
				260 (200—395)	<.394	>0.5D_1	.006—.012
S	Titanium Alloy	≤350HB	**VP20RT JM**	150 (115—165)	<.394	<0.5D_1	.003—.004
				150 (115—165)	<.394	>0.5D_1	.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)	D_1	<0.25D_1	.006—.010
	Carbon Steel Alloy Steel	180—350HB	**VP15TF JM**	330 (260—395)	D_1	<0.25D_1	.006—.010
	Alloy Tool Steel	≤300HB	**VP15TF JM**	260 (200—330)	D_1	<.394	.004—.008
M	Stainless Steel	≤200HB	**VP20RT JM**	330 (260—460)	D_1	<.394	.004—.006
K	Cast Iron	Tensile Strength ≤350MPa	**VP15TF WH**	260 (200—330)	D_1	<0.25D_1	.004—.010
				200 (165—330)	D_1	<0.6D_1	.004—.008
			VP15TF JM	260 (200—330)	D_1	<0.25D_1	.004—.008
				200 (165—330)	D_1	<0.6D_1	.004—.006
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF WH**	260 (200—330)	D_1	<0.25D_1	.004—.010
				200 (165—330)	D_1	<0.5D_1	.004—.008
			VP15TF JM	260 (200—330)	D_1	<0.25D_1	.004—.008
				200 (165—330)	D_1	<0.5D_1	.004—.006
S	Titanium Alloy	≤350HB	**VP20RT JM**	130 (115—165)	D_1	<0.25D_1	.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

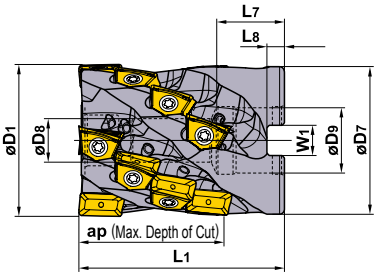
DEEP SHOULDER MILLING
<CUTTING FOR TITANIUM ALLOY>

0° Roughing

VFX5 NEW



- 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)									Mass
	R			D1	L1	D9	L7	D8	D7	W1	L8	ap	(lbs)
NEW VFX5UR0203CA10	●	3	6	2.0	2.0	1.00	.95	.520	1.929	.375	.219	1.0	.20
NEW 0203CA15	●	3	9	2.0	2.5	1.00	1.00	.520	1.929	.375	.219	1.5	.26
0204AA10	●	4	8	2.0	2.0	.75	.75	.395	1.929	.313	.187	1.0	.24
0204AA15	●	4	12	2.0	2.5	.75	.75	.395	1.929	.313	.187	1.5	.30
0204CA15	●	4	12	2.0	2.5	1.00	1.00	.520	1.929	.375	.219	1.5	.27
0204AA20	●	4	16	2.0	2.75	.75	.75	.395	1.929	.313	.187	2.0	.32
0204CA20	●	4	16	2.0	3.0	1.00	1.00	.520	1.929	.375	.219	2.0	.33
2505CA10	●	5	10	2.5	2.5	1.00	1.25	.520	2.421	.375	.219	1.0	.49
2505CA24	●	5	25	2.5	3.5	1.00	1.25	.520	2.421	.375	.219	2.4	.68
0306DA29	●	6	36	3.0	4.25	1.25	1.375	.645	2.894	.500	.281	2.9	1.21

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
0203CA15	TS352	9	WU500-S1	TKY10D	HSD04004H08	12	MK1KS	HSCUF50018	3	6
0204AA10	TS352	8	WU375-S1	TKY10D	HSD04004H08	12	MK1KS	HSCUF37513	4	4
0204AA15	TS352	12	WU375-S1	TKY10D	HSD04004H08	16	MK1KS	HSCUF37520	4	8
0204CA15	TS352	12	WU500-S1	TKY10D	HSD04004H08	16	MK1KS	HSCUF50018	4	8
0204AA20	TS352	16	WU375-S1	TKY10D	HSD04004H08	20	MK1KS	HSCUF37520	4	12
0204CA20	TS352	16	WU500-S1	TKY10D	HSD04004H08	20	MK1KS	HSCUF50023	4	12
2505CA10	TS352	10	WU500-S1	TKY10D	HSD04004H08	15	MK1KS	HSCUF50018	5	5
2505CA24	TS352	25	WU500-S1	TKY10D	HSD04004H08	30	MK1KS	HSCUF50028	5	20
0306DA29	TS352	36	WU625-S1	TKY10D	HSD04004H08	42	MK1KS	HSCUF62535	6	30

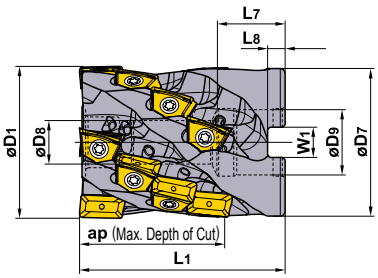
★1. Only corner radius Re.031 can be used.
★2. Clamp Torque (lbf-in) : TS352=22
★3. The .031" nozzels are installed in the standard. Select and use alternate nozzles from below list depending on coolant pressure.

	≤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 L1 dimension increases.
  Corner radius .125": L1+.028" Corner radius .157": L1+.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)									Mass
	R			D1	L1	D9	L7	D8	D7	W1	L8	ap	(kg)
VFX5-040A03A026R	★	3	6	40	50	16	21	8.5	38.2	8.4	5.6	26	0.3
-040A03A038R	★	3	9	40	60	16	21	8.5	38.2	8.4	5.6	38	0.4
-050X03A026R	★	3	6	50	50	27	23	12.5	48.2	12.4	7.0	26	0.4
-050X03A038R	★	3	9	50	60	27	23	12.5	48.2	12.4	7.0	38	0.5
-050A04A026R	★	4	8	50	50	22	21	10.5	48.2	10.4	6.3	26	0.5
-050A04A038R	★	4	12	50	60	22	21	10.5	48.2	10.4	6.3	38	0.6
-050X04A038R	★	4	12	50	60	27	23	12.5	48.2	12.4	7.0	38	0.5
-050A04A050R	★	4	16	50	70	22	21	10.5	48.2	10.4	6.3	50	0.7
-063A05A026R	★	5	10	63	60	27	28	12.5	61	12.4	7.0	26	1.0
-063A05A063R	★	5	25	63	85	27	28	12.5	61	12.4	7.0	63	1.4
-080A06A075R	★	6	36	80	100	32	28	16.5	77.3	14.4	8.0	75	2.8

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 cutting edge *1 XNMU1607 08R-○○
VFX5-040A03A026R	TS352	6	W8-S1	TKY10D	HSD04004H08	9	MK1KS	HSC08040	3	3
-040A03A038R	TS352	9	W8-S1	TKY10D	HSD04004H08	12	MK1KS	HSC08050	3	6
-050X03A026R	TS352	6	W12-S1	TKY10D	HSD04004H08	9	MK1KS	HSC12035	3	3
-050X03A038R	TS352	9	W12-S1	TKY10D	HSD04004H08	12	MK1KS	HSC12045	3	6
-050A04A026R	TS352	8	W10-S1	TKY10D	HSD04004H08	12	MK1KS	HSC10035	4	4
-050A04A038R	TS352	12	W10-S1	TKY10D	HSD04004H08	16	MK1KS	HSC10045	4	8
-050X04A038R	TS352	12	W12-S1	TKY10D	HSD04004H08	16	MK1KS	HSC12045	4	8
-050A04A050R	TS352	16	W10-S1	TKY10D	HSD04004H08	20	MK1KS	HSC10055	4	12
-063A05A026R	TS352	10	W12-S1	TKY10D	HSD04004H08	15	MK1KS	HSC12045	5	5
-063A05A063R	TS352	25	W12-S1	TKY10D	HSD04004H08	30	MK1KS	HSC12070	5	20
-080A06A075R	TS352	36	W16-S1	TKY10D	HSD04004H08	42	MK1KS	HSC16080	6	30

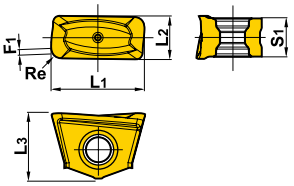
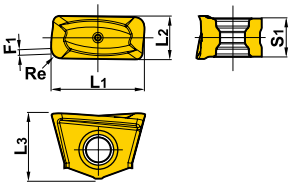
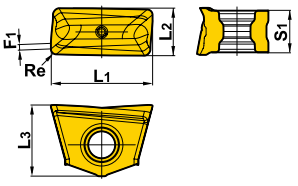
*1. Only corner radius Re.031 can be used.
*2. Clamp Torque (lbf-in) : TS352=22
*3. The .031" nozzels are installed in the standard. Select and use alternate nozzles from below list depending on coolant pressure.

	≤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 L1 dimension increases.
  Corner radius .125": L1+.028" Corner radius .157": L1+.059"

INSERTS ➤ K080
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

INSERTS

Shape	Order Number	Stock (Coated) MP9030	Stock (Coated) MP9130			Dimensions (inch) L1	L2	L3	S1	F1	Re	Geometry
	**XNMU160708R-MS**	●				.630	.276	.437	.256	.039	.031	
	160712R-MS	●				.630	.276	.437	.256	.039	.047	
	160716R-MS	●				.630	.276	.437	.256	.039	.063	
	160724R-MS	●				.630	.276	.437	.256	.039	.094	
	∗1 **160732R-MS**	●				.681	.276	.437	.256	—	.126	
	∗1 **160740R-MS**	●				.744	.276	.437	.256	—	.157	
	**XNMU160708R-HS**	●				.630	.276	.437	.256	.039	.031	
	**XNMU160708R-LS**		●			.630	.276	.437	.256	.039	.031	

∗1 Note for insert with a corner radius of .125" and above, as corner radius increases the L1 dimension increases.
Corner radius .125": L1+.028" Corner radius .157": L1+.059"

● : Inventory maintained.
<10 insert 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 max** (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 max** (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 (apmax) varies according to the machine rigidity and power.

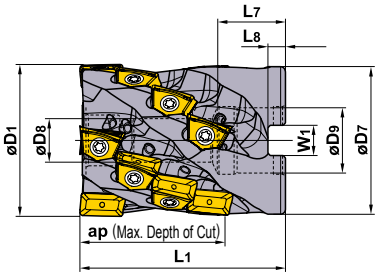
DEEP SHOULDER MILLING
<CUTTING FOR TITANIUM ALLOY>

0° Roughing

VFX6



- 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)									Mass
	R			D1	L1	D9	L7	D8	D7	W1	L8	ap	(lbs)
VFX6UR2504CA12	●	4	8	2.5	2.5	1.00	1.25	.520	2.421	.375	.219	1.2	.21
2504CA23	●	4	16	2.5	3.5	1.00	1.25	.520	2.421	.375	.219	2.3	.29
0305DA12	●	5	10	3.0	2.5	1.25	1.375	.645	2.894	.500	.281	1.2	.30
0305DA29	●	5	25	3.0	4.25	1.25	1.375	.645	2.894	.500	.281	2.9	.52
0406EA12	●	6	12	4.0	3.0	1.50	1.50	.770	3.866	.625	.375	1.2	.69
0406EA35	●	6	36	4.0	5.0	1.50	1.50	.770	3.866	.625	.375	3.5	1.16

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
2504CA23	TS450	16	WU500-S1	TKY20T	HSD04004H08	20	MK1KS	HSCUF50028	4	12
0305DA12	TS450	10	WU625-S1	TKY20T	HSD04004H08	15	MK1KS	HSCUF62518	5	5
0305DA29	TS450	25	WU625-S1	TKY20T	HSD04004H08	30	MK1KS	HSCUF62535	5	20
0406EA12	TS450	12	WU750-S1	TKY20T	HSD04004H08	18	MK1KS	HSCUF75018	6	6
0406EA35	TS450	36	WU750-S1	TKY20T	HSD04004H08	42	MK1KS	HSCUF75040	6	30

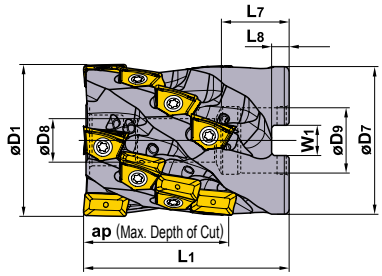
✶1. Only corner radius Re.047" can be used.
✶2. Clamp Torque (lbf-in) : TS450=44
✶3. The .031" nozzels are installed in the standard. Select and use alternate nozzles from below list depending on coolant pressure.

	≤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 L1 dimension increases.
  Corner radius .125": L1+.028" Corner radius .157": L1+.059" Corner radius .197": L1+.059"

● : Inventory maintained. ★ : Inventory maintained in Japan.





Right hand tool holder only.

METRIC Standard

For metric arbors

SHELL TYPE

Order Number	Stock	Number of Flutes	Total	Dimensions (mm)									Mass
	R			D1	L1	D9	L7	D8	D7	W1	L8	ap	(kg)
VFX6-063A04A031R	★	4	8	63	60	27	28	12.5	61	12.4	7	31	0.9
-063A04A060R	★	4	16	63	85	27	28	12.5	61	12.4	7	60	1.3
-080A05A031R	★	5	10	80	60	32	28	16.5	77.3	14.4	8	31	1.5
-080A05A075R	★	5	25	80	100	32	28	16.5	77.3	14.4	8	75	2.6
-100A06A031R	★	6	12	100	65	40	30	20.5	96.6	16.4	9	31	2.7
-100A06A090R	★	6	36	100	115	40	30	20.5	96.6	16.4	9	90	4.8

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
-063A04A060R	TS450	16	W12-S1	TKY20T	HSD04004H08	20	MK1KS	HSC12070	4	12
-080A05A031R	TS450	10	W16-S1	TKY20T	HSD04004H08	15	MK1KS	HSC16040	5	5
-080A05A075R	TS450	25	W16-S1	TKY20T	HSD04004H08	30	MK1KS	HSC16080	5	20
-100A06A031R	TS450	12	W20-S1	TKY20T	HSD04004H08	18	MK1KS	HSC20040	6	6
-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.

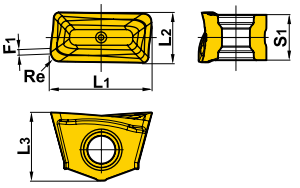
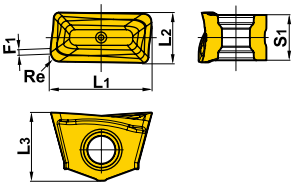
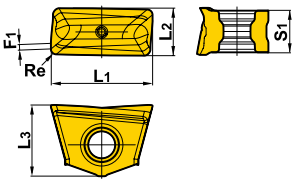
	≤140PSI (≤5.3gal/min)	←Standard→ (140PSI-720PSI)	≥720PSI (≥7.9gal/min)	≥1000PSI (≥13.2gal/min)
Nozzle Dia.	ø.024"	ø.031"	ø.047"	ø.063"
Order Number	**HSD04004H06**	**HSD04004H08**	**HSD04004H12**	**HSD04004H16**

- 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 L1 dimension increases.
  Corner radius .125": L1+.028" Corner radius .157": L1+.059" Corner radius .197": L1+.059"

MILLING

INSERTS ➤ K084
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

INSERTS

Shape	Order Number	Stock Coated MP9030	Stock Coated MP9130			Dimensions (inch) L1	L2	L3	S1	F1	Re	Geometry
	**XNMU190912R-MS**	●				.752	.374	.500	.335	.039	.047	
	190916R-MS	●				.752	.374	.500	.335	.039	.063	
	190924R-MS	●				.752	.374	.500	.335	.039	.094	
	∗1 **190932R-MS**	●				.795	.374	.500	.335	—	.126	
	∗1 **190940R-MS**	●				.858	.374	.500	.335	—	.157	
	∗1 **190950R-MS**	●				.858	.374	.500	.335	—	.197	
	**XNMU190912R-HS**	●				.752	.374	.500	.335	.039	.047	
	**XNMU190912R-LS**		●			.752	.374	.500	.335	.039	.047	

∗1 Note for insert with a corner radius of .125" and above, as corner radius increases the L1 dimension increases.
Corner radius .125": L1+.028" Corner radius .157": L1+.059" Corner radius .197": L1+.059"

● : Inventory maintained.
<10 insert 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 **apmax** (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 **apmax** (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 (apmax) varies according to the machine rigidity and power.

DEEP SHOULDER MILLING

0° Roughing

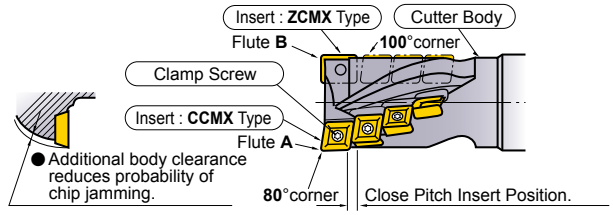
LER

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel



- 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

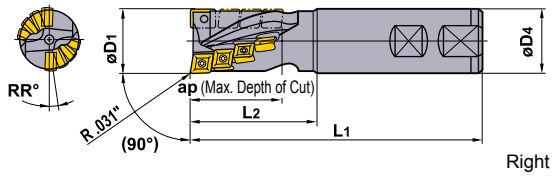
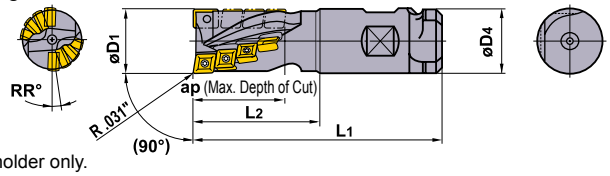


Fig.2 **Combination Shank**



Right hand tool holder only.

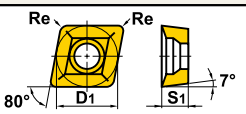
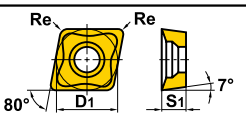
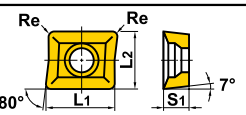
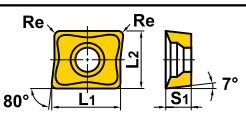
Order Number	Stock	Number of Flute	Number of Teeth	Dimensions (inch)						Type (Fig.)	*	① ②	Insert	
	R			D1	L1	D4	L2	ap	RR°		Insert Screw	Wrench	Insert	Teeth
LER1606W20	●	2	6	1.000	4.281	1.250	2.000	1.063	8°	1	CS300890T CS300890T	①TKY08F ②TKY08D	CCMX083508EN○ ZCMX083508ER○	5 1
2008W20	●	2	8	1.250	4.781	1.250	2.500	1.700	8° 35′	1	CS350990T CS350990T	①TKY10F ②TKY10D	CCMX09T308EN○ ZCMX09T308ER○	7 1
2012W20	●	2	12	1.250	5.531	1.250	3.250	2.480	8° 35′	1	CS350990T CS350990T	①TKY10F ②TKY10D	CCMX09T308EN○ ZCMX09T308ER○	11 1
2415W24	●	3	15	1.500	5.687	1.500	3.000	2.100	5° 27′	1	CS350990T CS350990T	①TKY10F ②TKY10D	CCMX09T308EN○ ZCMX09T308ER○	14 1
3218W32	●	3	18	2.000	6.750	2.000	3.500	2.500	5° 52′	2	CS350990T CS350990T	①TKY10F ②TKY10D	CCMX09T308EN○ ZCMX09T308ER○	17 1

* Clamp Torque (lbf-in) : CS300890T=8.9, CS350990T=22

INSERTS

Work Material		
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	Cermet NX2525	Carbide UTi20T	Dimensions (inch) L1	L2	D1	S1	Re	Geometry
Peripheral and Bottom Inserts	**CCMX083508ENA**	M	★		●		▲	—	—	.313	.138	.031	
	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	
	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.
▲ : This item to be discontinued within two years. <10 inserts in one case>

RECOMMENDED CUTTING CONDITIONS

SLOT MILLING

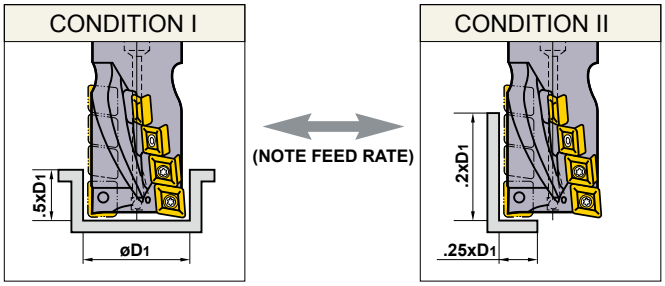
Work Material		Cutting Condition Vs.Tool Diameter					Insert grade
		Spindle Speed / Feed	ϕ1"	ϕ1.25"	ϕ1.5"	ϕ2"	
P	Mild Steel (<160HB)	min^{-1}	2250	1800	1500	1100	VP15TF
		inch/min	7—12	6—10	7—12	6—10	
	Carbon Steel (20HRC)	min^{-1}	2250	1800	1500	1100	
		inch/min	8—14	7—12	8—14	7—12	
	Alloy Steel (30HRC)	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

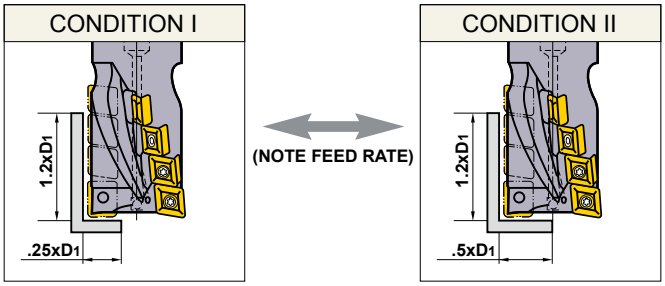
Work Material		Cutting Condition Vs.Tool Diameter					Insert grade
		Spindle Speed / Feed	ϕ1"	ϕ1.25"	ϕ1.5"	ϕ2"	
P	Mild Steel (<160HB)	min^{-1}	2250	1800	1500	1100	VP15TF
		inch/min	11—18	9—15	11—18	9—15	
	Carbon Steel (20HRC)	min^{-1}	2250	1800	1500	1100	
		inch/min	12—21	11—18	12—21	11—18	
	Alloy Steel (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.

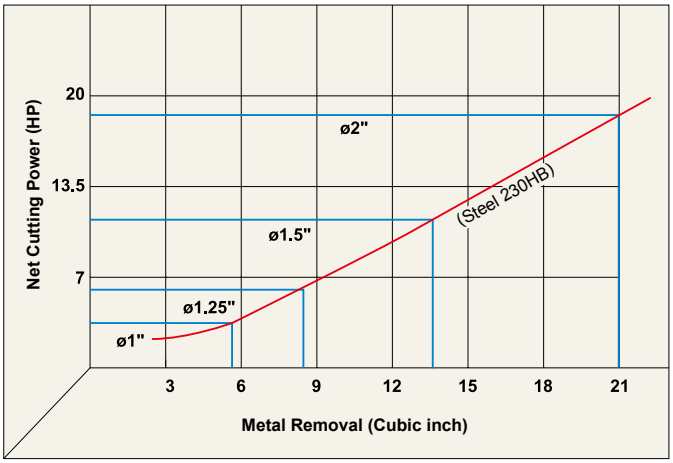
SHOULDER MILLING
GENERALLY DOWN (CLIMB) CUT IS RECOMMENDED



- Titanium alloy requires coolant (Cutting fluid).
- Use higher recommended feed rate under CONDITION I.
- Use lower recommended feed rate under CONDITION II.

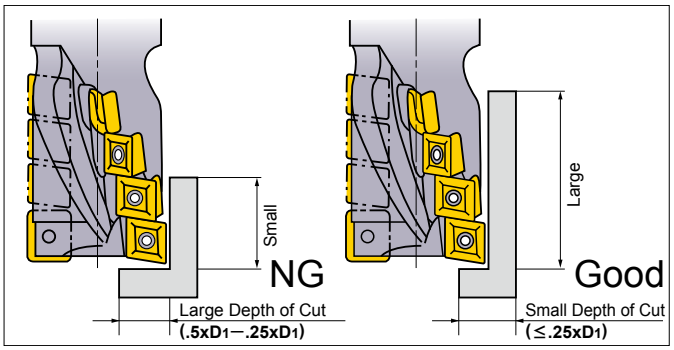
NET CUTTING POWER

- 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

0° Roughing

Including Flat faces

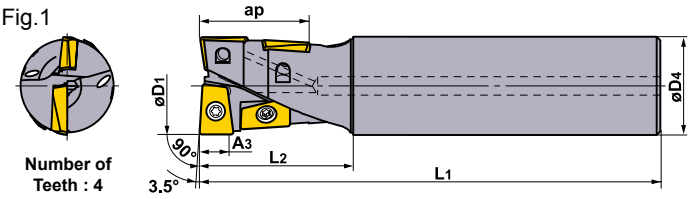
AQX

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel



- Air / coolant through.
- The center bottom cutting edge enables drilling and end milling without prepared hole.

Fig.1



Number of Teeth : 4

Fig.2

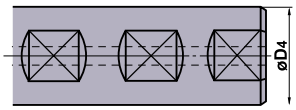
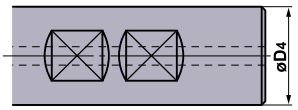


Fig.3



STANDARD EDGE TYPE

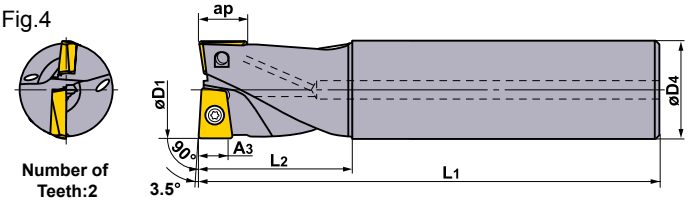
Right hand tool holder only.

Type	Order Number	Stock	Dimensions (inch)						Type (Fig.)	* Insert Screw	① ② Wrench	Insert
		R	D1	L1	D4	L2	A3*1	ap*2				
Standard	AQXUR124WA12S	●	.750	4.125	.750	1.375	.219	.750	3	TS25	①TKY08F	QOG/MT0934R-○○
	164WA16S	●	1.000	4.875	1.000	1.625	.281	1.000	2	TS32	②TKY08D	1443R-○○
	204WA20S	●	1.250	5.250	1.250	2.000	.375	1.250	2	TS407	②TKY15D	1651R-○○
	244WA20S	●	1.500	5.625	1.250	2.375	.438	1.500	2	TS5	②TKY25D	1959R-○○
Long	AQXUR124SA12L	●	.750	7.250	.750	2.375	.219	.750	1	TS25	①TKY08F	QOG/MT0934R-○○
	134SA12L	●	.797	7.250	.750	1.375	.219	.750	1	TS25	①TKY08F	0934R-○○
	164SA16L	●	1.000	8.500	1.000	3.000	.281	1.000	1	TS32	②TKY08D	1443R-○○
	174SA16L	●	1.047	8.500	1.000	1.625	.281	1.000	1	TS32	②TKY08D	1443R-○○
	204SA20L	●	1.250	9.000	1.250	3.500	.375	1.250	1	TS407	②TKY15D	1651R-○○
	214SA20L	●	1.297	9.000	1.250	2.000	.375	1.250	1	TS407	②TKY15D	1651R-○○
	244SA20L	●	1.500	9.500	1.250	2.375	.438	1.500	1	TS5	②TKY25D	1959R-○○

* Clamp Torque (lbf-in) : TS25=8.9, TS32=8.9, TS407=31, TS5=66



Fig.4



Number of Teeth:2

SHORT EDGE TYPE

Right hand tool holder only.

Type	Order Number	Stock	Dimensions (inch)						Type (Fig.)	*3 Insert Screw	① ② Wrench	Insert
		R	D1	L1	D4	L2	A3*1	ap*2				
Standard	AQXUR102WA10S	●	.625	3.688	.625	1.125	.188	.281	3	TS2A	①TKY06F	QOG/MT0830R-○○
	122WA12S	●	.750	4.125	.750	1.375	.219	.344	3	TS25	①TKY08F	0934R-○○
	162WA16S	●	1.000	4.875	1.000	1.625	.281	.469	2	TS32	②TKY08D	1443R-○○
	202WA20S	●	1.250	5.250	1.250	2.000	.375	.563	2	TS407	②TKY15D	1651R-○○
	242WA20S	●	1.500	5.625	1.250	2.375	.438	.688	2	TS55	②TKY25D	1959R-○○
Long	AQXUR102SA10L	●	.625	6.875	.625	2.000	.188	.281	4	TS2A	①TKY06F	QOG/MT0830R-○○
	112SA10L	●	.672	6.875	.625	1.125	.188	.281	4	TS2A	①TKY06F	0830R-○○
	122SA12L	●	.750	7.250	.750	2.375	.219	.344	4	TS25	①TKY08F	0934R-○○
	132SA12L	●	.797	7.250	.750	1.375	.219	.344	4	TS25	①TKY08F	0934R-○○
	162SA16L	●	1.000	8.500	1.000	3.000	.281	.469	4	TS32	②TKY08D	1443R-○○
	172SA16L	●	1.047	8.500	1.000	1.625	.281	.469	4	TS32	②TKY08D	1443R-○○
	202SA20L	●	1.250	9.000	1.250	3.500	.375	.563	4	TS407	②TKY15D	1651R-○○
	212SA20L	●	1.297	9.000	1.250	2.000	.375	.563	4	TS407	②TKY15D	1651R-○○
	242SA20L	●	1.500	9.500	1.250	2.375	.438	.688	4	TS55	②TKY25D	1959R-○○

(Note) When exceeding A3 depth of cut, reduce feed rates by 50%(Do not exceed ap depth of cut). Reference page K093.

*1 Dimension A3 represents the depth of cut when the cutting edge consists of 2 inserts.

*2 ap: Maximum depth of cut.

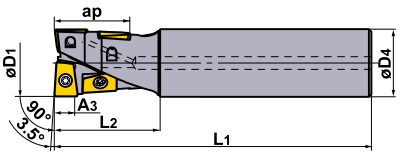
*3 Clamp Torque (lbf-in) : TS2A=5.3, TS25=8.9, TS33=8.9, TS407=31, TS5=66

● : 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	① ② ③ Wrench	Insert
		R		D1	L1	D4	L2	A3 *1	ap *2			
Standard	AQXR164SA16S	★	Y	16	120	16	30	4.5	17.6	TS2A	①TKY06F	QOG/MT0830R-G1/M2
	164SN16S	★	N	16	120	16	30	4.5	17.6	TS2A	①TKY06F	
	174SA16S	★	Y	17	120	16	30	4.5	17.6	TS2A	①TKY06F	
	174SN16S	★	N	17	120	16	30	4.5	17.6	TS2A	①TKY06F	
	204SA20S	★	Y	20	130	20	35	6	22	TS25	①TKY08F	QOG/MT1035R-G1/M2
	204SN20S	★	N	20	130	20	35	6	22	TS25	①TKY08F	
	214SA20S	★	Y	21	130	20	35	6	22	TS25	①TKY08F	
	214SN20S	★	N	21	130	20	35	6	22	TS25	①TKY08F	
	254SA25S	★	Y	25	140	25	40	7.5	27.5	TS33	①TKY08D	QOG/MT1342R-G1/M2
	254SN25S	★	N	25	140	25	40	7.5	27.5	TS33	②TKY08D	
	264SA25S	★	Y	26	140	25	40	7.5	27.5	TS33	②TKY08D	
	264SN25S	★	N	26	140	25	40	7.5	27.5	TS33	②TKY08D	
	324SA32S	★	Y	32	150	32	50	9.5	35.2	TS407	②TKY15D	QOG/MT1651R-G1/M2
	324SN32S	★	N	32	150	32	50	9.5	35.2	TS407	②TKY15D	
	334SA32S	★	Y	33	150	32	50	9.5	35.2	TS407	②TKY15D	
	334SN32S	★	N	33	150	32	50	9.5	35.2	TS407	②TKY15D	
	354SA32S	★	Y	35	150	32	50	11	40	TS407	②TKY15D	QOG/MT1856R-G1/M2
	354SN32S	★	N	35	150	32	50	11	40	TS407	②TKY15D	
	404SA32S	★	Y	40	160	32	60	12	44	TS55	②TKY25D	QOG/MT2062R-G1/M2
	404SN32S	★	N	40	160	32	60	12	44	TS55	②TKY25D	
	504SA42S	★	Y	50	170	42	70	15	55	TS6S	③TKY30T	QOG/MT2576R-G1/M2
	504SN42S	★	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
	164SN16L	★	N	16	175	16	50	4.5	17.6	TS2A	①TKY06F	
	174SA16L	★	Y	17	175	16	30	4.5	17.6	TS2A	①TKY06F	
	174SN16L	★	N	17	175	16	30	4.5	17.6	TS2A	①TKY06F	
	204SA20L	★	Y	20	185	20	60	6	22	TS25	①TKY08F	QOG/MT1035R-G1/M2
	204SN20L	★	N	20	185	20	60	6	22	TS25	①TKY08F	
	214SA20L	★	Y	21	185	20	35	6	22	TS25	①TKY08F	
	214SN20L	★	N	21	185	20	35	6	22	TS25	①TKY08F	
	254SA25L	★	Y	25	220	25	75	7.5	27.5	TS33	②TKY08D	QOG/MT1342R-G1/M2
	254SN25L	★	N	25	220	25	75	7.5	27.5	TS33	②TKY08D	
	264SA25L	★	Y	26	220	25	40	7.5	27.5	TS33	②TKY08D	
	264SN25L	★	N	26	220	25	40	7.5	27.5	TS33	②TKY08D	
	324SA32L	★	Y	32	230	32	90	9.5	35.2	TS407	②TKY15D	QOG/MT1651R-G1/M2
	324SN32L	★	N	32	230	32	90	9.5	35.2	TS407	②TKY15D	
	334SA32L	★	Y	33	230	32	50	9.5	35.2	TS407	②TKY15D	
	334SN32L	★	N	33	230	32	50	9.5	35.2	TS407	②TKY15D	
	354SA32L	★	Y	35	230	32	50	11	40	TS407	②TKY15D	QOG/MT1856R-G1/M2
	354SN32L	★	N	35	230	32	50	11	40	TS407	②TKY15D	
	404SA32L	★	Y	40	240	32	60	12	44	TS55	②TKY25D	QOG/MT2062R-G1/M2
	404SN32L	★	N	40	240	32	60	12	44	TS55	②TKY25D	
	504SA42L	★	Y	50	250	42	70	15	55	TS6S	③TKY30T	QOG/MT2576R-G1/M2
	504SN42L	★	N	50	250	42	70	15	55	TS6S	③TKY30T	

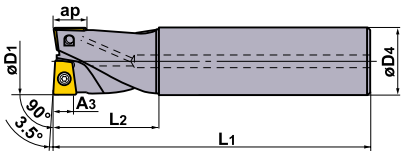
*1 Dimension A3 represents the depth of cut when the cutting edge consists of 2 inserts.
*2 ap: Maximum depth of cut.
*3 Clamp Torque (lbf-in) : TS2A=5.3, TS25=8.9, TS33=8.9, TS407=31, TS55=66, TS6S=89
*4 Y=Yes, N=No

INSERTS ➤ K092
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001





Number of Teeth : 2



METRIC Standard

SHORT EDGE TYPE

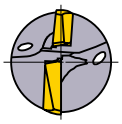
Right hand tool holder only.

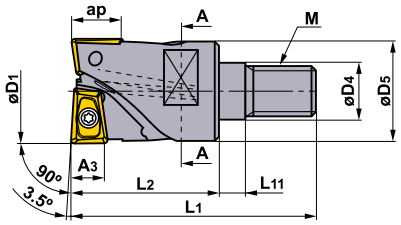
Type	Order Number	Stock R	Coolant Thru *4	Dimensions (mm) D1	L1	D4	L2	A3 *1	ap *2	*3 Insert Screw	Wrench	Insert
Standard	**AQXR162SA16S**	★	Y	16	120	16	30	4.5	7.4	TS2A	①TKY06F	QO□T0830R-□□
	162SN16S	★	N	16	120	16	30	4.5	7.4	TS2A	①TKY06F	
	172SA16S	★	Y	17	120	16	30	4.5	7.4	TS2A	①TKY06F	
	172SN16S	★	N	17	120	16	30	4.5	7.4	TS2A	①TKY06F	
	202SA20S	★	Y	20	130	20	35	6	9.2	TS25	①TKY08F	QO□T1035R-□□
	202SN20S	★	N	20	130	20	35	6	9.2	TS25	①TKY08F	
	212SA20S	★	Y	21	130	20	35	6	9.2	TS25	①TKY08F	
	212SN20S	★	N	21	130	20	35	6	9.2	TS25	①TKY08F	
	252SA25S	★	Y	25	140	25	40	7.5	11.5	TS33	②TKY08D	QO□T1342R-□□
	252SN25S	★	N	25	140	25	40	7.5	11.5	TS33	②TKY08D	
	262SA25S	★	Y	26	140	25	40	7.5	11.5	TS33	②TKY08D	
	262SN25S	★	N	26	140	25	40	7.5	11.5	TS33	②TKY08D	
	322SA32S	★	Y	32	150	32	50	9.5	14.5	TS407	②TKY15D	QO□T1651R-□□
	322SN32S	★	N	32	150	32	50	9.5	14.5	TS407	②TKY15D	
	332SA32S	★	Y	33	150	32	50	9.5	14.5	TS407	②TKY15D	
	332SN32S	★	N	33	150	32	50	9.5	14.5	TS407	②TKY15D	
	352SA32S	★	Y	35	150	32	50	11	16	TS407	②TKY15D	QO□T1856R-□□
	352SN32S	★	N	35	150	32	50	11	16	TS407	②TKY15D	
	402SA32S	★	Y	40	160	32	60	12	18	TS55	②TKY25D	QO□T2062R-□□
	402SN32S	★	N	40	160	32	60	12	18	TS55	②TKY25D	
	502SA42S	★	Y	50	170	42	70	15	23	TS6S	③TKY30T	QO□T2576R-□□
	502SN42S	★	N	50	170	42	70	15	23	TS6S	③TKY30T	
Long	**AQXR162SA16L**	★	Y	16	175	16	50	4.5	7.4	TS2A	①TKY06F	QO□T0830R-□□
	162SN16L	★	N	16	175	16	50	4.5	7.4	TS2A	①TKY06F	
	172SA16L	★	Y	17	175	16	30	4.5	7.4	TS2A	①TKY06F	
	172SN16L	★	N	17	175	16	30	4.5	7.4	TS2A	①TKY06F	
	202SA20L	★	Y	20	185	20	60	6	9.2	TS25	①TKY08F	QO□T1035R-□□
	202SN20L	★	N	20	185	20	60	6	9.2	TS25	①TKY08F	
	212SA20L	★	Y	21	185	20	35	6	9.2	TS25	①TKY08F	
	212SN20L	★	N	21	185	20	35	6	9.2	TS25	①TKY08F	
	252SA25L	★	Y	25	220	25	75	7.5	11.5	TS33	②TKY08D	QO□T1342R-□□
	252SN25L	★	N	25	220	25	75	7.5	11.5	TS33	②TKY08D	
	262SA25L	★	Y	26	220	25	40	7.5	11.5	TS33	②TKY08D	
	262SN25L	★	N	26	220	25	40	7.5	11.5	TS33	②TKY08D	
	322SA32L	★	Y	32	230	32	90	9.5	14.5	TS407	②TKY15D	QO□T1651R-□□
	322SN32L	★	N	32	230	32	90	9.5	14.5	TS407	②TKY15D	
	332SA32L	★	Y	33	230	32	50	9.5	14.5	TS407	②TKY15D	
	332SN32L	★	N	33	230	32	50	9.5	14.5	TS407	②TKY15D	
	352SA32L	★	Y	35	230	32	50	11	16	TS407	②TKY15D	QO□T1856R-□□
	352SN32L	★	N	35	230	32	50	11	16	TS407	②TKY15D	
	402SA32L	★	Y	40	240	32	60	12	18	TS55	②TKY25D	QO□T2062R-□□
	402SN32L	★	N	40	240	32	60	12	18	TS55	②TKY25D	
	502SA42L	★	Y	50	250	42	70	15	23	TS6S	③TKY30T	QO□T2576R-□□
	502SN42L	★	N	50	250	42	70	15	23	TS6S	③TKY30T	

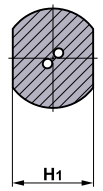
*1 Dimension A3 represents the depth of cut when the cutting edge consists of 2 inserts.
*2 ap: Maximum depth of cut.
*3 Clamp Torque (lbf-in) : TS2A=5.3, TS25=8.9, TS33=8.9, TS407=31, TS55=66, TS6S=89
*4 Y=Yes, N=No

★ : 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		D1	D4	D5	L1	L2	L11	H1	M *4	A3 *1	ap *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-○○
172M08A30	★	Y	17	8.5	14.5	48	30	6	10	M8	4.5	7.4	TS2A	①TKY06F	
202M10A30	★	Y	20	10.5	18.6	49	30	6	14	M10	6	9.2	TS25	①TKY08F	QO○T1035R-○○
212M10A30	★	Y	21	10.5	18.5	49	30	6	14	M10	6	9.2	TS25	①TKY08F	
252M12A35	★	Y	25	12.5	23.5	57	35	6	19	M12	7.5	11.5	TS33	②TKY08D	QO○T1342R-○○
262M12A35	★	Y	26	12.5	23.5	57	35	6	19	M12	7.5	11.5	TS33	②TKY08D	
322M16A40	★	Y	32	17	28.5	63	40	6	24	M16	9.5	14.5	TS407	②TKY15D	QO○T1651R-○○
332M16A40	★	Y	33	17	28.5	63	40	6	24	M16	9.5	14.5	TS407	②TKY15D	
352M16A40	★	Y	35	17	28.5	63	40	6	24	M16	11	16	TS407	②TKY15D	QO○T1856R-○○
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 ap: 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

SCREW-IN ARBORS	➤ K148
INSERTS	➤ K092
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	L1	L2	S1	Re	Geometry
M breaker	**QOMT0830R-M2**	ϕ.625, .672	M	E	●	●		.350	.220	.120	.031	
	0934R-M2	ϕ.750, .797	M	E	●	●		.401	.264	.134	.031	
	1443R-M2	ϕ1.000, 1.047	M	E	●	●		.528	.350	.169	.031	
	1651R-M2	ϕ1.250, 1.297	M	E	●	●		.650	.433	.200	.031	
	1959R-M2	ϕ1.500	M	E	●	●		.768	.512	.232	.031	
G breaker	**QOGT0830R-G1**	ϕ.625, .672	G	F*	★		●	.350	.220	.120	.016	
	0934R-G1	ϕ.750, .797	G	F			●	.401	.264	.134	.016	
	1443R-G1	ϕ1.000, 1.047	G	F			●	.528	.350	.169	.016	
	1651R-G1	ϕ1.250, 1.297	G	F*	★		●	.650	.433	.200	.016	
	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

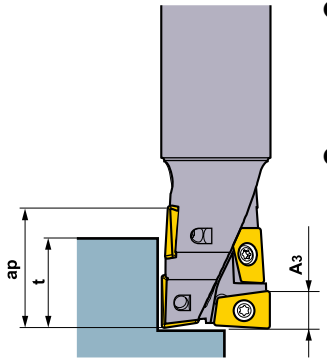
Honing :
E : Round **F** : Sharp

Shape	Order Number	End Mill Dia.	Class	Honing	Coated VP15TF	Coated VP30RT	Carbide HTi10	L1	L2	S1	Re	Geometry
M breaker	**QOMT0830R-M2**	ϕ16,17	M	E	●	●		8.4	5.5	3	0.8	
	1035R-M2	ϕ20,21	M	E	★	★		10.6	7	3.5	0.8	
	1342R-M2	ϕ25,26	M	E	★	★		13.1	8.7	4.2	0.8	
	1651R-M2	ϕ32,33	M	E	●	●		16.5	11	5.1	0.8	
	1856R-M2	ϕ35	M	E	★	★		18	12	5.6	0.8	
	2062R-M2	ϕ40	M	E	★	★		20.4	13.6	6.2	0.8	
	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	
	1035R-G1	ϕ20,21	G	F*	★		★	10.6	7	3.5	0.4	
	1342R-G1	ϕ25,26	G	F*	★		★	13.1	8.7	4.2	0.4	
	1651R-G1	ϕ32,33	G	F*	★		●	16.5	11	5.1	0.4	
	1856R-G1	ϕ35	G	F*	★		★	18	12	5.6	0.4	
	2062R-G1	ϕ40	G	F*	★		★	20.4	13.6	6.2	0.4	
	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>

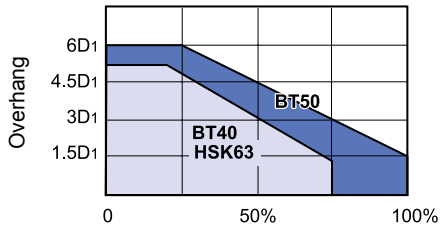
RECOMMENDED CUTTING CONDITIONS



(Note) Figures for A3 and ap 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) D1=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

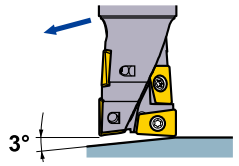
CUTTING CONDITIONS FOR SLOTTING

	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

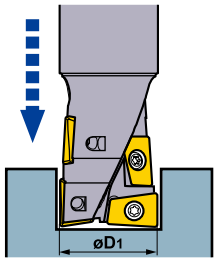
CUTTING CONDITIONS (For Ramping)



- 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)

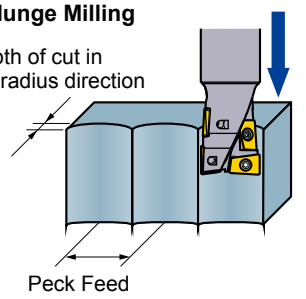
Drilling



- The recommended drilling depth is less than .5D1.
- 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.

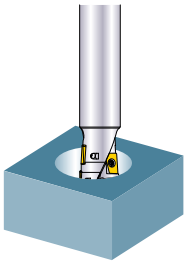
Depth of Cut in the Radius Direction	≤ .4D1
Peck Feed	≤ .5D1

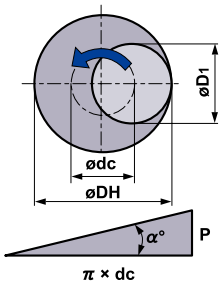
	Work Material	Hardness	Grade	Cutting Speed (SFM)	ϕ.625", ϕ.672" (ϕ16mm, ϕ17mm)		ϕ.750", ϕ.797" (ϕ20mm, ϕ21mm)		ϕ1.000", ϕ1.047" (ϕ25mm, ϕ26mm)		ϕ1.250", ϕ1.297" (ϕ32mm, ϕ33mm)		ϕ1.500" (ϕ40mm)	
					Feed (inch/rev)	Step (inch)	Feed (inch/rev)	Step (inch)	Feed (inch/rev)	Step (inch)	Feed (inch/rev)	Step (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.

$$Ø\,dc = Ø\,DH - Ø\,D_1$$

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 : $1.2D_1$
  Max. machined hole diameter at helical cutting : $1.8D_1$
- 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

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel



- 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**

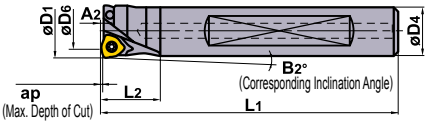


Fig.2

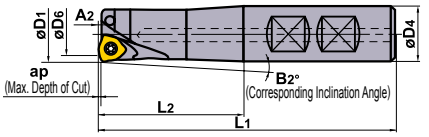


Fig.3

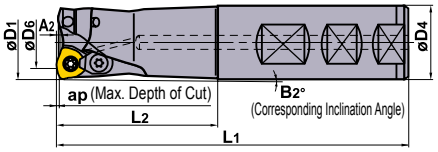
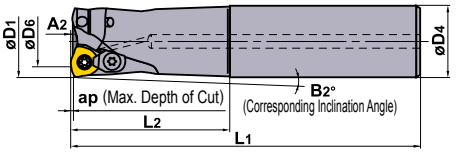


Fig.4



SHANK TYPE

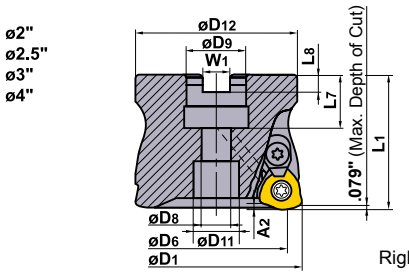
Right hand tool holder only.

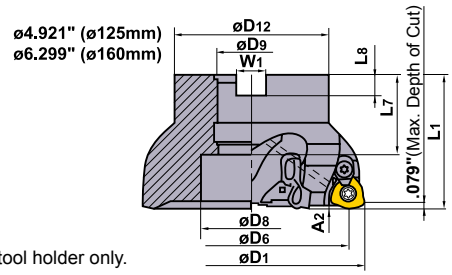
Type	Order Number	Stock	Number of Teeth	Dimensions (inch)								Type (Fig.)	Insert Screw *	Clamp Bridge	Clamp Bridge Screw *	Spring	Wrench	Insert
		R		D1	D4	D6	L1	L2	ap	A2	B2°							
Standard	AJXU06R102FA10S	●	2	.625	.625	.346	3.750	1.250	.039	.012	2.12°	1	TS25	–	–	–	①TKY08F	JOM□06T215 ZZSR-□□
	06R112FA10S	●	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-□□
	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□09T320 ZDSR-□□
	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□120420 ZDSR-□□
	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□140520 ZDSR-□□
Long	AJXU06R102SA10M	●	2	.625	.625	.346	5.750	1.500	.039	.012	1.75°	4	TS25	–	–	–	①TKY08F	JOM□06T215 ZZSR-□□
	06R102SA10L	●	2	.625	.625	.346	5.750	2.750	.039	.012	0.93°	4	TS25	–	–	–	①TKY08F	
	06R112SA10L	●	2	.688	.625	.409	5.750	.750	.039	.012	–	4	TS25	–	–	–	①TKY08F	
	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-□□
	08R142SA12L	●	2	.875	.750	.535	7.000	1.250	.059	.020	–	4	TS33	–	–	–	②TKY08D	
	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□09T320 ZDSR-□□
	09R182SA16L	●	2	1.125	1.000	.728	8.000	1.625	.079	.039	–	4	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	09R203SA20M	●	3	1.250	1.250	.854	8.000	3.125	.079	.039	0.82°	4	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	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□120420 ZDSR-□□
	12R243SA20L	●	3	1.500	1.250	1.038	10.000	2.000	.079	.059	–	4	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	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.

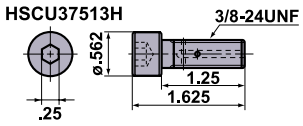


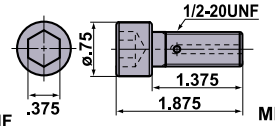


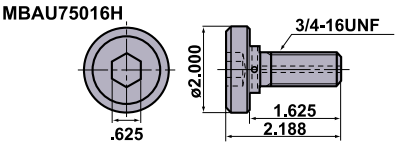


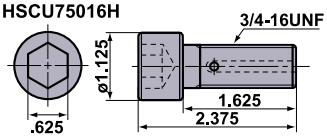
Right hand tool holder only.

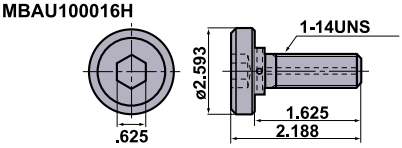
Coolant thru Set Bolt











AJX09 A.R :+8° R.R :-6°

AJX12 A.R :+8° R.R :-5°– -4°

AJX14 A.R :+8° R.R :-3°

ARBOR TYPE

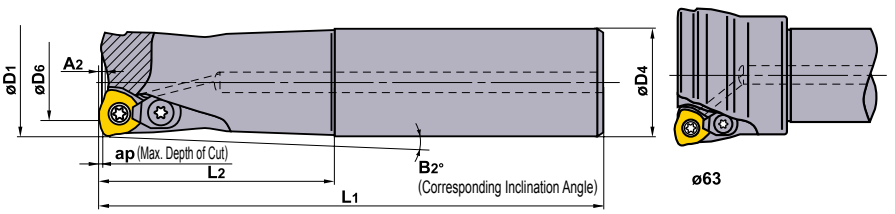
Type	Order Number	Stock	Number of Teeth	Dimensions (inch)											Insert Screw *	Clamp Bridge	Clamp Bridge Screw *	Spring	Wrench	Coolant thru Set Bolt	Insert
		R		D1	D6	L1	D9	L7	D8	D12	W1	L8	D11	A2							
Coarse Pitch	AJXU12R0203	●	3	2.000	1.539	2.000	.750	.748	.415	1.875	.313	.187	.600	.059	TS43	AMS4	AJS40 12T15	ASS2	①TKY15T	HSCU 37513H	JDM◌120420 ZDSR-◌◌
	14R2503C	●	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◌ 140520 ZDSR-◌◌
	14R0304C	●	4	3.000	2.532	2.000	1.000	1.024	.539	2.750	.375	.219	.787	.079							
	14R0405E	●	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	
	14RA16006F	●	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◌120420 ZDSR-◌◌
	14R2504C	●	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◌ 140520 ZDSR-◌◌
	14R0305C	●	5	3.000	2.532	2.000	1.000	1.024	.539	2.750	.375	.219	.787	.079							
	14R0406E	●	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	
	14RA16008F	●	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◌09T320 ZD◌R-◌◌
	12R2505C	●	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◌ 120420 ZDSR-◌◌
	12R0306C	●	6	3.000	2.543	2.000	1.000	1.024	.539	2.750	.375	.219	.787	.059							
	12R0407E	●	7	4.000	3.539	2.500	1.500	1.181	.787	3.750	.625	.375	1.181	.059						HSCU 75016H	

* Clamp Torque (lbf-in) : TS351=22, TS43=31, TS54=66, AJS3010T10=22, AJS4012T15=31, AJS5014T25=66

MILLING

INSERTS ➤ K103
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001





METRIC Standard

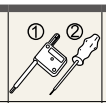
SHANK TYPE

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		D1	D4	D6	L1	L2	ap	A2	B2°						
Short	AJX06R162SA16SS	★	2	16	16	8.9	70	20	1.0	0.3	3°30′	TS25	—	—	—	①TKY08F	JOM◯06T215 ZZSR-◯◯
	172SA16SS	★	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-◯◯
	172SA16S	★	2	17	16	9.9	110	20	1.0	0.3	—	TS25	—	—	—	①TKY08F	
	203SA20S	★	3	20	20	12.9	130	50	1.0	0.3	1°18′	TS25	—	—	—	①TKY08F	
	223SA20S	★	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-◯◯
	222SA20S	★	2	22	20	13.4	130	30	1.5	0.5	—	TS33	—	—	—	②TKY08D	
	253SA25S	★	3	25	25	16.4	140	60	1.5	0.5	1°06′	TS33	—	—	—	②TKY08D	
	283SA25S	★	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◯ 09T320 ZDSR-◯◯
	282SA25S	★	2	28	25	17.9	140	40	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	303SA32S	★	3	30	32	20.0	150	70	2.0	1.0	1°48′	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	323SA32S	★	3	32	32	21.9	150	70	2.0	1.0	0°56′	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	353SA32S	★	3	35	32	24.9	150	50	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	404SA32S	★	4	40	32	29.9	150	50	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	404SA42S	★	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◯ 120420 ZDSR-◯◯
	322SA32S	★	2	32	32	20.3	150	70	2.0	1.5	1°	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	352SA32S	★	2	35	32	23.3	150	50	2.0	1.5	—	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	403SA32S	★	3	40	32	28.3	150	50	2.0	1.5	—	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	403SA42S	★	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◯140520 ZDSR-◯◯
	634SA42S	★	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

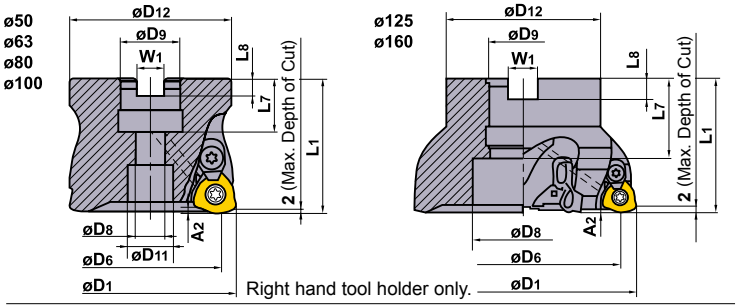
★ : Inventory maintained in Japan.

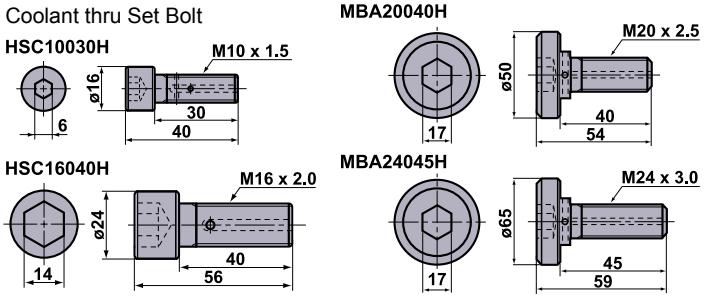
Type	Order Number	Stock	Number of Teeth	Dimensions (mm)								 *		 *			
		R		D1	D4	D6	L1	L2	ap	A2	B2°	Insert Screw	Clamp Bridge	Clamp Bridge Screw	Spring	Wrench	Insert
Long	**AJX06R162SA16L**	★	2	16	16	8.9	150	70	1.0	0.3	0°56′	TS25	—	—	—	①TKY08F	JOM○ 06T215 ZZSR-○○
	172SA16L	★	2	17	16	9.9	150	20	1.0	0.3	—	TS25	—	—	—	①TKY08F	
	203SA20L	★	3	20	20	12.9	180	100	1.0	0.3	0°38′	TS25	—	—	—	①TKY08F	
	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°36′	TS33	—	—	—	②TKY08D	JOM○ 080320 ZZSR-○○
	222SA20L	★	2	22	20	13.4	180	30	1.5	0.5	—	TS33	—	—	—	②TKY08D	
	253SA25L	★	3	25	25	16.4	200	120	1.5	0.5	0°32′	TS33	—	—	—	②TKY08D	
	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°30′	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	JDM○ 09T320 ZDSR-○○
	282SA25L	★	2	28	25	17.9	200	40	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	303SA32L	★	3	30	32	20.0	200	120	2.0	1.0	1°02′	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	323SA32L	★	3	32	32	21.9	200	120	2.0	1.0	0°32′	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	353SA32L	★	3	35	32	24.9	200	50	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	404SA32L	★	4	40	32	29.9	250	50	2.0	1.0	—	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
	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°	TS407	AMS4	AJS4012T15	ASS2	②TKY15D	JDM○ 120420 ZDSR-○○
	322SA32L	★	2	32	32	20.3	200	120	2.0	1.5	0°36′	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	352SA32L	★	2	35	32	23.3	200	50	2.0	1.5	—	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	403SA32L	★	3	40	32	28.3	250	50	2.0	1.5	—	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	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○ 140520 ZDSR-○○
	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-○○
	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-○○
	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°18′	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	JDM○ 09T320 ZDSR-○○
	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○ 120420 ZDSR-○○
	322SA32EL	★	2	32	32	20.3	300	180	2.0	1.5	0°24′	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	352SA32EL	★	2	35	32	23.3	300	50	2.0	1.5	—	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	402SA32EL	★	2	40	32	28.3	350	50	2.0	1.5	—	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
	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 ➤ K103
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001







METRIC Standard

For inch arbors

AJX09 A.R :+8° R.R :-6°

AJX12 A.R :+8° R.R :-5°– -4°

AJX14 A.R :+8° R.R :-3°

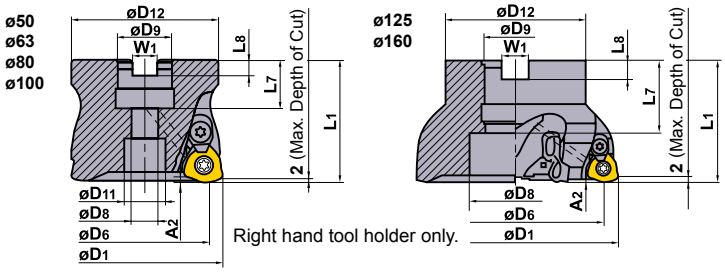
ARBOR TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions (mm) [inch]											Mass	* Insert Screw	Clamp Bridge	* Clamp Bridge Screw	Spring	Wrench	Set Bolt	Insert
		R		D1	D6	L1	D9	L7	D8	D12	W1	L8	D11	A2	(kg)							
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□120420 ZDSR-□□
	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□ 140520 ZDSR-□□
	R08004D	★	4	80	68.1	63	31.75 [1.25"]	32	17	76	12.7	8	26	2	1.3						HSC160 40H	
	R10005D	★	5	100	88.1	63	31.75 [1.25"]	32	17	96	12.7	8	26	2	2.4							
	R12505E	★	5	125	113.2	63	38.1 [1.5"]	40	56	100	15.9	10	–	2	3.3						MBA200 40H	
	R16006F	★	6	160	148.2	63	50.8 [2.0"]	43	72	100	19.1	11	–	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□120420 ZDSR-□□
	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□ 140520 ZDSR-□□
	R08005D	★	5	80	68.1	63	31.75 [1.25"]	32	17	76	12.7	8	26	2	1.3						HSC160 40H	
	R10006D	★	6	100	88.1	63	31.75 [1.25"]	32	17	96	12.7	8	26	2	2.4							
	R12507E	★	7	125	113.2	63	38.1 [1.5"]	40	56	100	15.9	10	–	2	3.3						MBA200 40H	
	R16008F	★	8	160	148.2	63	50.8 [2.0"]	43	72	100	19.1	11	–	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□09T320 ZDSR-□□
	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□ 120420 ZDSR-□□
	R08006D	★	6	80	68.3	63	31.75 [1.25"]	32	17	76	12.7	8	26	1.5	1.7						HSC160 40H	
	R10007D	★	7	100	88.3	63	31.75 [1.25"]	32	17	96	12.7	8	26	1.5	2.9							

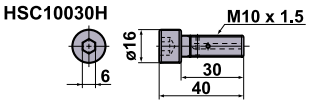
* Clamp Torque (lbf-in) : TS351=22, TS43=31, TS54=66, AJS3010T10=22, AJS4012T15=31, AJS5014T25=66

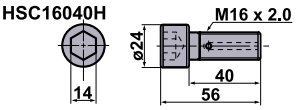
★ : Inventory maintained in Japan.

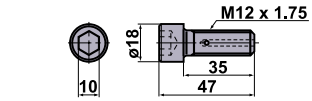


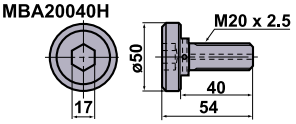


Coolant thru Set Bolt









METRIC Standard

For metric arbors

AJX09 A.R :+8° R.R :-6°

AJX12 A.R :+8° R.R :-5°– -4°

AJX14 A.R :+8° R.R :-3°

ARBOR TYPE

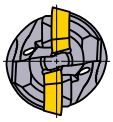
Type	Order Number	Stock	Number of Teeth	Dimensions (mm)											Mass	Insert Screw *	Clamp Bridge	Clamp Bridge Screw *	Spring	Wrench	Set Bolt	Insert
		R		D1	D6	L1	D9	L7	D8	D12	W1	L8	D11	A2	(kg)							
Coarse Pitch	AJX12-050A03R	★	3	50	38.3	50	22	20	11	47	10.4	6.3	17	1.5	0.4	TS43	AMS4	AJS40 12T15	ASS2	①TKY15T	HSC100 30H	JDM□120420 ZDSR-□□
	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□ 140520 ZDSR-□□
	-080A04R	★	4	80	68.1	50	27	23	13	76	12.4	7	19	2	1.2						HSC120 35H	
	-100A05R	★	5	100	88.1	63	32	26	17	96	14.4	8	26	2	2.4						HSC160 40H	
	-125B05R	★	5	125	113.2	63	40	40	56	100	16.4	9	–	2	3.3						MBA200 40H	
	-160B06R	★	6	160	148.2	63	40	40	56	100	16.4	9	–	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□09T320 ZDSR-□□
	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□ 120420 ZDSR-□□
	-063A05R	★	5	63	51.3	50	22	20	11	60	10.4	6.3	17	1.5	0.7							
	-080A06R	★	6	80	68.3	50	27	23	13	76	12.4	7	19	1.5	1.2						HSC120 35H	
	-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□ 140520 ZDSR-□□
	-080A05R	★	5	80	68.1	50	27	23	13	76	12.4	7	19	2	1.2						HSC120 35H	
	-100A06R	★	6	100	88.1	63	32	26	17	96	14.4	8	26	2	2.4						HSC160 40H	
	-125B07R	★	7	125	113.2	63	40	40	56	100	16.4	9	–	2	3.3						MBA200 40H	
	-160B08R	★	8	160	148.2	63	40	40	56	100	16.4	9	–	2	5.0							

* Clamp Torque (lbf-in) : TS351=22, TS43=31, TS54=66, AJS3010T10=22, AJS4012T15=31, AJS5014T25=66

MILLING

INSERTS ➤ K103
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001





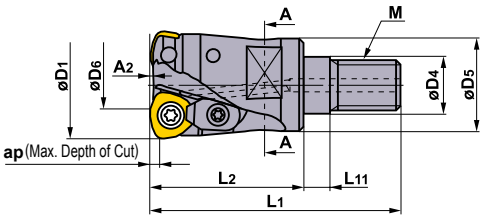


Fig.1

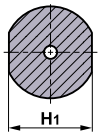


Fig.2

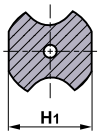
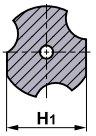


Fig.3



Section **A-A**

METRIC Standard

SCREW-IN TYPE

Right hand tool holder only.

Order Number	Stock	*3 Coolant Thru	Number of Teeth	Dimensions (mm)											Type (Fig.)	*1 Insert Screw	Clamp Bridge	*1 Clamp Bridge Screw	Spring	①② Wrench	Insert
	R			D1	D4	D5	D6	L1	L2	L11	H1	*2 M	ap	A2							
AJX06R162AM0830	★	Y	2	16	8.5	13	8.9	48	30	6	10	M8	1.0	0.3	1	TS25	—	—	—	①TKY08F	
172AM0830	★	Y	2	17	8.5	13	9.9	48	30	6	10	M8	1.0	0.3	1	TS25	—	—	—	①TKY08F	JOM○ 06T215 ZZSR-○○
203AM1030	★	Y	3	20	10.5	18	12.9	49	30	6	14	M10	1.0	0.3	3	TS25	—	—	—	①TKY08F	
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	
222AM1030	★	Y	2	22	10.5	18	13.4	49	30	6	14	M10	1.5	0.5	2	TS33	—	—	—	①TKY08D	JOM○ 080320 ZZSR-○○
253AM1235	★	Y	3	25	12.5	21	16.4	57	35	6	19	M12	1.5	0.5	1	TS33	—	—	—	①TKY08D	
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	
282AM1235	★	Y	2	28	12.5	21	17.9	57	35	6	19	M12	2.0	1.0	2	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
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○ 09T320 ZDSR-○○
323AM1645	★	Y	3	32	17.0	29	21.9	68	45	6	24	M16	2.0	1.0	1	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
353AM1645	★	Y	3	35	17.0	29	24.9	68	45	6	24	M16	2.0	1.0	1	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	
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	
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○ 120420 ZDSR-○○
352AM1645	★	Y	2	35	17.0	29	23.3	68	45	6	24	M16	2.0	1.5	2	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	
403AM1645	★	Y	3	40	17.0	29	28.3	68	45	6	24	M16	2.0	1.5	2	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	

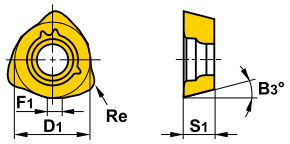
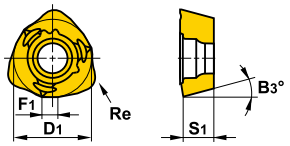
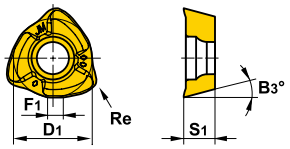
*1 Clamp Torque (lbf-in) : TS25=8.9, TS33=8.9, TS351=22, TS407=31, TS43=31, AJS3010T10=22, AJS4012T15=31
*2 Clamp Torque of the Head (lbf-ft) : M8=17.1, M10=33.8, M12=59.2, M16=66.7
*3 Y=Yes

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

INSERTS

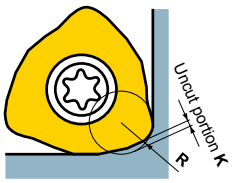
Work Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
S	Heat-resistant Alloy, Titanium Alloy	
H	Hardened Materials	

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

Shape	Order Number	Class	Coated			Dimensions (inch)					Geometry
			FH7020	VP15TF	VP30RT	B3°	D1	S1	F1	Re	
	**JOMW06T215ZZSR-FT**	M	●	●	●	13°	.250	.109	.047	.059	
	080320ZZSR-FT	M	●	●	●	13°	.315	.125	.055	.079	
	JDMW09T320ZDSR-FT	M	●	●	●	15°	.375	.156	.071	.079	
	120420ZDSR-FT	M	●	●	●	15°	.472	.187	.098	.079	
	140520ZDSR-FT	M	●	●	●	15°	.551	.219	.110	.079	
Strong Cutting Edge 	**JDMT120420ZDSR-ST**	M	●	●	●	15°	.472	.187	.098	.079	
	140520ZDSR-ST	M	●	●	●	15°	.551	.219	.110	.079	
Lower Cutting Resistance 	**JOMT06T215ZZSR-JM**	M	●	●	●	13°	.250	.109	.047	.059	
	080320ZZSR-JM	M	●	●	●	13°	.315	.125	.055	.079	
	JDMT09T320ZDSR-JM	M	●	●	●	15°	.375	.156	.071	.079	
	120420ZDSR-JM	M	●	●	●	15°	.472	.187	.098	.079	
	140520ZDSR-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.

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	Approx. R(inch)	Uncut portion K(inch)
JOM○06T215ZZSR-○○	.079	.013
JOM○080320ZZSR-○○	.098	.018
JDM○09T320ZDSR-○○	.118	.019
JDM○120420ZDSR-○○	.118	.025
JDM○140520ZDSR-○○	.118	.025

(Note) The uncut portion may change slightly depending on cutting conditions.

SCREW-IN ARBORS ➤ K148
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

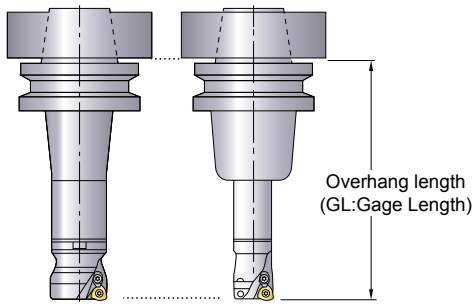
	Work Material	Hardness	Grade	Cutting Speed (SFM)	ϕ.625", ϕ.688" (ϕ16mm, ϕ17mm) (Shank type) AJXU06 Type 2 (Number of Teeth)			ϕ.750", ϕ.875" (ϕ20mm, ϕ22mm) (Shank type) AJXU08 Type 2 (Number of Teeth)			ϕ.750" (ϕ20mm) (Shank type) AJXU06 Type 3 (Number of Teeth)		
					Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (inch/tooth)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (inch/tooth)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (inch/tooth)
P	Mild Steel	≤180HB	FH7020	850 (700—1000)	5.5	.031	.031	6.3	.039	.039	6.3	.035	.035
					7.0	.024	.024	8.3	.031	.031	8.3	.028	.028
	Carbon Steel	180—280HB	FH7020 VP15TF	550 (400—700)	8.2	.016	.016	9.4	.024	.024	9.4	.020	.020
	Alloy Steel	280—350HB	FH7020 VP15TF	450 (300—600)	5.5	.028	.031	6.3	.031	.039	6.3	.028	.035
					7.0	.020	.024	8.3	.024	.031	8.3	.020	.028
	Alloy Tool Steel	≤350HB			8.2	.012	.016	9.4	.016	.024	9.4	.016	.020
	Pre-hardened Steel	≤35HRC	FH7020 VP15TF	390 (260—520)	5.5	.028	.028	6.3	.031	.031	6.3	.028	.028
					7.0	.020	.020	8.3	.024	.024	8.3	.020	.020
		35—43HRC	VP15TF	330 (230—430)	8.2	.012	.012	9.4	.016	.016	9.4	.016	.012
M	Stainless Steel	≤270HB	VP30RT	450 (300—600)	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	FH7020	850 (700—1000)	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 ≤800MPa	VP15TF	550 (400—700)	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
H	Hardened Steel	43—55HRC	VP15TF	230 (160—300)	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

	Work Material	Hardness	Grade	Cutting Speed (SFM)	ϕ1.500" (ϕ40mm) (ϕ1.500"shank) AJXU12 Type 3 (Number of Teeth)			ϕ2.000" (ϕ50mm) (Shank type) AJXU14 Type 3 (Number of Teeth)			ϕ2.000", ϕ2.500" (ϕ50mm, ϕ63mm) (Arbor type) AJXU12 Type (ϕ2.000") AJXU14 Type (ϕ2.500") 3 or 4 (Number of Teeth)		
					Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (inch/tooth)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (inch/tooth)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (inch/tooth)
P	Mild Steel	≤180HB	FH7020	850 (700—1000)	7.0	.047	.059	7.0	.055	.059	6.0	.059	.059
					9.5	.039	.051	9.5	.047	.051	10.0	.051	.051
	Carbon Steel	180—280HB	FH7020 VP15TF	550 (400—700)	12.0	.031	.043	—	—	—	14.0	.043	.043
	Alloy Steel	280—350HB	FH7020 VP15TF	450 (300—600)	7.0	.039	.059	7.0	.047	.059	6.0	.051	.059
					9.5	.031	.051	9.5	.039	.051	10.0	.043	.051
	Alloy Tool Steel	≤350HB			12.0	.024	.043	—	—	—	14.0	.035	.043
	Pre-hardened Steel	≤35HRC	FH7020 VP15TF	390 (260—520)	7.0	.039	.051	7.0	.047	.051	6.0	.051	.051
					9.5	.031	.043	9.5	.039	.043	10.0	.043	.043
		35—43HRC	VP15TF	330 (230—430)	12.0	.024	.035	—	—	—	14.0	.035	.035
M	Stainless Steel	≤270HB	VP30RT	450 (300—600)	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	FH7020	850 (700—1000)	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 ≤800MPa	VP15TF	550 (400—700)	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
H	Hardened Steel	43—55HRC	VP15TF	230 (160—300)	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	—	—	—	—	—	—

	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 (inch/tooth)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (inch/tooth)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (inch/tooth)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (inch/tooth)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (inch/tooth)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (inch/tooth)
	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	.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	.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

	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 (inch/tooth)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (inch/tooth)	Over-hang (inch)	Axial Depth of Cut (inch)	Feed per Tooth (inch/tooth)
	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	.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	.032	.039	7.0	.035	.043	7.0	.032	.039
	10.0	.025	.031	12.0	.028	.035	12.0	.025	.031
	—	—	—	—	—	—	—	—	—

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, ***VP30RT*** is recommended.

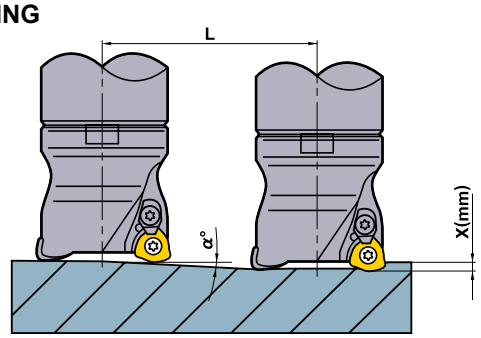
⑦A cutter body with a coarse pitch is recommended for use in unstable conditions such as a long tool overhang.

⑧Use "sharp" ***JM*** chipbreaker to lower cutting forces or when there is a long tool overhang.

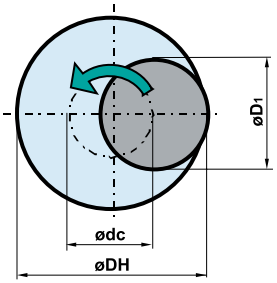
⑨Large chips are generated when machining with the ***AJX***. To avoid chip jamming-related problems, machine using an air blow to disperse the chips effectively.

MAXIMUM CAPACITIES BY MODE

RAMPING



HELICAL CUTTING



- How to calculate the theoretical center of the tool path.

$$\text{ødc} = \text{øDH} - \text{øD}_1$$

ødc: Theoretical center of the tool
øDH: Desired hole diameter
øD1: Cutting edge diameter

- Please set the depth of cut per cycle under max. depth of cut (ap).
- 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 **ap** (inch)	Ramp machining				Helical Cutting		Max. Drilling Depth **A2** (inch)
					Max. Angle	Required "X" distance for "Z" inch depth (inch)			Min. Hole Diameter (inch)	Max. Hole Diameter (inch)	
						Z=.039	Z=.059	Z=.079			
Shank Type	**AJXU06R102**	.625	.340	.039	3.0°	.744	—	—	.900	1.130	.012
	06R112	.688	.400	.039	2.5°	.893	—	—	1.020	1.260	.012
	06R123	.750	.472	.039	1.7°	1.314	—	—	1.150	1.380	.012
	08R122	.750	.410	.059	3.5°	.638	.965	—	.990	1.340	.020
	08R142	.875	.530	.059	3.0°	.744	1.126	—	1.240	1.590	.020
	08R163	1.000	.661	.059	2.0°	1.117	1.690	—	1.490	1.840	.020
	09R162	1.000	.590	.079	4.0°	.558	.844	1.130	1.330	1.840	.039
	09R182	1.125	.720	.079	3.0°	.744	1.126	1.507	1.580	2.090	.039
	09R203	1.250	.854	.079	3.3°	.676	1.023	1.370	1.830	2.340	.039
	09R244	1.500	1.114	.079	2.4°	.931	1.408	1.885	2.330	2.840	.039
	12R202	1.250	.790	.079	4.0°	.558	.844	1.130	1.590	2.340	.059
	12R243	1.500	1.040	.079	3.0°	.744	1.126	1.507	2.090	2.840	.059
	14R323	2.000	1.530	.079	4.2°	.531	.803	1.076	2.900	3.840	.079
Arbor Type	**AJXU09R02**	2.000	1.606	.079	1.1°	2.031	3.073	4.114	3.330	3.840	.039
	12R02	2.000	1.540	.079	2.0°	1.117	1.690	2.262	3.090	3.840	.059
	12R2505	2.500	2.039	.079	1.5°	1.489	2.253	3.017	4.090	4.840	.059
	12R0306	3.000	2.543	.079	1.2°	1.862	2.817	3.771	5.090	5.840	.059
	12R0407	4.000	3.539	.079	0.8°	2.793	4.225	5.658	7.090	7.840	.059
	14R25	2.500	2.030	.079	2.8°	.797	1.206	1.615	3.900	4.840	.079
	14R03	3.000	2.530	.079	1.8°	1.241	1.877	2.514	4.900	5.840	.079
	14R04	4.000	3.530	.079	1.2°	1.862	2.817	3.771	6.900	7.840	.079
	AJX14RA125	4.920	4.530	.079	.8°	2.793	4.225	5.658	8.740	9.680	.079
	14RA160	6.300	5.830	.079	.5°	4.469	6.761	9.053	11.500	12.440	.079

Memo

MULTI FUNCTIONAL MILLING

Roughing

Including Flat faces

ARX

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel



- Precision M-class 15°positive insert.
- Effective for various machining applications.
- Air / coolant through.

METRIC Standard

Fig.1 (Type with the center cutting edge)

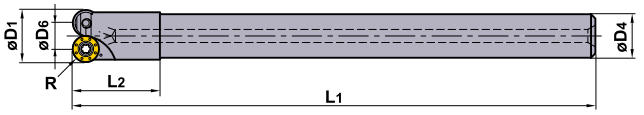
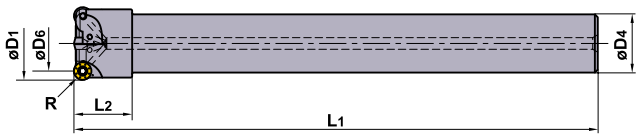


Fig.2 (Type without the center cutting edge (multi-tooth))



STEEL SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock R	Coolant Thru *1	Number of Teeth	Dimensions (mm) R	D1	D4	D6	L1	L2	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
	30R122SA10S	★	Y	2	3.0	12	10	6	120	20	1	TPS22S	TIP07FS	RDMW0620M0E
	35R142SA12S	★	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
	25R163SA16S	★	Y	3	2.5	16	16	11	180	20	2	TPS20	TIP06F	RDMW0517M0E
	30R163SA16S	★	Y	3	3.0	16	16	10	180	20	2	TPS22	TIP07FS	RDMW0620M0E
	25R173SA16S	★	Y	3	2.5	17	16	12	180	20	2	TPS20	TIP06F	RDMW0517M0E
	30R173SA16S	★	Y	3	3.0	17	16	11	180	20	2	TPS22	TIP07FS	RDMW0620M0E
	25R204SA20S	★	Y	4	2.5	20	20	15	180	20	2	TPS20	TIP06F	RDMW0517M0E
	30R203SA20S	★	Y	3	3.0	20	20	14	180	20	2	TPS22	TIP07FS	RDMW0620M0E
	25R224SA20S	★	Y	4	2.5	22	20	17	180	20	2	TPS20	TIP06F	RDMW0517M0E
	30R224SA20S	★	Y	4	3.0	22	20	16	180	20	2	TPS22	TIP07FS	RDMW0620M0E
	25R255SA20S	★	Y	5	2.5	25	20	20	180	20	2	TPS20	TIP06F	RDMW0517M0E
	30R254SA20S	★	Y	4	3.0	25	20	19	180	20	2	TPS22	TIP07FS	RDMW0620M0E

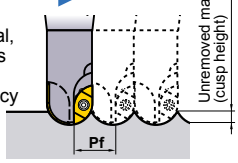
*1 Y=Yes *2 Clamp Torque (lbf-in) : TPS20=5.3, TPS22=5.3, TPS22S=5.3

Using the ARX Effectively (Reducing Unremoved Material)

●When Milling Even Surfaces

Ball nose end milling

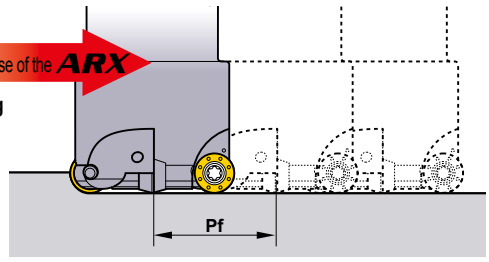
To reduce unremoved material, the pick feed needs to be reduced. (Machining efficiency will decrease.)



With the use of the ARX

Higher machining efficiency

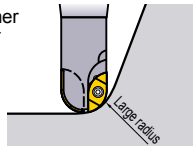
Even with a large pick feed, no unremoved material will remain.



●When Milling Corner Radius

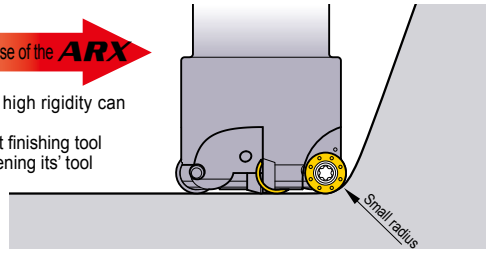
Ball nose end milling

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.)



MILLING

★ : Inventory maintained in Japan.



Fig.1

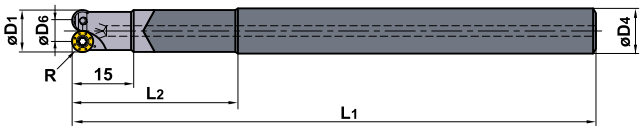


Fig.2

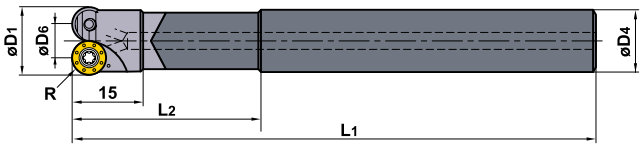
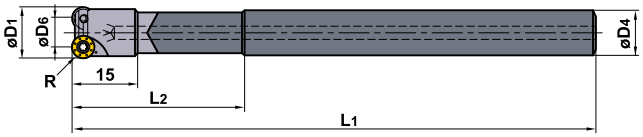


Fig.3



METRIC Standard

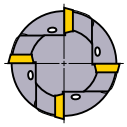
CARBIDE SHANK TYPE

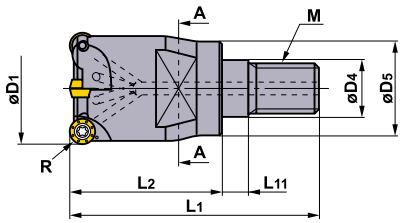
Right hand tool holder only.

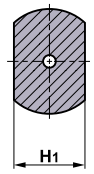
Type	Order Number	Stock	Coolant Thru *1	Number of Teeth	Dimensions (mm)						Type (Fig.)	*2		
		R			R	D1	D4	D6	L1	L2		Insert Screw	Wrench	Insert
With the Center Cutting Edge	**ARX25R102SA10LW**	★	Y	2	2.5	10	10	5	150	40	1	TPS20	TIP06F	RDMW0517M0E
	30R122SA10LW	★	Y	2	3.0	12	10	6	150	40	1	TPS22S	TIP07FS	RDMW0620M0E
	35R142SA12LW	★	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.

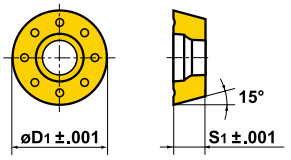
Order Number	Stock	Coolant Thru *3	Number of Teeth	Dimensions (mm)									Mass	*1		
	R			R	D1	D4	D5	L1	L2	L11	H1	M *2	(kg)	Insert Screw	Wrench	Insert
ARX25R163M08A30	★	Y	3	2.5	16	8.5	14.7	48	30	6	10	M8	0.1	TPS20	TIP06F	RDMW0517M0E
173M08A30	★	Y	3	2.5	17	8.5	14.5	48	30	6	10	M8	0.1	TPS20	TIP06F	RDMW0517M0E
204M10A30	★	Y	4	2.5	20	10.5	18.6	49	30	6	14	M10	0.2	TPS20	TIP06F	RDMW0517M0E
224M10A30	★	Y	4	2.5	22	10.5	18.5	49	30	6	14	M10	0.2	TPS20	TIP06F	RDMW0517M0E
255M12A35	★	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
173M08A30	★	Y	3	3.0	17	8.5	14.5	48	30	6	10	M8	0.1	TPS22	TIP07FS	RDMW0620M0E
203M10A30	★	Y	3	3.0	20	10.5	18.5	49	30	6	14	M10	0.2	TPS22	TIP07FS	RDMW0620M0E
224M10A30	★	Y	4	3.0	22	10.5	18.5	49	30	6	14	M10	0.2	TPS22	TIP07FS	RDMW0620M0E
254M12A35	★	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

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

INSERTS	➤ K108
SCREW-IN ARBORS	➤ K148
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

INSERTS

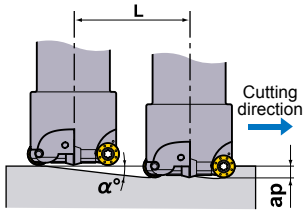
Shape	Order Number	Coated VP15TF	Coated MP8010	Dimensions (mm) D_1	Dimensions (mm) S_1	Geometry
	**RDMW0517M0E**	★	★	5.0	1.70	
	0620M0E	★	★	6.0	1.99	
	0724M0E	★	★	7.0	2.38	

CUTTING MODE MAXIMUM CAPACITIES

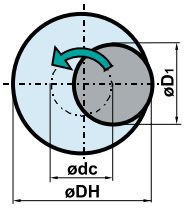
RAMPING

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 - øD1

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 K110 for helical cutting.
- Set the machine spindle revolution so that the tool is rotating and cutting in a down cut direction.

Type	Order Number	D_1 (mm)	R (mm)	Number of Teeth	Ramping max. α°	Ramping ap max. (mm)	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
	25R102SA10LW	10	2.5	2	90	2.5	0	15	19
	30R122SA10S	12	3.0	2	90	3.0	0	18	23
	30R122SA10LW	12	3.0	2	90	3.0	0	18	23
	35R142SA12S	14	3.5	2	90	3.5	0	21	27
	35R142SA12LW	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
	25R122SA10LW	12	2.5	2	27.17	2.5	4.87	19	23
	30R163SA16S	16	3.0	3	21.25	3.0	7.71	26	31
	25R163SA16S	16	2.5	3	13.70	2.5	10.26	27	31
	30R173SA16S	17	3.0	3	18.42	3.0	9.01	28	33
	25R173SA16S	17	2.5	3	12.22	2.5	11.54	29	33
	30R203SA20S	20	3.0	3	13.21	3.0	12.78	34	39
	25R204SA20S	20	2.5	4	9.23	2.5	15.38	35	39
	30R224SA20S	22	3.0	4	11.13	3.0	15.25	38	43
	25R224SA20S	22	2.5	4	7.94	2.5	17.92	39	43
	30R254SA20S	25	3.0	4	9.01	3.0	18.92	44	49
	25R255SA20S	25	2.5	5	6.57	2.5	21.71	45	49

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 K111.

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 K111.

MULTI FUNCTIONAL MILLING

Roughing

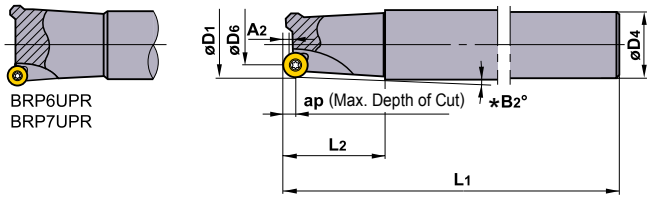
BRP

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel



- 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

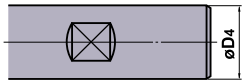


Fig.3

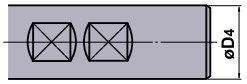
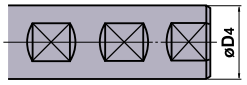


Fig.4



SHANK TYPE

Right hand tool holder only.

Corner Radius	Type *1	Order Number	Stock R	Number of Teeth	Dimensions (inch) D1	D6	L1	D4	L2	A2	ap	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
		101W10	●	1	.625	.303	3.500	.625	1.000	.039	.146	2° 56'	3	CS250560T	①TKY08F	
		122W12	●	2	.750	.429	4.000	.750	1.250	.066	.146	2° 16'	3	CS250560T	①TKY08F	
		163W16	●	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	
		101LW10	●	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	
		163ELW16	●	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
		121W12	●	1	.750	.366	4.000	.750	1.250	.035	.177	2° 20'	3	CS350760T	①TKY15F	
		162W16	●	2	1.000	.618	4.500	1.000	1.250	.098	.177	2° 20'	4	CS350760T	①TKY15F	
		203W20	●	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	
		121LW12	●	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	
		203ELW20	●	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
		243W20	●	3	1.500	.976	5.000	1.250	1.750	.157	.240	—	4	TS43	②TKY15D	
		324W20	●	4	2.000	1.492	5.000	1.250	1.750	.157	.240	—	4	TS43	②TKY15D	
		405W20	●	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	
		243ELS20	●	3	1.500	.996	12.000	1.250	1.750	.157	.240	—	1	TS43	②TKY15D	
		324ELS20	●	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
		404W20	●	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	

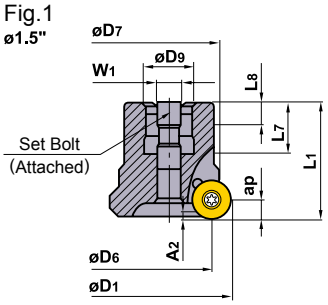
*1 Type R : Standard shank, L : Long shank, EL : Extra Long shank

*2 Clamp Torque (lbf-in) : CS250560T=8.9, CS350760T=31, TS43=31, TS54=66

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

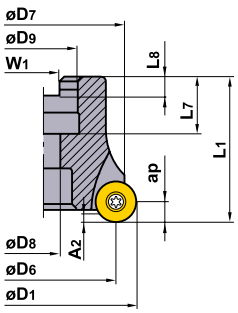


Fig.1
ø1.5"



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) D1	D6	D7	L1	D9	L7	D8	W1	L8	Max. Depth of cut A2	ap	Type (Fig.)	Insert
.250	**BRP6UPR1503X**	●	3	1.500	.996	1.228	2.000	.750	.748	—	.313	.187	.157	.240	1	RPMW120400E RPMT120400E-JS
	0204	●	4	2.000	1.492	1.715	2.000	.750	.748	.415	.313	.187	.157	.240	2	
	2505	●	5	2.500	1.992	2.214	2.000	.750	.748	.415	.313	.187	.157	.240	2	
	0306C	●	6	3.000	2.492	2.706	2.000	1.000	1.024	.539	.375	.219	.157	.240	2	
	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
	0305C	●	5	3.000	2.366	2.649	2.000	1.000	.969	.539	.375	.219	.217	.302	2	
	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	—

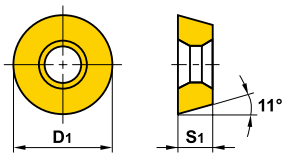
* Clamp Torque (lbf-in) : TS43=31, TS54=66

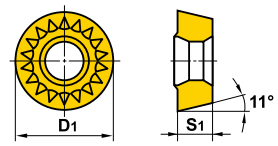
INSERTS

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 F7010	Coated VP15TF	Dimensions (inch) D1	S1	Geometry
	RPMW07T200E	M		●	.313	.109	
	09T300E	M		●	.313	.156	
	120400E	M	●	●	.500	.188	
	150600E	M		●	.625	.250	
JS breaker	**RPMT07T200E-JS**	M		●	.313	.109	
	09T300E-JS	M		●	.375	.156	
	120400E-JS	M		●	.500	.188	
	150600E-JS	M		●	.625	.250	





MILLING

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

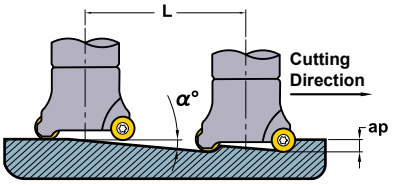
Work Material			Cutting Speed (SFM)	
			CVD	PVD
	Material	Hardness	F7010 / F7030 / F620	VP15TF / AP20M
P	Mild Steel	≤180HB	820 (660—980)	820 (660—980)
	Carbon Steel	180—280HB	590 (425—720)	590 (425—720)
	Alloy Steel	280—380HB	525 (360—620)	525 (360—620)
	Prehardened Steel	35—45HB	390 (260—460)	390 (260—460)
	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

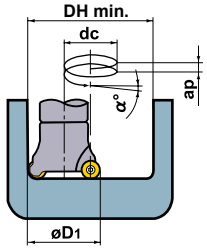
Type	Tool Diameter (inch)	Max. Ramp Angle α°Max.	Tan α° per inch	Min. Cutting Length According to Max. Ramp Angle **L** min. (inch)						
				ap = .094"	ap = .125"	ap = .156"	ap = .188"	ap = .250"	ap = .281"	ap = .312"
BRP3U	.500	3.71	.065	1.446	1.923	2.400	—	—	—	—
	.625	12.34	.219	.429	.571	.712	—	—	—	—
	.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



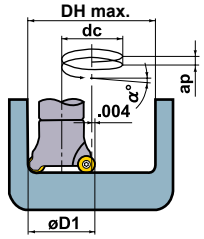
INTERPOLATING

CUTTING HOLE DIAMETER AND DEPTH OF CUT

Minimum Cutting Diameter



Maximum Cutting Diameter



Type	Tool Diameter ϕD1 (inch)	*1 ϕDH min.	*2 ϕdc	Inclination Angle α° ap=.094"	ap=.156"	ap=.188"	ap=.250"	ap=.312"	*1 ϕDH max.	*2 ϕdc	Inclination Angle α° ap=.094"	ap=.156"	ap=.188"	ap=.250"	ap=.312"
BRP3U	.500	.688	.188	ap max. =.039 → α°=3.778°					.922	.422	ap max. =.078 → α°= 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	ap max. =.039 → α°=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. = (D_1-.156) X 2, DH max. = (D_1-.039) X 2, ap max. =.156 (inch)
BRP4U type DH min. = (D_1-.188) X 2, DH max. = (D_1-.039) X 2, ap max. =.188 (inch)
BRP6U type DH min. = (D_1-.250) X 2, DH max. = (D_1-.039) X 2, ap max. =.250 (inch)
BRP7U type DH min. = (D_1-.312) X 2, DH max. = (D_1-.039) X 2, ap max. =.312 (inch)
dc = DH-D_1
*DH min. (Minimum Cutting Diameter) DH max.(Maximum Cutting Diameter) ap max. (Maximum Depth of Cut)

MULTI FUNCTIONAL MILLING

Roughing

BOE

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel



- 20° positive insert.
- Compatible with 8-corner use insert and round type insert.
- Multi functional milling.

Fig.1 (BOE4 type)

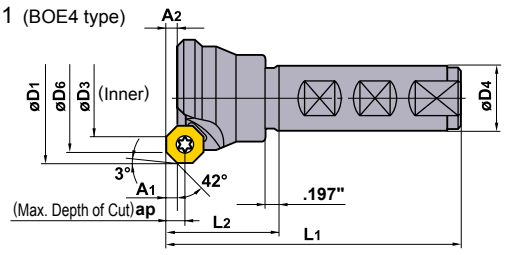
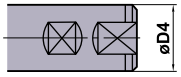


Fig.2 (BOE type)



WELDON SHANK TYPE

Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (inch)						Max. Depth of Cut			*	①, ②	①, ②
	R		D1	D6	D3	L1	D4	L2	A1	ap	A2	Insert Screw	Wrench	Insert
BOE4R202W20	●	2	1.250	.925	.516	5.022	1.250	1.772	.098	.276	.118	CS350990T	①TKY10F	
243W20	●	3	1.500	1.177	.767	5.022	1.250	1.772	.098	.276	.118	CS350990T	①TKY10F	①OEMX12T3ETR
323W20	●	3	2.000	1.680	1.269	5.022	1.250	1.772	.098	.276	.118	CS350990T	①TKY10F	②REMX12T3EN
404W20	●	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	
403W20	●	3	2.500	2.043	1.500	4.053	1.250	1.772	.118	.354	.155	CS501290T	②TKY25T	①OEMX1705E□R1
504W20	●	4	3.125	2.668	2.129	4.053	1.250	1.772	.118	.354	.155	CS501290T	②TKY25T	②REMX1705□N

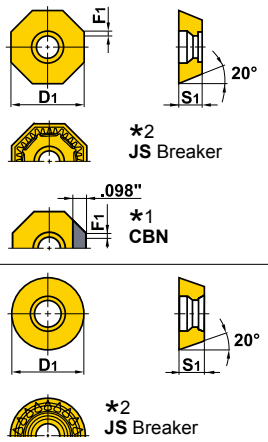
* Clamp Torque (lbf-in) : CS350990T=22, CS501290T=66

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	Cermet	CBN*1 MB835	CBN*1 MB730	Dimensions (inch) D1	S1	F1	Geometry
	OEMX12T3ETR1	M	T				●		●	●	.500	.156	.039	
	12T3ETR5	M	T						●	●	.500	.156	.197	
	12T3ESR1	M	S		●						.500	.156	.039	
	*2 **12T3EER1-JS**	M	E		★						.500	.156	.039	
	OEMX1705ETR1	M	T	●		●	●				.669	.197	.055	
	1705ESR1	M	S		●						.669	.197	.055	
	*2 **1705EER1-JS**	M	E		★						.669	.197	.055	
*2 JS Breaker	*2 **1705ETR1-JS**	M	T			●					.669	.197	.055	
	*2**REMX12T3EN-JS**	M	E		●						.510	.164	—	
	REMX1705EN	M	E		●						.679	.205	—	
	1705SN	M	S		★						.679	.205	—	
*2 JS Breaker	*2 **1705EN-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

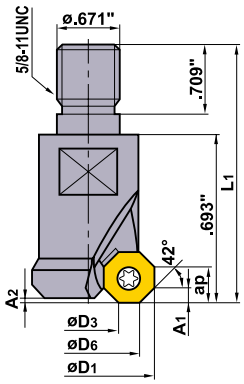


Fig.2

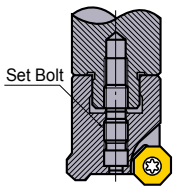


Fig.3

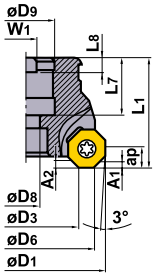
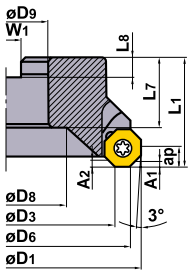


Fig.4



ARBOR TYPE

Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (inch)									Mass (lbs)	Max. Depth of Cut			Type (Fig.)	Insert
	R		D1	D6	D3	L1	D9	L7	D8	W1	L8		A1	ap	A2		
BOE4R202	●	2	1.250	.925	.516	2.598	—	—	—	—	—	—	.098	.276	.118	1	OEMX12T3 REMX12T3
1503X	●	3	1.500	1.177	.767	1.575	.750	.748	—	.313	.187	.5	.098	.276	.118	2	
0203	●	3	2.000	1.680	1.269	1.575	.750	.748	.415	.313	.201	.8	.098	.276	.118	2	
2504	●	4	2.500	2.181	1.772	1.969	.750	.748	.415	.313	.201	1.3	.098	.276	.118	3	
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
0304C	●	4	3.150	2.693	2.154	1.969	1.000	1.024	.512	.375	.219	3.8	.118	.354	.155	3	
0405E	●	5	3.937	3.484	2.941	2.480	1.500	1.181	.787	.625	.375	6.3	.118	.354	.155	3	
0506E	●	6	4.921	4.469	3.929	2.480	1.500	1.380	2.362	.625	.375	7.0	.118	.354	.155	4	
0608F	●	8	6.300	5.846	5.307	2.480	2.000	1.496	3.185	.750	.437	11.4	.118	.354	.155	4	
0809F	●	9	8.000	7.547	7.003	2.500	2.000	1.496	2.185	.750	.437	16.2	.118	.354	.155	4	

SPARE PARTS

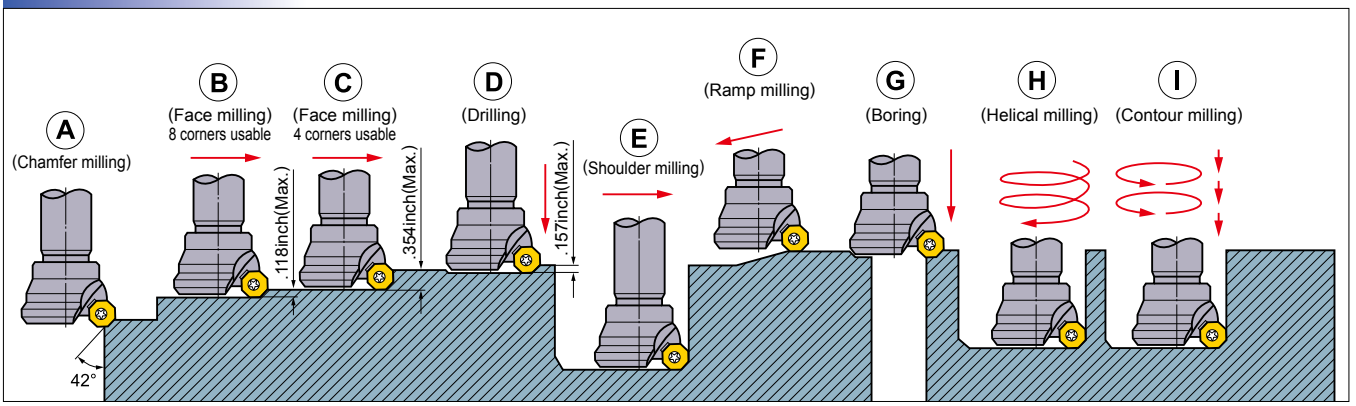
Milling Cutter No.	* Insert Screw	Wrench	Set Bolt
BOE4R202	CS350990T	①TKY10F	—
1503			①HDSU37513
0203			②BOE4S06U
2504			—
0305C			—
BOER2503A ı **BOER0809F**	CS501290T	②TKY25T	—

* Clamp Torque (lbf-in) : CS350990T=22, CS501290T=66

MILLING

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

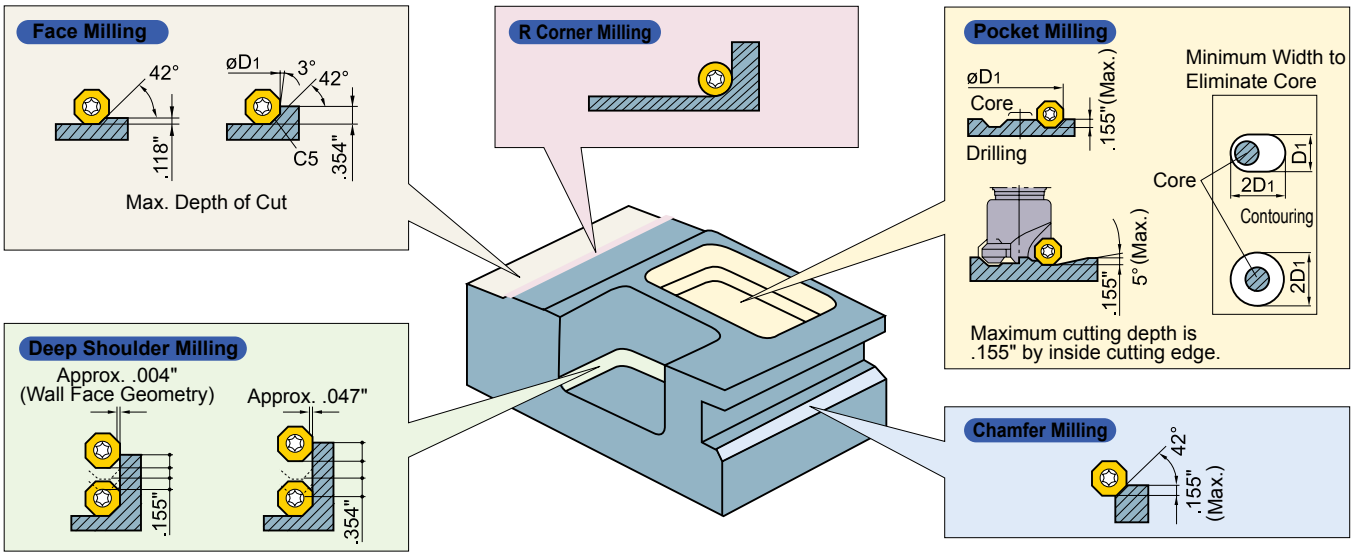


(Note) These are recommended cutting conditions when cutter diameter is less than 3.15inch. For cutters with diameter ≥ ϕ3.15inch increase cutting speed by 10%.
Above sizes are for OEMX1705 □□□□.

	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□□□□.

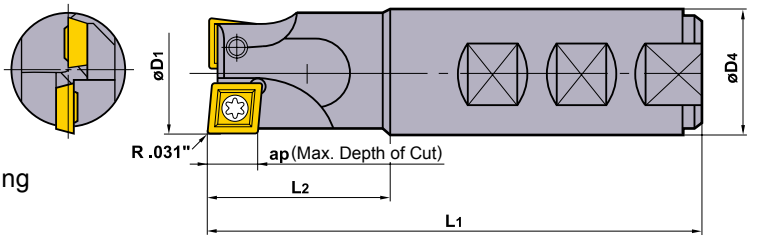
MULTI FUNCTIONAL MILLING

Roughing

ECMP



- Unique insert seat position facilitates smooth initial cutting and stable machining.
- Excellent chip disposal.
- 86°rhombic shape 11°positive insert.

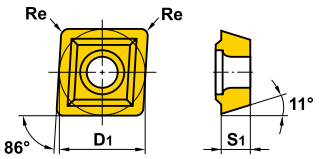


Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (inch)				Max. Depth of Cut	*		
	R		D1	L1	D4	L2	ap	Insert Screw	Wrench	Insert
ECMPR162W16	●	2	1.000	4.500	1.000	1.250	.315	TS4	TKY15R	MPMM322
202W20	●	2	1.250	5.000	1.250	1.750	.433	TS5	TKY25R	MPMM432
242W20	●	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	D1	S1	Re	
	**MPMM322**	**MPMT090308**	M	★	●	.375	.125	.031	
	432	**120408**	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
P	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
P	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

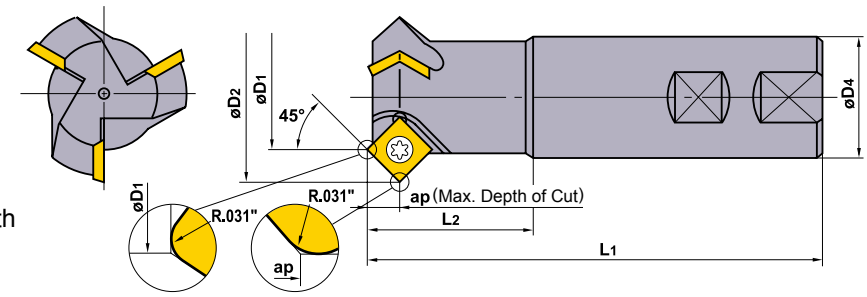
45° Roughing

CFSP

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel
	▬	▬		



- Excellent sharpness with 11°positive inserts.
- 45°chamfer series.



Right hand tool holder only.

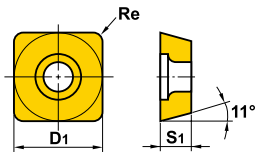
Order Number	Stock	Number of Teeth	Dimensions (inch)					Max. Depth of Cut	* Insert Screw	Wrench	Insert
	R		D1	D2	L1	D4	L2	ap			
CFSPR051W16	●	1	.313	.964	4.000	1.000	1.719	.327	TS52	TKY25R	SPMW42
101W16	●	1	.625	1.280	4.000	1.000	1.719	.327	TS5	TKY25R	SPMW42
203W20	●	3	1.250	1.905	4.125	1.250	1.844	.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	D1	S1	Re	
	**SPMW421**	**SPMW120304**	M	●	●		★	★	●	●	.500	.125	.016	
	422	**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

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

BALL NOSE END MILL

Finishing

Including curved faces

SRF

Light Alloy	Cast Iron	Carbon Steel Alloy Steel	Stainless Steel	Hardened Steel
	▬	▬		▬



Fig. 1

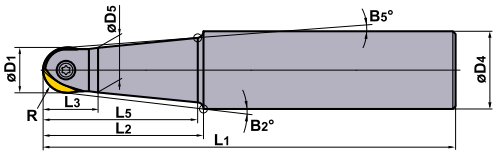


Fig. 2

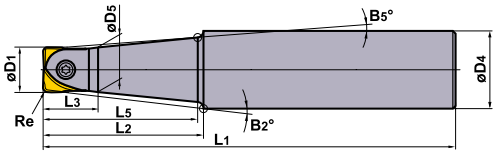


Fig. 3

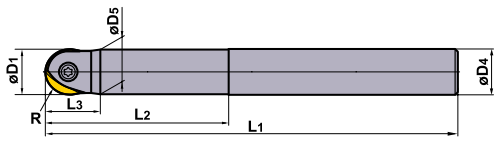


Fig. 4

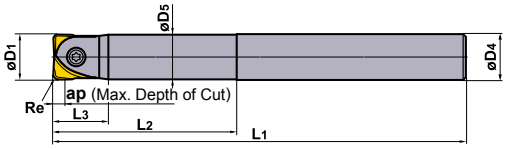


Fig. 5

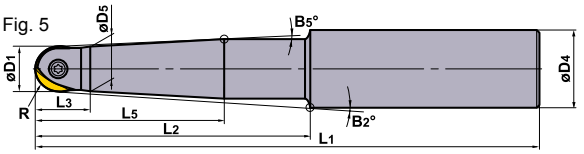
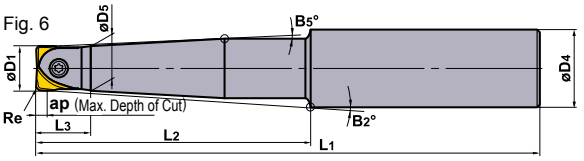


Fig. 6



Right hand tool holder only.
Refer to page K128 for ap &Re.

STEEL SHANK

Type	Order Number	Stock R	Inserts	Dimensions (inch) R	D1	D4	L1	D5	L2	L3	L5	B2°	B5°	Fig.	* Clamp Screw	①② Wrench	Anti-seize Lubricant
Standard	SRFU06S08M	●	SRFT0375	.1875	.375	.500	4.375	.354	1.625	512	1.535	2°30'	1°30'	1	RS3008TS	① TKY08D	MK1KS
			SRFT10	.1969	.394							2°08'	1°30'	1			
		NEW	SUFT10R○○	—	.394							2°08'	1°30'	2			
	08S10M	●	SRFT0500	.2500	.500	.625	4.750	.453	2.000	.591	1.902	2°03'	1°30'	1	RS3510T	① TKY10D	MK1KS
			SRFT12	.2362	.472							2°29'	1°30'	1			
		NEW	SUFT12R○○	—	.472							2°29'	1°30'	2			
	10S12M	●	SRFT0625	.3125	.625	.750	5.125	.606	2.000	.787	1.909	2°07'	1°30'	1	RS4015T	② TKY15T	MK1KS
			SRFT16	.3150	.630							2°02'	1°30'	1			
		NEW	SUFT16R○○	—	.630							2°02'	1°30'	2			
	12S16M	●	SRFT0750	.3750	.750	1.000	6.000	.732	2.875	.945	2.740	2°52'	1°30'	1	RS5020T	② TKY20T	MK1KS
			SRFT20	.3937	.787							2°27'	1°30'	1			
			SUFT20R○○	—	.787							2°27'	1°30'	2			
	16S20M	●	SRFT1000	.5000	1.000	1.250	7.125	.965	3.250	1.181	3.112	2°36'	1°30'	1	RS6025T	② TKY25T	MK1KS
			SRFT25	.4921	.984							2°46'	1°30'	1			
			SUFT25R○○	—	.984							2°46'	1°30'	2			
	20S20M	●	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	2.465	1°33'	1°30'	1	RS3008TS	① TKY08D	MK1KS
			SRFT10	.1969	.394							1°19'	1°30'	1			
		NEW	SUFT10R○○	—	.394							1°19'	1°30'	2			
	08S10L	●	SRFT0500	.2500	.500	.625	6.375	.453	2.875	.591	2.817	1°22'	1°30'	1	RS3510T	① TKY10D	MK1KS
			SRFT12	.2362	.472							1°39'	1°30'	1			
		NEW	SUFT12R○○	—	.472							1°39'	1°30'	2			
	10S12L	●	SRFT0625	.3125	.625	.750	7.125	.606	3.625	.787	2.488	1°05'	1°30'	5	RS4015T	② TKY15T	MK1KS
			SRFT16	.3150	.630							1°02'	1°30'	5			
		NEW	SUFT16R○○	—	.630							1°02'	1°30'	6			
	12S16L	●	SRFT0750	.3750	.750	1.000	8.500	.732	4.625	.945	4.539	1°41'	1°30'	1	RS5020T	② TKY20T	MK1KS
			SRFT20	.3937	.787							1°25'	1°30'	1			
			SUFT20R○○	—	.787							1°25'	1°30'	2			
	16S20L	●	SRFT1000	.5000	1.000	1.250	9.625	.965	5.750	1.181	5.697	1°22'	1°30'	1	RS6025T	② TKY25T	MK1KS
			SRFT25	.4921	.984							1°27'	1°30'	1			
			SUFT25○○	—	.984							1°27'	1°30'	2			
	20S20L	●	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 K129 & K130)

* 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

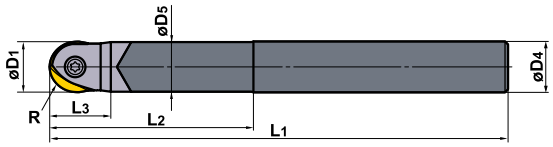
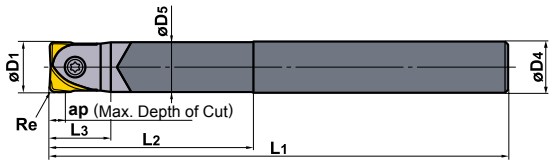


Fig. 2



CARBIDE SHANK

Right hand tool holder only.
Refer to page K128 for ap &Re.

Type	Order Number	Stock R	Inserts	Dimensions (inch) R	D1	D4	L1	D5	L2	L3	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			
		NEW	SUFT10R○○	—	.394						2			
	08S08MW	●	SRFT0500	.2500	.500	.500	4.750	.453	2.000	0.591	1	RS3510T	①TKY10D	MK1KS
			SRFT12	.2362	.472						1			
		NEW	SUFT12R○○	—	.472						2			
	10S10MW	●	SRFT0625	.3125	.625	.625	5.250	.606	2.125	0.787	1	RS4015T	②TKY15T	MK1KS
			SRFT16	.3150	.630						1			
		NEW	SUFT16R○○	—	.630						2			
	12S12MW	●	SRFT0750	.3750	.750	.750	7.125	.732	4.000	0.945	1	RS5020T	②TKY20T	MK1KS
			SRFT20	.3937	.787						1			
			SUFT20R○○	—	.787						2			
	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			
		NEW	SUFT10R○○	—	.394						2			
	08S08LW	●	SRFT0500	.2500	.500	.500	6.625	.453	3.125	.591	1	RS3510T	①TKY10D	MK1KS
			SRFT12	.2362	.472						1			
		NEW	SUFT12R○○	—	.472						2			
	10S10LW	●	SRFT0625	.3125	.625	.625	8.000	.606	4.500	.787	1	RS4015T	②TKY15T	MK1KS
			SRFT16	.3150	.630						1			
		NEW	SUFT16R○○	—	.630						2			
	12S12LW	●	SRFT0750	.3750	.750	.750	10.000	.732	6.125	.945	1	RS5020T	②TKY20T	MK1KS
			SRFT20	.3937	.787						1			
			SUFT20R○○	—	.787						2			
	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 K129 & K130)

* Clamp Torque (lbf-in) : RS3008TS=13, RS3510T=22, RS4015T=29, RS5020T=44, RS6025T=66, RS8030T=88

INSERTS ➤ K128
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig. 1

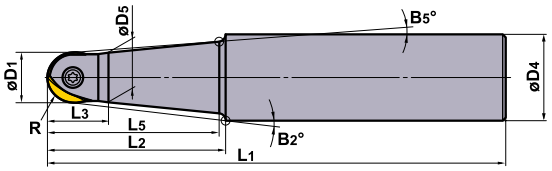


Fig. 2

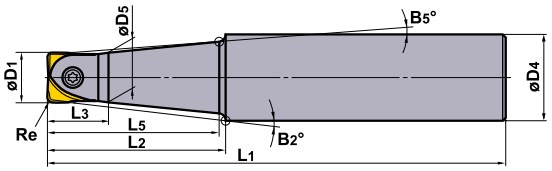


Fig. 3

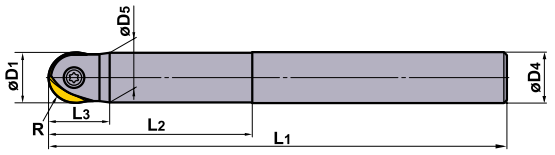


Fig. 4

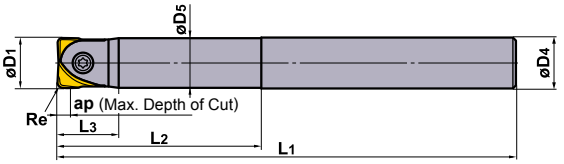


Fig. 5

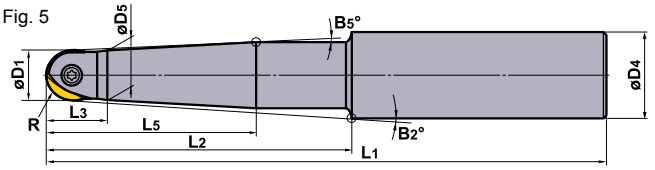
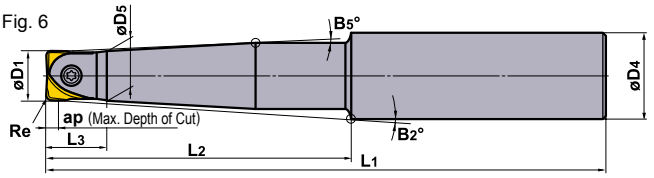


Fig. 6



METRIC Standard

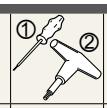
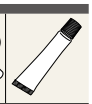
STEEL SHANK

Right hand tool holder only.
Refer to page K128 for ap &Re.

Type	Order Number	Stock R	Inserts	Dimensions (mm) R	D1	D4	L1	D5	L2	L3	L5	B2°	B5°	Fig.	★ Clamp Screw	①② Wrench	Anti-seize Lubricant
Standard	**SRFH10S12M**	★	SRFT10	5	10	12	110	9.5	40	13	39.1	1°38′	1°30′	1	RS3008T	①TKY08D	MK1KS
			NEW SUFT10R○○	—	10	12	110	9.5	40	13	—	1°38′	—	2			
	12S16M	★	SRFT12	6	12	16	120	11.5	50	15	47.9	2°36′	1°30′	1	RS3510T	①TKY10D	MK1KS
			NEW SUFT12R○○	—	12	16	120	11.5	50	15	—	2°36′	—	2			
	16S20M	★	SRFT16	8	16	20	130	15.5	50	20	47.9	2°44′	1°30′	1	RS4015T	②TKY15T	MK1KS
			NEW SUFT16R○○	—	16	20	130	15.5	50	20	—	2°44′	—	2			
	20S25M	★	SRFT20	10	20	25	150	19.5	70	24	67.5	2°23′	1°30′	1	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	25	150	19.5	70	24	67.5	2°23′	1°30′	2			
	25S32M	★	SRFT25	12.5	25	32	180	24.5	80	30	76.6	2°58′	1°30′	1	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	32	180	24.5	80	30	76.6	2°58′	1°30′	2			
	30S32M	★	SRFT30	15	30	32	200	29.5	100	35	—	—	—	3	RS8030T	②TKY30T	MK1KS
			SUFT30R○○	—	30	32	200	29.5	100	35	—	—	—	4			
	32S32M	★	SRFT32	16	32	32	200	31.5	100	35	—	—	—	3	RS8030T	②TKY30T	MK1KS
			NEW SUFT32R○○	—	32	32	200	31.5	100	35	—	—	—	4			
Semi Long	**SRFH10S12L**	★	SRFT10	5	10	12	150	9.5	60	13	39.3	1°30′	1°30′	1	RS3008T	①TKY08D	MK1KS
			NEW SUFT10R○○	—	10	12	150	9.5	60	13	—	1°30′	—	2			
	12S16L	★	SRFT12	6	12	16	160	11.5	70	15	68.5	1°47′	1°30′	1	RS3510T	①TKY10D	MK1KS
			NEW SUFT12R○○	—	12	16	160	11.5	70	15	—	1°47′	—	2			
	16S20L	★	SRFT16	8	16	20	160	15.5	70	20	68.4	1°51′	1°30′	1	RS4015T	②TKY15T	MK1KS
			NEW SUFT16R○○	—	16	20	160	15.5	70	20	—	1°51′	—	2			
	20S25L	★	SRFT20	10	20	25	180	19.5	80	24	77.7	2°03′	1°30′	1	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	25	180	19.5	80	24	77.7	2°03′	1°30′	2			
	20S20L80	★	SRFT20	10	20	20	180	19.5	80	24	—	—	—	3	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	20	180	19.5	80	24	—	—	—	4			
	25S32L	★	SRFT25	12.5	25	32	200	24.5	100	30	97.2	2°17′	1°30′	1	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	32	200	24.5	100	30	97.2	2°17′	1°30′	2			
	25S25L100	★	SRFT25	12.5	25	25	200	24.5	100	30	—	—	—	3	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	25	200	24.5	100	30	—	—	—	4			
	30S32L	★	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 K129 & K130)
(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	 Wrench	 Anti-seize Lubricant
		R		R	D1	D4	L1	D5	L2	L3	L5	B2°	B5°				
Long	**SRFH20S25E**	★	SRFT20	10	20	25	220	19.5	120	24	82.4	1°30′	1°30′	5	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	25	220	19.5	120	24	82.4	1°30′	1°30′	6			
	20S20E120	★	SRFT20	10	20	20	220	19.5	120	24	—	—	—	3	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	20	220	19.5	120	24	—	—	—	4			
	25S32E	★	SRFT25	12.5	25	32	250	24.5	150	30	125.5	1°30′	1°30′	5	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	32	250	24.5	150	30	125.5	1°30′	1°30′	6			
	25S25E150	★	SRFT25	12.5	25	25	250	24.5	150	30	—	—	—	3	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	25	250	24.5	150	30	—	—	—	4			
	30S32E	★	SRFT30	15	30	32	300	29.5	200	35	—	—	—	3	RS8030T	②TKY30T	MK1KS
			SUFT30R○○	—	30	32	300	29.5	200	35	—	—	—	4			
Extra Long	**SRFH20S25X**	★	SRFT20	10	20	25	250	19.5	150	24	82.4	1°30′	1°30′	5	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	25	250	19.5	150	24	82.4	1°30′	1°30′	6			
	25S32X	★	SRFT25	12.5	25	32	300	24.5	200	30	123.1	1°30′	1°30′	5	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	32	300	24.5	200	30	123.1	1°30′	1°30′	6			
	30S32X	★	SRFT30	15	30	32	350	29.5	250	35	—	—	—	3	RS8030T	②TKY30T	MK1KS
			SUFT30R○○	—	30	32	350	29.5	250	35	—	—	—	4			
	32S32X	★	SRFT32	16	32	32	350	31.5	250	35	—	—	—	3	RS8030T	②TKY30T	MK1KS
		NEW	SUFT32R○○	—	32	32	350	31.5	250	35	—	—	—	4			

(Note 1) Fit inserts in the right direction. (Refer to page K129 & K130)
(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

INSERTS ➤ K128
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Fig. 1

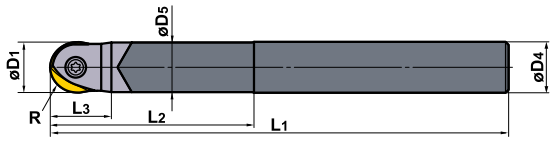
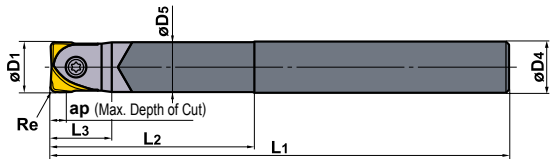


Fig. 2



METRIC Standard

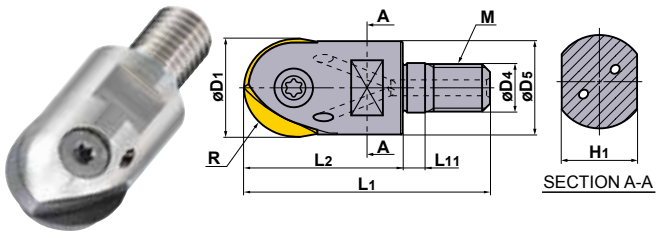
CARBIDE SHANK

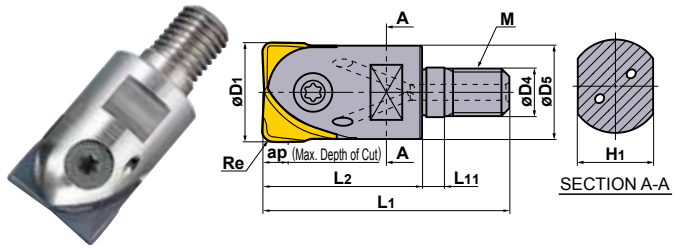
Right hand tool holder only.
Refer to page K128 for ap &Re.

Type	Order Number	Stock R	Inserts	Dimensions (mm) R	D1	D4	L1	D5	L2	L3	Fig.	* Clamp Screw	Wrench	Anti-seize Lubricant
Standard	**SRFH10S10MW**	★	SRFT10	5	10	10	110	9.5	40	13	1	RS3008T	①TKY08D	MK1KS
		NEW	SUFT10R○○	—	10	10	110	9.5	40	13	1			
	12S12MW	★	SRFT12	6	12	12	120	11.5	50	15	1	RS3510T	①TKY10D	MK1KS
		NEW	SUFT12R○○	—	12	12	120	11.5	50	15	1			
	16S16MW	★	SRFT16	8	16	16	130	15.5	50	20	1	RS4015T	②TKY15T	MK1KS
		NEW	SUFT16R○○	—	16	16	130	15.5	50	20	1			
	20S20MW	★	SRFT20	10	20	20	180	19.5	80	24	1	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	20	180	19.5	80	24	2			
	25S25MW	★	SRFT25	12.5	25	25	200	24.5	100	30	1	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	25	200	24.5	100	30	2			
	30S32MW	★	SRFT30	15	30	32	230	29.5	130	35	1	RS8030T	②TKY30T	MK1KS
		★	SRFT32	16	32	32	231	29.5	131	36	1			
			SUFT30R○○	—	32	32	230	29.5	130	35	2			
Long	**SRFH10S10LW**	★	SRFT10	5	10	10	150	9.5	60	13	1	RS3008T	①TKY08D	MK1KS
		NEW	SUFT10R○○	—	10	10	150	9.5	60	13	1			
	12S12LW	★	SRFT12	6	12	12	160	11.5	70	15	1	RS3510T	①TKY10D	MK1KS
		NEW	SUFT12R○○	—	12	12	160	11.5	70	15	1			
	16S16LW	★	SRFT16	8	16	16	160	15.5	70	20	1	RS4015T	②TKY15T	MK1KS
		NEW	SUFT16R○○	—	16	16	160	15.5	70	20	1			
	16S16EW	★	SRFT16	8	16	16	200	15.5	110	20	1	RS4015T	②TKY15T	MK1KS
	20S20LW	★	SRFT20	10	20	20	250	19.5	150	24	1	RS5020T	②TKY20T	MK1KS
			SUFT20R○○	—	20	20	250	19.5	150	24	2			
	25S25LW	★	SRFT25	12.5	25	25	300	24.5	200	30	1	RS6025T	②TKY25T	MK1KS
			SUFT25R○○	—	25	25	300	24.5	200	30	2			
	30S32LW	★	SRFT30	15	30	32	350	29.5	250	35	1	RS8030T	②TKY30T	MK1KS
		★	SRFT32	16	32	32	351	29.5	251	36	1			
			SUFT30R○○	—	30	32	350	29.5	250	35	2			

(Note 1) Fit inserts in the right direction. (Refer to page K129 & K130)
(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)									Mass (kg)	*2 Clamp Screw	Wrench	Anti-seize Lubricant
	R			R	D1	D4	D5	L1	L2	L11	H1	M				
SRFH16AM0830	★	Y	SRFT16	8	16	8.5	14.9	48	30	6	10	M8	0.1	RS4015T	TKY15T	MK1KS
		NEW	SUFT16R○○	—	16	8.5	14.9	48	30	6	10	M8				
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				
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				
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				

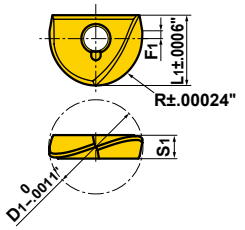
(Note 1) Fit inserts in the right direction. (Refer to page K129 & K130)
(Note 2) Inch type insert can not be installed on the metric holder.
*1 Y=Yes
*2 Clamp Torque (lbf-in) : RS4015T=29, RS5020T=44, RS6025T=66, RS8030T=88

MILLING

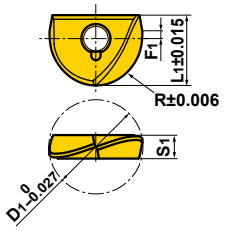
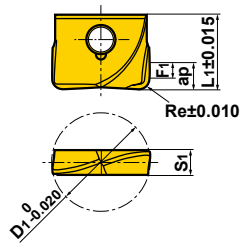
INSERTS ➤ K128
SCREW-IN ARBORS ➤ K148
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

INSERTS

INCH Standard

Shape	Order Number	Coated MP8010	Coated VP15TF		Dimensions (inch) D1	R	Re	L1	F1	S1	ap	Geometry
	SRFT0375	●	●		.375	.1875	—	.335	.020	.102	—	
	0500	●	●		.500	.2500	—	.394	.020	.118	—	
	0625	●	●		.625	.3125	—	.472	.039	.158	—	
	0750	●	●		.750	.3750	—	.591	.039	.197	—	
	1000	●	●		1.000	.5000	—	.728	.039	.236	—	
	1250	●	●		1.250	.6250	—	.925	.039	.276	—	

METRIC Standard

Shape	Order Number	Coated MP8010	Coated VP15TF		Dimensions (mm) D1	R	Re	L1	F1	S1	ap	Geometry
	SRFT10	★	★		10	5 (.1969")	—	8.5	0.5	2.6	—	
	12	★	★		12	6 (.2362")	—	10	0.5	3	—	
	16	★	★		16	8 (.3150")	—	12	1	4	—	
	20	★	★		20	10 (.3937")	—	15	1	5	—	
	25	★	★		25	12.5 (.4921")	—	18.5	1	6	—	
	30	★	★		30	15 (.5906")	—	22.5	1	7	—	
	32	★	★		32	16 (.6299")	—	23.5	1	7	—	
	SUFT10R05	★	★		10	—	0.5 (.0197")	8.5	1	2.6	1.5	
	10R10	★	★		10	—	1 (.0394")	8.5	1	2.6	2	
	10R20	★	★		10	—	2 (.0787")	8.5	1	2.6	3	
	12R05	★	★		12	—	0.5 (.0197")	10	1.2	3	1.7	
	12R10	★	★		12	—	1 (.0394")	10	1.2	3	2.2	
	12R20	★	★		12	—	2 (.0787")	10	1.2	3	3.2	
	12R30	★	★		12	—	3 (.1181")	10	1.2	3	4.2	
	16R05	★	★		16	—	0.5 (.0197")	12	1.6	4	2.1	
	16R10	★	★		16	—	1 (.0394")	12	1.6	4	2.6	
	16R15	★	★		16	—	1.5 (.0591")	12	1.6	4	3.1	
	16R20	★	★		16	—	2 (.0787")	12	1.6	4	3.6	
	16R30	★	★		16	—	3 (.1181")	12	1.6	4	4.6	
	20R05	★	★		20	—	0.5 (.0197")	15	2	5	2.5	
	20R10	★	★		20	—	1 (.0394")	15	2	5	3	
	20R15	★	★		20	—	1.5 (.0591")	15	2	5	3.5	
	20R20	★	★		20	—	2 (.0787")	15	2	5	4	
	20R30	★	★		20	—	3 (.1181")	15	2	5	5	
	25R05	★	★		25	—	0.5 (.0197")	18.5	2.5	6	3	
	25R10	★	★		25	—	1 (.0394")	18.5	2.5	6	3.5	
	25R20	★	★		25	—	2 (.0787")	18.5	2.5	6	4.5	
	25R30	★	★		25	—	3 (.1181")	18.5	2.5	6	5.5	
	30R05	★	★		30	—	0.5 (.0197")	22.5	3	7	3.5	
	30R10	★	★		30	—	1 (.0394")	22.5	3	7	4	
	30R20	★	★		30	—	2 (.0787")	22.5	3	7	5	
	30R30	★	★		30	—	3 (.1181")	22.5	3	7	6	
	32R05	★	★		32	—	0.5 (.0197")	23.5	3.2	7	3.7	
	32R10	★	★		32	—	1 (.0394")	23.5	3.2	7	4.2	
	32R20	★	★		32	—	2 (.0787")	23.5	3.2	7	5.2	

● : 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	Carbon Steel Alloy Steel	180—280HB	**VP15TF**	655 (260—985)	.008 (.004—.012)	≤0.05D1
P	Pre-hardened steels	≤45HRC	**VP15TF**	490 (260—655)	.008 (.004—.012)	≤0.05D1
P	Alloy Tool Steel	180—380HB	**VP15TF**	490 (260—655)	.008 (.004—.012)	≤0.05D1
K	Cast Iron	Tensile Strength ≤350MPa	**MP8010**	820 (590—1475)	.008 (.004—.012)	≤0.05D1
K	Ductile Cast Iron	Tensile Strength ≤800MPa	**MP8010**	655 (260—985)	.008 (.004—.012)	≤0.05D1
H	Hardened Steel	45—55HRC	**MP8010**	330 (195—395)	.008 (.004—.012)	≤0.05D1
H	Hardened Steel	≥55HRC	**MP8010**	260 (195—395)	.008 (.004—.012)	≤0.01D1

(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

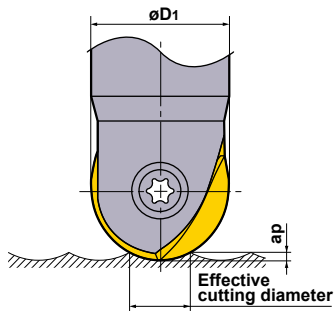
1. Effective cutting diameter = $2\sqrt{ap\ (D_1\text{-}ap)}$

D_1 : Tool diameter (inch)
ap : Depth of Cut (inch)

2. Using ap ➡ Calculate cutting speed at the depth of cut line.

$$vc = \frac{2\pi n\sqrt{ap\ (D_1\text{-}ap)}}{12}$$

vc : Actual cutting speed (SFM)
n : Revolution (min^{-1})



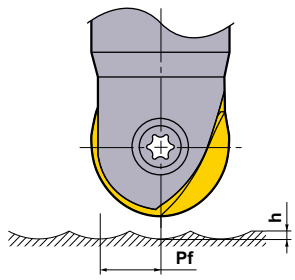
Selecting Pick Feed

Theoretical $h = \frac{(Pf)^2}{8R}$

h : Cusp height
pf : Pick feed
R : 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.

$$Pf = \sqrt{\frac{8xRxRz}{3}}$$



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)	≤0.05D_1	≤0.05D_1	.008 (≤.016)
	Pre-hardened steels	≤45HRC	**VP15TF**	490 (260−655)	≤0.05D_1	≤0.05D_1	.006 (≤.012)
	Alloy Tool Steel	180−380HB	**VP15TF**	490 (260−655)	≤0.05D_1	≤0.05D_1	.006 (≤.012)
M	Stainless Steel	≤270HB	**VP15TF**	490 (330−655)	≤0.05D_1	≤0.05D_1	.008 (≤.016)
K	Cast Iron	Tensile Strength ≤350MPa	**MP8010**	820 (590−1475)	≤0.05D_1	≤0.1D_1	.012 (≤.016)
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MP8010**	655 (260−985)	≤0.05D_1	≤0.1D_1	.012 (≤.016)
H	Hardened Steel	45−55HRC	**MP8010**	330 (260−395)	≤0.05D_1	≤0.02D_1	.004 (≤.008)
	Hardened Steel	55−65HRC	**MP8010**	260 (195−330)	≤0.05D_1	≤0.02D_1	.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)	≤0.02D_1	≤D_1	.008 (≤.016)
	Pre-hardened steels	≤45HRC	**VP15TF**	490 (260−655)	≤0.02D_1	≤D_1	.006 (≤.012)
	Alloy Tool Steel	180−380HB	**VP15TF**	490 (260−655)	≤0.02D_1	≤D_1	.006 (≤.012)
M	Stainless Steel	≤270HB	**VP15TF**	490 (330−655)	≤0.02D_1	≤D_1	.008 (≤.016)
K	Cast Iron	Tensile Strength ≤350MPa	**MP8010**	835 (590−1475)	≤0.03D_1	≤D_1	.012 (≤.016)
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MP8010**	655 (260−985)	≤0.03D_1	≤D_1	.012 (≤.016)
H	Hardened Steel	45−55HRC	**MP8010**	330 (260−395)	≤0.01D_1	≤D_1	.004 (≤.006)
	Hardened Steel	55−65HRC	**MP8010**	230 (195−330)	≤0.01D_1	≤D_1	.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 it is occurred vibration or chipping on the cutting edge, please decrease the cutting condition as width of cut, depth of cut and feed per tooth depending on the situation.

(Note 2)The value of cutting speed is stood at the peripheral diameter of the tool.
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 D_1 ÷ 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.



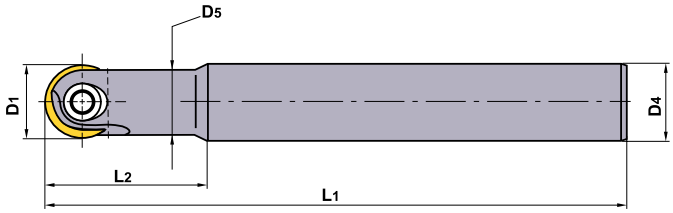
BALL NOSE END MILL

Finishing

Including curved faces

MBN





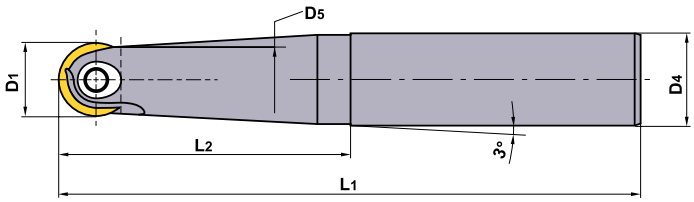
STRAIGHT MBN SERIES TOOL HOLDER

Order Number	Stock	Dimensions (inch)					*		
		D1	L1	D4	L2	D5	Insert Screw	Wrench	Insert
MBN040375SC	●	.375	3.540	.500	1.340	.335	BLS03	TKY15R	MBN0375
040500SB	●	.500	5.910	.500	1.810	.413	BLS04	TKY20R	MBN0500
050625SB	●	.625	6.300	.625	2.090	.551	BLS05	TKY20R	MBN0625
060750SA	●	.750	8.270	.750	2.360	.709	BLS06	TKY20R	MBN0750
081000SA	●	1.000	9.060	1.000	3.140	.882	BLS08	TKY30R	MBN1000
101250SB	●	1.250	8.270	1.250	3.150	1.126	BLS12	TKY30R	MBN1250
10M300SB	●	30mm	6.890	1.250	2.200	1.126	BLS12	TKY30R	MBNM300
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





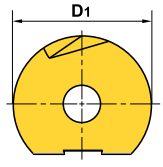
TAPERED NECK MBN SERIES TOOL HOLDER

Order Number	Stock	Dimensions (inch)					*		
		D1	L1	D4	L2	D5	Insert Screw	Wrench	Insert
MBN040312TB	●	.312	5.510	.500	1.970	.295	BLS02	TKY08D	MBN0312
040375TB	●	.375	5.910	.500	1.380	.354	BLS03	TKY15R	MBN0375
050500TB	●	.500	6.300	.625	2.360	.413	BLS04	TKY20R	MBN0500
060625TB	●	.625	6.890	.750	2.640	.551	BLS05	TKY20R	MBN0625
080750TB	●	.750	7.480	1.000	3.150	.709	BLS06	TKY20R	MBN0750
101000TB	●	1.000	8.270	1.250	3.940	.882	BLS08	TKY30R	MBN1000
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	D1 (inch)	Geometry
	**MBN0312001**	●	.312	
	0375001	●	.375	
	0500001	●	.500	
	0625001	●	.625	
	0750001	●	.750	
	1000001	●	1.000	
	1250001	●	1.250	
	M200001	●	20mm (.7874)	
	M300001	●	30mm (1.181)	

● : Inventory maintained.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

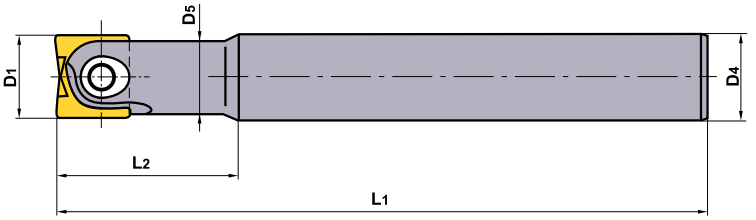
RADIUS END MILL

Finishing

Including curved faces

MBD/MBF





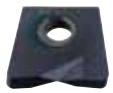
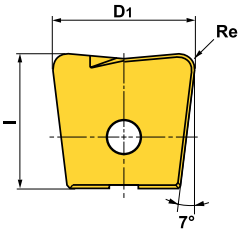
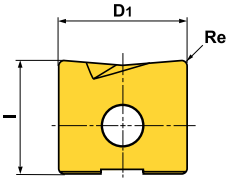
STRAIGHT NECK MBD SERIES TOOL HOLDER

Order Number	Stock	Dimensions (inch)					* Insert Screw	Wrench	Insert
		D1	L1	D4	L2	D5			
MBD040500SB	●	.500	5.980	.500	1.890	.413	BLS04	TKY20R	MBD/F 0500
050625SB	●	.625	6.380	.625	2.160	.551	BLS05	TKY20R	MBD/F 0625
060750SB	●	.750	6.890	.750	2.480	.709	BLS06	TKY20R	MBD/F 0750
081000SB	●	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	D1	Re	l	Geometry
	**MBD0500021**	●	.500	.031	.550	Backdraft 
	0500041	●	.500	.063	.550	
	0625021	●	.625	.031	.625	
	0625041	●	.625	.063	.625	
	0750021	●	.750	.031	.700	
	0750041	●	.750	.063	.700	
	1000021	●	1.000	.031	.925	
	1000041	●	1.000	.063	.925	
	1000081	●	1.000	.125	.925	
	**MBF0500021**	●	.500	.031	.550	Flat Bottom 
	0500041	●	.500	.063	.550	
	0625021	●	.625	.031	.625	
	0625041	●	.625	.063	.625	
	0750021	●	.750	.031	.700	
	0750041	●	.750	.063	.700	
	1000021	●	1.000	.031	.925	
	1000041	●	1.000	.063	.925	
	1000081	●	1.000	.125	.925	

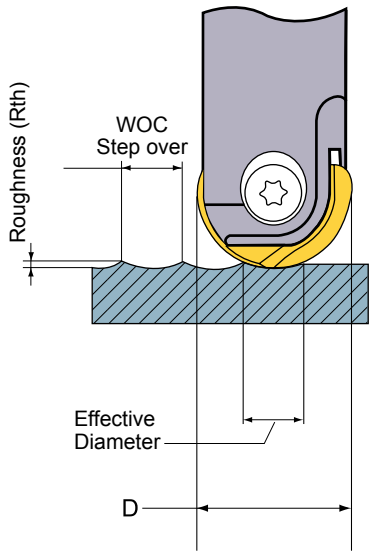
● : Inventory maintained.

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.



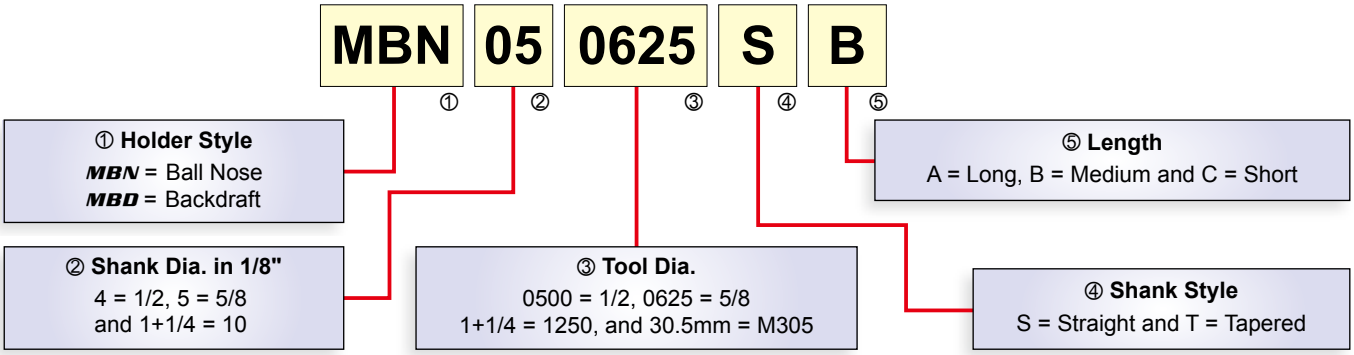
$$Rth = \frac{D}{2} - \sqrt{\frac{D^2 - WOC^2}{4}}$$

D=Tool Diameter

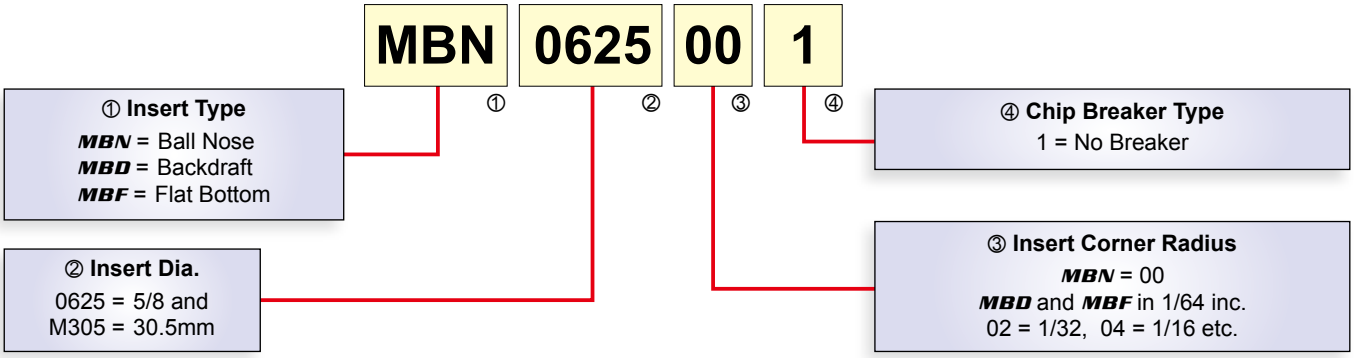
MILLING

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

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

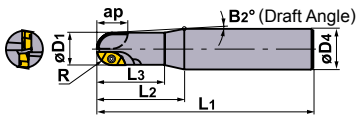
Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel



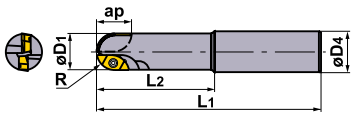
- Air / coolant through.
- Suitable for roughing to semi-finishing of small and medium molds.
- High rigidity body design.
- Low resistance chipbreaker.
- Key type clamp.
- Shrink fit ready.

Short Type

SRM210SAS2
SRM212SAS2

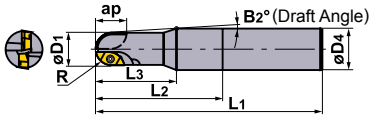


SRM216SAS2
SRM220SAS2

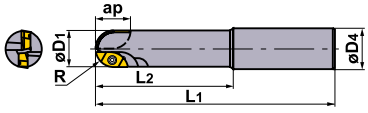


Medium Type

SRM210SAM2
SRM212SAM2

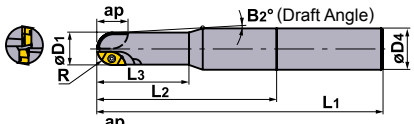


SRM216SAM2
SRM220SAM2

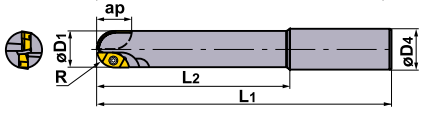


Long Type

SRM210SAL2
SRM212SAL2
SRM216SAL2

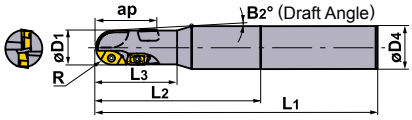


SRM220SAL2

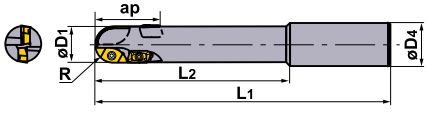


Long Edge Type

SRM212SAL4
SRM216SAL4



SRM220SAL4



Right hand tool holder only.

SHANK TYPE

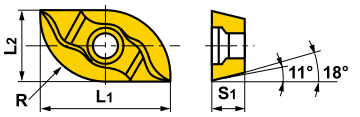
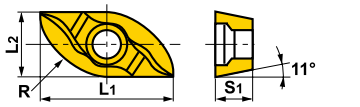
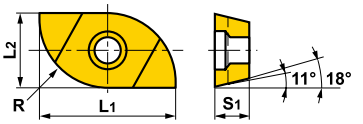
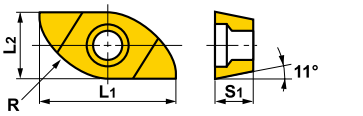
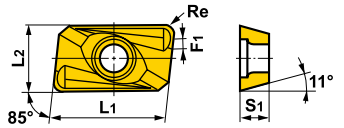
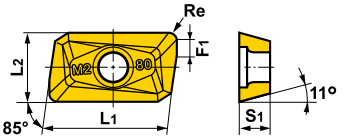
Type	Order Number	Stock	Number of Teeth	Dimensions (inch)								Inner, Outer Insert Screw *	Peripheral Insert Screw *	Inner, Outer Wrench	Peripheral Wrench	Inner Insert	Outer Insert	Peripheral Insert
		R		R	D1	L1	D4	L2	L3	ap	B2°							
Short	SRM210SAS2	●	2	.313	.625	4	.75	1.5	1.0	.625	3°	TS25H	—	① TKY08D	—	SRM210C-M	SRM210E-M	—
	212SAS2	●	2	.375	.75	4	1	1.5	1.25	.750	6° 30'	TS32	—	① TKY08D	—	SRM212C SRM212C-M	SRM212E SRM212E-M	—
	216SAS2	●	2	.500	1	4.5	1	2	—	.945	—	TS43	—	② TKY15T	—	SRM216C SRM216C-M	SRM216E SRM216E-M	—
	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	—
	212SAM2	●	2	.375	.75	5	1	2.5	1.25	.750	1° 30'	TS32	—	① TKY08D	—	SRM212C SRM212C-M	SRM212E SRM212E-M	—
	216SAM2	●	2	.500	1	5.5	1	3	—	.945	—	TS43	—	② TKY15T	—	SRM216C SRM216C-M	SRM216E SRM216E-M	—
	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	—
	212SAL2	●	2	.375	.75	6	1	3.5	1.50	.750	1° 30'	TS32	—	① TKY08D	—	SRM212C SRM212C-M	SRM212E SRM212E-M	—
	216SAL2	●	2	.500	1	6.5	1.25	4	1.75	.945	1° 30'	TS43	—	② TKY15T	—	SRM216C SRM216C-M	SRM216E SRM216E-M	—
	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
	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
	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.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

INSERTS

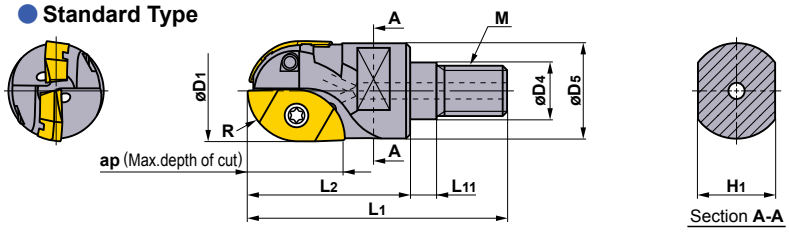
Type		Shape	Order Number	Class	Coated VP15TF		Dimensions (inch) R	L1	L2	S1	F1	Re	Geometry
Inner	With Breaker		**SRM210C-M**	M	●		.313	.630	.323	.138	–	–	
			212C-M	M	●		.375	.748	.385	.169	–	–	
			216C-M	M	●		.500	.945	.512	.216	–	–	
			220C-M	M	●		.625	1.102	.638	.275	–	–	
Outer	With Breaker		**SRM210E-M**	M	●		.313	.531	.258	.138	–	–	
			212E-M	M	●		.375	.610	.315	.169	–	–	
			216E-M	M	●		.500	.807	.409	.216	–	–	
			220E-M	M	●		.625	.964	.520	.275	–	–	
Inner	No Breaker	Strong Cutting Edge Type 	**SRM212C**	M	●		.375	.748	.385	.169	–	–	
			216C	M	●		.500	.945	.512	.216	–	–	
			220C	M	●		.625	1.102	.638	.275	–	–	
Outer	No Breaker	Strong Cutting Edge Type 	**SRM212E**	M	●		.375	.610	.315	.169	–	–	
			216E	M	●		.500	.807	.409	.216	–	–	
			220E	M	●		.625	.964	.520	.275	–	–	
Peripheral	With Breaker	Strong Cutting Edge Type 	**APMT1135PDER-H2**	M	●		–	.433	.250	.138	.047	.031	
			1604PDER-H2	M	●		–	.650	.375	.187	.055	.031	
	With Breaker	Low Resistance Type 	**APMT1135PDER-M2**	M	●		–	.433	.250	.138	.047	.031	
			1604PDER-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.

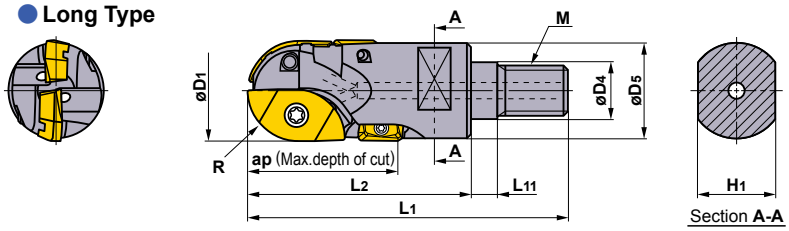
● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>



● Standard Type



● Long Type



METRIC Standard

SCREW-IN TYPE

Right hand tool holder only.

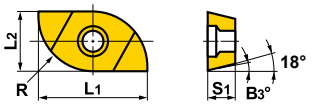
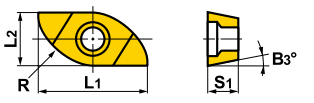
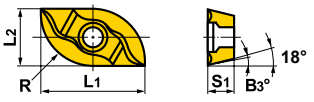
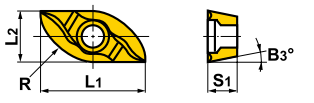
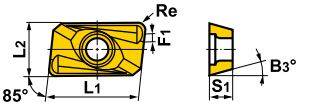
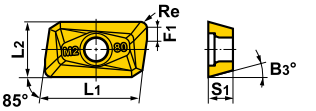
Type	Order Number	Stock	*3 Coolant Thru	Dimensions (mm)										Mass	*1 Inner, Outer Insert Screw	*1 Peripheral Insert Screw	Wrench	Inner Insert	Outer Insert	Peripheral Insert
		R		R	D1	D4	D5	L1	L2	L11	H1	*2 M	ap	(kg)						
Standard	SRM2160AM08S30	★	Y	8	16	8.5	14.6	48	30	6	10	M8	12	0.1	TS25H	—	①TKY08D	SRG16C SRM16C-M	SRG16E SRM16E-M	—
	2200AM10S35	★	Y	10	20	10.5	18.6	54	35	6	14	M10	14	0.1	TS32	—	①TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	—
	2250AM12S40	★	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	—
	2300AM16S45	★	Y	15	30	17	28.3	68	45	6	24	M16	24	0.2	TS55	—	②TKY15T ③TKY08F	SRG30C SRM30C-M	SRG30E SRM30E-M	—
	2320AM16S45	★	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
	2250AM12L55	★	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
	2300AM16L60	★	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
	2320AM16L60	★	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

SCREW-IN ARBORS ➤ K148
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

INSERTS

For Metric Standard

Type	Shape	Order Number	Class	Coated F7030	Coated VP15TF	R	L1	L2	S1	F1	Re	B3°	Geometry
Inner	Strong Cutting Edge Type 	**SRG16C**	G		★	8	16	8.2	3.5	—	—	11°	
		20C	G		★	10	19	10.2	4.6	—	—	10°	
		25C	G		★	12.5	24	12.8	5.5	—	—	10°	
		30C	G		★	15	28	15.3	7	—	—	10°	
		32C	G		★	16	28	16.3	7	—	—	10°	
Outer	Strong Cutting Edge Type 	**SRG16E**	G		★	8	13.5	6.7	3.5	—	—	11°	
		20E	G		★	10	15.5	8.5	4.6	—	—	9°	
		25E	G		★	12.5	20.5	10.2	5.5	—	—	9°	
		30E	G		★	15	25.2	12.2	7	—	—	9°	
		32E	G		★	16	26.1	13.1	7	—	—	9°	
Inner	Low Resistance Type 	**SRM16C-M**	M		★	8	16	8.2	3.5	—	—	11°	
		20C-M	M		★	10	19	10.2	4.6	—	—	10°	
		25C-M	M		★	12.5	24	12.8	5.5	—	—	10°	
		30C-M	M		★	15	28	15.3	7	—	—	10°	
		32C-M	M		★	16	28	16.3	7	—	—	10°	
Outer	Low Resistance Type 	**SRM16E-M**	M		★	8	13.5	6.7	3.5	—	—	11°	
		20E-M	M		★	10	15.5	8.5	4.6	—	—	9°	
		25E-M	M		★	12.5	20.5	10.2	5.5	—	—	9°	
		30E-M	M		★	15	25.2	12.2	7	—	—	9°	
		32E-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°	
		1604PDER-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°	
		1604PDER-M2	M	●	●	—	16.5	9.525	4.76	1.4	0.8	11°	

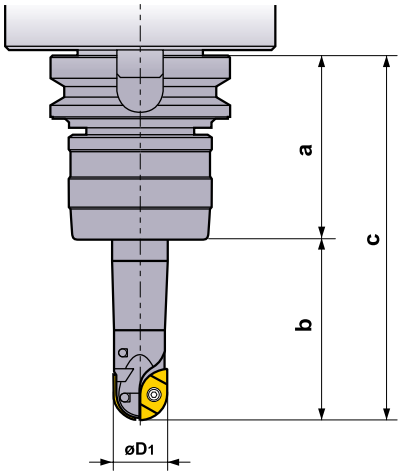
(Low-resistance inner or outer inserts are precision M class type.)

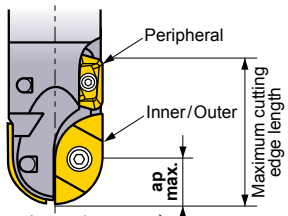
* Selection guide for peripheral cutting edges : The first recommendation is the super sharp M breaker (APMT....PDER-M2).
When cutting edge strength is particularly important, use the H breaker (APMT....PDER-H2).

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

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)

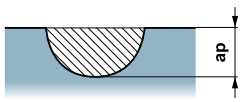
Cutting Diameter : øD1	Type	a	b	c
.625"	Short	4	1.5	5.5
	Medium		2.5	6.5
	Long		3.5	7.5
.750"	Short		1.5	5.5
	Medium		2.5	6.5
	Long		3.5	7.5
1.000"	Short		2.0	6.0
	Medium		3.0	7.0
	Long		4.0	8.0
1.250"	Short		2.0	6.0
	Medium		3.5	7.5
	Long		5.0	9.0

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 1.4-1.5D1. The peripheral insert is for light machining only.
Maximum ap is 0.5D1 or below.

SLOT MILLING

Cutting Mode



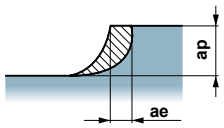
N: Spindle Speed (RPM)
F: Table Feed (IPM)

	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

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

SHOULDER MILLING (Cutting Depth : Small)

Cutting Mode

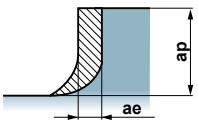


N : Spindle Speed (RPM)
F : Table Feed (IPM)

	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

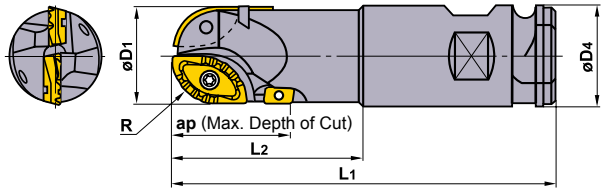
Roughing

Including curved faces

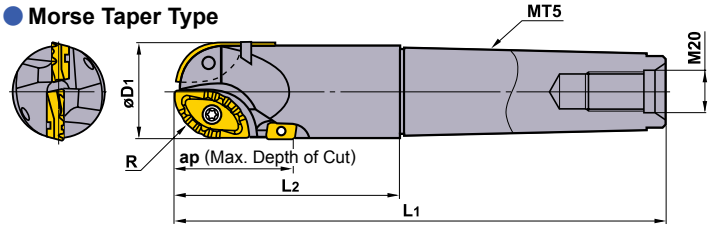
SRM2 Ø40(1.575") Ø50(1.969")



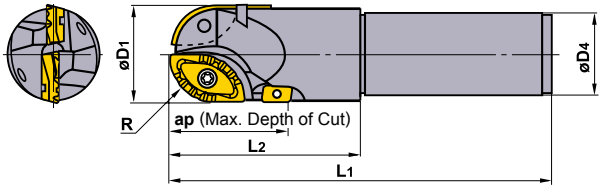
Combination Type



Morse Taper Type



Straight Type



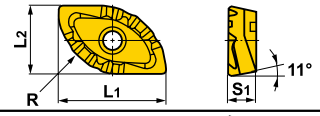
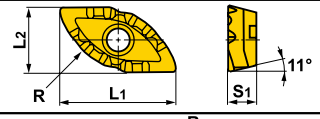
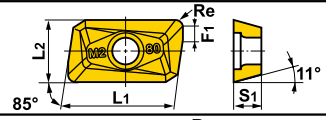
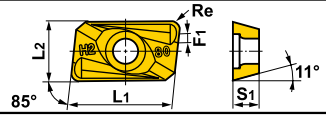
METRIC Standard

Right hand tool holder only.

Type		Order Number	Stock R	Number of Flutes	Dimensions (inch) R	D1	D4	L1	L2	ap	* 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
		2500WNLS	★	2	.984	1.969	2.000	7.874	4.724	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
	Long	**2400WNLM**	★	2	.787	1.575	2.000	9.843	6.693	2.126	TS6S	TS43	TKY30T	TKY15F	SRG40C	SRG40E	APMT1604 PDER-□2
		2500WNLM	★	2	.984	1.969	2.000	9.843	6.693	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
	Extra Long	**2500WNLL**	★	2	.984	1.969	2.000	11.811	8.661	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
		2500WNLX	★	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
		2500SNLS	★	2	.984	1.969	1.654	7.874	3.937	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
	Long	**2400SNLM**	★	2	.787	1.575	1.654	9.843	5.906	2.126	TS6S	TS43	TKY30T	TKY15F	SRG40C	SRG40E	APMT1604 PDER-□2
		2500SNLM	★	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	**2500MNLM**	★	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

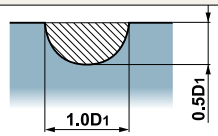
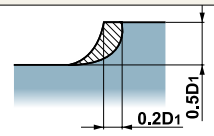
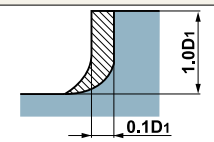
Application	Shape	Order Number	Class	Coated VP15TF	VP20RT	VP30RT	Dimensions (inch) R	L1	L2	S1	F1	Re	Geometry
Inner		* **SRG40C**	G	★	★	★	.787	1.417	.807	.315	—	—	
		* **50C**	G	★	★	★	.984	1.575	1.024	.335	—	—	
Outer		* **SRG40E**	G	★	★	★	.787	1.260	.654	.315	—	—	
		* **50E**	G	★	★	★	.984	1.409	.787	.335	—	—	
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>

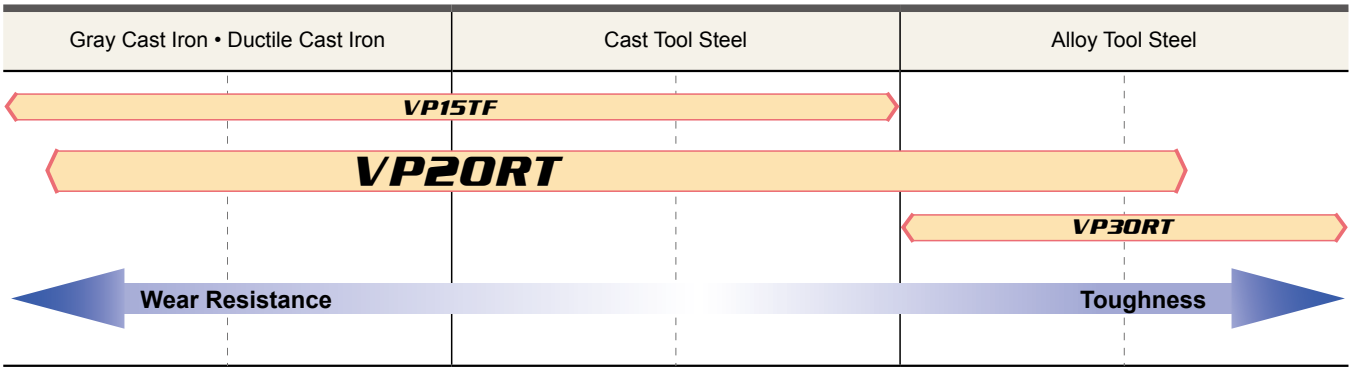
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

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



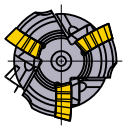
VERTICAL FEED MILLING

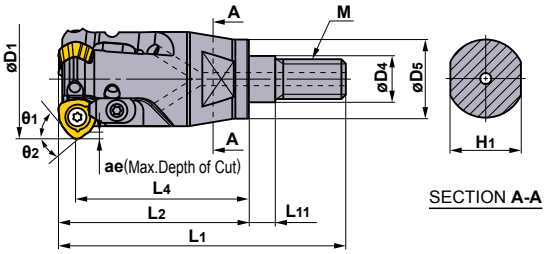
Roughing

PMC



- For under-cutting trimmed part of press mould.
- 2 directional cutting with large overhang.
- Suitable for automated 3 axis programming.





SECTION **A-A**

Right hand tool holder only.

Order Number	Stock	Coolant Hole *1	Number of Teeth	Dimensions (mm)												Mass		Shank Arbor
	R			D1	D4	D5	L1	L2	L4	L11	H1	M *2	ae	θ1	θ2	(kg)	Insert	
PMC08R252AM1035	★	Y	2	25	10.5	18	58.7	39.7	35	6	14	M10	1.5	35°	40.5°	0.1	JOM□080320 ZZSR-□□	SC20M10S □□□□W
09R323AM1245	★	Y	3	32	12.5	21	72.5	50.5	45	6	19	M12	3	35°	40.5°	0.2	JDM□09T320 ZDSR-□□	SC25M12S □□□□W
12R403AM1645	★	Y	3	40	17	29	74.4	51.4	45	6	24	M16	3.5	35°	40.5°	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

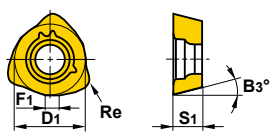
SPARE PARTS

Order Number	Clamp Bridge Screw *	Clamp Bridge	Clamp Screw *	Spring	Wrench	Anti-seize Lubricant
PMC08R252AM1035	TS33	AMS3	AJS3010T10	ASS2	②TKY08D ①TKY10R	MK1KS
09R323AM1245	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	MK1KS
12R403AM1645	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				Dimensions (mm)					PMC holder	Geometry
			FH7020	VP15TF	VP30RT		B3°	D1	S1	F1	Re		
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	
	120420ZDSR-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	
	120420ZDSR-JM	M	●	●	●		15°	12	4.76	2.5	2	PMC12R403AM1645	



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

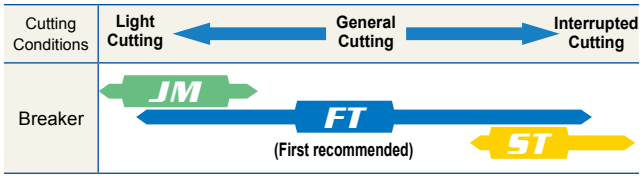
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

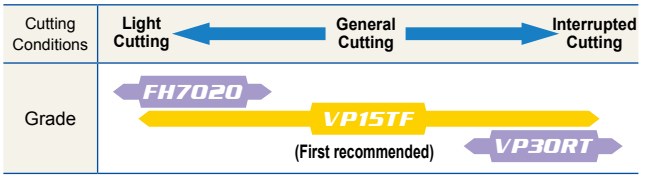
	Work Material	Hardness	Grade	Breaker	Cutting Dia. (mm)	Number of Teeth	Cutting Speed (SFM)	Feed per Tooth (inch/tooth)	Width of Cut (inch)	Pick Feed (inch)
P	Carbon Steel Alloy Steel	≤180HB	VP15TF	FT	ϕ40	3	820 (655—985)	—.024	—.059	—.236
					ϕ32	3	655 (490—720)	—.022	—.047	—.197
					ϕ25	2	655 (490—720)	—.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



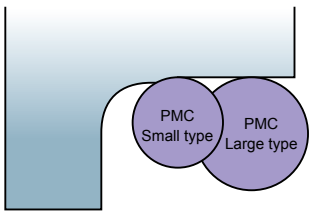
Application of Insert Grades

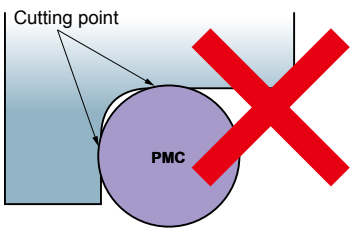


NOTES ON MACHINING METHODS

●How to choose an appropriate diameter tool.

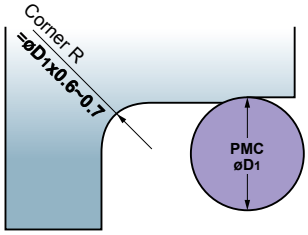
Machine plain surfaces with a larger tool and corner radii with smaller diameter cutters.





●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 D1(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 ➤ K148

VERTICAL FEED MILLING

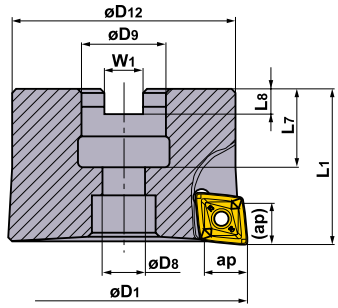
Roughing

PMR

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel

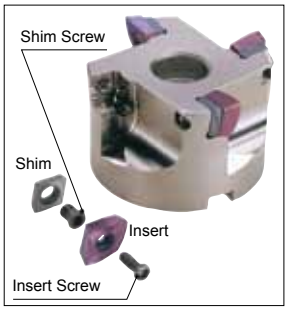


- 1 directional cutting with large overhang.
- Unique shape of curved edge gives high rigidity and low resistance.



Right hand tool holder only.

	Order Number	Stock R	Number of Teeth	Dimensions (mm) D1	L1	D9	L7	D8	D12	W1	L8	ap	Insert
Metric	**PMR405003A22R**	★	3	50	40	22	20	11	45	10.4	6.3	11	CPMT1205ZPEN-M2/3
	406304A22R	★	4	63	40	22	20	11	57	10.4	6.3	11	CPMT1205ZPEN-M2/3
	408005A27R	★	5	80	50	27	23	13.5	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
	406304BR	★	4	63	40	22.225	19	11	57	8.4	5	11	CPMT1205ZPEN-M2/3
	408005DR	★	5	80	63	31.75	32	17	73	12.7	8	11	CPMT1205ZPEN-M2/3

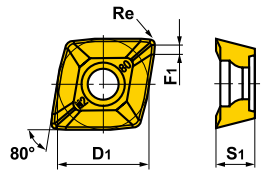


SPARE PARTS

Order Number	Shim	Shim Screw *	Insert Screw *	Wrench (Insert)	Wrench (Shim)	Set Bolt
PMR405003A22R	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
406304A22R	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
408005A27R	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC12040
405003BR	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
406304BR	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
408005DR	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC16040

* Clamp Torque (lbf-in) : WCS503507H=44, TPS35=31

INSERTS

Shape	Order Number	Class	Coated VP15TF	Dimensions (mm) D1	S1	F1	Re	Geometry
	**CPMT1205ZPEN-M2**	M	●	12.7	5.56	1.4	0.8	
	1205ZPEN-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)	≤.5D
		280—380HB				
K	Gray Cast Iron	Tensile Strength ≤350MPa	VP15TF	590 (490—655)	.008 (.004—.012)	≤.5D
	Ductile Cast Iron	Tensile Strength 360—500MPa	VP15TF	490 (390—555)	.008 (.004—.012)	≤.5D
		Tensile Strength 500—800MPa	VP15TF	390 (330—490)	.008 (.004—.012)	≤.5D

(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 ➤ K148
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

VERTICAL FEED MILLING

Finishing

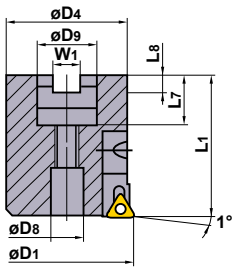
PMF

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel
	▬	▬		

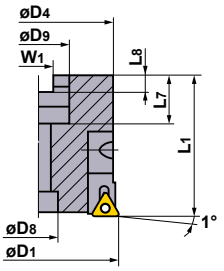


- 2 directional cutting with large overhang.
- No burring so no need for hand finishing.
- High precision multi directional insert ensures highly accurate surfaces.

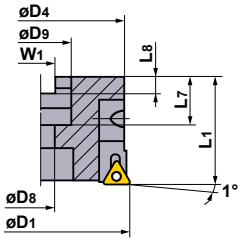
ø50



ø63



ø80



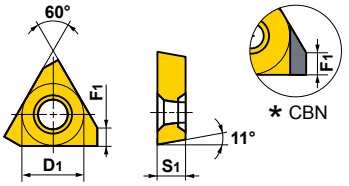
METRIC Standard

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 ① ②	Insert
	R		D1	L1	D9	L7	D8	W1	L8	D4	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
06306A22R	●	6	63	63	22	20	18	10.4	6.3	60	5000	10100	PMFA13R	TS254	TSS04005	HBH06012	TKY08F	HKY40R	②HSC10050	
08008A27R	●	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) D1	S1	F1	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)	

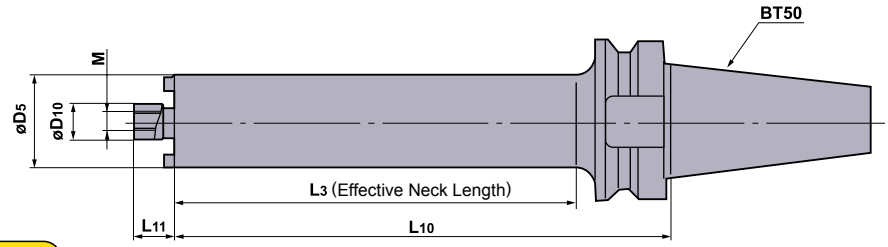
	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed per Tooth (inch/tooth)
K	Dactile Cast Iron	Tensile Strength ≤500MPa	**AP10H**	820 (490–1150)	.004 (.002–.006)
			MB710	3280 (2625–3940)	
		Tensile Strength ≤800MPa	**AP10H**	655 (330–985)	.004 (.002–.006)
			MB710	3280 (2625–3940)	

(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>

ARBORS ➤ K147

LONG ARBORS



METRIC Standard

Order Number	Stock	Dimensions (mm)						Mass (lbs)	Cutter
		D5	D10	L10	L11	L3	M		
BT50-22-250-050	▲	47	22	250	18	202	M10	14.3	PMF05004A22R, PMR405003A22R
22-250-063	▲	60	22	250	18	202	M10	18.7	PMF06306A22R, PMR406304A22R
27-300-080	▲	75	27	300	22	252	M12	27.6	PMF08008A27R, PMR408005A27R
22.225-250-050	▲	47	22.225	250	17	202	M10	14.3	PMR405003BR

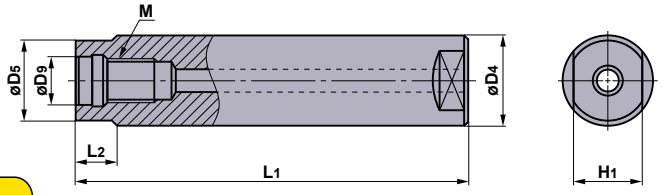
▲ : This item to be discontinued within two years.

PMF	➤ K146	SPARE PARTS	➤ M001
PMR	➤ K145	TECHNICAL DATA	➤ N001

SCREW-IN ARBORS

STRAIGHT SHANK ARBOR

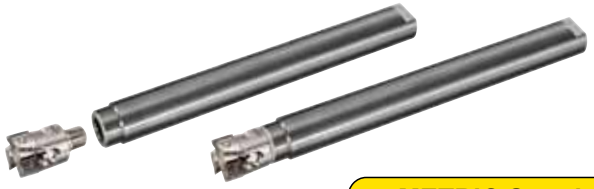


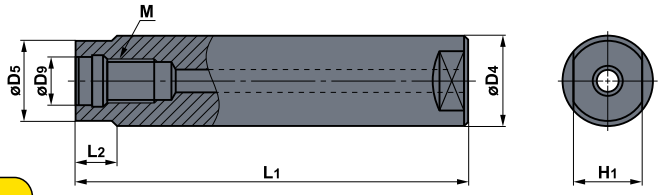


STEEL SHANK TYPE

METRIC Standard

Type	Order Number	Stock	Coolant Thru *	Dimensions (mm)							Mass (kg)
				D9	D4	D5	L1	L2	H1	M	
Steel Shank	SC16M08S100S	★	Y	8.5	16	14.5	100	10	10	M8	0.1
	08S200L	★	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
	10S220L	★	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
	12S245L	★	Y	12.5	25	23.5	245	10	19	M12	0.8
	SC32M16S140S	★	Y	17	32	28.5	140	15	24	M16	0.8
	16S280L	★	Y	17	32	28.5	280	15	24	M16	1.6





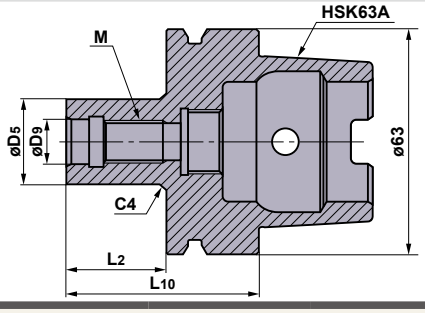
CARBIDE SHANK TYPE

METRIC Standard

Type	Order Number	Stock	Coolant Thru *	Dimensions (mm)							Mass (kg)
				D9	D4	D5	L1	L2	H1	M	
Carbide Shank	SC16M08S100SW	★	Y	8.5	16	14.5	100	10	10	M8	0.2
	08S200LW	★	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
	10S220LW	★	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
	12S245LW	★	Y	12.5	25	23.5	245	10	19	M12	1.5
	SC32M16S140SW	★	Y	17	32	28.5	140	15	24	M16	1.4
	16S280LW	★	Y	17	32	28.5	280	15	24	M16	2.8

HSK SHANK ARBOR





HSK63A SHANK ARBOR

METRIC Standard

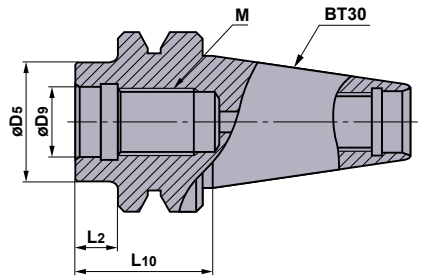
Order Number	Stock	Coolant Thru *	Dimensions (mm)					Mass (kg)
			D9	D5	L10	L2	M	
SC16M08S22-HSK63A	★	Y	8.5	14.5	48	22	M8	0.7
20M10S24-HSK63A	★	Y	10.5	18.5	50	24	M10	0.7
25M12S27-HSK63A	★	Y	12.5	23.5	53	27	M12	0.7
32M16S28-HSK63A	★	Y	17.0	28.5	54	28	M16	0.8

*1 Y=Yes

★ : Inventory maintained in Japan.

BT SHANK ARBOR





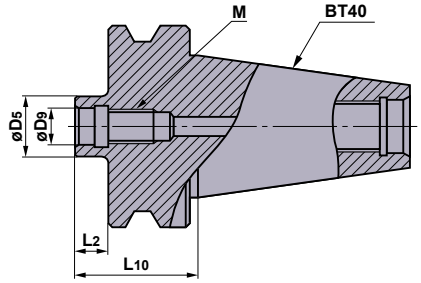
BT30 SHANK ARBOR

METRIC Standard

Order Number	Stock	Coolant Thru *	Dimensions (mm)					Mass (kg)
			D9	D5	L10	L2	M	
SC16M08S10-BT30	★	Y	8.5	14.5	32	10	M8	0.4
20M10S10-BT30	★	Y	10.5	18.5	32	10	M10	0.4
25M12S10-BT30	★	Y	12.5	23.5	32	10	M12	0.4
32M16S10-BT30	★	Y	17.0	28.5	32	10	M16	0.4

*1 Y=Yes





BT40 SHANK ARBOR

METRIC Standard

Order Number	Stock	Coolant Thru *	Dimensions (mm)					Mass (kg)
			D9	D5	L10	L2	M	
SC16M08S10-BT40	★	Y	8.5	14.5	37	10	M8	1.0
20M10S10-BT40	★	Y	10.5	18.5	37	10	M10	1.0
25M12S10-BT40	★	Y	12.5	23.5	37	10	M12	1.0
32M16S10-BT40	★	Y	17.0	28.5	37	10	M16	1.0

*1 Y=Yes

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	ASX445		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)
2.0"	18000	31			13000	71
2.5"	16000	31			12000	71
3.0"	14000	31	9200	53	11000	71
4.0"	13000	31	7700	53	9300	71
5.0"	12000	31	6500	53	8300	71
6.0"	10000	31	5500	53	7200	71
8.0"	9000	31	4000	53	6400	71
10.0"	8000	31	2800	53		
12.0"			1900	53		

Diameter	ASX400		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)
1.0"					38000	35		
1.25"			41000	31	33000	35		
1.5"			36000	31	29000	35		
2.0"	18000	31	30000	31	24000	35	12700	8.9
2.5"	16000	31	25000	31	21000	35	10100	8.9
3.0"	14000	31	23000	31	19000	35	7900	8.9
4.0"	13000	31	19000	31	16000	35		
5.0"	12000	31	16000	31				
6.0"	10000	31						
8.0"	9000	31						
10.0"	8000	31						
12.0"								

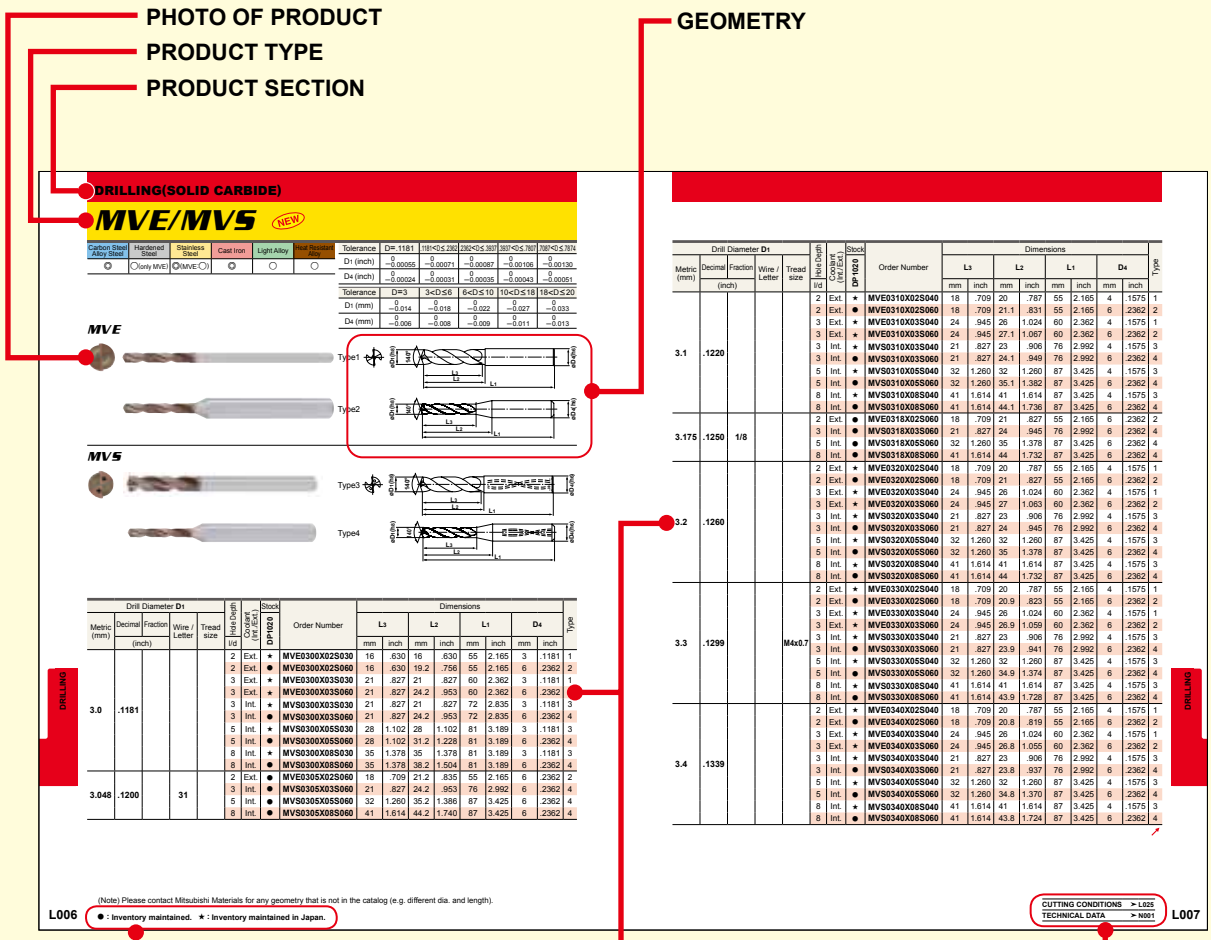
All values shown on this chart are based on the insert being properly seated in pocket and torqued to the recommended values.
(Note) You need to balance the tool and holder together so that it confirms to G40 or higher standards.

Memo

GUIDE TO DRILLING TOOLS

●Section organization

①Organized according to cutting mode for drilling. (Refer to DRILL LIST.)



●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

MVS/MVE DRILLS ····· L006
MWE/MWS DRILLS ····· L030
MMS DRILLS ····· L082
MHS DRILLS ····· L092
MNS DRILLS ····· L106
MSE DRILLS ····· L115
MSP DRILLS ····· L118
MAS/MAE DRILLS ····· L120
MZE/MZS DRILLS ····· L130
MZS STEP DRILLS ····· L137
MZE/MZS DRILLS (FOR TUBE SHEET) ····· L138
MICRO-MZE/MZS DRILLS ····· L140
MICRO-MGS DRILLS (SOLID GUN DRILLS) ····· L148
DRILLS FOR WHEEL HUB ····· L151
MCS DRILLS ····· L152

●INDEXABLE TYPE

MVX DRILLS ····· L154
TAF DRILLS ····· L158
STAW DRILLS ····· L168
TAW DRILLS ····· L178
TAW CHAMFER RING ····· L196

●BRAZED TYPE

BRA DRILLS ····· L198
BRS DRILLS ····· L200

*Arranged by Alphabetical order

L198 **BRA (INCH)**
L200 **BRS (INCH)**
L122 **MAE (METRIC)**
L120 **MAS (INCH)**
L122 **MAS (METRIC)**
L152 **MCS (INCH)**
L149 **MGD (INCH)**
L148 **MGS (METRIC)**
L151 **MHE**
L094 **MHS (METRIC)**
L082 **MMS (INCH/METRIC)**
L106 **MNS (METRIC)**
L115 **MSE (METRIC)**
L118 **MSP (METRIC)**
L006 **MVE (INCH/METRIC)**
L006 **MVS (INCH/METRIC)**
L154 **MVX (METRIC)**
L030 **MWE (INCH/METRIC)**
L030 **MWS (INCH/METRIC)**
L128 **MZE (INCH)**
L130 **MZE (METRIC)**
L140 **MZE (MICRO, INCH)**
L141 **MZE (MICRO, METRIC)**
L128 **MZS (INCH)**
L130 **MZS (METRIC)**
L140 **MZS (MICRO, INCH)**
L141 **MZS (MICRO, METRIC)**
L137 **MZS (STEP DRILL, METRIC)**
L168 **STAW (METRIC)**
L158 **TAF (INCH)**
L161 **TAF (METRIC)**
L178 **TAW (INCH)**
L184 **TAW (METRIC)**

DRILL SELECTION CHART

Drill Structure	Category	Drill Type	Product Code	Coolant	Hole Depth (l/d) INCH	Hole Depth (l/d) METRIC	Range of Size	Work Material P Carbon Steel Alloy Steel	Work Material H Hardened Steel	Work Material M Stainless Steel	Work Material K Cast Iron	Work Material N Light Alloy	Work Material S Heat-resistant Alloy	Page Dimensions	Page Cutting Conditions	Shape
Solid Carbide	For Micro Size Hole (≤ϕ.1200", ϕ2.95mm)	General Use	MWS	Internal	1 5 12	1 5 12 20 25 30	**INCH** ϕ.0200"—ϕ.1200" **METRIC** ϕ0.5—ϕ2.95 mm	◎		◎	◎	○	○	L031	L074	
			MZE	External	2	2 3	**INCH** ϕ.0394"—ϕ.1200" **METRIC** ϕ1.0—ϕ2.9 mm	◎	○	○	◎	○	○	L140 L141	L143	
			MZS	Internal	5	3 5	**INCH** ϕ.0394"—ϕ.1200" **METRIC** ϕ1.0—ϕ2.9 mm	◎		◎	◎	○	○	L140 L141	L146	
			MSE	External	—	5	**METRIC** ϕ0.1—ϕ0.99 mm	◎	○	○	◎	○	○	L115	L116	
		Starter Drill for MSE Type	MSP	External	—	—	**METRIC** ϕ0.1—ϕ0.99 mm	◎	◎	◎	◎	◎	○	L118	—	
	For General Size Hole (≥ϕ.1200", ϕ3.0mm)	New Generation	NEW MVE	External	2 3	2 3	**INCH** ϕ.1200"—ϕ.4685" **METRIC** ϕ3.0—ϕ12.0 mm	◎	○	○	◎	○	○	L006	L025	
			NEW MVS	Internal	3 5 8	3 5 8	**INCH** ϕ.1200"—ϕ.4685" **METRIC** ϕ3.0—ϕ12.0 mm	◎		◎	◎	○	○	L006	L027	
		General Use	MWE	External	—	2 3	**METRIC** ϕ3.0—ϕ20.0 mm	◎	○	○	◎	○	○	L040	L072	
			MWS	Internal	5 8	3 5 8	**INCH** ϕ.1250"—ϕ.7812" **METRIC** ϕ3.0—ϕ25.0 mm	◎		◎	◎	○	○	L041 L040	L074	
			MZE	External	2 3	2 3	**INCH** ϕ.1250"—ϕ.7812" **METRIC** ϕ3.0—ϕ20.0 mm	◎	○	○	◎	○	○	L128 L130	L143	
			MZS	Internal	3 5	3 5	**INCH** ϕ.1250"—ϕ.7812" **METRIC** ϕ3.0—ϕ20.0 mm	◎		◎	◎	○	○	L128 L130	L146	
		Step Drill	MZS	Internal	—	3	**METRIC** ϕ4.3—ϕ8.5 mm	◎		◎	◎	○	○	L137	L146	

Drill Structure	Category	Drill Type	Product Code	Coolant	Hole Depth (l/d) INCH	Hole Depth (l/d) METRIC	Range of Size	Work Material P Carbon Steel Alloy Steel	Work Material H Hardened Steel	Work Material M Stainless Steel	Work Material K Cast Iron	Work Material N Light Alloy	Work Material S Heat-resistant Alloy	Page Dimensions	Page Cutting Conditions	Shape
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	◎		◎	◎	○	○	L041 L040	L076	
		Solid Gun Drill	MGS	Internal	—	20 – 80	**METRIC** ϕ0.7−ϕ3.0 mm	◎	○	◎	◎	◎	○	L148	L149	
	For Stainless Steel	2 coolant holes	MMS	Internal	—	3 5	**METRIC** ϕ3.0−ϕ20.0 mm			◎				L082	L091	
	For Aluminum or Cast Iron	Helix Angle (10°)	MAE	External	—	3	**METRIC** ϕ3.0−ϕ16.0 mm				○	◎		L122	L127	
			MAS	Internal	3	3 6	**INCH** ϕ.1250"−ϕ.7812" **METRIC** ϕ3.0−ϕ16.0 mm				○	◎		L120 L122	L121 L127	
		4 coolant holes	MNS	Internal	—	5 10 20 30	**METRIC** ϕ3.0−ϕ14.0 mm					◎		L106	L111	
		General Use	MZE (HTi10)	External	—	2 3	**METRIC** ϕ3.0−ϕ20.0 mm				○	◎		L130	L143	
	For Hardened Steel	General Use	MHS	Internal	—	1 – 30	**METRIC** ϕ0.95−ϕ12.0 mm		◎					L094	L103	
	For Wheel Hub	Low Cutting Resistance	MHE	External	1	—	**INCH** ϕ.394"−ϕ.591"	◎						L151	L151	
	For CFRP	CVD Diamond Coating	MCS	Internal	—	3	**INCH** ϕ.1719"−ϕ.5010"	For CFRP						L152	L153	

DRILL SELECTION CHART

Drill Structure	Category	Drill Type	Product Code	Coolant	Hole Depth (l/d) INCH	Hole Depth (l/d) METRIC	Range of Size	Work Material P Carbon Steel Alloy Steel	Work Material H Hardened Steel	Work Material M Stainless Steel	Work Material K Cast Iron	Work Material N Light Alloy	Work Material S Heat-resistant Alloy	Page Dimensions	Page Cutting Conditions	Shape
Indexable	For General Use	Indexable Head	STAW	Internal	—	1.5 3 5 8	**METRIC** ϕ10.0—ϕ18.4 mm	◎		○	◎	○		L168	L176	
			TAW	Internal	3 5 8	3 5 8	**INCH** ϕ.5625"—ϕ1.1875" **METRIC** ϕ14.0—ϕ30.0 mm	◎		◎	◎			L178 L184	L189	
		Multi-corner Insert	TAF	Internal	2 3 4	2 3 4	**INCH** ϕ.468"—ϕ2.250" **METRIC** ϕ12.0—ϕ56.0 mm	◎		◎	◎	◎		L158 L161	L166	
	New Generation		NEW MVX	Internal	—	2 — 6	**METRIC** ϕ17.0—ϕ33.0 mm	◎		○	◎			L154	L157	
Brazed	For General Use	New Point Type	BRA	Internal	3	3	**INCH** ϕ.3125"—ϕ1.250" **METRIC** ϕ8.0—ϕ30.0 mm	◎		○	○			L198 L199	L199	
		High Helix (30°)	BRS	Internal	3	3	**INCH** ϕ.5000"—ϕ1.1875" **METRIC** ϕ14.0—ϕ30.0 mm	◎		◎	○			L200 L201	L201	

Memo

MVE/MVS NEW

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎	○(only MVE)	◎(MVE:○)	◎	○	○

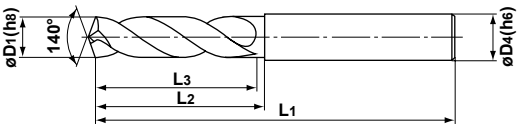
Tolerance	D=.1181	.1181<D≤.2362	.2362<D≤.3937	.3937<D≤.7807	.7087<D≤.7874
D1 (inch)	0 −0.00055	0 −0.00071	0 −0.00087	0 −0.00106	0 −0.00130
D4 (inch)	0 −0.00024	0 −0.00031	0 −0.00035	0 −0.00043	0 −0.00051

Tolerance	D=3	3<D≤6	6<D≤10	10<D≤18	18<D≤20
D1 (mm)	0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
D4 (mm)	0 −0.006	0 −0.008	0 −0.009	0 −0.011	0 −0.013

MVE

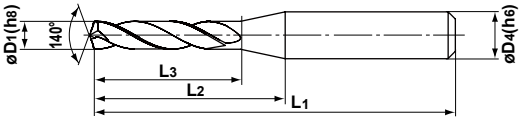


Type1





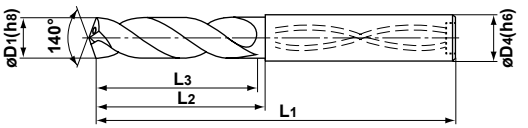
Type2



MVS

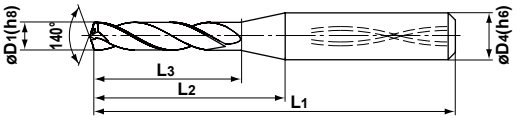


Type3





Type4



Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP1020		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
3.0	.1181				2	Ext.	★	MVE0300X02S030	16	.630	16	.630	55	2.165	3	.1181	1
					2	Ext.	●	MVE0300X02S060	16	.630	19.2	.756	55	2.165	6	.2362	2
					3	Ext.	★	MVE0300X03S030	21	.827	21	.827	60	2.362	3	.1181	1
					3	Ext.	★	MVE0300X03S060	21	.827	24.2	.953	60	2.362	6	.2362	2
					3	Int.	★	MVS0300X03S030	21	.827	21	.827	72	2.835	3	.1181	3
					3	Int.	●	MVS0300X03S060	21	.827	24.2	.953	72	2.835	6	.2362	4
					5	Int.	★	MVS0300X05S030	28	1.102	28	1.102	81	3.189	3	.1181	3
					5	Int.	●	MVS0300X05S060	28	1.102	31.2	1.228	81	3.189	6	.2362	4
					8	Int.	★	MVS0300X08S030	35	1.378	35	1.378	81	3.189	3	.1181	3
					8	Int.	●	MVS0300X08S060	35	1.378	38.2	1.504	81	3.189	6	.2362	4
3.048	.1200		31		2	Ext.	●	MVE0305X02S060	18	.709	21.2	.835	55	2.165	6	.2362	2
					3	Int.	●	MVS0305X03S060	21	.827	24.2	.953	76	2.992	6	.2362	4
					5	Int.	●	MVS0305X05S060	32	1.260	35.2	1.386	87	3.425	6	.2362	4
					8	Int.	●	MVS0305X08S060	41	1.614	44.2	1.740	87	3.425	6	.2362	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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP1020		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
3.1	.1220				2	Ext.	★	MVE0310X02S040	18	.709	20	.787	55	2.165	4	.1575	1
					2	Ext.	●	MVE0310X02S060	18	.709	21.1	.831	55	2.165	6	.2362	2
					3	Ext.	★	MVE0310X03S040	24	.945	26	1.024	60	2.362	4	.1575	1
					3	Ext.	★	MVE0310X03S060	24	.945	27.1	1.067	60	2.362	6	.2362	2
					3	Int.	★	MVS0310X03S040	21	.827	23	.906	76	2.992	4	.1575	3
					3	Int.	●	MVS0310X03S060	21	.827	24.1	.949	76	2.992	6	.2362	4
					5	Int.	★	MVS0310X05S040	32	1.260	32	1.260	87	3.425	4	.1575	3
					5	Int.	●	MVS0310X05S060	32	1.260	35.1	1.382	87	3.425	6	.2362	4
					8	Int.	★	MVS0310X08S040	41	1.614	41	1.614	87	3.425	4	.1575	3
					8	Int.	●	MVS0310X08S060	41	1.614	44.1	1.736	87	3.425	6	.2362	4
3.175	.1250	1/8			2	Ext.	●	MVE0318X02S060	18	.709	21	.827	55	2.165	6	.2362	2
					3	Int.	●	MVS0318X03S060	21	.827	24	.945	76	2.992	6	.2362	4
					5	Int.	●	MVS0318X05S060	32	1.260	35	1.378	87	3.425	6	.2362	4
					8	Int.	●	MVS0318X08S060	41	1.614	44	1.732	87	3.425	6	.2362	4
3.2	.1260				2	Ext.	★	MVE0320X02S040	18	.709	20	.787	55	2.165	4	.1575	1
					2	Ext.	●	MVE0320X02S060	18	.709	21	.827	55	2.165	6	.2362	2
					3	Ext.	★	MVE0320X03S040	24	.945	26	1.024	60	2.362	4	.1575	1
					3	Ext.	★	MVE0320X03S060	24	.945	27	1.063	60	2.362	6	.2362	2
					3	Int.	★	MVS0320X03S040	21	.827	23	.906	76	2.992	4	.1575	3
					3	Int.	●	MVS0320X03S060	21	.827	24	.945	76	2.992	6	.2362	4
					5	Int.	★	MVS0320X05S040	32	1.260	32	1.260	87	3.425	4	.1575	3
					5	Int.	●	MVS0320X05S060	32	1.260	35	1.378	87	3.425	6	.2362	4
					8	Int.	★	MVS0320X08S040	41	1.614	41	1.614	87	3.425	4	.1575	3
					8	Int.	●	MVS0320X08S060	41	1.614	44	1.732	87	3.425	6	.2362	4
3.3	.1299			M4x0.7	2	Ext.	★	MVE0330X02S040	18	.709	20	.787	55	2.165	4	.1575	1
					2	Ext.	●	MVE0330X02S060	18	.709	20.9	.823	55	2.165	6	.2362	2
					3	Ext.	★	MVE0330X03S040	24	.945	26	1.024	60	2.362	4	.1575	1
					3	Ext.	★	MVE0330X03S060	24	.945	26.9	1.059	60	2.362	6	.2362	2
					3	Int.	★	MVS0330X03S040	21	.827	23	.906	76	2.992	4	.1575	3
					3	Int.	●	MVS0330X03S060	21	.827	23.9	.941	76	2.992	6	.2362	4
					5	Int.	★	MVS0330X05S040	32	1.260	32	1.260	87	3.425	4	.1575	3
					5	Int.	●	MVS0330X05S060	32	1.260	34.9	1.374	87	3.425	6	.2362	4
					8	Int.	★	MVS0330X08S040	41	1.614	41	1.614	87	3.425	4	.1575	3
					8	Int.	●	MVS0330X08S060	41	1.614	43.9	1.728	87	3.425	6	.2362	4
3.4	.1339				2	Ext.	★	MVE0340X02S040	18	.709	20	.787	55	2.165	4	.1575	1
					2	Ext.	●	MVE0340X02S060	18	.709	20.8	.819	55	2.165	6	.2362	2
					3	Ext.	★	MVE0340X03S040	24	.945	26	1.024	60	2.362	4	.1575	1
					3	Ext.	★	MVE0340X03S060	24	.945	26.8	1.055	60	2.362	6	.2362	2
					3	Int.	★	MVS0340X03S040	21	.827	23	.906	76	2.992	4	.1575	3
					3	Int.	●	MVS0340X03S060	21	.827	23.8	.937	76	2.992	6	.2362	4
					5	Int.	★	MVS0340X05S040	32	1.260	32	1.260	87	3.425	4	.1575	3
					5	Int.	●	MVS0340X05S060	32	1.260	34.8	1.370	87	3.425	6	.2362	4
					8	Int.	★	MVS0340X08S040	41	1.614	41	1.614	87	3.425	4	.1575	3
					8	Int.	●	MVS0340X08S060	41	1.614	43.8	1.724	87	3.425	6	.2362	4

CUTTING CONDITIONS ➤ L025
TECHNICAL DATA ➤ N001

MVE/MVS NEW

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP1020		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
3.5	.1378				2	Ext.	★	MVE0350X02S040	18	.709	20	.787	55	2.165	4	.1575	1
					2	Ext.	●	MVE0350X02S060	18	.709	20.7	.815	55	2.165	6	.2362	2
					3	Ext.	★	MVE0350X03S040	24	.945	26	1.024	60	2.362	4	.1575	1
					3	Ext.	★	MVE0350X03S060	24	.945	26.7	1.051	60	2.362	6	.2362	2
					3	Int.	★	MVS0350X03S040	21	.827	23	.906	76	2.992	4	.1575	3
					3	Int.	●	MVS0350X03S060	21	.827	23.7	.933	76	2.992	6	.2362	4
					5	Int.	★	MVS0350X05S040	32	1.260	32	1.260	87	3.425	4	.1575	3
					5	Int.	●	MVS0350X05S060	32	1.260	34.7	1.366	87	3.425	6	.2362	4
					8	Int.	★	MVS0350X08S040	41	1.614	41	1.614	87	3.425	4	.1575	3
					8	Int.	●	MVS0350X08S060	41	1.614	43.7	1.720	87	3.425	6	.2362	4
3.572	.1406	9/64			2	Ext.	●	MVE0357X02S060	20	.787	22.6	.890	55	2.165	6	.2362	2
					3	Int.	●	MVS0357X03S060	23	.906	25.6	1.008	80	3.150	6	.2362	4
					5	Int.	●	MVS0357X05S060	36	1.417	38.6	1.520	92	3.622	6	.2362	4
					8	Int.	●	MVS0357X08S060	46	1.811	48.6	1.913	92	3.622	6	.2362	4
3.6	.1417				2	Ext.	★	MVE0360X02S040	20	.787	20	.787	55	2.165	4	.1575	1
					2	Ext.	●	MVE0360X02S060	20	.787	22.6	.890	55	2.165	6	.2362	2
					3	Ext.	★	MVE0360X03S040	27	1.063	27	1.063	60	2.362	4	.1575	1
					3	Ext.	★	MVE0360X03S060	27	1.063	29.6	1.165	60	2.362	6	.2362	2
					3	Int.	★	MVS0360X03S040	23	.906	23	.906	80	3.150	4	.1575	3
					3	Int.	●	MVS0360X03S060	23	.906	25.6	1.008	80	3.150	6	.2362	4
					5	Int.	★	MVS0360X05S040	36	1.417	36	1.417	92	3.622	4	.1575	3
					5	Int.	●	MVS0360X05S060	36	1.417	38.6	1.520	92	3.622	6	.2362	4
					8	Int.	★	MVS0360X08S040	46	1.811	46	1.811	92	3.622	4	.1575	3
					8	Int.	●	MVS0360X08S060	46	1.811	48.6	1.913	92	3.622	6	.2362	4
3.7	.1457			M4.5x0.75	2	Ext.	★	MVE0370X02S040	20	.787	20	.787	55	2.165	4	.1575	1
					2	Ext.	●	MVE0370X02S060	20	.787	22.5	.886	55	2.165	6	.2362	2
					3	Ext.	★	MVE0370X03S040	27	1.063	27	1.063	60	2.362	4	.1575	1
					3	Ext.	★	MVE0370X03S060	27	1.063	29.5	1.161	60	2.362	6	.2362	2
					3	Int.	★	MVS0370X03S040	23	.906	23	.906	80	3.150	4	.1575	3
					3	Int.	●	MVS0370X03S060	23	.906	25.5	1.004	80	3.150	6	.2362	4
					5	Int.	★	MVS0370X05S040	36	1.417	36	1.417	92	3.622	4	.1575	3
					5	Int.	●	MVS0370X05S060	36	1.417	38.5	1.516	92	3.622	6	.2362	4
					8	Int.	★	MVS0370X08S040	46	1.811	46	1.811	92	3.622	4	.1575	3
					8	Int.	●	MVS0370X08S060	46	1.811	48.5	1.909	92	3.622	6	.2362	4
3.8	.1496		25	#10-24	2	Ext.	★	MVE0380X02S040	20	.787	20	.787	55	2.165	4	.1575	1
					2	Ext.	●	MVE0380X02S060	20	.787	22.4	.882	55	2.165	6	.2362	2
					3	Ext.	★	MVE0380X03S040	27	1.063	27	1.063	60	2.362	4	.1575	1
					3	Ext.	★	MVE0380X03S060	27	1.063	29.4	1.157	60	2.362	6	.2362	2
					3	Int.	★	MVS0380X03S040	23	.906	23	.906	80	3.150	4	.1575	3
					3	Int.	●	MVS0380X03S060	23	.906	25.4	1.000	80	3.150	6	.2362	4
					5	Int.	★	MVS0380X05S040	36	1.417	36	1.417	92	3.622	4	.1575	3
					5	Int.	●	MVS0380X05S060	36	1.417	38.4	1.512	92	3.622	6	.2362	4
					8	Int.	★	MVS0380X08S040	46	1.811	46	1.811	92	3.622	4	.1575	3
					8	Int.	●	MVS0380X08S060	46	1.811	48.4	1.906	92	3.622	6	.2362	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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP1020		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
3.9	.1535				2	Ext.	★	MVE0390X02S040	20	.787	20	.787	55	2.165	4	.1575	1
					2	Ext.	●	MVE0390X02S060	20	.787	22.3	.878	55	2.165	6	.2362	2
					3	Ext.	★	MVE0390X03S040	27	1.063	27	1.063	60	2.362	4	.1575	1
					3	Ext.	★	MVE0390X03S060	27	1.063	29.3	1.154	60	2.362	6	.2362	2
					3	Int.	★	MVS0390X03S040	23	.906	23	.906	80	3.150	4	.1575	3
					3	Int.	●	MVS0390X03S060	23	.906	25.3	.996	80	3.150	6	.2362	4
					5	Int.	★	MVS0390X05S040	36	1.417	36	1.417	92	3.622	4	.1575	3
					5	Int.	●	MVS0390X05S060	36	1.417	38.3	1.508	92	3.622	6	.2362	4
					8	Int.	★	MVS0390X08S040	46	1.811	46	1.811	92	3.622	4	.1575	3
					8	Int.	●	MVS0390X08S060	46	1.811	48.3	1.902	92	3.622	6	.2362	4
3.969	.1562	5/32			2	Ext.	●	MVE0397X02S060	20	.787	22.2	.874	55	2.165	6	.2362	2
					3	Int.	●	MVS0397X03S060	23	.906	25.2	.992	80	3.150	6	.2362	4
					5	Int.	●	MVS0397X05S060	36	1.417	38.2	1.504	92	3.622	6	.2362	4
					8	Int.	●	MVS0397X08S060	46	1.811	48.2	1.898	92	3.622	6	.2362	4
4.0	.1575				2	Ext.	★	MVE0400X02S040	20	.787	20	.787	55	2.165	4	.1575	1
					2	Ext.	●	MVE0400X02S060	20	.787	22.1	.870	55	2.165	6	.2362	2
					3	Ext.	★	MVE0400X03S040	27	1.063	27	1.063	60	2.362	4	.1575	1
					3	Ext.	★	MVE0400X03S060	27	1.063	29.1	1.146	60	2.362	6	.2362	2
					3	Int.	★	MVS0400X03S040	23	.906	23	.906	80	3.150	4	.1575	3
					3	Int.	●	MVS0400X03S060	23	.906	25.1	.988	80	3.150	6	.2362	4
					5	Int.	★	MVS0400X05S040	36	1.417	36	1.417	92	3.622	4	.1575	3
					5	Int.	●	MVS0400X05S060	36	1.417	38.1	1.500	92	3.622	6	.2362	4
					8	Int.	★	MVS0400X08S040	46	1.811	46	1.811	92	3.622	4	.1575	3
					8	Int.	●	MVS0400X08S060	46	1.811	48.1	1.894	92	3.622	6	.2362	4
4.039	.1590		21	#10-32	2	Ext.	●	MVE0404X02S060	22	.866	24.1	.949	62	2.441	6	.2362	2
					3	Int.	●	MVS0404X03S060	25	.984	27.1	1.067	86	3.386	6	.2362	4
					5	Int.	●	MVS0404X05S060	40	1.575	42.1	1.657	100	3.937	6	.2362	4
					8	Int.	●	MVS0404X08S060	52	2.047	54.1	2.130	100	3.937	6	.2362	4
4.1	.1614				2	Ext.	★	MVE0410X02S050	22	.866	24	.945	62	2.441	5	.1969	1
					2	Ext.	●	MVE0410X02S060	22	.866	24	.945	62	2.441	6	.2362	2
					3	Ext.	★	MVE0410X03S050	29	1.142	31	1.220	68	2.677	5	.1969	1
					3	Ext.	★	MVE0410X03S060	29	1.142	31	1.220	68	2.677	6	.2362	2
					3	Int.	★	MVS0410X03S050	25	.984	25	.984	86	3.386	5	.1969	3
					3	Int.	●	MVS0410X03S060	25	.984	27	1.063	86	3.386	6	.2362	4
					5	Int.	★	MVS0410X05S050	40	1.575	40	1.575	100	3.937	5	.1969	3
					5	Int.	●	MVS0410X05S060	40	1.575	42	1.654	100	3.937	6	.2362	4
					8	Int.	★	MVS0410X08S050	52	2.047	52	2.047	100	3.937	5	.1969	3
					8	Int.	●	MVS0410X08S060	52	2.047	54	2.126	100	3.937	6	.2362	4

CUTTING CONDITIONS ➤ L025
TECHNICAL DATA ➤ N001

MVE/MVS NEW

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP1020		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
4.2	.1654			M5x0.8	2	Ext.	★	MVE0420X02S050	22	.866	24	.945	62	2.441	5	.1969	1
					2	Ext.	●	MVE0420X02S060	22	.866	23.9	.941	62	2.441	6	.2362	2
					3	Ext.	★	MVE0420X03S050	29	1.142	31	1.220	68	2.677	5	.1969	1
					3	Ext.	★	MVE0420X03S060	29	1.142	30.9	1.217	68	2.677	6	.2362	2
					3	Int.	★	MVS0420X03S050	25	.984	25	.984	86	3.386	5	.1969	3
					3	Int.	●	MVS0420X03S060	25	.984	26.9	1.059	86	3.386	6	.2362	4
					5	Int.	★	MVS0420X05S050	40	1.575	40	1.575	100	3.937	5	.1969	3
					5	Int.	●	MVS0420X05S060	40	1.575	41.9	1.650	100	3.937	6	.2362	4
					8	Int.	★	MVS0420X08S050	52	2.047	52	2.047	100	3.937	5	.1969	3
					8	Int.	●	MVS0420X08S060	52	2.047	53.9	2.122	100	3.937	6	.2362	4
4.3	.1693				2	Ext.	★	MVE0430X02S050	22	.866	24	.945	62	2.441	5	.1969	1
					2	Ext.	●	MVE0430X02S060	22	.866	23.8	.937	62	2.441	6	.2362	2
					3	Ext.	★	MVE0430X03S050	29	1.142	31	1.220	68	2.677	5	.1969	1
					3	Ext.	★	MVE0430X03S060	29	1.142	30.8	1.213	68	2.677	6	.2362	2
					3	Int.	★	MVS0430X03S050	25	.984	25	.984	86	3.386	5	.1969	3
					3	Int.	●	MVS0430X03S060	25	.984	26.8	1.055	86	3.386	6	.2362	4
					5	Int.	★	MVS0430X05S050	40	1.575	40	1.575	100	3.937	5	.1969	3
					5	Int.	●	MVS0430X05S060	40	1.575	41.8	1.646	100	3.937	6	.2362	4
					8	Int.	★	MVS0430X08S050	52	2.047	52	2.047	100	3.937	5	.1969	3
					8	Int.	●	MVS0430X08S060	52	2.047	53.8	2.118	100	3.937	6	.2362	4
4.366	.1719	11/64			2	Ext.	●	MVE0437X02S060	22	.866	23.8	.937	62	2.441	6	.2362	2
					3	Int.	●	MVS0437X03S060	25	.984	26.8	1.055	86	3.386	6	.2362	4
					5	Int.	●	MVS0437X05S060	40	1.575	41.8	1.646	100	3.937	6	.2362	4
					8	Int.	●	MVS0437X08S060	52	2.047	53.8	2.118	100	3.937	6	.2362	4
4.4	.1732				2	Ext.	★	MVE0440X02S050	22	.866	24	.945	62	2.441	5	.1969	1
					2	Ext.	●	MVE0440X02S060	22	.866	23.7	.933	62	2.441	6	.2362	2
					3	Ext.	★	MVE0440X03S050	29	1.142	31	1.220	68	2.677	5	.1969	1
					3	Ext.	★	MVE0440X03S060	29	1.142	30.7	1.209	68	2.677	6	.2362	2
					3	Int.	★	MVS0440X03S050	25	.984	25	.984	86	3.386	5	.1969	3
					3	Int.	●	MVS0440X03S060	25	.984	26.7	1.051	86	3.386	6	.2362	4
					5	Int.	★	MVS0440X05S050	40	1.575	40	1.575	100	3.937	5	.1969	3
					5	Int.	●	MVS0440X05S060	40	1.575	41.7	1.642	100	3.937	6	.2362	4
					8	Int.	★	MVS0440X08S050	52	2.047	52	2.047	100	3.937	5	.1969	3
					8	Int.	●	MVS0440X08S060	52	2.047	53.7	2.114	100	3.937	6	.2362	4
4.5	.1772		16	#12-24	2	Ext.	★	MVE0450X02S050	22	.866	24	.945	62	2.441	5	.1969	1
					2	Ext.	●	MVE0450X02S060	22	.866	23.6	.929	62	2.441	6	.2362	2
					3	Ext.	★	MVE0450X03S050	29	1.142	31	1.220	68	2.677	5	.1969	1
					3	Ext.	★	MVE0450X03S060	29	1.142	30.6	1.205	68	2.677	6	.2362	2
					3	Int.	★	MVS0450X03S050	25	.984	25	.984	86	3.386	5	.1969	3
					3	Int.	●	MVS0450X03S060	25	.984	26.6	1.047	86	3.386	6	.2362	4
					5	Int.	★	MVS0450X05S050	40	1.575	40	1.575	100	3.937	5	.1969	3
					5	Int.	●	MVS0450X05S060	40	1.575	41.6	1.638	100	3.937	6	.2362	4
					8	Int.	★	MVS0450X08S050	52	2.047	52	2.047	100	3.937	5	.1969	3
					8	Int.	●	MVS0450X08S060	52	2.047	53.6	2.110	100	3.937	6	.2362	4

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

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Drill Diameter D_1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP1020		L_3		L_2		L_1		D_4		
									mm	inch	mm	inch	mm	inch	mm	inch	
4.6	.1811				2	Ext.	★	MVE0460X02S050	24	.945	24	.945	62	2.441	5	.1969	1
					2	Ext.	●	MVE0460X02S060	24	.945	27	1.063	62	2.441	6	.2362	1
					3	Ext.	★	MVE0460X03S050	32	1.260	32	1.260	68	2.677	5	.1969	1
					3	Ext.	★	MVE0460X03S060	32	1.260	35	1.378	68	2.677	6	.2362	1
					3	Int.	★	MVS0460X03S050	27.5	1.083	27.5	1.083	90	3.543	5	.1969	3
					3	Int.	●	MVS0460X03S060	27.5	1.083	30.5	1.201	90	3.543	6	.2362	3
					5	Int.	★	MVS0460X05S050	44	1.732	44	1.732	105	4.134	5	.1969	3
					5	Int.	●	MVS0460X05S060	44	1.732	47	1.850	105	4.134	6	.2362	3
					8	Int.	★	MVS0460X08S050	57	2.244	57	2.244	105	4.134	5	.1969	3
					8	Int.	●	MVS0460X08S060	57	2.244	60	2.362	105	4.134	6	.2362	3
4.7	.1850		13		2	Ext.	★	MVE0470X02S050	24	.945	24	.945	62	2.441	5	.1969	1
					2	Ext.	●	MVE0470X02S060	24	.945	27	1.063	62	2.441	6	.2362	1
					3	Ext.	★	MVE0470X03S050	32	1.260	32	1.260	68	2.677	5	.1969	1
					3	Ext.	★	MVE0470X03S060	32	1.260	35	1.378	68	2.677	6	.2362	1
					3	Int.	★	MVS0470X03S050	27.5	1.083	27.5	1.083	90	3.543	5	.1969	3
					3	Int.	●	MVS0470X03S060	27.5	1.083	30.5	1.201	90	3.543	6	.2362	3
					5	Int.	★	MVS0470X05S050	44	1.732	44	1.732	105	4.134	5	.1969	3
					5	Int.	●	MVS0470X05S060	44	1.732	47	1.850	105	4.134	6	.2362	3
					8	Int.	★	MVS0470X08S050	57	2.244	57	2.244	105	4.134	5	.1969	3
					8	Int.	●	MVS0470X08S060	57	2.244	60	2.362	105	4.134	6	.2362	3
4.763	.1875	3/16			2	Ext.	●	MVE0476X02S060	24	.945	25.3	.996	62	2.441	6	.2362	1
					3	Int.	●	MVS0476X03S060	27.5	1.083	28.8	1.134	90	3.543	6	.2362	1
					5	Int.	●	MVS0476X05S060	44	1.732	45.3	1.783	105	4.134	6	.2362	1
					8	Int.	●	MVS0476X08S060	57	2.244	58.3	2.295	105	4.134	6	.2362	1
4.8	.1890				2	Ext.	★	MVE0480X02S050	24	.945	24	.945	62	2.441	5	.1969	1
					2	Ext.	●	MVE0480X02S060	24	.945	27	1.063	62	2.441	6	.2362	1
					3	Ext.	★	MVE0480X03S050	32	1.260	32	1.260	68	2.677	5	.1969	1
					3	Ext.	★	MVE0480X03S060	32	1.260	35	1.378	68	2.677	6	.2362	1
					3	Int.	★	MVS0480X03S050	27.5	1.083	27.5	1.083	90	3.543	5	.1969	3
					3	Int.	●	MVS0480X03S060	27.5	1.083	30.5	1.201	90	3.543	6	.2362	3
					5	Int.	★	MVS0480X05S050	44	1.732	44	1.732	105	4.134	5	.1969	3
					5	Int.	●	MVS0480X05S060	44	1.732	47	1.850	105	4.134	6	.2362	3
					8	Int.	★	MVS0480X08S050	57	2.244	57	2.244	105	4.134	5	.1969	3
					8	Int.	●	MVS0480X08S060	57	2.244	60	2.362	105	4.134	6	.2362	3
4.9	.1929				2	Ext.	★	MVE0490X02S050	24	.945	24	.945	62	2.441	5	.1969	1
					2	Ext.	●	MVE0490X02S060	24	.945	27	1.063	62	2.441	6	.2362	1
					3	Ext.	★	MVE0490X03S050	32	1.260	32	1.260	68	2.677	5	.1969	1
					3	Ext.	★	MVE0490X03S060	32	1.260	35	1.378	68	2.677	6	.2362	1
					3	Int.	★	MVS0490X03S050	27.5	1.083	27.5	1.083	90	3.543	5	.1969	3
					3	Int.	●	MVS0490X03S060	27.5	1.083	30.5	1.201	90	3.543	6	.2362	3
					5	Int.	★	MVS0490X05S050	44	1.732	44	1.732	105	4.134	5	.1969	3
					5	Int.	●	MVS0490X05S060	44	1.732	47	1.850	105	4.134	6	.2362	3
					8	Int.	★	MVS0490X08S050	57	2.244	57	2.244	105	4.134	5	.1969	3
					8	Int.	●	MVS0490X08S060	57	2.244	60	2.362	105	4.134	6	.2362	3

CUTTING CONDITIONS ➤ L025
TECHNICAL DATA ➤ N001

MVE/MVS NEW

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP1020		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
5.0	.1969			M6x1.0	2	Ext.	★	MVE0500X02S050	24	.945	24	.945	62	2.441	5	.1969	1
					2	Ext.	●	MVE0500X02S060	24	.945	27	1.063	62	2.441	6	.2362	1
					3	Ext.	★	MVE0500X03S050	32	1.260	32	1.260	68	2.677	5	.1969	1
					3	Ext.	★	MVE0500X03S060	32	1.260	35	1.378	68	2.677	6	.2362	1
					3	Int.	★	MVS0500X03S050	27.5	1.083	27.5	1.083	90	3.543	5	.1969	3
					3	Int.	●	MVS0500X03S060	27.5	1.083	30.5	1.201	90	3.543	6	.2362	3
					5	Int.	★	MVS0500X05S050	44	1.732	44	1.732	105	4.134	5	.1969	3
					5	Int.	●	MVS0500X05S060	44	1.732	47	1.850	105	4.134	6	.2362	3
					8	Int.	★	MVS0500X08S050	57	2.244	57	2.244	105	4.134	5	.1969	3
					8	Int.	●	MVS0500X08S060	57	2.244	60	2.362	105	4.134	6	.2362	3
5.1	.2008		7	1/4-20	2	Ext.	●	MVE0510X02S060	26	1.024	28	1.102	66	2.598	6	.2362	1
					3	Ext.	★	MVE0510X03S060	34	1.339	36	1.417	74	2.913	6	.2362	1
					3	Int.	●	MVS0510X03S060	27.5	1.083	30	1.181	82	3.228	6	.2362	3
					5	Int.	●	MVS0510X05S060	44	1.732	48	1.890	100	3.937	6	.2362	3
					8	Int.	●	MVS0510X08S060	61	2.402	66	2.598	118	4.646	6	.2362	3
5.159	.2031	13/64			2	Ext.	●	MVE0516X02S060	26	1.024	26.9	1.059	66	2.598	6	.2362	1
					3	Int.	●	MVS0516X03S060	27.5	1.083	28.4	1.118	82	3.228	6	.2362	3
					5	Int.	●	MVS0516X05S060	44	1.732	44.9	1.768	100	3.937	6	.2362	3
					8	Int.	●	MVS0516X08S060	61	2.402	61.9	2.437	118	4.646	6	.2362	3
5.2	.2047				2	Ext.	●	MVE0520X02S060	26	1.024	28	1.102	66	2.598	6	.2362	1
					3	Ext.	★	MVE0520X03S060	34	1.339	36	1.417	74	2.913	6	.2362	1
					3	Int.	●	MVS0520X03S060	27.5	1.083	30	1.181	82	3.228	6	.2362	3
					5	Int.	●	MVS0520X05S060	44	1.732	48	1.890	100	3.937	6	.2362	3
					8	Int.	●	MVS0520X08S060	61	2.402	66	2.598	118	4.646	6	.2362	3
5.3	.2087				2	Ext.	●	MVE0530X02S060	26	1.024	28	1.102	66	2.598	6	.2362	1
					3	Ext.	★	MVE0530X03S060	34	1.339	36	1.417	74	2.913	6	.2362	1
					3	Int.	●	MVS0530X03S060	27.5	1.083	30	1.181	82	3.228	6	.2362	3
					5	Int.	●	MVS0530X05S060	44	1.732	48	1.890	100	3.937	6	.2362	3
					8	Int.	●	MVS0530X08S060	61	2.402	66	2.598	118	4.646	6	.2362	3
5.4	.2126		3	1/4-28	2	Ext.	●	MVE0540X02S060	26	1.024	28	1.102	66	2.598	6	.2362	1
					3	Ext.	★	MVE0540X03S060	34	1.339	36	1.417	74	2.913	6	.2362	1
					3	Int.	●	MVS0540X03S060	27.5	1.083	30	1.181	82	3.228	6	.2362	3
					5	Int.	●	MVS0540X05S060	44	1.732	48	1.890	100	3.937	6	.2362	3
					8	Int.	●	MVS0540X08S060	61	2.402	66	2.598	118	4.646	6	.2362	3
5.5	.2165				2	Ext.	●	MVE0550X02S060	26	1.024	28	1.102	66	2.598	6	.2362	1
					3	Ext.	★	MVE0550X03S060	34	1.339	36	1.417	74	2.913	6	.2362	1
					3	Int.	●	MVS0550X03S060	27.5	1.083	30	1.181	82	3.228	6	.2362	3
					5	Int.	●	MVS0550X05S060	44	1.732	48	1.890	100	3.937	6	.2362	3
					8	Int.	●	MVS0550X08S060	61	2.402	66	2.598	118	4.646	6	.2362	3
5.556	.2188	7/32			2	Ext.	●	MVE0556X02S060	28	1.102	28.5	1.122	66	2.598	6	.2362	1
					3	Int.	●	MVS0556X03S060	30	1.181	30.5	1.201	82	3.228	6	.2362	3
					5	Int.	●	MVS0556X05S060	48	1.890	48.5	1.909	100	3.937	6	.2362	3
					8	Int.	●	MVS0556X08S060	66	2.598	66.5	2.618	118	4.646	6	.2362	3
5.6	.2205				2	Ext.	●	MVE0560X02S060	28	1.102	28	1.102	66	2.598	6	.2362	1
					3	Ext.	★	MVE0560X03S060	36	1.417	36	1.417	74	2.913	6	.2362	1
					3	Int.	●	MVS0560X03S060	30	1.181	30	1.181	82	3.228	6	.2362	3
					5	Int.	●	MVS0560X05S060	48	1.890	48	1.890	100	3.937	6	.2362	3
					8	Int.	●	MVS0560X08S060	66	2.598	66	2.598	118	4.646	6	.2362	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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP1020		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
5.7	.2244				2	Ext.	●	MVE0570X02S060	28	1.102	28	1.102	66	2.598	6	.2362	1
					3	Ext.	★	MVE0570X03S060	36	1.417	36	1.417	74	2.913	6	.2362	1
					3	Int.	●	MVS0570X03S060	30	1.181	30	1.181	82	3.228	6	.2362	3
					5	Int.	●	MVS0570X05S060	48	1.890	48	1.890	100	3.937	6	.2362	3
					8	Int.	●	MVS0570X08S060	66	2.598	66	2.598	118	4.646	6	.2362	3
5.8	.2283		1		2	Ext.	●	MVE0580X02S060	28	1.102	28	1.102	66	2.598	6	.2362	1
					3	Ext.	★	MVE0580X03S060	36	1.417	36	1.417	74	2.913	6	.2362	1
					3	Int.	●	MVS0580X03S060	30	1.181	30	1.181	82	3.228	6	.2362	3
					5	Int.	●	MVS0580X05S060	48	1.890	48	1.890	100	3.937	6	.2362	3
					8	Int.	●	MVS0580X08S060	66	2.598	66	2.598	118	4.646	6	.2362	3
5.9	.2323				2	Ext.	●	MVE0590X02S060	28	1.102	28	1.102	66	2.598	6	.2362	1
					3	Ext.	★	MVE0590X03S060	36	1.417	36	1.417	74	2.913	6	.2362	1
					3	Int.	●	MVS0590X03S060	30	1.181	30	1.181	82	3.228	6	.2362	3
					5	Int.	●	MVS0590X05S060	48	1.890	48	1.890	100	3.937	6	.2362	3
					8	Int.	●	MVS0590X08S060	66	2.598	66	2.598	118	4.646	6	.2362	3
5.953	.2344	15/64			2	Ext.	●	MVE0595X02S060	28	1.102	28.1	1.106	66	2.598	6	.2362	1
					3	Int.	●	MVS0595X03S060	30	1.181	30.1	1.185	82	3.228	6	.2362	3
					5	Int.	●	MVS0595X05S060	48	1.890	48.1	1.894	100	3.937	6	.2362	3
					8	Int.	●	MVS0595X08S060	66	2.598	66.1	2.602	118	4.646	6	.2362	3
6.0	.2362			M7x1.0	2	Ext.	●	MVE0600X02S060	28	1.102	28	1.102	66	2.598	6	.2362	1
					3	Ext.	★	MVE0600X03S060	36	1.417	36	1.417	74	2.913	6	.2362	1
					3	Int.	●	MVS0600X03S060	30	1.181	30	1.181	82	3.228	6	.2362	3
					5	Int.	●	MVS0600X05S060	48	1.890	48	1.890	100	3.937	6	.2362	3
					8	Int.	●	MVS0600X08S060	66	2.598	66	2.598	118	4.646	6	.2362	3
6.1	.2402				2	Ext.	★	MVE0610X02S070	31	1.220	34	1.339	74	2.913	7	.2756	1
					2	Ext.	●	MVE0610X02S080	31	1.220	34	1.339	74	2.913	8	.3150	1
					3	Ext.	★	MVE0610X03S070	41	1.614	44	1.732	83	3.268	7	.2756	1
					3	Ext.	★	MVE0610X03S080	41	1.614	44	1.732	83	3.268	8	.3150	1
					3	Int.	★	MVS0610X03S070	32.5	1.280	35	1.378	88	3.465	7	.2756	3
					3	Int.	●	MVS0610X03S080	32.5	1.280	35	1.378	88	3.465	8	.3150	3
					5	Int.	★	MVS0610X05S070	52	2.047	56	2.205	109	4.291	7	.2756	3
					5	Int.	●	MVS0610X05S080	52	2.047	56	2.205	109	4.291	8	.3150	3
					8	Int.	★	MVS0610X08S070	72	2.835	77	3.031	130	5.118	7	.2756	3
					8	Int.	●	MVS0610X08S080	72	2.835	77	3.031	130	5.118	8	.3150	3
6.2	.2441				2	Ext.	★	MVE0620X02S070	31	1.220	34	1.339	74	2.913	7	.2756	1
					2	Ext.	●	MVE0620X02S080	31	1.220	34	1.339	74	2.913	8	.3150	1
					3	Ext.	★	MVE0620X03S070	41	1.614	44	1.732	83	3.268	7	.2756	1
					3	Ext.	★	MVE0620X03S080	41	1.614	44	1.732	83	3.268	8	.3150	1
					3	Int.	★	MVS0620X03S070	32.5	1.280	35	1.378	88	3.465	7	.2756	3
					3	Int.	●	MVS0620X03S080	32.5	1.280	35	1.378	88	3.465	8	.3150	3
					5	Int.	★	MVS0620X05S070	52	2.047	56	2.205	109	4.291	7	.2756	3
					5	Int.	●	MVS0620X05S080	52	2.047	56	2.205	109	4.291	8	.3150	3
					8	Int.	★	MVS0620X08S070	72	2.835	77	3.031	130	5.118	7	.2756	3
					8	Int.	●	MVS0620X08S080	72	2.835	77	3.031	130	5.118	8	.3150	3

CUTTING CONDITIONS ➤ L025
TECHNICAL DATA ➤ N001

MVE/MVS NEW

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP1020		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
6.3	.2480				2	Ext.	★	MVE0630X02S070	31	1.220	34	1.339	74	2.913	7	.2756	1
					2	Ext.	●	MVE0630X02S080	31	1.220	34	1.339	74	2.913	8	.3150	1
					3	Ext.	★	MVE0630X03S070	41	1.614	44	1.732	83	3.268	7	.2756	1
					3	Ext.	★	MVE0630X03S080	41	1.614	44	1.732	83	3.268	8	.3150	1
					3	Int.	★	MVS0630X03S070	32.5	1.280	35	1.378	88	3.465	7	.2756	3
					3	Int.	●	MVS0630X03S080	32.5	1.280	35	1.378	88	3.465	8	.3150	3
					5	Int.	★	MVS0630X05S070	52	2.047	56	2.205	109	4.291	7	.2756	3
					5	Int.	●	MVS0630X05S080	52	2.047	56	2.205	109	4.291	8	.3150	3
					8	Int.	★	MVS0630X08S070	72	2.835	77	3.031	130	5.118	7	.2756	3
					8	Int.	●	MVS0630X08S080	72	2.835	77	3.031	130	5.118	8	.3150	3
6.350	.2500	1/4	E		2	Ext.	●	MVE0635X02S080	31	1.220	32.8	1.291	74	2.913	8	.3150	1
					3	Int.	●	MVS0635X03S080	32.5	1.280	34.3	1.350	88	3.465	8	.3150	3
					5	Int.	●	MVS0635X05S080	52	2.047	53.8	2.118	109	4.291	8	.3150	3
					8	Int.	●	MVS0635X08S080	72	2.835	73.8	2.906	130	5.118	8	.3150	3
6.4	.2520				2	Ext.	★	MVE0640X02S070	31	1.220	34	1.339	74	2.913	7	.2756	1
					2	Ext.	●	MVE0640X02S080	31	1.220	34	1.339	74	2.913	8	.3150	1
					3	Ext.	★	MVE0640X03S070	41	1.614	44	1.732	83	3.268	7	.2756	1
					3	Ext.	★	MVE0640X03S080	41	1.614	44	1.732	83	3.268	8	.3150	1
					3	Int.	★	MVS0640X03S070	32.5	1.280	35	1.378	88	3.465	7	.2756	3
					3	Int.	●	MVS0640X03S080	32.5	1.280	35	1.378	88	3.465	8	.3150	3
					5	Int.	★	MVS0640X05S070	52	2.047	56	2.205	109	4.291	7	.2756	3
					5	Int.	●	MVS0640X05S080	52	2.047	56	2.205	109	4.291	8	.3150	3
					8	Int.	★	MVS0640X08S070	72	2.835	77	3.031	130	5.118	7	.2756	3
					8	Int.	●	MVS0640X08S080	72	2.835	77	3.031	130	5.118	8	.3150	3
6.5	.2559				2	Ext.	★	MVE0650X02S070	31	1.220	34	1.339	74	2.913	7	.2756	1
					2	Ext.	●	MVE0650X02S080	31	1.220	34	1.339	74	2.913	8	.3150	1
					3	Ext.	★	MVE0650X03S070	41	1.614	44	1.732	83	3.268	7	.2756	1
					3	Ext.	★	MVE0650X03S080	41	1.614	44	1.732	83	3.268	8	.3150	1
					3	Int.	★	MVS0650X03S070	32.5	1.280	35	1.378	88	3.465	7	.2756	3
					3	Int.	●	MVS0650X03S080	32.5	1.280	35	1.378	88	3.465	8	.3150	3
					5	Int.	★	MVS0650X05S070	52	2.047	56	2.205	109	4.291	7	.2756	3
					5	Int.	●	MVS0650X05S080	52	2.047	56	2.205	109	4.291	8	.3150	3
					8	Int.	★	MVS0650X08S070	72	2.835	77	3.031	130	5.118	7	.2756	3
					8	Int.	●	MVS0650X08S080	72	2.835	77	3.031	130	5.118	8	.3150	3
6.528	.2570		F	5/16-18	2	Ext.	●	MVE0653X02S080	34	1.339	35.6	1.402	74	2.913	8	.3150	1
					3	Int.	●	MVS0653X03S080	35	1.378	36.6	1.441	88	3.465	8	.3150	3
					5	Int.	●	MVS0653X05S080	56	2.205	57.6	2.268	109	4.291	8	.3150	3
					8	Int.	●	MVS0653X08S080	77	3.031	78.6	3.094	130	5.118	8	.3150	3
6.6	.2598				2	Ext.	★	MVE0660X02S070	34	1.339	34	1.339	74	2.913	7	.2756	1
					2	Ext.	●	MVE0660X02S080	34	1.339	36	1.417	74	2.913	8	.3150	1
					3	Ext.	★	MVE0660X03S070	43	1.693	43	1.693	83	3.268	7	.2756	1
					3	Ext.	★	MVE0660X03S080	43	1.693	45	1.772	83	3.268	8	.3150	1
					3	Int.	★	MVS0660X03S070	35	1.378	35	1.378	88	3.465	7	.2756	3
					3	Int.	●	MVS0660X03S080	35	1.378	37	1.457	88	3.465	8	.3150	3
					5	Int.	★	MVS0660X05S070	56	2.205	56	2.205	109	4.291	7	.2756	3
					5	Int.	●	MVS0660X05S080	56	2.205	58	2.283	109	4.291	8	.3150	3
					8	Int.	★	MVS0660X08S070	77	3.031	77	3.031	130	5.118	7	.2756	3
					8	Int.	●	MVS0660X08S080	77	3.031	79	3.110	130	5.118	8	.3150	3

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Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP1020		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
6.7	.2638			M8x1.25	2	Ext.	★	MVE0670X02S070	34	1.339	34	1.339	74	2.913	7	.2756	1
					2	Ext.	●	MVE0670X02S080	34	1.339	36	1.417	74	2.913	8	.3150	1
					3	Ext.	★	MVE0670X03S070	43	1.693	43	1.693	83	3.268	7	.2756	1
					3	Ext.	★	MVE0670X03S080	43	1.693	45	1.772	83	3.268	8	.3150	1
					3	Int.	★	MVS0670X03S070	35	1.378	35	1.378	88	3.465	7	.2756	3
					3	Int.	●	MVS0670X03S080	35	1.378	37	1.457	88	3.465	8	.3150	3
					5	Int.	★	MVS0670X05S070	56	2.205	56	2.205	109	4.291	7	.2756	3
					5	Int.	●	MVS0670X05S080	56	2.205	58	2.283	109	4.291	8	.3150	3
					8	Int.	★	MVS0670X08S070	77	3.031	77	3.031	130	5.118	7	.2756	3
					8	Int.	●	MVS0670X08S080	77	3.031	79	3.110	130	5.118	8	.3150	3
6.747	.2656	17/64			2	Ext.	●	MVE0675X02S080	34	1.339	35.3	1.390	74	2.913	8	.3150	1
					3	Int.	●	MVS0675X03S080	35	1.378	36.3	1.429	88	3.465	8	.3150	3
					5	Int.	●	MVS0675X05S080	56	2.205	57.3	2.256	109	4.291	8	.3150	3
					8	Int.	●	MVS0675X08S080	77	3.031	78.3	3.083	130	5.118	8	.3150	3
6.8	.2677				2	Ext.	★	MVE0680X02S070	34	1.339	34	1.339	74	2.913	7	.2756	1
					2	Ext.	●	MVE0680X02S080	34	1.339	36	1.417	74	2.913	8	.3150	1
					3	Ext.	★	MVE0680X03S070	43	1.693	43	1.693	83	3.268	7	.2756	1
					3	Ext.	★	MVE0680X03S080	43	1.693	45	1.772	83	3.268	8	.3150	1
					3	Int.	★	MVS0680X03S070	35	1.378	35	1.378	88	3.465	7	.2756	3
					3	Int.	●	MVS0680X03S080	35	1.378	37	1.457	88	3.465	8	.3150	3
					5	Int.	★	MVS0680X05S070	56	2.205	56	2.205	109	4.291	7	.2756	3
					5	Int.	●	MVS0680X05S080	56	2.205	58	2.283	109	4.291	8	.3150	3
					8	Int.	★	MVS0680X08S070	77	3.031	77	3.031	130	5.118	7	.2756	3
					8	Int.	●	MVS0680X08S080	77	3.031	79	3.110	130	5.118	8	.3150	3
6.9	.2717		I	5/16-24	2	Ext.	★	MVE0690X02S070	34	1.339	34	1.339	74	2.913	7	.2756	1
					2	Ext.	●	MVE0690X02S080	34	1.339	36	1.417	74	2.913	8	.3150	1
					3	Ext.	★	MVE0690X03S070	43	1.693	43	1.693	83	3.268	7	.2756	1
					3	Ext.	★	MVE0690X03S080	43	1.693	45	1.772	83	3.268	8	.3150	1
					3	Int.	★	MVS0690X03S070	35	1.378	35	1.378	88	3.465	7	.2756	3
					3	Int.	●	MVS0690X03S080	35	1.378	37	1.457	88	3.465	8	.3150	3
					5	Int.	★	MVS0690X05S070	56	2.205	56	2.205	109	4.291	7	.2756	3
					5	Int.	●	MVS0690X05S080	56	2.205	58	2.283	109	4.291	8	.3150	3
					8	Int.	★	MVS0690X08S070	77	3.031	77	3.031	130	5.118	7	.2756	3
					8	Int.	●	MVS0690X08S080	77	3.031	79	3.110	130	5.118	8	.3150	3
7.0	.2756			M8x1.0	2	Ext.	★	MVE0700X02S070	34	1.339	34	1.339	74	2.913	7	.2756	1
					2	Ext.	●	MVE0700X02S080	34	1.339	36	1.417	74	2.913	8	.3150	1
					3	Ext.	★	MVE0700X03S070	43	1.693	43	1.693	83	3.268	7	.2756	1
					3	Ext.	★	MVE0700X03S080	43	1.693	45	1.772	83	3.268	8	.3150	1
					3	Int.	★	MVS0700X03S070	35	1.378	35	1.378	88	3.465	7	.2756	3
					3	Int.	●	MVS0700X03S080	35	1.378	37	1.457	88	3.465	8	.3150	3
					5	Int.	★	MVS0700X05S070	56	2.205	56	2.205	109	4.291	7	.2756	3
					5	Int.	●	MVS0700X05S080	56	2.205	58	2.283	109	4.291	8	.3150	3
					8	Int.	★	MVS0700X08S070	77	3.031	77	3.031	130	5.118	7	.2756	3
					8	Int.	●	MVS0700X08S080	77	3.031	79	3.110	130	5.118	8	.3150	3

CUTTING CONDITIONS ➤ L025
TECHNICAL DATA ➤ N001

MVE/MVS NEW

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP1020		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
7.1	.2795				2	Ext.	●	MVE0710X02S080	34	1.339	37	1.457	79	3.110	8	.3150	1
					3	Ext.	★	MVE0710X03S080	45	1.772	48	1.890	90	3.543	8	.3150	1
					3	Int.	●	MVS0710X03S080	37.5	1.476	40	1.575	94	3.701	8	.3150	3
					5	Int.	●	MVS0710X05S080	60	2.362	64	2.520	118	4.646	8	.3150	3
					8	Int.	●	MVS0710X08S080	83	3.268	88	3.465	142	5.591	8	.3150	3
7.144	.2812	9/32			2	Ext.	●	MVE0714X02S080	34	1.339	34.9	1.374	79	3.110	8	.3150	1
					3	Int.	●	MVS0714X03S080	37.5	1.476	38.4	1.512	94	3.701	8	.3150	3
					5	Int.	●	MVS0714X05S080	60	2.362	60.9	2.398	118	4.646	8	.3150	3
					8	Int.	●	MVS0714X08S080	83	3.268	83.9	3.303	142	5.591	8	.3150	3
7.2	.2835				2	Ext.	●	MVE0720X02S080	34	1.339	37	1.457	79	3.110	8	.3150	1
					3	Ext.	★	MVE0720X03S080	45	1.772	48	1.890	90	3.543	8	.3150	1
					3	Int.	●	MVS0720X03S080	37.5	1.476	40	1.575	94	3.701	8	.3150	3
					5	Int.	●	MVS0720X05S080	60	2.362	64	2.520	118	4.646	8	.3150	3
					8	Int.	●	MVS0720X08S080	83	3.268	88	3.465	142	5.591	8	.3150	3
7.3	.2874				2	Ext.	●	MVE0730X02S080	34	1.339	37	1.457	79	3.110	8	.3150	1
					3	Ext.	★	MVE0730X03S080	45	1.772	48	1.890	90	3.543	8	.3150	1
					3	Int.	●	MVS0730X03S080	37.5	1.476	40	1.575	94	3.701	8	.3150	3
					5	Int.	●	MVS0730X05S080	60	2.362	64	2.520	118	4.646	8	.3150	3
					8	Int.	●	MVS0730X08S080	83	3.268	88	3.465	142	5.591	8	.3150	3
7.4	.2913				2	Ext.	●	MVE0740X02S080	34	1.339	37	1.457	79	3.110	8	.3150	1
					3	Ext.	★	MVE0740X03S080	45	1.772	48	1.890	90	3.543	8	.3150	1
					3	Int.	●	MVS0740X03S080	37.5	1.476	40	1.575	94	3.701	8	.3150	3
					5	Int.	●	MVS0740X05S080	60	2.362	64	2.520	118	4.646	8	.3150	3
					8	Int.	●	MVS0740X08S080	83	3.268	88	3.465	142	5.591	8	.3150	3
7.5	.2953				2	Ext.	●	MVE0750X02S080	34	1.339	37	1.457	79	3.110	8	.3150	1
					3	Ext.	★	MVE0750X03S080	45	1.772	48	1.890	90	3.543	8	.3150	1
					3	Int.	●	MVS0750X03S080	37.5	1.476	40	1.575	94	3.701	8	.3150	3
					5	Int.	●	MVS0750X05S080	60	2.362	64	2.520	118	4.646	8	.3150	3
					8	Int.	●	MVS0750X08S080	83	3.268	88	3.465	142	5.591	8	.3150	3
7.541	.2969	19/64			2	Ext.	●	MVE0754X02S080	37	1.457	37.5	1.476	79	3.110	8	.3150	1
					3	Int.	●	MVS0754X03S080	40	1.575	40.5	1.594	94	3.701	8	.3150	3
					5	Int.	●	MVS0754X05S080	64	2.520	64.5	2.539	118	4.646	8	.3150	3
					8	Int.	●	MVS0754X08S080	88	3.465	88.5	3.484	142	5.591	8	.3150	3
7.6	.2992				2	Ext.	●	MVE0760X02S080	37	1.457	37	1.457	79	3.110	8	.3150	1
					3	Ext.	★	MVE0760X03S080	48	1.890	48	1.890	90	3.543	8	.3150	1
					3	Int.	●	MVS0760X03S080	40	1.575	40	1.575	94	3.701	8	.3150	3
					5	Int.	●	MVS0760X05S080	64	2.520	64	2.520	118	4.646	8	.3150	3
					8	Int.	●	MVS0760X08S080	88	3.465	88	3.465	142	5.591	8	.3150	3
7.7	.3031				2	Ext.	●	MVE0770X02S080	37	1.457	37	1.457	79	3.110	8	.3150	1
					3	Ext.	★	MVE0770X03S080	48	1.890	48	1.890	90	3.543	8	.3150	1
					3	Int.	●	MVS0770X03S080	40	1.575	40	1.575	94	3.701	8	.3150	3
					5	Int.	●	MVS0770X05S080	64	2.520	64	2.520	118	4.646	8	.3150	3
					8	Int.	●	MVS0770X08S080	88	3.465	88	3.465	142	5.591	8	.3150	3
7.8	.3071				2	Ext.	●	MVE0780X02S080	37	1.457	37	1.457	79	3.110	8	.3150	1
					3	Ext.	★	MVE0780X03S080	48	1.890	48	1.890	90	3.543	8	.3150	1
					3	Int.	●	MVS0780X03S080	40	1.575	40	1.575	94	3.701	8	.3150	3
					5	Int.	●	MVS0780X05S080	64	2.520	64	2.520	118	4.646	8	.3150	3
					8	Int.	●	MVS0780X08S080	88	3.465	88	3.465	142	5.591	8	.3150	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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP1020		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
7.9	.3110				2	Ext.	●	MVE0790X02S080	37	1.457	37	1.457	79	3.110	8	.3150	1
					3	Ext.	★	MVE0790X03S080	48	1.890	48	1.890	90	3.543	8	.3150	1
					3	Int.	●	MVS0790X03S080	40	1.575	40	1.575	94	3.701	8	.3150	3
					5	Int.	●	MVS0790X05S080	64	2.520	64	2.520	118	4.646	8	.3150	3
					8	Int.	●	MVS0790X08S080	88	3.465	88	3.465	142	5.591	8	.3150	3
7.938	.3125	5/16		3/8-16	2	Ext.	●	MVE0794X02S080	37	1.457	37.1	1.461	79	3.110	8	.3150	1
					3	Int.	●	MVS0794X03S080	40	1.575	40.1	1.579	94	3.701	8	.3150	3
					5	Int.	●	MVS0794X05S080	64	2.520	64.1	2.524	118	4.646	8	.3150	3
					8	Int.	●	MVS0794X08S080	88	3.465	88.1	3.469	142	5.591	8	.3150	3
8.0	.3150				2	Ext.	●	MVE0800X02S080	37	1.457	37	1.457	79	3.110	8	.3150	1
					3	Ext.	★	MVE0800X03S080	48	1.890	48	1.890	90	3.543	8	.3150	1
					3	Int.	●	MVS0800X03S080	40	1.575	40	1.575	94	3.701	8	.3150	3
					5	Int.	●	MVS0800X05S080	64	2.520	64	2.520	118	4.646	8	.3150	3
					8	Int.	●	MVS0800X08S080	88	3.465	88	3.465	142	5.591	8	.3150	3
8.1	.3189				2	Ext.	★	MVE0810X02S090	37	1.457	40	1.575	84	3.307	9	.3543	1
					2	Ext.	●	MVE0810X02S100	37	1.457	40	1.575	84	3.307	10	.3937	1
					3	Ext.	★	MVE0810X03S090	53	2.087	56	2.205	98	3.858	9	.3543	1
					3	Ext.	★	MVE0810X03S100	53	2.087	56	2.205	98	3.858	10	.3937	1
					3	Int.	★	MVS0810X03S090	42.5	1.673	45	1.772	100	3.937	9	.3543	3
					3	Int.	●	MVS0810X03S100	42.5	1.673	45	1.772	100	3.937	10	.3937	3
					5	Int.	★	MVS0810X05S090	68	2.677	72	2.835	127	5.000	9	.3543	3
					5	Int.	●	MVS0810X05S100	68	2.677	72	2.835	127	5.000	10	.3937	3
					8	Int.	★	MVS0810X08S090	94	3.701	99	3.898	154	6.063	9	.3543	3
					8	Int.	●	MVS0810X08S100	94	3.701	99	3.898	154	6.063	10	.3937	3
8.2	.3228				2	Ext.	★	MVE0820X02S090	37	1.457	40	1.575	84	3.307	9	.3543	1
					2	Ext.	●	MVE0820X02S100	37	1.457	40	1.575	84	3.307	10	.3937	1
					3	Ext.	★	MVE0820X03S090	53	2.087	56	2.205	98	3.858	9	.3543	1
					3	Ext.	★	MVE0820X03S100	53	2.087	56	2.205	98	3.858	10	.3937	1
					3	Int.	★	MVS0820X03S090	42.5	1.673	45	1.772	100	3.937	9	.3543	3
					3	Int.	●	MVS0820X03S100	42.5	1.673	45	1.772	100	3.937	10	.3937	3
					5	Int.	★	MVS0820X05S090	68	2.677	72	2.835	127	5.000	9	.3543	3
					5	Int.	●	MVS0820X05S100	68	2.677	72	2.835	127	5.000	10	.3937	3
					8	Int.	★	MVS0820X08S090	94	3.701	99	3.898	154	6.063	9	.3543	3
					8	Int.	●	MVS0820X08S100	94	3.701	99	3.898	154	6.063	10	.3937	3
8.3	.3268				2	Ext.	★	MVE0830X02S090	37	1.457	40	1.575	84	3.307	9	.3543	1
					2	Ext.	●	MVE0830X02S100	37	1.457	40	1.575	84	3.307	10	.3937	1
					3	Ext.	★	MVE0830X03S090	53	2.087	56	2.205	98	3.858	9	.3543	1
					3	Ext.	★	MVE0830X03S100	53	2.087	56	2.205	98	3.858	10	.3937	1
					3	Int.	★	MVS0830X03S090	42.5	1.673	45	1.772	100	3.937	9	.3543	3
					3	Int.	●	MVS0830X03S100	42.5	1.673	45	1.772	100	3.937	10	.3937	3
					5	Int.	★	MVS0830X05S090	68	2.677	72	2.835	127	5.000	9	.3543	3
					5	Int.	●	MVS0830X05S100	68	2.677	72	2.835	127	5.000	10	.3937	3
					8	Int.	★	MVS0830X08S090	94	3.701	99	3.898	154	6.063	9	.3543	3
					8	Int.	●	MVS0830X08S100	94	3.701	99	3.898	154	6.063	10	.3937	3
8.334	.3281	21/64			2	Ext.	●	MVE0833X02S100	37	1.457	38.8	1.528	84	3.307	10	.3937	1
					3	Int.	●	MVS0833X03S100	42.5	1.673	44.3	1.744	100	3.937	10	.3937	3
					5	Int.	●	MVS0833X05S100	68	2.677	69.8	2.748	127	5.000	10	.3937	3
					8	Int.	●	MVS0833X08S100	94	3.701	95.8	3.772	154	6.063	10	.3937	3

CUTTING CONDITIONS ➤ L025
TECHNICAL DATA ➤ N001

MVE/MVS NEW

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP1020		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
8.4	.3307				2	Ext.	★	MVE0840X02S090	37	1.457	40	1.575	84	3.307	9	.3543	1
					2	Ext.	●	MVE0840X02S100	37	1.457	40	1.575	84	3.307	10	.3937	1
					3	Ext.	★	MVE0840X03S090	53	2.087	56	2.205	98	3.858	9	.3543	1
					3	Ext.	★	MVE0840X03S100	53	2.087	56	2.205	98	3.858	10	.3937	1
					3	Int.	★	MVS0840X03S090	42.5	1.673	45	1.772	100	3.937	9	.3543	3
					3	Int.	●	MVS0840X03S100	42.5	1.673	45	1.772	100	3.937	10	.3937	3
					5	Int.	★	MVS0840X05S090	68	2.677	72	2.835	127	5.000	9	.3543	3
					5	Int.	●	MVS0840X05S100	68	2.677	72	2.835	127	5.000	10	.3937	3
					8	Int.	★	MVS0840X08S090	94	3.701	99	3.898	154	6.063	9	.3543	3
					8	Int.	●	MVS0840X08S100	94	3.701	99	3.898	154	6.063	10	.3937	3
8.433	.3320		Q	3/8-24	2	Ext.	●	MVE0843X02S100	37	1.457	38.7	1.524	84	3.307	10	.3937	1
					3	Int.	●	MVS0843X03S100	42.5	1.673	44.2	1.740	100	3.937	10	.3937	3
					5	Int.	●	MVS0843X05S100	68	2.677	69.7	2.744	127	5.000	10	.3937	3
					8	Int.	●	MVS0843X08S100	94	3.701	95.7	3.768	154	6.063	10	.3937	3
8.5	.3346			M10x1.5	2	Ext.	★	MVE0850X02S090	37	1.457	40	1.575	84	3.307	9	.3543	1
					2	Ext.	●	MVE0850X02S100	37	1.457	40	1.575	84	3.307	10	.3937	1
					3	Ext.	★	MVE0850X03S090	53	2.087	56	2.205	98	3.858	9	.3543	1
					3	Ext.	★	MVE0850X03S100	53	2.087	56	2.205	98	3.858	10	.3937	1
					3	Int.	★	MVS0850X03S090	42.5	1.673	45	1.772	100	3.937	9	.3543	3
					3	Int.	●	MVS0850X03S100	42.5	1.673	45	1.772	100	3.937	10	.3937	3
					5	Int.	★	MVS0850X05S090	68	2.677	72	2.835	127	5.000	9	.3543	3
					5	Int.	●	MVS0850X05S100	68	2.677	72	2.835	127	5.000	10	.3937	3
					8	Int.	★	MVS0850X08S090	94	3.701	99	3.898	154	6.063	9	.3543	3
					8	Int.	●	MVS0850X08S100	94	3.701	99	3.898	154	6.063	10	.3937	3
8.6	.3386				2	Ext.	★	MVE0860X02S090	40	1.575	40	1.575	84	3.307	9	.3543	1
					2	Ext.	●	MVE0860X02S100	40	1.575	42	1.654	84	3.307	10	.3937	1
					3	Ext.	★	MVE0860X03S090	55	2.165	55	2.165	98	3.858	9	.3543	1
					3	Ext.	★	MVE0860X03S100	55	2.165	57	2.244	98	3.858	10	.3937	1
					3	Int.	★	MVS0860X03S090	45	1.772	45	1.772	100	3.937	9	.3543	3
					3	Int.	●	MVS0860X03S100	45	1.772	47	1.850	100	3.937	10	.3937	3
					5	Int.	★	MVS0860X05S090	72	2.835	72	2.835	127	5.000	9	.3543	3
					5	Int.	●	MVS0860X05S100	72	2.835	74	2.913	127	5.000	10	.3937	3
					8	Int.	★	MVS0860X08S090	99	3.898	99	3.898	154	6.063	9	.3543	3
					8	Int.	●	MVS0860X08S100	99	3.898	101	3.976	154	6.063	10	.3937	3
8.7	.3425			M10x1.25	2	Ext.	★	MVE0870X02S090	40	1.575	40	1.575	84	3.307	9	.3543	1
					2	Ext.	●	MVE0870X02S100	40	1.575	42	1.654	84	3.307	10	.3937	1
					3	Ext.	★	MVE0870X03S090	55	2.165	55	2.165	98	3.858	9	.3543	1
					3	Ext.	★	MVE0870X03S100	55	2.165	57	2.244	98	3.858	10	.3937	1
					3	Int.	★	MVS0870X03S090	45	1.772	45	1.772	100	3.937	9	.3543	3
					3	Int.	●	MVS0870X03S100	45	1.772	47	1.850	100	3.937	10	.3937	3
					5	Int.	★	MVS0870X05S090	72	2.835	72	2.835	127	5.000	9	.3543	3
					5	Int.	●	MVS0870X05S100	72	2.835	74	2.913	127	5.000	10	.3937	3
					8	Int.	★	MVS0870X08S090	99	3.898	99	3.898	154	6.063	9	.3543	3
					8	Int.	●	MVS0870X08S100	99	3.898	101	3.976	154	6.063	10	.3937	3
8.731	.3438	11/32			2	Ext.	●	MVE0873X02S100	40	1.575	41.4	1.630	84	3.307	10	.3937	1
					3	Int.	●	MVS0873X03S100	45	1.772	46.4	1.827	100	3.937	10	.3937	3
					5	Int.	●	MVS0873X05S100	72	2.835	73.4	2.890	127	5.000	10	.3937	3
					8	Int.	●	MVS0873X08S100	99	3.898	100.4	3.953	154	6.063	10	.3937	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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP1020		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
8.8	.3465				2	Ext.	★	MVE0880X02S090	40	1.575	40	1.575	84	3.307	9	.3543	1
					2	Ext.	●	MVE0880X02S100	40	1.575	42	1.654	84	3.307	10	.3937	1
					3	Ext.	★	MVE0880X03S090	55	2.165	55	2.165	98	3.858	9	.3543	1
					3	Ext.	★	MVE0880X03S100	55	2.165	57	2.244	98	3.858	10	.3937	1
					3	Int.	★	MVS0880X03S090	45	1.772	45	1.772	100	3.937	9	.3543	3
					3	Int.	●	MVS0880X03S100	45	1.772	47	1.850	100	3.937	10	.3937	3
					5	Int.	★	MVS0880X05S090	72	2.835	72	2.835	127	5.000	9	.3543	3
					5	Int.	●	MVS0880X05S100	72	2.835	74	2.913	127	5.000	10	.3937	3
					8	Int.	★	MVS0880X08S090	99	3.898	99	3.898	154	6.063	9	.3543	3
					8	Int.	●	MVS0880X08S100	99	3.898	101	3.976	154	6.063	10	.3937	3
8.9	.3504				2	Ext.	★	MVE0890X02S090	40	1.575	40	1.575	84	3.307	9	.3543	1
					2	Ext.	●	MVE0890X02S100	40	1.575	42	1.654	84	3.307	10	.3937	1
					3	Ext.	★	MVE0890X03S090	55	2.165	55	2.165	98	3.858	9	.3543	1
					3	Ext.	★	MVE0890X03S100	55	2.165	57	2.244	98	3.858	10	.3937	1
					3	Int.	★	MVS0890X03S090	45	1.772	45	1.772	100	3.937	9	.3543	3
					3	Int.	●	MVS0890X03S100	45	1.772	47	1.850	100	3.937	10	.3937	3
					5	Int.	★	MVS0890X05S090	72	2.835	72	2.835	127	5.000	9	.3543	3
					5	Int.	●	MVS0890X05S100	72	2.835	74	2.913	127	5.000	10	.3937	3
					8	Int.	★	MVS0890X08S090	99	3.898	99	3.898	154	6.063	9	.3543	3
					8	Int.	●	MVS0890X08S100	99	3.898	101	3.976	154	6.063	10	.3937	3
9.0	.3543				2	Ext.	★	MVE0900X02S090	40	1.575	40	1.575	84	3.307	9	.3543	1
					2	Ext.	●	MVE0900X02S100	40	1.575	42	1.654	84	3.307	10	.3937	1
					3	Ext.	★	MVE0900X03S090	55	2.165	55	2.165	98	3.858	9	.3543	1
					3	Ext.	★	MVE0900X03S100	55	2.165	57	2.244	98	3.858	10	.3937	1
					3	Int.	★	MVS0900X03S090	45	1.772	45	1.772	100	3.937	9	.3543	3
					3	Int.	●	MVS0900X03S100	45	1.772	47	1.850	100	3.937	10	.3937	3
					5	Int.	★	MVS0900X05S090	72	2.835	72	2.835	127	5.000	9	.3543	3
					5	Int.	●	MVS0900X05S100	72	2.835	74	2.913	127	5.000	10	.3937	3
					8	Int.	★	MVS0900X08S090	99	3.898	99	3.898	154	6.063	9	.3543	3
					8	Int.	●	MVS0900X08S100	99	3.898	101	3.976	154	6.063	10	.3937	3
9.1	.3583				2	Ext.	●	MVE0910X02S100	40	1.575	43	1.693	89	3.504	10	.3937	1
					3	Ext.	★	MVE0910X03S100	58	2.283	61	2.402	105	4.134	10	.3937	1
					3	Int.	●	MVS0910X03S100	47.5	1.870	50	1.969	106	4.173	10	.3937	3
					5	Int.	●	MVS0910X05S100	76	2.992	80	3.150	136	5.354	10	.3937	3
					8	Int.	●	MVS0910X08S100	105	4.134	110	4.331	166	6.535	10	.3937	3
9.128	.3594	23/64			2	Ext.	●	MVE0913X02S100	40	1.575	40.9	1.610	89	3.504	10	.3937	1
					3	Int.	●	MVS0913X03S100	47.5	1.870	48.4	1.906	106	4.173	10	.3937	3
					5	Int.	●	MVS0913X05S100	76	2.992	76.9	3.028	136	5.354	10	.3937	3
					8	Int.	●	MVS0913X08S100	105	4.134	105.9	4.169	166	6.535	10	.3937	3
9.2	.3622				2	Ext.	●	MVE0920X02S100	40	1.575	43	1.693	89	3.504	10	.3937	1
					3	Ext.	★	MVE0920X03S100	58	2.283	61	2.402	105	4.134	10	.3937	1
					3	Int.	●	MVS0920X03S100	47.5	1.870	50	1.969	106	4.173	10	.3937	3
					5	Int.	●	MVS0920X05S100	76	2.992	80	3.150	136	5.354	10	.3937	3
					8	Int.	●	MVS0920X08S100	105	4.134	110	4.331	166	6.535	10	.3937	3

CUTTING CONDITIONS ➤ L025
TECHNICAL DATA ➤ N001

MVE/MVS NEW

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP1020		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
9.3	.3661				2	Ext.	●	MVE0930X02S100	40	1.575	43	1.693	89	3.504	10	.3937	1
					3	Ext.	★	MVE0930X03S100	58	2.283	61	2.402	105	4.134	10	.3937	1
					3	Int.	●	MVS0930X03S100	47.5	1.870	50	1.969	106	4.173	10	.3937	3
					5	Int.	●	MVS0930X05S100	76	2.992	80	3.150	136	5.354	10	.3937	3
					8	Int.	●	MVS0930X08S100	105	4.134	110	4.331	166	6.535	10	.3937	3
9.347	.3680		U	7/16-14	2	Ext.	●	MVE0935X02S100	40	1.575	40.7	1.602	89	3.504	10	.3937	1
					3	Int.	●	MVS0935X03S100	47.5	1.870	48.2	1.898	106	4.173	10	.3937	3
					5	Int.	●	MVS0935X05S100	76	2.992	76.7	3.020	136	5.354	10	.3937	3
					8	Int.	●	MVS0935X08S100	105	4.134	105.7	4.161	166	6.535	10	.3937	3
9.4	.3701				2	Ext.	●	MVE0940X02S100	40	1.575	43	1.693	89	3.504	10	.3937	1
					3	Ext.	★	MVE0940X03S100	58	2.283	61	2.402	105	4.134	10	.3937	1
					3	Int.	●	MVS0940X03S100	47.5	1.870	50	1.969	106	4.173	10	.3937	3
					5	Int.	●	MVS0940X05S100	76	2.992	80	3.150	136	5.354	10	.3937	3
					8	Int.	●	MVS0940X08S100	105	4.134	110	4.331	166	6.535	10	.3937	3
9.5	.3740				2	Ext.	●	MVE0950X02S100	40	1.575	43	1.693	89	3.504	10	.3937	1
					3	Ext.	★	MVE0950X03S100	58	2.283	61	2.402	105	4.134	10	.3937	1
					3	Int.	●	MVS0950X03S100	47.5	1.870	50	1.969	106	4.173	10	.3937	3
					5	Int.	●	MVS0950X05S100	76	2.992	80	3.150	136	5.354	10	.3937	3
					8	Int.	●	MVS0950X08S100	105	4.134	110	4.331	166	6.535	10	.3937	3
9.525	.3750	3/8			2	Ext.	●	MVE0953X02S100	43	1.693	43.5	1.713	89	3.504	10	.3937	1
					3	Int.	●	MVS0953X03S100	50	1.969	50.5	1.988	106	4.173	10	.3937	3
					5	Int.	●	MVS0953X05S100	80	3.150	80.5	3.169	136	5.354	10	.3937	3
					8	Int.	●	MVS0953X08S100	110	4.331	110.5	4.350	166	6.535	10	.3937	3
9.6	.3780				2	Ext.	●	MVE0960X02S100	43	1.693	43	1.693	89	3.504	10	.3937	1
					3	Ext.	★	MVE0960X03S100	60	2.362	60	2.362	105	4.134	10	.3937	1
					3	Int.	●	MVS0960X03S100	50	1.969	50	1.969	106	4.173	10	.3937	3
					5	Int.	●	MVS0960X05S100	80	3.150	80	3.150	136	5.354	10	.3937	3
					8	Int.	●	MVS0960X08S100	110	4.331	110	4.331	166	6.535	10	.3937	3
9.7	.3819		Tube Sheet		2	Ext.	●	MVE0970X02S100	43	1.693	43	1.693	89	3.504	10	.3937	1
					3	Ext.	★	MVE0970X03S100	60	2.362	60	2.362	105	4.134	10	.3937	1
					3	Int.	●	MVS0970X03S100	50	1.969	50	1.969	106	4.173	10	.3937	3
					5	Int.	●	MVS0970X05S100	80	3.150	80	3.150	136	5.354	10	.3937	3
					8	Int.	●	MVS0970X08S100	110	4.331	110	4.331	166	6.535	10	.3937	3
9.8	.3858				2	Ext.	●	MVE0980X02S100	43	1.693	43	1.693	89	3.504	10	.3937	1
					3	Ext.	★	MVE0980X03S100	60	2.362	60	2.362	105	4.134	10	.3937	1
					3	Int.	●	MVS0980X03S100	50	1.969	50	1.969	106	4.173	10	.3937	3
					5	Int.	●	MVS0980X05S100	80	3.150	80	3.150	136	5.354	10	.3937	3
					8	Int.	●	MVS0980X08S100	110	4.331	110	4.331	166	6.535	10	.3937	3
9.9	.3898				2	Ext.	●	MVE0990X02S100	43	1.693	43	1.693	89	3.504	10	.3937	1
					3	Ext.	★	MVE0990X03S100	60	2.362	60	2.362	105	4.134	10	.3937	1
					3	Int.	●	MVS0990X03S100	50	1.969	50	1.969	106	4.173	10	.3937	3
					5	Int.	●	MVS0990X05S100	80	3.150	80	3.150	136	5.354	10	.3937	3
					8	Int.	●	MVS0990X08S100	110	4.331	110	4.331	166	6.535	10	.3937	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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP1020		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
9.922	.3906	25/64		7/16-20	2	Ext.	●	MVE0992X02S100	43	1.693	43.1	1.697	89	3.504	10	.3937	1
					3	Int.	●	MVS0992X03S100	50	1.969	50.1	1.972	106	4.173	10	.3937	3
					5	Int.	●	MVS0992X05S100	80	3.150	80.1	3.154	136	5.354	10	.3937	3
					8	Int.	●	MVS0992X08S100	110	4.331	110.1	4.335	166	6.535	10	.3937	3
10.0	.3937				2	Ext.	●	MVE1000X02S100	43	1.693	43	1.693	89	3.504	10	.3937	1
					3	Ext.	★	MVE1000X03S100	60	2.362	60	2.362	105	4.134	10	.3937	1
					3	Int.	●	MVS1000X03S100	50	1.969	50	1.969	106	4.173	10	.3937	3
					5	Int.	●	MVS1000X05S100	80	3.150	80	3.150	136	5.354	10	.3937	3
					8	Int.	●	MVS1000X08S100	110	4.331	110	4.331	166	6.535	10	.3937	3
10.1	.3976				2	Ext.	★	MVE1010X02S110	43	1.693	46	1.811	95	3.740	11	.4331	1
					2	Ext.	●	MVE1010X02S120	43	1.693	46	1.811	95	3.740	12	.4724	1
					3	Ext.	★	MVE1010X03S110	66	2.598	69	2.717	114	4.488	11	.4331	1
					3	Ext.	★	MVE1010X03S120	66	2.598	69	2.717	114	4.488	12	.4724	1
					3	Int.	★	MVS1010X03S110	52.5	2.067	55	2.165	116	4.567	11	.4331	3
					3	Int.	●	MVS1010X03S120	52.5	2.067	55	2.165	116	4.567	12	.4724	3
					5	Int.	★	MVS1010X05S110	84	3.307	88	3.465	149	5.866	11	.4331	3
					5	Int.	●	MVS1010X05S120	84	3.307	88	3.465	149	5.866	12	.4724	3
					8	Int.	★	MVS1010X08S110	116	4.567	121	4.764	182	7.165	11	.4331	3
					8	Int.	●	MVS1010X08S120	116	4.567	121	4.764	182	7.165	12	.4724	3
10.2	.4016			M12x1.75	2	Ext.	★	MVE1020X02S110	43	1.693	46	1.811	95	3.740	11	.4331	1
					2	Ext.	●	MVE1020X02S120	43	1.693	46	1.811	95	3.740	12	.4724	1
					3	Ext.	★	MVE1020X03S110	66	2.598	69	2.717	114	4.488	11	.4331	1
					3	Ext.	★	MVE1020X03S120	66	2.598	69	2.717	114	4.488	12	.4724	1
					3	Int.	★	MVS1020X03S110	52.5	2.067	55	2.165	116	4.567	11	.4331	3
					3	Int.	●	MVS1020X03S120	52.5	2.067	55	2.165	116	4.567	12	.4724	3
					5	Int.	★	MVS1020X05S110	84	3.307	88	3.465	149	5.866	11	.4331	3
					5	Int.	●	MVS1020X05S120	84	3.307	88	3.465	149	5.866	12	.4724	3
					8	Int.	★	MVS1020X08S110	116	4.567	121	4.764	182	7.165	11	.4331	3
					8	Int.	●	MVS1020X08S120	116	4.567	121	4.764	182	7.165	12	.4724	3
10.3	.4055				2	Ext.	★	MVE1030X02S110	43	1.693	46	1.811	95	3.740	11	.4331	1
					2	Ext.	●	MVE1030X02S120	43	1.693	46	1.811	95	3.740	12	.4724	1
					3	Ext.	★	MVE1030X03S110	66	2.598	69	2.717	114	4.488	11	.4331	1
					3	Ext.	★	MVE1030X03S120	66	2.598	69	2.717	114	4.488	12	.4724	1
					3	Int.	★	MVS1030X03S110	52.5	2.067	55	2.165	116	4.567	11	.4331	3
					3	Int.	●	MVS1030X03S120	52.5	2.067	55	2.165	116	4.567	12	.4724	3
					5	Int.	★	MVS1030X05S110	84	3.307	88	3.465	149	5.866	11	.4331	3
					5	Int.	●	MVS1030X05S120	84	3.307	88	3.465	149	5.866	12	.4724	3
					8	Int.	★	MVS1030X08S110	116	4.567	121	4.764	182	7.165	11	.4331	3
					8	Int.	●	MVS1030X08S120	116	4.567	121	4.764	182	7.165	12	.4724	3
10.319	.4062	13/32			2	Ext.	●	MVE1032X02S120	43	1.693	44.8	1.764	95	3.740	12	.4724	1
					3	Int.	●	MVS1032X03S120	52.5	2.067	54.3	2.138	116	4.567	12	.4724	3
					5	Int.	●	MVS1032X05S120	84	3.307	85.8	3.378	149	5.866	12	.4724	3
					8	Int.	●	MVS1032X08S120	116	4.567	117.8	4.638	182	7.165	12	.4724	3

CUTTING CONDITIONS ➤ L025
TECHNICAL DATA ➤ N001

MVE/MVS NEW

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP1020		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
10.4	.4094				2	Ext.	★	MVE1040X02S110	43	1.693	46	1.811	95	3.740	11	.4331	1
					2	Ext.	●	MVE1040X02S120	43	1.693	46	1.811	95	3.740	12	.4724	1
					3	Ext.	★	MVE1040X03S110	66	2.598	69	2.717	114	4.488	11	.4331	1
					3	Ext.	★	MVE1040X03S120	66	2.598	69	2.717	114	4.488	12	.4724	1
					3	Int.	★	MVS1040X03S110	52.5	2.067	55	2.165	116	4.567	11	.4331	3
					3	Int.	●	MVS1040X03S120	52.5	2.067	55	2.165	116	4.567	12	.4724	3
					5	Int.	★	MVS1040X05S110	84	3.307	88	3.465	149	5.866	11	.4331	3
					5	Int.	●	MVS1040X05S120	84	3.307	88	3.465	149	5.866	12	.4724	3
					8	Int.	★	MVS1040X08S110	116	4.567	121	4.764	182	7.165	11	.4331	3
					8	Int.	●	MVS1040X08S120	116	4.567	121	4.764	182	7.165	12	.4724	3
10.5	.4134				2	Ext.	★	MVE1050X02S110	43	1.693	46	1.811	95	3.740	11	.4331	1
					2	Ext.	●	MVE1050X02S120	43	1.693	46	1.811	95	3.740	12	.4724	1
					3	Ext.	★	MVE1050X03S110	66	2.598	69	2.717	114	4.488	11	.4331	1
					3	Ext.	★	MVE1050X03S120	66	2.598	69	2.717	114	4.488	12	.4724	1
					3	Int.	★	MVS1050X03S110	52.5	2.067	55	2.165	116	4.567	11	.4331	3
					3	Int.	●	MVS1050X03S120	52.5	2.067	55	2.165	116	4.567	12	.4724	3
					5	Int.	★	MVS1050X05S110	84	3.307	88	3.465	149	5.866	11	.4331	3
					5	Int.	●	MVS1050X05S120	84	3.307	88	3.465	149	5.866	12	.4724	3
					8	Int.	★	MVS1050X08S110	116	4.567	121	4.764	182	7.165	11	.4331	3
					8	Int.	●	MVS1050X08S120	116	4.567	121	4.764	182	7.165	12	.4724	3
10.6	.4173				2	Ext.	★	MVE1060X02S110	47	1.850	47	1.850	95	3.740	11	.4331	1
					2	Ext.	●	MVE1060X02S120	47	1.850	48	1.890	95	3.740	12	.4724	1
					3	Ext.	★	MVE1060X03S110	68	2.677	68	2.677	114	4.488	11	.4331	1
					3	Ext.	★	MVE1060X03S120	68	2.677	69	2.717	114	4.488	12	.4724	1
					3	Int.	★	MVS1060X03S110	55	2.165	55	2.165	116	4.567	11	.4331	3
					3	Int.	●	MVS1060X03S120	55	2.165	56	2.205	116	4.567	12	.4724	3
					5	Int.	★	MVS1060X05S110	88	3.465	88	3.465	149	5.866	11	.4331	3
					5	Int.	●	MVS1060X05S120	88	3.465	89	3.504	149	5.866	12	.4724	3
					8	Int.	★	MVS1060X08S110	121	4.764	121	4.764	182	7.165	11	.4331	3
					8	Int.	●	MVS1060X08S120	121	4.764	122	4.803	182	7.165	12	.4724	3
10.7	.4213				2	Ext.	★	MVE1070X02S110	47	1.850	47	1.850	95	3.740	11	.4331	1
					2	Ext.	●	MVE1070X02S120	47	1.850	48	1.890	95	3.740	12	.4724	1
					3	Ext.	★	MVE1070X03S110	68	2.677	68	2.677	114	4.488	11	.4331	1
					3	Ext.	★	MVE1070X03S120	68	2.677	69	2.717	114	4.488	12	.4724	1
					3	Int.	★	MVS1070X03S110	55	2.165	55	2.165	116	4.567	11	.4331	3
					3	Int.	●	MVS1070X03S120	55	2.165	56	2.205	116	4.567	12	.4724	3
					5	Int.	★	MVS1070X05S110	88	3.465	88	3.465	149	5.866	11	.4331	3
					5	Int.	●	MVS1070X05S120	88	3.465	89	3.504	149	5.866	12	.4724	3
					8	Int.	★	MVS1070X08S110	121	4.764	121	4.764	182	7.165	11	.4331	3
					8	Int.	●	MVS1070X08S120	121	4.764	122	4.803	182	7.165	12	.4724	3
10.716	.4219	27/64		1/2-13	2	Ext.	●	MVE1072X02S120	47	1.850	48.4	1.906	95	3.740	12	.4724	1
					3	Int.	●	MVS1072X03S120	55	2.165	56.4	2.220	116	4.567	12	.4724	3
					5	Int.	●	MVS1072X05S120	88	3.465	89.4	3.520	149	5.866	12	.4724	3
					8	Int.	●	MVS1072X08S120	121	4.764	122.4	4.819	182	7.165	12	.4724	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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP1020		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
10.8	.4252			M12x1.25	2	Ext.	★	MVE1080X02S110	47	1.850	47	1.850	95	3.740	11	.4331	1
					2	Ext.	●	MVE1080X02S120	47	1.850	48	1.890	95	3.740	12	.4724	1
					3	Ext.	★	MVE1080X03S110	68	2.677	68	2.677	114	4.488	11	.4331	1
					3	Ext.	★	MVE1080X03S120	68	2.677	69	2.717	114	4.488	12	.4724	1
					3	Int.	★	MVS1080X03S110	55	2.165	55	2.165	116	4.567	11	.4331	3
					3	Int.	●	MVS1080X03S120	55	2.165	56	2.205	116	4.567	12	.4724	3
					5	Int.	★	MVS1080X05S110	88	3.465	88	3.465	149	5.866	11	.4331	3
					5	Int.	●	MVS1080X05S120	88	3.465	89	3.504	149	5.866	12	.4724	3
					8	Int.	★	MVS1080X08S110	121	4.764	121	4.764	182	7.165	11	.4331	3
					8	Int.	●	MVS1080X08S120	121	4.764	122	4.803	182	7.165	12	.4724	3
10.9	.4291				2	Ext.	★	MVE1090X02S110	47	1.850	47	1.850	95	3.740	11	.4331	1
					2	Ext.	●	MVE1090X02S120	47	1.850	48	1.890	95	3.740	12	.4724	1
					3	Ext.	★	MVE1090X03S110	68	2.677	68	2.677	114	4.488	11	.4331	1
					3	Ext.	★	MVE1090X03S120	68	2.677	69	2.717	114	4.488	12	.4724	1
					3	Int.	★	MVS1090X03S110	55	2.165	55	2.165	116	4.567	11	.4331	3
					3	Int.	●	MVS1090X03S120	55	2.165	56	2.205	116	4.567	12	.4724	3
					5	Int.	★	MVS1090X05S110	88	3.465	88	3.465	149	5.866	11	.4331	3
					5	Int.	●	MVS1090X05S120	88	3.465	89	3.504	149	5.866	12	.4724	3
					8	Int.	★	MVS1090X08S110	121	4.764	121	4.764	182	7.165	11	.4331	3
					8	Int.	●	MVS1090X08S120	121	4.764	122	4.803	182	7.165	12	.4724	3
11.0	.4331				2	Ext.	★	MVE1100X02S110	47	1.850	47	1.850	95	3.740	11	.4331	1
					2	Ext.	●	MVE1100X02S120	47	1.850	48	1.890	95	3.740	12	.4724	1
					3	Ext.	★	MVE1100X03S110	68	2.677	68	2.677	114	4.488	11	.4331	1
					3	Ext.	★	MVE1100X03S120	68	2.677	69	2.717	114	4.488	12	.4724	1
					3	Int.	★	MVS1100X03S110	55	2.165	55	2.165	116	4.567	11	.4331	3
					3	Int.	●	MVS1100X03S120	55	2.165	56	2.205	116	4.567	12	.4724	3
					5	Int.	★	MVS1100X05S110	88	3.465	88	3.465	149	5.866	11	.4331	3
					5	Int.	●	MVS1100X05S120	88	3.465	89	3.504	149	5.866	12	.4724	3
					8	Int.	★	MVS1100X08S110	121	4.764	121	4.764	182	7.165	11	.4331	3
					8	Int.	●	MVS1100X08S120	121	4.764	122	4.803	182	7.165	12	.4724	3
11.1	.4370				2	Ext.	●	MVE1110X02S120	47	1.850	50	1.969	95	3.740	12	.4724	1
					3	Ext.	★	MVE1110X03S120	71	2.795	74	2.913	121	4.764	12	.4724	1
					3	Int.	●	MVS1110X03S120	57.5	2.264	60	2.362	122	4.803	12	.4724	3
					5	Int.	●	MVS1110X05S120	92	3.622	96	3.780	158	6.220	12	.4724	3
					8	Int.	●	MVS1110X08S120	127	5.000	132	5.197	194	7.638	12	.4724	3
11.113	.4375	7/16			2	Ext.	●	MVE1111X02S120	47	1.850	48	1.890	95	3.740	12	.4724	1
					3	Int.	●	MVS1111X03S120	57.5	2.264	58.5	2.303	122	4.803	12	.4724	3
					5	Int.	●	MVS1111X05S120	92	3.622	93	3.661	158	6.220	12	.4724	3
					8	Int.	●	MVS1111X08S120	127	5.000	128	5.039	194	7.638	12	.4724	3
11.2	.4409				2	Ext.	●	MVE1120X02S120	47	1.850	50	1.969	95	3.740	12	.4724	1
					3	Ext.	★	MVE1120X03S120	71	2.795	74	2.913	121	4.764	12	.4724	1
					3	Int.	●	MVS1120X03S120	57.5	2.264	60	2.362	122	4.803	12	.4724	3
					5	Int.	●	MVS1120X05S120	92	3.622	96	3.780	158	6.220	12	.4724	3
					8	Int.	●	MVS1120X08S120	127	5.000	132	5.197	194	7.638	12	.4724	3

CUTTING CONDITIONS ➤ L025
TECHNICAL DATA ➤ N001

MVE/MVS NEW

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP1020		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
11.3	.4449				2	Ext.	●	MVE1130X02S120	47	1.850	50	1.969	95	3.740	12	.4724	1
					3	Ext.	★	MVE1130X03S120	71	2.795	74	2.913	121	4.764	12	.4724	1
					3	Int.	●	MVS1130X03S120	57.5	2.264	60	2.362	122	4.803	12	.4724	3
					5	Int.	●	MVS1130X05S120	92	3.622	96	3.780	158	6.220	12	.4724	3
					8	Int.	●	MVS1130X08S120	127	5.000	132	5.197	194	7.638	12	.4724	3
11.4	.4488				2	Ext.	●	MVE1140X02S120	47	1.850	50	1.969	95	3.740	12	.4724	1
					3	Ext.	★	MVE1140X03S120	71	2.795	74	2.913	121	4.764	12	.4724	1
					3	Int.	●	MVS1140X03S120	57.5	2.264	60	2.362	122	4.803	12	.4724	3
					5	Int.	●	MVS1140X05S120	92	3.622	96	3.780	158	6.220	12	.4724	3
					8	Int.	●	MVS1140X08S120	127	5.000	132	5.197	194	7.638	12	.4724	3
11.5	.4528				2	Ext.	●	MVE1150X02S120	47	1.850	50	1.969	95	3.740	12	.4724	1
					3	Ext.	★	MVE1150X03S120	71	2.795	74	2.913	121	4.764	12	.4724	1
					3	Int.	●	MVS1150X03S120	57.5	2.264	60	2.362	122	4.803	12	.4724	3
					5	Int.	●	MVS1150X05S120	92	3.622	96	3.780	158	6.220	12	.4724	3
					8	Int.	●	MVS1150X08S120	127	5.000	132	5.197	194	7.638	12	.4724	3
11.509	.4531	29/64		1/2-20	2	Ext.	●	MVE1151X02S120	47	1.850	47.5	1.870	95	3.740	12	.4724	1
					3	Int.	●	MVS1151X03S120	60	2.362	60.5	2.382	122	4.803	12	.4724	3
					5	Int.	●	MVS1151X05S120	96	3.780	96.5	3.799	158	6.220	12	.4724	3
					8	Int.	●	MVS1151X08S120	132	5.197	132.5	5.217	194	7.638	12	.4724	3
11.6	.4567				2	Ext.	●	MVE1160X02S120	47	1.850	47	1.850	95	3.740	12	.4724	1
					3	Ext.	★	MVE1160X03S120	73	2.874	73	2.874	121	4.764	12	.4724	1
					3	Int.	●	MVS1160X03S120	60	2.362	60	2.362	122	4.803	12	.4724	3
					5	Int.	●	MVS1160X05S120	96	3.780	96	3.780	158	6.220	12	.4724	3
					8	Int.	●	MVS1160X08S120	132	5.197	132	5.197	194	7.638	12	.4724	3
11.7	.4606				2	Ext.	●	MVE1170X02S120	47	1.850	47	1.850	95	3.740	12	.4724	1
					3	Ext.	★	MVE1170X03S120	73	2.874	73	2.874	121	4.764	12	.4724	1
					3	Int.	●	MVS1170X03S120	60	2.362	60	2.362	122	4.803	12	.4724	3
					5	Int.	●	MVS1170X05S120	96	3.780	96	3.780	158	6.220	12	.4724	3
					8	Int.	●	MVS1170X08S120	132	5.197	132	5.197	194	7.638	12	.4724	3
11.8	.4646				2	Ext.	●	MVE1180X02S120	47	1.850	47	1.850	95	3.740	12	.4724	1
					3	Ext.	★	MVE1180X03S120	73	2.874	73	2.874	121	4.764	12	.4724	1
					3	Int.	●	MVS1180X03S120	60	2.362	60	2.362	122	4.803	12	.4724	3
					5	Int.	●	MVS1180X05S120	96	3.780	96	3.780	158	6.220	12	.4724	3
					8	Int.	●	MVS1180X08S120	132	5.197	132	5.197	194	7.638	12	.4724	3
11.9	.4685	15/32			2	Ext.	●	MVE1190X02S120	47	1.850	47	1.850	95	3.740	12	.4724	1
					3	Ext.	★	MVE1190X03S120	73	2.874	73	2.874	121	4.764	12	.4724	1
					3	Int.	●	MVS1190X03S120	60	2.362	60	2.362	122	4.803	12	.4724	3
					5	Int.	●	MVS1190X05S120	96	3.780	96	3.780	158	6.220	12	.4724	3
					8	Int.	●	MVS1190X08S120	132	5.197	132	5.197	194	7.638	12	.4724	3
12.0	.4724			M14x2.0	2	Ext.	●	MVE1200X02S120	47	1.850	47	1.850	95	3.740	12	.4724	1
					3	Ext.	★	MVE1200X03S120	73	2.874	73	2.874	121	4.764	12	.4724	1
					3	Int.	●	MVS1200X03S120	60	2.362	60	2.362	122	4.803	12	.4724	3
					5	Int.	●	MVS1200X05S120	96	3.780	96	3.780	158	6.220	12	.4724	3
					8	Int.	●	MVS1200X08S120	132	5.197	132	5.197	194	7.638	12	.4724	3

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

CUTTING CONDITIONS ➤ L025
TECHNICAL DATA ➤ N001

● : Inventory maintained. ★ : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

MVE

Work Material		Mild Steel (≤180HB) AISI 1010 etc.			Carbon Steel, Alloy Steel (180−280HB) AISI 1045, 4140 etc.		
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.−Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.−Max.) (IPR)
inch	mm						
.1181	**3.0**	210	6800	.0039 (.0024−.0051)	195	6300	.0039 (.0024−.0051)
.1575	**4.0**	225	5500	.0047 (.0031−.0063)	210	5100	.0047 (.0031−.0063)
.1969	**5.0**	225	4400	.0059 (.0039−.0079)	210	4100	.0059 (.0039−.0079)
.2480	**6.3**	260	4000	.0079 (.0051−.0102)	240	3700	.0079 (.0051−.0102)
.3150	**8.0**	270	3300	.0091 (.0071−.0110)	255	3100	.0091 (.0071−.0110)
.3937	**10.0**	290	2800	.0106 (.0087−.0126)	280	2700	.0106 (.0087−.0126)
.4724	**12.0**	310	2500	.0122 (.0110−.0134)	280	2300	.0122 (.0110−.0134)

Work Material		Carbon Steel, Alloy Steel (280−350HB) AISI 4340 etc.			Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.		
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.−Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.−Max.) (IPR)
inch	mm						
.1181	**3.0**	180	5800	.0035 (.0024−.0047)	65	2100	.0028 (.0020−.0031)
.1575	**4.0**	190	4700	.0043 (.0028−.0055)	60	1500	.0031 (.0024−.0039)
.1969	**5.0**	195	3800	.0055 (.0035−.0071)	60	1200	.0039 (.0028−.0051)
.2480	**6.3**	225	3500	.0071 (.0043−.0094)	75	1200	.0051 (.0035−.0067)
.3150	**8.0**	240	2900	.0083 (.0063−.0098)	75	900	.0055 (.0039−.0071)
.3937	**10.0**	255	2500	.0091 (.0075−.0106)	70	700	.0063 (.0047−.0075)
.4724	**12.0**	270	2200	.0102 (.0091−.0114)	75	600	.0071 (.0059−.0079)

Work Material		Gray Cast Iron (≤350MPa) No45B etc.			Ductile Cast Iron (≤450MPa) 60-40-8 etc.		
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.−Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.−Max.) (IPR)
inch	mm						
.1181	**3.0**	230	7400	.0039 (.0024−.0051)	210	6800	.0039 (.0024−.0051)
.1575	**4.0**	225	5500	.0047 (.0031−.0063)	210	5100	.0047 (.0031−.0063)
.1969	**5.0**	225	4400	.0059 (.0039−.0079)	210	4100	.0059 (.0039−.0079)
.2480	**6.3**	240	3700	.0079 (.0051−.0102)	225	3500	.0079 (.0051−.0102)
.3150	**8.0**	240	2900	.0098 (.0071−.0122)	220	2700	.0091 (.0071−.0110)
.3937	**10.0**	235	2300	.0114 (.0087−.0138)	225	2200	.0106 (.0087−.0126)
.4724	**12.0**	260	2100	.0130 (.0110−.0146)	235	1900	.0122 (.0110−.0134)

(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 NEW

RECOMMENDED CUTTING CONDITIONS

MVE

Work Material		Aluminium Alloy (Si<5%) ASTM A6061, 7075 etc.			Heat Resistant Alloy Inconel718 etc.		
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
inch	mm						
.1181	**3.0**	260	8400	.0039 (.0024—.0051)	65	2100	.0028 (.0020—.0035)
.1575	**4.0**	260	6300	.0047 (.0031—.0063)	60	1500	.0035 (.0024—.0043)
.1969	**5.0**	255	5000	.0059 (.0039—.0079)	60	1200	.0043 (.0031—.0055)
.2480	**6.3**	290	4500	.0079 (.0051—.0102)	75	1200	.0055 (.0035—.0075)
.3150	**8.0**	290	3500	.0091 (.0071—.0110)	75	900	.0055 (.0043—.0067)
.3937	**10.0**	290	2800	.0106 (.0087—.0126)	70	700	.0063 (.0047—.0075)
.4724	**12.0**	320	2600	.0122 (.0110—.0134)	70	600	.0063 (.0051—.0071)

Work Material		Hardened Steel (40—55HRC) AISI H13, L6 etc.		
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
inch	mm			
.1181	**3.0**	65	2100	.0028 (.0020—.0035)
.1575	**4.0**	60	1500	.0035 (.0024—.0043)
.1969	**5.0**	60	1200	.0043 (.0031—.0055)
.2480	**6.3**	75	1200	.0055 (.0035—.0075)
.3150	**8.0**	75	900	.0055 (.0043—.0067)
.3937	**10.0**	70	700	.0063 (.0047—.0075)
.4724	**12.0**	75	600	.0063 (.0051—.0071)

(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.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.−Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.−Max.) (IPR)
inch	mm						
.1181	**3.0**	290	9500	.0039 (.0024−.0051)	260	8400	.0039 (.0024−.0051)
.1575	**4.0**	325	7900	.0047 (.0031−.0063)	290	7100	.0047 (.0031−.0063)
.1969	**5.0**	325	6300	.0059 (.0039−.0079)	290	5700	.0059 (.0039−.0079)
.2480	**6.3**	355	5500	.0079 (.0051−.0102)	325	5000	.0079 (.0051−.0102)
.3150	**8.0**	385	4700	.0091 (.0071−.0110)	355	4300	.0091 (.0071−.0110)
.3937	**10.0**	420	4100	.0106 (.0087−.0126)	390	3800	.0106 (.0087−.0126)
.4724	**12.0**	455	3700	.0118 (.0102−.0134)	420	3400	.0118 (.0102−.0134)

Work Material		Carbon Steel, Alloy Steel (280−350HB) AISI 4340 etc.			Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.		
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.−Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.−Max.) (IPR)
inch	mm						
.1181	**3.0**	230	7400	.0039 (.0024−.0051)	130	4200	.0031 (.0024−.0039)
.1575	**4.0**	260	6300	.0043 (.0028−.0055)	125	3100	.0035 (.0024−.0043)
.1969	**5.0**	255	5000	.0055 (.0035−.0071)	130	2500	.0043 (.0031−.0055)
.2480	**6.3**	290	4500	.0071 (.0043−.0094)	160	2500	.0055 (.0035−.0071)
.3150	**8.0**	320	3900	.0083 (.0063−.0098)	155	1900	.0059 (.0039−.0075)
.3937	**10.0**	360	3500	.0091 (.0075−.0106)	155	1500	.0063 (.0047−.0079)
.4724	**12.0**	380	3100	.0102 (.0087−.0114)	185	1500	.0071 (.0059−.0083)

Work Material		Gray Cast Iron (≤350MPa) No45B etc.			Ductile Cast Iron (≤450MPa) 60-60-8 etc.		
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.−Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.−Max.) (IPR)
inch	mm						
.1181	**3.0**	290	9500	.0039 (.0024−.0051)	210	6900	.0039 (.0024−.0051)
.1575	**4.0**	325	7900	.0047 (.0031−.0063)	210	5100	.0047 (.0031−.0063)
.1969	**5.0**	325	6300	.0059 (.0039−.0079)	215	4100	.0059 (.0039−.0079)
.2480	**6.3**	355	5500	.0079 (.0051−.0102)	225	3500	.0079 (.0051−.0102)
.3150	**8.0**	385	4700	.0098 (.0071−.0122)	220	2700	.0091 (.0071−.0110)
.3937	**10.0**	420	4100	.0114 (.0087−.0138)	225	2200	.0106 (.0087−.0126)
.4724	**12.0**	455	3700	.0126 (.0102−.0146)	285	2300	.0118 (.0102−.0134)

(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 NEW

RECOMMENDED CUTTING CONDITIONS

MVS

Work Material	Aluminium Alloy (Si<5%) ASTM 6061, 7075 etc.		
Drill Dia. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.1181	**3.0**	390	12700	.0091 (.0039—.0138)
.1575	**4.0**	390	9500	.0094 (.0047—.0138)
.1969	**5.0**	390	7600	.0098 (.0059—.0138)
.2480	**6.3**	485	7500	.0138 (.0079—.0197)
.3150	**8.0**	485	5900	.0138 (.0079—.0197)
.3937	**10.0**	485	4700	.0197 (.0079—.0315)
.4724	**12.0**	520	4200	.0197 (.0079—.0315)

(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

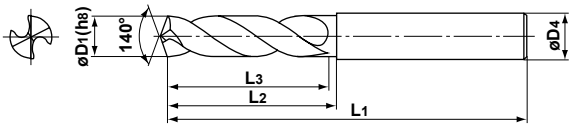
Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎	○(only MWE)	◎(MWE:○)	◎	○	○

Tolerance	D=3	3<D≤6	6<D≤10	10<D≤14	18<D≤25
D1 (mm)	0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
D4 (mm)	0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033

MWE (External coolant)



Type 1



MWS (Internal coolant)

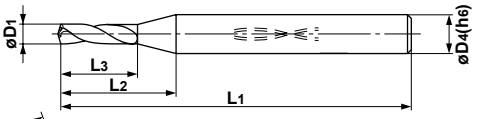
Tolerance	0.5≤D<1	1≤D<2.95
D1 (mm)	+0.009 0	+0.014 0
D4 (mm)	0 −0.006	0 −0.006

SB Type

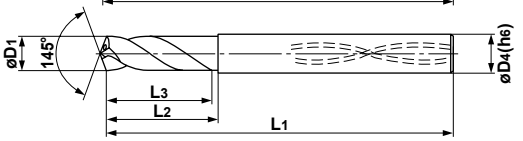




Type 2



Type 3



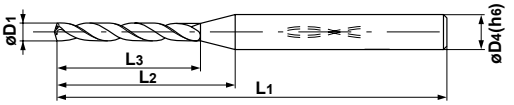
LB/XB Type (ϕ.0200"−ϕ.1200" & ϕ0.50−ϕ2.95mm)

Tolerance	0.5≤D<1	1≤D<2.95
D1 (mm)	0 −0.009	0 −0.014
D4 (mm)	0 −0.006	0 −0.006





Type 4

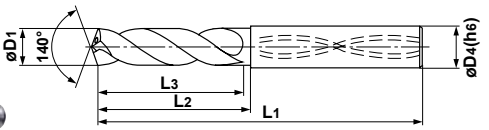


DB Type (ϕ.0200"−ϕ.1200" & ϕ0.50−ϕ2.95mm)





Type 5

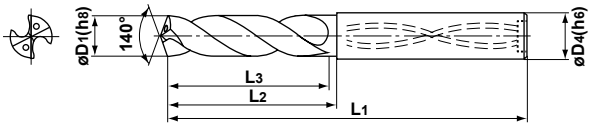


MB/LB/X8DB Type (ϕ.1250"−ϕ.7812" & ϕ3−ϕ25mm)

Tolerance	D=3	3<D≤6	6<D≤10	10<D≤14	18<D≤25
D1 (mm)	0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
D4 (mm)	0 −0.006	0 −0.008	0 −0.009	0 −0.011	0 −0.013



Type 6

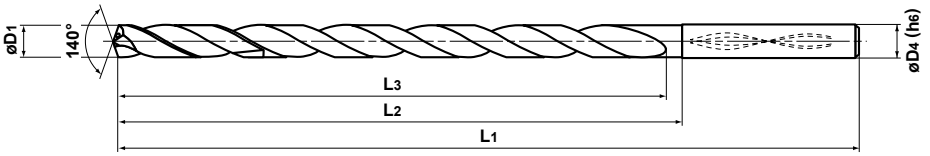


X10DB/X15DB/X20DB/X25DB/X30DB Type (ϕ.1250"−ϕ.5000" & ϕ3−ϕ14mm)

Tolerance	D=3	3<D≤6	6<D≤10	10<D≤14
D1 (mm)	−0.017 −0.031	−0.025 −0.043	−0.033 −0.055	−0.041 −0.068
D4 (mm)	0 −0.006	0 −0.008	0 −0.009	0 −0.011



Type 7



Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
0.50	.0197				1	Int.	★	MWS0050SB	2.5	.098	7.2	.283	47	1.850	3.0	.1181	2
					5	Int.	★	MWS0050LB	8	.315	13	.512	47	1.850	3.0	.1181	4
					12	Int.	★	MWS0050XB	16	.630	21	.827	47	1.850	3.0	.1181	4
0.508	.0200		76		1	Int.	●	MWS00200SB	2.5	.098	7.5	.294	45	1.772	3.175	.1250	2
					5	Int.	●	MWS00200LB	8	.315	13.0	.511	47	1.850	3.175	.1250	4
					12	Int.	●	MWS00200XB	16	.630	21.0	.826	47	1.850	3.175	.1250	4
0.51	.0201				1	Int.	★	MWS0051SB	2.6	.102	7.2	.283	47	1.850	3.0	.1181	2
					5	Int.	★	MWS0051LB	8	.315	13	.512	47	1.850	3.0	.1181	4
					12	Int.	★	MWS0051XB	16	.630	21	.827	47	1.850	3.0	.1181	4
0.52	.0205				1	Int.	●	MWS0052SB	2.6	.102	7.2	.283	47	1.850	3.0	.1181	2
					5	Int.	★	MWS0052LB	8	.315	13	.512	47	1.850	3.0	.1181	4
					12	Int.	●	MWS0052XB	16	.630	21	.827	47	1.850	3.0	.1181	4
0.53	.0209				1	Int.	★	MWS0053SB	2.6	.102	7.2	.283	47	1.850	3.0	.1181	2
					5	Int.	★	MWS0053LB	8	.315	13	.512	47	1.850	3.0	.1181	4
					12	Int.	★	MWS0053XB	16	.630	21	.827	47	1.850	3.0	.1181	4
0.533	.0210		75		1	Int.	●	MWS00210SB	2.6	.102	7.5	.296	45	1.772	3.175	.1250	2
					5	Int.	●	MWS00210LB	8	.315	12.9	.509	47	1.850	3.175	.1250	4
					12	Int.	●	MWS00210XB	16	.630	20.9	.824	47	1.850	3.175	.1250	4
0.54	.0213				1	Int.	★	MWS0054SB	2.6	.102	7.2	.283	47	1.850	3.0	.1181	2
					5	Int.	★	MWS0054LB	8	.315	13	.512	47	1.850	3.0	.1181	4
					12	Int.	★	MWS0054XB	16	.630	21	.827	47	1.850	3.0	.1181	4
0.55	.0217				1	Int.	●	MWS0055SB	2.6	.102	7.2	.283	47	1.850	3.0	.1181	2
					5	Int.	★	MWS0055LB	8	.315	13	.512	47	1.850	3.0	.1181	4
					12	Int.	●	MWS0055XB	16	.630	21	.827	47	1.850	3.0	.1181	4
0.56	.0220				1	Int.	●	MWS0056SB	2.9	.114	7.5	.295	47	1.850	3.0	.1181	2
					5	Int.	★	MWS0056LB	8	.315	13	.512	47	1.850	3.0	.1181	4
					12	Int.	●	MWS0056XB	16	.630	21	.827	47	1.850	3.0	.1181	4
0.57	.0224				1	Int.	●	MWS0057SB	2.9	.114	7.4	.291	47	1.850	3.0	.1181	2
					5	Int.	★	MWS0057LB	8	.315	13	.512	47	1.850	3.0	.1181	4
					12	Int.	●	MWS0057XB	16	.630	21	.827	47	1.850	3.0	.1181	4
0.572	.0225		74		1	Int.	●	MWS00225SB	2.9	.114	7.8	.305	45	1.772	3.175	.1250	2
					5	Int.	●	MWS00225LB	8	.315	12.9	.506	47	1.850	3.175	.1250	4
					12	Int.	●	MWS00225XB	16	.630	20.9	.821	47	1.850	3.175	.1250	4
0.58	.0228				1	Int.	★	MWS0058SB	2.9	.114	7.4	.291	47	1.850	3.0	.1181	2
					5	Int.	★	MWS0058LB	8	.315	13	.512	47	1.850	3.0	.1181	4
					12	Int.	★	MWS0058XB	16	.630	21	.827	47	1.850	3.0	.1181	4
0.59	.0232				1	Int.	★	MWS0059SB	2.9	.114	7.4	.291	47	1.850	3.0	.1181	2
					5	Int.	★	MWS0059LB	8	.315	12	.472	47	1.850	3.0	.1181	4
					12	Int.	★	MWS0059XB	16	.630	20	.787	47	1.850	3.0	.1181	4
0.60	.0236				1	Int.	●	MWS0060SB	2.9	.114	7.4	.291	47	1.850	3.0	.1181	2
					5	Int.	★	MWS0060LB	8	.315	12	.472	47	1.850	3.0	.1181	4
					12	Int.	●	MWS0060XB	16	.630	20	.787	47	1.850	3.0	.1181	4
0.610	.0240		73		1	Int.	●	MWS00240SB	3.1	.122	7.9	.311	45	1.772	3.175	.1250	2
					1	Int.	★	MWS0061SB	3.1	.122	7.6	.299	47	1.850	3.0	.1181	4
					5	Int.	●	MWS00240LB	8	.315	12.8	.503	47	1.850	3.175	.1250	4
					5	Int.	★	MWS0061LB	8	.315	12	.472	47	1.850	3.0	.1181	4
					12	Int.	●	MWS00240XB	16	.630	20.8	.818	47	1.850	3.175	.1250	4
					12	Int.	★	MWS0061XB	16	.630	20	.787	47	1.850	3.0	.1181	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 CONDITION MWE/MWS ➤ L072
HOW TO USE ➤ L078
TECHNICAL DATA ➤ N001

MWE/MWS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
0.62	.0244				1	Int.	★	MWS0062SB	3.1	.122	7.5	.295	47	1.850	3.0	.1181	2
					5	Int.	★	MWS0062LB	8	.315	12	.472	47	1.850	3.0	.1181	4
					12	Int.	★	MWS0062XB	16	.630	20	.787	47	1.850	3.0	.1181	4
0.63	.0248				1	Int.	★	MWS0063SB	3.1	.122	7.5	.295	47	1.850	3.0	.1181	2
					5	Int.	★	MWS0063LB	8	.315	12	.472	47	1.850	3.0	.1181	4
					12	Int.	★	MWS0063XB	16	.630	20	.787	47	1.850	3.0	.1181	4
0.635	.0250		72		1	Int.	●	MWS00250SB	3.1	.122	7.8	.309	45	1.772	3.175	.1250	2
					5	Int.	●	MWS00250LB	8	.315	12.7	.502	47	1.850	3.175	.1250	4
					12	Int.	●	MWS00250XB	16	.630	20.7	.817	47	1.850	3.175	.1250	4
0.64	.0252				1	Int.	★	MWS0064SB	3.1	.122	7.5	.295	47	1.850	3.0	.1181	2
					5	Int.	★	MWS0064LB	8	.315	12	.472	47	1.850	3.0	.1181	4
					12	Int.	★	MWS0064XB	16	.630	20	.787	47	1.850	3.0	.1181	4
0.65	.0256				1	Int.	●	MWS0065SB	3.1	.122	7.5	.295	47	1.850	3.0	.1181	2
					5	Int.	★	MWS0065LB	8	.315	12	.472	47	1.850	3.0	.1181	4
					12	Int.	●	MWS0065XB	16	.630	20	.787	47	1.850	3.0	.1181	4
0.660	.0260		71		1	Int.	●	MWS00260SB	3.4	.134	8.1	.319	45	1.772	3.175	.1250	2
					1	Int.	●	MWS0066SB	3.4	.134	7.8	.307	47	1.850	3.0	.1181	2
					5	Int.	●	MWS00260LB	8	.315	12.7	.500	47	1.850	3.175	.1250	4
					5	Int.	●	MWS0066LB	8	.315	12	.472	47	1.850	3.0	.1181	4
					12	Int.	●	MWS00260XB	16	.630	20.7	.815	47	1.850	3.175	.1250	4
					12	Int.	★	MWS0066XB	16	.630	20	.787	47	1.850	3.0	.1181	4
0.67	.0264				1	Int.	★	MWS0067SB	3.4	.134	7.7	.303	47	1.850	3.0	.1181	2
					5	Int.	★	MWS0067LB	8	.315	12	.472	47	1.850	3.0	.1181	4
					12	Int.	★	MWS0067XB	16	.630	20	.787	47	1.850	3.0	.1181	4
0.68	.0268				1	Int.	★	MWS0068SB	3.4	.134	7.7	.303	47	1.850	3.0	.1181	2
					5	Int.	★	MWS0068LB	8	.315	12	.472	47	1.850	3.0	.1181	4
					12	Int.	★	MWS0068XB	16	.630	20	.787	47	1.850	3.0	.1181	4
0.69	.0272				1	Int.	★	MWS0069SB	3.4	.134	7.7	.303	47	1.850	3.0	.1181	2
					5	Int.	★	MWS0069LB	8	.315	12	.472	47	1.850	3.0	.1181	4
					12	Int.	★	MWS0069XB	16	.630	20	.787	47	1.850	3.0	.1181	4
0.70	.0276				1	Int.	●	MWS0070SB	3.4	.134	7.7	.303	47	1.850	3.0	.1181	2
					5	Int.	★	MWS0070LB	8	.315	12	.472	47	1.850	3.0	.1181	4
					12	Int.	★	MWS0070XB	16	.630	20	.787	47	1.850	3.0	.1181	4
0.71	.0280		70		1	Int.	★	MWS0071SB	3.6	.142	7.9	.311	50	1.969	3.0	.1181	2
					5	Int.	★	MWS0071LB	20	.787	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0071XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.711	.0280		70		1	Int.	●	MWS00280SB	3.6	.142	8.2	.323	50	1.969	3.175	.1250	2
					5	Int.	●	MWS00280LB	10	.394	14.6	.575	50	1.969	3.175	.1250	4
					12	Int.	●	MWS00280XB	20	.787	24.6	.968	50	1.969	3.175	.1250	4
0.72	.0283				1	Int.	★	MWS0072SB	3.6	.142	7.9	.311	50	1.969	3.0	.1181	2
					5	Int.	★	MWS0072LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0072XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.73	.0287				1	Int.	★	MWS0073SB	3.6	.142	7.8	.307	50	1.969	3.0	.1181	2
					5	Int.	★	MWS0073LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0073XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.74	.0291				1	Int.	★	MWS0074SB	3.6	.142	7.8	.307	50	1.969	3.0	.1181	2
					5	Int.	★	MWS0074LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0074XB	20	.787	24	.945	50	1.969	3.0	.1181	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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
0.742	.0292		69		1	Int.	●	MWS00292SB	3.6	.142	8.1	.320	50	1.969	3.175	.1250	2
					5	Int.	●	MWS00292LB	10	.394	14.5	.572	50	1.969	3.175	.1250	4
					12	Int.	●	MWS00292XB	20	.787	24.5	.966	50	1.969	3.175	.1250	4
0.75	.0295				1	Int.	●	MWS0075SB	3.6	.142	7.8	.307	50	1.969	3.0	.1181	2
					5	Int.	●	MWS0075LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	●	MWS0075XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.76	.0299				1	Int.	●	MWS0076SB	3.9	.154	8.1	.319	50	1.969	3.0	.1181	2
					5	Int.	●	MWS0076LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	●	MWS0076XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.77	.0303				1	Int.	★	MWS0077SB	3.9	.154	8.1	.319	50	1.969	3.0	.1181	2
					5	Int.	★	MWS0077LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0077XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.78	.0307				1	Int.	●	MWS0078SB	3.9	.154	8	.315	50	1.969	3.0	.1181	2
					5	Int.	★	MWS0078LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	●	MWS0078XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.787	.0310		68		1	Int.	●	MWS00310SB	3.9	.154	8.4	.329	50	1.969	3.175	.1250	2
					5	Int.	●	MWS00310LB	10	.394	14.5	.569	50	1.969	3.175	.1250	4
					12	Int.	●	MWS00310XB	20	.787	24.5	.963	50	1.969	3.175	.1250	4
0.79	.0311				1	Int.	★	MWS0079SB	3.9	.154	8	.315	50	1.969	3.0	.1181	2
					5	Int.	★	MWS0079LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0079XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.792	.0312	1/32			1	Int.	●	MWS00312SB	3.9	.154	8.3	.329	50	1.969	3.175	.1250	2
					5	Int.	●	MWS00312LB	10	.394	14.4	.569	50	1.969	3.175	.1250	4
					12	Int.	●	MWS00312XB	20	.787	24.4	.962	50	1.969	3.175	.1250	4
0.80	.0315				1	Int.	●	MWS0080SB	3.9	.154	8	.315	50	1.969	3.0	.1181	2
					5	Int.	●	MWS0080LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	●	MWS0080XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.81	.0319				1	Int.	★	MWS0081SB	4.1	.161	8.2	.323	50	1.969	3.0	.1181	2
					5	Int.	★	MWS0081LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0081XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.813	.0320		67		1	Int.	●	MWS00320SB	4.1	.161	8.5	.335	50	1.969	3.175	.1250	2
					5	Int.	●	MWS00320LB	10	.394	14.4	.567	50	1.969	3.175	.1250	4
					12	Int.	●	MWS00320XB	20	.787	24.4	.961	50	1.969	3.175	.1250	4
0.82	.0323				1	Int.	●	MWS0082SB	4.1	.161	8.2	.323	50	1.969	3.0	.1181	2
					5	Int.	●	MWS0082LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0082XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.83	.0327				1	Int.	●	MWS0083SB	4.1	.161	8.1	.319	50	1.969	3.0	.1181	2
					5	Int.	●	MWS0083LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0083XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.838	.0330		66		1	Int.	●	MWS00330SB	4.1	.161	8.5	.333	50	1.969	3.175	.1250	2
					5	Int.	●	MWS00330LB	10	.394	14.4	.565	50	1.969	3.175	.1250	4
					12	Int.	●	MWS00330XB	20	.787	24.4	.959	50	1.969	3.175	.1250	4
0.84	.0331				1	Int.	★	MWS0084SB	4.1	.161	8.1	.319	50	1.969	3.0	.1181	2
					5	Int.	★	MWS0084LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0084XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.85	.0335				1	Int.	●	MWS0085SB	4.1	.161	8.1	.319	50	1.969	3.0	.1181	2
					5	Int.	●	MWS0085LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0085XB	20	.787	24	.945	50	1.969	3.0	.1181	4

MWE/MWS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
0.86	.0339				1	Int.	●	MWS0086SB	4.4	.173	8.4	.331	50	1.969	3.0	.1181	2
					5	Int.	★	MWS0086LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0086XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.87	.0343				1	Int.	★	MWS0087SB	4.4	.173	8.4	.331	50	1.969	3.0	.1181	2
					5	Int.	★	MWS0087LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0087XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.88	.0346				1	Int.	★	MWS0088SB	4.4	.173	8.4	.331	50	1.969	3.0	.1181	2
					5	Int.	★	MWS0088LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0088XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.889	.0350		65		1	Int.	●	MWS00350SB	4.4	.173	8.7	.341	50	1.969	3.175	.1250	2
					5	Int.	●	MWS00350LB	10	.394	14.3	.562	50	1.969	3.175	.1250	4
					12	Int.	●	MWS00350XB	20	.787	24.3	.955	50	1.969	3.175	.1250	4
0.89	.0350		65		1	Int.	★	MWS0089SB	4.4	.173	8.3	.327	50	1.969	3.0	.1181	2
					5	Int.	★	MWS0089LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0089XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.90	.0354				1	Int.	●	MWS0090SB	4.4	.173	8.3	.327	50	1.969	3.0	.1181	2
					5	Int.	●	MWS0090LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0090XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.91	.0358				1	Int.	★	MWS0091SB	4.6	.181	8.5	.335	50	1.969	3.0	.1181	2
					5	Int.	★	MWS0091LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0091XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.914	.0360		64		1	Int.	●	MWS00360SB	4.6	.181	8.8	.347	50	1.969	3.175	.1250	2
					5	Int.	●	MWS00360LB	10	.394	14.2	.560	50	1.969	3.175	.1250	4
					12	Int.	●	MWS00360XB	20	.787	24.2	.953	50	1.969	3.175	.1250	4
0.92	.0362				1	Int.	★	MWS0092SB	4.6	.181	8.5	.335	50	1.969	3.0	.1181	2
					5	Int.	★	MWS0092LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0092XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.93	.0366				1	Int.	●	MWS0093SB	4.6	.181	8.5	.335	50	1.969	3.0	.1181	2
					5	Int.	●	MWS0093LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0093XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.940	.0370		63		1	Int.	●	MWS00370SB	4.6	.181	8.8	.345	50	1.969	3.175	.1250	2
					1	Int.	★	MWS0094SB	4.6	.181	8.4	.331	50	1.969	3.0	.1181	2
					5	Int.	●	MWS00370LB	10	.394	14.2	.558	50	1.969	3.175	.1250	4
					5	Int.	★	MWS0094LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	●	MWS00370XB	20	.787	24.2	.952	50	1.969	3.175	.1250	4
					12	Int.	★	MWS0094XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.95	.0374				1	Int.	★	MWS0095SB	4.6	.181	8.4	.331	50	1.969	3.0	.1181	2
					5	Int.	★	MWS0095LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0095XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.96	.0378				1	Int.	★	MWS0096SB	4.9	.193	8.7	.343	50	1.969	3.0	.1181	2
					5	Int.	★	MWS0096LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0096XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.965	.0380		62		1	Int.	●	MWS00380SB	4.9	.193	9.0	.355	50	1.969	3.175	.1250	2
					5	Int.	●	MWS00380LB	10	.394	14.1	.556	50	1.969	3.175	.1250	4
					12	Int.	●	MWS00380XB	20	.787	24.1	.950	50	1.969	3.175	.1250	4
0.97	.0382				1	Int.	●	MWS0097SB	4.9	.193	8.7	.343	50	1.969	3.0	.1181	2
					5	Int.	●	MWS0097LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0097XB	20	.787	24	.945	50	1.969	3.0	.1181	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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
0.980	.0386				1	Int.	★	MWS0098SB	4.9	.193	8.7	.343	50	1.969	3.0	.1181	2
					5	Int.	★	MWS0098LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0098XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.990	.0390		61		1	Int.	●	MWS0099SB	4.9	.193	8.7	.343	50	1.969	3.0	.1181	2
					5	Int.	★	MWS0099LB	10	.394	14	.551	50	1.969	3.0	.1181	4
					12	Int.	★	MWS0099XB	20	.787	24	.945	50	1.969	3.0	.1181	4
0.991	.0390		61		1	Int.	●	MWS00390SB	4.9	.193	9.0	.353	50	1.969	3.175	.1250	2
					5	Int.	●	MWS00390LB	10	.394	14.1	.554	50	1.969	3.175	.1250	4
					12	Int.	●	MWS00390XB	20	.787	24.1	.948	50	1.969	3.175	.1250	4
1.000	.0394				1	Int.	●	MWS0100SB	5	.197	8.7	.343	55	2.165	3.0	.1181	2
					5	Int.	●	MWS0100LB	11	.433	15	.591	55	2.165	3.0	.1181	4
					12	Int.	●	MWS0100XB	23	.906	27	1.063	55	2.165	3.0	.1181	4
					20	Int.	●	MWS0100X20DB	24	.945	28	1.102	60	2.362	3.0	.1181	4
					25	Int.	●	MWS0100X25DB	28	1.102	32	1.260	66	2.598	3.0	.1181	4
					30	Int.	●	MWS0100X30DB	33	1.299	37	1.457	72	2.835	3.0	.1181	4
1.001	.0394				1	Int.	●	MWS00394SB	5	.197	9.1	.357	55	2.165	3.175	.1250	2
					12	Int.	●	MWS00394XB	23	.906	27.1	1.065	55	2.165	3.175	.1250	4
1.016	.0400		60		1	Int.	●	MWS00400SB	5	.197	9.0	.355	55	2.165	3.175	.1250	2
					12	Int.	●	MWS00400XB	23	.906	27.0	1.064	55	2.165	3.175	.1250	4
1.041	.0410		59		1	Int.	●	MWS00410SB	5.2	.205	9.2	.361	55	2.165	3.175	.1250	2
					12	Int.	●	MWS00410XB	23	.906	27.0	1.063	55	2.165	3.175	.1250	4
1.050	.0413				1	Int.	●	MWS0105SB	5.2	.205	8.8	.346	55	2.165	3.0	.1181	2
					20	Int.	□	MWS0105X20DB	24	.945	28	1.102	60	2.362	3.0	.1181	4
					25	Int.	●	MWS0105X25DB	29	1.142	33	1.299	66	2.598	3.0	.1181	4
					30	Int.	□	MWS0105X30DB	35	1.378	38	1.496	72	2.835	3.0	.1181	4
1.067	.0420		58		1	Int.	●	MWS00420SB	5.2	.205	9.1	.360	55	2.165	3.175	.1250	2
					12	Int.	●	MWS00420XB	23	.906	26.9	1.060	55	2.165	3.175	.1250	4
1.092	.0430		57		1	Int.	●	MWS00430SB	5.4	.213	9.3	.366	55	2.165	3.175	.1250	2
					12	Int.	●	MWS00430XB	23	.906	26.9	1.059	55	2.165	3.175	.1250	4
1.100	.0433				1	Int.	●	MWS0110SB	5.4	.213	8.9	.350	55	2.165	3.0	.1181	2
					5	Int.	★	MWS0110LB	17	.669	21	.827	55	2.165	3.0	.1181	4
					12	Int.	●	MWS0110XB	23	.906	27	1.063	55	2.165	3.0	.1181	4
					20	Int.	★	MWS0110X20DB	25	.984	29	1.142	60	2.362	3.0	.1181	4
					25	Int.	●	MWS0110X25DB	31	1.220	34	1.339	66	2.598	3.0	.1181	4
					30	Int.	★	MWS0110X30DB	36	1.417	40	1.575	72	2.835	3.0	.1181	4
1.150	.0453				1	Int.	□	MWS0115SB	5.6	.220	9.1	.358	55	2.165	3.0	.1181	2
					20	Int.	□	MWS0115X20DB	26	1.024	30	1.181	60	2.362	3.0	.1181	4
					25	Int.	□	MWS0115X25DB	32	1.260	36	1.417	66	2.598	3.0	.1181	4
					30	Int.	□	MWS0115X30DB	38	1.496	41	1.614	72	2.835	3.0	.1181	4
1.181	.0465		56		1	Int.	●	MWS00465SB	6	.236	9.7	.383	55	2.165	3.175	.1250	2
					12	Int.	●	MWS00465XB	23	.906	26.7	1.052	55	2.165	3.175	.1250	4
1.200	.0472				1	Int.	●	MWS0120SB	6	.236	9.4	.370	55	2.165	3.0	.1181	2
					5	Int.	★	MWS0120LB	17	.669	20	.787	55	2.165	3.0	.1181	4
					12	Int.	●	MWS0120XB	23	.906	26	1.024	55	2.165	3.0	.1181	4
					20	Int.	●	MWS0120X20DB	28	1.102	31	1.220	60	2.362	3.0	.1181	4
					25	Int.	●	MWS0120X25DB	34	1.339	37	1.457	66	2.598	3.0	.1181	4
					30	Int.	●	MWS0120X30DB	40	1.575	43	1.693	72	2.835	3.0	.1181	4

CUTTING CONDITION MWE/MWS ➤ L072
HOW TO USE ➤ L078
TECHNICAL DATA ➤ N001

MWE/MWS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
1.250	.0492				1	Int.	●	MWS0125SB	6.2	.244	9.5	.374	55	2.165	3.0	.1181	2
					20	Int.	●	MWS0125X20DB	29	1.142	32	1.260	68	2.677	3.0	.1181	4
					25	Int.	□	MWS0125X25DB	35	1.378	38	1.496	74	2.913	3.0	.1181	4
					30	Int.	□	MWS0125X30DB	41	1.614	45	1.772	82	3.228	3.0	.1181	4
1.300	.0512				1	Int.	●	MWS0130SB	6.4	.252	9.6	.378	55	2.165	3.0	.1181	2
					5	Int.	★	MWS0130LB	17	.669	20	.787	55	2.165	3.0	.1181	4
					12	Int.	●	MWS0130XB	23	.906	26	1.024	55	2.165	3.0	.1181	4
					20	Int.	●	MWS0130X20DB	30	1.181	33	1.299	68	2.677	3.0	.1181	4
					25	Int.	●	MWS0130X25DB	36	1.417	40	1.575	74	2.913	3.0	.1181	4
					30	Int.	●	MWS0130X30DB	43	1.693	46	1.811	82	3.228	3.0	.1181	4
1.321	.0520		55		1	Int.	●	MWS00520SB	6.4	.252	9.9	.388	55	2.165	3.175	.1250	2
					12	Int.	●	MWS00520XB	23	.906	26.5	1.042	55	2.165	3.175	.1250	4
1.350	.0531				1	Int.	□	MWS0135SB	6.6	.260	9.7	.382	55	2.165	3.0	.1181	2
					20	Int.	□	MWS0135X20DB	31	1.220	34	1.339	68	2.677	3.0	.1181	4
					25	Int.	□	MWS0135X25DB	38	1.496	41	1.614	74	2.913	3.0	.1181	4
					30	Int.	□	MWS0135X30DB	45	1.772	48	1.890	82	3.228	3.0	.1181	4
1.397	.0550		54		1	Int.	●	MWS00550SB	7	.276	10.3	.406	55	2.165	3.175	.1250	2
					12	Int.	●	MWS00550XB	23	.906	26.3	1.036	55	2.165	3.175	.1250	4
1.400	.0551				1	Int.	●	MWS0140SB	7	.276	10	.394	55	2.165	3.0	.1181	2
					5	Int.	★	MWS0140LB	17	.669	20	.787	55	2.165	3.0	.1181	4
					12	Int.	●	MWS0140XB	23	.906	26	1.024	55	2.165	3.0	.1181	4
					20	Int.	●	MWS0140X20DB	32	1.260	35	1.378	68	2.677	3.0	.1181	4
					25	Int.	●	MWS0140X25DB	39	1.535	42	1.654	74	2.913	3.0	.1181	4
					30	Int.	●	MWS0140X30DB	46	1.811	49	1.929	82	3.228	3.0	.1181	4
1.450	.0571				1	Int.	●	MWS0145SB	7.2	.283	10.1	.398	55	2.165	3.0	.1181	2
					20	Int.	●	MWS0145X20DB	33	1.299	36	1.417	68	2.677	3.0	.1181	4
					25	Int.	□	MWS0145X25DB	41	1.614	43	1.693	74	2.913	3.0	.1181	4
					30	Int.	□	MWS0145X30DB	48	1.890	51	2.008	82	3.228	3.0	.1181	4
1.500	.0591			#1-64	1	Int.	●	MWS0150SB	7.4	.291	10.2	.402	55	2.165	3.0	.1181	2
					5	Int.	●	MWS0150LB	17	.669	20	.787	55	2.165	3.0	.1181	4
					12	Int.	●	MWS0150XB	23	.906	26	1.024	55	2.165	3.0	.1181	4
					20	Int.	●	MWS0150X20DB	35	1.378	37	1.457	68	2.677	3.0	.1181	4
					25	Int.	●	MWS0150X25DB	42	1.654	45	1.772	74	2.913	3.0	.1181	4
					30	Int.	●	MWS0150X30DB	50	1.969	52	2.047	82	3.228	3.0	.1181	4
1.501	.0591			#1-64	1	Int.	●	MWS00591SB	7.4	.291	10.5	.414	55	2.165	3.175	.1250	2
					12	Int.	●	MWS00591XB	23	.906	26.1	1.028	55	2.165	3.175	.1250	4
1.550	.0610				1	Int.	●	MWS0155SB	7.6	.299	10.3	.406	68	2.677	3.0	.1181	2
					20	Int.	●	MWS0155X20DB	36	1.417	38	1.496	78	3.071	3.0	.1181	4
					25	Int.	□	MWS0155X25DB	43	1.693	46	1.811	86	3.386	3.0	.1181	4
					30	Int.	□	MWS0155X30DB	51	2.008	54	2.126	95	3.740	3.0	.1181	4
1.588	.0625	1/16			1	Int.	●	MWS00625SB	8	.315	11.0	.432	68	2.677	3.175	.1250	2
					12	Int.	●	MWS00625XB	30	1.181	33.0	1.298	68	2.677	3.175	.1250	4
1.600	.0630				1	Int.	●	MWS0160SB	8	.315	10.6	.417	68	2.677	3.0	.1181	2
					5	Int.	★	MWS0160LB	22	.866	25	.984	68	2.677	3.0	.1181	4
					12	Int.	●	MWS0160XB	30	1.181	33	1.299	68	2.677	3.0	.1181	4
					20	Int.	●	MWS0160X20DB	37	1.457	39	1.535	78	3.071	3.0	.1181	4
					25	Int.	●	MWS0160X25DB	45	1.772	47	1.850	86	3.386	3.0	.1181	4
					30	Int.	●	MWS0160X30DB	53	2.087	55	2.165	95	3.740	3.0	.1181	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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
1.613	**.0635**		**52**		1	Int.	●	**MWS00635SB**	8	.315	10.9	.430	68	2.677	3.175	.1250	2
					12	Int.	●	**MWS00635XB**	30	1.181	32.9	1.296	68	2.677	3.175	.1250	4
1.650	**.0650**				1	Int.	□	**MWS0165SB**	8.2	.323	10.7	.421	68	2.677	3.0	.1181	2
					20	Int.	□	**MWS0165X20DB**	38	1.496	40	1.575	78	3.071	3.0	.1181	4
					25	Int.	□	**MWS0165X25DB**	46	1.811	49	1.929	86	3.386	3.0	.1181	4
					30	Int.	□	**MWS0165X30DB**	54	2.126	57	2.244	95	3.740	3.0	.1181	4
1.700	**.0670**		**51**		1	Int.	●	**MWS0170SB**	8.4	.331	10.8	.425	68	2.677	3.0	.1181	2
					5	Int.	★	**MWS0170LB**	22	.866	24	.945	68	2.677	3.0	.1181	4
					12	Int.	●	**MWS0170XB**	30	1.181	32	1.260	68	2.677	3.0	.1181	4
					20	Int.	●	**MWS0170X20DB**	39	1.535	42	1.654	78	3.071	3.0	.1181	4
					25	Int.	●	**MWS0170X25DB**	48	1.890	50	1.969	86	3.386	3.0	.1181	4
					30	Int.	★	**MWS0170X30DB**	56	2.205	59	2.323	95	3.740	3.0	.1181	4
1.702	**.0670**		**51**		1	Int.	●	**MWS00670SB**	8.4	.331	11.1	.439	68	2.677	3.175	.1250	2
					12	Int.	●	**MWS00670XB**	30	1.181	32.7	1.289	68	2.677	3.175	.1250	4
1.750	**.0689**				1	Int.	●	**MWS0175SB**	8.6	.339	10.9	.429	68	2.677	3.0	.1181	2
					20	Int.	□	**MWS0175X20DB**	40	1.575	43	1.693	84	3.307	3.0	.1181	4
					25	Int.	□	**MWS0175X25DB**	49	1.929	51	2.008	94	3.701	3.0	.1181	4
					30	Int.	□	**MWS0175X30DB**	58	2.283	60	2.362	102	4.016	3.0	.1181	4
1.778	**.0700**		**50**	**#2-56**	1	Int.	●	**MWS00700SB**	9	.354	11.6	.457	68	2.677	3.175	.1250	2
					12	Int.	●	**MWS00700XB**	30	1.181	32.6	1.284	68	2.677	3.175	.1250	4
1.800	**.0709**				1	Int.	●	**MWS0180SB**	9	.354	11.2	.441	68	2.677	3.0	.1181	2
					5	Int.	★	**MWS0180LB**	22	.866	24	.945	68	2.677	3.0	.1181	4
					12	Int.	●	**MWS0180XB**	30	1.181	32	1.260	68	2.677	3.0	.1181	4
					20	Int.	●	**MWS0180X20DB**	41	1.614	44	1.732	84	3.307	3.0	.1181	4
					25	Int.	●	**MWS0180X25DB**	50	1.969	53	2.087	94	3.701	3.0	.1181	4
					30	Int.	●	**MWS0180X30DB**	59	2.323	62	2.441	102	4.016	3.0	.1181	4
1.850	**.0728**				1	Int.	□	**MWS0185SB**	9.2	.362	11.3	.445	68	2.677	3.0	.1181	2
					20	Int.	□	**MWS0185X20DB**	43	1.693	45	1.772	84	3.307	3.0	.1181	4
					25	Int.	□	**MWS0185X25DB**	52	2.047	54	2.126	94	3.701	3.0	.1181	4
					30	Int.	□	**MWS0185X30DB**	61	2.402	63	2.480	102	4.016	3.0	.1181	4
1.854	**.0730**		**49**		1	Int.	●	**MWS00730SB**	9.2	.362	11.7	.459	68	2.677	3.175	.1250	2
					12	Int.	●	**MWS00730XB**	30	1.181	32.5	1.278	68	2.677	3.175	.1250	4
1.900	**.0748**				1	Int.	●	**MWS0190SB**	9.4	.370	11.5	.453	68	2.677	3.0	.1181	2
					5	Int.	★	**MWS0190LB**	22	.866	24	.945	68	2.677	3.0	.1181	4
					12	Int.	★	**MWS0190XB**	30	1.181	32	1.260	68	2.677	3.0	.1181	4
					20	Int.	●	**MWS0190X20DB**	44	1.732	46	1.811	84	3.307	3.0	.1181	4
					25	Int.	●	**MWS0190X25DB**	53	2.087	55	2.165	94	3.701	3.0	.1181	4
					30	Int.	●	**MWS0190X30DB**	63	2.480	65	2.559	102	4.016	3.0	.1181	4
1.930	**.0760**		**48**		1	Int.	●	**MWS00760SB**	9.6	.378	11.9	.469	68	2.677	3.175	.1250	2
					12	Int.	●	**MWS00760XB**	30	1.181	32.3	1.273	68	2.677	3.175	.1250	4
1.950	**.0768**				1	Int.	□	**MWS0195SB**	9.6	.378	11.6	.457	68	2.677	3.0	.1181	2
					20	Int.	□	**MWS0195X20DB**	45	1.772	47	1.850	84	3.307	3.0	.1181	4
					25	Int.	□	**MWS0195X25DB**	55	2.165	57	2.244	94	3.701	3.0	.1181	4
					30	Int.	□	**MWS0195X30DB**	64	2.520	66	2.598	102	4.016	3.0	.1181	4
1.994	**.0785**				1	Int.	●	**MWS00785SB**	10	.394	12.2	.480	68	2.677	3.175	.1250	2
					12	Int.	●	**MWS00785XB**	30	1.181	32.2	1.268	68	2.677	3.175	.1250	4

CUTTING CONDITION MWE/MWS ➤ L072
HOW TO USE ➤ L078
TECHNICAL DATA ➤ N001

MWE/MWS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
2.000	.0787			#3-48	1	Int.	●	MWS0200SB	10	.394	11.9	.469	68	2.677	3.0	.1181	2
					5	Int.	●	MWS0200LB	22	.866	24	.945	68	2.677	3.0	.1181	4
					12	Int.	●	MWS0200XB	30	1.181	32	1.260	68	2.677	3.0	.1181	4
					20	Int.	●	MWS0200X20DB	46	1.811	48	1.890	84	3.307	3.0	.1181	4
					25	Int.	●	MWS0200X25DB	56	2.205	58	2.283	94	3.701	3.0	.1181	4
					30	Int.	●	MWS0200X30DB	66	2.598	68	2.677	102	4.016	3.0	.1181	4
2.050	.0807				1	Int.	●	MWS0205SB	10.2	.402	12.0	.472	74	2.913	3.0	.1181	2
					20	Int.	□	MWS0205X20DB	47	1.850	49	1.929	94	3.701	3.0	.1181	4
					25	Int.	□	MWS0205X25DB	57	2.244	59	2.323	107	4.213	3.0	.1181	4
					30	Int.	□	MWS0205X30DB	68	2.677	69	2.717	118	4.646	3.0	.1181	4
2.057	.0810		46		1	Int.	●	MWS00810SB	10.2	.402	12.3	.484	74	2.913	3.175	.1250	2
					12	Int.	●	MWS00810XB	38	1.496	40.1	1.578	74	2.913	3.175	.1250	4
2.100	.0827				1	Int.	●	MWS0210SB	10.4	.409	12.1	.476	68	2.677	3.0	.1181	2
					5	Int.	★	MWS0210LB	28	1.102	30	1.181	74	2.913	3.0	.1181	4
					12	Int.	●	MWS0210XB	38	1.496	40	1.575	74	2.913	3.0	.1181	4
					20	Int.	★	MWS0210X20DB	48	1.890	50	1.969	94	3.701	3.0	.1181	4
					25	Int.	★	MWS0210X25DB	59	2.323	60	2.362	107	4.213	3.0	.1181	4
					30	Int.	●	MWS0210X30DB	69	2.717	71	2.795	118	4.646	3.0	.1181	4
2.150	.0846				1	Int.	□	MWS0215SB	10.6	.417	12.2	.480	74	2.913	3.0	.1181	2
					20	Int.	□	MWS0215X20DB	49	1.929	51	2.008	94	3.701	3.0	.1181	4
					25	Int.	□	MWS0215X25DB	60	2.362	62	2.441	107	4.213	3.0	.1181	4
					30	Int.	□	MWS0215X30DB	71	2.795	73	2.874	118	4.646	3.0	.1181	4
2.184	.0860		44		1	Int.	●	MWS00860SB	11	.433	12.8	.506	74	2.913	3.175	.1250	2
					12	Int.	●	MWS00860XB	38	1.496	39.8	1.569	74	2.913	3.175	.1250	4
2.200	.0866				1	Int.	●	MWS0220SB	11	.433	12.5	.492	74	2.913	3.0	.1181	2
					5	Int.	★	MWS0220LB	28	1.102	29	1.142	74	2.913	3.0	.1181	4
					12	Int.	●	MWS0220XB	38	1.496	39	1.535	74	2.913	3.0	.1181	4
					20	Int.	★	MWS0220X20DB	51	2.008	52	2.047	94	3.701	3.0	.1181	4
					25	Int.	★	MWS0220X25DB	62	2.441	63	2.480	107	4.213	3.0	.1181	4
					30	Int.	●	MWS0220X30DB	73	2.874	74	2.913	118	4.646	3.0	.1181	4
2.250	.0886				1	Int.	●	MWS0225SB	11.2	.441	12.6	.496	74	2.913	3.0	.1181	2
					20	Int.	□	MWS0225X20DB	52	2.047	53	2.087	94	3.701	3.0	.1181	4
					25	Int.	□	MWS0225X25DB	63	2.480	64	2.520	107	4.213	3.0	.1181	4
					30	Int.	□	MWS0225X30DB	74	2.913	76	2.992	118	4.646	3.0	.1181	4
2.261	.0890		43	#4-40	1	Int.	●	MWS00890SB	11.2	.441	12.9	.508	74	2.913	3.175	.1250	2
					12	Int.	●	MWS00890XB	38	1.496	39.7	1.563	74	2.913	3.175	.1250	4
2.300	.0906				1	Int.	●	MWS0230SB	11.4	.449	12.7	.500	74	2.913	3.0	.1181	2
					5	Int.	★	MWS0230LB	28	1.102	29	1.142	74	2.913	3.0	.1181	4
					12	Int.	●	MWS0230XB	38	1.496	39	1.535	74	2.913	3.0	.1181	4
					20	Int.	●	MWS0230X20DB	53	2.087	54	2.126	94	3.701	3.0	.1181	4
					25	Int.	●	MWS0230X25DB	64	2.520	66	2.598	107	4.213	3.0	.1181	4
					30	Int.	●	MWS0230X30DB	76	2.992	77	3.031	118	4.646	3.0	.1181	4
2.350	.0925				1	Int.	●	MWS0235SB	11.6	.457	12.8	.504	74	2.913	3.0	.1181	2
					20	Int.	●	MWS0235X20DB	54	2.126	55	2.165	94	3.701	3.0	.1181	4
					25	Int.	□	MWS0235X25DB	66	2.598	67	2.638	107	4.213	3.0	.1181	4
					30	Int.	□	MWS0235X30DB	78	3.071	79	3.110	118	4.646	3.0	.1181	4
2.383	.0938	3/32			1	Int.	●	MWS00938SB	12	.472	13.5	.531	74	2.913	3.175	.1250	2
					12	Int.	●	MWS00938XB	38	1.496	39.5	1.554	74	2.913	3.175	.1250	4

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□ : Non stock, produced to order only.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
2.400	.0945				1	Int.	●	MWS0240SB	12	.472	13.1	.516	74	2.913	3.0	.1181	2
					5	Int.	★	MWS0240LB	28	1.102	29	1.142	74	2.913	3.0	.1181	4
					12	Int.	●	MWS0240XB	38	1.496	39	1.535	74	2.913	3.0	.1181	4
					20	Int.	●	MWS0240X20DB	55	2.165	56	2.205	94	3.701	3.0	.1181	4
					25	Int.	●	MWS0240X25DB	67	2.638	68	2.677	107	4.213	3.0	.1181	4
					30	Int.	●	MWS0240X30DB	79	3.110	80	3.150	118	4.646	3.0	.1181	4
2.438	.0960		41		1	Int.	●	MWS00960SB	12.2	.480	13.6	.534	74	2.913	3.175	.1250	2
					12	Int.	●	MWS00960XB	38	1.496	39.4	1.550	74	2.913	3.175	.1250	4
2.450	.0965				1	Int.	□	MWS0245SB	12.2	.480	13.2	.520	74	2.913	3.0	.1181	2
					20	Int.	□	MWS0245X20DB	56	2.205	57	2.244	94	3.701	3.0	.1181	4
					25	Int.	□	MWS0245X25DB	69	2.717	70	2.756	107	4.213	3.0	.1181	4
					30	Int.	□	MWS0245X30DB	81	3.189	82	3.228	118	4.646	3.0	.1181	4
2.500	.0984				1	Int.	●	MWS0250SB	12.4	.488	13.3	.524	74	2.913	3.0	.1181	2
					5	Int.	●	MWS0250LB	28	1.102	29	1.142	74	2.913	3.0	.1181	4
					12	Int.	●	MWS0250XB	38	1.496	39	1.535	74	2.913	3.0	.1181	4
					20	Int.	●	MWS0250X20DB	58	2.283	59	2.323	94	3.701	3.0	.1181	4
					25	Int.	●	MWS0250X25DB	70	2.756	71	2.795	107	4.213	3.0	.1181	4
					30	Int.	●	MWS0250X30DB	83	3.268	84	3.307	118	4.646	3.0	.1181	4
2.550	.1004				1	Int.	□	MWS0255SB	12.6	.496	12.6	.496	81	3.189	3.0	.1181	3
					20	Int.	□	MWS0255X20DB	59	2.323	59	2.323	103	4.055	3.0	.1181	5
					25	Int.	□	MWS0255X25DB	71	2.795	71	2.795	117	4.606	3.0	.1181	5
					30	Int.	□	MWS0255X30DB	84	3.307	84	3.307	132	5.197	3.0	.1181	5
2.565	.1010				1	Int.	●	MWS01010SB	12.6	.496	12.6	.496	81	3.189	3.175	.1250	3
					12	Int.	●	MWS01010XB	45	1.772	45.0	1.772	81	3.189	3.175	.1250	5
2.600	.1024				1	Int.	●	MWS0260SB	13	.512	13	.512	81	3.189	3.0	.1181	3
					5	Int.	★	MWS0260LB	33	1.299	33	1.299	81	3.189	3.0	.1181	5
					12	Int.	●	MWS0260XB	45	1.772	45	1.772	81	3.189	3.0	.1181	5
					20	Int.	●	MWS0260X20DB	60	2.362	60	2.362	103	4.055	3.0	.1181	5
					25	Int.	●	MWS0260X25DB	73	2.874	73	2.874	117	4.606	3.0	.1181	5
					30	Int.	●	MWS0260X30DB	86	3.386	86	3.386	132	5.197	3.0	.1181	5
2.642	.1040		37	#5-44	1	Int.	●	MWS01040SB	13.2	.520	13.2	.520	81	3.189	3.175	.1250	3
					12	Int.	●	MWS01040XB	45	1.772	45.0	1.772	81	3.189	3.175	.1250	5
2.650	.1043				1	Int.	□	MWS0265SB	13.2	.520	13.2	.520	81	3.189	3.0	.1181	3
					20	Int.	□	MWS0265X20DB	61	2.402	61	2.402	103	4.055	3.0	.1181	5
					25	Int.	□	MWS0265X25DB	74	2.913	74	2.913	117	4.606	3.0	.1181	5
					30	Int.	□	MWS0265X30DB	87	3.425	87	3.425	132	5.197	3.0	.1181	5
2.692	.1060				1	Int.	●	MWS01060SB	13.4	.528	13.4	.528	81	3.189	3.175	.1250	3
					12	Int.	●	MWS01060XB	45	1.772	45.0	1.772	81	3.189	3.175	.1250	5
2.700	.1063		36	#6-32	1	Int.	●	MWS0270SB	13.4	.528	13.4	.528	81	3.189	3.0	.1181	3
					5	Int.	★	MWS0270LB	33	1.299	33	1.299	81	3.189	3.0	.1181	5
					12	Int.	●	MWS0270XB	45	1.772	45	1.772	81	3.189	3.0	.1181	5
					20	Int.	★	MWS0270X20DB	62	2.441	62	2.441	103	4.055	3.0	.1181	5
					25	Int.	●	MWS0270X25DB	76	2.992	76	2.992	117	4.606	3.0	.1181	5
					30	Int.	●	MWS0270X30DB	89	3.504	89	3.504	132	5.197	3.0	.1181	5
2.750	.1083				1	Int.	□	MWS0275SB	13.6	.535	13.6	.535	81	3.189	3.0	.1181	3
					20	Int.	□	MWS0275X20DB	63	2.480	63	2.480	103	4.055	3.0	.1181	5
					25	Int.	□	MWS0275X25DB	77	3.031	77	3.031	117	4.606	3.0	.1181	5
					30	Int.	□	MWS0275X30DB	91	3.583	91	3.583	132	5.197	3.0	.1181	5

MWE/MWS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
2.779	.1094	7/64			1	Int.	●	MWS01094SB	14	.551	14.0	.551	81	3.189	3.175	.1250	3
					12	Int.	●	MWS01094XB	45	1.772	45.0	1.772	81	3.189	3.175	.1250	5
2.80	.1102		35		1	Int.	●	MWS0280SB	14	.551	14	.551	81	3.189	3.0	.1181	3
					5	Int.	★	MWS0280LB	33	1.299	33	1.299	81	3.189	3.0	.1181	5
					12	Int.	●	MWS0280XB	45	1.772	45	1.772	81	3.189	3.0	.1181	5
					20	Int.	●	MWS0280X20DB	64	2.520	64	2.520	103	4.055	3.0	.1181	5
					25	Int.	●	MWS0280X25DB	78	3.071	78	3.071	117	4.606	3.0	.1181	5
					30	Int.	●	MWS0280X30DB	92	3.622	92	3.622	132	5.197	3.0	.1181	5
2.85	.1122				1	Int.	□	MWS0285SB	14.2	.559	14.2	.559	81	3.189	3.0	.1181	3
					20	Int.	□	MWS0285X20DB	66	2.598	66	2.598	103	4.055	3.0	.1181	5
					25	Int.	□	MWS0285X25DB	80	3.150	80	3.150	117	4.606	3.0	.1181	5
					30	Int.	□	MWS0285X30DB	94	3.701	94	3.701	132	5.197	3.0	.1181	5
2.90	.1142				1	Int.	●	MWS0290SB	14.4	.567	14.4	.567	81	3.189	3.0	.1181	3
					5	Int.	●	MWS0290LB	33	1.299	33	1.299	81	3.189	3.0	.1181	5
					12	Int.	●	MWS0290XB	45	1.772	45	1.772	81	3.189	3.0	.1181	5
					20	Int.	★	MWS0290X20DB	67	2.638	67	2.638	103	4.055	3.0	.1181	5
					25	Int.	★	MWS0290X25DB	81	3.189	81	3.189	117	4.606	3.0	.1181	5
					30	Int.	★	MWS0290X30DB	96	3.780	96	3.780	132	5.197	3.0	.1181	5
2.95	.1161		32		1	Int.	□	MWS0295SB	14.6	.575	14.6	.575	81	3.189	3.0	.1181	3
					20	Int.	□	MWS0295X20DB	68	2.677	68	2.677	103	4.055	3.0	.1181	5
					25	Int.	□	MWS0295X25DB	83	3.268	83	3.268	117	4.606	3.0	.1181	5
					30	Int.	□	MWS0295X30DB	97	3.819	97	3.819	132	5.197	3.0	.1181	5
3.0	.1181				2	Ext.	●	MWE0300SA	16	.630	16	.630	55	2.165	3.0	.1181	1
					3	Ext.	●	MWE0300MA	21	.827	21	.827	60	2.362	3.0	.1181	1
					3	Int.	●	MWS0300MB	24	.945	24	.945	72	2.835	3.0	.1181	6
					5	Int.	●	MWS0300LB	33	1.299	33	1.299	81	3.189	3.0	.1181	6
					8	Int.	●	MWS0300X8DB	35	1.378	35	1.378	81	3.189	3.0	.1181	6
					10	Int.	★	MWS0300X10DB	39	1.535	42	1.654	90	3.543	3.0	.1181	7
					15	Int.	★	MWS0300X15DB	54	2.126	57	2.244	105	4.134	3.0	.1181	7
					20	Int.	★	MWS0300X20DB	69	2.717	72	2.835	120	4.724	3.0	.1181	7
					25	Int.	★	MWS0300X25DB	84	3.307	87	3.425	135	5.315	3.0	.1181	7
					30	Int.	★	MWS0300X30DB	99	3.898	102	4.016	150	5.906	3.0	.1181	7
3.048	.1200		31		1	Int.	●	MWS01200SB	15.2	.598	15.2	.598	87	3.425	3.175	.1250	2
					12	Int.	●	MWS01200XB	52	2.047	52.0	2.047	87	3.425	3.175	.1250	2
3.1	.1220				2	Ext.	●	MWE0310SA	18	.709	18	.709	55	2.165	3.1	.1220	1
					3	Ext.	●	MWE0310MA	24	.945	24	.945	60	2.362	3.1	.1220	1
					3	Int.	●	MWS0310MB	28	1.102	28	1.102	76	2.992	4.0	.1575	6
					5	Int.	●	MWS0310LB	39	1.535	39	1.535	87	3.425	4.0	.1575	6
					8	Int.	●	MWS0310X8DB	41	1.614	41	1.614	87	3.425	4.0	.1575	6
					10	Int.	★	MWS0310X10DB	46	1.811	49	1.929	97	3.819	4.0	.1575	7
					15	Int.	●	MWS0310X15DB	63	2.480	66	2.598	114	4.488	4.0	.1575	7
					20	Int.	●	MWS0310X20DB	81	3.189	84	3.307	132	5.197	4.0	.1575	7
					25	Int.	★	MWS0310X25DB	98	3.858	101	3.976	149	5.866	4.0	.1575	7
					30	Int.	★	MWS0310X30DB	116	4.567	119	4.685	167	6.575	4.0	.1575	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.**

□ : **Non stock, produced to order only.**

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
3.175	.1250	1/8			2	Ext.	●	MZE01250SA	17.8	.701	17.8	.701	48.8	1.921	3.175	.1250	1
					5	Int.	●	MWS01250LB	39	1.535	39	1.535	87	3.425	4.0	.1575	6
					8	Int.	●	MWS01250X8DB	39	1.535	39	1.535	87	3.425	4.0	.1575	6
					15	Int.	●	MWS01250X15DB	63	2.480	66	2.598	114	4.488	4.0	.1575	7
					20	Int.	●	MWS01250X20DB	81	3.189	84	3.307	132	5.197	4.0	.1575	7
					25	Int.	●	MWS01250X25DB	98	3.858	101	3.976	149	5.866	4.0	.1575	7
					30	Int.	●	MWS01250X30DB	116	4.567	119	4.685	167	6.575	4.0	.1575	7
3.2	.1260				2	Ext.	●	MWE0320SA	18	.709	18	.709	55	2.165	3.2	.1260	1
					3	Ext.	●	MWE0320MA	24	.945	24	.945	60	2.362	3.2	.1260	1
					3	Int.	●	MWS0320MB	28	1.102	28	1.102	76	2.992	4.0	.1575	6
					5	Int.	●	MWS0320LB	39	1.535	39	1.535	87	3.425	4.0	.1575	6
					8	Int.	●	MWS0320X8DB	41	1.614	41	1.614	87	3.425	4.0	.1575	6
					10	Int.	●	MWS0320X10DB	46	1.811	49	1.929	97	3.819	4.0	.1575	7
					15	Int.	●	MWS0320X15DB	63	2.480	66	2.598	114	4.488	4.0	.1575	7
					20	Int.	★	MWS0320X20DB	81	3.189	84	3.307	132	5.197	4.0	.1575	7
					25	Int.	★	MWS0320X25DB	98	3.858	101	3.976	149	5.866	4.0	.1575	7
					30	Int.	●	MWS0320X30DB	116	4.567	119	4.685	167	6.575	4.0	.1575	7
3.3	.1299			M4x0.7	2	Ext.	●	MWE0330SA	18	.709	18	.709	55	2.165	3.3	.1299	1
					3	Ext.	●	MWE0330MA	24	.945	24	.945	60	2.362	3.3	.1299	1
					3	Int.	●	MWS0330MB	28	1.102	28	1.102	76	2.992	4.0	.1575	6
					5	Int.	●	MWS0330LB	39	1.535	39	1.535	87	3.425	4.0	.1575	6
					8	Int.	●	MWS0330X8DB	41	1.614	41	1.614	87	3.425	4.0	.1575	6
					10	Int.	●	MWS0330X10DB	46	1.811	49	1.929	97	3.819	4.0	.1575	7
					15	Int.	●	MWS0330X15DB	63	2.480	66	2.598	114	4.488	4.0	.1575	7
					20	Int.	●	MWS0330X20DB	81	3.189	84	3.307	132	5.197	4.0	.1575	7
					25	Int.	★	MWS0330X25DB	98	3.858	101	3.976	149	5.866	4.0	.1575	7
					30	Int.	●	MWS0330X30DB	116	4.567	119	4.685	167	6.575	4.0	.1575	7
3.4	.1339				2	Ext.	●	MWE0340SA	20	.787	20	.787	55	2.165	3.4	.1339	1
					3	Ext.	●	MWE0340MA	24	.945	24	.945	60	2.362	3.4	.1339	1
					3	Int.	●	MWS0340MB	28	1.102	28	1.102	76	2.992	4.0	.1575	6
					5	Int.	●	MWS0340LB	39	1.535	39	1.535	87	3.425	4.0	.1575	6
					8	Int.	●	MWS0340X8DB	41	1.614	41	1.614	87	3.425	4.0	.1575	6
					10	Int.	★	MWS0340X10DB	46	1.811	49	1.929	97	3.819	4.0	.1575	7
					15	Int.	●	MWS0340X15DB	63	2.480	66	2.598	114	4.488	4.0	.1575	7
					20	Int.	★	MWS0340X20DB	81	3.189	84	3.307	132	5.197	4.0	.1575	7
					25	Int.	★	MWS0340X25DB	98	3.858	101	3.976	149	5.866	4.0	.1575	7
					30	Int.	★	MWS0340X30DB	116	4.567	119	4.685	167	6.575	4.0	.1575	7
3.5	.1378				2	Ext.	●	MWE0350SA	20	.787	20	.787	55	2.165	3.5	.1378	1
					3	Ext.	●	MWE0350MA	24	.945	24	.945	60	2.362	3.5	.1378	1
					3	Int.	●	MWS0350MB	28	1.102	28	1.102	76	2.992	4.0	.1575	6
					5	Int.	●	MWS0350LB	39	1.535	39	1.535	87	3.425	4.0	.1575	6
					8	Int.	●	MWS0350X8DB	41	1.614	41	1.614	87	3.425	4.0	.1575	6
					10	Int.	●	MWS0350X10DB	46	1.811	49	1.929	97	3.819	4.0	.1575	7
					15	Int.	●	MWS0350X15DB	63	2.480	66	2.598	114	4.488	4.0	.1575	7
					20	Int.	●	MWS0350X20DB	81	3.189	84	3.307	132	5.197	4.0	.1575	7
					25	Int.	●	MWS0350X25DB	98	3.858	101	3.976	149	5.866	4.0	.1575	7
					30	Int.	●	MWS0350X30DB	116	4.567	119	4.685	167	6.575	4.0	.1575	7

CUTTING CONDITION MWE/MWS ➤ L072
CUTTING CONDITION MZE/MZS ➤ L143
HOW TO USE ➤ L078
TECHNICAL DATA ➤ N001

MWE/MWS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
3.569	.1405		28		5	Int.	●	MWS01405LB	44	1.732	44	1.732	92	3.622	4.0	.1575	6
3.571	.1406	9/64			2	Ext.	●	MZE01406SA	19.8	.780	19.8	.780	52	2.047	3.571	.1406	1
					8	Int.	●	MWS01406X8DB	44	1.732	44	1.732	92	3.622	4.0	.1575	6
					15	Int.	●	MWS01406X15DB	72	2.835	75	2.953	123	4.843	4.0	.1575	7
					20	Int.	●	MWS01406X20DB	92	3.622	95	3.740	143	5.630	4.0	.1575	7
					25	Int.	●	MWS01406X25DB	112	4.409	115	4.528	163	6.417	4.0	.1575	7
					30	Int.	●	MWS01406X30DB	132	5.197	135	5.315	183	7.205	4.0	.1575	7
3.600	.1417				2	Ext.	●	MWE0360SA	20	.787	20	.787	55	2.165	3.6	.1417	1
					3	Ext.	●	MWE0360MA	27	1.063	27	1.063	60	2.362	3.6	.1417	1
					3	Int.	●	MWS0360MB	32	1.260	32	1.260	80	3.150	4.0	.1575	6
					5	Int.	●	MWS0360LB	44	1.732	44	1.732	92	3.622	4.0	.1575	6
					8	Int.	●	MWS0360X8DB	46	1.811	46	1.811	92	3.622	4.0	.1575	6
					10	Int.	●	MWS0360X10DB	52	2.047	55	2.165	103	4.055	4.0	.1575	7
					15	Int.	★	MWS0360X15DB	72	2.835	75	2.953	123	4.843	4.0	.1575	7
					20	Int.	●	MWS0360X20DB	92	3.622	95	3.740	143	5.630	4.0	.1575	7
					25	Int.	★	MWS0360X25DB	112	4.409	115	4.528	163	6.417	4.0	.1575	7
					30	Int.	★	MWS0360X30DB	132	5.197	135	5.315	183	7.205	4.0	.1575	7
3.700	.1457			M4.5x0.75	2	Ext.	●	MWE0370SA	20	.787	20	.787	55	2.165	3.7	.1457	1
					3	Ext.	●	MWE0370MA	27	1.063	27	1.063	60	2.362	3.7	.1457	1
					3	Int.	●	MWS0370MB	32	1.260	32	1.260	80	3.150	4.0	.1575	6
					5	Int.	●	MWS0370LB	44	1.732	44	1.732	92	3.622	4.0	.1575	6
					8	Int.	●	MWS0370X8DB	46	1.811	46	1.811	92	3.622	4.0	.1575	6
					10	Int.	★	MWS0370X10DB	52	2.047	55	2.165	103	4.055	4.0	.1575	7
					15	Int.	●	MWS0370X15DB	72	2.835	75	2.953	123	4.843	4.0	.1575	7
					20	Int.	★	MWS0370X20DB	92	3.622	95	3.740	143	5.630	4.0	.1575	7
					25	Int.	★	MWS0370X25DB	112	4.409	115	4.528	163	6.417	4.0	.1575	7
					30	Int.	●	MWS0370X30DB	132	5.197	135	5.315	183	7.205	4.0	.1575	7
3.797	.1495		25	#10-24	3	Int.	●	MZS01495MB	32	1.260	32	1.260	80.0	3.150	4.0	.1575	6
					5	Int.	●	MWS01495LB	44	1.732	44	1.732	92	3.622	4.0	.1575	6
					8	Int.	●	MWS01495X8DB	44	1.732	44	1.732	92	3.622	4.0	.1575	6
					15	Int.	●	MWS01495X15DB	72	2.835	75	2.953	123	4.843	4.0	.1575	7
					20	Int.	●	MWS01495X20DB	92	3.622	95	3.740	143	5.630	4.0	.1575	7
					25	Int.	●	MWS01495X25DB	112	4.409	115	4.528	163	6.417	4.0	.1575	7
					30	Int.	●	MWS01495X30DB	132	5.197	135	5.315	183	7.205	4.0	.1575	7
3.800	.1496		25	#10-24	2	Ext.	●	MWE0380SA	22	.866	22	.866	55	2.165	3.8	.1496	1
					3	Ext.	●	MWE0380MA	27	1.063	27	1.063	60	2.362	3.8	.1496	1
					3	Int.	●	MWS0380MB	32	1.260	32	1.260	80	3.150	4.0	.1575	6
					5	Int.	●	MWS0380LB	44	1.732	44	1.732	92	3.622	4.0	.1575	6
					8	Int.	●	MWS0380X8DB	46	1.811	46	1.811	92	3.622	4.0	.1575	6
					10	Int.	★	MWS0380X10DB	52	2.047	55	2.165	103	4.055	4.0	.1575	7
					15	Int.	●	MWS0380X15DB	72	2.835	75	2.953	123	4.843	4.0	.1575	7
					20	Int.	●	MWS0380X20DB	92	3.622	95	3.740	143	5.630	4.0	.1575	7
					25	Int.	★	MWS0380X25DB	112	4.409	115	4.528	163	6.417	4.0	.1575	7
					30	Int.	★	MWS0380X30DB	132	5.197	135	5.315	183	7.205	4.0	.1575	7

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

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Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
3.900	.1535				2	Ext.	●	MWE0390SA	22	.866	22	.866	55	2.165	3.9	.1535	1
					3	Ext.	●	MWE0390MA	27	1.063	27	1.063	60	2.362	3.9	.1535	1
					3	Int.	●	MWS0390MB	32	1.260	32	1.260	80	3.150	4.0	.1575	6
					5	Int.	●	MWS0390LB	44	1.732	44	1.732	92	3.622	4.0	.1575	6
					8	Int.	●	MWS0390X8DB	46	1.811	46	1.811	92	3.622	4.0	.1575	6
					10	Int.	★	MWS0390X10DB	52	2.047	55	2.165	103	4.055	4.0	.1575	7
					15	Int.	●	MWS0390X15DB	72	2.835	75	2.953	123	4.843	4.0	.1575	7
					20	Int.	●	MWS0390X20DB	92	3.622	95	3.740	143	5.630	4.0	.1575	7
					25	Int.	★	MWS0390X25DB	112	4.409	115	4.528	163	6.417	4.0	.1575	7
					30	Int.	★	MWS0390X30DB	132	5.197	135	5.315	183	7.205	4.0	.1575	7
3.967	.1562	5/32			2	Ext.	●	MZE01562SA	22.2	.874	22.2	.874	55.6	2.189	3.967	.1562	1
					5	Int.	●	MWS01562LB	44	1.732	44	1.732	92	3.622	4.0	.1575	6
					8	Int.	●	MWS01562X8DB	44	1.732	44	1.732	92	3.622	4.0	.1575	6
					15	Int.	●	MWS01562X15DB	72	2.835	75	2.953	123	4.843	4.0	.1575	7
					20	Int.	●	MWS01562X20DB	92	3.622	95	3.740	143	5.630	4.0	.1575	7
					25	Int.	●	MWS01562X25DB	112	4.409	115	4.528	163	6.417	4.0	.1575	7
					30	Int.	●	MWS01562X30DB	132	5.197	135	5.315	183	7.205	4.0	.1575	7
4.000	.1575				2	Ext.	●	MWE0400SA	22	.866	22	.866	55	2.165	4.0	.1575	1
					3	Ext.	●	MWE0400MA	27	1.063	27	1.063	60	2.362	4.0	.1575	1
					3	Int.	●	MWS0400MB	32	1.260	32	1.260	80	3.150	4.0	.1575	6
					5	Int.	●	MWS0400LB	44	1.732	44	1.732	92	3.622	4.0	.1575	6
					8	Int.	●	MWS0400X8DB	46	1.811	46	1.811	92	3.622	4.0	.1575	6
					10	Int.	●	MWS0400X10DB	52	2.047	55	2.165	103	4.055	4.0	.1575	7
					15	Int.	●	MWS0400X15DB	72	2.835	75	2.953	123	4.843	4.0	.1575	7
					20	Int.	●	MWS0400X20DB	92	3.622	95	3.740	143	5.630	4.0	.1575	7
					25	Int.	●	MWS0400X25DB	112	4.409	115	4.528	163	6.417	4.0	.1575	7
					30	Int.	●	MWS0400X30DB	132	5.197	135	5.315	183	7.205	4.0	.1575	7
4.039	.1590		21	#10-32	3	Int.	●	MZS01590MB	36	1.417	36	1.417	80	3.150	5.0	.1969	6
					5	Int.	●	MWS01590LB	50	1.969	50	1.969	100	3.937	5.0	.1969	6
					8	Int.	●	MWS01590X8DB	50	1.969	50	1.969	100	3.937	5.0	.1969	6
					15	Int.	●	MWS01590X15DB	81	3.189	84	3.307	134	5.276	5.0	.1969	7
					20	Int.	●	MWS01590X20DB	104	4.094	107	4.213	157	6.181	5.0	.1969	7
					25	Int.	●	MWS01590X25DB	126	4.961	129	5.079	179	7.047	5.0	.1969	7
					30	Int.	●	MWS01590X30DB	149	5.866	152	5.984	202	7.953	5.0	.1969	7
4.100	.1614				2	Ext.	●	MWE0410SA	22	.866	22	.866	55	2.165	4.1	.1614	1
					3	Ext.	●	MWE0410MA	29	1.142	29	1.142	63	2.480	4.1	.1614	1
					3	Int.	●	MWS0410MB	36	1.417	36	1.417	86	3.386	5.0	.1969	6
					5	Int.	●	MWS0410LB	50	1.969	50	1.969	100	3.937	5.0	.1969	6
					8	Int.	●	MWS0410X8DB	52	2.047	52	2.047	100	3.937	5.0	.1969	6
					10	Int.	●	MWS0410X10DB	59	2.323	62	2.441	112	4.409	5.0	.1969	7
					15	Int.	●	MWS0410X15DB	81	3.189	84	3.307	134	5.276	5.0	.1969	7
					20	Int.	●	MWS0410X20DB	104	4.094	107	4.213	157	6.181	5.0	.1969	7
					25	Int.	★	MWS0410X25DB	126	4.961	129	5.079	179	7.047	5.0	.1969	7
					30	Int.	●	MWS0410X30DB	149	5.866	152	5.984	202	7.953	5.0	.1969	7

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MWE/MWS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
4.200	.1654			M5x0.8	2	Ext.	●	MWE0420SA	22	.866	22	.866	55	2.165	4.2	.1654	1
					3	Ext.	●	MWE0420MA	29	1.142	29	1.142	63	2.480	4.2	.1654	1
					3	Int.	●	MWS0420MB	36	1.417	36	1.417	86	3.386	5.0	.1969	6
					5	Int.	●	MWS0420LB	50	1.969	50	1.969	100	3.937	5.0	.1969	6
					8	Int.	●	MWS0420X8DB	52	2.047	52	2.047	100	3.937	5.0	.1969	6
					10	Int.	●	MWS0420X10DB	59	2.323	62	2.441	112	4.409	5.0	.1969	7
					15	Int.	●	MWS0420X15DB	81	3.189	84	3.307	134	5.276	5.0	.1969	7
					20	Int.	★	MWS0420X20DB	104	4.094	107	4.213	157	6.181	5.0	.1969	7
					25	Int.	★	MWS0420X25DB	126	4.961	129	5.079	179	7.047	5.0	.1969	7
					30	Int.	★	MWS0420X30DB	149	5.866	152	5.984	202	7.953	5.0	.1969	7
4.300	.1693				2	Ext.	●	MWE0430SA	24	.945	24	.945	58	2.283	4.3	.1693	1
					3	Ext.	●	MWE0430MA	29	1.142	29	1.142	63	2.480	4.3	.1693	1
					3	Int.	●	MWS0430MB	36	1.417	36	1.417	86	3.386	5.0	.1969	6
					5	Int.	●	MWS0430LB	50	1.969	50	1.969	100	3.937	5.0	.1969	6
					8	Int.	●	MWS0430X8DB	52	2.047	52	2.047	100	3.937	5.0	.1969	6
					8	Int.	●	MWS01693X8DB	50	1.969	50	1.969	100	3.937	5.0	.1969	6
					10	Int.	●	MWS0430X10DB	59	2.323	62	2.441	112	4.409	5.0	.1969	7
					15	Int.	●	MWS0430X15DB	81	3.189	84	3.307	134	5.276	5.0	.1969	7
					15	Int.	●	MWS01693X15DB	81	3.189	84	3.307	134	5.276	5.0	.1969	7
					20	Int.	●	MWS0430X20DB	104	4.094	107	4.213	157	6.181	5.0	.1969	7
					20	Int.	●	MWS01693X20DB	104	4.094	107	4.213	157	6.181	5.0	.1969	6
					25	Int.	★	MWS0430X25DB	126	4.961	129	5.079	179	7.047	5.0	.1969	7
					25	Int.	●	MWS01693X25DB	126	4.961	129	5.079	179	7.047	5.0	.1969	7
					30	Int.	★	MWS0430X30DB	149	5.866	152	5.984	202	7.953	5.0	.1969	7
					30	Int.	●	MWS01693X30DB	149	5.866	152	5.984	202	7.953	5.0	.1969	7
4.366	.1719	11/64			2	Ext.	●	MZE01719SA	23.8	.937	23.8	.937	57.9	2.280	4.366	.1719	1
					5	Int.	●	MWS01719LB	50	1.969	50	1.969	100	3.937	5.0	.1969	6
					8	Int.	●	MWS01719X8DB	50	1.969	50	1.969	100	3.937	5.0	.1969	6
					15	Int.	●	MWS01719X15DB	81	3.189	84	3.307	134	5.276	5.0	.1969	7
					20	Int.	●	MWS01719X20DB	104	4.094	107	4.213	157	6.181	5.0	.1969	7
					25	Int.	●	MWS01719X25DB	126	4.961	129	5.079	179	7.047	5.0	.1969	7
					30	Int.	●	MWS01719X30DB	149	5.866	152	5.984	202	7.953	5.0	.1969	7
4.400	.1732		17		2	Ext.	●	MWE0440SA	24	.945	24	.945	58	2.283	4.4	.1732	1
					3	Ext.	●	MWE0440MA	29	1.142	29	1.142	63	2.480	4.4	.1732	1
					3	Int.	●	MWS0440MB	36	1.417	36	1.417	86	3.386	5.0	.1969	6
					5	Int.	●	MWS0440LB	50	1.969	50	1.969	100	3.937	5.0	.1969	6
					8	Int.	●	MWS0440X8DB	52	2.047	52	2.047	100	3.937	5.0	.1969	6
					10	Int.	★	MWS0440X10DB	59	2.323	62	2.441	112	4.409	5.0	.1969	7
					15	Int.	●	MWS0440X15DB	81	3.189	84	3.307	134	5.276	5.0	.1969	7
					20	Int.	●	MWS0440X20DB	104	4.094	107	4.213	157	6.181	5.0	.1969	7
					25	Int.	★	MWS0440X25DB	126	4.961	129	5.079	179	7.047	5.0	.1969	7
					30	Int.	★	MWS0440X30DB	149	5.866	152	5.984	202	7.953	5.0	.1969	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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
4.500	.1772		16	#12-24	2	Ext.	●	MWE0450SA	24	.945	24	.945	58	2.283	4.5	.1772	1
					3	Ext.	●	MWE0450MA	29	1.142	29	1.142	63	2.480	4.5	.1772	1
					3	Int.	●	MWS0450MB	36	1.417	36	1.417	86	3.386	5.0	.1969	6
					5	Int.	●	MWS0450LB	50	1.969	50	1.969	100	3.937	5.0	.1969	6
					8	Int.	●	MWS0450X8DB	52	2.047	52	2.047	100	3.937	5.0	.1969	6
					10	Int.	●	MWS0450X10DB	59	2.323	62	2.441	112	4.409	5.0	.1969	7
					15	Int.	●	MWS0450X15DB	81	3.189	84	3.307	134	5.276	5.0	.1969	7
					20	Int.	●	MWS0450X20DB	104	4.094	107	4.213	157	6.181	5.0	.1969	7
					25	Int.	●	MWS0450X25DB	126	4.961	129	5.079	179	7.047	5.0	.1969	7
					30	Int.	●	MWS0450X30DB	149	5.866	152	5.984	202	7.953	5.0	.1969	7
4.600	.1811				2	Ext.	●	MWE0460SA	24	.945	24	.945	58	2.283	4.6	.1811	1
					3	Ext.	●	MWE0460MA	32	1.260	32	1.260	68	2.677	4.6	.1811	1
					3	Int.	●	MWS0460MB	40	1.575	40	1.575	90	3.543	5.0	.1969	6
					5	Int.	●	MWS0460LB	55	2.165	55	2.165	105	4.134	5.0	.1969	6
					8	Int.	●	MWS0460X8DB	57	2.244	57	2.244	105	4.134	5.0	.1969	6
					10	Int.	●	MWS0460X10DB	65	2.559	68	2.677	118	4.646	5.0	.1969	7
					15	Int.	●	MWS0460X15DB	90	3.543	93	3.661	143	5.630	5.0	.1969	7
					20	Int.	●	MWS0460X20DB	115	4.528	118	4.646	168	6.614	5.0	.1969	7
					25	Int.	●	MWS0460X25DB	126	4.961	143	5.630	179	7.047	5.0	.1969	7
					30	Int.	★	MWS0460X30DB	165	6.496	168	6.614	218	8.583	5.0	.1969	7
4.700	.1850		13		2	Ext.	●	MWE0470SA	24	.945	24	.945	58	2.283	4.7	.1850	1
					3	Ext.	●	MWE0470MA	32	1.260	32	1.260	68	2.677	4.7	.1850	1
					3	Int.	●	MWS0470MB	40	1.575	40	1.575	90	3.543	5.0	.1969	6
					5	Int.	●	MWS0470LB	55	2.165	55	2.165	105	4.134	5.0	.1969	6
					8	Int.	●	MWS0470X8DB	57	2.244	57	2.244	105	4.134	5.0	.1969	6
					10	Int.	★	MWS0470X10DB	65	2.559	68	2.677	118	4.646	5.0	.1969	7
					15	Int.	★	MWS0470X15DB	90	3.543	93	3.661	143	5.630	5.0	.1969	7
					20	Int.	★	MWS0470X20DB	115	4.528	118	4.646	168	6.614	5.0	.1969	7
					25	Int.	★	MWS0470X25DB	140	5.512	143	5.630	193	7.598	5.0	.1969	7
					30	Int.	★	MWS0470X30DB	165	6.496	168	6.614	218	8.583	5.0	.1969	7
4.763	.1875	3/16			2	Ext.	●	MZE01875SA	25.4	1.000	25.4	1.000	61.9	2.437	4.763	.1875	1
					5	Int.	●	MWS01875LB	55	2.165	55	2.165	105	4.134	5.0	.1969	6
					8	Int.	●	MWS01875X8DB	55	2.165	55	2.165	105	4.134	5.0	.1969	6
					15	Int.	●	MWS01875X15DB	90	3.543	93	3.661	143	5.630	5.0	.1969	7
					20	Int.	●	MWS01875X20DB	115	4.528	118	4.646	168	6.614	5.0	.1969	7
					25	Int.	●	MWS01875X25DB	140	5.512	143	5.630	193	7.598	5.0	.1969	7
					30	Int.	●	MWS01875X30DB	165	6.496	168	6.614	218	8.583	5.0	.1969	7
4.800	.1890		12		2	Ext.	●	MWE0480SA	26	1.024	26	1.024	62	2.441	4.8	.1890	1
					3	Ext.	●	MWE0480MA	32	1.260	32	1.260	68	2.677	4.8	.1890	1
					3	Int.	●	MWS0480MB	40	1.575	40	1.575	90	3.543	5.0	.1969	6
					5	Int.	●	MWS0480LB	55	2.165	55	2.165	105	4.134	5.0	.1969	6
					8	Int.	●	MWS0480X8DB	57	2.244	57	2.244	105	4.134	5.0	.1969	6
					10	Int.	★	MWS0480X10DB	65	2.559	68	2.677	118	4.646	5.0	.1969	7
					15	Int.	●	MWS0480X15DB	90	3.543	93	3.661	143	5.630	5.0	.1969	7
					20	Int.	★	MWS0480X20DB	115	4.528	118	4.646	168	6.614	5.0	.1969	7
					25	Int.	★	MWS0480X25DB	140	5.512	143	5.630	193	7.598	5.0	.1969	7
					30	Int.	●	MWS0480X30DB	165	6.496	168	6.614	218	8.583	5.0	.1969	7

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Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
4.900	.1929				2	Ext.	●	MWE0490SA	26	1.024	26	1.024	62	2.441	4.9	.1929	1
					3	Ext.	●	MWE0490MA	32	1.260	32	1.260	68	2.677	4.9	.1929	1
					3	Int.	●	MWS0490MB	40	1.575	40	1.575	90	3.543	5.0	.1969	6
					5	Int.	●	MWS0490LB	55	2.165	55	2.165	105	4.134	5.0	.1969	6
					8	Int.	●	MWS0490X8DB	57	2.244	57	2.244	105	4.134	5.0	.1969	6
					10	Int.	●	MWS0490X10DB	65	2.559	68	2.677	118	4.646	5.0	.1969	7
					15	Int.	●	MWS0490X15DB	90	3.543	93	3.661	143	5.630	5.0	.1969	7
					20	Int.	★	MWS0490X20DB	115	4.528	118	4.646	168	6.614	5.0	.1969	7
					25	Int.	★	MWS0490X25DB	140	5.512	143	5.630	193	7.598	5.0	.1969	7
					30	Int.	★	MWS0490X30DB	165	6.496	168	6.614	218	8.583	5.0	.1969	7
5.000	.1969			M6x10	2	Ext.	●	MWE0500SA	26	1.024	26	1.024	62	2.441	5.0	.1969	1
					3	Ext.	●	MWE0500MA	32	1.260	32	1.260	68	2.677	5.0	.1969	1
					3	Int.	●	MWS0500MB	27.5	1.083	30	1.181	82	3.228	6.0	.2362	6
					5	Int.	●	MWS0500LB	44	1.732	48	1.890	100	3.937	6.0	.2362	6
					8	Int.	●	MWS0500X8DB	57	2.244	57	2.244	105	4.134	5.0	.1969	6
					10	Int.	●	MWS0500X10DB	65	2.559	68	2.677	118	4.646	5.0	.1969	7
					15	Int.	●	MWS0500X15DB	90	3.543	93	3.661	143	5.630	5.0	.1969	7
					20	Int.	●	MWS0500X20DB	115	4.528	118	4.646	168	6.614	5.0	.1969	7
					25	Int.	●	MWS0500X25DB	140	5.512	143	5.630	193	7.598	5.0	.1969	7
					30	Int.	●	MWS0500X30DB	165	6.496	168	6.614	218	8.583	5.0	.1969	7
5.100	.2008		7	1/4-20	2	Ext.	●	MWE0510SA	26	1.024	26	1.024	62	2.441	5.1	.2008	1
					3	Ext.	●	MWE0510MA	34	1.339	34	1.339	72	2.835	5.1	.2008	1
					3	Int.	●	MWS0510MB	27.5	1.083	30	1.181	82	3.228	6.0	.2362	6
					5	Int.	●	MWS0510LB	44	1.732	48	1.890	100	3.937	6.0	.2362	6
					8	Int.	●	MWS0510X8DB	61	2.402	66	2.598	118	4.646	6.0	.2362	6
					10	Int.	★	MWS0510X10DB	72	2.835	75	2.953	127	5.000	6.0	.2362	6
					15	Int.	●	MWS0510X15DB	99	3.898	102	4.016	154	6.063	6.0	.2362	7
					20	Int.	●	MWS0510X20DB	127	5.000	130	5.118	182	7.165	6.0	.2362	7
					25	Int.	★	MWS0510X25DB	154	6.063	157	6.181	209	8.228	6.0	.2362	7
					30	Int.	★	MWS0510X30DB	182	7.165	185	7.283	237	9.331	6.0	.2362	7
5.159	.2031	13/64			2	Ext.	●	MZE02031SA	25.4	1.000	25.4	1.000	61.9	2.437	5.159	.2031	1
					5	Int.	●	MWS02031LB	44	1.732	48	1.890	100	3.937	5.954	.2344	6
					8	Int.	●	MWS02031X8DB	61	2.402	66	2.598	118	4.646	5.954	.2344	6
					15	Int.	●	MWS02031X15DB	99	3.898	102	4.016	154	6.063	5.954	.2344	7
					20	Int.	●	MWS02031X20DB	127	5.000	130	5.118	182	7.165	5.954	.2344	7
					25	Int.	●	MWS02031X25DB	154	6.063	157	6.181	209	8.228	5.954	.2344	7
					30	Int.	●	MWS02031X30DB	182	7.165	185	7.283	237	9.331	5.954	.2344	7
5.200	.2047				2	Ext.	●	MWE0520SA	26	1.024	26	1.024	62	2.441	5.2	.2047	1
					3	Ext.	●	MWE0520MA	34	1.339	34	1.339	72	2.835	5.2	.2047	1
					3	Int.	●	MWS0520MB	27.5	1.083	30	1.181	82	3.228	6.0	.2362	6
					5	Int.	●	MWS0520LB	44	1.732	48	1.890	100	3.937	6.0	.2362	6
					8	Int.	●	MWS0520X8DB	61	2.402	66	2.598	118	4.646	6.0	.2362	6
					10	Int.	●	MWS0520X10DB	72	2.835	75	2.953	127	5.000	6.0	.2362	7
					15	Int.	●	MWS0520X15DB	99	3.898	102	4.016	154	6.063	6.0	.2362	7
					20	Int.	★	MWS0520X20DB	127	5.000	130	5.118	182	7.165	6.0	.2362	7
					25	Int.	★	MWS0520X25DB	154	6.063	157	6.181	209	8.228	6.0	.2362	7
					30	Int.	★	MWS0520X30DB	182	7.165	185	7.283	237	9.331	6.0	.2362	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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
5.300	.2087		4		2	Ext.	●	MWE0530SA	26	1.024	26	1.024	62	2.441	5.3	.2087	1
					3	Ext.	●	MWE0530MA	34	1.339	34	1.339	72	2.835	5.3	.2087	1
					3	Int.	●	MWS0530MB	27.5	1.083	30	1.181	82	3.228	6.0	.2362	6
					5	Int.	●	MWS0530LB	44	1.732	48	1.890	100	3.937	6.0	.2362	6
					8	Int.	●	MWS0530X8DB	61	2.402	66	2.598	118	4.646	6.0	.2362	6
					10	Int.	●	MWS0530X10DB	72	2.835	75	2.953	127	5.000	6.0	.2362	7
					15	Int.	●	MWS0530X15DB	99	3.898	102	4.016	154	6.063	6.0	.2362	7
					20	Int.	●	MWS0530X20DB	127	5.000	130	5.118	182	7.165	6.0	.2362	7
					25	Int.	●	MWS0530X25DB	154	6.063	157	6.181	209	8.228	6.0	.2362	7
					30	Int.	★	MWS0530X30DB	182	7.165	185	7.283	237	9.331	6.0	.2362	7
5.400	.2126				2	Ext.	●	MWE0540SA	28	1.102	28	1.102	66	2.598	5.4	.2126	1
					3	Ext.	●	MWE0540MA	34	1.339	34	1.339	72	2.835	5.4	.2126	1
					3	Int.	●	MWS0540MB	27.5	1.083	30	1.181	82	3.228	6.0	.2362	6
					5	Int.	●	MWS0540LB	44	1.732	48	1.890	100	3.937	6.0	.2362	6
					8	Int.	●	MWS0540X8DB	61	2.402	66	2.598	118	4.646	6.0	.2362	6
					10	Int.	●	MWS0540X10DB	72	2.835	75	2.953	127	5.000	6.0	.2362	7
					15	Int.	●	MWS0540X15DB	99	3.898	102	4.016	154	6.063	6.0	.2362	7
					20	Int.	★	MWS0540X20DB	127	5.000	130	5.118	182	7.165	6.0	.2362	6
					25	Int.	★	MWS0540X25DB	154	6.063	157	6.181	209	8.228	6.0	.2362	7
					30	Int.	★	MWS0540X30DB	182	7.165	185	7.283	237	9.331	6.0	.2362	7
5.410	.2130		3	1/4-28	8	Int.	●	MWS02130X8DB	61	2.402	66	2.598	118	4.646	5.954	.2344	6
					15	Int.	●	MWS02130X15DB	99	3.898	102	4.016	154	6.063	5.954	.2344	7
					20	Int.	●	MWS02130X20DB	127	5.000	130	5.118	182	7.165	5.954	.2344	7
					25	Int.	●	MWS02130X25DB	154	6.063	157	6.181	209	8.228	5.954	.2344	7
					30	Int.	●	MWS02130X30DB	182	7.165	185	7.283	237	9.331	5.954	.2344	7
5.500	.2165				2	Ext.	●	MWE0550SA	28	1.102	28	1.102	66	2.598	5.5	.2165	1
					3	Ext.	●	MWE0550MA	34	1.339	34	1.339	72	2.835	5.5	.2165	1
					3	Int.	●	MWS0550MB	27.5	1.083	30	1.181	82	3.228	6.0	.2362	6
					5	Int.	●	MWS0550LB	44	1.732	48	1.890	100	3.937	6.0	.2362	6
					8	Int.	●	MWS0550X8DB	61	2.402	66	2.598	118	4.646	6.0	.2362	6
					10	Int.	●	MWS0550X10DB	72	2.835	75	2.953	127	5.000	6.0	.2362	7
					15	Int.	●	MWS0550X15DB	99	3.898	102	4.016	154	6.063	6.0	.2362	7
					20	Int.	●	MWS0550X20DB	127	5.000	130	5.118	182	7.165	6.0	.2362	7
					25	Int.	●	MWS0550X25DB	154	6.063	157	6.181	209	8.228	6.0	.2362	7
					30	Int.	●	MWS0550X30DB	182	7.165	185	7.283	237	9.331	6.0	.2362	7
5.558	.2188	7/32			2	Ext.	●	MZE02188SA	28.6	1.126	28.6	1.126	66.7	2.626	5.556	.2187	1
					5	Int.	●	MWS02188LB	48	1.890	48	1.890	100	3.937	5.954	.2344	6
					8	Int.	●	MWS02188X8DB	66	2.598	66	2.598	118	4.646	5.954	.2344	6
					15	Int.	●	MWS02188X15DB	108	4.252	111	4.370	163	6.417	5.954	.2344	7
					20	Int.	●	MWS02188X20DB	138	5.433	141	5.551	193	7.598	5.954	.2344	7
					25	Int.	●	MWS02188X25DB	168	6.614	171	6.732	223	8.780	5.954	.2344	7
					30	Int.	●	MWS02188X30DB	198	7.795	201	7.913	253	9.961	5.954	.2344	7

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HOW TO USE ➤ L078
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MWE/MWS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
5.600	.2205		2		2	Ext.	●	MWE0560SA	28	1.102	28	1.102	66	2.598	5.6	.2205	1
					3	Ext.	●	MWE0560MA	36	1.417	36	1.417	74	2.913	5.6	.2205	1
					3	Int.	●	MWS0560MB	30	1.181	30	1.181	82	3.228	6.0	.2362	6
					5	Int.	●	MWS0560LB	48	1.890	48	1.890	100	3.937	6.0	.2362	6
					8	Int.	●	MWS0560X8DB	66	2.598	66	2.598	118	4.646	6.0	.2362	6
					10	Int.	★	MWS0560X10DB	78	3.071	81	3.189	133	5.236	6.0	.2362	7
					15	Int.	★	MWS0560X15DB	108	4.252	111	4.370	163	6.417	6.0	.2362	7
					20	Int.	★	MWS0560X20DB	138	5.433	141	5.551	193	7.598	6.0	.2362	7
					25	Int.	★	MWS0560X25DB	168	6.614	171	6.732	223	8.780	6.0	.2362	7
					30	Int.	★	MWS0560X30DB	198	7.795	201	7.913	253	9.961	6.0	.2362	7
5.700	.2244				2	Ext.	●	MWE0570SA	28	1.102	28	1.102	66	2.598	5.7	.2244	1
					3	Ext.	●	MWE0570MA	36	1.417	36	1.417	74	2.913	5.7	.2244	1
					3	Int.	●	MWS0570MB	30	1.181	30	1.181	82	3.228	6.0	.2362	6
					5	Int.	●	MWS0570LB	48	1.890	48	1.890	100	3.937	6.0	.2362	6
					8	Int.	●	MWS0570X8DB	66	2.598	66	2.598	118	4.646	6.0	.2362	6
					10	Int.	●	MWS0570X10DB	78	3.071	81	3.189	133	5.236	6.0	.2362	7
					15	Int.	●	MWS0570X15DB	108	4.252	111	4.370	163	6.417	6.0	.2362	7
					20	Int.	●	MWS0570X20DB	138	5.433	141	5.551	193	7.598	6.0	.2362	7
					25	Int.	●	MWS0570X25DB	168	6.614	171	6.732	223	8.780	6.0	.2362	7
					30	Int.	★	MWS0570X30DB	198	7.795	201	7.913	253	9.961	6.0	.2362	7
5.800	.2283		1		2	Ext.	●	MWE0580SA	28	1.102	28	1.102	66	2.598	5.8	.2283	1
					3	Ext.	●	MWE0580MA	36	1.417	36	1.417	74	2.913	5.8	.2283	1
					3	Int.	●	MWS0580MB	30	1.181	30	1.181	82	3.228	6.0	.2362	6
					5	Int.	●	MWS0580LB	48	1.890	48	1.890	100	3.937	6.0	.2362	6
					8	Int.	●	MWS0580X8DB	66	2.598	66	2.598	118	4.646	6.0	.2362	7
					10	Int.	●	MWS0580X10DB	78	3.071	81	3.189	133	5.236	6.0	.2362	7
					15	Int.	★	MWS0580X15DB	108	4.252	111	4.370	163	6.417	6.0	.2362	7
					20	Int.	●	MWS0580X20DB	138	5.433	141	5.551	193	7.598	6.0	.2362	7
					25	Int.	★	MWS0580X25DB	168	6.614	171	6.732	223	8.780	6.0	.2362	7
					30	Int.	★	MWS0580X30DB	198	7.795	201	7.913	253	9.961	6.0	.2362	7
5.900	.2323				2	Ext.	●	MWE0590SA	28	1.102	28	1.102	66	2.598	5.9	.2323	1
					3	Ext.	●	MWE0590MA	36	1.417	36	1.417	74	2.913	5.9	.2323	1
					3	Int.	●	MWS0590MB	30	1.181	30	1.181	82	3.228	6.0	.2362	6
					5	Int.	●	MWS0590LB	48	1.890	48	1.890	100	3.937	6.0	.2362	6
					8	Int.	●	MWS0590X8DB	66	2.598	66	2.598	118	4.646	6.0	.2362	6
					10	Int.	★	MWS0590X10DB	78	3.071	81	3.189	133	5.236	6.0	.2362	7
					15	Int.	★	MWS0590X15DB	108	4.252	111	4.370	163	6.417	6.0	.2362	7
					20	Int.	★	MWS0590X20DB	138	5.433	141	5.551	193	7.598	6.0	.2362	7
					25	Int.	★	MWS0590X25DB	168	6.614	171	6.732	223	8.780	6.0	.2362	7
					30	Int.	★	MWS0590X30DB	198	7.795	201	7.913	253	9.961	6.0	.2362	7
5.954	.2344	15/64	A		2	Ext.	●	MZE02344SA	28.6	1.126	28.6	1.126	66.7	2.626	5.954	.2344	1
					5	Int.	●	MWS02344LB	48	1.890	48	1.890	100	3.937	5.954	.2344	6
					8	Int.	●	MWS02344X8DB	66	2.598	66	2.598	118	4.646	5.954	.2344	6
					15	Int.	●	MWS02344X15DB	108	4.252	111	4.370	163	6.417	5.954	.2344	7
					20	Int.	●	MWS02344X20DB	138	5.433	141	5.551	193	7.598	5.954	.2344	7
					25	Int.	●	MWS02344X25DB	168	6.614	171	6.732	223	8.780	5.954	.2344	7
					30	Int.	●	MWS02344X30DB	198	7.795	201	7.913	253	9.961	5.954	.2344	7

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Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
6.000	.2362			M7x1.0	2	Ext.	●	MWE0600SA	28	1.102	28	1.102	66	2.598	6.0	.2362	1
					3	Ext.	●	MWE0600MA	41	1.614	41	1.614	81	3.189	6.0	.2362	1
					3	Int.	●	MWS0600MB	30	1.181	30	1.181	82	3.228	6.0	.2362	6
					5	Int.	●	MWS0600LB	48	1.890	48	1.890	100	3.937	6.0	.2362	6
					8	Int.	●	MWS0600X8DB	66	2.598	66	2.598	118	4.646	6.0	.2362	6
					10	Int.	●	MWS0600X10DB	78	3.071	81	3.189	133	5.236	6.0	.2362	7
					15	Int.	●	MWS0600X15DB	108	4.252	111	4.370	163	6.417	6.0	.2362	7
					20	Int.	●	MWS0600X20DB	138	5.433	141	5.551	193	7.598	6.0	.2362	7
					25	Int.	●	MWS0600X25DB	168	6.614	171	6.732	223	8.780	6.0	.2362	7
					30	Int.	●	MWS0600X30DB	198	7.795	201	7.913	253	9.961	6.0	.2362	7
6.100	.2402				2	Ext.	●	MWE0610SA	31	1.220	31	1.220	70	2.756	6.1	.2402	1
					3	Ext.	●	MWE0610MA	41	1.614	41	1.614	81	3.189	6.1	.2402	1
					3	Int.	●	MWS0610MB	32.5	1.280	35	1.378	88	3.465	7.0	.2756	6
					5	Int.	●	MWS0610LB	52	2.047	56	2.205	109	4.291	7.0	.2756	6
					8	Int.	●	MWS0610X8DB	72	2.835	77	3.031	130	5.118	7.0	.2756	6
					10	Int.	★	MWS0610X10DB	85	3.346	88	3.465	141	5.551	7.0	.2756	7
					15	Int.	★	MWS0610X15DB	117	4.606	120	4.724	173	6.811	7.0	.2756	7
					20	Int.	★	MWS0610X20DB	150	5.906	153	6.024	206	8.110	7.0	.2756	7
					25	Int.	★	MWS0610X25DB	168	6.614	185	7.283	223	8.780	7.0	.2756	7
					30	Int.	●	MWS0610X30DB	215	8.465	218	8.583	271	10.669	7.0	.2756	7
6.200	.2441				2	Ext.	●	MWE0620SA	31	1.220	31	1.220	70	2.756	6.2	.2441	1
					3	Ext.	●	MWE0620MA	41	1.614	41	1.614	81	3.189	6.2	.2441	1
					3	Int.	●	MWS0620MB	32.5	1.280	35	1.378	88	3.465	7.0	.2756	6
					5	Int.	●	MWS0620LB	52	2.047	56	2.205	109	4.291	7.0	.2756	6
					8	Int.	●	MWS0620X8DB	72	2.835	77	3.031	130	5.118	7.0	.2756	6
					10	Int.	●	MWS0620X10DB	85	3.346	88	3.465	141	5.551	7.0	.2756	7
					15	Int.	●	MWS0620X15DB	117	4.606	120	4.724	173	6.811	7.0	.2756	7
					20	Int.	●	MWS0620X20DB	150	5.906	153	6.024	206	8.110	7.0	.2756	7
					25	Int.	●	MWS0620X25DB	182	7.165	185	7.283	238	9.370	7.0	.2756	7
					30	Int.	●	MWS0620X30DB	215	8.465	218	8.583	271	10.669	7.0	.2756	7
6.300	.2480				2	Ext.	●	MWE0630SA	31	1.220	31	1.220	70	2.756	6.3	.2480	1
					3	Ext.	●	MWE0630MA	41	1.614	41	1.614	81	3.189	6.3	.2480	1
					3	Int.	●	MWS0630MB	32.5	1.280	35	1.378	88	3.465	7.0	.2756	6
					5	Int.	●	MWS0630LB	52	2.047	56	2.205	109	4.291	7.0	.2756	6
					8	Int.	●	MWS0630X8DB	72	2.835	77	3.031	130	5.118	7.0	.2756	6
					10	Int.	●	MWS0630X10DB	85	3.346	88	3.465	141	5.551	7.0	.2756	7
					15	Int.	★	MWS0630X15DB	117	4.606	120	4.724	173	6.811	7.0	.2756	7
					20	Int.	★	MWS0630X20DB	150	5.906	153	6.024	206	8.110	7.0	.2756	7
					25	Int.	★	MWS0630X25DB	182	7.165	185	7.283	238	9.370	7.0	.2756	7
					30	Int.	★	MWS0630X30DB	215	8.465	218	8.583	271	10.669	7.0	.2756	7
6.350	.2500	1/4	E		3	Ext.	●	MZE02500MA	41.3	1.626	41.3	1.626	81.0	3.189	6.350	.2500	1
					5	Int.	●	MWS02500LB	52	2.047	56	2.205	109	4.291	6.746	.2656	6
					8	Int.	●	MWS02500X8DB	72	2.835	77	3.031	130	5.118	6.746	.2656	6
					15	Int.	●	MWS02500X15DB	117	4.606	120	4.724	173	6.811	6.746	.26 56	7
					20	Int.	●	MWS02500X20DB	150	5.906	153	6.024	206	8.110	6.746	.2656	7
					25	Int.	●	MWS02500X25DB	182	7.165	185	7.283	238	9.370	6.746	.2656	7
					30	Int.	●	MWS02500X30DB	215	8.465	218	8.583	271	10.669	6.746	.2656	7

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MWE/MWS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
6.400	.2520				2	Ext.	●	MWE0640SA	31	1.220	31	1.220	70	2.756	6.4	.2520	1
					3	Ext.	●	MWE0640MA	41	1.614	41	1.614	81	3.189	6.4	.2520	1
					3	Int.	●	MWS0640MB	32.5	1.280	35	1.378	88	3.465	7.0	.2756	6
					5	Int.	●	MWS0640LB	52	2.047	56	2.205	109	4.291	7.0	.2756	6
					8	Int.	●	MWS0640X8DB	72	2.835	77	3.031	130	5.118	7.0	.2756	6
					10	Int.	●	MWS0640X10DB	85	3.346	88	3.465	141	5.551	7.0	.2756	7
					15	Int.	●	MWS0640X15DB	117	4.606	120	4.724	173	6.811	7.0	.2756	7
					20	Int.	●	MWS0640X20DB	150	5.906	153	6.024	206	8.110	7.0	.2756	7
					25	Int.	●	MWS0640X25DB	182	7.165	185	7.283	238	9.370	7.0	.2756	7
					30	Int.	●	MWS0640X30DB	215	8.465	218	8.583	271	10.669	7.0	.2756	7
6.500	.2559				2	Ext.	●	MWE0650SA	31	1.220	31	1.220	70	2.756	6.5	.2559	1
					3	Ext.	●	MWE0650MA	41	1.614	41	1.614	81	3.189	6.5	.2559	1
					3	Int.	●	MWS0650MB	32.5	1.280	35	1.378	88	3.465	7.0	.2756	6
					5	Int.	●	MWS0650LB	52	2.047	56	2.205	109	4.291	7.0	.2756	6
					8	Int.	●	MWS0650X8DB	72	2.835	77	3.031	130	5.118	7.0	.2756	6
					10	Int.	★	MWS0650X10DB	85	3.346	88	3.465	141	5.551	7.0	.2756	7
					15	Int.	★	MWS0650X15DB	117	4.606	120	4.724	173	6.811	7.0	.2756	7
					20	Int.	●	MWS0650X20DB	150	5.906	153	6.024	206	8.110	7.0	.2756	7
					25	Int.	★	MWS0650X25DB	182	7.165	185	7.283	238	9.370	7.0	.2756	7
					30	Int.	●	MWS0650X30DB	215	8.465	218	8.583	271	10.669	7.0	.2756	7
6.528	.2570		F	5/16-18	3	Ext.	●	MZE02570MA	42.9	1.689	42.9	1.689	83.0	3.268	6.528	.2570	1
					5	Int.	●	MWS02570LB	56	2.205	56	2.205	109	4.291	6.746	.2656	6
					8	Int.	●	MWS02570X8DB	77	3.031	77	3.031	130	5.118	6.746	.2656	6
					15	Int.	●	MWS02570X15DB	126	4.961	129	5.079	182	7.165	6.746	.2656	7
					20	Int.	●	MWS02570X20DB	161	6.339	164	6.457	217	8.543	6.746	.2656	7
					25	Int.	●	MWS02570X25DB	196	7.717	199	7.835	252	9.921	6.746	.2656	7
					30	Int.	●	MWS02570X30DB	231	9.094	234	9.213	287	11.299	6.746	.2656	7
6.600	.2598				2	Ext.	●	MWE0660SA	31	1.220	31	1.220	70	2.756	6.6	.2598	1
					3	Ext.	●	MWE0660MA	43	1.693	43	1.693	83	3.268	6.6	.2598	1
					3	Int.	●	MWS0660MB	35	1.378	35	1.378	88	3.465	7.0	.2756	6
					5	Int.	●	MWS0660LB	56	2.205	56	2.205	109	4.291	7.0	.2756	6
					8	Int.	●	MWS0660X8DB	77	3.031	77	3.031	130	5.118	7.0	.2756	6
					10	Int.	★	MWS0660X10DB	91	3.583	94	3.701	147	5.787	7.0	.2756	7
					15	Int.	●	MWS0660X15DB	126	4.961	129	5.079	182	7.165	7.0	.2756	7
					20	Int.	★	MWS0660X20DB	161	6.339	164	6.457	217	8.543	7.0	.2756	7
					25	Int.	★	MWS0660X25DB	196	7.717	199	7.835	252	9.921	7.0	.2756	7
					30	Int.	★	MWS0660X30DB	231	9.094	234	9.213	287	11.299	7.0	.2756	7
6.700	.2638			M8x1.25	2	Ext.	●	MWE0670SA	31	1.220	31	1.220	70	2.756	6.7	.2638	1
					3	Ext.	●	MWE0670MA	43	1.693	43	1.693	83	3.268	6.7	.2638	1
					3	Int.	●	MWS0670MB	35	1.378	35	1.378	88	3.465	7.0	.2756	6
					5	Int.	●	MWS0670LB	56	2.205	56	2.205	109	4.291	7.0	.2756	6
					8	Int.	●	MWS0670X8DB	77	3.031	77	3.031	130	5.118	7.0	.2756	6
					10	Int.	★	MWS0670X10DB	91	3.583	94	3.701	147	5.787	7.0	.2756	7
					15	Int.	●	MWS0670X15DB	126	4.961	129	5.079	182	7.165	7.0	.2756	7
					20	Int.	★	MWS0670X20DB	161	6.339	164	6.457	217	8.543	7.0	.2756	7
					25	Int.	★	MWS0670X25DB	196	7.717	199	7.835	252	9.921	7.0	.2756	7
					30	Int.	★	MWS0670X30DB	231	9.094	234	9.213	287	11.299	7.0	.2756	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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
6.746	.2656	17/64			3	Ext.	●	MZE02656MA	42.9	1.689	42.9	1.689	82.6	3.252	6.746	.2656	1
					5	Int.	●	MWS02656LB	56	2.205	56	2.205	109	4.291	6.746	.2656	6
					8	Int.	●	MWS02656X8DB	77	3.031	77	3.031	130	5.118	6.746	.2656	6
					15	Int.	●	MWS02656X15DB	126	4.961	129	5.079	182	7.165	6.746	.2656	7
					20	Int.	●	MWS02656X20DB	161	6.339	164	6.457	217	8.543	6.746	.2656	7
					25	Int.	●	MWS02656X25DB	196	7.717	199	7.835	252	9.921	6.746	.2656	7
					30	Int.	●	MWS02656X30DB	231	9.094	234	9.213	287	11.299	6.746	.2656	7
6.800	.2677				2	Ext.	●	MWE0680SA	34	1.339	34	1.339	74	2.913	6.8	.2677	1
					3	Ext.	●	MWE0680MA	43	1.693	43	1.693	83	3.268	6.8	.2677	1
					3	Int.	●	MWS0680MB	35	1.378	35	1.378	88	3.465	7.0	.2756	6
					5	Int.	●	MWS0680LB	56	2.205	56	2.205	109	4.291	7.0	.2756	6
					8	Int.	●	MWS0680X8DB	77	3.031	77	3.031	130	5.118	7.0	.2756	6
					10	Int.	★	MWS0680X10DB	91	3.583	94	3.701	147	5.787	7.0	.2756	7
					15	Int.	●	MWS0680X15DB	126	4.961	129	5.079	182	7.165	7.0	.2756	7
					20	Int.	●	MWS0680X20DB	161	6.339	164	6.457	217	8.543	7.0	.2756	7
					25	Int.	★	MWS0680X25DB	196	7.717	199	7.835	252	9.921	7.0	.2756	7
					30	Int.	★	MWS0680X30DB	231	9.094	234	9.213	287	11.299	7.0	.2756	7
6.900	.2717			5/16-24	2	Ext.	●	MWE0690SA	34	1.339	34	1.339	74	2.913	6.9	.2717	1
					3	Ext.	●	MWE0690MA	43	1.693	43	1.693	83	3.268	6.9	.2717	1
					3	Int.	●	MWS0690MB	35	1.378	35	1.378	88	3.465	7.0	.2756	6
					5	Int.	●	MWS0690LB	56	2.205	56	2.205	109	4.291	7.0	.2756	6
					8	Int.	●	MWS0690X8DB	77	3.031	77	3.031	130	5.118	7.0	.2756	6
					10	Int.	★	MWS0690X10DB	91	3.583	94	3.701	147	5.787	7.0	.2756	7
					15	Int.	●	MWS0690X15DB	126	4.961	129	5.079	182	7.165	7.0	.2756	7
					20	Int.	★	MWS0690X20DB	161	6.339	164	6.457	217	8.543	7.0	.2756	7
					25	Int.	★	MWS0690X25DB	196	7.717	199	7.835	252	9.921	7.0	.2756	7
					30	Int.	★	MWS0690X30DB	231	9.094	234	9.213	287	11.299	7.0	.2756	7
6.909	.2720		I	5/16-24	3	Ext.	●	MZE02720MA	42.9	1.689	42.9	1.689	83	3.268	6.909	.2720	1
					5	Int.	●	MWS02720LB	56	2.205	56	2.205	109	4.291	6.909	.2720	6
					8	Int.	●	MWS02720X8DB	77	3.031	77	3.031	130	5.118	6.909	.2720	6
					15	Int.	●	MWS02720X15DB	126	4.961	129	5.079	182	7.165	6.909	.2720	7
					20	Int.	●	MWS02720X20DB	161	6.339	164	6.457	217	8.543	6.909	.2720	7
					25	Int.	●	MWS02720X25DB	196	7.717	199	7.835	252	9.921	6.909	.2720	7
					30	Int.	●	MWS02720X30DB	231	9.094	234	9.213	287	11.299	6.909	.2720	7
7.000	.2756			M8x1.0	2	Ext.	●	MWE0700SA	34	1.339	34	1.339	74	2.913	7.0	.2756	1
					3	Ext.	●	MWE0700MA	43	1.693	43	1.693	83	3.268	7.0	.2756	1
					3	Int.	●	MWS0700MB	35	1.378	35	1.378	88	3.465	7.0	.2756	6
					5	Int.	●	MWS0700LB	56	2.205	56	2.205	109	4.291	7.0	.2756	6
					8	Int.	●	MWS0700X8DB	77	3.031	77	3.031	130	5.118	7.0	.2756	6
					10	Int.	●	MWS0700X10DB	91	3.583	94	3.701	147	5.787	7.0	.2756	7
					15	Int.	●	MWS0700X15DB	126	4.961	129	5.079	182	7.165	7.0	.2756	7
					20	Int.	●	MWS0700X20DB	161	6.339	164	6.457	217	8.543	7.0	.2756	7
					25	Int.	●	MWS0700X25DB	196	7.717	199	7.835	252	9.921	7.0	.2756	7
					30	Int.	●	MWS0700X30DB	231	9.094	234	9.213	287	11.299	7.0	.2756	7

CUTTING CONDITION MWE/MWS ➤ L072
CUTTING CONDITION MZE/MZS ➤ L143
HOW TO USE ➤ L078
TECHNICAL DATA ➤ N001

MWE/MWS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
7.100	.2795				2	Ext.	●	MWE0710SA	34	1.339	34	1.339	74	2.913	7.1	.2795	1
					3	Ext.	●	MWE0710MA	45	1.772	45	1.772	87	3.425	7.1	.2795	1
					3	Int.	●	MWS0710MB	37.5	1.476	40	1.575	94	3.701	8.0	.3150	6
					5	Int.	●	MWS0710LB	60	2.362	64	2.520	118	4.646	8.0	.3150	6
					8	Int.	●	MWS0710X8DB	83	3.268	88	3.465	142	5.591	8.0	.3150	6
					10	Int.	★	MWS0710X10DB	98	3.858	101	3.976	155	6.102	8.0	.3150	7
					15	Int.	●	MWS0710X15DB	135	5.315	138	5.433	192	7.559	8.0	.3150	7
					20	Int.	★	MWS0710X20DB	173	6.811	176	6.929	230	9.055	8.0	.3150	7
					25	Int.	★	MWS0710X25DB	210	8.268	213	8.386	267	10.512	8.0	.3150	7
					30	Int.	★	MWS0710X30DB	248	9.764	251	9.882	305	12.008	8.0	.3150	7
7.142	.2812	9/32	K		3	Ext.	●	MZE02812MA	44.4	1.748	44.4	1.748	87.3	3.437	7.142	.2812	1
					5	Int.	●	MWS02812LB	60	2.362	64	2.520	118	4.646	7.938	.3125	6
					8	Int.	●	MWS02812X8DB	83	3.268	88	3.465	142	5.591	7.938	.3125	6
					15	Int.	●	MWS02812X15DB	135	5.315	138	5.433	192	7.559	7.938	.3125	7
					20	Int.	●	MWS02812X20DB	173	6.811	176	6.929	230	9.055	7.938	.3125	7
					25	Int.	●	MWS02812X25DB	210	8.268	213	8.386	267	10.512	7.938	.3125	7
					30	Int.	●	MWS02812X30DB	248	9.764	251	9.882	305	12.008	7.938	.3125	7
7.200	.2835				2	Ext.	●	MWE0720SA	34	1.339	34	1.339	74	2.913	7.2	.2835	1
					3	Ext.	●	MWE0720MA	45	1.772	45	1.772	87	3.425	7.2	.2835	1
					3	Int.	●	MWS0720MB	37.5	1.476	40	1.575	94	3.701	8.0	.3150	6
					5	Int.	●	MWS0720LB	60	2.362	64	2.520	118	4.646	8.0	.3150	6
					8	Int.	●	MWS0720X8DB	83	3.268	88	3.465	142	5.591	8.0	.3150	6
					10	Int.	★	MWS0720X10DB	98	3.858	101	3.976	155	6.102	8.0	.3150	7
					15	Int.	★	MWS0720X15DB	135	5.315	138	5.433	192	7.559	8.0	.3150	7
					20	Int.	●	MWS0720X20DB	173	6.811	176	6.929	230	9.055	8.0	.3150	7
					25	Int.	★	MWS0720X25DB	210	8.268	213	8.386	267	10.512	8.0	.3150	7
					30	Int.	★	MWS0720X30DB	248	9.764	251	9.882	305	12.008	8.0	.3150	7
7.300	.2874				2	Ext.	●	MWE0730SA	34	1.339	34	1.339	74	2.913	7.3	.2874	1
					3	Ext.	●	MWE0730MA	45	1.772	45	1.772	87	3.425	7.3	.2874	1
					3	Int.	●	MWS0730MB	37.5	1.476	40	1.575	94	3.701	8.0	.3150	6
					5	Int.	●	MWS0730LB	60	2.362	64	2.520	118	4.646	8.0	.3150	6
					8	Int.	●	MWS0730X8DB	83	3.268	88	3.465	142	5.591	8.0	.3150	6
					10	Int.	★	MWS0730X10DB	98	3.858	101	3.976	155	6.102	8.0	.3150	7
					15	Int.	●	MWS0730X15DB	135	5.315	138	5.433	192	7.559	8.0	.3150	7
					20	Int.	★	MWS0730X20DB	173	6.811	176	6.929	230	9.055	8.0	.3150	7
					25	Int.	★	MWS0730X25DB	210	8.268	213	8.386	267	10.512	8.0	.3150	7
					30	Int.	★	MWS0730X30DB	248	9.764	251	9.882	305	12.008	8.0	.3150	7
7.400	.2913				2	Ext.	●	MWE0740SA	34	1.339	34	1.339	74	2.913	7.4	.2913	1
					3	Ext.	●	MWE0740MA	45	1.772	45	1.772	87	3.425	7.4	.2913	1
					3	Int.	●	MWS0740MB	37.5	1.476	40	1.575	94	3.701	8.0	.3150	6
					5	Int.	●	MWS0740LB	60	2.362	64	2.520	118	4.646	8.0	.3150	6
					8	Int.	●	MWS0740X8DB	83	3.268	88	3.465	142	5.591	8.0	.3150	6
					10	Int.	★	MWS0740X10DB	98	3.858	101	3.976	155	6.102	8.0	.3150	7
					15	Int.	●	MWS0740X15DB	135	5.315	138	5.433	192	7.559	8.0	.3150	7
					20	Int.	★	MWS0740X20DB	173	6.811	176	6.929	230	9.055	8.0	.3150	7
					25	Int.	★	MWS0740X25DB	210	8.268	213	8.386	267	10.512	8.0	.3150	7
					30	Int.	★	MWS0740X30DB	248	9.764	251	9.882	305	12.008	8.0	.3150	7

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Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
7.500	.2953		M		2	Ext.	●	MWE0750SA	34	1.339	34	1.339	74	2.913	7.5	.2953	1
					3	Ext.	●	MWE0750MA	45	1.772	45	1.772	87	3.425	7.5	.2953	1
					3	Int.	●	MWS0750MB	37.5	1.476	40	1.575	94	3.701	8.0	.3150	6
					5	Int.	●	MWS0750LB	60	2.362	64	2.520	118	4.646	8.0	.3150	6
					8	Int.	●	MWS0750X8DB	83	3.268	88	3.465	142	5.591	8.0	.3150	6
					10	Int.	●	MWS0750X10DB	98	3.858	101	3.976	155	6.102	8.0	.3150	7
					15	Int.	●	MWS0750X15DB	135	5.315	138	5.433	192	7.559	8.0	.3150	7
					20	Int.	★	MWS0750X20DB	173	6.811	176	6.929	230	9.055	8.0	.3150	7
					25	Int.	★	MWS0750X25DB	210	8.268	213	8.386	267	10.512	8.0	.3150	7
					30	Int.	★	MWS0750X30DB	248	9.764	251	9.882	305	12.008	8.0	.3150	7
7.541	.2969	19/64			3	Ext.	●	MZE02969MA	47.6	1.874	47.6	1.874	90.5	3.563	7.541	.2969	1
					5	Int.	●	MWS02969LB	64	2.520	64	2.520	118	4.646	7.938	.3125	6
					8	Int.	●	MWS02969X8DB	88	3.465	88	3.465	142	5.591	7.938	.3125	6
					15	Int.	●	MWS02969X15DB	144	5.669	147	5.787	201	7.913	7.938	.3125	7
					20	Int.	●	MWS02969X20DB	184	7.244	187	7.362	241	9.488	7.938	.3125	7
					25	Int.	●	MWS02969X25DB	224	8.819	227	8.937	281	11.063	7.938	.3125	7
					30	Int.	●	MWS02969X30DB	264	10.394	267	10.512	321	12.638	7.938	.3125	7
7.600	.2992				2	Ext.	●	MWE0760SA	37	1.457	37	1.457	79	3.110	7.6	.2992	1
					3	Ext.	●	MWE0760MA	48	1.890	48	1.890	90	3.543	7.6	.2992	1
					3	Int.	●	MWS0760MB	40	1.575	40	1.575	94	3.701	8.0	.3150	6
					5	Int.	●	MWS0760LB	64	2.520	64	2.520	118	4.646	8.0	.3150	6
					8	Int.	●	MWS0760X8DB	88	3.465	88	3.465	142	5.591	8.0	.3150	6
					10	Int.	★	MWS0760X10DB	104	4.094	107	4.213	161	6.339	8.0	.3150	7
					15	Int.	★	MWS0760X15DB	144	5.669	147	5.787	201	7.913	8.0	.3150	7
					20	Int.	★	MWS0760X20DB	184	7.244	187	7.362	241	9.488	8.0	.3150	7
					25	Int.	★	MWS0760X25DB	224	8.819	227	8.937	281	11.063	8.0	.3150	7
					30	Int.	★	MWS0760X30DB	264	10.394	267	10.512	321	12.638	8.0	.3150	7
7.700	.3031				2	Ext.	●	MWE0770SA	37	1.457	37	1.457	79	3.110	7.7	.3031	1
					3	Ext.	●	MWE0770MA	48	1.890	48	1.890	90	3.543	7.7	.3031	1
					3	Int.	●	MWS0770MB	40	1.575	40	1.575	94	3.701	8.0	.3150	6
					5	Int.	●	MWS0770LB	64	2.520	64	2.520	118	4.646	8.0	.3150	6
					8	Int.	●	MWS0770X8DB	88	3.465	88	3.465	142	5.591	8.0	.3150	6
					10	Int.	●	MWS0770X10DB	104	4.094	107	4.213	161	6.339	8.0	.3150	7
					15	Int.	●	MWS0770X15DB	144	5.669	147	5.787	201	7.913	8.0	.3150	7
					20	Int.	★	MWS0770X20DB	184	7.244	187	7.362	241	9.488	8.0	.3150	7
					25	Int.	★	MWS0770X25DB	224	8.819	227	8.937	281	11.063	8.0	.3150	7
					30	Int.	★	MWS0770X30DB	264	10.394	267	10.512	321	12.638	8.0	.3150	7
7.800	.3071				2	Ext.	●	MWE0780SA	37	1.457	37	1.457	79	3.110	7.8	.3071	1
					3	Ext.	●	MWE0780MA	48	1.890	48	1.890	90	3.543	7.8	.3071	1
					3	Int.	●	MWS0780MB	40	1.575	40	1.575	94	3.701	8.0	.3150	6
					5	Int.	●	MWS0780LB	64	2.520	64	2.520	118	4.646	8.0	.3150	6
					8	Int.	●	MWS0780X8DB	88	3.465	88	3.465	142	5.591	8.0	.3150	6
					10	Int.	★	MWS0780X10DB	104	4.094	107	4.213	161	6.339	8.0	.3150	7
					15	Int.	●	MWS0780X15DB	144	5.669	147	5.787	201	7.913	8.0	.3150	7
					20	Int.	●	MWS0780X20DB	184	7.244	187	7.362	241	9.488	8.0	.3150	7
					25	Int.	●	MWS0780X25DB	224	8.819	227	8.937	281	11.063	8.0	.3150	7
					30	Int.	★	MWS0780X30DB	264	10.394	267	10.512	321	12.638	8.0	.3150	7

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MWE/MWS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
7.900	.3110				2	Ext.	●	MWE0790SA	37	1.457	37	1.457	79	3.110	7.9	.3110	1
					3	Ext.	●	MWE0790MA	48	1.890	48	1.890	90	3.543	7.9	.3110	1
					3	Int.	●	MWS0790MB	40	1.575	40	1.575	94	3.701	8.0	.3150	6
					5	Int.	●	MWS0790LB	64	2.520	64	2.520	118	4.646	8.0	.3150	6
					8	Int.	●	MWS0790X8DB	88	3.465	88	3.465	142	5.591	8.0	.3150	6
					10	Int.	●	MWS0790X10DB	104	4.094	107	4.213	161	6.339	8.0	.3150	7
					15	Int.	★	MWS0790X15DB	144	5.669	147	5.787	201	7.913	8.0	.3150	7
					20	Int.	★	MWS0790X20DB	184	7.244	187	7.362	241	9.488	8.0	.3150	7
					25	Int.	★	MWS0790X25DB	224	8.819	227	8.937	281	11.063	8.0	.3150	7
					30	Int.	★	MWS0790X30DB	264	10.394	267	10.512	321	12.638	8.0	.3150	7
7.938	.3125	5/16		3/8-16	3	Ext.	●	MZE03125MA	47.6	1.874	47.6	1.874	90.5	3.563	7.938	.3125	1
					5	Int.	●	MWS03125LB	64	2.520	64	2.520	118	4.646	7.938	.3125	6
					8	Int.	●	MWS03125X8DB	88	3.465	88	3.465	142	5.591	7.938	.3125	6
					15	Int.	●	MWS03125X15DB	144	5.669	147	5.787	201	7.913	7.938	.3125	7
					20	Int.	●	MWS03125X20DB	184	7.244	187	7.362	241	9.488	7.938	.3125	7
					25	Int.	●	MWS03125X25DB	224	8.819	227	8.937	281	11.063	7.938	.3125	7
					30	Int.	●	MWS03125X30DB	264	10.394	267	10.512	321	12.638	7.938	.3125	7
8.000	.3150				2	Ext.	●	MWE0800SA	37	1.457	37	1.457	79	3.110	8.0	.3150	1
					3	Ext.	●	MWE0800MA	48	1.890	48	1.890	90	3.543	8.0	.3150	1
					3	Int.	●	MWS0800MB	40	1.575	40	1.575	94	3.701	8.0	.3150	6
					5	Int.	●	MWS0800LB	64	2.520	64	2.520	118	4.646	8.0	.3150	6
					8	Int.	●	MWS0800X8DB	88	3.465	88	3.465	142	5.591	8.0	.3150	6
					10	Int.	●	MWS0800X10DB	104	4.094	107	4.213	161	6.339	8.0	.3150	7
					15	Int.	●	MWS0800X15DB	144	5.669	147	5.787	201	7.913	8.0	.3150	7
					20	Int.	●	MWS0800X20DB	184	7.244	187	7.362	241	9.488	8.0	.3150	7
					25	Int.	★	MWS0800X25DB	224	8.819	227	8.937	281	11.063	8.0	.3150	7
					30	Int.	●	MWS0800X30DB	264	10.394	267	10.512	321	12.638	8.0	.3150	7
8.100	.3189				2	Ext.	●	MWE0810SA	37	1.457	37	1.457	79	3.110	8.1	.3189	1
					3	Ext.	●	MWE0810MA	53	2.087	53	2.087	96	3.780	8.1	.3189	1
					3	Int.	●	MWS0810MB	42.5	1.673	45	1.772	100	3.937	9.0	.3543	6
					5	Int.	●	MWS0810LB	68	2.677	72	2.835	127	5.000	9.0	.3543	6
					8	Int.	●	MWS0810X8DB	94	3.701	99	3.898	154	6.063	9.0	.3543	6
					10	Int.	●	MWS0810X10DB	111	4.370	114	4.488	169	6.654	9.0	.3543	7
					15	Int.	★	MWS0810X15DB	153	6.024	156	6.142	211	8.307	9.0	.3543	7
					20	Int.	★	MWS0810X20DB	196	7.717	199	7.835	254	10.000	9.0	.3543	7
					25	Int.	★	MWS0810X25DB	238	9.370	241	9.488	296	11.654	9.0	.3543	7
					30	Int.	★	MWS0810X30DB	281	11.063	284	11.181	339	13.346	9.0	.3543	7
8.200	.3228		P		2	Ext.	●	MWE0820SA	37	1.457	37	1.457	79	3.110	8.2	.3228	1
					3	Ext.	●	MWE0820MA	53	2.087	53	2.087	96	3.780	8.2	.3228	1
					3	Int.	●	MWS0820MB	42.5	1.673	45	1.772	100	3.937	9.0	.3543	6
					5	Int.	●	MWS0820LB	68	2.677	72	2.835	127	5.000	9.0	.3543	6
					8	Int.	●	MWS0820X8DB	94	3.701	99	3.898	154	6.063	9.0	.3543	6
					10	Int.	★	MWS0820X10DB	111	4.370	114	4.488	169	6.654	9.0	.3543	7
					15	Int.	★	MWS0820X15DB	153	6.024	156	6.142	211	8.307	9.0	.3543	7
					20	Int.	★	MWS0820X20DB	196	7.717	199	7.835	254	10.000	9.0	.3543	7
					25	Int.	★	MWS0820X25DB	238	9.370	241	9.488	296	11.654	9.0	.3543	7
					30	Int.	●	MWS0820X30DB	281	11.063	284	11.181	339	13.346	9.0	.3543	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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
8.300	.3268				2	Ext.	●	MWE0830SA	37	1.457	37	1.457	79	3.110	8.3	.3268	1
					3	Ext.	●	MWE0830MA	53	2.087	53	2.087	96	3.780	8.3	.3268	1
					3	Int.	●	MWS0830MB	42.5	1.673	45	1.772	100	3.937	9.0	.3543	6
					5	Int.	●	MWS0830LB	68	2.677	72	2.835	127	5.000	9.0	.3543	6
					8	Int.	●	MWS0830X8DB	94	3.701	99	3.898	154	6.063	9.0	.3543	6
					10	Int.	★	MWS0830X10DB	111	4.370	114	4.488	169	6.654	9.0	.3543	7
					15	Int.	★	MWS0830X15DB	153	6.024	156	6.142	211	8.307	9.0	.3543	7
					20	Int.	★	MWS0830X20DB	196	7.717	199	7.835	254	10.000	9.0	.3543	7
					25	Int.	★	MWS0830X25DB	238	9.370	241	9.488	296	11.654	9.0	.3543	7
					30	Int.	★	MWS0830X30DB	281	11.063	284	11.181	339	13.346	9.0	.3543	7
8.334	.3281	21/64			3	Ext.	●	MZE03281MA	52.4	2.063	52.4	2.063	95.3	3.752	8.334	.3281	1
					5	Int.	●	MWS03281LB	68	2.677	72	2.835	127	5.000	8.733	.3438	6
					8	Int.	●	MWS03281X8DB	94	3.701	99	3.898	154	6.063	8.733	.3438	6
					15	Int.	●	MWS03281X15DB	153	6.024	156	6.142	211	8.307	8.733	.3438	7
					20	Int.	●	MWS03281X20DB	196	7.717	199	7.835	254	10.000	8.733	.3438	7
					25	Int.	●	MWS03281X25DB	238	9.370	241	9.488	296	11.654	8.733	.3438	7
8.400	.3307				2	Ext.	●	MWE0840SA	37	1.457	37	1.457	79	3.110	8.4	.3307	1
					3	Ext.	●	MWE0840MA	53	2.087	53	2.087	96	3.780	8.4	.3307	1
					3	Int.	●	MWS0840MB	42.5	1.673	45	1.772	100	3.937	9.0	.3543	6
					5	Int.	●	MWS0840LB	68	2.677	72	2.835	127	5.000	9.0	.3543	6
					8	Int.	●	MWS0840X8DB	94	3.701	99	3.898	154	6.063	9.0	.3543	6
					10	Int.	★	MWS0840X10DB	111	4.370	114	4.488	169	6.654	9.0	.3543	7
					15	Int.	★	MWS0840X15DB	153	6.024	156	6.142	211	8.307	9.0	.3543	7
					20	Int.	★	MWS0840X20DB	196	7.717	199	7.835	254	10.000	9.0	.3543	7
					25	Int.	★	MWS0840X25DB	238	9.370	241	9.488	296	11.654	9.0	.3543	7
					30	Int.	★	MWS0840X30DB	281	11.063	284	11.181	339	13.346	9.0	.3543	7
8.433	.3320		Q	3/8-24	3	Ext.	●	MZE03320MA	53	2.087	53	2.087	96	3.780	8.433	.3320	1
					5	Int.	●	MWS03320LB	68	2.677	72	2.835	127	5.000	8.733	.3438	6
					8	Int.	●	MWS03320X8DB	94	3.701	99	3.898	154	6.063	8.733	.3438	6
					15	Int.	●	MWS03320X15DB	153	6.024	156	6.142	211	8.307	8.733	.3438	7
					20	Int.	●	MWS03320X20DB	196	7.717	199	7.835	254	10.000	8.733	.3438	7
					25	Int.	●	MWS03320X25DB	238	9.370	241	9.488	296	11.654	8.733	.3438	7
8.500	.3346			M10x1.5	2	Ext.	●	MWE0850SA	37	1.457	37	1.457	79	3.110	8.5	.3346	1
					3	Ext.	●	MWE0850MA	53	2.087	53	2.087	96	3.780	8.5	.3346	1
					3	Int.	●	MWS0850MB	42.5	1.673	45	1.772	100	3.937	9.0	.3543	6
					5	Int.	●	MWS0850LB	68	2.677	72	2.835	127	5.000	9.0	.3543	6
					8	Int.	●	MWS0850X8DB	94	3.701	99	3.898	154	6.063	9.0	.3543	6
					10	Int.	●	MWS0850X10DB	111	4.370	114	4.488	169	6.654	9.0	.3543	7
					15	Int.	●	MWS0850X15DB	153	6.024	156	6.142	211	8.307	9.0	.3543	7
					20	Int.	●	MWS0850X20DB	196	7.717	199	7.835	254	10.000	9.0	.3543	7
					25	Int.	★	MWS0850X25DB	238	9.370	241	9.488	296	11.654	9.0	.3543	7
					30	Int.	●	MWS0850X30DB	281	11.063	284	11.181	339	13.346	9.0	.3543	7

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MWE/MWS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
8.600	.3386		R		2	Ext.	●	MWE0860SA	40	1.575	40	1.575	84	3.307	8.6	.3386	1
					3	Ext.	●	MWE0860MA	55	2.165	55	2.165	98	3.858	8.6	.3386	1
					3	Int.	●	MWS0860MB	45	1.772	45	1.772	100	3.937	9.0	.3543	6
					5	Int.	●	MWS0860LB	72	2.835	72	2.835	127	5.000	9.0	.3543	6
					8	Int.	●	MWS0860X8DB	99	3.898	99	3.898	154	6.063	9.0	.3543	6
					10	Int.	★	MWS0860X10DB	117	4.606	120	4.724	175	6.890	9.0	.3543	7
					15	Int.	★	MWS0860X15DB	162	6.378	165	6.496	220	8.661	9.0	.3543	7
					20	Int.	★	MWS0860X20DB	207	8.150	210	8.268	265	10.433	9.0	.3543	7
					25	Int.	★	MWS0860X25DB	252	9.921	255	10.039	310	12.205	9.0	.3543	7
					30	Int.	★	MWS0860X30DB	297	11.693	300	11.811	355	13.976	9.0	.3543	7
8.700	.3425			M10x1.25	2	Ext.	●	MWE0870SA	40	1.575	40	1.575	84	3.307	8.7	.3425	1
					3	Ext.	●	MWE0870MA	55	2.165	55	2.165	98	3.858	8.7	.3425	1
					3	Int.	●	MWS0870MB	45	1.772	45	1.772	100	3.937	9.0	.3543	6
					5	Int.	●	MWS0870LB	72	2.835	72	2.835	127	5.000	9.0	.3543	6
					8	Int.	●	MWS0870X8DB	99	3.898	99	3.898	154	6.063	9.0	.3543	6
					10	Int.	●	MWS0870X10DB	117	4.606	120	4.724	175	6.890	9.0	.3543	7
					15	Int.	★	MWS0870X15DB	162	6.378	165	6.496	220	8.661	9.0	.3543	7
					20	Int.	★	MWS0870X20DB	207	8.150	210	8.268	265	10.433	9.0	.3543	7
					25	Int.	★	MWS0870X25DB	252	9.921	255	10.039	310	12.205	9.0	.3543	7
					30	Int.	★	MWS0870X30DB	297	11.693	300	11.811	355	13.976	9.0	.3543	7
8.733	.3438	11/32			3	Ext.	●	MZE03438MA	55.5	2.185	55.5	2.185	98.4	3.874	8.733	.3438	1
					5	Int.	●	MWS03438LB	72	2.835	72	2.835	127	5.000	8.733	.3438	6
					8	Int.	●	MWS03438X8DB	99	3.898	99	3.898	154	6.063	8.733	.3438	6
					15	Int.	●	MWS03438X15DB	162	6.378	165	6.496	220	8.661	8.733	.3438	7
					20	Int.	●	MWS03438X20DB	207	8.150	210	8.268	265	10.433	8.733	.3438	7
					25	Int.	●	MWS03438X25DB	252	9.921	255	10.039	310	12.205	8.733	.3438	7
8.800	.3465				2	Ext.	●	MWE0880SA	40	1.575	40	1.575	84	3.307	8.8	.3465	1
					3	Ext.	●	MWE0880MA	55	2.165	55	2.165	98	3.858	8.8	.3465	1
					3	Int.	●	MWS0880MB	45	1.772	45	1.772	100	3.937	9.0	.3543	6
					5	Int.	●	MWS0880LB	72	2.835	72	2.835	127	5.000	9.0	.3543	6
					8	Int.	●	MWS0880X8DB	99	3.898	99	3.898	154	6.063	9.0	.3543	6
					10	Int.	★	MWS0880X10DB	117	4.606	120	4.724	175	6.890	9.0	.3543	7
					15	Int.	★	MWS0880X15DB	162	6.378	165	6.496	220	8.661	9.0	.3543	7
					20	Int.	★	MWS0880X20DB	207	8.150	210	8.268	265	10.433	9.0	.3543	7
					25	Int.	★	MWS0880X25DB	252	9.921	255	10.039	310	12.205	9.0	.3543	7
					30	Int.	★	MWS0880X30DB	297	11.693	300	11.811	355	13.976	9.0	.3543	7
8.900	.3504				2	Ext.	●	MWE0890SA	40	1.575	40	1.575	84	3.307	8.9	.3504	1
					3	Ext.	●	MWE0890MA	55	2.165	55	2.165	98	3.858	8.9	.3504	1
					3	Int.	●	MWS0890MB	45	1.772	45	1.772	100	3.937	9.0	.3543	6
					5	Int.	●	MWS0890LB	72	2.835	72	2.835	127	5.000	9.0	.3543	6
					8	Int.	●	MWS0890X8DB	99	3.898	99	3.898	154	6.063	9.0	.3543	6
					10	Int.	★	MWS0890X10DB	117	4.606	120	4.724	175	6.890	9.0	.3543	7
					15	Int.	★	MWS0890X15DB	162	6.378	165	6.496	220	8.661	9.0	.3543	7
					20	Int.	★	MWS0890X20DB	207	8.150	210	8.268	265	10.433	9.0	.3543	7
					25	Int.	★	MWS0890X25DB	252	9.921	255	10.039	310	12.205	9.0	.3543	7
					30	Int.	★	MWS0890X30DB	297	11.693	300	11.811	355	13.976	9.0	.3543	7

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Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
9.000	.3543				2	Ext.	●	MWE0900SA	40	1.575	40	1.575	84	3.307	9.0	.3543	1
					3	Ext.	●	MWE0900MA	55	2.165	55	2.165	98	3.858	9.0	.3543	1
					3	Int.	●	MWS0900MB	45	1.772	45	1.772	100	3.937	9.0	.3543	6
					5	Int.	●	MWS0900LB	72	2.835	72	2.835	127	5.000	9.0	.3543	6
					8	Int.	●	MWS0900X8DB	99	3.898	99	3.898	154	6.063	9.0	.3543	6
					10	Int.	●	MWS0900X10DB	117	4.606	120	4.724	175	6.890	9.0	.3543	7
					15	Int.	●	MWS0900X15DB	162	6.378	165	6.496	220	8.661	9.0	.3543	7
					20	Int.	●	MWS0900X20DB	207	8.150	210	8.268	265	10.433	9.0	.3543	7
					25	Int.	★	MWS0900X25DB	252	9.921	255	10.039	310	12.205	9.0	.3543	7
					30	Int.	★	MWS0900X30DB	297	11.693	300	11.811	355	13.976	9.0	.3543	7
9.100	.3583		T		2	Ext.	●	MWE0910SA	40	1.575	40	1.575	84	3.307	9.1	.3583	1
					3	Ext.	●	MWE0910MA	58	2.283	58	2.283	102	4.016	9.1	.3583	1
					3	Int.	●	MWS0910MB	47.5	1.870	50	1.969	106	4.173	10.0	.3937	6
					5	Int.	●	MWS0910LB	76	2.992	80	3.150	136	5.354	10.0	.3937	6
					8	Int.	●	MWS0910X8DB	105	4.134	110	4.331	166	6.535	10.0	.3937	6
					10	Int.	★	MWS0910X10DB	124	4.882	127	5.000	182	7.165	10.0	.3937	7
					15	Int.	★	MWS0910X15DB	171	6.732	174	6.850	229	9.016	10.0	.3937	7
					20	Int.	★	MWS0910X20DB	219	8.622	222	8.740	277	10.906	10.0	.3937	7
					25	Int.	★	MWS0910X25DB	266	10.472	269	10.591	324	12.756	10.0	.3937	7
					30	Int.	★	MWS0910X30DB	314	12.362	317	12.480	372	14.646	10.0	.3937	7
9.129	.3594	23/64			3	Ext.	●	MZE03594MA	57.9	2.280	57.9	2.280	101.6	4.000	9.129	.3594	1
					5	Int.	●	MWS03594LB	76	2.992	80	3.150	136	5.354	9.921	.3906	6
					8	Int.	●	MWS03594X8DB	105	4.134	110	4.331	166	6.535	9.921	.3906	6
					15	Int.	●	MWS03594X15DB	171	6.732	174	6.850	229	9.016	9.921	.3906	7
					20	Int.	●	MWS03594X20DB	219	8.622	222	8.740	277	10.906	9.921	.3906	7
					25	Int.	●	MWS03594X25DB	266	10.472	269	10.591	324	12.756	9.921	.3906	7
9.200	.3622				2	Ext.	●	MWE0920SA	40	1.575	40	1.575	84	3.307	9.2	.3622	1
					3	Ext.	●	MWE0920MA	58	2.283	58	2.283	102	4.016	9.2	.3622	1
					3	Int.	●	MWS0920MB	47.5	1.870	50	1.969	106	4.173	10.0	.3937	6
					5	Int.	●	MWS0920LB	76	2.992	80	3.150	136	5.354	10.0	.3937	6
					8	Int.	●	MWS0920X8DB	105	4.134	110	4.331	166	6.535	10.0	.3937	6
					10	Int.	★	MWS0920X10DB	124	4.882	127	5.000	182	7.165	10.0	.3937	7
					15	Int.	★	MWS0920X15DB	171	6.732	174	6.850	229	9.016	10.0	.3937	7
					20	Int.	★	MWS0920X20DB	219	8.622	222	8.740	277	10.906	10.0	.3937	7
					25	Int.	★	MWS0920X25DB	266	10.472	269	10.591	324	12.756	10.0	.3937	7
					30	Int.	★	MWS0920X30DB	314	12.362	317	12.480	372	14.646	10.0	.3937	7
9.300	.3661				2	Ext.	●	MWE0930SA	40	1.575	40	1.575	84	3.307	9.3	.3661	1
					3	Ext.	●	MWE0930MA	58	2.283	58	2.283	102	4.016	9.3	.3661	1
					3	Int.	●	MWS0930MB	47.5	1.870	50	1.969	106	4.173	10.0	.3937	6
					5	Int.	●	MWS0930LB	76	2.992	80	3.150	136	5.354	10.0	.3937	6
					8	Int.	●	MWS0930X8DB	105	4.134	110	4.331	166	6.535	10.0	.3937	6
					10	Int.	●	MWS0930X10DB	124	4.882	127	5.000	182	7.165	10.0	.3937	7
					15	Int.	●	MWS0930X15DB	171	6.732	174	6.850	229	9.016	10.0	.3937	7
					20	Int.	★	MWS0930X20DB	219	8.622	222	8.740	277	10.906	10.0	.3937	7
					25	Int.	★	MWS0930X25DB	266	10.472	269	10.591	324	12.756	10.0	.3937	7
					30	Int.	★	MWS0930X30DB	314	12.362	317	12.480	372	14.646	10.0	.3937	7

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Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
9.347	.3680		U	7/16-14	3	Ext.	●	MZE03680MA	58	2.283	58	2.283	102	4.016	9.347	.3680	1
					5	Int.	●	MWS03680LB	76	2.992	80	3.150	136	5.354	9.921	.3906	6
					8	Int.	●	MWS03680X8DB	105	4.134	110	4.331	166	6.535	9.921	.3906	6
					15	Int.	●	MWS03680X15DB	171	6.732	174	6.850	229	9.016	9.921	.3906	7
					20	Int.	●	MWS03680X20DB	219	8.622	222	8.740	277	10.906	9.921	.3906	7
					25	Int.	●	MWS03680X25DB	266	10.472	269	10.591	324	12.756	9.921	.3906	7
9.400	.3701				2	Ext.	●	MWE0940SA	40	1.575	40	1.575	84	3.307	9.4	.3701	1
					3	Ext.	●	MWE0940MA	58	2.283	58	2.283	102	4.016	9.4	.3701	1
					3	Int.	●	MWS0940MB	47.5	1.870	50	1.969	106	4.173	10.0	.3937	6
					5	Int.	●	MWS0940LB	76	2.992	80	3.150	136	5.354	10.0	.3937	6
					8	Int.	●	MWS0940X8DB	105	4.134	110	4.331	166	6.535	10.0	.3937	6
					10	Int.	★	MWS0940X10DB	124	4.882	127	5.000	182	7.165	10.0	.3937	7
					15	Int.	★	MWS0940X15DB	171	6.732	174	6.850	229	9.016	10.0	.3937	7
					20	Int.	★	MWS0940X20DB	219	8.622	222	8.740	277	10.906	10.0	.3937	7
					25	Int.	★	MWS0940X25DB	266	10.472	269	10.591	324	12.756	10.0	.3937	7
					30	Int.	★	MWS0940X30DB	314	12.362	317	12.480	372	14.646	10.0	.3937	7
9.500	.3740				2	Ext.	●	MWE0950SA	40	1.575	40	1.575	84	3.307	9.5	.3740	1
					3	Ext.	●	MWE0950MA	58	2.283	58	2.283	102	4.016	9.5	.3740	1
					3	Int.	●	MWS0950MB	47.5	1.870	50	1.969	106	4.173	10.0	.3937	6
					5	Int.	●	MWS0950LB	76	2.992	80	3.150	136	5.354	10.0	.3937	6
					8	Int.	●	MWS0950X8DB	105	4.134	110	4.331	166	6.535	10.0	.3937	6
					10	Int.	●	MWS0950X10DB	124	4.882	127	5.000	182	7.165	10.0	.3937	7
					15	Int.	★	MWS0950X15DB	171	6.732	174	6.850	229	9.016	10.0	.3937	7
					20	Int.	●	MWS0950X20DB	219	8.622	222	8.740	277	10.906	10.0	.3937	7
					25	Int.	●	MWS0950X25DB	266	10.472	269	10.591	324	12.756	10.0	.3937	7
					30	Int.	●	MWS0950X30DB	314	12.362	317	12.480	372	14.646	10.0	.3937	7
9.525	.3750	3/8			3	Ext.	●	MZE03750MA	60.3	2.374	60.3	2.374	104.8	4.126	9.525	.3750	1
					5	Int.	●	MWS03750LB	80	3.150	80	3.150	136	5.354	9.921	.3906	6
					8	Int.	●	MWS03750X8DB	110	4.331	110	4.331	166	6.535	9.921	.3906	6
					15	Int.	●	MWS03750X15DB	180	7.087	183	7.205	238	9.370	9.921	.3906	7
					20	Int.	●	MWS03750X20DB	230	9.055	233	9.173	288	11.339	9.921	.3906	7
					25	Int.	●	MWS03750X25DB	280	11.024	283	11.142	338	13.307	9.921	.3906	7
9.600	.3780				2	Ext.	●	MWE0960SA	43	1.693	43	1.693	89	3.504	9.6	.3780	1
					3	Ext.	●	MWE0960MA	60	2.362	60	2.362	105	4.134	9.6	.3780	1
					3	Int.	●	MWS0960MB	50	1.969	50	1.969	106	4.173	10.0	.3937	6
					5	Int.	●	MWS0960LB	80	3.150	80	3.150	136	5.354	10.0	.3937	6
					8	Int.	●	MWS0960X8DB	110	4.331	110	4.331	166	6.535	10.0	.3937	6
					10	Int.	●	MWS0960X10DB	130	5.118	133	5.236	188	7.402	10.0	.3937	7
					15	Int.	●	MWS0960X15DB	180	7.087	183	7.205	238	9.370	10.0	.3937	7
					20	Int.	★	MWS0960X20DB	230	9.055	233	9.173	288	11.339	10.0	.3937	7
					25	Int.	★	MWS0960X25DB	280	11.024	283	11.142	338	13.307	10.0	.3937	7
					30	Int.	★	MWS0960X30DB	330	12.992	333	13.110	388	15.276	10.0	.3937	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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3 mm	L3 inch	L2 mm	L2 inch	L1 mm	L1 inch	D4 mm	D4 inch	
9.700	.3819		Tube Sheet		2	Ext.	●	MWE0970SA	43	1.693	43	1.693	89	3.504	9.7	.3819	1
					3	Ext.	●	MWE0970MA	60	2.362	60	2.362	105	4.134	9.7	.3819	1
					3	Int.	●	MWS0970MB	50	1.969	50	1.969	106	4.173	10.0	.3937	6
					5	Int.	●	MWS0970LB	80	3.150	80	3.150	136	5.354	10.0	.3937	6
					8	Int.	●	MWS0970X8DB	110	4.331	110	4.331	166	6.535	10.0	.3937	6
					10	Int.	★	MWS0970X10DB	130	5.118	133	5.236	188	7.402	10.0	.3937	7
					15	Int.	●	MWS0970X15DB	180	7.087	183	7.205	238	9.370	10.0	.3937	7
					20	Int.	★	MWS0970X20DB	230	9.055	233	9.173	288	11.339	10.0	.3937	7
					25	Int.	★	MWS0970X25DB	280	11.024	283	11.142	338	13.307	10.0	.3937	7
					30	Int.	★	MWS0970X30DB	330	12.992	333	13.110	388	15.276	10.0	.3937	7
9.800	.3858		W		2	Ext.	●	MWE0980SA	43	1.693	43	1.693	89	3.504	9.8	.3858	1
					3	Ext.	●	MWE0980MA	60	2.362	60	2.362	105	4.134	9.8	.3858	1
					3	Int.	●	MWS0980MB	50	1.969	50	1.969	106	4.173	10.0	.3937	6
					5	Int.	●	MWS0980LB	80	3.150	80	3.150	136	5.354	10.0	.3937	6
					8	Int.	●	MWS0980X8DB	110	4.331	110	4.331	166	6.535	10.0	.3937	6
					10	Int.	●	MWS0980X10DB	130	5.118	133	5.236	188	7.402	10.0	.3937	7
					15	Int.	★	MWS0980X15DB	180	7.087	183	7.205	238	9.370	10.0	.3937	7
					20	Int.	★	MWS0980X20DB	230	9.055	233	9.173	288	11.339	10.0	.3937	7
					25	Int.	★	MWS0980X25DB	280	11.024	283	11.142	338	13.307	10.0	.3937	7
					30	Int.	★	MWS0980X30DB	330	12.992	333	13.110	388	15.276	10.0	.3937	7
9.900	.3898				2	Ext.	●	MWE0990SA	43	1.693	43	1.693	89	3.504	9.9	.3898	1
					3	Ext.	●	MWE0990MA	60	2.362	60	2.362	105	4.134	9.9	.3898	1
					3	Int.	●	MWS0990MB	50	1.969	50	1.969	106	4.173	10.0	.3937	6
					5	Int.	●	MWS0990LB	80	3.150	80	3.150	136	5.354	10.0	.3937	6
					8	Int.	●	MWS0990X8DB	110	4.331	110	4.331	166	6.535	10.0	.3937	6
					10	Int.	●	MWS0990X10DB	130	5.118	133	5.236	188	7.402	10.0	.3937	7
					15	Int.	★	MWS0990X15DB	180	7.087	183	7.205	238	9.370	10.0	.3937	7
					20	Int.	★	MWS0990X20DB	230	9.055	233	9.173	288	11.339	10.0	.3937	7
					25	Int.	★	MWS0990X25DB	280	11.024	283	11.142	338	13.307	10.0	.3937	7
					30	Int.	★	MWS0990X30DB	330	12.992	333	13.110	388	15.276	10.0	.3937	7
9.921	.3906	25/64		7/16-20	3	Ext.	●	MZE03906MA	60.3	2.374	60.3	2.374	104.8	4.126	9.921	.3906	1
					5	Int.	●	MWS03906LB	80	3.150	80	3.150	136	5.354	9.921	.3906	6
					8	Int.	●	MWS03906X8DB	110	4.331	110	4.331	166	6.535	9.921	.3906	6
					15	Int.	●	MWS03906X15DB	180	7.087	183	7.205	238	9.370	9.921	.3906	7
					20	Int.	●	MWS03906X20DB	230	9.055	233	9.173	288	11.339	9.921	.3906	7
					25	Int.	●	MWS03906X25DB	280	11.024	283	11.142	338	13.307	9.921	.3906	7
10.000	.3937				2	Ext.	●	MWE1000SA	43	1.693	43	1.693	89	3.504	10.0	.3937	1
					3	Ext.	●	MWE1000MA	60	2.362	60	2.362	105	4.134	10.0	.3937	1
					3	Int.	●	MWS1000MB	50	1.969	50	1.969	106	4.173	10.0	.3937	6
					5	Int.	●	MWS1000LB	80	3.150	80	3.150	136	5.354	10.0	.3937	6
					8	Int.	●	MWS1000X8DB	110	4.331	110	4.331	166	6.535	10.0	.3937	6
					10	Int.	●	MWS1000X10DB	130	5.118	133	5.236	188	7.402	10.0	.3937	7
					15	Int.	●	MWS1000X15DB	180	7.087	183	7.205	238	9.370	10.0	.3937	7
					20	Int.	★	MWS1000X20DB	230	9.055	233	9.173	288	11.339	10.0	.3937	7
					25	Int.	★	MWS1000X25DB	280	11.024	283	11.142	338	13.307	10.0	.3937	7
					30	Int.	●	MWS1000X30DB	330	12.992	333	13.110	388	15.276	10.0	.3937	7

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Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
10.100	.3976				2	Ext.	●	MWE1010SA	43	1.693	43	1.693	89	3.504	10.1	.3976	1
					3	Ext.	●	MWE1010MA	66	2.598	66	2.598	112	4.409	10.1	.3976	1
					3	Int.	●	MWS1010MB	52.5	2.067	55	2.165	116	4.567	11.0	.4331	6
					5	Int.	●	MWS1010LB	84	3.307	88	3.465	149	5.866	11.0	.4331	6
					8	Int.	●	MWS1010X8DB	116	4.567	121	4.764	182	7.165	11.0	.4331	6
					10	Int.	★	MWS1010X10DB	137	5.394	140	5.512	201	7.913	11.0	.4331	7
					15	Int.	★	MWS1010X15DB	189	7.441	192	7.559	253	9.961	11.0	.4331	7
					20	Int.	★	MWS1010X20DB	242	9.528	245	9.646	306	12.047	11.0	.4331	7
					25	Int.	★	MWS1010X25DB	294	11.575	297	11.693	358	14.094	11.0	.4331	7
10.200	.4016			M12x1.75	2	Ext.	●	MWE1020SA	43	1.693	43	1.693	89	3.504	10.2	.4016	1
					3	Ext.	●	MWE1020MA	66	2.598	66	2.598	112	4.409	10.2	.4016	1
					3	Int.	●	MWS1020MB	52.5	2.067	55	2.165	116	4.567	11.0	.4331	6
					5	Int.	●	MWS1020LB	84	3.307	88	3.465	149	5.866	11.0	.4331	6
					8	Int.	●	MWS1020X8DB	116	4.567	121	4.764	182	7.165	11.0	.4331	6
					10	Int.	★	MWS1020X10DB	137	5.394	140	5.512	201	7.913	11.0	.4331	7
					15	Int.	●	MWS1020X15DB	189	7.441	192	7.559	253	9.961	11.0	.4331	7
					20	Int.	★	MWS1020X20DB	242	9.528	245	9.646	306	12.047	11.0	.4331	7
					25	Int.	★	MWS1020X25DB	294	11.575	297	11.693	358	14.094	11.0	.4331	7
10.300	.4055				2	Ext.	●	MWE1030SA	43	1.693	43	1.693	89	3.504	10.3	.4055	1
					3	Ext.	●	MWE1030MA	66	2.598	66	2.598	112	4.409	10.3	.4055	1
					3	Int.	●	MWS1030MB	52.5	2.067	55	2.165	116	4.567	11.0	.4331	6
					5	Int.	●	MWS1030LB	84	3.307	88	3.465	149	5.866	11.0	.4331	6
					8	Int.	●	MWS1030X8DB	116	4.567	121	4.764	182	7.165	11.0	.4331	6
					10	Int.	★	MWS1030X10DB	137	5.394	140	5.512	201	7.913	11.0	.4331	7
					15	Int.	★	MWS1030X15DB	189	7.441	192	7.559	253	9.961	11.0	.4331	7
					20	Int.	★	MWS1030X20DB	242	9.528	245	9.646	306	12.047	11.0	.4331	7
					25	Int.	★	MWS1030X25DB	294	11.575	297	11.693	358	14.094	11.0	.4331	7
10.317	.4062	13/32			3	Ext.	●	MZE04062MA	66.7	2.626	66.7	2.626	111.9	4.406	10.317	.4062	1
					5	Int.	●	MWS04062LB	84	3.307	88	3.465	149	5.866	10.716	.4219	6
					8	Int.	●	MWS04062X8DB	116	4.567	121	4.764	182	7.165	10.716	.4219	6
					15	Int.	●	MWS04062X15DB	189	7.441	192	7.559	253	9.961	10.716	.4219	7
					20	Int.	●	MWS04062X20DB	242	9.528	245	9.646	306	12.047	10.716	.4219	7
10.400	.4094				2	Ext.	●	MWE1040SA	43	1.693	43	1.693	89	3.504	10.4	.4094	1
					3	Ext.	●	MWE1040MA	66	2.598	66	2.598	112	4.409	10.4	.4094	1
					3	Int.	●	MWS1040MB	52.5	2.067	55	2.165	116	4.567	11.0	.4331	6
					5	Int.	●	MWS1040LB	84	3.307	88	3.465	149	5.866	11.0	.4331	6
					8	Int.	●	MWS1040X8DB	116	4.567	121	4.764	182	7.165	11.0	.4331	6
					10	Int.	★	MWS1040X10DB	137	5.394	140	5.512	201	7.913	11.0	.4331	7
					15	Int.	★	MWS1040X15DB	189	7.441	192	7.559	253	9.961	11.0	.4331	7
					20	Int.	★	MWS1040X20DB	242	9.528	245	9.646	306	12.047	11.0	.4331	7
					25	Int.	★	MWS1040X25DB	294	11.575	297	11.693	358	14.094	11.0	.4331	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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
10.500	.4134		Z		2	Ext.	●	MWE1050SA	43	1.693	43	1.693	89	3.504	10.5	.4134	1
					3	Ext.	●	MWE1050MA	66	2.598	66	2.598	112	4.409	10.5	.4134	1
					3	Int.	●	MWS1050MB	52.5	2.067	55	2.165	116	4.567	11.0	.4331	6
					5	Int.	●	MWS1050LB	84	3.307	88	3.465	149	5.866	11.0	.4331	6
					8	Int.	●	MWS1050X8DB	116	4.567	121	4.764	182	7.165	11.0	.4331	6
					10	Int.	★	MWS1050X10DB	137	5.394	140	5.512	201	7.913	11.0	.4331	7
					15	Int.	●	MWS1050X15DB	189	7.441	192	7.559	253	9.961	11.0	.4331	7
					20	Int.	★	MWS1050X20DB	242	9.528	245	9.646	306	12.047	11.0	.4331	7
					25	Int.	★	MWS1050X25DB	294	11.575	297	11.693	358	14.094	11.0	.4331	7
10.600	.4173				2	Ext.	●	MWE1060SA	43	1.693	43	1.693	89	3.504	10.6	.4173	1
					3	Ext.	●	MWE1060MA	68	2.677	68	2.677	114	4.488	10.6	.4173	1
					3	Int.	●	MWS1060MB	55	2.165	55	2.165	116	4.567	11.0	.4331	6
					5	Int.	●	MWS1060LB	88	3.465	88	3.465	149	5.866	11.0	.4331	6
					8	Int.	●	MWS1060X8DB	121	4.764	121	4.764	182	7.165	11.0	.4331	6
					10	Int.	●	MWS1060X10DB	143	5.630	146	5.748	207	8.150	11.0	.4331	7
					15	Int.	★	MWS1060X15DB	198	7.795	201	7.913	262	10.315	11.0	.4331	7
					20	Int.	★	MWS1060X20DB	253	9.961	256	10.079	317	12.480	11.0	.4331	7
					25	Int.	★	MWS1060X25DB	308	12.126	311	12.244	372	14.646	11.0	.4331	7
10.700	.4213				2	Ext.	●	MWE1070SA	47	1.850	47	1.850	95	3.740	10.7	.4213	1
					3	Ext.	●	MWE1070MA	68	2.677	68	2.677	114	4.488	10.7	.4213	1
					3	Int.	●	MWS1070MB	55	2.165	55	2.165	116	4.567	11.0	.4331	6
					5	Int.	●	MWS1070LB	88	3.465	88	3.465	149	5.866	11.0	.4331	6
					8	Int.	●	MWS1070X8DB	121	4.764	121	4.764	182	7.165	11.0	.4331	6
					10	Int.	●	MWS1070X10DB	143	5.630	146	5.748	207	8.150	11.0	.4331	7
					15	Int.	★	MWS1070X15DB	198	7.795	201	7.913	262	10.315	11.0	.4331	7
					20	Int.	●	MWS1070X20DB	253	9.961	256	10.079	317	12.480	11.0	.4331	7
					25	Int.	★	MWS1070X25DB	308	12.126	311	12.244	372	14.646	11.0	.4331	7
10.716	.4219	27/64		1/2-13	3	Ext.	●	MZE04219MA	68.3	2.689	68.3	2.689	114.3	4.500	10.716	.4219	1
					5	Int.	●	MWS04219LB	88	3.465	88	3.465	149	5.866	10.716	.4219	6
					8	Int.	●	MWS04219X8DB	121	4.764	121	4.764	182	7.165	10.716	.4219	6
					15	Int.	●	MWS04219X15DB	198	7.795	201	7.913	262	10.315	10.716	.4219	7
					20	Int.	●	MWS04219X20DB	253	9.961	256	10.079	317	12.480	10.716	.4219	7
10.800	.4252			M12x1.25	2	Ext.	●	MWE1080SA	47	1.850	47	1.850	95	3.740	10.8	.4252	1
					3	Ext.	●	MWE1080MA	68	2.677	68	2.677	114	4.488	10.8	.4252	1
					3	Int.	●	MWS1080MB	55	2.165	55	2.165	116	4.567	11.0	.4331	6
					5	Int.	●	MWS1080LB	88	3.465	88	3.465	149	5.866	11.0	.4331	6
					8	Int.	●	MWS1080X8DB	121	4.764	121	4.764	182	7.165	11.0	.4331	6
					10	Int.	●	MWS1080X10DB	143	5.630	146	5.748	207	8.150	11.0	.4331	7
					15	Int.	★	MWS1080X15DB	198	7.795	201	7.913	262	10.315	11.0	.4331	7
					20	Int.	●	MWS1080X20DB	253	9.961	256	10.079	317	12.480	11.0	.4331	7
					25	Int.	★	MWS1080X25DB	308	12.126	311	12.244	372	14.646	11.0	.4331	7

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MWE/MWS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
10.900	.4291				2	Ext.	●	MWE1090SA	47	1.850	47	1.850	95	3.740	10.9	.4291	1
					3	Ext.	●	MWE1090MA	68	2.677	68	2.677	114	4.488	10.9	.4291	1
					3	Int.	●	MWS1090MB	55	2.165	55	2.165	116	4.567	11.0	.4331	6
					5	Int.	●	MWS1090LB	88	3.465	88	3.465	149	5.866	11.0	.4331	6
					8	Int.	●	MWS1090X8DB	121	4.764	121	4.764	182	7.165	11.0	.4331	7
					10	Int.	●	MWS1090X10DB	143	5.630	146	5.748	207	8.150	11.0	.4331	7
					15	Int.	★	MWS1090X15DB	198	7.795	201	7.913	262	10.315	11.0	.4331	7
					20	Int.	★	MWS1090X20DB	253	9.961	256	10.079	317	12.480	11.0	.4331	7
					25	Int.	★	MWS1090X25DB	308	12.126	311	12.244	372	14.646	11.0	.4331	7
11.000	.4331				2	Ext.	●	MWE1100SA	47	1.850	47	1.850	95	3.740	11.0	.4331	1
					3	Ext.	●	MWE1100MA	68	2.677	68	2.677	114	4.488	11.0	.4331	1
					3	Int.	●	MWS1100MB	55	2.165	55	2.165	116	4.567	11.0	.4331	6
					5	Int.	●	MWS1100LB	88	3.465	88	3.465	149	5.866	11.0	.4331	6
					8	Int.	●	MWS1100X8DB	121	4.764	121	4.764	182	7.165	11.0	.4331	6
					10	Int.	●	MWS1100X10DB	143	5.630	146	5.748	207	8.150	11.0	.4331	7
					15	Int.	●	MWS1100X15DB	198	7.795	201	7.913	262	10.315	11.0	.4331	7
					20	Int.	★	MWS1100X20DB	253	9.961	256	10.079	317	12.480	11.0	.4331	7
					25	Int.	●	MWS1100X25DB	308	12.126	311	12.244	372	14.646	11.0	.4331	7
11.100	.4370				2	Ext.	●	MWE1110SA	47	1.850	47	1.850	95	3.740	11.1	.4370	1
					3	Ext.	●	MWE1110MA	71	2.795	71	2.795	118	4.646	11.1	.4370	1
					3	Int.	●	MWS1110MB	57.5	2.264	60	2.362	122	4.803	12.0	.4724	6
					5	Int.	●	MWS1110LB	92	3.622	96	3.780	158	6.220	12.0	.4724	6
					8	Int.	●	MWS1110X8DB	127	5.000	132	5.197	194	7.638	12.0	.4724	6
					10	Int.	●	MWS1110X10DB	150	5.906	153	6.024	215	8.465	12.0	.4724	7
					15	Int.	★	MWS1110X15DB	207	8.150	210	8.268	272	10.709	12.0	.4724	7
					20	Int.	●	MWS1110X20DB	265	10.433	268	10.551	330	12.992	12.0	.4724	7
					25	Int.	★	MWS1110X25DB	322	12.677	325	12.795	387	15.236	12.0	.4724	7
11.113	.4375	7/16			3	Ext.	●	MZE04375MA	71.5	2.815	71.5	2.815	117.5	4.626	11.113	.4375	1
					5	Int.	●	MWS04375LB	92	3.622	96	3.780	158	6.220	11.908	.4688	6
					8	Int.	●	MWS04375X8DB	127	5.000	132	5.197	194	7.638	11.908	.4688	6
					15	Int.	●	MWS04375X15DB	207	8.150	210	8.268	272	10.709	11.908	.4688	7
					20	Int.	●	MWS04375X20DB	265	10.433	268	10.551	330	12.992	11.908	.4688	7
11.200	.4409				2	Ext.	●	MWE1120SA	47	1.850	47	1.850	95	3.740	11.2	.4409	1
					3	Ext.	●	MWE1120MA	71	2.795	71	2.795	118	4.646	11.2	.4409	1
					3	Int.	●	MWS1120MB	57.5	2.264	60	2.362	122	4.803	12.0	.4724	6
					5	Int.	●	MWS1120LB	92	3.622	96	3.780	158	6.220	12.0	.4724	6
					8	Int.	●	MWS1120X8DB	127	5.000	132	5.197	194	7.638	12.0	.4724	6
					10	Int.	★	MWS1120X10DB	150	5.906	153	6.024	215	8.465	12.0	.4724	7
					15	Int.	●	MWS1120X15DB	207	8.150	210	8.268	272	10.709	12.0	.4724	7
					20	Int.	★	MWS1120X20DB	265	10.433	268	10.551	330	12.992	12.0	.4724	7
					25	Int.	★	MWS1120X25DB	322	12.677	325	12.795	387	15.236	12.0	.4724	7

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Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
11.300	.4449				2	Ext.	●	MWE1130SA	47	1.850	47	1.850	95	3.740	11.3	.4449	1
					3	Ext.	●	MWE1130MA	71	2.795	71	2.795	118	4.646	11.3	.4449	1
					3	Int.	●	MWS1130MB	57.5	2.264	60	2.362	122	4.803	12.0	.4724	6
					5	Int.	●	MWS1130LB	92	3.622	96	3.780	158	6.220	12.0	.4724	6
					8	Int.	●	MWS1130X8DB	127	5.000	132	5.197	194	7.638	12.0	.4724	6
					10	Int.	★	MWS1130X10DB	150	5.906	153	6.024	215	8.465	12.0	.4724	7
					15	Int.	★	MWS1130X15DB	207	8.150	210	8.268	272	10.709	12.0	.4724	7
					20	Int.	★	MWS1130X20DB	265	10.433	268	10.551	330	12.992	12.0	.4724	7
					25	Int.	★	MWS1130X25DB	322	12.677	325	12.795	387	15.236	12.0	.4724	7
11.400	.4488				2	Ext.	●	MWE1140SA	47	1.850	47	1.850	95	3.740	11.4	.4488	1
					3	Ext.	●	MWE1140MA	71	2.795	71	2.795	118	4.646	11.4	.4488	1
					3	Int.	●	MWS1140MB	57.5	2.264	60	2.362	122	4.803	12.0	.4724	6
					5	Int.	●	MWS1140LB	92	3.622	96	3.780	158	6.220	12.0	.4724	6
					8	Int.	●	MWS1140X8DB	127	5.000	132	5.197	194	7.638	12.0	.4724	6
					10	Int.	★	MWS1140X10DB	150	5.906	153	6.024	215	8.465	12.0	.4724	6
					15	Int.	★	MWS1140X15DB	207	8.150	210	8.268	272	10.709	12.0	.4724	7
					20	Int.	★	MWS1140X20DB	265	10.433	268	10.551	330	12.992	12.0	.4724	7
					25	Int.	★	MWS1140X25DB	322	12.677	325	12.795	387	15.236	12.0	.4724	7
11.500	.4528				2	Ext.	●	MWE1150SA	47	1.850	47	1.850	95	3.740	11.5	.4528	1
					3	Ext.	●	MWE1150MA	71	2.795	71	2.795	118	4.646	11.5	.4528	1
					3	Int.	●	MWS1150MB	57.5	2.264	60	2.362	122	4.803	12.0	.4724	6
					5	Int.	●	MWS1150LB	92	3.622	96	3.780	158	6.220	12.0	.4724	6
					8	Int.	●	MWS1150X8DB	127	5.000	132	5.197	194	7.638	12.0	.4724	6
					10	Int.	★	MWS1150X10DB	150	5.906	153	6.024	215	8.465	12.0	.4724	7
					15	Int.	★	MWS1150X15DB	207	8.150	210	8.268	272	10.709	12.0	.4724	7
					20	Int.	★	MWS1150X20DB	265	10.433	268	10.551	330	12.992	12.0	.4724	7
					25	Int.	●	MWS1150X25DB	322	12.677	325	12.795	387	15.236	12.0	.4724	7
11.509	.4531	29/64		1/2-20	3	Ext.	●	MZE04531MA	73	2.874	73	2.874	120.7	4.752	11.509	.4531	1
					5	Int.	●	MWS04531LB	96	3.780	96	3.780	158	6.220	11.908	.4688	6
					8	Int.	●	MWS04531X8DB	132	5.197	132	5.197	194	7.638	11.908	.4688	6
					15	Int.	●	MWS04531X15DB	216	8.504	219	8.622	281	11.063	11.908	.4688	7
					20	Int.	●	MWS04531X20DB	276	10.866	279	10.984	341	13.425	11.908	.4688	7
11.600	.4567				2	Ext.	●	MWE1160SA	47	1.850	47	1.850	95	3.740	11.6	.4567	1
					3	Ext.	●	MWE1160MA	73	2.874	73	2.874	121	4.764	11.6	.4567	1
					3	Int.	●	MWS1160MB	60	2.362	60	2.362	122	4.803	12.0	.4724	6
					5	Int.	●	MWS1160LB	96	3.780	96	3.780	158	6.220	12.0	.4724	6
					8	Int.	●	MWS1160X8DB	132	5.197	132	5.197	194	7.638	12.0	.4724	6
					10	Int.	★	MWS1160X10DB	156	6.142	159	6.260	221	8.701	12.0	.4724	7
					15	Int.	★	MWS1160X15DB	216	8.504	219	8.622	281	11.063	12.0	.4724	7
					20	Int.	★	MWS1160X20DB	276	10.866	279	10.984	341	13.425	12.0	.4724	7
					25	Int.	★	MWS1160X25DB	336	13.228	339	13.346	401	15.787	12.0	.4724	7

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MWE/MWS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
11.700	.4606				2	Ext.	●	MWE1170SA	47	1.850	47	1.850	95	3.740	11.7	.4606	1
					3	Ext.	●	MWE1170MA	73	2.874	73	2.874	121	4.764	11.7	.4606	1
					3	Int.	●	MWS1170MB	60	2.362	60	2.362	122	4.803	12.0	.4724	6
					5	Int.	●	MWS1170LB	96	3.780	96	3.780	158	6.220	12.0	.4724	6
					8	Int.	●	MWS1170X8DB	132	5.197	132	5.197	194	7.638	12.0	.4724	6
					10	Int.	★	MWS1170X10DB	156	6.142	159	6.260	221	8.701	12.0	.4724	7
					15	Int.	★	MWS1170X15DB	216	8.504	219	8.622	281	11.063	12.0	.4724	7
					20	Int.	★	MWS1170X20DB	276	10.866	279	10.984	341	13.425	12.0	.4724	7
					25	Int.	★	MWS1170X25DB	336	13.228	339	13.346	401	15.787	12.0	.4724	7
11.800	.4646				2	Ext.	●	MWE1180SA	47	1.850	47	1.850	95	3.740	11.8	.4646	1
					3	Ext.	●	MWE1180MA	73	2.874	73	2.874	121	4.764	11.8	.4646	1
					3	Int.	●	MWS1180MB	60	2.362	60	2.362	122	4.803	12.0	.4724	6
					5	Int.	●	MWS1180LB	96	3.780	96	3.780	158	6.220	12.0	.4724	6
					8	Int.	●	MWS1180X8DB	132	5.197	132	5.197	194	7.638	12.0	.4724	6
					10	Int.	★	MWS1180X10DB	156	6.142	159	6.260	221	8.701	12.0	.4724	7
					15	Int.	★	MWS1180X15DB	216	8.504	219	8.622	281	11.063	12.0	.4724	7
					20	Int.	★	MWS1180X20DB	276	10.866	279	10.984	341	13.425	12.0	.4724	7
					25	Int.	●	MWS1180X25DB	336	13.228	339	13.346	401	15.787	12.0	.4724	7
11.900	.4685				2	Ext.	●	MWE1190SA	51	2.008	51	2.008	102	4.016	11.9	.4685	1
					3	Ext.	●	MWE1190MA	73	2.874	73	2.874	121	4.764	11.9	.4685	1
					3	Int.	●	MWS1190MB	60	2.362	60	2.362	122	4.803	12.0	.4724	6
					5	Int.	●	MWS1190LB	96	3.780	96	3.780	158	6.220	12.0	.4724	6
					8	Int.	●	MWS1190X8DB	132	5.197	132	5.197	194	7.638	12.0	.4724	6
					10	Int.	●	MWS1190X10DB	156	6.142	159	6.260	221	8.701	12.0	.4724	7
					15	Int.	★	MWS1190X15DB	216	8.504	219	8.622	281	11.063	12.0	.4724	7
					20	Int.	★	MWS1190X20DB	276	10.866	279	10.984	341	13.425	12.0	.4724	7
					25	Int.	★	MWS1190X25DB	336	13.228	339	13.346	401	15.787	12.0	.4724	7
11.908	.4688	15/32			3	Ext.	●	MZE04688MA	73	2.874	73	2.874	120.7	4.752	11.908	.4688	1
					5	Int.	●	MWS04688LB	96	3.780	96	3.780	158	6.220	11.908	.4688	6
					8	Int.	●	MWS04688X8DB	132	5.197	132	5.197	194	7.638	11.908	.4688	6
					15	Int.	●	MWS04688X15DB	216	8.504	219	8.622	281	11.063	11.908	.4688	7
					20	Int.	●	MWS04688X20DB	276	10.866	279	10.984	341	13.425	11.908	.4688	7
12.000	.4724			M14x2.0	2	Ext.	●	MWE1200SA	51	2.008	51	2.008	102	4.016	12.0	.4724	1
					3	Ext.	●	MWE1200MA	73	2.874	73	2.874	121	4.764	12.0	.4724	1
					3	Int.	●	MWS1200MB	60	2.362	60	2.362	122	4.803	12.0	.4724	6
					5	Int.	●	MWS1200LB	96	3.780	96	3.780	158	6.220	12.0	.4724	6
					8	Int.	●	MWS1200X8DB	132	5.197	132	5.197	194	7.638	12.0	.4724	6
					10	Int.	●	MWS1200X10DB	156	6.142	159	6.260	221	8.701	12.0	.4724	7
					15	Int.	★	MWS1200X15DB	216	8.504	219	8.622	281	11.063	12.0	.4724	7
					20	Int.	★	MWS1200X20DB	276	10.866	279	10.984	341	13.425	12.0	.4724	7
					25	Int.	●	MWS1200X25DB	336	13.228	339	13.346	401	15.787	12.0	.4724	7
12.100	.4764				2	Ext.	●	MWE1210SA	51	2.008	51	2.008	102	4.016	12.1	.4764	1
					3	Ext.	●	MWE1210MA	76	2.992	76	2.992	135	5.315	12.1	.4764	1
					3	Int.	●	MWS1210MB	62.5	2.461	65	2.559	128	5.039	13.0	.5118	6
					5	Int.	●	MWS1210LB	100	3.937	104	4.094	167	6.575	13.0	.5118	6
					10	Int.	□	MWS1210X10DB	163	6.417	166	6.535	229	9.016	13.0	.5118	7
					15	Int.	□	MWS1210X15DB	225	8.858	228	8.976	291	11.457	13.0	.5118	7
					20	Int.	□	MWS1210X20DB	288	11.339	291	11.457	354	13.937	13.0	.5118	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.

□ : Non stock, produced to order only.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
12.200	.4803				2	Ext.	●	MWE1220SA	51	2.008	51	2.008	102	4.016	12.2	.4803	1
					3	Ext.	●	MWE1220MA	76	2.992	76	2.992	135	5.315	12.2	.4803	1
					3	Int.	●	MWS1220MB	62.5	2.461	65	2.559	128	5.039	13.0	.5118	6
					5	Int.	●	MWS1220LB	100	3.937	104	4.094	167	6.575	13.0	.5118	6
					10	Int.	□	MWS1220X10DB	163	6.417	166	6.535	229	9.016	13.0	.5118	7
					15	Int.	□	MWS1220X15DB	225	8.858	228	8.976	291	11.457	13.0	.5118	7
					20	Int.	□	MWS1220X20DB	288	11.339	291	11.457	354	13.937	13.0	.5118	7
12.300	.4843			9/16-32	2	Ext.	●	MWE1230SA	51	2.008	51	2.008	102	4.016	12.3	.4843	1
					3	Ext.	●	MWE1230MA	76	2.992	76	2.992	135	5.315	12.3	.4843	1
					3	Int.	●	MWS1230MB	62.5	2.461	65	2.559	128	5.039	13.0	.5118	6
					5	Int.	●	MWS1230LB	100	3.937	104	4.094	167	6.575	13.0	.5118	6
					10	Int.	□	MWS1230X10DB	163	6.417	166	6.535	229	9.016	13.0	.5118	7
					15	Int.	□	MWS1230X15DB	225	8.858	228	8.976	291	11.457	13.0	.5118	7
					20	Int.	□	MWS1230X20DB	354	13.937	291	11.457	288	11.339	13.0	.5118	7
12.304	.4844	31/64		9/16-32	3	Ext.	●	MZE04844MA	76.2	3.000	76.2	3.000	135	5.315	12.304	.4844	1
					5	Int.	●	MWS04844LB	100	3.937	104	4.094	167	6.575	12.700	.5000	6
					8	Int.	●	MWS04844X8DB	138	5.433	143	5.630	206	8.110	12.700	.5000	6
					15	Int.	●	MWS04844X15DB	225	8.858	228	8.976	291	11.457	12.700	.5000	7
12.400	.4882				2	Ext.	●	MWE1240SA	51	2.008	51	2.008	102	4.016	12.4	.4882	1
					3	Ext.	●	MWE1240MA	76	2.992	76	2.992	135	5.315	12.4	.4882	1
					3	Int.	●	MWS1240MB	62.5	2.461	65	2.559	128	5.039	13.0	.5118	6
					5	Int.	●	MWS1240LB	100	3.937	104	4.094	167	6.575	13.0	.5118	6
					10	Int.	□	MWS1240X10DB	163	6.417	166	6.535	229	9.016	13.0	.5118	7
					15	Int.	□	MWS1240X15DB	225	8.858	228	8.976	291	11.457	13.0	.5118	7
					20	Int.	□	MWS1240X20DB	288	11.339	291	11.457	354	13.937	13.0	.5118	7
12.500	.4921			M14x1.5	2	Ext.	●	MWE1250SA	51	2.008	51	2.008	102	4.016	12.5	.4921	1
					3	Ext.	●	MWE1250MA	76	2.992	76	2.992	135	5.315	12.5	.4921	1
					3	Int.	●	MWS1250MB	62.5	2.461	65	2.559	128	5.039	13.0	.5118	6
					5	Int.	●	MWS1250LB	100	3.937	104	4.094	167	6.575	13.0	.5118	6
					8	Int.	●	MWS1250X8DB	138	5.433	143	5.630	206	8.110	13.0	.5118	6
					10	Int.	●	MWS1250X10DB	163	6.417	166	6.535	229	9.016	13.0	.5118	7
					15	Int.	●	MWS1250X15DB	225	8.858	228	8.976	291	11.457	13.0	.5118	7
					20	Int.	★	MWS1250X20DB	288	11.339	291	11.457	354	13.937	13.0	.5118	7
12.600	.4961				2	Ext.	●	MWE1260SA	51	2.008	51	2.008	102	4.016	12.6	.4961	1
					3	Ext.	●	MWE1260MA	78	3.071	78	3.071	137	5.394	12.6	.4961	1
					3	Int.	●	MWS1260MB	65	2.559	65	2.559	128	5.039	13.0	.5118	6
					5	Int.	●	MWS1260LB	104	4.094	104	4.094	167	6.575	13.0	.5118	6
					10	Int.	□	MWS1260X10DB	169	6.654	172	6.772	235	9.252	13.0	.5118	7
					15	Int.	□	MWS1260X15DB	234	9.213	237	9.331	300	11.811	13.0	.5118	7
					20	Int.	□	MWS1260X20DB	299	11.772	302	11.890	365	14.370	13.0	.5118	7

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MWE/MWS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
12.700	.5000	1/2			2	Ext.	●	MWE1270SA	51	2.008	51	2.008	102	4.016	12.700	.5000	1
					3	Ext.	●	MWE1270MA	78	3.071	78	3.071	137	5.394	12.700	.5000	1
					3	Int.	●	MWS1270MB	65	2.559	65	2.559	128	5.039	13.0	.5118	6
					5	Int.	●	MWS05000LB	104	4.094	104	4.094	167	6.575	12.700	.5000	6
					5	Int.	●	MWS1270LB	104	4.094	104	4.094	167	6.575	13.0	.5118	6
					8	Int.	●	MWS05000X8DB	143	5.630	143	5.630	206	8.110	12.700	.5000	6
					10	Int.	□	MWS1270X10DB	169	6.654	172	6.772	235	9.252	13.0	.5118	7
					15	Int.	●	MWS05000X15DB	234	9.213	237	9.331	300	11.811	12.700	.5000	7
					15	Int.	□	MWS1270X15DB	234	9.213	237	9.331	300	11.811	13.0	.5118	7
					20	Int.	●	MWS1270X20DB	299	11.772	302	11.890	365	14.370	13.0	.5118	7
12.8	.5039				2	Ext.	●	MWE1280SA	51	2.008	51	2.008	102	4.016	12.8	.5039	1
					3	Ext.	●	MWE1280MA	78	3.071	78	3.071	137	5.394	12.8	.5039	1
					3	Int.	●	MWS1280MB	65	2.559	65	2.559	128	5.039	13.0	.5118	6
					5	Int.	●	MWS1280LB	104	4.094	104	4.094	167	6.575	13.0	.5118	6
					10	Int.	□	MWS1280X10DB	169	6.654	172	6.772	235	9.252	13.0	.5118	6
					15	Int.	□	MWS1280X15DB	234	9.213	237	9.331	300	11.811	13.0	.5118	7
					20	Int.	□	MWS1280X20DB	299	11.772	302	11.890	365	14.370	13.0	.5118	7
12.827	.5050				5	Int.	●	MWS05050LB	104	4.094	104	4.094	167	6.575	13.0	.5118	6
12.9	.5079				2	Ext.	●	MWE1290SA	51	2.008	51	2.008	102	4.016	12.9	.5079	1
					3	Ext.	●	MWE1290MA	78	3.071	78	3.071	137	5.394	12.9	.5079	1
					3	Int.	●	MWS1290MB	65	2.559	65	2.559	128	5.039	13.0	.5118	6
					5	Int.	●	MWS1290LB	104	4.094	104	4.094	167	6.575	13.0	.5118	6
					10	Int.	□	MWS1290X10DB	169	6.654	172	6.772	235	9.252	13.0	.5118	7
					15	Int.	□	MWS1290X15DB	234	9.213	237	9.331	300	11.811	13.0	.5118	7
					20	Int.	□	MWS1290X20DB	299	11.772	302	11.890	365	14.370	13.0	.5118	7
13.0	.5118				2	Ext.	●	MWE1300SA	51	2.008	51	2.008	102	4.016	13.0	.5118	1
					3	Ext.	●	MWE1300MA	78	3.071	78	3.071	137	5.394	13.0	.5118	1
					3	Int.	●	MWS1300MB	65	2.559	65	2.559	128	5.039	13.0	.5118	6
					5	Int.	●	MWS1300LB	104	4.094	104	4.094	167	6.575	13.0	.5118	6
					5	Int.	●	MWS05118LB	104	4.094	104	4.094	167	6.575	13.0	.5118	6
					8	Int.	●	MWS1300X8DB	143	5.630	143	5.630	206	8.110	13.0	.5118	6
					10	Int.	●	MWS1300X10DB	169	6.654	172	6.772	235	9.252	13.0	.5118	7
					15	Int.	●	MWS1300X15DB	234	9.213	237	9.331	300	11.811	13.0	.5118	7
					20	Int.	★	MWS1300X20DB	299	11.772	302	11.890	365	14.370	13.0	.5118	7
13.096	.5156	33/64		9/16-18	5	Int.	●	MWS05156LB	108	4.252	112	4.409	176	6.929	13.891	.5469	6
13.1	.5157	33/64		9/16-18	2	Ext.	●	MWE1310SA	51	2.008	51	2.008	102	4.016	13.1	.5157	1
					3	Ext.	●	MWE1310MA	84	3.307	84	3.307	144	5.669	13.1	.5157	1
					3	Int.	●	MWS1310MB	67.5	2.657	70	2.756	134	5.276	14.0	.5512	6
					5	Int.	●	MWS1310LB	108	4.252	112	4.409	176	6.929	14.0	.5512	6
					10	Int.	□	MWS1310X10DB	176	6.929	179	7.047	243	9.567	14.0	.5512	7
					15	Int.	□	MWS1310X15DB	243	9.567	246	9.685	310	12.205	14.0	.5512	7
					20	Int.	●	MWS1310X20DB	311	12.244	314	12.362	378	14.882	14.0	.5512	7

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Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
13.200	.5197				2	Ext.	●	MWE1320SA	51	2.008	51	2.008	102	4.016	13.2	.5197	1
					3	Ext.	●	MWE1320MA	84	3.307	84	3.307	144	5.669	13.2	.5197	1
					3	Int.	●	MWS1320MB	67.5	2.657	70	2.756	134	5.276	14.0	.5512	6
					5	Int.	●	MWS1320LB	108	4.252	112	4.409	176	6.929	14.0	.5512	6
					10	Int.	□	MWS1320X10DB	176	6.929	179	7.047	243	9.567	14.0	.5512	7
					15	Int.	□	MWS1320X15DB	243	9.567	246	9.685	310	12.205	14.0	.5512	7
					20	Int.	□	MWS1320X20DB	311	12.244	314	12.362	378	14.882	14.0	.5512	7
13.300	.5236				2	Ext.	●	MWE1330SA	54	2.126	54	2.126	107	4.213	13.3	.5236	1
					3	Ext.	●	MWE1330MA	84	3.307	84	3.307	144	5.669	13.3	.5236	1
					3	Int.	●	MWS1330MB	67.5	2.657	70	2.756	134	5.276	14.0	.5512	6
					5	Int.	●	MWS1330LB	108	4.252	112	4.409	176	6.929	14.0	.5512	6
					10	Int.	●	MWS1330X10DB	176	6.929	179	7.047	243	9.567	14.0	.5512	7
					15	Int.	□	MWS1330X15DB	243	9.567	246	9.685	310	12.205	14.0	.5512	7
					20	Int.	□	MWS1330X20DB	311	12.244	314	12.362	378	14.882	14.0	.5512	7
13.400	.5276				2	Ext.	●	MWE1340SA	54	2.126	54	2.126	107	4.213	13.4	.5276	1
					3	Ext.	●	MWE1340MA	84	3.307	84	3.307	144	5.669	13.4	.5276	1
					3	Int.	●	MWS1340MB	67.5	2.657	70	2.756	134	5.276	14.0	.5512	6
					5	Int.	●	MWS1340LB	108	4.252	112	4.409	176	6.929	14.0	.5512	6
					10	Int.	□	MWS1340X10DB	176	6.929	179	7.047	243	9.567	14.0	.5512	7
					15	Int.	□	MWS1340X15DB	243	9.567	246	9.685	310	12.205	14.0	.5512	7
					20	Int.	□	MWS1340X20DB	311	12.244	314	12.362	378	14.882	14.0	.5512	7
13.492	.5312	17/32		5/8-11	5	Int.	●	MWS05312LB	108	4.252	112	4.409	176	6.929	13.891	.5469	6
13.500	.5315			5/8-11	2	Ext.	●	MWE1350SA	54	2.126	54	2.126	107	4.213	13.5	.5315	1
					3	Ext.	●	MWE1350MA	84	3.307	84	3.307	144	5.669	13.5	.5315	1
					3	Int.	●	MWS1350MB	67.5	2.657	70	2.756	134	5.276	14.0	.5512	6
					5	Int.	●	MWS1350LB	108	4.252	112	4.409	176	6.929	14.0	.5512	6
					8	Int.	●	MWS1350X8DB	149	5.866	154	6.063	218	8.583	14.0	.5512	6
					10	Int.	●	MWS1350X10DB	176	6.929	179	7.047	243	9.567	14.0	.5512	7
					15	Int.	●	MWS1350X15DB	243	9.567	246	9.685	310	12.205	14.0	.5512	7
					20	Int.	★	MWS1350X20DB	311	12.244	314	12.362	378	14.882	14.0	.5512	7
13.600	.5354				2	Ext.	●	MWE1360SA	54	2.126	54	2.126	107	4.213	13.6	.5354	1
					3	Ext.	●	MWE1360MA	86	3.386	86	3.386	147	5.787	13.6	.5354	1
					3	Int.	●	MWS1360MB	70	2.756	70	2.756	134	5.276	14.0	.5512	6
					5	Int.	●	MWS1360LB	112	4.409	112	4.409	176	6.929	14.0	.5512	6
					10	Int.	□	MWS1360X10DB	182	7.165	185	7.283	249	9.803	14.0	.5512	7
					15	Int.	□	MWS1360X15DB	252	9.921	255	10.039	319	12.559	14.0	.5512	7
					20	Int.	□	MWS1360X20DB	322	12.677	325	12.795	389	15.315	14.0	.5512	7
13.700	.5394				2	Ext.	●	MWE1370SA	54	2.126	54	2.126	107	4.213	13.7	.5394	1
					3	Ext.	●	MWE1370MA	86	3.386	86	3.386	147	5.787	13.7	.5394	1
					3	Int.	●	MWS1370MB	70	2.756	70	2.756	134	5.276	14.0	.5512	6
					5	Int.	●	MWS1370LB	112	4.409	112	4.409	176	6.929	14.0	.5512	6
					10	Int.	□	MWS1370X10DB	182	7.165	185	7.283	249	9.803	14.0	.5512	7
					15	Int.	□	MWS1370X15DB	252	9.921	255	10.039	319	12.559	14.0	.5512	7
					20	Int.	●	MWS1370X20DB	322	12.677	325	12.795	389	15.315	14.0	.5512	7

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MWE/MWS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
13.800	.5433				2	Ext.	●	MWE1380SA	54	2.126	54	2.126	107	4.213	13.8	.5433	1
					3	Ext.	●	MWE1380MA	86	3.386	86	3.386	147	5.787	13.8	.5433	1
					3	Int.	●	MWS1380MB	70	2.756	70	2.756	134	5.276	14.0	.5512	6
					5	Int.	●	MWS1380LB	112	4.409	112	4.409	176	6.929	14.0	.5512	6
					10	Int.	□	MWS1380X10DB	182	7.165	185	7.283	249	9.803	14.0	.5512	7
					15	Int.	□	MWS1380X15DB	252	9.921	255	10.039	319	12.559	14.0	.5512	7
					20	Int.	□	MWS1380X20DB	322	12.677	325	12.795	389	15.315	14.0	.5512	7
13.891	.5469	35/64			5	Int.	●	MWS05469LB	112	4.409	112	4.409	176	6.929	13.891	.5469	6
13.900	.5472				2	Ext.	●	MWE1390SA	54	2.126	54	2.126	107	4.213	13.9	.5472	1
					3	Ext.	●	MWE1390MA	86	3.386	86	3.386	147	5.787	13.9	.5472	1
					3	Int.	●	MWS1390MB	70	2.756	70	2.756	134	5.276	14.0	.5512	6
					5	Int.	●	MWS1390LB	112	4.409	112	4.409	176	6.929	14.0	.5512	6
					10	Int.	□	MWS1390X10DB	182	7.165	185	7.283	249	9.803	14.0	.5512	7
					15	Int.	□	MWS1390X15DB	252	9.921	255	10.039	319	12.559	14.0	.5512	7
					20	Int.	□	MWS1390X20DB	322	12.677	325	12.795	389	15.315	14.0	.5512	7
14.000	.5512			M16x2.0	2	Ext.	●	MWE1400SA	54	2.126	54	2.126	107	4.213	14.0	.5512	1
					3	Ext.	●	MWE1400MA	86	3.386	86	3.386	147	5.787	14.0	.5512	1
					3	Int.	●	MWS1400MB	70	2.756	70	2.756	134	5.276	14.0	.5512	6
					5	Int.	●	MWS1400LB	112	4.409	112	4.409	176	6.929	14.0	.5512	6
					8	Int.	●	MWS1400X8DB	154	6.063	154	6.063	218	8.583	14.0	.5512	6
					10	Int.	●	MWS1400X10DB	182	7.165	185	7.283	249	9.803	14.0	.5512	7
					15	Int.	●	MWS1400X15DB	252	9.921	255	10.039	319	12.559	14.0	.5512	7
					20	Int.	●	MWS1400X20DB	322	12.677	325	12.795	389	15.315	14.0	.5512	7
14.100	.5551				2	Ext.	●	MWE1410SA	56	2.205	56	2.205	111	4.370	14.1	.5551	1
					3	Ext.	●	MWE1410MA	89	3.504	89	3.504	151	5.945	14.1	.5551	1
					3	Int.	●	MWS1410MB	72.5	2.854	75	2.953	140	5.512	15.0	.5906	6
					5	Int.	●	MWS1410LB	116	4.567	120	4.724	185	7.283	15.0	.5906	6
14.200	.5591				2	Ext.	●	MWE1420SA	56	2.205	56	2.205	111	4.370	14.2	.5591	1
					3	Ext.	●	MWE1420MA	89	3.504	89	3.504	151	5.945	14.2	.5591	1
					3	Int.	●	MWS1420MB	72.5	2.854	75	2.953	140	5.512	15.0	.5906	6
					5	Int.	●	MWS1420LB	116	4.567	120	4.724	185	7.283	15.0	.5906	6
					8	Int.	★	MWS1420X8DB	160	6.299	165	6.496	225	8.858	15.0	.5906	6
14.288	.5625	9/16			5	Int.	●	MWS05625LB	116	4.567	120	4.724	185	7.283	14.684	.5781	6
14.300	.5630				3	Ext.	●	MWE1430MA	89	3.504	89	3.504	151	5.945	14.3	.5630	1
					3	Int.	●	MWS1430MB	72.5	2.854	75	2.953	140	5.512	15.0	.5906	6
					5	Int.	●	MWS1430LB	116	4.567	120	4.724	185	7.283	15.0	.5906	6
14.400	.5669				3	Ext.	●	MWE1440MA	89	3.504	89	3.504	151	5.945	14.4	.5669	1
					3	Int.	●	MWS1440MB	72.5	2.854	75	2.953	140	5.512	15.0	.5906	6
					5	Int.	●	MWS1440LB	116	4.567	120	4.724	185	7.283	15.0	.5906	6
14.500	.5709			M16x1.5	2	Ext.	●	MWE1450SA	56	2.205	56	2.205	111	4.370	14.5	.5709	1
					3	Ext.	●	MWE1450MA	89	3.504	89	3.504	151	5.945	14.5	.5709	1
					3	Int.	●	MWS1450MB	72.5	2.854	75	2.953	140	5.512	15.0	.5906	6
					5	Int.	●	MWS1450LB	116	4.567	120	4.724	185	7.283	15.0	.5906	6
					8	Int.	●	MWS1450X8DB	160	6.299	165	6.496	225	8.858	15.0	.5906	6
14.600	.5748				3	Ext.	●	MWE1460MA	91	3.583	91	3.583	153	6.024	14.6	.5748	1
					3	Int.	●	MWS1460MB	75	2.953	75	2.953	140	5.512	15.0	.5906	6
					5	Int.	●	MWS1460LB	120	4.724	120	4.724	185	7.283	15.0	.5906	6
14.684	.5781	37/64		5/8-18	5	Int.	●	MWS05781LB	120	4.724	120	4.724	185	7.283	14.684	.5781	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.

□ : Non stock, produced to order only.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
14.700	.5787				3	Ext.	●	MWE1470MA	91	3.583	91	3.583	153	6.024	14.7	.5787	1
					3	Int.	●	MWS1470MB	75	2.953	75	2.953	140	5.512	15.0	.5906	6
					5	Int.	●	MWS1470LB	120	4.724	120	4.724	185	7.283	15.0	.5906	6
14.800	.5827				3	Ext.	●	MWE1480MA	91	3.583	91	3.583	153	6.024	14.8	.5827	1
					3	Int.	●	MWS1480MB	75	2.953	75	2.953	140	5.512	15.0	.5906	6
					5	Int.	●	MWS1480LB	120	4.724	120	4.724	185	7.283	15.0	.5906	6
14.900	.5866				3	Ext.	●	MWE1490MA	91	3.583	91	3.583	153	6.024	14.9	.5866	1
					3	Int.	●	MWS1490MB	75	2.953	75	2.953	140	5.512	15.0	.5906	6
					5	Int.	●	MWS1490LB	120	4.724	120	4.724	185	7.283	15.0	.5906	6
15.000	.5906				2	Ext.	●	MWE1500SA	56	2.205	56	2.205	111	4.370	15.0	.5906	1
					3	Ext.	●	MWE1500MA	91	3.583	91	3.583	153	6.024	15.0	.5906	1
					3	Int.	●	MWS1500MB	75	2.953	75	2.953	140	5.512	15.0	.5906	6
					5	Int.	●	MWS1500LB	120	4.724	120	4.724	185	7.283	15.0	.5906	6
					8	Int.	●	MWS1500X8DB	165	6.496	165	6.496	225	8.858	15.0	.5906	6
15.080	.5937	19/32			5	Int.	●	MWS05937LB	124	4.882	128	5.039	193	7.598	15.875	.6250	6
15.100	.5945				3	Ext.	●	MWE1510MA	94	3.701	94	3.701	157	6.181	15.1	.5945	1
					3	Int.	●	MWS1510MB	77.5	3.051	80	3.150	145	5.709	16.0	.6299	6
					5	Int.	●	MWS1510LB	124	4.882	128	5.039	193	7.598	16.0	.6299	6
15.200	.5984				2	Ext.	●	MWE1520SA	58	2.283	58	2.283	115	4.528	15.2	.5984	1
					3	Ext.	●	MWE1520MA	94	3.701	94	3.701	157	6.181	15.2	.5984	1
					3	Int.	●	MWS1520MB	77.5	3.051	80	3.150	145	5.709	16.0	.6299	6
					5	Int.	●	MWS1520LB	124	4.882	128	5.039	193	7.598	16.0	.6299	6
15.300	.6024				3	Ext.	●	MWE1530MA	94	3.701	94	3.701	157	6.181	15.3	.6024	1
					3	Int.	●	MWS1530MB	77.5	3.051	80	3.150	145	5.709	16.0	.6299	6
					5	Int.	●	MWS1530LB	124	4.882	128	5.039	193	7.598	16.0	.6299	6
15.400	.6063				3	Ext.	●	MWE1540MA	94	3.701	94	3.701	157	6.181	15.4	.6063	1
					3	Int.	●	MWS1540MB	77.5	3.051	80	3.150	145	5.709	16.0	.6299	6
					5	Int.	●	MWS1540LB	124	4.882	128	5.039	193	7.598	16.0	.6299	6
15.479	.6094	39/64			5	Int.	●	MWS06094LB	124	4.882	128	5.039	193	7.598	15.875	.6250	6
15.500	.6102			M18x2.5	2	Ext.	●	MWE1550SA	58	2.283	58	2.283	115	4.528	15.5	.6102	1
					3	Ext.	●	MWE1550MA	94	3.701	94	3.701	157	6.181	15.5	.6102	1
					3	Int.	●	MWS1550MB	77.5	3.051	80	3.150	145	5.709	16.0	.6299	6
					5	Int.	●	MWS1550LB	124	4.882	128	5.039	193	7.598	16.0	.6299	6
					8	Int.	●	MWS1550X8DB	171	6.732	181	7.126	241	9.488	16.0	.6299	6
15.600	.6142				3	Ext.	●	MWE1560MA	96	3.780	96	3.780	160	6.299	15.6	.6142	1
					3	Int.	●	MWS1560MB	80	3.150	80	3.150	145	5.709	16.0	.6299	6
					5	Int.	●	MWS1560LB	128	5.039	128	5.039	193	7.598	16.0	.6299	6
15.700	.6181				3	Ext.	●	MWE1570MA	96	3.780	96	3.780	160	6.299	15.7	.6181	1
					3	Int.	●	MWS1570MB	80	3.150	80	3.150	145	5.709	16.0	.6299	6
					5	Int.	●	MWS1570LB	128	5.039	128	5.039	193	7.598	16.0	.6299	6
15.800	.6220				3	Ext.	●	MWE1580MA	96	3.780	96	3.780	160	6.299	15.8	.6220	1
					3	Int.	●	MWS1580MB	80	3.150	80	3.150	145	5.709	16.0	.6299	6
					5	Int.	●	MWS1580LB	128	5.039	128	5.039	193	7.598	16.0	.6299	6
15.875	.6250	5/8			5	Int.	●	MWS06250LB	128	5.039	128	5.039	193	7.598	15.875	.6250	6
15.900	.6260				3	Ext.	●	MWE1590MA	96	3.780	96	3.780	160	6.299	15.9	.6260	1
					3	Int.	●	MWS1590MB	80	3.150	80	3.150	145	5.709	16.0	.6299	6
					5	Int.	●	MWS1590LB	128	5.039	128	5.039	193	7.598	16.0	.6299	6

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Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
16.000	.6299				2	Ext.	●	MWE1600SA	58	2.283	58	2.283	115	4.528	16.0	.6299	1
					3	Ext.	●	MWE1600MA	96	3.780	96	3.780	160	6.299	16.0	.6299	1
					3	Int.	●	MWS1600MB	80	3.150	80	3.150	145	5.709	16.0	.6299	6
					5	Int.	●	MWS1600LB	128	5.039	128	5.039	193	7.598	16.0	.6299	6
					8	Int.	●	MWS1600X8DB	176	6.929	181	7.126	241	9.488	16.0	.6299	6
16.078	.6330				5	Int.	●	MWS06330LB	132	5.197	136	5.354	201	7.913	16.670	.6563	6
16.200	.6378				2	Ext.	●	MWE1620SA	60	2.362	60	2.362	119	4.685	16.2	.6378	1
16.271	.6406	41/64			5	Int.	●	MWS06406LB	132	5.197	136	5.354	201	7.913	16.670	.6563	6
16.300	.6417				2	Ext.	●	MWE1630SA	60	2.362	60	2.362	119	4.685	16.3	.6417	1
16.500	.6496			M18x1.5	2	Ext.	●	MWE1650SA	60	2.362	60	2.362	119	4.685	16.5	.6496	1
					3	Ext.	●	MWE1650MA	102	4.016	102	4.016	167	6.575	16.5	.6496	1
					3	Int.	●	MWS1650MB	82.5	3.248	85	3.346	150	5.906	17.0	.6693	6
					5	Int.	●	MWS1650LB	132	5.197	136	5.354	201	7.913	17.0	.6693	6
16.670	.6563	21/32		3/4-10	5	Int.	●	MWS06563LB	136	5.354	136	5.354	201	7.913	16.670	.6563	6
17.000	.6693		Tube sheet		2	Ext.	●	MWE1700SA	60	2.362	60	2.362	119	4.685	17.0	.6693	1
					3	Ext.	●	MWE1700MA	102	4.016	102	4.016	167	6.575	17.0	.6693	1
					3	Int.	●	MWS1700MB	85	3.346	85	3.346	150	5.906	17.0	.6693	6
					5	Int.	●	MWS1700LB	136	5.354	136	5.354	201	7.913	17.0	.6693	6
17.064	.6718	43/64			5	Int.	●	MWS06718LB	140	5.512	144	5.669	209	8.228	17.859	.7031	6
17.100	.6732				3	Int.	●	MWS1710MB	87.5	3.445	90	3.543	155	6.102	18.0	.7087	6
17.463	.6875	11/16		3/4-16	5	Int.	●	MWS06875LB	140	5.512	144	5.669	209	8.228	17.859	.7031	6
17.500	.6890			M20x2.5	2	Ext.	●	MWE1750SA	62	2.441	62	2.441	123	4.843	17.5	.6890	1
					3	Ext.	●	MWE1750MA	102	4.016	102	4.016	167	6.575	17.5	.6890	1
					3	Int.	●	MWS1750MB	87.5	3.445	90	3.543	155	6.102	18.0	.7087	6
					5	Int.	●	MWS1750LB	140	5.512	144	5.669	209	8.228	18.0	.7087	6
17.800	.7008				2	Ext.	●	MWE1780SA	62	2.441	62	2.441	123	4.843	17.8	.7008	1
17.859	.7031	45/64			5	Int.	●	MWS07031LB	144	5.669	144	5.669	209	8.228	17.859	.7031	6
18.000	.7087				2	Ext.	●	MWE1800SA	62	2.441	62	2.441	123	4.843	18.0	.7087	1
					3	Ext.	●	MWE1800MA	102	4.016	102	4.016	167	6.575	18.0	.7087	1
					3	Int.	●	MWS1800MB	90	3.543	90	3.543	155	6.102	18.0	.7087	6
					5	Int.	●	MWS1800LB	144	5.669	144	5.669	209	8.228	18.0	.7087	6
18.258	.7188	23/32			5	Int.	●	MWS07188LB	148	5.827	152	5.984	217	8.543	18.654	.7344	6
18.500	.7283			M20x1.5	2	Ext.	●	MWE1850SA	64	2.520	64	2.520	127	5.000	18.5	.7283	1
					3	Ext.	●	MWE1850MA	114	4.488	114	4.488	179	7.047	18.5	.7283	1
					3	Int.	●	MWS1850MB	92.5	3.642	95	3.740	160	6.299	19.0	.7480	6
					5	Int.	●	MWS1850LB	148	5.827	152	5.984	217	8.543	19.0	.7480	6
18.654	.7344	47/64			5	Int.	●	MWS07344LB	152	5.984	152	5.984	217	8.543	18.654	.7344	6
19.000	.7480				2	Ext.	●	MWE1900SA	64	2.520	64	2.520	127	5.000	19.0	.7480	1
					3	Ext.	●	MWE1900MA	114	4.488	114	4.488	179	7.047	19.0	.7480	1
					3	Int.	●	MWS1900MB	95	3.740	95	3.740	160	6.299	19.0	.7480	6
					5	Int.	●	MWS1900LB	152	5.984	152	5.984	217	8.543	19.0	.7480	6
19.050	.7500	3/4			5	Int.	●	MWS07500LB	156	6.142	160	6.299	225	8.858	19.842	.7812	6
19.253	.7580		Tube sheet		5	Int.	●	MWS07580LB	156	6.142	160	6.299	225	8.858	19.842	.7812	6
19.446	.7656	49/64		7/8-9	5	Int.	●	MWS07656LB	156	6.142	160	6.299	225	8.858	19.842	.7812	6
19.500	.7677			M22x2.5	2	Ext.	●	MWE1950SA	66	2.598	66	2.598	131	5.157	19.5	.7677	1
					3	Ext.	●	MWE1950MA	114	4.488	114	4.488	179	7.047	19.5	.7677	1
					3	Int.	●	MWS1950MB	97.5	3.839	100	3.937	165	6.496	20.0	.7874	6
					5	Int.	●	MWS1950LB	156	6.142	160	6.299	225	8.858	20.0	.7874	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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions								Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size	l/d		VP15TF		L3		L2		L1		D4		
									mm	inch	mm	inch	mm	inch	mm	inch	
19.842	**.7812**	**25/32**			5	Int.	●	**MWS07812LB**	160	6.299	160	6.299	225	8.858	19.842	.7812	6
20.000	**.7874**				2	Ext.	●	**MWE2000SA**	66	2.598	66	2.598	131	5.157	20.0	.7874	1
					3	Ext.	●	**MWE2000MA**	114	4.488	114	4.488	179	7.047	20.0	.7874	1
					3	Int.	●	**MWS2000MB**	100	3.937	100	3.937	165	6.496	20.0	.7874	6
					5	Int.	●	**MWS2000LB**	160	6.299	160	6.299	225	8.858	20.0	.7874	6
20.500	**.8071**				3	Int.	★	**MWS2050MB**	103	4.055	105	4.134	176	6.929	21.0	.8268	6
					5	Int.	★	**MWS2050LB**	166	6.535	168	6.614	239	9.409	21.0	.8268	6
21.000	**.8268**				3	Int.	★	**MWS2100MB**	105	4.134	105	4.134	176	6.929	21.0	.8268	6
					5	Int.	★	**MWS2100LB**	168	6.614	168	6.614	239	9.409	21.0	.8268	6
21.500	**.8465**				3	Int.	●	**MWS2150MB**	108	4.252	110	4.331	182	7.165	22.0	.8661	6
					5	Int.	★	**MWS2150LB**	174	6.850	176	6.929	248	9.764	22.0	.8661	6
22.000	**.8661**				3	Int.	★	**MWS2200MB**	110	4.331	110	4.331	182	7.165	22.0	.8661	6
					5	Int.	★	**MWS2200LB**	176	6.929	176	6.929	248	9.764	22.0	.8661	6
22.500	**.8858**				3	Int.	★	**MWS2250MB**	115	4.528	115	4.528	188	7.402	23.0	.9055	6
					5	Int.	★	**MWS2250LB**	182	7.165	184	7.244	257	10.118	23.0	.9055	6
23.000	**.9055**				3	Int.	★	**MWS2300MB**	115	4.528	115	4.528	188	7.402	23.0	.9055	6
					5	Int.	●	**MWS2300LB**	184	7.244	184	7.244	257	10.118	23.0	.9055	6
23.500	**.9252**				3	Int.	★	**MWS2350MB**	118	4.646	120	4.724	194	7.638	24.0	.9449	6
					5	Int.	★	**MWS2350LB**	190	7.480	192	7.559	266	10.472	24.0	.9449	6
24.000	**.9449**				3	Int.	★	**MWS2400MB**	120	4.724	120	4.724	194	7.638	24.0	.9449	6
					5	Int.	★	**MWS2400LB**	192	7.559	192	7.559	266	10.472	24.0	.9449	6
24.500	**.9646**				3	Int.	★	**MWS2450MB**	123	4.843	125	4.921	200	7.874	25.0	.9843	6
					5	Int.	★	**MWS2450LB**	198	7.795	200	7.874	270	10.630	25.0	.9843	6
25.000	**.9843**				3	Int.	★	**MWS2500MB**	125	4.921	125	4.921	200	7.874	25.0	.9843	6
					5	Int.	★	**MWS2500LB**	200	7.874	200	7.874	270	10.630	25.0	.9843	6

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RECOMMENDED CUTTING CONDITIONS

MWE

Work Material		Mild Steel (≤180HB) AISI 1010 etc.			Carbon Steel, Alloy Steel (180—280HB) AISI 1045, 4140 etc.		
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
inch	mm						
.1181	**3.0**	210	6800	.0039 (.0024—.0051)	195	6300	.0039 (.0024—.0051)
.1575	**4.0**	225	5500	.0047 (.0031—.0063)	210	5100	.0047 (.0031—.0063)
.1969	**5.0**	225	4400	.0059 (.0039—.0079)	210	4100	.0059 (.0039—.0079)
.2480	**6.3**	260	4000	.0079 (.0051—.0102)	240	3700	.0079 (.0051—.0102)
.3150	**8.0**	270	3300	.0091 (.0071—.0110)	255	3100	.0091 (.0071—.0110)
.3937	**10.0**	290	2800	.0106 (.0087—.0126)	280	2700	.0106 (.0087—.0126)
.4724	**12.0**	310	2500	.0122 (.0110—.0134)	285	2300	.0122 (.0110—.0134)
.6299	**16.0**	310	1900	.0130 (.0110—.0150)	280	1700	.0130 (.0110—.0150)
.7874	**20.0**	310	1500	.0138 (.0118—.0157)	290	1400	.0138 (.0118—.0157)

Work Material		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.			Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.		
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
inch	mm						
.1181	**3.0**	180	5800	.0035 (.0024—.0047)	65	2100	.0028 (.0020—.0031)
.1575	**4.0**	190	4700	.0043 (.0028—.0055)	60	1500	.0031 (.0024—.0039)
.1969	**5.0**	195	3800	.0055 (.0035—.0071)	60	1200	.0039 (.0028—.0051)
.2480	**6.3**	225	3500	.0071 (.0043—.0094)	75	1200	.0051 (.0035—.0067)
.3150	**8.0**	240	2900	.0083 (.0063—.0098)	75	900	.0055 (.0039—.0071)
.3937	**10.0**	255	2500	.0091 (.0075—.0106)	70	700	.0063 (.0047—.0075)
.4724	**12.0**	270	2200	.0102 (.0091—.0114)	75	600	.0071 (.0059—.0079)
.6299	**16.0**	260	1600	.0114 (.0094—.0130)	65	400	.0075 (.0059—.0091)
.7874	**20.0**	265	1300	.0118 (.0102—.0134)	60	300	.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.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
inch	mm						
.1181	3.0	230	7400	.0039 (.0024—.0051)	210	6800	.0039 (.0024—.0051)
.1575	4.0	225	5500	.0047 (.0031—.0063)	210	5100	.0047 (.0031—.0063)
.1969	5.0	225	4400	.0059 (.0039—.0079)	210	4100	.0059 (.0039—.0079)
.2480	6.3	240	3700	.0079 (.0051—.0102)	225	3500	.0079 (.0051—.0102)
.3150	8.0	240	2900	.0098 (.0071—.0122)	220	2700	.0091 (.0071—.0110)
.3937	10.0	235	2300	.0114 (.0087—.0138)	225	2200	.0106 (.0087—.0126)
.4724	12.0	260	2100	.0130 (.0110—.0146)	235	1900	.0122 (.0110—.0134)
.6299	16.0	245	1500	.0138 (.0110—.0165)	230	1400	.0130 (.0110—.0150)
.7874	20.0	265	1300	.0146 (.0118—.0173)	245	1200	.0138 (.0118—.0157)

Work Material		Aluminium Alloy (Si<5%) ASTM A6061, A7075 etc.			Heat Resistant Alloy Inconel718 etc.		
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
inch	mm						
.1181	3.0	260	8400	.0039 (.0024—.0051)	65	2100	.0028 (.0020—.0035)
.1575	4.0	260	6300	.0047 (.0031—.0063)	60	1500	.0035 (.0024—.0043)
.1969	5.0	255	5000	.0059 (.0039—.0079)	60	1200	.0043 (.0031—.0055)
.2480	6.3	290	4500	.0079 (.0051—.0102)	75	1200	.0055 (.0035—.0075)
.3150	8.0	290	3500	.0091 (.0071—.0110)	75	900	.0055 (.0043—.0067)
.3937	10.0	290	2800	.0106 (.0087—.0126)	70	700	.0063 (.0047—.0075)
.4724	12.0	320	2600	.0122 (.0110—.0134)	70	600	.0063 (.0051—.0071)
.6299	16.0	310	1900	.0130 (.0110—.0150)	65	400	.0071 (.0055—.0083)
.7874	20.0	350	1700	.0138 (.0118—.0157)	80	400	.0075 (.0059—.0087)

Work Material		Hardened Steel (40—55HRC) AISI H13, L6 etc.		
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
inch	mm			
.1181	3.0	65	2100	.0028 (.0020—.0035)
.1575	4.0	60	1500	.0035 (.0024—.0043)
.1969	5.0	60	1200	.0043 (.0031—.0055)
.2480	6.3	75	1200	.0055 (.0035—.0075)
.3150	8.0	75	900	.0055 (.0043—.0067)
.3937	10.0	70	700	.0063 (.0047—.0075)
.4724	12.0	75	600	.0063 (.0051—.0071)
.6299	16.0	65	400	.0071 (.0055—.0083)
.7874	20.0	80	400	.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. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.0197	0.50	130	25400	.0004 (.0002—.0006)	130	25400	.0004 (.0002—.0006)
.0248	0.63	130	20200	.0006 (.0003—.0008)	130	20200	.0006 (.0003—.0008)
.0315	0.80	145	17900	.0011 (.0006—.0016)	145	17900	.0011 (.0006—.0016)
.0394	1.00	160	15900	.0014 (.0008—.0020)	160	15900	.0014 (.0008—.0020)
.0472	1.20	160	13200	.0018 (.0012—.0024)	160	13200	.0018 (.0012—.0024)
.0630	1.60	160	9900	.0022 (.0014—.0031)	160	9900	.0022 (.0014—.0031)
.0787	2.00	160	7900	.0028 (.0016—.0039)	160	7900	.0028 (.0016—.0039)
.0984	2.50	195	7600	.0033 (.0020—.0049)	195	7600	.0033 (.0020—.0049)
.1260	3.20	290	8900	.0039 (.0024—.0051)	260	7900	.0039 (.0024—.0051)
.1575	4.00	325	7900	.0047 (.0031—.0063)	290	7100	.0047 (.0031—.0063)
.1969	5.00	325	6300	.0059 (.0039—.0079)	290	5700	.0059 (.0039—.0079)
.2480	6.30	355	5500	.0079 (.0051—.0102)	325	5000	.0079 (.0051—.0102)
.3150	8.00	385	4700	.0091 (.0071—.0110)	355	4300	.0091 (.0071—.0110)
.3937	10.00	420	4100	.0106 (.0087—.0126)	390	3800	.0106 (.0087—.0126)
.4724	12.00	455	3700	.0118 (.0102—.0134)	420	3400	.0118 (.0102—.0134)
.6299	16.00	510	3100	.0130 (.0106—.0150)	445	2700	.0130 (.0106—.0150)
.7874	20.00	515	2500	.0138 (.0118—.0157)	455	2200	.0138 (.0118—.0157)
.9843	25.00	515	2000	.0138 (.0118—.0157)	440	1700	.0138 (.0118—.0157)

Work Material		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.			Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.		
Drill Dia. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.0197	0.50	95	19000	.0004 (.0002—.0006)	65	12700	.0003 (.0002—.0004)
.0248	0.63	100	15100	.0006 (.0003—.0008)	65	10100	.0004 (.0003—.0005)
.0315	0.80	115	13900	.0011 (.0006—.0016)	80	9900	.0008 (.0006—.0010)
.0394	1.00	130	12700	.0014 (.0008—.0020)	95	9500	.0012 (.0008—.0017)
.0472	1.20	130	10600	.0018 (.0012—.0024)	95	7900	.0016 (.0012—.0021)
.0630	1.60	130	7900	.0022 (.0014—.0031)	95	5900	.0020 (.0014—.0028)
.0787	2.00	130	6300	.0028 (.0016—.0039)	95	4700	.0024 (.0016—.0031)
.0984	2.50	160	6300	.0033 (.0020—.0049)	130	5000	.0030 (.0020—.0039)
.1260	3.20	225	6900	.0039 (.0024—.0051)	130	3900	.0031 (.0024—.0039)
.1575	4.00	260	6300	.0043 (.0028—.0055)	125	3100	.0035 (.0024—.0043)
.1969	5.00	255	5000	.0055 (.0035—.0071)	130	2500	.0043 (.0031—.0055)
.2480	6.30	290	4500	.0071 (.0043—.0094)	160	2500	.0055 (.0035—.0071)
.3150	8.00	320	3900	.0083 (.0063—.0098)	155	1900	.0059 (.0039—.0075)
.3937	10.00	360	3500	.0091 (.0075—.0106)	155	1500	.0063 (.0047—.0079)
.4724	12.00	380	3100	.0102 (.0087—.0114)	185	1500	.0071 (.0059—.0083)
.6299	16.00	410	2500	.0110 (.0091—.0130)	180	1100	.0075 (.0055—.0094)
.7874	20.00	410	2000	.0118 (.0102—.0134)	185	900	.0083 (.0059—.0102)
.9843	25.00	410	1600	.0126 (.0110—.0138)	180	700	.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. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.0197	0.50	130	25400	.0004 (.0002—.0006)	95	19000	.0004 (.0002—.0006)
.0248	0.63	130	20200	.0006 (.0003—.0008)	100	15100	.0006 (.0003—.0008)
.0315	0.80	145	17900	.0011 (.0006—.0016)	115	13900	.0011 (.0006—.0016)
.0394	1.00	160	15900	.0014 (.0008—.0020)	130	12700	.0014 (.0008—.0020)
.0472	1.20	160	13200	.0018 (.0012—.0024)	130	10600	.0018 (.0012—.0024)
.0630	1.60	160	9900	.0022 (.0014—.0031)	130	7900	.0022 (.0014—.0031)
.0787	2.00	160	7900	.0028 (.0016—.0039)	130	6300	.0028 (.0016—.0039)
.0984	2.50	195	7600	.0033 (.0020—.0049)	160	6300	.0033 (.0020—.0049)
.1260	3.20	290	8900	.0039 (.0024—.0051)	210	6400	.0039 (.0024—.0051)
.1575	4.00	325	7900	.0047 (.0031—.0063)	210	5100	.0047 (.0031—.0063)
.1969	5.00	325	6300	.0059 (.0039—.0079)	210	4100	.0059 (.0039—.0079)
.2480	6.30	355	5500	.0079 (.0051—.0102)	225	3500	.0079 (.0051—.0102)
.3150	8.00	385	4700	.0098 (.0071—.0122)	220	2700	.0091 (.0071—.0110)
.3937	10.00	420	4100	.0114 (.0087—.0138)	225	2200	.0106 (.0087—.0126)
.4724	12.00	455	3700	.0126 (.0102—.0146)	285	2300	.0118 (.0102—.0134)
.6299	16.00	510	3100	.0138 (.0110—.0165)	280	1700	.0130 (.0110—.0150)
.7874	20.00	515	2500	.0146 (.0118—.0173)	310	1500	.0138 (.0118—.0157)
.9843	25.00	515	2000	.0146 (.0118—.0173)	310	1200	.0138 (.0118—.0157)

Work Material		Aluminium Alloy (Si<5%) ASTM A6061, A7075 etc.			Heat Resistant Alloy Inconel718 etc.		
Drill Dia. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.0197	0.50	130	25400	.0006 (.0003—.0008)	30	6300	.0002 (.0002—.0003)
.0248	0.63	130	20200	.0008 (.0005—.0012)	30	5000	.0003 (.0003—.0004)
.0315	0.80	145	17900	.0014 (.0009—.0020)	30	3900	.0006 (.0005—.0008)
.0394	1.00	195	19000	.0020 (.0012—.0030)	30	3100	.0008 (.0006—.0011)
.0472	1.20	230	18500	.0026 (.0018—.0035)	30	2600	.0010 (.0009—.0013)
.0630	1.60	260	15900	.0033 (.0021—.0047)	30	1900	.0012 (.0010—.0016)
.0787	2.00	295	14300	.0041 (.0024—.0059)	45	2300	.0016 (.0013—.0020)
.0984	2.50	325	12700	.0053 (.0030—.0079)	50	1900	.0020 (.0016—.0024)
.1260	3.20	390	11900	.0091 (.0039—.0138)	60	1900	.0028 (.0020—.0035)
.1575	4.00	390	9500	.0094 (.0047—.0138)	60	1500	.0035 (.0024—.0043)
.1969	5.00	390	7600	.0098 (.0059—.0138)	60	1200	.0043 (.0031—.0055)
.2480	6.30	485	7500	.0138 (.0079—.0197)	75	1200	.0051 (.0035—.0063)
.3150	8.00	485	5900	.0138 (.0079—.0197)	75	900	.0055 (.0043—.0067)
.3937	10.00	485	4700	.0197 (.0079—.0315)	70	700	.0059 (.0047—.0067)
.4724	12.00	520	4200	.0197 (.0079—.0315)	75	600	.0063 (.0051—.0071)
.6299	16.00	510	3100	.0236 (.0079—.0394)	65	400	.0071 (.0055—.0083)
.7874	20.00	555	2700	.0236 (.0079—.0394)	80	400	.0075 (.0059—.0087)
.9843	25.00	540	2100	.0236 (.0079—.0394)	75	300	.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. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.0394	1.0	160	15900	.0008 (.0004—.0012)	130	12700	.0008 (.0004—.0012)
.0472	1.2	160	13200	.0010 (.0006—.0015)	130	10600	.0010 (.0006—.0015)
.0630	1.6	160	9900	.0022 (.0013—.0031)	130	7900	.0022 (.0013—.0031)
.0787	2.0	195	9500	.0028 (.0016—.0039)	160	7900	.0028 (.0016—.0039)
.0984	2.5	195	7600	.0035 (.0025—.0049)	160	6300	.0035 (.0022—.0049)
.1260	3.2	290	8900	.0039 (.0024—.0051)	260	7900	.0039 (.0024—.0051)
.1575	4.0	290	7100	.0047 (.0031—.0063)	260	6300	.0047 (.0031—.0063)
.1969	5.0	290	5700	.0059 (.0039—.0079)	255	5000	.0059 (.0039—.0079)
.2480	6.3	355	5500	.0079 (.0051—.0102)	290	4500	.0079 (.0051—.0102)
.3150	8.0	355	4300	.0091 (.0071—.0110)	290	3500	.0091 (.0071—.0110)
.3937	10.0	360	3500	.0102 (.0079—.0126)	290	2800	.0102 (.0079—.0126)
.4724	12.0	420	3400	.0118 (.0098—.0134)	360	2900	.0118 (.0098—.0134)
.6299	16.0	410	2500	.0122 (.0094—.0150)	345	2100	.0122 (.0094—.0150)

Work Material		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.			Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.		
Drill Dia. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.0394	1.0	95	9500	.0006 (.0004—.0011)	95	9500	.0006 (.0004—.0011)
.0472	1.2	95	7900	.0008 (.0005—.0014)	95	7900	.0008 (.0005—.0014)
.0630	1.6	95	5900	.0020 (.0011—.0030)	95	5900	.0020 (.0011—.0030)
.0787	2.0	160	7900	.0026 (.0013—.0037)	95	4700	.0026 (.0013—.0037)
.0984	2.5	160	6300	.0031 (.0018—.0047)	95	3800	.0031 (.0018—.0047)
.1260	3.2	225	6900	.0035 (.0020—.0047)	160	4900	.0028 (.0020—.0035)
.1575	4.0	225	5500	.0043 (.0028—.0059)	160	3900	.0031 (.0024—.0039)
.1969	5.0	225	4400	.0055 (.0035—.0075)	160	3100	.0039 (.0028—.0047)
.2480	6.3	260	4000	.0071 (.0043—.0098)	225	3500	.0047 (.0031—.0063)
.3150	8.0	255	3100	.0083 (.0059—.0102)	220	2700	.0055 (.0039—.0067)
.3937	10.0	255	2500	.0091 (.0059—.0118)	225	2200	.0059 (.0047—.0071)
.4724	12.0	285	2300	.0098 (.0075—.0122)	260	2100	.0067 (.0055—.0075)
.6299	16.0	280	1700	.0110 (.0075—.0142)	245	1500	.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. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.0394	**1.0**	130	12700	.0008 (.0004—.0012)	95	9500	.0006 (.0004—.0011)
.0472	**1.2**	130	10600	.0010 (.0006—.0015)	95	7900	.0008 (.0005—.0014)
.0630	**1.6**	130	7900	.0022 (.0013—.0031)	95	5900	.0020 (.0011—.0030)
.0787	**2.0**	160	7900	.0028 (.0016—.0039)	160	7900	.0026 (.0013—.0037)
.0984	**2.5**	160	6300	.0035 (.0022—.0049)	160	6300	.0031 (.0018—.0047)
.1260	**3.2**	290	8900	.0039 (.0024—.0051)	160	4900	.0035 (.0020—.0047)
.1575	**4.0**	290	7100	.0047 (.0031—.0063)	160	3900	.0043 (.0028—.0059)
.1969	**5.0**	290	5700	.0059 (.0039—.0079)	160	3100	.0055 (.0035—.0075)
.2480	**6.3**	355	5500	.0079 (.0051—.0102)	195	3000	.0071 (.0043—.0098)
.3150	**8.0**	355	4300	.0091 (.0071—.0110)	190	2300	.0083 (.0059—.0102)
.3937	**10.0**	360	3500	.0102 (.0079—.0126)	195	1900	.0091 (.0059—.0118)
.4724	**12.0**	420	3400	.0118 (.0098—.0134)	260	2100	.0098 (.0075—.0122)
.6299	**16.0**	410	2500	.0122 (.0094—.0150)	245	1500	.0110 (.0075—.0142)

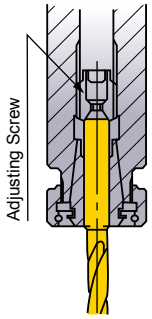
Work Material		Aluminium Alloy (Si<5%) AISI A6061, A7075 etc.			Heat Resistant Alloy Inconel718 etc.		
Drill Dia. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.0394	**1.0**	160	15900	.0020 (.0012—.0030)	30	3100	.0008 (.0006—.0011)
.0472	**1.2**	195	15900	.0026 (.0018—.0035)	30	2600	.0010 (.0009—.0013)
.0630	**1.6**	230	13900	.0033 (.0021—.0047)	30	1900	.0012 (.0010—.0016)
.0787	**2.0**	260	12700	.0041 (.0024—.0059)	45	2300	.0016 (.0013—.0020)
.0984	**2.5**	290	11400	.0053 (.0030—.0079)	50	1900	.0020 (.0016—.0024)
.1260	**3.2**	325	9900	.0091 (.0039—.0138)	60	1900	.0028 (.0020—.0035)
.1575	**4.0**	325	7900	.0094 (.0047—.0138)	60	1500	.0035 (.0024—.0043)
.1969	**5.0**	325	6300	.0098 (.0059—.0138)	60	1200	.0043 (.0031—.0055)
.2480	**6.3**	420	6500	.0138 (.0079—.0197)	65	1000	.0051 (.0035—.0063)
.3150	**8.0**	420	5100	.0138 (.0079—.0197)	55	700	.0055 (.0043—.0063)
.3937	**10.0**	420	4100	.0197 (.0079—.0315)	60	600	.0059 (.0047—.0067)
.4724	**12.0**	455	3700	.0197 (.0079—.0315)	50	500	.0063 (.0051—.0071)
.6299	**16.0**	445	2700	.0197 (.0079—.0315)	50	300	.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

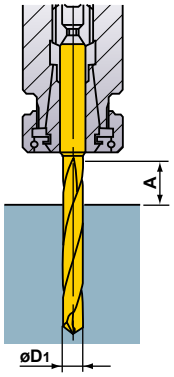
OPERATIONAL GUIDANCE FOR THE MWS DRILLS (Φ.0200"-Φ.1200" & Φ0.50-Φ2.95mm)

Drill Holding



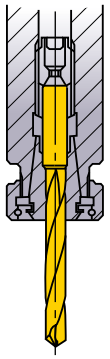
Thrust bearing type collet chuck holds the drill securely.

Drill Length



A ≥ D1 x 2

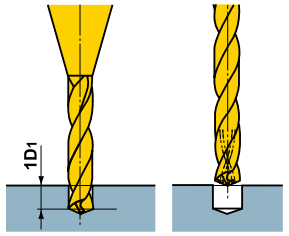
Drill Installation



NG

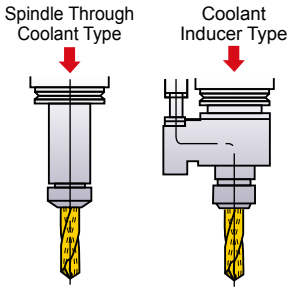
Do not clamp on the flutes.

Drill Installation



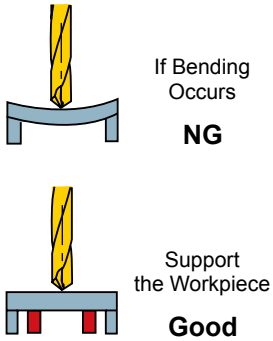
①A pilot hole must proceed application of XB or DB drill.
②Use SB drill for pilot hole.
③Depending on cutting conditions peck feeding may be necessary.

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

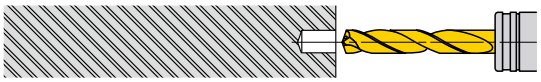
- Please use a fine mesh filter (mesh≤3 micro) for coolant to prevent jamming in the oil hole.
- For deep drilling with the long type drill, machining a pilot hole is recommended.
  (Otherwise, centrifugal forces may cause drill breakage.)

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



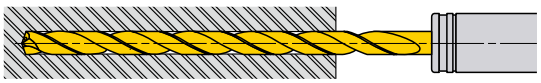
①Use a drill with a larger (flatter) point angle than the MWS...DB type. Mitsubishi type MZE, MZS, MWE or MWS drill is recommended.
②Use a drill with the same diameter as the deep hole drill.
③Drill depth : Approx 1D or deeper.
④Ensure a high precision hole is drilled for the pilot.

2. Initial cutting with the long type drill



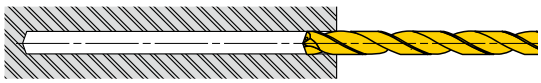
①Penetrate the pilot hole at a low revolution. (Cutting speed 65-100 SFM, feed rate .008-.012 IPR)
②Stop the long type drill .039-.118 inch short of the pilot hole bottom.

3. Drill the deep hole



①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

4. Drill retraction

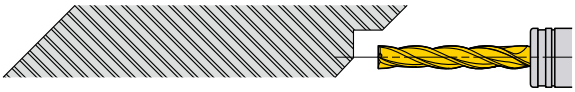


①After drilling, lower the cutting revolution about .039-.079 inch short of the hole end. (Cutting speed of around 65-100 SFM)
②Retract the drill to the pilot hole depth starting point at a feed rate of 120 inch/min.
③Finally clear the hole at a cutting speed of 65-100 SFM and feed rate of .008-.012 IPR.

IRREGULAR FACE DRILLING

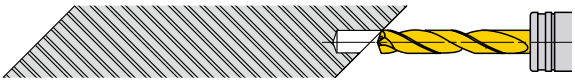
●Drilling and breaking through on irregular faces or angles

1. Spot facing



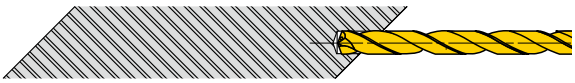
①Machine a flat on the irregular face by using an end mill or drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a pilot hole



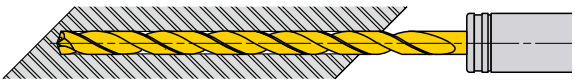
①Use a drill with a larger (flatter) point angle than the MWS...DB type. Mitsubishi type MZE, MZS, MWE or MWS drill is recommended.
②Use a drill with the same diameter as the deep hole drill.
③Drill depth : Approx 1D or deeper.
④Ensure a high precision hole is drilled for the pilot.

3. Initial cutting with the long type drill



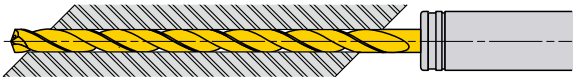
①Penetrate the pilot hole at a low revolution. (Cutting speed 65-100 SFM, feed rate .008-.012 IPR)
②Stop the long type drill .039-.118 inch short of the pilot hole bottom.

4. Drill the deep hole



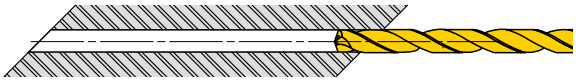
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

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.

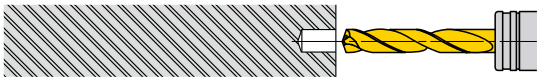
MWE/MWS

OPERATIONAL GUIDANCE FOR THE MICRO-MWS DRILL (Φ.0200"-Φ.1200" & Φ0.50-Φ2.95mm) (L/D≥10)

FLAT FACE DRILLING

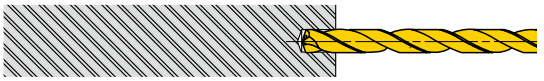
●Drilling a blind hole

1. Drilling a pilot hole



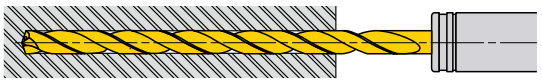
①Use the SB type drill.
②Use a drill with the same diameter as the deep hole drill.
③Drill depth : Approx 1D.
④Ensure a high precision hole is drilled for the guide pilot.

2. Initial cutting with the long type drill



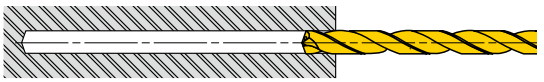
①Penetrate the pilot hole at a low revolution. (Revolution speed 500-1000 min^{-1}, feed rate .008-.012 IPR)
②Stop the long type drill .020-.039 inch short of the pilot hole bottom.

3. Drill the deep hole



①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

4. Drill retraction

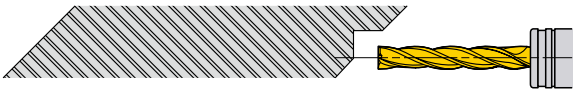


①After drilling, lower the cutting revolution about .020-.039 inch short of the hole end. (Revolution speed of around 500-1000 min^{-1})
②Retract the drill to the pilot hole depth starting point at a feed rate of 120 inch/min.
③Finally clear the hole at a cutting speed of 65-100 SFM and feed rate of .008-.012 IPR.

IRREGULAR FACE DRILLING

●Drilling and breaking through on irregular faces or angles

1. Spot facing



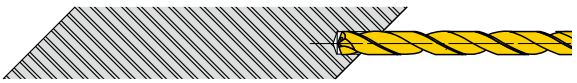
①Machine a flat on the irregular face by using an end mill or drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a pilot hole



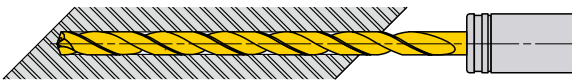
①Use a drill with a larger (flatter) point angle than XB or DB type. The MWS-SB type is recommended.
②Ensure a high precision hole is drilled for the pilot.
③Drill depth : Approx 1D.

3. Initial cutting with the long type drill



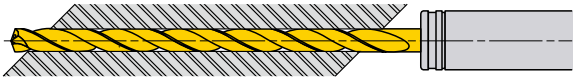
①Penetrate the pilot hole at a low revolution. (Revolution speed 500-1000 min^{-1}, feed rate .008-.012 IPR)
②Stop the long type drill .020-.039 inch short of the pilot hole bottom.

4. Drill the deep hole



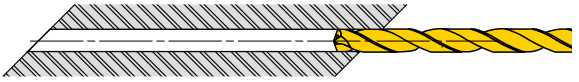
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

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

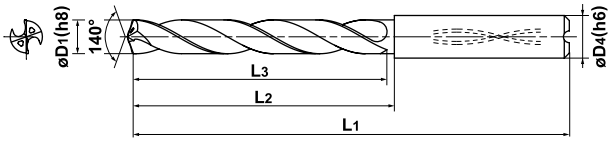
- New grade DP7020 and a unique margin, developed specifically for stainless steel, complement high flow coolant holes.
- Long drill life and high efficiency drilling in stainless steel.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
		◎			

Tolerance	D=.1181	.1181<D≤.2362	.2362<D≤.3937	.3937<D≤.7807	.7087<D≤.7874
D1 (inch)	0 −0.00055	0 −0.00071	0 −0.00087	0 −0.00106	0 −0.00130
D4 (inch)		0 −0.00031	0 −0.00035	0 −0.00043	0 −0.00051

Tolerance	D=3	3<D≤6	6<D≤10	10<D≤18	18<D≤20
D1 (mm)	0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
D4 (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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP7020		L3		L2		L1		D4	
									mm	inch	mm	inch	mm	inch	mm	inch
3.0	.1181				3	Int.	●	MMS0300X3DB	21	.827	23	.906	70	2.756	6	.2362
					5	Int.	●	0300X5DB	28	1.102	31	1.220	78	3.071	6	.2362
NEW 3.048	.1200		31		3	Int.	●	0305X3D060	21	.827	23	.906	70	2.756	6	.2362
					5	Int.	●	0305X5D060	28	1.102	31	1.220	78	3.071	6	.2362
3.1	.1220				3	Int.	●	0310X3DB	21	.827	23	.906	70	2.756	6	.2362
					5	Int.	●	0310X5DB	28	1.102	31	1.220	78	3.071	6	.2362
NEW 3.175	.1250	1/8			3	Int.	●	0318X3D060	21	.827	23	.906	70	2.756	6	.2362
					5	Int.	●	0318X5D060	28	1.102	31	1.220	78	3.071	6	.2362
3.2	.1260				3	Int.	●	0320X3DB	21	.827	23	.906	70	2.756	6	.2362
					5	Int.	●	0320X5DB	28	1.102	31	1.220	78	3.071	6	.2362
NEW 3.3	.1299			M4x0.7	3	Int.	●	0330X3DB	21	.827	23	.906	70	2.756	6	.2362
					5	Int.	●	0330X5DB	28	1.102	31	1.220	78	3.071	6	.2362
3.4	.1339				3	Int.	●	0340X3DB	21	.827	23	.906	70	2.756	6	.2362
					5	Int.	●	0340X5DB	28	1.102	31	1.220	78	3.071	6	.2362
3.5	.1378				3	Int.	●	0350X3DB	21	.827	23	.906	70	2.756	6	.2362
					5	Int.	●	0350X5DB	28	1.102	31	1.220	78	3.071	6	.2362
NEW 3.572	.1406	9/64			3	Int.	●	0357X3D060	22	.866	23	.906	70	2.756	6	.2362
					5	Int.	●	0357X5D060	30	1.181	31	1.220	78	3.071	6	.2362
3.6	.1417				3	Int.	●	0360X3DB	22	.866	23	.906	70	2.756	6	.2362
					5	Int.	●	0360X5DB	30	1.181	31	1.220	78	3.071	6	.2362
3.7	.1457			M4.5x0.75	3	Int.	●	0370X3DB	22	.866	23	.906	70	2.756	6	.2362
					5	Int.	●	0370X5DB	30	1.181	31	1.220	78	3.071	6	.2362
3.8	.1496		25	#10-24	3	Int.	●	0380X3DB	22	.866	23	.906	70	2.756	6	.2362
					5	Int.	●	0380X5DB	30	1.181	31	1.220	78	3.071	6	.2362
3.9	.1535				3	Int.	●	0390X3DB	22	.866	23	.906	70	2.756	6	.2362
					5	Int.	●	0390X5DB	30	1.181	31	1.220	78	3.071	6	.2362
NEW 3.969	.1562	5/32			3	Int.	●	0397X3D060	22	.866	23	.906	70	2.756	6	.2362
					5	Int.	●	0397X5D060	30	1.181	31	1.220	78	3.071	6	.2362
4.0	.1575				3	Int.	●	0400X3DB	22	.866	23	.906	70	2.756	6	.2362
					5	Int.	●	0400X5DB	30	1.181	31	1.220	78	3.071	6	.2362
NEW 4.039	.1590		21	#10-32	3	Int.	●	0404X3D060	24	.945	26	1.024	73	2.874	6	.2362
					5	Int.	●	0404X5D060	33	1.299	35	1.378	82	3.228	6	.2362
4.1	.1614				3	Int.	●	0410X3DB	24	.945	26	1.024	73	2.874	6	.2362
					5	Int.	●	0410X5DB	33	1.299	35	1.378	82	3.228	6	.2362

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP7020		L3		L2		L1		D4	
									mm	inch	mm	inch	mm	inch	mm	inch
4.2	.1654			M5x0.8	3	Int.	●	MMS0420X3DB	24	.945	26	1.024	73	2.874	6	.2362
					5	Int.	●	0420X5DB	33	1.299	35	1.378	82	3.228	6	.2362
4.3	.1693				3	Int.	●	0430X3DB	24	.945	26	1.024	73	2.874	6	.2362
					5	Int.	●	0430X5DB	33	1.299	35	1.378	82	3.228	6	.2362
NEW 4.366	.1719	11/64			3	Int.	●	0437X3D060	24	.945	26	1.024	73	2.874	6	.2362
					5	Int.	●	0437X5D060	33	1.299	35	1.378	82	3.228	6	.2362
4.4	.1732				3	Int.	●	0440X3DB	24	.945	26	1.024	73	2.874	6	.2362
					5	Int.	●	0440X5DB	33	1.299	35	1.378	82	3.228	6	.2362
4.5	.1772		16	#12-24	3	Int.	●	0450X3DB	24	.945	26	1.024	73	2.874	6	.2362
					5	Int.	●	0450X5DB	33	1.299	35	1.378	82	3.228	6	.2362
4.6	.1811				3	Int.	●	0460X3DB	25	.984	28	1.102	75	2.953	6	.2362
					5	Int.	●	0460X5DB	35	1.378	38	1.496	85	3.346	6	.2362
4.7	.1850		13		3	Int.	●	0470X3DB	25	.984	28	1.102	75	2.953	6	.2362
					5	Int.	●	0470X5DB	35	1.378	38	1.496	85	3.346	6	.2362
NEW 4.763	.1875	3/16			3	Int.	●	0476X3D060	25	.984	28	1.102	75	2.953	6	.2362
					5	Int.	●	0476X5D060	35	1.378	38	1.496	85	3.346	6	.2362
4.8	.1890				3	Int.	●	0480X3DB	25	.984	28	1.102	75	2.953	6	.2362
					5	Int.	●	0480X5DB	35	1.378	38	1.496	85	3.346	6	.2362
4.9	.1929				3	Int.	●	0490X3DB	25	.984	28	1.102	75	2.953	6	.2362
					5	Int.	●	0490X5DB	35	1.378	38	1.496	85	3.346	6	.2362
5.0	.1969			M6x1.0	3	Int.	●	0500X3DB	25	.984	28	1.102	75	2.953	6	.2362
					5	Int.	●	0500X5DB	35	1.378	38	1.496	85	3.346	6	.2362
5.1	.2008		7	1/4-20	3	Int.	●	0510X3DB	28	1.102	30	1.181	81	3.189	6	.2362
					5	Int.	●	0510X5DB	39	1.535	42	1.654	89	3.504	6	.2362
NEW 5.159	.2031	13/64			3	Int.	●	0516X3D060	28	1.102	30	1.181	81	3.189	6	.2362
					5	Int.	●	0516X5D060	39	1.535	42	1.654	89	3.504	6	.2362
5.2	.2047				3	Int.	●	0520X3DB	28	1.102	30	1.181	81	3.189	6	.2362
					5	Int.	●	0520X5DB	39	1.535	42	1.654	89	3.504	6	.2362
5.3	.2087				3	Int.	●	0530X3DB	28	1.102	30	1.181	81	3.189	6	.2362
					5	Int.	●	0530X5DB	39	1.535	42	1.654	89	3.504	6	.2362
5.4	.2126		3	1/4-28	3	Int.	●	0540X3DB	28	1.102	30	1.181	81	3.189	6	.2362
					5	Int.	●	0540X5DB	39	1.535	42	1.654	89	3.504	6	.2362
5.5	.2165				3	Int.	●	0550X3DB	28	1.102	30	1.181	81	3.189	6	.2362
					5	Int.	●	0550X5DB	39	1.535	42	1.654	89	3.504	6	.2362
NEW 5.556	.2188	7/32			3	Int.	●	0556X3D060	30	1.181	30	1.181	81	3.189	6	.2362
					5	Int.	●	0556X5D060	42	1.654	42	1.654	89	3.504	6	.2362
5.6	.2205				3	Int.	●	0560X3DB	30	1.181	30	1.181	81	3.189	6	.2362
					5	Int.	●	0560X5DB	42	1.654	42	1.654	89	3.504	6	.2362
5.7	.2244				3	Int.	●	0570X3DB	30	1.181	30	1.181	81	3.189	6	.2362
					5	Int.	●	0570X5DB	42	1.654	42	1.654	89	3.504	6	.2362
5.8	.2283		1		3	Int.	●	0580X3DB	30	1.181	30	1.181	81	3.189	6	.2362
					5	Int.	●	0580X5DB	42	1.654	42	1.654	89	3.504	6	.2362
5.9	.2323				3	Int.	●	0590X3DB	30	1.181	30	1.181	81	3.189	6	.2362
					5	Int.	●	0590X5DB	42	1.654	42	1.654	89	3.504	6	.2362
NEW 5.953	.2344	15/64			3	Int.	●	0595X3D060	30	1.181	30	1.181	81	3.189	6	.2362
					5	Int.	●	0595X5D060	42	1.654	42	1.654	89	3.504	6	.2362
6.0	.2362			M7x1.0	3	Int.	●	0600X3DB	30	1.181	30	1.181	81	3.189	6	.2362
					5	Int.	●	0600X5DB	42	1.654	42	1.654	89	3.504	6	.2362

DRILLING

CUTTING CONDITIONS ➤ L091
TECHNICAL DATA ➤ N001

MMS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP7020		L3		L2		L1		D4	
									mm	inch	mm	inch	mm	inch	mm	inch
6.1	.2402				3	Int.	●	MMS0610X3DB	33	1.299	35	1.378	86	3.386	8	.3150
					5	Int.	●	0610X5DB	46	1.811	48	1.890	95	3.740	8	.3150
6.2	.2441				3	Int.	●	0620X3DB	33	1.299	35	1.378	86	3.386	8	.3150
					5	Int.	●	0620X5DB	46	1.811	48	1.890	95	3.740	8	.3150
6.3	.2480				3	Int.	●	0630X3DB	33	1.299	35	1.378	86	3.386	8	.3150
					5	Int.	●	0630X5DB	46	1.811	48	1.890	95	3.740	8	.3150
NEW 6.350	.2500	1/4	E		3	Int.	●	0635X3D080	33	1.299	35	1.378	86	3.386	8	.3150
					5	Int.	●	0635X5D080	46	1.811	48	1.890	95	3.740	8	.3150
6.4	.2520				3	Int.	●	0640X3DB	33	1.299	35	1.378	86	3.386	8	.3150
					5	Int.	●	0640X5DB	46	1.811	48	1.890	95	3.740	8	.3150
6.5	.2559				3	Int.	●	0650X3DB	33	1.299	35	1.378	86	3.386	8	.3150
					5	Int.	●	0650X5DB	46	1.811	48	1.890	95	3.740	8	.3150
NEW 6.528	.2570		F	5/16-18	3	Int.	●	0653X3D080	35	1.378	37	1.457	90	3.543	8	.3150
					5	Int.	●	0653X5D080	49	1.929	51	2.008	98	3.858	8	.3150
6.6	.2598				3	Int.	●	0660X3DB	35	1.378	37	1.457	90	3.543	8	.3150
					5	Int.	●	0660X5DB	49	1.929	51	2.008	98	3.858	8	.3150
6.7	.2638			M8x1.25	3	Int.	●	0670X3DB	35	1.378	37	1.457	90	3.543	8	.3150
					5	Int.	●	0670X5DB	49	1.929	51	2.008	98	3.858	8	.3150
NEW 6.747	.2656	17/64			3	Int.	●	0675X3D080	35	1.378	37	1.457	90	3.543	8	.3150
					5	Int.	●	0675X5D080	49	1.929	51	2.008	98	3.858	8	.3150
6.8	.2677				3	Int.	●	0680X3DB	35	1.378	37	1.457	90	3.543	8	.3150
					5	Int.	●	0680X5DB	49	1.929	51	2.008	98	3.858	8	.3150
6.9	.2717		I	5/16-24	3	Int.	●	0690X3DB	35	1.378	37	1.457	90	3.543	8	.3150
					5	Int.	●	0690X5DB	49	1.929	51	2.008	98	3.858	8	.3150
7.0	.2756			M8x1.0	3	Int.	●	0700X3DB	35	1.378	37	1.457	90	3.543	8	.3150
					5	Int.	●	0700X5DB	49	1.929	51	2.008	98	3.858	8	.3150
7.1	.2795				3	Int.	●	0710X3DB	38	1.496	39	1.535	90	3.543	8	.3150
					5	Int.	●	0710X5DB	53	2.087	56	2.205	103	4.055	8	.3150
NEW 7.144	.2812	9/32			3	Int.	●	0714X3D080	38	1.496	39	1.535	90	3.543	8	.3150
					5	Int.	●	0714X5D080	53	2.087	56	2.205	103	4.055	8	.3150
7.2	.2835				3	Int.	●	0720X3DB	38	1.496	39	1.535	90	3.543	8	.3150
					5	Int.	●	0720X5DB	53	2.087	56	2.205	103	4.055	8	.3150
7.3	.2874				3	Int.	●	0730X3DB	38	1.496	39	1.535	90	3.543	8	.3150
					5	Int.	●	0730X5DB	53	2.087	56	2.205	103	4.055	8	.3150
7.4	.2913				3	Int.	●	0740X3DB	38	1.496	39	1.535	90	3.543	8	.3150
					5	Int.	●	0740X5DB	53	2.087	56	2.205	103	4.055	8	.3150
7.5	.2953				3	Int.	●	0750X3DB	38	1.496	39	1.535	90	3.543	8	.3150
					5	Int.	●	0750X5DB	53	2.087	56	2.205	103	4.055	8	.3150
NEW 7.541	.2969	19/64			3	Int.	●	0754X3D080	40	1.575	40	1.575	90	3.543	8	.3150
					5	Int.	●	0754X5D080	56	2.205	56	2.205	103	4.055	8	.3150
7.6	.2992				3	Int.	●	0760X3DB	40	1.575	40	1.575	90	3.543	8	.3150
					5	Int.	●	0760X5DB	56	2.205	56	2.205	103	4.055	8	.3150
7.7	.3031				3	Int.	●	0770X3DB	40	1.575	40	1.575	90	3.543	8	.3150
					5	Int.	●	0770X5DB	56	2.205	56	2.205	103	4.055	8	.3150
7.8	.3071				3	Int.	●	0780X3DB	40	1.575	40	1.575	90	3.543	8	.3150
					5	Int.	●	0780X5DB	56	2.205	56	2.205	103	4.055	8	.3150
7.9	.3110				3	Int.	●	0790X3DB	40	1.575	40	1.575	90	3.543	8	.3150
					5	Int.	●	0790X5DB	56	2.205	56	2.205	103	4.055	8	.3150

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP7020		L3		L2		L1		D4	
									mm	inch	mm	inch	mm	inch	mm	inch
NEW 7.938	.3125	5/16		3/8-16	3	Int.	●	MMS0794X3D080	40	1.575	40	1.575	90	3.543	8	.3150
					5	Int.	●	0794X5D080	56	2.205	56	2.205	103	4.055	8	.3150
8.0	.3150				3	Int.	●	0800X3DB	40	1.575	40	1.575	90	3.543	8	.3150
					5	Int.	●	0800X5DB	56	2.205	56	2.205	103	4.055	8	.3150
8.1	.3189				3	Int.	●	0810X3DB	43	1.693	45	1.772	96	3.780	10	.3937
					5	Int.	●	0810X5DB	60	2.362	62	2.441	113	4.449	10	.3937
8.2	.3228				3	Int.	●	0820X3DB	43	1.693	45	1.772	96	3.780	10	.3937
					5	Int.	●	0820X5DB	60	2.362	62	2.441	113	4.449	10	.3937
8.3	.3268				3	Int.	●	0830X3DB	43	1.693	45	1.772	96	3.780	10	.3937
					5	Int.	●	0830X5DB	60	2.362	62	2.441	113	4.449	10	.3937
NEW 8.334	.3281	21/64			3	Int.	●	0833X3D100	43	1.693	45	1.772	96	3.780	10	.3937
					5	Int.	●	0833X5D100	60	2.362	62	2.441	113	4.449	10	.3937
8.4	.3307				3	Int.	●	0840X3DB	43	1.693	45	1.772	96	3.780	10	.3937
					5	Int.	●	0840X5DB	60	2.362	62	2.441	113	4.449	10	.3937
NEW 8.433	.3320		Q	3/8-24	3	Int.	●	0843X3D100	43	1.693	45	1.772	96	3.780	10	.3937
					5	Int.	●	0843X5D100	60	2.362	62	2.441	113	4.449	10	.3937
8.5	.3346			M10x1.5	3	Int.	●	0850X3DB	43	1.693	45	1.772	96	3.780	10	.3937
					5	Int.	●	0850X5DB	60	2.362	62	2.441	113	4.449	10	.3937
8.6	.3386				3	Int.	●	0860X3DB	45	1.772	47	1.850	101	3.976	10	.3937
					5	Int.	●	0860X5DB	63	2.480	65	2.559	116	4.567	10	.3937
8.7	.3425			M10x1.25	3	Int.	●	0870X3DB	45	1.772	47	1.850	101	3.976	10	.3937
					5	Int.	●	0870X5DB	63	2.480	65	2.559	116	4.567	10	.3937
NEW 8.731	.3438	11/32			3	Int.	●	0873X3D100	45	1.772	47	1.850	101	3.976	10	.3937
					5	Int.	●	0873X5D100	63	2.480	65	2.559	116	4.567	10	.3937
8.8	.3465				3	Int.	●	0880X3DB	45	1.772	47	1.850	101	3.976	10	.3937
					5	Int.	●	0880X5DB	63	2.480	65	2.559	116	4.567	10	.3937
8.9	.3504				3	Int.	●	0890X3DB	45	1.772	47	1.850	101	3.976	10	.3937
					5	Int.	●	0890X5DB	63	2.480	65	2.559	116	4.567	10	.3937
9.0	.3543				3	Int.	●	0900X3DB	45	1.772	47	1.850	101	3.976	10	.3937
					5	Int.	●	0900X5DB	63	2.480	65	2.559	116	4.567	10	.3937
9.1	.3583				3	Int.	●	0910X3DB	48	1.890	50	1.969	101	3.976	10	.3937
					5	Int.	●	0910X5DB	67	2.638	70	2.756	121	4.764	10	.3937
NEW 9.128	.3594	23/64			3	Int.	●	0913X3D100	48	1.890	50	1.969	101	3.976	10	.3937
					5	Int.	●	0913X5D100	67	2.638	70	2.756	121	4.764	10	.3937
9.2	.3622				3	Int.	●	0920X3DB	48	1.890	50	1.969	101	3.976	10	.3937
					5	Int.	●	0920X5DB	67	2.638	70	2.756	121	4.764	10	.3937
9.3	.3661				3	Int.	●	0930X3DB	48	1.890	50	1.969	101	3.976	10	.3937
					5	Int.	●	0930X5DB	67	2.638	70	2.756	121	4.764	10	.3937
NEW 9.347	.3680		U	7/16-14	3	Int.	●	0935X3D100	48	1.890	50	1.969	101	3.976	10	.3937
					5	Int.	●	0935X5D100	67	2.638	70	2.756	121	4.764	10	.3937
9.4	.3701				3	Int.	●	0940X3DB	48	1.890	50	1.969	101	3.976	10	.3937
					5	Int.	●	0940X5DB	67	2.638	70	2.756	121	4.764	10	.3937
9.5	.3740				3	Int.	●	0950X3DB	48	1.890	50	1.969	101	3.976	10	.3937
					5	Int.	●	0950X5DB	67	2.638	70	2.756	121	4.764	10	.3937
NEW 9.525	.3750	3/8			3	Int.	●	0953X3D100	50	1.969	50	1.969	101	3.976	10	.3937
					5	Int.	●	0953X5D100	70	2.756	70	2.756	121	4.764	10	.3937
9.6	.3780				3	Int.	●	0960X3DB	50	1.969	50	1.969	101	3.976	10	.3937
					5	Int.	●	0960X5DB	70	2.756	70	2.756	121	4.764	10	.3937

CUTTING CONDITIONS ➤ L091 TECHNICAL DATA ➤ N001

MMS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP7020		L3		L2		L1		D4	
									mm	inch	mm	inch	mm	inch	mm	inch
9.7	.3819		Tube sheet		3	Int.	●	MMS0970X3DB	50	1.969	50	1.969	101	3.976	10	.3937
					5	Int.	●	0970X5DB	70	2.756	70	2.756	121	4.764	10	.3937
9.8	.3858				3	Int.	●	0980X3DB	50	1.969	50	1.969	101	3.976	10	.3937
					5	Int.	●	0980X5DB	70	2.756	70	2.756	121	4.764	10	.3937
9.9	.3898				3	Int.	●	0990X3DB	50	1.969	50	1.969	101	3.976	10	.3937
					5	Int.	●	0990X5DB	70	2.756	70	2.756	121	4.764	10	.3937
NEW 9.922	.3906	25/64		7/16-20	3	Int.	●	0992X3D100	50	1.969	50	1.969	101	3.976	10	.3937
					5	Int.	●	0992X5D100	70	2.756	70	2.756	121	4.764	10	.3937
10.0	.3937				3	Int.	●	1000X3DB	50	1.969	50	1.969	101	3.976	10	.3937
					5	Int.	●	1000X5DB	70	2.756	70	2.756	121	4.764	10	.3937
10.1	.3976				3	Int.	●	1010X3DB	53	2.087	55	2.165	111	4.370	12	.4724
					5	Int.	●	1010X5DB	74	2.913	78	3.071	134	5.276	12	.4724
10.2	.4016			M12x1.75	3	Int.	●	1020X3DB	53	2.087	55	2.165	111	4.370	12	.4724
					5	Int.	●	1020X5DB	74	2.913	78	3.071	134	5.276	12	.4724
10.3	.4055				3	Int.	●	1030X3DB	53	2.087	55	2.165	111	4.370	12	.4724
					5	Int.	●	1030X5DB	74	2.913	78	3.071	134	5.276	12	.4724
NEW 10.319	.4062	13/32			3	Int.	●	1032X3D120	53	2.087	55	2.165	111	4.370	12	.4724
					5	Int.	●	1032X5D120	74	2.913	78	3.071	134	5.276	12	.4724
10.4	.4094				3	Int.	●	1040X3DB	53	2.087	55	2.165	111	4.370	12	.4724
					5	Int.	●	1040X5DB	74	2.913	78	3.071	134	5.276	12	.4724
10.5	.4134				3	Int.	●	1050X3DB	53	2.087	55	2.165	111	4.370	12	.4724
					5	Int.	●	1050X5DB	74	2.913	78	3.071	134	5.276	12	.4724
10.6	.4173				3	Int.	●	1060X3DB	55	2.165	56	2.205	116	4.567	12	.4724
					5	Int.	●	1060X5DB	77	3.031	78	3.071	134	5.276	12	.4724
10.7	.4213				3	Int.	●	1070X3DB	55	2.165	56	2.205	116	4.567	12	.4724
					5	Int.	●	1070X5DB	77	3.031	78	3.071	134	5.276	12	.4724
NEW 10.716	.4219	27/64		1/2-13	3	Int.	●	1072X3D120	55	2.165	56	2.205	116	4.567	12	.4724
					5	Int.	●	1072X5D120	77	3.031	78	3.071	134	5.276	12	.4724
10.8	.4252			M12X1.25	3	Int.	●	1080X3DB	55	2.165	56	2.205	116	4.567	12	.4724
					5	Int.	●	1080X5DB	77	3.031	78	3.071	134	5.276	12	.4724
10.9	.4291				3	Int.	●	1090X3DB	55	2.165	56	2.205	116	4.567	12	.4724
					5	Int.	●	1090X5DB	77	3.031	78	3.071	134	5.276	12	.4724
11.0	.4331				3	Int.	●	1100X3DB	55	2.165	56	2.205	116	4.567	12	.4724
					5	Int.	●	1100X5DB	77	3.031	78	3.071	134	5.276	12	.4724
11.1	.4370				3	Int.	●	1110X3DB	58	2.283	60	2.362	116	4.567	12	.4724
					5	Int.	●	1110X5DB	81	3.189	84	3.307	140	5.512	12	.4724
NEW 11.113	.4375	7/16			3	Int.	●	1111X3D120	58	2.283	60	2.362	116	4.567	12	.4724
					5	Int.	●	1111X5D120	81	3.189	84	3.307	140	5.512	12	.4724
11.2	.4409				3	Int.	●	1120X3DB	58	2.283	60	2.362	116	4.567	12	.4724
					5	Int.	●	1120X5DB	81	3.189	84	3.307	140	5.512	12	.4724
11.3	.4449				3	Int.	●	1130X3DB	58	2.283	60	2.362	116	4.567	12	.4724
					5	Int.	●	1130X5DB	81	3.189	84	3.307	140	5.512	12	.4724
11.4	.4488				3	Int.	●	1140X3DB	58	2.283	60	2.362	116	4.567	12	.4724
					5	Int.	●	1140X5DB	81	3.189	84	3.307	140	5.512	12	.4724
11.5	.4528				3	Int.	●	1150X3DB	58	2.283	60	2.362	116	4.567	12	.4724
					5	Int.	●	1150X5DB	81	3.189	84	3.307	140	5.512	12	.4724
NEW 11.509	.4531	29/64		1/2-20	3	Int.	●	1151X3D120	60	2.362	60	2.362	116	4.567	12	.4724
					5	Int.	●	1151X5D120	84	3.307	84	3.307	140	5.512	12	.4724

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP7020		L3		L2		L1		D4	
									mm	inch	mm	inch	mm	inch	mm	inch
11.6	.4567				3	Int.	●	MMS1160X3DB	60	2.362	60	2.362	116	4.567	12	.4724
					5	Int.	●	1160X5DB	84	3.307	84	3.307	140	5.512	12	.4724
11.7	.4606				3	Int.	●	1170X3DB	60	2.362	60	2.362	116	4.567	12	.4724
					5	Int.	●	1170X5DB	84	3.307	84	3.307	140	5.512	12	.4724
11.8	.4646				3	Int.	●	1180X3DB	60	2.362	60	2.362	116	4.567	12	.4724
					5	Int.	●	1180X5DB	84	3.307	84	3.307	140	5.512	12	.4724
11.9	.4685	15/32			3	Int.	●	1190X3DB	60	2.362	60	2.362	116	4.567	12	.4724
					5	Int.	●	1190X5DB	84	3.307	84	3.307	140	5.512	12	.4724
12.0	.4724			M14x2.0	3	Int.	●	1200X3DB	60	2.362	60	2.362	116	4.567	12	.4724
					5	Int.	●	1200X5DB	84	3.307	84	3.307	140	5.512	12	.4724
12.1	.4764				3	Int.	●	1210X3DB	63	2.480	66	2.598	122	4.803	14	.5512
					5	Int.	●	1210X5DB	88	3.465	92	3.622	148	5.827	14	.5512
12.2	.4803				3	Int.	●	1220X3DB	63	2.480	66	2.598	122	4.803	14	.5512
					5	Int.	●	1220X5DB	88	3.465	92	3.622	148	5.827	14	.5512
12.3	.4843	31/64		9/16-12	3	Int.	●	1230X3DB	63	2.480	66	2.598	122	4.803	14	.5512
					5	Int.	●	1230X5DB	88	3.465	92	3.622	148	5.827	14	.5512
12.4	.4882				3	Int.	●	1240X3DB	63	2.480	66	2.598	122	4.803	14	.5512
					5	Int.	●	1240X5DB	88	3.465	92	3.622	148	5.827	14	.5512
12.5	.4921			M14x1.5	3	Int.	●	1250X3DB	63	2.480	66	2.598	122	4.803	14	.5512
					5	Int.	●	1250X5DB	88	3.465	92	3.622	148	5.827	14	.5512
12.6	.4961				3	Int.	●	1260X3DB	65	2.559	66	2.598	122	4.803	14	.5512
					5	Int.	●	1260X5DB	91	3.583	92	3.622	148	5.827	14	.5512
12.7	.5000	1/2			3	Int.	●	1270X3DB	65	2.559	66	2.598	122	4.803	14	.5512
					5	Int.	●	1270X5DB	91	3.583	92	3.622	148	5.827	14	.5512
12.8	.5039				3	Int.	●	1280X3DB	65	2.559	66	2.598	122	4.803	14	.5512
					5	Int.	●	1280X5DB	91	3.583	92	3.622	148	5.827	14	.5512
12.9	.5079				3	Int.	●	1290X3DB	65	2.559	66	2.598	122	4.803	14	.5512
					5	Int.	●	1290X5DB	91	3.583	92	3.622	148	5.827	14	.5512
13.0	.5118				3	Int.	●	1300X3DB	65	2.559	66	2.598	122	4.803	14	.5512
					5	Int.	●	1300X5DB	91	3.583	92	3.622	148	5.827	14	.5512
13.1	.5157	33/64		9/16-18	3	Int.	●	1310X3DB	68	2.677	70	2.756	126	4.961	14	.5512
					5	Int.	●	1310X5DB	95	3.740	98	3.858	154	6.063	14	.5512
13.2	.5197				3	Int.	●	1320X3DB	68	2.677	70	2.756	126	4.961	14	.5512
					5	Int.	●	1320X5DB	95	3.740	98	3.858	154	6.063	14	.5512
13.3	.5236				3	Int.	●	1330X3DB	68	2.677	70	2.756	126	4.961	14	.5512
					5	Int.	●	1330X5DB	95	3.740	98	3.858	154	6.063	14	.5512
13.4	.5276				3	Int.	●	1340X3DB	68	2.677	70	2.756	126	4.961	14	.5512
					5	Int.	●	1340X5DB	95	3.740	98	3.858	154	6.063	14	.5512
13.5	.5315	17/32		5/8-11	3	Int.	●	1350X3DB	68	2.677	70	2.756	126	4.961	14	.5512
					5	Int.	●	1350X5DB	95	3.740	98	3.858	154	6.063	14	.5512
13.6	.5354				3	Int.	●	1360X3DB	70	2.756	70	2.756	126	4.961	14	.5512
					5	Int.	●	1360X5DB	98	3.858	98	3.858	154	6.063	14	.5512
13.7	.5394				3	Int.	●	1370X3DB	70	2.756	70	2.756	126	4.961	14	.5512
					5	Int.	●	1370X5DB	98	3.858	98	3.858	154	6.063	14	.5512
13.8	.5433				3	Int.	●	1380X3DB	70	2.756	70	2.756	126	4.961	14	.5512
					5	Int.	●	1380X5DB	98	3.858	98	3.858	154	6.063	14	.5512
NEW 13.891	.5469	35/64			3	Int.	●	1389X3D140	70	2.756	70	2.756	126	4.961	14	.5512
					5	Int.	●	1389X5D140	98	3.858	98	3.858	154	6.063	14	.5512

CUTTING CONDITIONS ➤ L091 TECHNICAL DATA ➤ N001

MMS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP7020		L3		L2		L1		D4	
									mm	inch	mm	inch	mm	inch	mm	inch
13.9	.5472				3	Int.	●	MMS1390X3DB	70	2.756	70	2.756	126	4.961	14	.5512
					5	Int.	●	1390X5DB	98	3.858	98	3.858	154	6.063	14	.5512
14.0	.5512			M16x2.0	3	Int.	●	1400X3DB	70	2.756	70	2.756	126	4.961	14	.5512
					5	Int.	●	1400X5DB	98	3.858	98	3.858	154	6.063	14	.5512
14.1	.5551				3	Int.	●	1410X3DB	73	2.874	76	2.992	135	5.315	16	.6299
					5	Int.	●	1410X5DB	102	4.016	106	4.173	165	6.496	16	.6299
14.2	.5591				3	Int.	●	1420X3DB	73	2.874	76	2.992	135	5.315	16	.6299
					5	Int.	●	1420X5DB	102	4.016	106	4.173	165	6.496	16	.6299
NEW 14.288	.5625	9/16			3	Int.	●	1429X3D160	73	2.874	76	2.992	135	5.315	16	.6299
					5	Int.	●	1429X5D160	102	4.016	106	4.173	165	6.496	16	.6299
14.3	.5630				3	Int.	●	1430X3DB	73	2.874	76	2.992	135	5.315	16	.6299
					5	Int.	●	1430X5DB	102	4.016	106	4.173	165	6.496	16	.6299
14.4	.5670				3	Int.	●	1440X3DB	73	2.874	76	2.992	135	5.315	16	.6299
					5	Int.	●	1440X5DB	102	4.016	106	4.173	165	6.496	16	.6299
14.5	.5709			M16x1.5	3	Int.	●	1450X3DB	73	2.874	76	2.992	135	5.315	16	.6299
					5	Int.	●	1450X5DB	102	4.016	106	4.173	165	6.496	16	.6299
14.6	.5748				3	Int.	●	1460X3DB	75	2.953	76	2.992	135	5.315	16	.6299
					5	Int.	●	1460X5DB	105	4.134	106	4.173	165	6.496	16	.6299
NEW 14.684	.5781	37/64		5/8-18	3	Int.	●	1468X3D160	75	2.953	76	2.992	135	5.315	16	.6299
					5	Int.	●	1468X5D160	105	4.134	106	4.173	165	6.496	16	.6299
14.7	.5787				3	Int.	●	1470X3DB	75	2.953	76	2.992	135	5.315	16	.6299
					5	Int.	●	1470X5DB	105	4.134	106	4.173	165	6.496	16	.6299
14.8	.5827				3	Int.	●	1480X3DB	75	2.953	76	2.992	135	5.315	16	.6299
					5	Int.	●	1480X5DB	105	4.134	106	4.173	165	6.496	16	.6299
14.9	.5866				3	Int.	●	1490X3DB	75	2.953	76	2.992	135	5.315	16	.6299
					5	Int.	●	1490X5DB	105	4.134	106	4.173	165	6.496	16	.6299
15.0	.5906				3	Int.	●	1500X3DB	75	2.953	76	2.992	135	5.315	16	.6299
					5	Int.	●	1500X5DB	105	4.134	106	4.173	165	6.496	16	.6299
NEW 15.081	.5938	19/32			3	Int.	●	1508X3D160	78	3.071	80	3.150	139	5.472	16	.6299
					5	Int.	●	1508X5D160	109	4.291	112	4.409	171	6.732	16	.6299
15.1	.5945				3	Int.	●	1510X3DB	78	3.071	80	3.150	139	5.472	16	.6299
					5	Int.	●	1510X5DB	109	4.291	112	4.409	171	6.732	16	.6299
15.2	.5984				3	Int.	●	1520X3DB	78	3.071	80	3.150	139	5.472	16	.6299
					5	Int.	●	1520X5DB	109	4.291	112	4.409	171	6.732	16	.6299
15.3	.6024				3	Int.	●	1530X3DB	78	3.071	80	3.150	139	5.472	16	.6299
					5	Int.	●	1530X5DB	109	4.291	112	4.409	171	6.732	16	.6299
15.4	.6063				3	Int.	●	1540X3DB	78	3.071	80	3.150	139	5.472	16	.6299
					5	Int.	●	1540X5DB	109	4.291	112	4.409	171	6.732	16	.6299
NEW 15.478	.6094	39/64			3	Int.	●	1548X3D160	78	3.071	80	3.150	139	5.472	16	.6299
					5	Int.	●	1548X5D160	109	4.291	112	4.409	171	6.732	16	.6299
15.5	.6102			M18x2.5	3	Int.	●	1550X3DB	78	3.071	80	3.150	139	5.472	16	.6299
					5	Int.	●	1550X5DB	109	4.291	112	4.409	171	6.732	16	.6299
15.6	.6142				3	Int.	●	1560X3DB	80	3.150	80	3.150	139	5.472	16	.6299
					5	Int.	●	1560X5DB	112	4.409	112	4.409	171	6.732	16	.6299
15.7	.6181				3	Int.	●	1570X3DB	80	3.150	80	3.150	139	5.472	16	.6299
					5	Int.	●	1570X5DB	112	4.409	112	4.409	171	6.732	16	.6299
15.8	.6220				3	Int.	●	1580X3DB	80	3.150	80	3.150	139	5.472	16	.6299
					5	Int.	●	1580X5DB	112	4.409	112	4.409	171	6.732	16	.6299

(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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP7020		L3		L2		L1		D4	
									mm	inch	mm	inch	mm	inch	mm	inch
NEW 15.875	.6250	5/8			3	Int.	●	MMS1588X3D160	80	3.150	80	3.150	139	5.472	16	.6299
					5	Int.	●	1588X5D160	112	4.409	112	4.409	171	6.732	16	.6299
15.9	.6260				3	Int.	●	1590X3DB	80	3.150	80	3.150	139	5.472	16	.6299
					5	Int.	●	1590X5DB	112	4.409	112	4.409	171	6.732	16	.6299
16.0	.6299				3	Int.	●	1600X3DB	80	3.150	80	3.150	139	5.472	16	.6299
					5	Int.	●	1600X5DB	112	4.409	112	4.409	171	6.732	16	.6299
16.1	.6339				3	Int.	□	1610X3DB	83	3.268	86	3.386	145	5.709	18	.7087
					5	Int.	□	1610X5DB	116	4.567	120	4.724	179	7.047	18	.7087
16.2	.6378				3	Int.	□	1620X3DB	83	3.268	86	3.386	145	5.709	18	.7087
					5	Int.	□	1620X5DB	116	4.567	120	4.724	179	7.047	18	.7087
NEW 16.272	.6406	41/64			3	Int.	●	1627X3D180	83	3.268	86	3.386	145	5.709	18	.7087
					5	Int.	●	1627X5D180	116	4.567	120	4.724	179	7.047	18	.7087
16.3	.6417				3	Int.	□	1630X3DB	83	3.268	86	3.386	145	5.709	18	.7087
					5	Int.	□	1630X5DB	116	4.567	120	4.724	179	7.047	18	.7087
16.4	.6457				3	Int.	□	1640X3DB	83	3.268	86	3.386	145	5.709	18	.7087
					5	Int.	□	1640X5DB	116	4.567	120	4.724	179	7.047	18	.7087
16.5	.6496			M18x1.5	3	Int.	●	1650X3DB	83	3.268	86	3.386	145	5.709	18	.7087
					5	Int.	●	1650X5DB	116	4.567	120	4.724	179	7.047	18	.7087
16.6	.6535				3	Int.	□	1660X3DB	85	3.346	86	3.386	145	5.709	18	.7087
					5	Int.	□	1660X5DB	119	4.685	120	4.724	179	7.047	18	.7087
NEW 16.669	.6562	21/32		3/4-10	3	Int.	●	1667X3D180	85	3.346	86	3.386	145	5.709	18	.7087
					5	Int.	●	1667X5D180	119	4.685	120	4.724	179	7.047	18	.7087
16.7	.6575				3	Int.	□	1670X3DB	85	3.346	86	3.386	145	5.709	18	.7087
					5	Int.	□	1670X5DB	119	4.685	120	4.724	179	7.047	18	.7087
16.8	.6614				3	Int.	□	1680X3DB	85	3.346	86	3.386	145	5.709	18	.7087
					5	Int.	□	1680X5DB	119	4.685	120	4.724	179	7.047	18	.7087
16.9	.6654				3	Int.	□	1690X3DB	85	3.346	86	3.386	145	5.709	18	.7087
					5	Int.	□	1690X5DB	119	4.685	120	4.724	179	7.047	18	.7087
17.0	.6693		Tube sheet		3	Int.	●	1700X3DB	85	3.346	86	3.386	145	5.709	18	.7087
					5	Int.	●	1700X5DB	119	4.685	120	4.724	179	7.047	18	.7087
NEW 17.066	.6719	43/64			3	Int.	●	1707X3D180	88	3.465	90	3.543	149	5.866	18	.7087
					5	Int.	●	1707X5D180	123	4.843	126	4.961	185	7.283	18	.7087
17.1	.6732				3	Int.	□	1710X3DB	88	3.465	90	3.543	149	5.866	18	.7087
					5	Int.	□	1710X5DB	123	4.843	126	4.961	185	7.283	18	.7087
17.2	.6772				3	Int.	□	1720X3DB	88	3.465	90	3.543	149	5.866	18	.7087
					5	Int.	□	1720X5DB	123	4.843	126	4.961	185	7.283	18	.7087
17.3	.6811				3	Int.	□	1730X3DB	88	3.465	90	3.543	149	5.866	18	.7087
					5	Int.	□	1730X5DB	123	4.843	126	4.961	185	7.283	18	.7087
17.4	.6850				3	Int.	□	1740X3DB	88	3.465	90	3.543	149	5.866	18	.7087
					5	Int.	□	1740X5DB	123	4.843	126	4.961	185	7.283	18	.7087
NEW 17.463	.6875	11/16		3/4-16	3	Int.	●	1746X3D180	88	3.465	90	3.543	149	5.866	18	.7087
					5	Int.	●	1746X5D180	123	4.843	126	4.961	185	7.283	18	.7087
17.5	.6890			M20x2.5	3	Int.	●	1750X3DB	88	3.465	90	3.543	149	5.866	18	.7087
					5	Int.	●	1750X5DB	123	4.843	126	4.961	185	7.283	18	.7087
17.6	.6929				3	Int.	□	1760X3DB	90	3.543	90	3.543	149	5.866	18	.7087
					5	Int.	□	1760X5DB	126	4.961	126	4.961	185	7.283	18	.7087
17.7	.6969				3	Int.	□	1770X3DB	90	3.543	90	3.543	149	5.866	18	.7087
					5	Int.	□	1770X5DB	126	4.961	126	4.961	185	7.283	18	.7087

CUTTING CONDITIONS ➤ L091 TECHNICAL DATA ➤ N001

MMS

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP7020		L3		L2		L1		D4	
									mm	inch	mm	inch	mm	inch	mm	inch
17.8	.7008				3	Int.	□	MMS1780X3DB	90	3.543	90	3.543	149	5.866	18	.7087
					5	Int.	□	1780X5DB	126	4.961	126	4.961	185	7.283	18	.7087
NEW 17.859	.7031	45/64			3	Int.	●	1786X3D180	90	3.543	90	3.543	149	5.866	18	.7087
					5	Int.	●	1786X5D180	126	4.961	126	4.961	185	7.283	18	.7087
17.9	.7047				3	Int.	□	1790X3DB	90	3.543	90	3.543	149	5.866	18	.7087
					5	Int.	□	1790X5DB	126	4.961	126	4.961	185	7.283	18	.7087
18.0	.7087				3	Int.	●	1800X3DB	90	3.543	90	3.543	149	5.866	18	.7087
					5	Int.	●	1800X5DB	126	4.961	126	4.961	185	7.283	18	.7087
18.1	.7126				3	Int.	□	1810X3DB	93	3.661	96	3.780	157	6.181	20	.7874
					5	Int.	□	1810X5DB	130	5.118	134	5.276	195	7.677	20	.7874
18.2	.7165				3	Int.	□	1820X3DB	93	3.661	96	3.780	157	6.181	20	.7874
					5	Int.	□	1820X5DB	130	5.118	134	5.276	195	7.677	20	.7874
NEW 18.256	.7188	23/32			3	Int.	●	1826X3D200	93	3.661	96	3.780	157	6.181	20	.7874
					5	Int.	●	1826X5D200	130	5.118	134	5.276	195	7.677	20	.7874
18.3	.7205				3	Int.	□	1830X3DB	93	3.661	96	3.780	157	6.181	20	.7874
					5	Int.	□	1830X5DB	130	5.118	134	5.276	195	7.677	20	.7874
18.4	.7244				3	Int.	□	1840X3DB	93	3.661	96	3.780	157	6.181	20	.7874
					5	Int.	□	1840X5DB	130	5.118	134	5.276	195	7.677	20	.7874
18.5	.7283			M20x1.5	3	Int.	●	1850X3DB	93	3.661	96	3.780	157	6.181	20	.7874
					5	Int.	●	1850X5DB	130	5.118	134	5.276	195	7.677	20	.7874
18.6	.7323				3	Int.	□	1860X3DB	95	3.740	96	3.780	157	6.181	20	.7874
					5	Int.	□	1860X5DB	133	5.236	134	5.276	195	7.677	20	.7874
NEW 18.654	.7344	47/64			3	Int.	●	1865X3D200	95	3.740	96	3.780	157	6.181	20	.7874
					5	Int.	●	1865X5D200	133	5.236	134	5.276	195	7.677	20	.7874
18.7	.7362				3	Int.	□	1870X3DB	95	3.740	96	3.780	157	6.181	20	.7874
					5	Int.	□	1870X5DB	133	5.236	134	5.276	195	7.677	20	.7874
18.8	.7402				3	Int.	□	1880X3DB	95	3.740	96	3.780	157	6.181	20	.7874
					5	Int.	□	1880X5DB	133	5.236	134	5.276	195	7.677	20	.7874
18.9	.7441				3	Int.	□	1890X3DB	95	3.740	96	3.780	157	6.181	20	.7874
					5	Int.	□	1890X5DB	133	5.236	134	5.276	195	7.677	20	.7874
19.0	.7480				3	Int.	●	1900X3DB	95	3.740	96	3.780	157	6.181	20	.7874
					5	Int.	●	1900X5DB	133	5.236	134	5.276	195	7.677	20	.7874
NEW 19.050	.7500	3/4			3	Int.	●	1905X3D200	98	3.858	100	3.937	161	6.339	20	.7874
					5	Int.	●	1905X5D200	137	5.394	140	5.512	201	7.913	20	.7874
19.1	.7520				3	Int.	□	1910X3DB	98	3.858	100	3.937	161	6.339	20	.7874
					5	Int.	□	1910X5DB	137	5.394	140	5.512	201	7.913	20	.7874
19.2	.7559				3	Int.	□	1920X3DB	98	3.858	100	3.937	161	6.339	20	.7874
					5	Int.	□	1920X5DB	137	5.394	140	5.512	201	7.913	20	.7874
NEW 19.250	.7579		Tube sheet		3	Int.	●	1925X3D200	98	3.858	100	3.937	161	6.339	20	.7874
					5	Int.	●	1925X5D200	137	5.394	140	5.512	201	7.913	20	.7874
19.3	.7598				3	Int.	□	1930X3DB	98	3.858	100	3.937	161	6.339	20	.7874
					5	Int.	□	1930X5DB	137	5.394	140	5.512	201	7.913	20	.7874
19.4	.7638				3	Int.	□	1940X3DB	98	3.858	100	3.937	161	6.339	20	.7874
					5	Int.	□	1940X5DB	137	5.394	140	5.512	201	7.913	20	.7874
NEW 19.447	.7656	49/64		7/8-9	3	Int.	●	1945X3D200	98	3.858	100	3.937	161	6.339	20	.7874
					5	Int.	●	1945X5D200	137	5.394	140	5.512	201	7.913	20	.7874
19.5	.7677			M22x2.5	3	Int.	●	1950X3DB	98	3.858	100	3.937	161	6.339	20	.7874
					5	Int.	●	1950X5DB	137	5.394	140	5.512	201	7.913	20	.7874

(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.

Drill Diameter D1					Hole Depth	Coolant (Int./Ext.)	Stock	Order Number	Dimensions							
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Tread size	l/d		DP7020		L3		L2		L1		D4	
									mm	inch	mm	inch	mm	inch	mm	inch
19.6	.7717				3	Int.	□	MMS1960X3DB	100	3.937	100	3.937	161	6.339	20	.7874
					5	Int.	□	1960X5DB	140	5.512	140	5.512	201	7.913	20	.7874
19.7	.7756				3	Int.	□	1970X3DB	100	3.937	100	3.937	161	6.339	20	.7874
					5	Int.	□	1970X5DB	140	5.512	140	5.512	201	7.913	20	.7874
19.8	.7795				3	Int.	□	1980X3DB	100	3.937	100	3.937	161	6.339	20	.7874
					5	Int.	□	1980X5DB	140	5.512	140	5.512	201	7.913	20	.7874
NEW 19.844	.7812	25/32			3	Int.	●	1984X3D200	100	3.937	100	3.937	161	6.339	20	.7874
					5	Int.	●	1984X5D200	140	5.512	140	5.512	201	7.913	20	.7874
19.9	.7835				3	Int.	□	1990X3DB	100	3.937	100	3.937	161	6.339	20	.7874
					5	Int.	□	1990X5DB	140	5.512	140	5.512	201	7.913	20	.7874
20.0	.7874				3	Int.	●	2000X3DB	100	3.937	100	3.937	161	6.339	20	.7874
					5	Int.	●	2000X5DB	140	5.512	140	5.512	201	7.913	20	.7874

RECOMMENDED CUTTING CONDITIONS

MMS

Work Material	Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.			Austenitic Stainless Steel (>200HB) AISI 304LN, 316LN etc.		
Drill Dia. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min-1)	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min-1)	Feed (Min.—Max.) (IPR)
.1181	3.0	260	8400	.0051 (.0031—.0071)	195	6300	.0039 (.0020—.0059)
.1575	4.0	260	6300	.0059 (.0039—.0079)	190	4700	.0047 (.0031—.0071)
.1969	5.0	255	5000	.0059 (.0039—.0079)	195	3800	.0047 (.0031—.0071)
.2480	6.3	260	4000	.0067 (.0047—.0087)	195	3000	.0059 (.0039—.0079)
.3150	8.0	255	3100	.0075 (.0055—.0094)	190	2300	.0067 (.0047—.0087)
.3937	10.0	195	1900	.0079 (.0059—.0098)	155	1500	.0071 (.0051—.0091)
.4724	12.0	185	1500	.0083 (.0063—.0102)	160	1300	.0075 (.0055—.0094)
.6299	16.0	180	1100	.0087 (.0067—.0106)	150	900	.0079 (.0059—.0098)
.7874	20.0	185	900	.0091 (.0071—.0110)	145	700	.0083 (.0063—.0102)

Work Material	Duplex Steel (≤280HB) AISI 329 etc.			Ferritic, Martensitic Stainless Steel (≤200HB) AISI 410, 430 etc.		
Drill Dia. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min-1)	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min-1)	Feed (Min.—Max.) (IPR)
.1181	3.0	160	5300	.0039 (.0020—.0059)	260	8400	.0051 (.0031—.0071)
.1575	4.0	160	3900	.0047 (.0031—.0071)	260	6300	.0059 (.0039—.0079)
.1969	5.0	160	3100	.0047 (.0031—.0071)	255	5000	.0059 (.0039—.0079)
.2480	6.3	160	2500	.0059 (.0039—.0079)	260	4000	.0067 (.0047—.0087)
.3150	8.0	155	1900	.0067 (.0047—.0087)	255	3100	.0075 (.0055—.0094)
.3937	10.0	120	1200	.0071 (.0051—.0091)	195	1900	.0079 (.0059—.0098)
.4724	12.0	120	1000	.0075 (.0055—.0094)	185	1500	.0083 (.0063—.0102)
.6299	16.0	115	700	.0079 (.0059—.0098)	180	1100	.0087 (.0067—.0106)
.7874	20.0	120	600	.0083 (.0063—.0102)	185	900	.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 favourable 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. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.1181	**3.0**	195	6300	.0039 (.0020—.0059)	160	5300	.0039 (.0020—.0059)
.1575	**4.0**	190	4700	.0047 (.0031—.0071)	160	3900	.0047 (.0031—.0071)
.1969	**5.0**	195	3800	.0047 (.0031—.0071)	160	3100	.0047 (.0031—.0071)
.2480	**6.3**	195	3000	.0059 (.0039—.0079)	160	2500	.0059 (.0039—.0079)
.3150	**8.0**	190	2300	.0067 (.0047—.0087)	155	1900	.0067 (.0047—.0087)
.3937	**10.0**	155	1500	.0071 (.0051—.0091)	120	1200	.0071 (.0051—.0091)
.4724	**12.0**	160	1300	.0075 (.0055—.0094)	120	1000	.0075 (.0055—.0094)
.6299	**16.0**	150	900	.0079 (.0059—.0098)	115	700	.0079 (.0059—.0098)
.7874	**20.0**	145	700	.0083 (.0063—.0102)	120	600	.0083 (.0063—.0102)

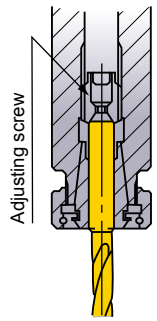
(Note 1) For stable machining, internal coolant supply with high pressure is recommended.
(Note 2) Emulsion type of water coolant is recommended.
(Note 3) Recommended cutting conditions are for machining under the conditions of favorable machining environment and coolant. Please lower the cutting conditions 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	
		AIS/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

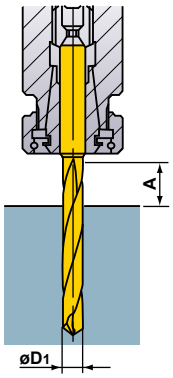
Operational Guidance for the MMS Drill

Drill holding



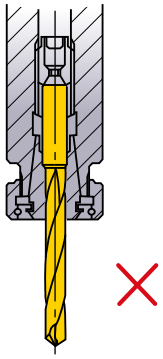
Thrust bearing type collet chuck holds the drill securely.

Drill holding



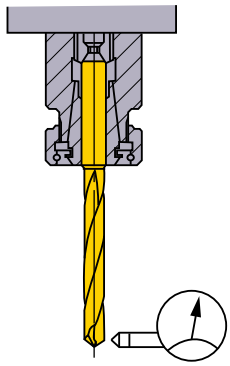
A : ≥ D1 x 1.5

Drill Installation



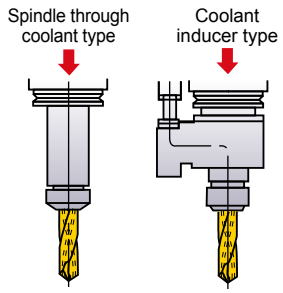
Do not clamp on the flutes.

Installation tolerance



Runout ≤ .001"

Through Coolant Type



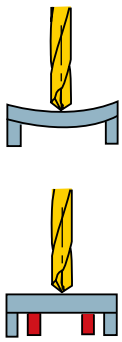
Coolant pressure is approx. 70 - 1015 PSI (0.5 - 7MPa).

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.

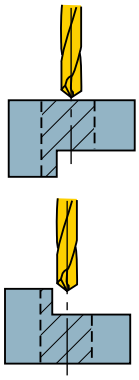
Thin workpieces



If bending occurs ×

Support the workpiece ○

Interrupted cutting



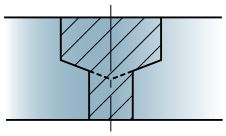
One process ○

①Lower the feed when drilling the interrupted part.

Requires prior machining △

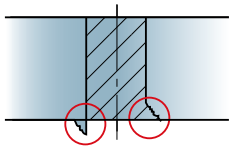
①Spot face with an end mill prior to drilling.

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.

MHS

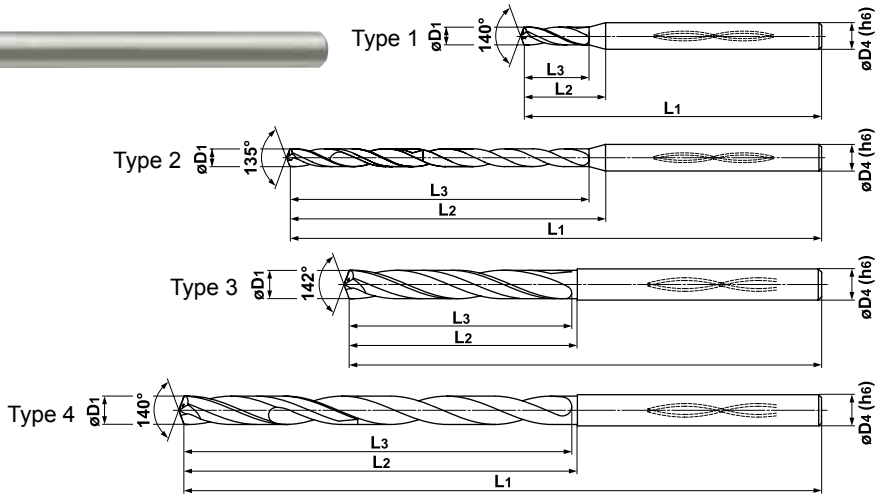
- High web strength compliments a stablizing double margin design.
- Long drill life and no-peck drilling in harderned steel up to HRC55.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
○	◎	○			○

Tolerance	D≤3	3<D≤6	6<D≤10	10<D≤12
D1 (mm)	+0.010 −0.002	+0.010 −0.002	+0.010 −0.005	+0.010 −0.008
D4 (mm)	0 −0.006	0 −0.008	0 −0.009	0 −0.011

METRIC STANDARD





(Note 1) MHS type can be used for shrink fit holders.
(Note 2) Use the shortest type in the respective diameter as a pilot drill.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
NEW	3	Int.	★	MHS0095L006B	6	9.8	60	3	1
	6	Int.	★	0095L009B	9	12.8	60	3	2
0.95	13	Int.	★	0095L015B	15	18.8	60	3	2
	23	Int.	★	0095L025B	25	28.8	60	3	2
	30	Int.	★	0095L035B	35	38.8	80	3	2
NEW	3	Int.	★	0100L006B	6	9.7	60	3	1
	6	Int.	★	0100L009B	9	12.7	60	3	2
1.00	12	Int.	★	0100L015B	15	18.7	60	3	2
	22	Int.	★	0100L025B	25	28.7	60	3	2
	30	Int.	★	0100L035B	35	38.7	80	3	2
NEW	2	Int.	★	0110L006B	6	9.5	60	3	1
	5	Int.	★	0110L009B	9	12.5	60	3	2
1.10	11	Int.	★	0110L015B	15	18.5	60	3	2
	20	Int.	★	0110L025B	25	28.5	60	3	2
	29	Int.	★	0110L035B	35	38.5	80	3	2
NEW	2	Int.	★	0120L006B	6	9.4	60	3	1
	5	Int.	★	0120L009B	9	12.4	60	3	2
1.20	10	Int.	★	0120L015B	15	18.4	60	3	2
	18	Int.	★	0120L025B	25	28.4	60	3	2
	26	Int.	★	0120L035B	35	38.4	80	3	2
NEW	2	Int.	★	0130L007B	7	10.2	60	3	1
	5	Int.	★	0130L011B	11	14.2	60	3	2
1.30	12	Int.	★	0130L020B	20	23.2	60	3	2
	20	Int.	★	0130L030B	30	33.2	80	3	2
	30	Int.	★	0130L045B	45	48.2	80	3	2

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
NEW	2	Int.	★	MHS0140L007B	7	10.0	60	3	1
	5	Int.	★	0140L011B	11	14.0	60	3	2
1.40	11	Int.	★	0140L020B	20	23.0	60	3	2
	18	Int.	★	0140L030B	30	33.0	80	3	2
	29	Int.	★	0140L045B	45	48.0	80	3	2
NEW	3	Int.	★	0145L008B	8	10.9	60	3	1
	6	Int.	★	0145L013B	13	15.9	60	3	2
1.45	11	Int.	★	0145L020B	20	22.9	60	3	2
	21	Int.	★	0145L035B	35	37.9	80	3	2
	30	Int.	★	0145L055B	55	57.9	100	3	2
NEW	2	Int.	★	0150L008B	8	10.8	60	3	1
	6	Int.	★	0150L01 3B	13	15.8	60	3	2
1.50	10	Int.	★	0150L020B	20	22.8	60	3	2
	20	Int.	★	0150L035B	35	37.8	80	3	2
	30	Int.	★	0150L055B	55	57.8	100	3	2
NEW	2	Int.	★	0160L008B	8	10.6	60	3	1
	5	Int.	★	0160L013B	13	15.6	60	3	2
1.60	10	Int.	★	0160L020B	20	22.6	60	3	2
	19	Int.	★	0160L035B	35	37.6	80	3	2
	30	Int.	★	0160L055B	55	57.6	100	3	2
NEW	2	Int.	★	0170L008B	8	10.4	60	3	1
	5	Int.	★	0170L013B	13	15.4	60	3	2
1.70	9	Int.	★	0170L020B	20	22.4	60	3	2
	18	Int.	★	0170L035B	35	37.4	80	3	2
	29	Int.	★	0170L055B	55	57.4	100	3	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 Dia. D_1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L_3	L_2	L_1	D_4	Type
NEW	3	Int.	★	**MHS0180L010B**	10	12.2	60	3	1
	5	Int.	★	**0180L015B**	15	17.2	60	3	2
1.80	11	Int.	★	**0180L025B**	25	27.2	60	3	2
	22	Int.	★	**0180L045B**	45	47.2	80	3	2
	30	Int.	★	**0180L065B**	65	67.2	100	3	2
NEW	2	Int.	★	**0190L010B**	10	12.1	60	3	1
	5	Int.	★	**0190L015B**	15	17.1	60	3	2
1.90	10	Int.	★	**0190L025B**	25	27.1	60	3	2
	21	Int.	★	**0190L045B**	45	47.1	80	3	2
	30	Int.	★	**0190L065B**	65	67.1	100	3	2
NEW	2	Int.	★	**0195L010B**	10	12.0	60	3	1
	5	Int.	★	**0195L015B**	15	17.0	60	3	2
1.95	10	Int.	★	**0195L025B**	25	27.0	60	3	2
	20	Int.	★	**0195L045B**	45	47.0	80	3	2
	30	Int.	★	**0195L065B**	65	67.0	100	3	2
NEW	2	Int.	★	**0200L010B**	10	11.9	60	3	1
	5	Int.	★	**0200L015B**	15	16.9	60	3	2
2.00	9	Int.	★	**0200L025B**	25	26.9	60	3	2
	20	Int.	★	**0200L045B**	45	46.9	80	3	2
	30	Int.	★	**0200L065B**	65	66.9	100	3	2
NEW	3	Int.	★	**0210L012B**	12	13.7	60	3	1
	7	Int.	★	**0210L020B**	20	21.7	60	3	2
2.10	11	Int.	★	**0210L030B**	30	31.7	80	3	2
	23	Int.	★	**0210L055B**	55	56.7	100	3	2
	30	Int.	★	**0210L075B**	75	76.7	120	3	2
NEW	2	Int.	★	**0220L012B**	12	13.5	60	3	1
	6	Int.	★	**0220L020B**	20	21.5	60	3	2
2.20	11	Int.	★	**0220L030B**	30	31.5	80	3	2
	22	Int.	★	**0220L055B**	55	56.5	100	3	2
	30	Int.	★	**0220L075B**	75	76.5	120	3	2
NEW	2	Int.	★	**0230L012B**	12	13.3	60	3	1
	6	Int.	★	**0230L020B**	20	21.3	60	3	2
2.30	10	Int.	★	**0230L030B**	30	31.3	80	3	2
	21	Int.	★	**0230L055B**	55	56.3	100	3	2
	30	Int.	★	**0230L075B**	75	76.3	120	3	2
NEW	2	Int.	★	**0240L012B**	12	13.1	60	3	1
	5	Int.	★	**0240L020B**	20	21.1	60	3	2
2.40	9	Int.	★	**0240L030B**	30	31.1	80	3	2
	20	Int.	★	**0240L055B**	55	56.1	100	3	2
	28	Int.	★	**0240L075B**	75	76.1	120	3	2
NEW	2	Int.	★	**0245L013B**	13	14.0	70	4	1
	5	Int.	★	**0245L020B**	20	21.0	70	4	2
2.45	11	Int.	★	**0245L035B**	35	36.0	90	4	2
	24	Int.	★	**0245L065B**	65	66.0	110	4	2
	30	Int.	★	**0245L090B**	90	91.0	140	4	2

Drill Dia. D_1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L_3	L_2	L_1	D_4	Type
NEW	2	Int.	★	**MHS0250L013B**	13	15.8	70	4	1
	5	Int.	★	**0250L020B**	20	22.8	70	4	2
2.50	11	Int.	★	**0250L035B**	35	37.8	90	4	2
	23	Int.	★	**0250L065B**	65	67.8	110	4	2
	30	Int.	★	**0250L090B**	90	92.8	140	4	2
NEW	2	Int.	★	**0260L013B**	13	15.6	70	4	1
	5	Int.	★	**0260L020B**	20	22.6	70	4	2
2.60	10	Int.	★	**0260L035B**	35	37.6	90	4	2
	22	Int.	★	**0260L065B**	65	67.6	110	4	2
	30	Int.	★	**0260L090B**	90	92.6	140	4	2
NEW	2	Int.	★	**0270L013B**	13	15.4	70	4	1
	4	Int.	★	**0270L020B**	20	22.4	70	4	2
2.70	10	Int.	★	**0270L035B**	35	37.4	90	4	2
	21	Int.	★	**0270L065B**	65	67.4	110	4	2
	30	Int.	★	**0270L090B**	90	92.4	140	4	2
NEW	2	Int.	★	**0280L014B**	14	16.2	70	4	1
	4	Int.	★	**0280L020B**	20	22.2	70	4	2
2.80	9	Int.	★	**0280L035B**	35	37.2	90	4	2
	20	Int.	★	**0280L065B**	65	67.2	110	4	2
	29	Int.	★	**0280L090B**	90	92.2	140	4	2
NEW	2	Int.	★	**0290L014B**	14	16.1	70	4	1
	4	Int.	★	**0290L020B**	20	22.1	70	4	2
2.90	9	Int.	★	**0290L035B**	35	37.1	90	4	2
	19	Int.	★	**0290L065B**	65	67.1	110	4	2
	28	Int.	★	**0290L090B**	90	92.1	140	4	2
NEW	2	Int.	★	**0295L014B**	14	16	70	4	1
	4	Int.	★	**0295L020B**	20	22	70	4	2
2.95	9	Int.	★	**0295L035B**	35	37	90	4	2
	19	Int.	★	**0295L065B**	65	67	110	4	2
	28	Int.	★	**0295L090B**	90	92	140	4	2
	4	Int.	★	**0300L020B**	19	20	70	4	3
	10	Int.	★	**0300L040B**	39	40	90	4	4
3.0	17	Int.	★	**0300L060B**	59	60	110	4	4
	27	Int.	★	**0300L090B**	89	90	140	4	4
	4	Int.	□	**0310L020B**	19.5	20	70	4	3
	10	Int.	□	**0310L040B**	39.5	40	90	4	4
3.1	17	Int.	□	**0310L060B**	59.5	60	110	4	4
	26	Int.	□	**0310L090B**	89.5	90	140	4	4
	4	Int.	□	**0320L020B**	19.5	20	70	4	3
	10	Int.	□	**0320L040B**	39.5	40	90	4	4
3.2	16	Int.	□	**0320L060B**	59.5	60	110	4	4
	25	Int.	□	**0320L090B**	89.5	90	140	4	4
	3	Int.	□	**0330L020B**	19.5	20	70	4	3
	9	Int.	□	**0330L040B**	39.5	40	90	4	4
3.3	16	Int.	□	**0330L060B**	59.5	60	110	4	4
	25	Int.	□	**0330L090B**	89.5	90	140	4	4

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MHS

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
3.4	3	Int.	□	MHS0340L020B	19.5	20	70	4	3
	9	Int.	□	0340L040B	39.5	40	90	4	4
	15	Int.	□	0340L060B	59.5	60	110	4	4
	24	Int.	□	0340L090B	89.5	90	140	4	4
3.5	3	Int.	★	0350L020B	19.5	20	70	4	3
	9	Int.	★	0350L040B	39.5	40	90	4	4
	14	Int.	★	0350L060B	59.5	60	110	4	4
	23	Int.	★	0350L090B	89.5	90	140	4	4
3.6	3	Int.	□	0360L020B	20	20	70	4	3
	9	Int.	□	0360L040B	40	40	90	4	4
	14	Int.	□	0360L060B	60	60	110	4	4
	22	Int.	□	0360L090B	90	90	140	4	4
	30	Int.	□	0360L120B	120	120	170	4	4
3.7	3	Int.	□	0370L020B	20	20	70	4	3
	8	Int.	□	0370L040B	40	40	90	4	4
	14	Int.	□	0370L060B	60	60	110	4	4
	22	Int.	□	0370L090B	90	90	140	4	4
	30	Int.	□	0370L120B	120	120	170	4	4
3.8	3	Int.	★	0380L020B	20	20	70	4	3
	8	Int.	★	0380L040B	40	40	90	4	4
	13	Int.	★	0380L060B	60	60	110	4	4
	21	Int.	★	0380L090B	90	90	140	4	4
	29	Int.	★	0380L120B	120	120	170	4	4
3.9	3	Int.	□	0390L020B	20	20	70	4	3
	8	Int.	□	0390L040B	40	40	90	4	4
	13	Int.	□	0390L060B	60	60	110	4	4
	21	Int.	□	0390L090B	90	90	140	4	4
	28	Int.	□	0390L120B	120	120	170	4	4
4.0	2	Int.	★	0400L020B	20	20	70	4	3
	7	Int.	★	0400L040B	40	40	90	4	4
	12	Int.	★	0400L060B	60	60	110	4	4
	20	Int.	★	0400L090B	90	90	140	4	4
	27	Int.	★	0400L120B	120	120	170	4	4
4.1	2	Int.	□	0410L020B	18.5	20	70	6	3
	7	Int.	□	0410L040B	38.5	40	90	6	4
	12	Int.	□	0410L060B	58.5	60	110	6	4
	19	Int.	□	0410L090B	88.5	90	140	6	4
	26	Int.	□	0410L120B	118.5	120	170	6	4
4.2	2	Int.	□	0420L020B	18.5	20	70	6	3
	7	Int.	□	0420L040B	38.5	40	90	6	4
	11	Int.	□	0420L060B	58.5	60	110	6	4
	19	Int.	□	0420L090B	88.5	90	140	6	4
	26	Int.	□	0420L120B	118.5	120	170	6	4
4.3	2	Int.	□	MHS0430L020B	18.5	20	70	6	3
	6	Int.	□	0430L040B	38.5	40	90	6	4
	11	Int.	□	0430L060B	58.5	60	110	6	4
	18	Int.	□	0430L090B	88.5	90	140	6	4
	25	Int.	□	0430L120B	118.5	120	170	6	4
4.4	2	Int.	□	0440L020B	18.5	20	70	6	3
	6	Int.	□	0440L040B	38.5	40	90	6	4
	11	Int.	□	0440L060B	58.5	60	110	6	4
	18	Int.	□	0440L090B	88.5	90	140	6	4
	24	Int.	□	0440L120B	118.5	120	170	6	4
4.5	2	Int.	★	0450L020B	18.5	20	70	6	3
	6	Int.	★	0450L040B	38.5	40	90	6	4
	10	Int.	★	0450L060B	58.5	60	110	6	4
	17	Int.	★	0450L090B	88.5	90	140	6	4
	24	Int.	★	0450L120B	118.5	120	170	6	4
4.6	2	Int.	□	0460L020B	19	20	70	6	3
	6	Int.	□	0460L040B	39	40	90	6	4
	10	Int.	□	0460L060B	59	60	110	6	4
	17	Int.	□	0460L090B	89	90	140	6	4
	23	Int.	□	0460L120B	119	120	170	6	4
	30	Int.	□	0460L150B	149	150	200	6	4
4.7	2	Int.	□	0470L020B	19	20	70	6	3
	6	Int.	□	0470L040B	39	40	90	6	4
	10	Int.	□	0470L060B	59	60	110	6	4
	16	Int.	□	0470L090B	89	90	140	6	4
	23	Int.	□	0470L120B	119	120	170	6	4
	29	Int.	□	0470L150B	149	150	200	6	4
4.8	1	Int.	★	0480L020B	19	20	70	6	3
	6	Int.	★	0480L040B	39	40	90	6	4
	10	Int.	★	0480L060B	59	60	110	6	4
	16	Int.	★	0480L090B	89	90	140	6	4
	22	Int.	★	0480L120B	119	120	170	6	4
	29	Int.	★	0480L150B	149	150	200	6	4
4.9	1	Int.	□	0490L020B	19	20	70	6	3
	5	Int.	□	0490L040B	39	40	90	6	4
	10	Int.	□	0490L060B	59	60	110	6	4
	16	Int.	□	0490L090B	89	90	140	6	4
	22	Int.	□	0490L120B	119	120	170	6	4
	28	Int.	□	0490L150B	149	150	200	6	4
5.0	1	Int.	★	0500L020B	19	20	70	6	3
	5	Int.	★	0500L040B	39	40	90	6	4
	9	Int.	★	0500L060B	59	60	110	6	4
	15	Int.	★	0500L090B	89	90	140	6	4
	21	Int.	★	0500L120B	119	120	170	6	4
	27	Int.	★	0500L150B	149	150	200	6	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 Dia. D_1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L_3	L_2	L_1	D_4	Type
	3	Int.	□	**MHS0510L030B**	29.5	30	80	6	3
	9	Int.	□	**0510L060B**	59.5	60	110	6	4
5.1	15	Int.	□	**0510L090B**	89.5	90	140	6	4
	21	Int.	□	**0510L120B**	119.5	120	170	6	4
	27	Int.	□	**0510L150B**	149.5	150	200	6	4
	3	Int.	□	**0520L030B**	29.5	30	80	6	3
	9	Int.	□	**0520L060B**	59.5	60	110	6	4
5.2	15	Int.	□	**0520L090B**	89.5	90	140	6	4
	20	Int.	□	**0520L120B**	119.5	120	170	6	4
	26	Int.	□	**0520L150B**	149.5	150	200	6	4
	3	Int.	□	**0530L030B**	29.5	30	80	6	3
	9	Int.	□	**0530L060B**	59.5	60	110	6	4
5.3	14	Int.	□	**0530L090B**	89.5	90	140	6	4
	20	Int.	□	**0530L120B**	119.5	120	170	6	4
	26	Int.	□	**0530L150B**	149.5	150	200	6	4
	3	Int.	□	**0540L030B**	29.5	30	80	6	3
	9	Int.	□	**0540L060B**	59.5	60	110	6	4
5.4	14	Int.	□	**0540L090B**	89.5	90	140	6	4
	20	Int.	□	**0540L120B**	119.5	120	170	6	4
	25	Int.	□	**0540L150B**	149.5	150	200	6	4
	3	Int.	★	**0550L030B**	29.5	30	80	6	3
	8	Int.	★	**0550L060B**	59.5	60	110	6	4
5.5	14	Int.	★	**0550L090B**	89.5	90	140	6	4
	19	Int.	★	**0550L120B**	119.5	120	170	6	4
	25	Int.	★	**0550L150B**	149.5	150	200	6	4
	3	Int.	□	**0560L030B**	30	30	80	6	3
	8	Int.	□	**0560L060B**	60	60	110	6	4
5.6	14	Int.	□	**0560L090B**	90	90	140	6	4
	19	Int.	□	**0560L120B**	120	120	170	6	4
	24	Int.	□	**0560L150B**	150	150	200	6	4
	3	Int.	□	**0570L030B**	30	30	80	6	3
	8	Int.	□	**0570L060B**	60	60	110	6	4
5.7	13	Int.	□	**0570L090B**	90	90	140	6	4
	19	Int.	□	**0570L120B**	120	120	170	6	4
	24	Int.	□	**0570L150B**	150	150	200	6	4
	3	Int.	★	**0580L030B**	30	30	80	6	3
	8	Int.	★	**0580L060B**	60	60	110	6	4
5.8	13	Int.	★	**0580L090B**	90	90	140	6	4
	18	Int.	★	**0580L120B**	120	120	170	6	4
	23	Int.	★	**0580L150B**	150	150	200	6	4
	3	Int.	□	**0590L030B**	30	30	80	6	3
	8	Int.	□	**0590L060B**	60	60	110	6	4
5.9	13	Int.	□	**0590L090B**	90	90	140	6	4
	18	Int.	□	**0590L120B**	120	120	170	6	4
	23	Int.	□	**0590L150B**	150	150	200	6	4

Drill Dia. D_1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L_3	L_2	L_1	D_4	Type
	2	Int.	★	**MHS0600L030B**	30	30	80	6	3
	7	Int.	★	**0600L060B**	60	60	110	6	4
6.0	12	Int.	★	**0600L090B**	90	90	140	6	4
	17	Int.	★	**0600L120B**	120	120	170	6	4
	22	Int.	★	**0600L150B**	150	150	200	6	4
	2	Int.	□	**0610L030B**	28.5	30	80	8	3
	7	Int.	□	**0610L060B**	58.5	60	110	8	4
6.1	12	Int.	□	**0610L090B**	88.5	90	140	8	4
	17	Int.	□	**0610L120B**	118.5	120	170	8	4
	22	Int.	□	**0610L150B**	148.5	150	200	8	4
	2	Int.	□	**0620L030B**	28.5	30	80	8	3
	7	Int.	□	**0620L060B**	58.5	60	110	8	4
6.2	12	Int.	□	**0620L090B**	88.5	90	140	8	4
	17	Int.	□	**0620L120B**	118.5	120	170	8	4
	21	Int.	□	**0620L150B**	148.5	150	200	8	4
	2	Int.	□	**0630L030B**	28.5	30	80	8	3
	7	Int.	□	**0630L060B**	58.5	60	110	8	4
6.3	12	Int.	□	**0630L090B**	88.5	90	140	8	4
	16	Int.	□	**0630L120B**	118.5	120	170	8	4
	21	Int.	□	**0630L150B**	148.5	150	200	8	4
	2	Int.	□	**0640L030B**	28.5	30	80	8	3
	7	Int.	□	**0640L060B**	58.5	60	110	8	4
6.4	11	Int.	□	**0640L090B**	88.5	90	140	8	4
	16	Int.	□	**0640L120B**	118.5	120	170	8	4
	21	Int.	□	**0640L150B**	148.5	150	200	8	4
	2	Int.	★	**0650L030B**	28.5	30	80	8	3
	6	Int.	★	**0650L060B**	58.5	60	110	8	4
6.5	11	Int.	★	**0650L090B**	88.5	90	140	8	4
	16	Int.	★	**0650L120B**	118.5	120	170	8	4
	20	Int.	★	**0650L150B**	148.5	150	200	8	4
	2	Int.	□	**0660L030B**	29	30	80	8	3
	6	Int.	□	**0660L060B**	59	60	110	8	4
6.6	11	Int.	□	**0660L090B**	89	90	140	8	4
	16	Int.	□	**0660L120B**	119	120	170	8	4
	20	Int.	□	**0660L150B**	149	150	200	8	4
	28	Int.	□	**0660L200B**	199	200	250	8	4
	2	Int.	□	**0670L030B**	29	30	80	8	3
	6	Int.	□	**0670L060B**	59	60	110	8	4
6.7	11	Int.	□	**0670L090B**	89	90	140	8	4
	15	Int.	□	**0670L120B**	119	120	170	8	4
	20	Int.	□	**0670L150B**	149	150	200	8	4
	27	Int.	□	**0670L200B**	199	200	250	8	4

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TECHNICAL DATA ➤ N001

MHS

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
6.8	2	Int.	★	MHS0680L030B	29	30	80	8	3
	6	Int.	★	0680L060B	59	60	110	8	4
	11	Int.	★	0680L090B	89	90	140	8	4
	15	Int.	★	0680L120B	119	120	170	8	4
	19	Int.	★	0680L150B	149	150	200	8	4
	27	Int.	★	0680L200B	199	200	250	8	4
6.9	2	Int.	□	0690L030B	29	30	80	8	3
	6	Int.	□	0690L060B	59	60	110	8	4
	10	Int.	□	0690L090B	89	90	140	8	4
	15	Int.	□	0690L120B	119	120	170	8	4
	19	Int.	□	0690L150B	149	150	200	8	4
	26	Int.	□	0690L200B	199	200	250	8	4
7.0	2	Int.	★	0700L030B	29	30	80	8	3
	6	Int.	★	0700L060B	59	60	110	8	4
	10	Int.	★	0700L090B	89	90	140	8	4
	14	Int.	★	0700L120B	119	120	170	8	4
	19	Int.	★	0700L150B	149	150	200	8	4
	26	Int.	★	0700L200B	199	200	250	8	4
7.1	2	Int.	□	0710L030B	29.5	30	80	8	3
	6	Int.	□	0710L060B	59.5	60	110	8	4
	10	Int.	□	0710L090B	89.5	90	140	8	4
	14	Int.	□	0710L120B	119.5	120	170	8	4
	19	Int.	□	0710L150B	149.5	150	200	8	4
	26	Int.	□	0710L200B	199.5	200	250	8	4
7.2	2	Int.	□	0720L030B	29.5	30	80	8	3
	6	Int.	□	0720L060B	59.5	60	110	8	4
	10	Int.	□	0720L090B	89.5	90	140	8	4
	14	Int.	□	0720L120B	119.5	120	170	8	4
	18	Int.	□	0720L150B	149.5	150	200	8	4
	25	Int.	□	0720L200B	199.5	200	250	8	4
7.3	2	Int.	□	0730L030B	29.5	30	80	8	3
	6	Int.	□	0730L060B	59.5	60	110	8	4
	10	Int.	□	0730L090B	89.5	90	140	8	4
	14	Int.	□	0730L120B	119.5	120	170	8	4
	18	Int.	□	0730L150B	149.5	150	200	8	4
	25	Int.	□	0730L200B	199.5	200	250	8	4
7.4	1	Int.	□	0740L030B	29.5	30	80	8	3
	6	Int.	□	0740L060B	59.5	60	110	8	4
	10	Int.	□	0740L090B	89.5	90	140	8	4
	14	Int.	□	0740L120B	119.5	120	170	8	4
	18	Int.	□	0740L150B	149.5	150	200	8	4
	24	Int.	□	0740L200B	199.5	200	250	8	4
7.5	1	Int.	★	MHS0750L030B	29.5	30	80	8	3
	5	Int.	★	0750L060B	59.5	60	110	8	4
	9	Int.	★	0750L090B	89.5	90	140	8	4
	13	Int.	★	0750L120B	119.5	120	170	8	4
	17	Int.	★	0750L150B	149.5	150	200	8	4
	24	Int.	★	0750L200B	199.5	200	250	8	4
7.6	1	Int.	□	0760L030B	30	30	80	8	3
	5	Int.	□	0760L060B	60	60	110	8	4
	9	Int.	□	0760L090B	90	90	140	8	4
	13	Int.	□	0760L120B	120	120	170	8	4
	17	Int.	□	0760L150B	150	150	200	8	4
	24	Int.	□	0760L200B	200	200	250	8	4
	30	Int.	□	0760L250B	250	250	300	8	4
7.7	1	Int.	□	0770L030B	30	30	80	8	3
	5	Int.	□	0770L060B	60	60	110	8	4
	9	Int.	□	0770L090B	90	90	140	8	4
	13	Int.	□	0770L120B	120	120	170	8	4
	17	Int.	□	0770L150B	150	150	200	8	4
	23	Int.	□	0770L200B	200	200	250	8	4
	30	Int.	□	0770L250B	250	250	300	8	4
7.8	1	Int.	★	0780L030B	30	30	80	8	3
	5	Int.	★	0780L060B	60	60	110	8	4
	9	Int.	★	0780L090B	90	90	140	8	4
	13	Int.	★	0780L120B	120	120	170	8	4
	17	Int.	★	0780L150B	150	150	200	8	4
	23	Int.	★	0780L200B	200	200	250	8	4
	30	Int.	★	0780L250B	250	250	300	8	4
7.9	1	Int.	□	0790L030B	30	30	80	8	3
	5	Int.	□	0790L060B	60	60	110	8	4
	9	Int.	□	0790L090B	90	90	140	8	4
	13	Int.	□	0790L120B	120	120	170	8	4
	16	Int.	□	0790L150B	150	150	200	8	4
	23	Int.	□	0790L200B	200	200	250	8	4
	29	Int.	□	0790L250B	250	250	300	8	4
8.0	1	Int.	★	0800L030B	30	30	80	8	3
	5	Int.	★	0800L060B	60	60	110	8	4
	9	Int.	★	0800L090B	90	90	140	8	4
	12	Int.	★	0800L120B	120	120	170	8	4
	16	Int.	★	0800L150B	150	150	200	8	4
	22	Int.	★	0800L200B	200	200	250	8	4
	29	Int.	★	0800L250B	250	250	300	8	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 Dia. D_1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L_3	L_2	L_1	D_4	Type
8.1	2	Int.	□	**MHS0810L040B**	38.5	40	100	10	3
	8	Int.	□	**0810L090B**	88.5	90	150	10	4
	12	Int.	□	**0810L120B**	118.5	120	180	10	4
	16	Int.	□	**0810L150B**	148.5	150	210	10	4
	22	Int.	□	**0810L200B**	198.5	200	260	10	4
	28	Int.	□	**0810L250B**	248.5	250	310	10	4
8.2	2	Int.	□	**0820L040B**	38.5	40	100	10	3
	8	Int.	□	**0820L090B**	88.5	90	150	10	4
	12	Int.	□	**0820L120B**	118.5	120	180	10	4
	16	Int.	□	**0820L150B**	148.5	150	210	10	4
	22	Int.	□	**0820L200B**	198.5	200	260	10	4
	28	Int.	□	**0820L250B**	248.5	250	310	10	4
8.3	2	Int.	□	**0830L040B**	38.5	40	100	10	3
	8	Int.	□	**0830L090B**	88.5	90	150	10	4
	12	Int.	□	**0830L120B**	118.5	120	180	10	4
	15	Int.	□	**0830L150B**	148.5	150	210	10	4
	21	Int.	□	**0830L200B**	198.5	200	260	10	4
	27	Int.	□	**0830L250B**	248.5	250	310	10	4
8.4	2	Int.	□	**0840L040B**	38.5	40	100	10	3
	8	Int.	□	**0840L090B**	88.5	90	150	10	4
	12	Int.	□	**0840L120B**	118.5	120	180	10	4
	15	Int.	□	**0840L150B**	148.5	150	210	10	4
	21	Int.	□	**0840L200B**	198.5	200	260	10	4
	27	Int.	□	**0840L250B**	248.5	250	310	10	4
8.5	2	Int.	★	**0850L040B**	38.5	40	100	10	3
	8	Int.	★	**0850L090B**	88.5	90	150	10	4
	11	Int.	★	**0850L120B**	118.5	120	180	10	4
	15	Int.	★	**0850L150B**	148.5	150	210	10	4
	21	Int.	★	**0850L200B**	198.5	200	260	10	4
	27	Int.	★	**0850L250B**	248.5	250	310	10	4
8.6	2	Int.	□	**0860L040B**	39	40	100	10	3
	8	Int.	□	**0860L090B**	89	90	150	10	4
	11	Int.	□	**0860L120B**	119	120	180	10	4
	15	Int.	□	**0860L150B**	149	150	210	10	4
	21	Int.	□	**0860L200B**	199	200	260	10	4
	26	Int.	□	**0860L250B**	249	250	310	10	4
8.7	2	Int.	□	**0870L040B**	39	40	100	10	3
	8	Int.	□	**0870L090B**	89	90	150	10	4
	11	Int.	□	**0870L120B**	119	120	180	10	4
	15	Int.	□	**0870L150B**	149	150	210	10	4
	20	Int.	□	**0870L200B**	199	200	260	10	4
	26	Int.	□	**0870L250B**	249	250	310	10	4

Drill Dia. D_1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L_3	L_2	L_1	D_4	Type
8.8	2	Int.	★	**MHS0880L040B**	39	40	100	10	3
	8	Int.	★	**0880L090B**	89	90	150	10	4
	11	Int.	★	**0880L120B**	119	120	180	10	4
	14	Int.	★	**0880L150B**	149	150	210	10	4
	20	Int.	★	**0880L200B**	199	200	260	10	4
	26	Int.	★	**0880L250B**	249	250	310	10	4
8.9	2	Int.	□	**0890L040B**	39	40	100	10	3
	7	Int.	□	**0890L090B**	89	90	150	10	4
	11	Int.	□	**0890L120B**	119	120	180	10	4
	14	Int.	□	**0890L150B**	149	150	210	10	4
	20	Int.	□	**0890L200B**	199	200	260	10	4
	25	Int.	□	**0890L250B**	249	250	310	10	4
9.0	2	Int.	★	**0900L040B**	39	40	100	10	3
	7	Int.	★	**0900L090B**	89	90	150	10	4
	11	Int.	★	**0900L120B**	119	120	180	10	4
	14	Int.	★	**0900L150B**	149	150	210	10	4
	20	Int.	★	**0900L200B**	199	200	260	10	4
	25	Int.	★	**0900L250B**	249	250	310	10	4
9.1	2	Int.	□	**0910L040B**	39.5	40	100	10	3
	7	Int.	□	**0910L090B**	89.5	90	150	10	4
	11	Int.	□	**0910L120B**	119.5	120	180	10	4
	14	Int.	□	**0910L150B**	149.5	150	210	10	4
	19	Int.	□	**0910L200B**	199.5	200	260	10	4
	25	Int.	□	**0910L250B**	249.5	250	310	10	4
	30	Int.	□	**0910L300B**	299.5	300	360	10	4
9.2	2	Int.	□	**0920L040B**	39.5	40	100	10	3
	7	Int.	□	**0920L090B**	89.5	90	150	10	4
	10	Int.	□	**0920L120B**	119.5	120	180	10	4
	14	Int.	□	**0920L150B**	149.5	150	210	10	4
	19	Int.	□	**0920L200B**	199.5	200	260	10	4
	25	Int.	□	**0920L250B**	249.5	250	310	10	4
	30	Int.	□	**0920L300B**	299.5	300	360	10	4
9.3	2	Int.	□	**0930L040B**	39.5	40	100	10	3
	7	Int.	□	**0930L090B**	89.5	90	150	10	4
	10	Int.	□	**0930L120B**	119.5	120	180	10	4
	14	Int.	□	**0930L150B**	149.5	150	210	10	4
	19	Int.	□	**0930L200B**	199.5	200	260	10	4
	24	Int.	□	**0930L250B**	249.5	250	310	10	4
	30	Int.	□	**0930L300B**	299.5	300	360	10	4

CUTTING CONDITIONS ➤ L103
HOW TO USE ➤ L104
TECHNICAL DATA ➤ N001

MHS

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
9.4	2	Int.	□	MHS0940L040B	39.5	40	100	10	3
	7	Int.	□	0940L090B	89.5	90	150	10	4
	10	Int.	□	0940L120B	119.5	120	180	10	4
	13	Int.	□	0940L150B	149.5	150	210	10	4
	19	Int.	□	0940L200B	199.5	200	260	10	4
	24	Int.	□	0940L250B	249.5	250	310	10	4
	29	Int.	□	0940L300B	299.5	300	360	10	4
9.5	2	Int.	★	0950L040B	39.5	40	100	10	3
	7	Int.	★	0950L090B	89.5	90	150	10	4
	10	Int.	★	0950L120B	119.5	120	180	10	4
	13	Int.	★	0950L150B	149.5	150	210	10	4
	18	Int.	★	0950L200B	199.5	200	260	10	4
	24	Int.	★	0950L250B	249.5	250	310	10	4
	29	Int.	★	0950L300B	299.5	300	360	10	4
9.6	2	Int.	□	0960L040B	40	40	100	10	3
	7	Int.	□	0960L090B	90	90	150	10	4
	10	Int.	□	0960L120B	120	120	180	10	4
	13	Int.	□	0960L150B	150	150	210	10	4
	18	Int.	□	0960L200B	200	200	260	10	4
	24	Int.	□	0960L250B	250	250	310	10	4
	29	Int.	□	0960L300B	300	300	360	10	4
9.7	2	Int.	□	0970L040B	40	40	100	10	3
	7	Int.	□	0970L090B	90	90	150	10	4
	10	Int.	□	0970L120B	120	120	180	10	4
	13	Int.	□	0970L150B	150	150	210	10	4
	18	Int.	□	0970L200B	200	200	260	10	4
	23	Int.	□	0970L250B	250	250	310	10	4
	28	Int.	□	0970L300B	300	300	360	10	4
9.8	2	Int.	★	0980L040B	40	40	100	10	3
	7	Int.	★	0980L090B	90	90	150	10	4
	10	Int.	★	0980L120B	120	120	180	10	4
	13	Int.	★	0980L150B	150	150	210	10	4
	18	Int.	★	0980L200B	200	200	260	10	4
	23	Int.	★	0980L250B	250	250	310	10	4
	28	Int.	★	0980L300B	300	300	360	10	4
9.9	2	Int.	□	0990L040B	40	40	100	10	3
	7	Int.	□	0990L090B	90	90	150	10	4
	10	Int.	□	0990L120B	120	120	180	10	4
	13	Int.	□	0990L150B	150	150	210	10	4
	18	Int.	□	0990L200B	200	200	260	10	4
	23	Int.	□	0990L250B	250	250	310	10	4
	28	Int.	□	0990L300B	300	300	360	10	4

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
10.0	1	Int.	★	MHS1000L040B	40	40	100	10	3
	6	Int.	★	1000L090B	90	90	150	10	4
	9	Int.	★	1000L120B	120	120	180	10	4
	12	Int.	★	1000L150B	150	150	210	10	4
	17	Int.	★	1000L200B	200	200	260	10	4
	22	Int.	★	1000L250B	250	250	310	10	4
	27	Int.	★	1000L300B	300	300	360	10	4
10.1	1	Int.	□	1010L040B	38.5	40	100	12	3
	6	Int.	□	1010L090B	88.5	90	150	12	4
	9	Int.	□	1010L120B	118.5	120	180	12	4
	12	Int.	□	1010L150B	148.5	150	210	12	4
	17	Int.	□	1010L200B	198.5	200	260	12	4
	22	Int.	□	1010L250B	248.5	250	310	12	4
	27	Int.	□	1010L300B	298.5	300	360	12	4
10.2	1	Int.	□	1020L040B	38.5	40	100	12	3
	6	Int.	□	1020L090B	88.5	90	150	12	4
	9	Int.	□	1020L120B	118.5	120	180	12	4
	12	Int.	□	1020L150B	148.5	150	210	12	4
	17	Int.	□	1020L200B	198.5	200	260	12	4
	22	Int.	□	1020L250B	248.5	250	310	12	4
	27	Int.	□	1020L300B	298.5	300	360	12	4
10.3	1	Int.	□	1030L040B	38.5	40	100	12	3
	6	Int.	□	1030L090B	88.5	90	150	12	4
	9	Int.	□	1030L120B	118.5	120	180	12	4
	12	Int.	□	1030L150B	148.5	150	210	12	4
	17	Int.	□	1030L200B	198.5	200	260	12	4
	22	Int.	□	1030L250B	248.5	250	310	12	4
	26	Int.	□	1030L300B	298.5	300	360	12	4
10.4	1	Int.	□	1040L040B	38.5	40	100	12	3
	6	Int.	□	1040L090B	88.5	90	150	12	4
	9	Int.	□	1040L120B	118.5	120	180	12	4
	12	Int.	□	1040L150B	148.5	150	210	12	4
	17	Int.	□	1040L200B	198.5	200	260	12	4
	21	Int.	□	1040L250B	248.5	250	310	12	4
	26	Int.	□	1040L300B	298.5	300	360	12	4
10.5	1	Int.	★	1050L040B	38.5	40	100	12	3
	6	Int.	★	1050L090B	88.5	90	150	12	4
	9	Int.	★	1050L120B	118.5	120	180	12	4
	12	Int.	★	1050L150B	148.5	150	210	12	4
	16	Int.	★	1050L200B	198.5	200	260	12	4
	21	Int.	★	1050L250B	248.5	250	310	12	4
	26	Int.	★	1050L300B	298.5	300	360	12	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 Dia. D_1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L_3	L_2	L_1	D_4	Type
	1	Int.	□	**MHS1060L040B**	39	40	100	12	3
	6	Int.	□	**1060L090B**	89	90	150	12	4
	9	Int.	□	**1060L120B**	119	120	180	12	4
10.6	12	Int.	□	**1060L150B**	149	150	210	12	4
	16	Int.	□	**1060L200B**	199	200	260	12	4
	21	Int.	□	**1060L250B**	249	250	310	12	4
	26	Int.	□	**1060L300B**	299	300	360	12	4
	1	Int.	□	**1070L040B**	39	40	100	12	3
	6	Int.	□	**1070L090B**	89	90	150	12	4
	9	Int.	□	**1070L120B**	119	120	180	12	4
10.7	11	Int.	□	**1070L150B**	149	150	210	12	4
	16	Int.	□	**1070L200B**	199	200	260	12	4
	21	Int.	□	**1070L250B**	249	250	310	12	4
	25	Int.	□	**1070L300B**	299	300	360	12	4
	1	Int.	★	**1080L040B**	39	40	100	12	3
	6	Int.	★	**1080L090B**	89	90	150	12	4
	9	Int.	★	**1080L120B**	119	120	180	12	4
10.8	11	Int.	★	**1080L150B**	149	150	210	12	4
	16	Int.	★	**1080L200B**	199	200	260	12	4
	21	Int.	★	**1080L250B**	249	250	310	12	4
	25	Int.	★	**1080L300B**	299	300	360	12	4
	1	Int.	□	**1090L040B**	39	40	100	12	3
	6	Int.	□	**1090L090B**	89	90	150	12	4
	8	Int.	□	**1090L120B**	119	120	180	12	4
10.9	11	Int.	□	**1090L150B**	149	150	210	12	4
	16	Int.	□	**1090L200B**	199	200	260	12	4
	20	Int.	□	**1090L250B**	249	250	310	12	4
	25	Int.	□	**1090L300B**	299	300	360	12	4
	1	Int.	★	**1100L040B**	39	40	100	12	3
	6	Int.	★	**1100L090B**	89	90	150	12	4
	8	Int.	★	**1100L120B**	119	120	180	12	4
11.0	11	Int.	★	**1100L150B**	149	150	210	12	4
	16	Int.	★	**1100L200B**	199	200	260	12	4
	20	Int.	★	**1100L250B**	249	250	310	12	4
	25	Int.	★	**1100L300B**	299	300	360	12	4
	1	Int.	□	**1110L040B**	39.5	40	100	12	3
	6	Int.	□	**1110L090B**	89.5	90	150	12	4
	8	Int.	□	**1110L120B**	119.5	120	180	12	4
11.1	11	Int.	□	**1110L150B**	149.5	150	210	12	4
	15	Int.	□	**1110L200B**	199.5	200	260	12	4
	20	Int.	□	**1110L250B**	249.5	250	310	12	4
	24	Int.	□	**1110L300B**	299.5	300	360	12	4

Drill Dia. D_1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L_3	L_2	L_1	D_4	Type
	1	Int.	□	**MHS1120L040B**	39.5	40	100	12	3
	5	Int.	□	**1120L090B**	89.5	90	150	12	4
	8	Int.	□	**1120L120B**	119.5	120	180	12	4
11.2	11	Int.	□	**1120L150B**	149.5	150	210	12	4
	15	Int.	□	**1120L200B**	199.5	200	260	12	4
	20	Int.	□	**1120L250B**	249.5	250	310	12	4
	24	Int.	□	**1120L300B**	299.5	300	360	12	4
	1	Int.	□	**1130L040B**	39.5	40	100	12	3
	5	Int.	□	**1130L090B**	89.5	90	150	12	4
	8	Int.	□	**1130L120B**	119.5	120	180	12	4
11.3	11	Int.	□	**1130L150B**	149.5	150	210	12	4
	15	Int.	□	**1130L200B**	199.5	200	260	12	4
	20	Int.	□	**1130L250B**	249.5	250	310	12	4
	24	Int.	□	**1130L300B**	299.5	300	360	12	4
	1	Int.	□	**1140L040B**	39.5	40	100	12	3
	5	Int.	□	**1140L090B**	89.5	90	150	12	4
	8	Int.	□	**1140L120B**	119.5	120	180	12	4
11.4	11	Int.	□	**1140L150B**	149.5	150	210	12	4
	15	Int.	□	**1140L200B**	199.5	200	260	12	4
	19	Int.	□	**1140L250B**	249.5	250	310	12	4
	24	Int.	□	**1140L300B**	299.5	300	360	12	4
	1	Int.	★	**1150L040B**	39.5	40	100	12	3
	5	Int.	★	**1150L090B**	89.5	90	150	12	4
	8	Int.	★	**1150L120B**	119.5	120	180	12	4
11.5	10	Int.	★	**1150L150B**	149.5	150	210	12	4
	15	Int.	★	**1150L200B**	199.5	200	260	12	4
	19	Int.	★	**1150L250B**	249.5	250	310	12	4
	24	Int.	★	**1150L300B**	299.5	300	360	12	4
	1	Int.	□	**1160L040B**	40	40	100	12	3
	5	Int.	□	**1160L090B**	90	90	150	12	4
	8	Int.	□	**1160L120B**	120	120	180	12	4
11.6	10	Int.	□	**1160L150B**	150	150	210	12	4
	15	Int.	□	**1160L200B**	200	200	260	12	4
	19	Int.	□	**1160L250B**	250	250	310	12	4
	23	Int.	□	**1160L300B**	300	300	360	12	4
	1	Int.	□	**1170L040B**	40	40	100	12	3
	5	Int.	□	**1170L090B**	90	90	150	12	4
	8	Int.	□	**1170L120B**	120	120	180	12	4
11.7	10	Int.	□	**1170L150B**	150	150	210	12	4
	15	Int.	□	**1170L200B**	200	200	260	12	4
	19	Int.	□	**1170L250B**	250	250	310	12	4
	23	Int.	□	**1170L300B**	300	300	360	12	4

CUTTING CONDITIONS ➤ L103
HOW TO USE ➤ L104
TECHNICAL DATA ➤ N001

MHS

Drill Dia. D_1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L_3	L_2	L_1	D_4	Type
	1	Int.	★	**MHS1180L040B**	40	40	100	12	3
	5	Int.	★	**1180L090B**	90	90	150	12	4
	8	Int.	★	**1180L120B**	120	120	180	12	4
11.8	10	Int.	★	**1180L150B**	150	150	210	12	4
	14	Int.	★	**1180L200B**	200	200	260	12	4
	19	Int.	★	**1180L250B**	250	250	310	12	4
	23	Int.	★	**1180L300B**	300	300	360	12	4
	1	Int.	□	**1190L040B**	40	40	100	12	3
	5	Int.	□	**1190L090B**	90	90	150	12	4
	8	Int.	□	**1190L120B**	120	120	180	12	4
11.9	10	Int.	□	**1190L150B**	150	150	210	12	4
	14	Int.	□	**1190L200B**	200	200	260	12	4
	19	Int.	□	**1190L250B**	250	250	310	12	4
	23	Int.	□	**1190L300B**	300	300	360	12	4
	1	Int.	★	**1200L040B**	40	40	100	12	3
	5	Int.	★	**1200L090B**	90	90	150	12	4
	7	Int.	★	**1200L120B**	120	120	180	12	4
12.0	10	Int.	★	**1200L150B**	150	150	210	12	4
	14	Int.	★	**1200L200B**	200	200	260	12	4
	18	Int.	★	**1200L250B**	250	250	310	12	4
	22	Int.	★	**1200L300B**	300	300	360	12	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.

HOW TO USE ➤ L104
TECHNICAL DATA ➤ N001

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.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
inch	mm						
.0394	**1.0**	130	12700	.0015 (.0008—.0016)	65	6300	.0011 (.0008—.0016)
.0472	**1.2**	160	13200	.0018 (.0010—.0020)	95	7900	.0013 (.0010—.0020)
.0630	**1.6**	195	11900	.0024 (.0012—.0026)	130	7900	.0017 (.0012—.0026)
.0787	**2.0**	230	11100	.0030 (.0016—.0031)	160	7900	.0021 (.0016—.0031)
.0984	**2.5**	260	10100	.0037 (.0020—.0039)	195	7600	.0026 (.0020—.0039)
.1260	**3.2**	260	7900	.0047 (.0028—.0051)	195	5900	.0035 (.0028—.0051)
.1575	**4.0**	260	6300	.0059 (.0035—.0043)	190	4700	.0043 (.0031—.0035)
.1969	**5.0**	260	5000	.0075 (.0043—.0055)	195	3800	.0055 (.0039—.0047)
.2480	**6.3**	260	4000	.0067 (.0055—.0071)	195	3000	.0059 (.0051—.0059)
.3150	**8.0**	255	3100	.0087 (.0071—.0091)	190	2300	.0075 (.0063—.0075)
.3937	**10.0**	255	2500	.0106 (.0087—.0110)	195	1900	.0094 (.0079—.0091)
.4724	**12.0**	260	2100	.0126 (.0106—.0134)	185	1500	.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.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
inch	mm						
.0394	**1.0**	65	6300	.0009 (.0008—.0012)	65	6300	.0007 (.0006—.0010)
.0472	**1.2**	95	7900	.0011 (.0008—.0014)	95	7900	.0009 (.0008—.0012)
.0630	**1.6**	130	7900	.0015 (.0012—.0018)	130	7900	.0012 (.0010—.0016)
.0787	**2.0**	160	7900	.0019 (.0014—.0024)	160	7900	.0015 (.0012—.0020)
.0984	**2.5**	195	7600	.0023 (.0018—.0030)	195	7600	.0019 (.0016—.0026)
.1260	**3.2**	195	5900	.0031 (.0024—.0035)	195	5900	.0024 (.0020—.0031)
.1575	**4.0**	190	4700	.0039 (.0028—.0039)	190	4700	.0031 (.0024—.0039)
.1969	**5.0**	195	3800	.0047 (.0035—.0051)	195	3800	.0039 (.0031—.0051)
.2480	**6.3**	195	3000	.0055 (.0043—.0063)	195	3000	.0043 (.0035—.0051)
.3150	**8.0**	190	2300	.0067 (.0055—.0079)	190	2300	.0055 (.0047—.0063)
.3937	**10.0**	195	1900	.0083 (.0067—.0098)	195	1900	.0071 (.0055—.0079)
.4724	**12.0**	185	1500	.0098 (.0083—.0118)	185	1500	.0083 (.0067—.0094)

Work Material		Hardened Steel (40-55HRC) Heat Resistant Alloy ASTM H13, AISI L6 Inconel718 etc.		
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
inch	mm			
.0394	**1.0**	30	3100	.0006 (.0006—.0008)
.0472	**1.2**	30	2600	.0007 (.0006—.0010)
.0630	**1.6**	30	1900	.0010 (.0008—.0012)
.0787	**2.0**	60	3100	.0013 (.0010—.0016)
.0984	**2.5**	65	2500	.0015 (.0012—.0020)
.1260	**3.2**	60	1900	.0024 (.0016—.0028)
.1575	**4.0**	95	2300	.0028 (.0020—.0031)
.1969	**5.0**	95	1900	.0031 (.0024—.0039)
.2480	**6.3**	95	1500	.0039 (.0031—.0043)
.3150	**8.0**	120	1500	.0047 (.0039—.0051)
.3937	**10.0**	120	1200	.0059 (.0051—.0067)
.4724	**12.0**	120	1000	.0071 (.0059—.0079)

(Note 1) When using the drill with alength 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)

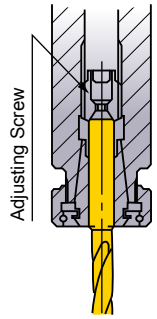
(Note 2) Use the shortest flute drill in the respective size as a pilot drill.

(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.

MHS

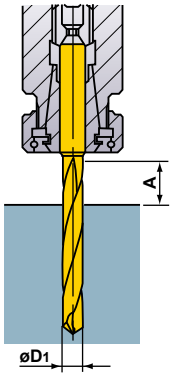
OPERATIONAL GUIDANCE FOR THE MHS DRILL

Drill Holding



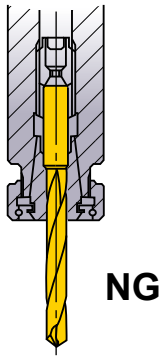
Thrust bearing type collet chuck holds the drill securely.

Drill Length



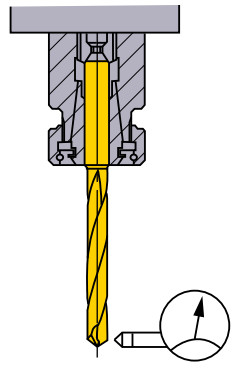
A ≥ D1 x 1.5

Drill Installation



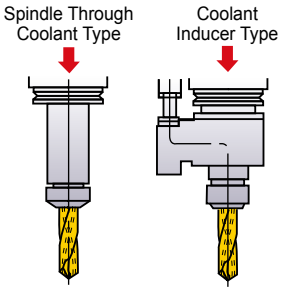
Do not clamp on the flutes.

Installation Tolerance



Runout ≤ .001″

Through Coolant Type



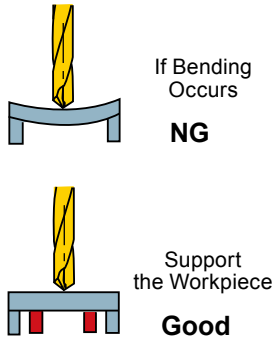
Recommended coolant pressure: 70 - 1015 PSI (0.5 - 7 MPa).

Coolant Handling

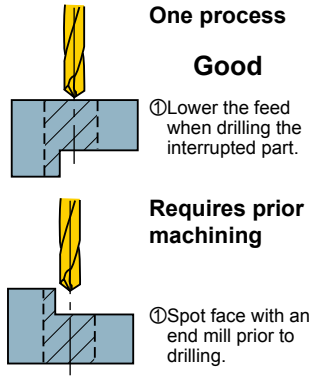
1) Small particles of swarf will jam in the oil hole of small diameter drills. Always use a fine mesh filter as a preventative measure.

2) Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended.

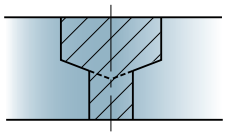
Thin Workpiece



Interrupted Cutting

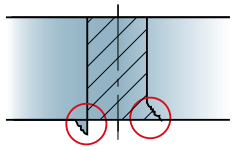


Stepped Holes



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



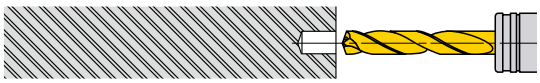
①Lower the feed rate when breaking through.
②Add a chamfer.
③Change the point angle.

OPERATIONAL GUIDANCE FOR THE MHS LONG TYPE DRILL (L/D≥10)

FLAT FACE DRILLING

●Drilling a blind hole

1. Drilling a pilot hole



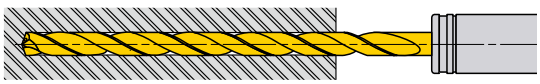
①Use a drill with a larger (flatter) point angle than the MHS drill.
Use the shortest flute possible.
②Ensure a high precision hole is drilled for the pilot.
③Drill depth : Approx 1D or deeper.
(Adjust the pilot hole depth according to the length of the MHS drill.)

2. Initial cutting with the long type drill



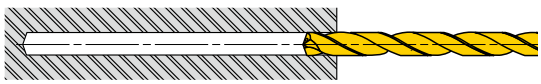
①Penetrate the pilot hole at a low revolution. (Cutting speed 65-100 SFM, feed rate .008-.012 IPR)
②Stop the long type drill .039-.118 inch short of the pilot hole bottom.

3. Drill the deep hole



①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

4. Drill retraction

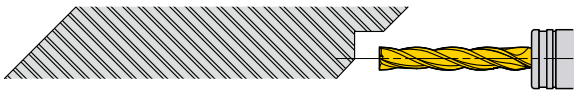


①After drilling, lower the cutting revolution about .039-.079 inch short of the hole end. (Cutting speed of around 65-100 SFM)
②Retract the drill to the pilot hole depth starting point at a feed rate of 120 inch/min.
③Finally clear the hole at a cutting speed of 65-100 SFM and feed rate of .008-.012 IPR.

IRREGULAR FACE DRILLING

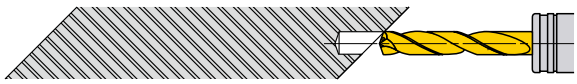
●Drilling and breaking through on irregular faces or angles

1. Spot facing



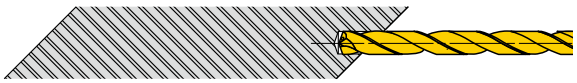
①Machine a flat on the irregular face by using an end mill or drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a pilot hole



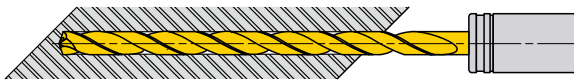
①Use a drill with a larger (flatter) point angle than the super long type.
Use the shortest flute possible.
②Ensure a high precision hole is drilled for the pilot.
③Drill depth : Approx 1D or deeper.
(Adjust the pilot hole depth according to the length of the super long type.)

3. Initial cutting with the long type drill



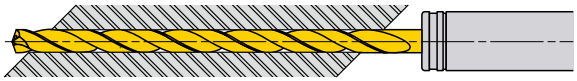
①Penetrate the pilot hole at a low revolution. (Cutting speed 65-100 SFM, feed rate .008-.012 IPR)
②Stop the long type drill .039-.118 inch short of the pilot hole bottom.

4. Drill the deep hole



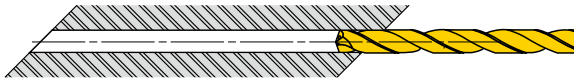
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

5. Breaking through



①When breaking through, the cutting edge can be damaged.
②A feed rate of .001-.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.

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.

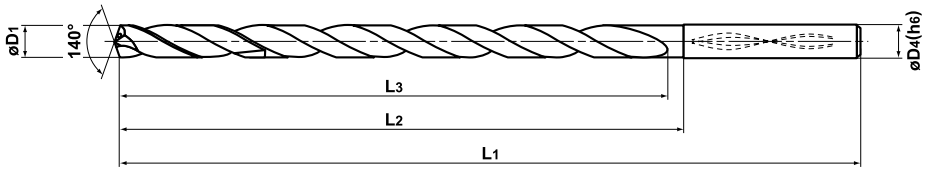
Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
				◎	

Tolerance	D=3	3<D≤6	6<D≤10	10<D≤14
D1 (mm)	0 −0.014	0 −0.018	0 −0.022	0 −0.027
D4 (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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock TF15	Order Number	Dimensions (mm) L3	L2	L1	D4
3.0	5	Int.	★	MNS0300LB	33	33	81	3.0
	10	Int.	★	0300X10DB	39	42	90	3.0
	20	Int.	★	0300X20DB	69	72	120	3.0
	30	Int.	★	0300X30DB	99	102	150	3.0
3.1	5	Int.	★	0310LB	39	39	87	4.0
	10	Int.	□	0310X10DB	46	49	97	4.0
	20	Int.	□	0310X20DB	81	84	132	4.0
	30	Int.	□	0310X30DB	116	119	167	4.0
3.2	5	Int.	★	0320LB	39	39	87	4.0
	10	Int.	★	0320X10DB	46	49	97	4.0
	20	Int.	★	0320X20DB	81	84	132	4.0
	30	Int.	★	0320X30DB	116	119	167	4.0
3.3	5	Int.	★	0330LB	39	39	87	4.0
	10	Int.	□	0330X10DB	46	49	97	4.0
	20	Int.	□	0330X20DB	81	84	132	4.0
	30	Int.	□	0330X30DB	116	119	167	4.0
3.4	5	Int.	★	0340LB	39	39	87	4.0
	10	Int.	★	0340X10DB	46	49	97	4.0
	20	Int.	★	0340X20DB	81	84	132	4.0
	30	Int.	★	0340X30DB	116	119	167	4.0
3.5	5	Int.	★	0350LB	39	39	87	4.0
	10	Int.	□	0350X10DB	46	49	97	4.0
	20	Int.	□	0350X20DB	81	84	132	4.0
	30	Int.	□	0350X30DB	116	119	167	4.0
3.6	5	Int.	★	0360LB	44	44	92	4.0
	10	Int.	★	0360X10DB	52	55	103	4.0
	20	Int.	★	0360X20DB	92	95	143	4.0
	30	Int.	★	0360X30DB	132	135	183	4.0
3.7	5	Int.	★	0370LB	44	44	92	4.0
	10	Int.	□	0370X10DB	52	55	103	4.0
	20	Int.	□	0370X20DB	92	95	143	4.0
	30	Int.	□	0370X30DB	132	135	183	4.0
3.8	5	Int.	★	MNS0380LB	44	44	92	4.0
	10	Int.	□	0380X10DB	52	55	103	4.0
	20	Int.	□	0380X20DB	92	95	143	4.0
	30	Int.	□	0380X30DB	132	135	183	4.0
3.9	5	Int.	★	0390LB	44	44	92	4.0
	10	Int.	★	0390X10DB	52	55	103	4.0
	20	Int.	★	0390X20DB	92	95	143	4.0
	30	Int.	★	0390X30DB	132	135	183	4.0
4.0	5	Int.	★	0400LB	44	44	92	4.0
	10	Int.	★	0400X10DB	52	55	103	4.0
	20	Int.	★	0400X20DB	92	95	143	4.0
	30	Int.	★	0400X30DB	132	135	183	4.0
4.1	5	Int.	★	0410LB	50	50	100	5.0
	10	Int.	□	0410X10DB	59	62	112	5.0
	20	Int.	□	0410X20DB	104	107	157	5.0
	30	Int.	□	0410X30DB	149	152	202	5.0
4.2	5	Int.	★	0420LB	50	50	100	5.0
	10	Int.	□	0420X10DB	59	62	112	5.0
	20	Int.	□	0420X20DB	104	107	157	5.0
	30	Int.	□	0420X30DB	149	152	202	5.0
4.3	5	Int.	★	0430LB	50	50	100	5.0
	10	Int.	□	0430X10DB	59	62	112	5.0
	20	Int.	□	0430X20DB	104	107	157	5.0
	30	Int.	□	0430X30DB	149	152	202	5.0
4.4	5	Int.	★	0440LB	50	50	100	5.0
	10	Int.	□	0440X10DB	59	62	112	5.0
	20	Int.	□	0440X20DB	104	107	157	5.0
	30	Int.	□	0440X30DB	149	152	202	5.0
4.5	5	Int.	★	0450LB	50	50	100	5.0
	10	Int.	□	0450X10DB	59	62	112	5.0
	20	Int.	□	0450X20DB	104	107	157	5.0
	30	Int.	□	0450X30DB	149	152	202	5.0

(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 Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock TF15	Order Number	Dimensions (mm) L3	L2	L1	D4
4.6	5	Int.	★	MNS0460LB	55	55	105	5.0
	10	Int.	□	0460X10DB	65	68	118	5.0
	20	Int.	□	0460X20DB	115	118	168	5.0
	30	Int.	□	0460X30DB	165	168	218	5.0
4.7	5	Int.	★	0470LB	55	55	105	5.0
	10	Int.	□	0470X10DB	65	68	118	5.0
	20	Int.	□	0470X20DB	115	118	168	5.0
	30	Int.	□	0470X30DB	165	168	218	5.0
4.8	5	Int.	★	0480LB	55	55	105	5.0
	10	Int.	□	0480X10DB	65	68	118	5.0
	20	Int.	□	0480X20DB	115	118	168	5.0
	30	Int.	□	0480X30DB	165	168	218	5.0
4.9	5	Int.	★	0490LB	55	55	105	5.0
	10	Int.	★	0490X10DB	65	68	118	5.0
	20	Int.	★	0490X20DB	115	118	168	5.0
	30	Int.	★	0490X30DB	165	168	218	5.0
5.0	5	Int.	★	0500LB	44	44	100	6.0
	10	Int.	★	0500X10DB	65	68	118	5.0
	20	Int.	★	0500X20DB	115	118	168	5.0
	30	Int.	★	0500X30DB	165	168	218	5.0
5.1	5	Int.	★	0510LB	44	44	100	6.0
	10	Int.	★	0510X10DB	72	75	127	6.0
	20	Int.	★	0510X20DB	127	130	182	6.0
	30	Int.	★	0510X30DB	182	185	237	6.0
5.2	5	Int.	★	0520LB	44	44	100	6.0
	10	Int.	□	0520X10DB	72	75	127	6.0
	20	Int.	□	0520X20DB	127	130	182	6.0
	30	Int.	□	0520X30DB	182	185	237	6.0
5.3	5	Int.	★	0530LB	44	44	100	6.0
	10	Int.	□	0530X10DB	72	75	127	6.0
	20	Int.	□	0530X20DB	127	130	182	6.0
	30	Int.	□	0530X30DB	182	185	237	6.0
5.4	5	Int.	★	0540LB	44	44	100	6.0
	10	Int.	□	0540X10DB	72	75	127	6.0
	20	Int.	□	0540X20DB	127	130	182	6.0
	30	Int.	□	0540X30DB	182	185	237	6.0
5.5	5	Int.	★	0550LB	44	44	100	6.0
	10	Int.	★	0550X10DB	72	75	127	6.0
	20	Int.	★	0550X20DB	127	130	182	6.0
	30	Int.	★	0550X30DB	182	185	237	6.0
5.6	5	Int.	★	0560LB	48	48	100	6.0
	10	Int.	□	0560X10DB	78	81	133	6.0
	20	Int.	□	0560X20DB	138	141	193	6.0
	30	Int.	□	0560X30DB	198	201	253	6.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock TF15	Order Number	Dimensions (mm) L3	L2	L1	D4
5.7	5	Int.	★	MNS0570LB	48	48	100	6.0
	10	Int.	□	0570X10DB	78	81	133	6.0
	20	Int.	□	0570X20DB	138	141	193	6.0
	30	Int.	□	0570X30DB	198	201	253	6.0
5.8	5	Int.	★	0580LB	48	48	100	6.0
	10	Int.	□	0580X10DB	78	81	133	6.0
	20	Int.	□	0580X20DB	138	141	193	6.0
	30	Int.	□	0580X30DB	198	201	253	6.0
5.9	5	Int.	★	0590LB	48	48	100	6.0
	10	Int.	□	0590X10DB	78	81	133	6.0
	20	Int.	□	0590X20DB	138	141	193	6.0
	30	Int.	□	0590X30DB	198	201	253	6.0
6.0	5	Int.	★	0600LB	48	48	100	6.0
	10	Int.	★	0600X10DB	78	81	133	6.0
	20	Int.	★	0600X20DB	138	141	193	6.0
	30	Int.	★	0600X30DB	198	201	253	6.0
6.1	5	Int.	★	0610LB	52	52	109	7.0
	10	Int.	★	0610X10DB	85	88	141	7.0
	20	Int.	★	0610X20DB	150	153	206	7.0
	30	Int.	★	0610X30DB	215	218	271	7.0
6.2	5	Int.	★	0620LB	52	52	109	7.0
	10	Int.	□	0620X10DB	85	88	141	7.0
	20	Int.	□	0620X20DB	150	153	206	7.0
	30	Int.	□	0620X30DB	215	218	271	7.0
6.3	5	Int.	★	0630LB	52	52	109	7.0
	10	Int.	□	0630X10DB	85	88	141	7.0
	20	Int.	□	0630X20DB	150	153	206	7.0
	30	Int.	□	0630X30DB	215	218	271	7.0
6.4	5	Int.	★	0640LB	52	52	109	7.0
	10	Int.	□	0640X10DB	85	88	141	7.0
	20	Int.	□	0640X20DB	150	153	206	7.0
	30	Int.	□	0640X30DB	215	218	271	7.0
6.5	5	Int.	★	0650LB	52	52	109	7.0
	10	Int.	★	0650X10DB	85	88	141	7.0
	20	Int.	★	0650X20DB	150	153	206	7.0
	30	Int.	★	0650X30DB	215	218	271	7.0
6.6	5	Int.	★	0660LB	56	56	109	7.0
	10	Int.	□	0660X10DB	91	94	147	7.0
	20	Int.	□	0660X20DB	161	164	217	7.0
	30	Int.	□	0660X30DB	231	234	287	7.0
6.7	5	Int.	★	0670LB	56	56	109	7.0
	10	Int.	★	0670X10DB	91	94	147	7.0
	20	Int.	★	0670X20DB	161	164	217	7.0
	30	Int.	★	0670X30DB	231	234	287	7.0

CUTTING CONDITIONS ➤ L111
HOW TO USE ➤ L113
TECHNICAL DATA ➤ N001

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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock TF15	Order Number	Dimensions (mm) L3	L2	L1	D4
6.8	5	Int.	★	MNS0680LB	56	56	109	7.0
	10	Int.	□	0680X10DB	91	94	147	7.0
	20	Int.	□	0680X20DB	161	164	217	7.0
	30	Int.	□	0680X30DB	231	234	287	7.0
6.9	5	Int.	★	0690LB	56	56	109	7.0
	10	Int.	□	0690X10DB	91	94	147	7.0
	20	Int.	□	0690X20DB	161	164	217	7.0
	30	Int.	□	0690X30DB	231	234	287	7.0
7.0	5	Int.	★	0700LB	56	56	109	7.0
	10	Int.	★	0700X10DB	91	94	147	7.0
	20	Int.	★	0700X20DB	161	164	217	7.0
	30	Int.	★	0700X30DB	231	234	287	7.0
7.1	5	Int.	★	0710LB	60	64	118	8.0
	10	Int.	□	0710X10DB	98	101	155	8.0
	20	Int.	□	0710X20DB	173	176	230	8.0
	30	Int.	□	0710X30DB	248	251	305	8.0
7.2	5	Int.	★	0720LB	60	64	118	8.0
	10	Int.	★	0720X10DB	98	101	155	8.0
	20	Int.	★	0720X20DB	173	176	230	8.0
	30	Int.	★	0720X30DB	248	251	305	8.0
7.3	5	Int.	★	0730LB	60	64	118	8.0
	10	Int.	□	0730X10DB	98	101	155	8.0
	20	Int.	□	0730X20DB	173	176	230	8.0
	30	Int.	□	0730X30DB	248	251	305	8.0
7.4	5	Int.	★	0740LB	60	64	118	8.0
	10	Int.	□	0740X10DB	98	101	155	8.0
	20	Int.	□	0740X20DB	173	176	230	8.0
	30	Int.	□	0740X30DB	248	251	305	8.0
7.5	5	Int.	★	0750LB	60	64	118	8.0
	10	Int.	□	0750X10DB	98	101	155	8.0
	20	Int.	□	0750X20DB	173	176	230	8.0
	30	Int.	□	0750X30DB	248	251	305	8.0
7.6	5	Int.	★	0760LB	64	64	118	8.0
	10	Int.	□	0760X10DB	104	107	161	8.0
	20	Int.	□	0760X20DB	184	187	241	8.0
	30	Int.	□	0760X30DB	264	267	321	8.0
7.7	5	Int.	★	0770LB	64	64	118	8.0
	10	Int.	□	0770X10DB	104	107	161	8.0
	20	Int.	□	0770X20DB	184	187	241	8.0
	30	Int.	□	0770X30DB	264	267	321	8.0
7.8	5	Int.	★	0780LB	64	64	118	8.0
	10	Int.	★	0780X10DB	104	107	161	8.0
	20	Int.	★	0780X20DB	184	187	241	8.0
	30	Int.	★	0780X30DB	264	267	321	8.0
7.9	5	Int.	★	MNS0790LB	64	64	118	8.0
	10	Int.	□	0790X10DB	104	107	161	8.0
	20	Int.	□	0790X20DB	184	187	241	8.0
	30	Int.	□	0790X30DB	264	267	321	8.0
8.0	5	Int.	★	0800LB	64	64	118	8.0
	10	Int.	★	0800X10DB	104	107	161	8.0
	20	Int.	★	0800X20DB	184	187	241	8.0
	30	Int.	★	0800X30DB	264	267	321	8.0
8.1	5	Int.	★	0810LB	68	72	127	9.0
	10	Int.	□	0810X10DB	111	114	169	9.0
	20	Int.	□	0810X20DB	196	199	254	9.0
	30	Int.	□	0810X30DB	281	284	339	9.0
8.2	5	Int.	★	0820LB	68	72	127	9.0
	10	Int.	□	0820X10DB	111	114	169	9.0
	20	Int.	□	0820X20DB	196	199	254	9.0
	30	Int.	□	0820X30DB	281	284	339	9.0
8.3	5	Int.	★	0830LB	68	72	127	9.0
	10	Int.	□	0830X10DB	111	114	169	9.0
	20	Int.	□	0830X20DB	196	199	254	9.0
	30	Int.	□	0830X30DB	281	284	339	9.0
8.4	5	Int.	★	0840LB	68	72	127	9.0
	10	Int.	□	0840X10DB	111	114	169	9.0
	20	Int.	□	0840X20DB	196	199	254	9.0
	30	Int.	□	0840X30DB	281	284	339	9.0
8.5	5	Int.	★	0850LB	68	72	127	9.0
	10	Int.	□	0850X10DB	111	114	169	9.0
	20	Int.	□	0850X20DB	196	199	254	9.0
	30	Int.	□	0850X30DB	281	284	339	9.0
8.6	5	Int.	★	0860LB	72	72	127	9.0
	10	Int.	□	0860X10DB	117	120	175	9.0
	20	Int.	□	0860X20DB	207	210	265	9.0
	30	Int.	□	0860X30DB	297	300	355	9.0
8.7	5	Int.	★	0870LB	72	72	127	9.0
	10	Int.	□	0870X10DB	117	120	175	9.0
	20	Int.	□	0870X20DB	207	210	265	9.0
	30	Int.	□	0870X30DB	297	300	355	9.0
8.8	5	Int.	★	0880LB	72	72	127	9.0
	10	Int.	□	0880X10DB	117	120	175	9.0
	20	Int.	□	0880X20DB	207	210	265	9.0
	30	Int.	□	0880X30DB	297	300	355	9.0
8.9	5	Int.	★	0890LB	72	72	127	9.0
	10	Int.	□	0890X10DB	117	120	175	9.0
	20	Int.	□	0890X20DB	207	210	265	9.0
	30	Int.	□	0890X30DB	297	300	355	9.0

(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 Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock TF15	Order Number	Dimensions (mm) L3	L2	L1	D4
9.0	5	Int.	★	MNS0900LB	72	72	127	9.0
	10	Int.	★	0900X10DB	117	120	175	9.0
	20	Int.	★	0900X20DB	207	210	265	9.0
	30	Int.	★	0900X30DB	297	300	355	9.0
9.1	5	Int.	★	0910LB	76	80	136	10.0
	10	Int.	□	0910X10DB	124	127	182	10.0
	20	Int.	□	0910X20DB	219	222	277	10.0
	30	Int.	□	0910X30DB	314	317	372	10.0
9.2	5	Int.	★	0920LB	76	80	136	10.0
	10	Int.	□	0920X10DB	124	127	182	10.0
	20	Int.	□	0920X20DB	219	222	277	10.0
	30	Int.	□	0920X30DB	314	317	372	10.0
9.3	5	Int.	★	0930LB	76	80	136	10.0
	10	Int.	□	0930X10DB	124	127	182	10.0
	20	Int.	□	0930X20DB	219	222	277	10.0
	30	Int.	□	0930X30DB	314	317	372	10.0
9.4	5	Int.	★	0940LB	76	80	136	10.0
	10	Int.	□	0940X10DB	124	127	182	10.0
	20	Int.	□	0940X20DB	219	222	277	10.0
	30	Int.	□	0940X30DB	314	317	372	10.0
9.5	5	Int.	★	0950LB	76	80	136	10.0
	10	Int.	□	0950X10DB	124	127	182	10.0
	20	Int.	□	0950X20DB	219	222	277	10.0
	30	Int.	□	0950X30DB	314	317	372	10.0
9.6	5	Int.	★	0960LB	80	80	136	10.0
	10	Int.	□	0960X10DB	130	133	188	10.0
	20	Int.	□	0960X20DB	230	233	288	10.0
	30	Int.	□	0960X30DB	330	333	388	10.0
9.7	5	Int.	★	0970LB	80	80	136	10.0
	10	Int.	□	0970X10DB	130	133	188	10.0
	20	Int.	□	0970X20DB	230	233	288	10.0
	30	Int.	□	0970X30DB	330	333	388	10.0
9.8	5	Int.	★	0980LB	80	80	136	10.0
	10	Int.	★	0980X10DB	130	133	188	10.0
	20	Int.	★	0980X20DB	230	233	288	10.0
	30	Int.	★	0980X30DB	330	333	388	10.0
9.9	5	Int.	★	0990LB	80	80	136	10.0
	10	Int.	□	0990X10DB	130	133	188	10.0
	20	Int.	□	0990X20DB	230	233	288	10.0
	30	Int.	□	0990X30DB	330	333	388	10.0
10.0	5	Int.	★	1000LB	80	80	136	10.0
	10	Int.	★	1000X10DB	130	133	188	10.0
	20	Int.	★	1000X20DB	230	233	288	10.0
	30	Int.	★	1000X30DB	330	333	388	10.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock TF15	Order Number	Dimensions (mm) L3	L2	L1	D4
10.1	5	Int.	★	MNS1010LB	84	88	149	11.0
	10	Int.	□	1010X10DB	137	140	201	11.0
	20	Int.	□	1010X20DB	242	245	306	11.0
10.2	5	Int.	★	1020LB	84	88	149	11.0
	10	Int.	□	1020X10DB	137	140	201	11.0
	20	Int.	□	1020X20DB	242	245	306	11.0
10.3	5	Int.	★	1030LB	84	88	149	11.0
	10	Int.	□	1030X10DB	137	140	201	11.0
	20	Int.	□	1030X20DB	242	245	306	11.0
10.4	5	Int.	★	1040LB	84	88	149	11.0
	10	Int.	□	1040X10DB	137	140	201	11.0
	20	Int.	□	1040X20DB	242	245	306	11.0
10.5	5	Int.	★	1050LB	84	88	149	11.0
	10	Int.	★	1050X10DB	137	140	201	11.0
	20	Int.	★	1050X20DB	242	245	306	11.0
10.6	5	Int.	★	1060LB	88	88	149	11.0
	10	Int.	□	1060X10DB	143	146	207	11.0
	20	Int.	□	1060X20DB	253	256	317	11.0
10.7	5	Int.	★	1070LB	88	88	149	11.0
	10	Int.	□	1070X10DB	143	146	207	11.0
	20	Int.	□	1070X20DB	253	256	317	11.0
10.8	5	Int.	★	1080LB	88	88	149	11.0
	10	Int.	□	1080X10DB	143	146	207	11.0
	20	Int.	□	1080X20DB	253	256	317	11.0
10.9	5	Int.	★	1090LB	88	88	149	11.0
	10	Int.	□	1090X10DB	143	146	207	11.0
	20	Int.	□	1090X20DB	253	256	317	11.0
11.0	5	Int.	★	1100LB	88	88	149	11.0
	10	Int.	★	1100X10DB	143	146	207	11.0
	20	Int.	★	1100X20DB	253	256	317	11.0
11.1	5	Int.	★	1110LB	92	96	158	12.0
	10	Int.	□	1110X10DB	150	153	215	12.0
	20	Int.	□	1110X20DB	265	268	330	12.0
11.2	5	Int.	★	1120LB	92	96	158	12.0
	10	Int.	□	1120X10DB	150	153	215	12.0
	20	Int.	□	1120X20DB	265	268	330	12.0
11.3	5	Int.	★	1130LB	92	96	158	12.0
	10	Int.	□	1130X10DB	150	153	215	12.0
	20	Int.	□	1130X20DB	265	268	330	12.0
11.4	5	Int.	★	1140LB	92	96	158	12.0
	10	Int.	□	1140X10DB	150	153	215	12.0
	20	Int.	□	1140X20DB	265	268	330	12.0
11.5	5	Int.	★	1150LB	92	96	158	12.0
	10	Int.	□	1150X10DB	150	153	215	12.0
	20	Int.	□	1150X20DB	265	268	330	12.0

CUTTING CONDITIONS ➤ L111
HOW TO USE ➤ L113
TECHNICAL DATA ➤ N001

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.

Drill Dia. D_1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock TF15	Order Number	Dimensions (mm) L_3	L_2	L_1	D_4
	5	Int.	★	**MNS1160LB**	96	96	158	12.0
11.6	10	Int.	□	**1160X10DB**	156	159	221	12.0
	20	Int.	□	**1160X20DB**	276	279	341	12.0
	5	Int.	★	**1170LB**	96	96	158	12.0
11.7	10	Int.	□	**1170X10DB**	156	159	221	12.0
	20	Int.	□	**1170X20DB**	276	279	341	12.0
	5	Int.	★	**1180LB**	96	96	158	12.0
11.8	10	Int.	□	**1180X10DB**	156	159	221	12.0
	20	Int.	□	**1180X20DB**	276	279	341	12.0
	5	Int.	★	**1190LB**	96	96	158	12.0
11.9	10	Int.	□	**1190X10DB**	156	159	221	12.0
	20	Int.	□	**1190X20DB**	276	279	341	12.0
	5	Int.	★	**1200LB**	96	96	158	12.0
12.0	10	Int.	★	**1200X10DB**	156	159	221	12.0
	20	Int.	★	**1200X20DB**	276	279	341	12.0
	5	Int.	★	**1210LB**	100	104	167	13.0
12.1	10	Int.	□	**1210X10DB**	163	166	229	13.0
	20	Int.	□	**1210X20DB**	288	291	354	13.0
	5	Int.	★	**1220LB**	100	104	167	13.0
12.2	10	Int.	□	**1220X10DB**	163	166	229	13.0
	20	Int.	□	**1220X20DB**	288	291	354	13.0
	5	Int.	★	**1230LB**	100	104	167	13.0
12.3	10	Int.	□	**1230X10DB**	163	166	229	13.0
	20	Int.	□	**1230X20DB**	288	291	354	13.0
	5	Int.	★	**1240LB**	100	104	167	13.0
12.4	10	Int.	□	**1240X10DB**	163	166	229	13.0
	20	Int.	□	**1240X20DB**	288	291	354	13.0
	5	Int.	★	**1250LB**	100	104	167	13.0
12.5	10	Int.	□	**1250X10DB**	163	166	229	13.0
	20	Int.	□	**1250X20DB**	288	291	354	13.0
	5	Int.	★	**1260LB**	104	104	167	13.0
12.6	10	Int.	□	**1260X10DB**	169	172	235	13.0
	20	Int.	□	**1260X20DB**	299	302	365	13.0
	5	Int.	★	**1270LB**	104	104	167	13.0
12.7	10	Int.	□	**1270X10DB**	169	172	235	13.0
	20	Int.	□	**1270X20DB**	299	302	365	13.0
	5	Int.	★	**1280LB**	104	104	167	13.0
12.8	10	Int.	□	**1280X10DB**	169	172	235	13.0
	20	Int.	□	**1280X20DB**	299	302	365	13.0
	5	Int.	★	**1290LB**	104	104	167	13.0
12.9	10	Int.	□	**1290X10DB**	169	172	235	13.0
	20	Int.	□	**1290X20DB**	299	302	365	13.0
	5	Int.	★	**1300LB**	104	104	167	13.0
13.0	10	Int.	★	**1300X10DB**	169	172	235	13.0
	20	Int.	★	**1300X20DB**	299	302	365	13.0
	5	Int.	★	**MNS1310LB**	108	112	176	14.0
13.1	10	Int.	□	**1310X10DB**	176	179	243	14.0
	20	Int.	□	**1310X20DB**	311	314	378	14.0
	5	Int.	★	**1320LB**	108	112	176	14.0
13.2	10	Int.	□	**1320X10DB**	176	179	243	14.0
	20	Int.	□	**1320X20DB**	311	314	378	14.0
	5	Int.	★	**1330LB**	108	112	176	14.0
13.3	10	Int.	□	**1330X10DB**	176	179	243	14.0
	20	Int.	□	**1330X20DB**	311	314	378	14.0
	5	Int.	★	**1340LB**	108	112	176	14.0
13.4	10	Int.	□	**1340X10DB**	176	179	243	14.0
	20	Int.	□	**1340X20DB**	311	314	378	14.0
	5	Int.	★	**1350LB**	108	112	176	14.0
13.5	10	Int.	□	**1350X10DB**	176	179	243	14.0
	20	Int.	□	**1350X20DB**	311	314	378	14.0
	5	Int.	★	**1360LB**	112	112	176	14.0
13.6	10	Int.	□	**1360X10DB**	182	185	249	14.0
	20	Int.	□	**1360X20DB**	322	325	389	14.0
	5	Int.	★	**1370LB**	112	112	176	14.0
13.7	10	Int.	□	**1370X10DB**	182	185	249	14.0
	20	Int.	□	**1370X20DB**	322	325	389	14.0
	5	Int.	★	**1380LB**	112	112	176	14.0
13.8	10	Int.	□	**1380X10DB**	182	185	249	14.0
	20	Int.	□	**1380X20DB**	322	325	389	14.0
	5	Int.	★	**1390LB**	112	112	176	14.0
13.9	10	Int.	□	**1390X10DB**	182	185	249	14.0
	20	Int.	□	**1390X20DB**	322	325	389	14.0
	5	Int.	★	**1400LB**	112	112	176	14.0
14.0	10	Int.	★	**1400X10DB**	182	185	249	14.0
	20	Int.	★	**1400X20DB**	322	325	389	14.0

(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.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
inch	mm						
.1181	**3.0**	390	12700	.0039 (.0043—.0063)	390	12700	.0059 (.0063—.0083)
.1575	**4.0**	390	9500	.0059 (.0051—.0079)	390	9500	.0079 (.0079—.0106)
.1969	**5.0**	390	7600	.0079 (.0067—.0098)	390	7600	.0098 (.0098—.0130)
.2480	**6.3**	485	7500	.0098 (.0083—.0126)	485	7500	.0138 (.0126—.0165)
.3150	**8.0**	485	5900	.0118 (.0106—.0157)	485	5900	.0177 (.0157—.0209)
.3937	**10.0**	485	4700	.0157 (.0130—.0197)	485	4700	.0217 (.0197—.0264)
.4724	**12.0**	655	5300	.0197 (.0157—.0236)	655	5300	.0276 (.0236—.0315)
.5512	**14.0**	650	4500	.0197 (.0157—.0236)	650	4500	.0276 (.0236—.0315)

Work Material		Aluminium Alloy (Si>10%) ASTM 380.0, A390.0 etc.		
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
inch	mm			
.1181	**3.0**	390	12700	.0059 (.0063—.0083)
.1575	**4.0**	390	9500	.0079 (.0079—.0106)
.1969	**5.0**	390	7600	.0098 (.0098—.0130)
.2480	**6.3**	485	7500	.0138 (.0126—.0165)
.3150	**8.0**	485	5900	.0177 (.0157—.0209)
.3937	**10.0**	485	4700	.0217 (.0197—.0264)
.4724	**12.0**	655	5300	.0276 (.0236—.0315)
.5512	**14.0**	650	4500	.0276 (.0236—.0315)

(Note 1) When using the drill with a length over l/d 10, it is necessary to use a prep holes 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 ➤ L113
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. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.1181	**3.0**	290	9500	.0039 (.0043—.0063)	290	9500	.0059 (.0063—.0083)
.1575	**4.0**	290	7100	.0059 (.0051—.0079)	290	7100	.0079 (.0079—.0106)
.1969	**5.0**	290	5700	.0079 (.0067—.0098)	290	5700	.0098 (.0098—.0130)
.2480	**6.3**	390	6000	.0098 (.0083—.0126)	390	6000	.0138 (.0126—.0165)
.3150	**8.0**	385	4700	.0118 (.0106—.0157)	385	4700	.0177 (.0157—.0209)
.3937	**10.0**	390	3800	.0157 (.0130—.0197)	390	3800	.0217 (.0197—.0264)
.4724	**12.0**	520	4200	.0197 (.0157—.0236)	520	4200	.0276 (.0236—.0315)
.5512	**14.0**	520	3600	.0197 (.0157—.0236)	520	3600	.0276 (.0236—.0315)

Work Material		Aluminium Alloy (Si>10%) ASTM 383.0, A390.0 etc.		
Drill Dia. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.1181	**3.0**	290	9500	.0059 (.0063—.0083)
.1575	**4.0**	290	7100	.0079 (.0079—.0106)
.1969	**5.0**	290	5700	.0098 (.0098—.0130)
.2480	**6.3**	390	6000	.0138 (.0126—.0165)
.3150	**8.0**	385	4700	.0177 (.0157—.0209)
.3937	**10.0**	390	3800	.0217 (.0197—.0264)
.4724	**12.0**	520	4200	.0276 (.0236—.0315)
.5512	**14.0**	520	3600	.0276 (.0236—.0315)

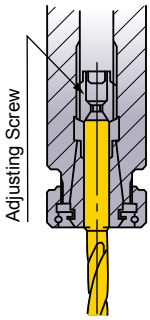
(Note 1) When using the drill with a length over l/d 10, it is necessary to use a prep holes as the pilot. (If no prep-hole is used then drill breakage can occur)

(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.

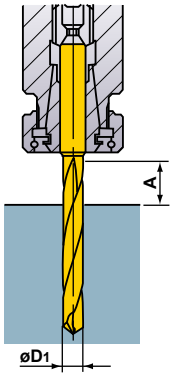
OPERATIONAL GUIDANCE FOR THE MNS...LB DRILL

Drill Holding



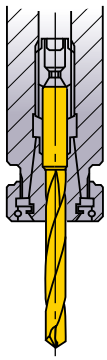
Thrust bearing type collet chuck holds the drill securely.

Drill Length



A ≥ D1 x 1.5

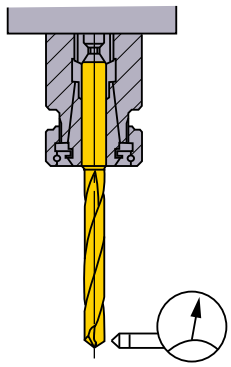
Drill Installation



NG

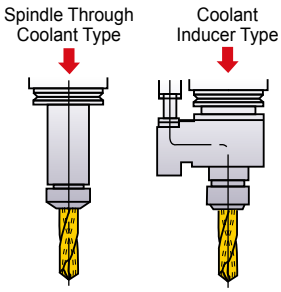
Do not clamp on the flutes.

Installation Tolerance



Runout ≤ .001″

Through Coolant Type



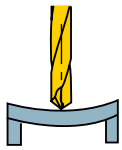
Recommended coolant pressure: 70 - 1015 PSI (0.5 - 7MPa).

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.

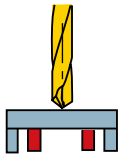
2) Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended.

Thin Workpiece



If Bending Occurs

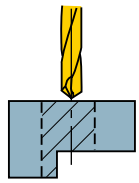
NG



Support the Workpiece

Good

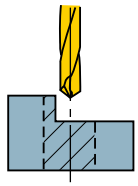
Interrupted Cutting



One process

Good

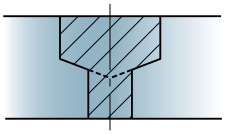
①Lower the feed when drilling the interrupted part.



Requires prior machining

①Spot face with an end mill prior to drilling.

Stepped Holes

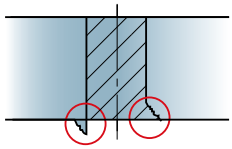


①Divide the machining into two processes.

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.

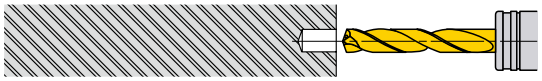
MNS...DB

OPERATIONAL GUIDANCE FOR THE MNS...DB DRILL

FLAT FACE DRILLING

●Drilling a blind hole

1. Drilling a pilot hole



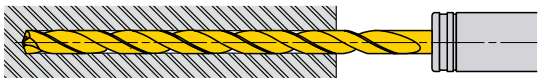
①Use a drill with a larger (flatter) point angle than the MNS...DB type. Mitsubishi type MNS-LB, MAE-MB or MAS-MB drill is recommended.
②Ensure a high precision hole is drilled for the pilot.
③Drill depth : Approx 1D or deeper.
(Adjust the pilot hole depth according to the length of the MNS...DB type.)

2. Initial cutting with the long type drill



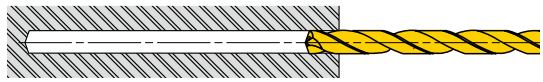
①Penetrate the pilot hole at a low revolution. (Cutting speed 65-100 SFM, feed rate .008-.012 IPR)
②Stop the long type drill .039-.118 inch short of the pilot hole bottom.

3. Drill the deep hole



①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

4. Drill retraction

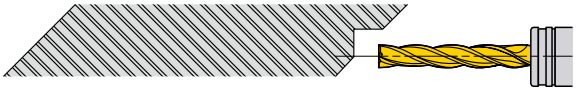


①After drilling, lower the cutting revolution about .039-.079 inch short of the hole end. (Cutting speed of around 65-100 SFM)
②Retract the drill to the pilot hole depth starting point at a feed rate of 120 inch/min.
③Finally clear the hole at a cutting speed of 65-100 SFM and feed rate of .008-.012 IPR.

IRREGULAR FACE DRILLING

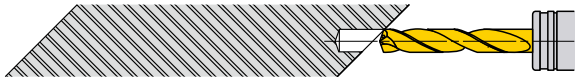
●Drilling and breaking through on irregular faces or angles

1. Spot facing



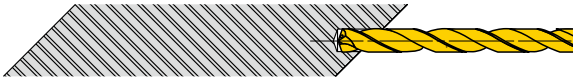
①Machine a flat on the irregular face by using an end mill or drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a pilot hole



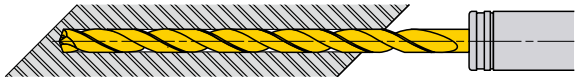
①Use a drill with a larger (flatter) point angle than the super long type. Mitsubishi type MNS-LB, MAE-MB or MAS-MB drill is recommended.
②Ensure a high precision hole is drilled for the pilot.
③Drill depth : Approx 1D or deeper.
(Adjust the pilot hole depth according to the length of the super long type.)

3. Initial cutting with the long type drill



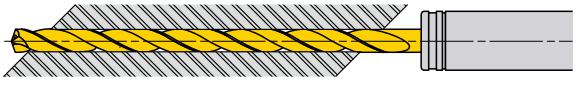
①Penetrate the pilot hole at a low revolution. (Cutting speed 65-100 SFM, feed rate .008-.012 IPR)
②Stop the long type drill .039-.118 inch short of the pilot hole bottom.

4. Drill the deep hole



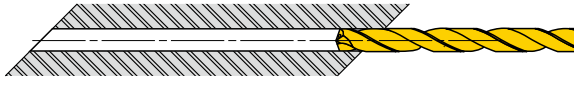
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

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.

MSE

- Wide flute for preventing chip jamming.
- Stable, small diameter machining.

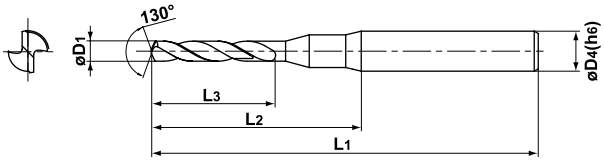
Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎	○	○	◎	○	○

Tolerance	0.1≤D≤3
D1 (mm)	$^{0}_{-0.009}$
D4 (mm)	$^{0}_{-0.006}$

METRIC STANDARD

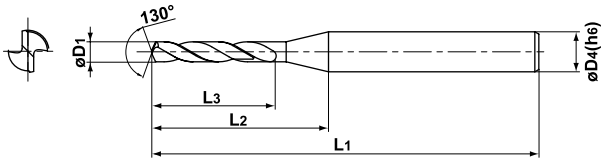


Type A





Type B



(Note) MSE type can be used for shrink fit holders.

Drill Dia. D1 (mm)	Coolant (Int./Ext.)	Stock VP20MF	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
0.10	Ext.	★		MSE0010SB	1.2	9.7	38	3	A
0.11	Ext.	★		0011SB	1.2	9.7	38	3	A
0.12	Ext.	★		0012SB	1.4	9.7	38	3	A
0.13	Ext.	★		0013SB	1.4	9.7	38	3	A
0.14	Ext.	★		0014SB	2	9.7	38	3	A
0.15	Ext.	★		0015SB	2	9.7	38	3	A
0.16	Ext.	★		0016SB	2	9.7	38	3	A
0.17	Ext.	★		0017SB	2	9.7	38	3	A
0.18	Ext.	★		0018SB	2	9.7	38	3	A
0.19	Ext.	★		0019SB	2	9.7	38	3	A
0.20	Ext.	★		0020SB	2.5	9.7	38	3	A
0.21	Ext.	★		0021SB	2.5	9.7	38	3	A
0.22	Ext.	★		0022SB	2.5	9.7	38	3	A
0.23	Ext.	★		0023SB	2.5	9.7	38	3	A
0.24	Ext.	★		0024SB	3	9.7	38	3	A
0.25	Ext.	★		0025SB	3	9.7	38	3	A
0.26	Ext.	★		0026SB	3	9.7	38	3	A
0.27	Ext.	★		0027SB	3	9.7	38	3	A
0.28	Ext.	★		0028SB	3	9.7	38	3	A
0.29	Ext.	★		0029SB	3	9.7	38	3	A
0.30	Ext.		★	0030SB	5	10.2	38	3	B
0.31	Ext.		★	0031SB	5	10.2	38	3	B
0.32	Ext.		★	0032SB	5	10.2	38	3	B
0.33	Ext.		★	0033SB	5	10.2	38	3	B
0.34	Ext.		★	0034SB	6	11.2	38	3	B
0.35	Ext.		★	0035SB	6	11.1	38	3	B
0.36	Ext.		★	0036SB	6	11.1	38	3	B
0.37	Ext.		★	0037SB	6	11.1	38	3	B
0.38	Ext.		★	0038SB	6	11.1	38	3	B
0.39	Ext.		★	0039SB	6	11.1	38	3	B
0.40	Ext.		★	0040SB	7	12.1	38	3	B
0.41	Ext.		★	0041SB	7	12.0	38	3	B
0.42	Ext.		★	MSE0042SB	7	12.0	38	3	B
0.43	Ext.		★	0043SB	7	12.0	38	3	B
0.44	Ext.		★	0044SB	7	12.0	38	3	B
0.45	Ext.		★	0045SB	7	12.0	38	3	B
0.46	Ext.		★	0046SB	7	11.9	38	3	B
0.47	Ext.		★	0047SB	7	11.9	38	3	B
0.48	Ext.		★	0048SB	7	11.9	38	3	B
0.49	Ext.		★	0049SB	7	11.9	38	3	B
0.50	Ext.		★	0050SB	7	11.9	38	3	B
0.51	Ext.		★	0051SB	7	11.8	38	3	B
0.52	Ext.		★	0052SB	7	11.8	38	3	B
0.53	Ext.		★	0053SB	7	11.8	38	3	B
0.54	Ext.		★	0054SB	7	11.8	38	3	B
0.55	Ext.		★	0055SB	7	11.8	38	3	B
0.56	Ext.		★	0056SB	7	11.8	38	3	B
0.57	Ext.		★	0057SB	7	11.7	38	3	B
0.58	Ext.		★	0058SB	7	11.7	38	3	B
0.59	Ext.		★	0059SB	7	11.7	38	3	B
0.60	Ext.		★	0060SB	7	11.7	38	3	B
0.61	Ext.		★	0061SB	7	11.7	38	3	B
0.62	Ext.		★	0062SB	7	11.6	38	3	B
0.63	Ext.		★	0063SB	7	11.6	38	3	B
0.64	Ext.		★	0064SB	7	11.6	38	3	B
0.65	Ext.		★	0065SB	7	11.6	38	3	B
0.66	Ext.		★	0066SB	7	11.6	38	3	B
0.67	Ext.		★	0067SB	7	11.5	38	3	B
0.68	Ext.		★	0068SB	7	11.5	38	3	B
0.69	Ext.		★	0069SB	7	11.5	38	3	B
0.70	Ext.		★	0070SB	8	12.5	38	3	B
0.71	Ext.		★	0071SB	8	12.5	38	3	B
0.72	Ext.		★	0072SB	8	12.5	38	3	B
0.73	Ext.		★	0073SB	8	12.4	38	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.

CUTTING CONDITIONS ➤ L116 TECHNICAL DATA ➤ N001

MSE

Drill Dia. D1 (mm)	Coolant (Int./Ext.)	Stock VP20MF	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
0.74	Ext.		★	MSE0074SB	8	12.4	38	3	B
0.75	Ext.		★	0075SB	8	12.4	38	3	B
0.76	Ext.		★	0076SB	8	12.4	38	3	B
0.77	Ext.		★	0077SB	8	12.4	38	3	B
0.78	Ext.		★	0078SB	8	12.3	38	3	B
0.79	Ext.		★	0079SB	8	12.3	38	3	B
0.80	Ext.		★	0080SB	10	14.3	38	3	B
0.81	Ext.		★	0081SB	10	14.3	38	3	B
0.82	Ext.		★	0082SB	10	14.3	38	3	B
0.83	Ext.		★	0083SB	10	14.3	38	3	B
0.84	Ext.		★	0084SB	10	14.2	38	3	B
0.85	Ext.		★	0085SB	10	14.2	38	3	B
0.86	Ext.		★	0086SB	10	14.2	38	3	B
0.87	Ext.		★	MSE0087SB	10	14.2	38	3	B
0.88	Ext.		★	0088SB	10	14.2	38	3	B
0.89	Ext.		★	0089SB	10	14.1	38	3	B
0.90	Ext.		★	0090SB	10	14.1	38	3	B
0.91	Ext.		★	0091SB	10	14.1	38	3	B
0.92	Ext.		★	0092SB	10	14.1	38	3	B
0.93	Ext.		★	0093SB	10	14.1	38	3	B
0.94	Ext.		★	0094SB	10	14.0	38	3	B
0.95	Ext.		★	0095SB	10	14.0	38	3	B
0.96	Ext.		★	0096SB	10	14.0	38	3	B
0.97	Ext.		★	0097SB	10	14.0	38	3	B
0.98	Ext.		★	0098SB	10	14.0	38	3	B
0.99	Ext.		★	0099SB	10	14.0	38	3	B

RECOMMENDED CUTTING CONDITIONS

Work Mate rial	Mild Steel (≤180HB) AISI 1010 etc.				Carbon Steel, Alloy Steel (180−280HB) AISI 1045, 4140 etc.			
Drill Dia. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min-1)	Feed (Min.−Max.) (IPR)	Pe ck (inch)	Cutting Speed (SFM)	Revolution (min-1)	Feed (Min.−Max.) (IPR)	Peck (inch)
.0394	0.10	20	20000	.0001 (.00004−.0001)	.0008	20	20000	.0001 (.00004−.0001)	.0008
.0472	0.12	25	20000	.0001 (.00004−.0001)	.0008	25	20000	.0001 (.00004−.0001)	.0008
.0630	0.16	30	20000	.0001 (.00004−.0001)	.0008	30	20000	.0001 (.00004−.0001)	.0008
.0787	0.20	40	20000	.0001 (.0001−.0002)	.0016	40	20000	.0001 (.0001−.0002)	.0016
.0984	0.25	50	20000	.0001 (.0001−.0002)	.0016	50	20000	.0001 (.0001−.0002)	.0016
.1260	0.32	65	20000	.0002 (.0001−.0002)	.0020	65	20000	.0002 (.0001−.0002)	.0020
.1575	0.40	80	20000	.0002 (.0001−.0002)	.0020	80	20000	.0002 (.0001−.0002)	.0020
.1969	0.50	100	20000	.0002 (.0002−.0003)	.0039	100	20000	.0002 (.0002−.0003)	.0039
.2480	0.63	130	20000	.0003 (.0002−.0004)	.0039	130	20000	.0003 (.0002−.0004)	.0039
.3150	0.80	165	20000	.0008 (.0006−.0010)	.0118	165	20000	.0006 (.0005−.0007)	.0118
.3937	0.99	205	20000	.0016 (.0012−.0020)	.0118	205	20000	.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 5D, reduce the step stated above.
(Note 4) The use of water-soluble fl uid (diluted by 20 times) is recommended for drilling under the cutting conditions above. Lower the revolutions if you use oil fl uid 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.

★ : Inventory maintained in Japan.

Work Material		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.				Pre-hardened Steel AISI P21, P20 etc.			
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Peck (inch)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Peck (inch)
inch	mm								
.0394	**0.10**	20	20000	.0001 (.00004—.0001)	.0008	20	20000	.0001 (.00004—.0001)	.0008
.0472	**0.12**	25	20000	.0001 (.00004—.0001)	.0008	25	20000	.0001 (.00004—.0001)	.0008
.0630	**0.16**	30	20000	.0001 (.00004—.0001)	.0008	30	20000	.0001 (.00004—.0001)	.0008
.0787	**0.20**	40	20000	.0001 (.00008—.0002)	.0016	40	20000	.0001 (.00008—.0002)	.0016
.0984	**0.25**	50	20000	.0001 (.00008—.0002)	.0016	50	20000	.0001 (.00008—.0002)	.0016
.1260	**0.32**	65	20000	.0002 (.00012—.0002)	.0020	65	20000	.0002 (.00012—.0002)	.0020
.1575	**0.40**	80	20000	.0002 (.00012—.0002)	.0020	80	20000	.0002 (.00012—.0002)	.0020
.1969	**0.50**	100	20000	.0002 (.00020—.0003)	.0039	100	20000	.0002 (.00020—.0003)	.0039
.2480	**0.63**	130	20000	.0003 (.00024—.0004)	.0039	130	20000	.0003 (.00024—.0004)	.0039
.3150	**0.80**	165	20000	.0006 (.00047—.0007)	.0118	165	20000	.0006 (.00047—.0007)	.0118
.3937	**0.99**	205	20000	.0008 (.00059—.0010)	.0118	205	20000	.0008 (.00059—.0010)	.0118

Work Material		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.				Gray Cast Iron (≤350MPa) No45B etc.			
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Peck (inch)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Peck (inch)
inch	mm								
.0394	**0.10**	20	20000	.0001 (.00004—.0001)	.0008	20	20000	.0001 (.00004—.0001)	.0008
.0472	**0.12**	25	20000	.0001 (.00004—.0001)	.0008	25	20000	.0001 (.00004—.0001)	.0008
.0630	**0.16**	30	20000	.0001 (.00004—.0001)	.0008	30	20000	.0001 (.00004—.0001)	.0008
.0787	**0.20**	35	18000	.0001 (.00008—.0002)	.0016	40	20000	.0001 (.00008—.0002)	.0016
.0984	**0.25**	45	18000	.0001 (.00008—.0002)	.0016	50	20000	.0001 (.00008—.0002)	.0016
.1260	**0.32**	50	15000	.0002 (.00012—.0002)	.0020	65	20000	.0002 (.00012—.0002)	.0020
.1575	**0.40**	60	15000	.0002 (.00012—.0002)	.0020	80	20000	.0002 (.00012—.0002)	.0020
.1969	**0.50**	50	10000	.0002 (.00020—.0003)	.0039	100	20000	.0002 (.00020—.0003)	.0039
.2480	**0.63**	65	10000	.0003 (.00024—.0004)	.0039	130	20000	.0003 (.00024—.0004)	.0039
.3150	**0.80**	50	6000	.0006 (.00047—.0007)	.0079	165	20000	.0008 (.00059—.0010)	.0118
.3937	**0.99**	60	6000	.0008 (.00059—.0010)	.0079	205	20000	.0016 (.00118—.0020)	.0118

Work Material		Aluminium Alloy (Si<5%) ASTM A6061, A7075 etc.				Heat Resistant Alloy Inconel718 etc.			
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Peck (inch)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Peck (inch)
inch	mm								
.0394	**0.10**	20	20000	.0001 (.00004—.0001)	.0020	5	7000	.00004 (.00002—.00004)	.0008
.0472	**0.12**	25	20000	.0001 (.00008—.0002)	.0020	10	7000	.00004 (.00002—.00004)	.0008
.0630	**0.16**	30	20000	.0002 (.00012—.0002)	.0020	10	7000	.00004 (.00002—.00004)	.0008
.0787	**0.20**	40	20000	.0002 (.00020—.0003)	.0039	10	5000	.00008 (.00004—.00008)	.0016
.0984	**0.25**	50	20000	.0003 (.00024—.0004)	.0039	10	5000	.00008 (.00004—.00008)	.0016
.1260	**0.32**	65	20000	.0004 (.00031—.0005)	.0118	10	4000	.00008 (.00004—.00008)	.0020
.1575	**0.40**	80	20000	.0008 (.00059—.0010)	.0118	15	4000	.00008 (.00004—.00008)	.0020
.1969	**0.50**	100	20000	.0012 (.00098—.0014)	.0197	15	3000	.00012 (.00004—.00012)	.0039
.2480	**0.63**	130	20000	.0016 (.00138—.0018)	.0197	20	3000	.00016 (.00008—.00016)	.0039
.3150	**0.80**	165	20000	.0020 (.00177—.0022)	.0315	15	1800	.00024 (.00016—.00024)	.0079
.3937	**0.99**	205	20000	.0024 (.00217—.0026)	.0315	20	1800	.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 5D, reduce the step stated above.
(Note 4) The use of water-soluble fl uid (diluted by 20 times) is recommended for drilling under the cutting conditions above. Lower the revolutions if you use oil fl uid 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.

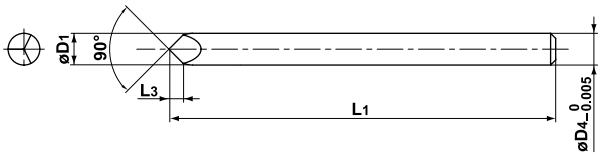
MSP STARTER Drill

●For use with MSE Type drill.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎	◎	◎	◎	◎	◎

METRIC STANDARD





(Note) MSP type can be used for shrink fit holders.

Order Number	Grade	Stock	Dimensions (mm)				Range of Diameter (mm)
			D1	D4	L1	L3	
MSP0300SB	**VP15TF**	●	3.0	3.0	38	1.5	**0.10—0.99**

● : **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
0011SB	0.11	0.066—0.088	0.033—0.044
0012SB	0.12	0.072—0.096	0.036—0.048
0013SB	0.13	0.078—0.104	0.039—0.052
0014SB	0.14	0.084—0.112	0.042—0.056
0015SB	0.15	0.090—0.120	0.045—0.060
0016SB	0.16	0.096—0.128	0.048—0.064
0017SB	0.17	0.102—0.136	0.051—0.068
0018SB	0.18	0.108—0.144	0.054—0.072
0019SB	0.19	0.114—0.152	0.057—0.076
0020SB	0.20	0.120—0.160	0.060—0.080
0021SB	0.21	0.126—0.168	0.063—0.084
0022SB	0.22	0.132—0.176	0.066—0.088
0023SB	0.23	0.138—0.184	0.069—0.092
0024SB	0.24	0.144—0.192	0.072—0.096
0025SB	0.25	0.150—0.200	0.075—0.100
0026SB	0.26	0.156—0.208	0.078—0.104
0027SB	0.27	0.162—0.216	0.081—0.108
0028SB	0.28	0.168—0.224	0.084—0.112
0029SB	0.29	0.174—0.232	0.087—0.116
0030SB	0.30	0.180—0.240	0.090—0.120
0031SB	0.31	0.186—0.248	0.093—0.124
0032SB	0.32	0.192—0.256	0.096—0.128
0033SB	0.33	0.198—0.264	0.099—0.132
0034SB	0.34	0.204—0.272	0.102—0.136
0035SB	0.35	0.210—0.280	0.105—0.140
0036SB	0.36	0.216—0.288	0.108—0.144
0037SB	0.37	0.222—0.296	0.111—0.148
0038SB	0.38	0.228—0.304	0.114—0.152
0039SB	0.39	0.234—0.312	0.117—0.156
0040SB	0.40	0.240—0.320	0.120—0.160
0041SB	0.41	0.246—0.328	0.123—0.164
0042SB	0.42	0.252—0.336	0.126—0.168
0043SB	0.43	0.258—0.344	0.129—0.172
0044SB	0.44	0.264—0.352	0.132—0.176
0045SB	0.45	0.270—0.360	0.135—0.180
0046SB	0.46	0.276—0.368	0.138—0.184
0047SB	0.47	0.282—0.376	0.141—0.188
0048SB	0.48	0.288—0.384	0.144—0.192
0049SB	0.49	0.294—0.392	0.147—0.196
0050SB	0.50	0.300—0.400	0.150—0.200
0051SB	0.51	0.306—0.408	0.153—0.204
0052SB	0.52	0.312—0.416	0.156—0.208
0053SB	0.53	0.318—0.424	0.159—0.212
0054SB	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
0056SB	0.56	0.336—0.448	0.168—0.224
0057SB	0.57	0.342—0.456	0.171—0.228
0058SB	0.58	0.348—0.464	0.174—0.232
0059SB	0.59	0.354—0.472	0.177—0.236
0060SB	0.60	0.360—0.480	0.180—0.240
0061SB	0.61	0.366—0.488	0.183—0.244
0062SB	0.62	0.372—0.496	0.186—0.248
0063SB	0.63	0.378—0.504	0.189—0.252
0064SB	0.64	0.384—0.512	0.192—0.256
0065SB	0.65	0.390—0.520	0.195—0.260
0066SB	0.66	0.396—0.528	0.198—0.264
0067SB	0.67	0.402—0.536	0.201—0.268
0068SB	0.68	0.408—0.544	0.204—0.272
0069SB	0.69	0.414—0.552	0.207—0.276
0070SB	0.70	0.420—0.560	0.210—0.280
0071SB	0.71	0.426—0.568	0.213—0.284
0072SB	0.72	0.432—0.576	0.216—0.288
0073SB	0.73	0.438—0.584	0.219—0.292
0074SB	0.74	0.444—0.592	0.222—0.296
0075SB	0.75	0.450—0.600	0.225—0.300
0076SB	0.76	0.456—0.608	0.228—0.304
0077SB	0.77	0.462—0.616	0.231—0.308
0078SB	0.78	0.468—0.624	0.234—0.312
0079SB	0.79	0.474—0.632	0.237—0.316
0080SB	0.80	0.480—0.640	0.240—0.320
0081SB	0.81	0.486—0.648	0.243—0.324
0082SB	0.82	0.492—0.656	0.246—0.328
0083SB	0.83	0.498—0.664	0.249—0.332
0084SB	0.84	0.504—0.672	0.252—0.336
0085SB	0.85	0.510—0.680	0.255—0.340
0086SB	0.86	0.516—0.688	0.258—0.344
0087SB	0.87	0.522—0.696	0.261—0.348
0088SB	0.88	0.528—0.704	0.264—0.352
0089SB	0.89	0.534—0.712	0.267—0.356
0090SB	0.90	0.540—0.720	0.270—0.360
0091SB	0.91	0.546—0.728	0.273—0.364
0092SB	0.92	0.552—0.736	0.276—0.368
0093SB	0.93	0.558—0.744	0.279—0.372
0094SB	0.94	0.564—0.752	0.282—0.376
0095SB	0.95	0.570—0.760	0.285—0.380
0096SB	0.96	0.576—0.768	0.288—0.384
0097SB	0.97	0.582—0.776	0.291—0.388
0098SB	0.98	0.588—0.784	0.294—0.392
0099SB	0.99	0.594—0.792	0.297—0.396

MAS

- Specialized in aluminum and cast iron drilling.
- High hole accuracy.
- Pre-hole drilling for rolled tap.
- Helical coolant hole enables high speed machining.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
			○	◎	

Tolerance	.1250≤D≤.2344	.2500≤D≤.3906	.4062≤D≤.7031	.7186≤D≤.7812
D1 (inch)	+0.00020 0	+0.00020 0	+0.00020 0	+0.00020 0
D4 (inch)	0 −0.00031	0 −0.00035	0 −0.00043	0 −0.00051

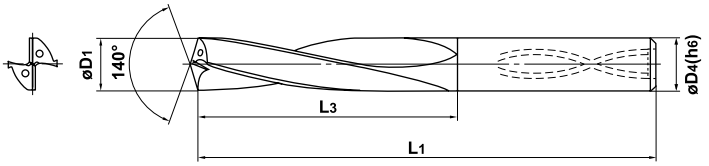
INCH STANDARD

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°

Drill Dia. D1 (inch)	Order Number	Stock HTi10	Dimensions (inch) L3	L1	D4	Rolled Thread Tap Size
.1250	MAS01250MB	●	.945	2.520	.157	
.1406	01406MB	●	1.102	2.677	.157	
.1495	01495MB	●	1.102	2.677	.157	10-24NC
.1563	01563MB	●	1.102	2.677	.157	
.1590	01590MB	●	1.220	2.795	.197	10-32NF
.1719	01719MB	●	1.220	2.795	.197	
.1875	01875MB	●	1.299	2.874	.197	
.2031	02031MB	●	1.417	2.992	.236	
.2165	02165MB	●	1.417	2.992	.236	
.2188	02188MB	●	1.535	3.110	.236	
.2344	02344MB	●	1.535	3.110	.236	
.2500	02500MB	●	1.654	3.307	.276	1/16-27NS
.2570	02570MB	●	1.654	3.307	.276	5/16-18NC
.2656	02656MB	●	1.654	3.307	.276	
.2720	02720MB	●	1.654	3.307	.276	5/16-24NF
.2812	02812MB	●	1.890	3.543	.315	
.2969	02969MB	●	1.890	3.543	.315	
.3125	03125MB	●	1.890	3.543	.315	3/8-16NC
.3281	03281MB	●	1.969	3.701	.354	1/8-27NPT
.3320	03320MB	●	1.969	3.701	.354	3/8-24NF
.3438	03438MB	●	1.969	3.701	.354	
.3594	03594MB	●	2.087	3.819	.394	
.3680	03680MB	●	2.087	3.819	.394	7/16-14NC
.3750	03750MB	●	2.087	3.819	.394	
.3906	03906MB	●	2.087	3.819	.394	7/16-20NF
.4062	04062MB	●	2.165	3.976	.433	

Drill Dia. D1 (inch)	Order Number	Stock HTi10	Dimensions (inch) L3	L1	D4	Rolled Thread Tap Size
.4219	MAS04219MB	●	2.165	3.976	.433	1/2-13, 1/2-12
.4375	04375MB	●	2.362	4.173	.472	1/4-18NPT
.4531	04531MB	●	2.362	4.173	.472	1/2-20, 1/4-18NS
.4688	04688MB	●	2.362	4.173	.472	
.4844	04844MB	●	2.559	4.528	.512	9/16-12NC
.5000	05000MB	●	2.559	4.528	.512	
.5118	05118MB	●	2.559	4.528	.512	
.5156	05156MB	●	2.756	4.724	.551	9/16-18NF
.5312	05312MB	●	2.756	4.724	.551	5/8-11NC
.5469	05469MB	●	2.756	4.724	.551	
.5625	05625MB	●	2.835	5.118	.591	3/8-18NPT
.5781	05781MB	●	2.835	5.118	.591	5/8-18NF
.5937	05937MB	●	2.992	5.276	.630	3/8-18NS
.6094	06094MB	●	2.992	5.276	.630	
.6250	06250MB	●	2.992	5.276	.630	
.6406	06406MB	●	3.150	5.433	.669	
.6563	06563MB	●	3.150	5.433	.669	3/4-10NC
.6718	06718MB	●	3.346	5.630	.709	
.6875	06875MB	●	3.346	5.630	.709	3/4-16NF
.7031	07031MB	●	3.346	5.630	.709	1/2-14NPT
.7188	07188MB	●	3.543	5.827	.748	
.7344	07344MB	●	3.543	5.827	.748	7/8-9, 1/2-14NS
.7500	07500MB	●	3.740	6.024	.787	
.7656	07656MB	●	3.740	6.024	.787	
.7812	07812MB	●	3.740	6.024	.787	

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : Inventory maintained.

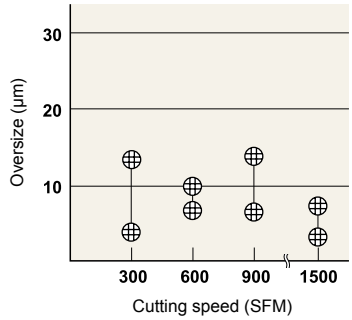
RECOMMENDED CUTTING CONDITIONS

	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)

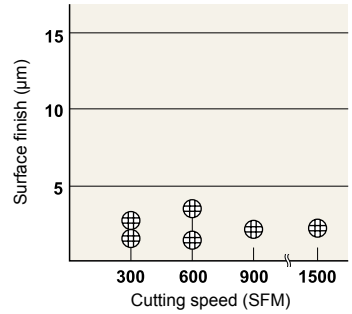
MACHINED HOLE ACCURACY

Tool : MAS1000LB Workpiece : 330Aluminum Feed : .008inch/rev Drilled Depth : 2.36inch (Through hole) WSO (10%)

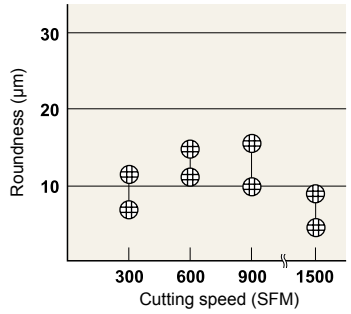
Oversize



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.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
			○	◎	

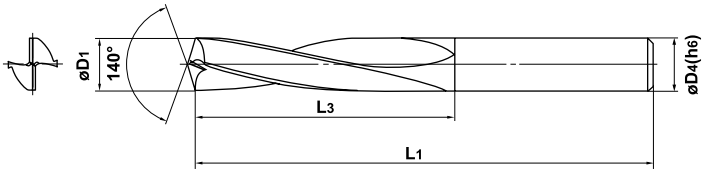
Tolerance	D=3	3<D≤6	6<D≤10	10<D≤16
D_1 (mm)	+0.005 0	+0.005 0	+0.005 0	+0.005 0
D_4 (mm)	0 −0.006	0 −0.007	0 −0.009	0 −0.011

METRIC STANDARD

MAE (External Coolant)



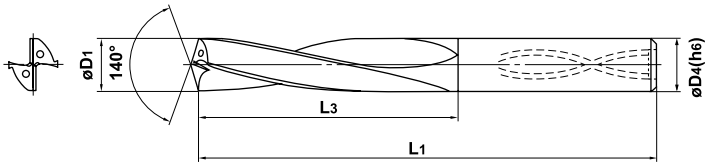




MAS (Internal Coolant)







(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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10		Order Number	Dimensions (mm) L3	L1	D4
3.0	3	Ext.	★		MAE0300MB	21	61	3.0
	3	Int.	□		MAS0300MB	21	61	3.0
	6	Int.	★		MAS0300LB	30	70	3.0
3.1	3	Ext.	★		MAE0310MB	24	64	4.0
	3	Int.	□		MAS0310MB	24	64	4.0
	6	Int.	★		MAS0310LB	34	74	4.0
3.2	3	Ext.	★		MAE0320MB	24	64	4.0
	3	Int.	□		MAS0320MB	24	64	4.0
	6	Int.	★		MAS0320LB	34	74	4.0
3.3	3	Ext.	★		MAE0330MB	24	64	4.0
	3	Int.	□		MAS0330MB	24	64	4.0
	6	Int.	★		MAS0330LB	34	74	4.0
3.4	3	Ext.	★		MAE0340MB	24	64	4.0
	3	Int.	□		MAS0340MB	24	64	4.0
	6	Int.	★		MAS0340LB	34	74	4.0
3.5	3	Ext.	★		MAE0350MB	24	64	4.0
	3	Int.	□		MAS0350MB	24	64	4.0
	6	Int.	★		MAS0350LB	34	74	4.0
3.6	3	Ext.	★		MAE0360MB	28	68	4.0
	3	Int.	□		MAS0360MB	28	68	4.0
	6	Int.	★		MAS0360LB	40	80	4.0
3.65	3	Ext.	★	*	MAE0365MB	28	68	4.0
	3	Int.	□	*	MAS0365MB	28	68	4.0
	6	Int.	★	*	MAS0365LB	40	80	4.0
3.7	3	Ext.	★		MAE0370MB	28	68	4.0
	3	Int.	□		MAS0370MB	28	68	4.0
	6	Int.	★		MAS0370LB	40	80	4.0
3.8	3	Ext.	★		MAE0380MB	28	68	4.0
	3	Int.	□		MAS0380MB	28	68	4.0
	6	Int.	★		MAS0380LB	40	80	4.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10		Order Number	Dimensions (mm) L3	L1	D4
3.9	3	Ext.	★		MAE0390MB	28	68	4.0
	3	Int.	□		MAS0390MB	28	68	4.0
	6	Int.	★		MAS0390LB	40	80	4.0
4.0	3	Ext.	★		MAE0400MB	28	68	4.0
	3	Int.	□		MAS0400MB	28	68	4.0
	6	Int.	★		MAS0400LB	40	80	4.0
4.1	3	Ext.	★		MAE0410MB	31	71	5.0
	3	Int.	□		MAS0410MB	31	71	5.0
	6	Int.	★		MAS0410LB	44	84	5.0
4.2	3	Ext.	★		MAE0420MB	31	71	5.0
	3	Int.	□		MAS0420MB	31	71	5.0
	6	Int.	★		MAS0420LB	44	84	5.0
4.3	3	Ext.	★		MAE0430MB	31	71	5.0
	3	Int.	□		MAS0430MB	31	71	5.0
	6	Int.	★		MAS0430LB	44	84	5.0
4.4	3	Ext.	★		MAE0440MB	31	71	5.0
	3	Int.	□		MAS0440MB	31	71	5.0
	6	Int.	★		MAS0440LB	44	84	5.0
4.5	3	Ext.	★		MAE0450MB	31	71	5.0
	3	Int.	□		MAS0450MB	31	71	5.0
	6	Int.	★		MAS0450LB	44	84	5.0
4.6	3	Ext.	★	*	MAE0460MB	33	73	5.0
	3	Int.	□	*	MAS0460MB	33	73	5.0
	6	Int.	★	*	MAS0460LB	48	88	5.0
4.7	3	Ext.	★		MAE0470MB	33	73	5.0
	3	Int.	□		MAS0470MB	33	73	5.0
	6	Int.	★		MAS0470LB	48	88	5.0
4.8	3	Ext.	★		MAE0480MB	33	73	5.0
	3	Int.	□		MAS0480MB	33	73	5.0
	6	Int.	★		MAS0480LB	48	88	5.0

* : 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.

Drill Dia. D_1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) L_3	L_1	D_4
4.9	3	Ext.	★	MAE0490MB	33	73	5.0
	3	Int.	□	MAS0490MB	33	73	5.0
	6	Int.	★	MAS0490LB	48	88	5.0
5.0	3	Ext.	★	MAE0500MB	33	73	5.0
	3	Int.	★	MAS0500MB	33	73	5.0
	6	Int.	★	MAS0500LB	48	88	5.0
5.1	3	Ext.	★	MAE0510MB	36	76	6.0
	3	Int.	□	MAS0510MB	36	76	6.0
	6	Int.	★	MAS0510LB	52	92	6.0
5.2	3	Ext.	★	MAE0520MB	36	76	6.0
	3	Int.	□	MAS0520MB	36	76	6.0
	6	Int.	★	MAS0520LB	52	92	6.0
5.3	3	Ext.	★	MAE0530MB	36	76	6.0
	3	Int.	□	MAS0530MB	36	76	6.0
	6	Int.	★	MAS0530LB	52	92	6.0
5.4	3	Ext.	★	MAE0540MB	36	76	6.0
	3	Int.	□	MAS0540MB	36	76	6.0
	6	Int.	★	MAS0540LB	52	92	6.0
5.5	3	Ext.	★	* MAE0550MB	36	76	6.0
	3	Int.	★	* MAS0550MB	36	76	6.0
	6	Int.	★	* MAS0550LB	52	92	6.0
5.6	3	Ext.	★	MAE0560MB	39	79	6.0
	3	Int.	□	MAS0560MB	39	79	6.0
	6	Int.	★	MAS0560LB	57	97	6.0
5.7	3	Ext.	★	MAE0570MB	39	79	6.0
	3	Int.	□	MAS0570MB	39	79	6.0
	6	Int.	★	MAS0570LB	57	97	6.0
5.8	3	Ext.	★	MAE0580MB	39	79	6.0
	3	Int.	□	MAS0580MB	39	79	6.0
	6	Int.	★	MAS0580LB	57	97	6.0
5.9	3	Ext.	★	MAE0590MB	39	79	6.0
	3	Int.	□	MAS0590MB	39	79	6.0
	6	Int.	★	MAS0590LB	57	97	6.0
6.0	3	Ext.	★	MAE0600MB	39	79	6.0
	3	Int.	★	MAS0600MB	39	79	6.0
	6	Int.	★	MAS0600LB	57	97	6.0
6.1	3	Ext.	★	MAE0610MB	42	84	7.0
	3	Int.	□	MAS0610MB	42	84	7.0
	6	Int.	★	MAS0610LB	62	104	7.0
6.2	3	Ext.	★	MAE0620MB	42	84	7.0
	3	Int.	□	MAS0620MB	42	84	7.0
	6	Int.	★	MAS0620LB	62	104	7.0
6.3	3	Ext.	★	MAE0630MB	42	84	7.0
	3	Int.	□	MAS0630MB	42	84	7.0
	6	Int.	★	MAS0630LB	62	104	7.0
6.4	3	Ext.	★	MAE0640MB	42	84	7.0
	3	Int.	□	MAS0640MB	42	84	7.0
	6	Int.	★	MAS0640LB	62	104	7.0
6.5	3	Ext.	★	MAE0650MB	42	84	7.0
	3	Int.	★	MAS0650MB	42	84	7.0
	6	Int.	★	MAS0650LB	62	104	7.0
6.6	3	Ext.	★	MAE0660MB	42	84	7.0
	3	Int.	□	MAS0660MB	42	84	7.0
	6	Int.	★	MAS0660LB	65	107	7.0
6.7	3	Ext.	★	MAE0670MB	42	84	7.0
	3	Int.	□	MAS0670MB	42	84	7.0
	6	Int.	★	MAS0670LB	65	107	7.0
6.8	3	Ext.	★	MAE0680MB	42	84	7.0
	3	Int.	★	MAS0680MB	42	84	7.0
	6	Int.	★	MAS0680LB	65	107	7.0
6.9	3	Ext.	★	MAE0690MB	42	84	7.0
	3	Int.	□	MAS0690MB	42	84	7.0
	6	Int.	★	MAS0690LB	65	107	7.0
7.0	3	Ext.	★	MAE0700MB	42	84	7.0
	3	Int.	★	MAS0700MB	42	84	7.0
	6	Int.	★	MAS0700LB	65	107	7.0
7.1	3	Ext.	★	MAE0710MB	48	90	8.0
	3	Int.	□	MAS0710MB	48	90	8.0
	6	Int.	★	MAS0710LB	68	110	8.0
7.2	3	Ext.	★	MAE0720MB	48	90	8.0
	3	Int.	□	MAS0720MB	48	90	8.0
	6	Int.	★	MAS0720LB	68	110	8.0
7.3	3	Ext.	★	MAE0730MB	48	90	8.0
	3	Int.	□	MAS0730MB	48	90	8.0
	6	Int.	★	MAS0730LB	68	110	8.0
7.35	3	Ext.	★	* MAE0735MB	48	90	8.0
	3	Int.	★	* MAS0735MB	48	90	8.0
	6	Int.	★	* MAS0735LB	68	110	8.0
7.4	3	Ext.	★	MAE0740MB	48	90	8.0
	3	Int.	□	MAS0740MB	48	90	8.0
	6	Int.	★	MAS0740LB	68	110	8.0
7.5	3	Ext.	★	MAE0750MB	48	90	8.0
	3	Int.	□	MAS0750MB	48	90	8.0
	6	Int.	★	MAS0750LB	68	110	8.0
7.6	3	Ext.	★	MAE0760MB	48	90	8.0
	3	Int.	□	MAS0760MB	48	90	8.0
	6	Int.	★	MAS0760LB	72	114	8.0
7.7	3	Ext.	★	MAE0770MB	48	90	8.0
	3	Int.	□	MAS0770MB	48	90	8.0
	6	Int.	★	MAS0770LB	72	114	8.0

CUTTING CONDITIONS ➤ L127
TECHNICAL DATA ➤ N001

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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) L3	L1	D4
7.8	3	Ext.	★	MAE0780MB	48	90	8.0
	3	Int.	□	MAS0780MB	48	90	8.0
	6	Int.	★	MAS0780LB	72	114	8.0
7.9	3	Ext.	★	MAE0790MB	48	90	8.0
	3	Int.	□	MAS0790MB	48	90	8.0
	6	Int.	★	MAS0790LB	72	114	8.0
8.0	3	Ext.	★	MAE0800MB	48	90	8.0
	3	Int.	★	MAS0800MB	48	90	8.0
	6	Int.	★	MAS0800LB	72	114	8.0
8.1	3	Ext.	★	MAE0810MB	50	94	9.0
	3	Int.	□	MAS0810MB	50	94	9.0
	6	Int.	★	MAS0810LB	75	119	9.0
8.2	3	Ext.	★	MAE0820MB	50	94	9.0
	3	Int.	□	MAS0820MB	50	94	9.0
	6	Int.	★	MAS0820LB	75	119	9.0
8.3	3	Ext.	★	MAE0830MB	50	94	9.0
	3	Int.	□	MAS0830MB	50	94	9.0
	6	Int.	★	MAS0830LB	75	119	9.0
8.4	3	Ext.	★	MAE0840MB	50	94	9.0
	3	Int.	□	MAS0840MB	50	94	9.0
	6	Int.	★	MAS0840LB	75	119	9.0
8.5	3	Ext.	★	MAE0850MB	50	94	9.0
	3	Int.	★	MAS0850MB	50	94	9.0
	6	Int.	★	MAS0850LB	75	119	9.0
8.6	3	Ext.	★	MAE0860MB	50	94	9.0
	3	Int.	□	MAS0860MB	50	94	9.0
	6	Int.	★	MAS0860LB	77	121	9.0
8.7	3	Ext.	★	MAE0870MB	50	94	9.0
	3	Int.	□	MAS0870MB	50	94	9.0
	6	Int.	★	MAS0870LB	77	121	9.0
8.8	3	Ext.	★	MAE0880MB	50	94	9.0
	3	Int.	□	MAS0880MB	50	94	9.0
	6	Int.	★	MAS0880LB	77	121	9.0
8.9	3	Ext.	★	MAE0890MB	50	94	9.0
	3	Int.	□	MAS0890MB	50	94	9.0
	6	Int.	★	MAS0890LB	77	121	9.0
9.0	3	Ext.	★	MAE0900MB	50	94	9.0
	3	Int.	★	MAS0900MB	50	94	9.0
	6	Int.	★	MAS0900LB	77	121	9.0
9.1	3	Ext.	★	MAE0910MB	53	97	10.0
	3	Int.	□	MAS0910MB	53	97	10.0
	6	Int.	★	MAS0910LB	81	125	10.0
9.2	3	Ext.	★	MAE0920MB	53	97	10.0
	3	Int.	□	MAS0920MB	53	97	10.0
	6	Int.	★	MAS0920LB	81	125	10.0
9.21	3	Ext.	★	* MAE0921MB	53	97	10.0
	3	Int.	★	* MAS0921MB	53	97	10.0
	6	Int.	★	* MAS0921LB	81	125	10.0
9.3	3	Ext.	★	MAE0930MB	53	97	10.0
	3	Int.	□	MAS0930MB	53	97	10.0
	6	Int.	★	MAS0930LB	81	125	10.0
9.4	3	Ext.	★	MAE0940MB	53	97	10.0
	3	Int.	□	MAS0940MB	53	97	10.0
	6	Int.	★	MAS0940LB	81	125	10.0
9.5	3	Ext.	★	MAE0950MB	53	97	10.0
	3	Int.	★	MAS0950MB	53	97	10.0
	6	Int.	★	MAS0950LB	81	125	10.0
9.6	3	Ext.	★	MAE0960MB	53	97	10.0
	3	Int.	□	MAS0960MB	53	97	10.0
	6	Int.	★	MAS0960LB	81	125	10.0
9.7	3	Ext.	★	MAE0970MB	53	97	10.0
	3	Int.	□	MAS0970MB	53	97	10.0
	6	Int.	★	MAS0970LB	81	125	10.0
9.8	3	Ext.	★	MAE0980MB	53	97	10.0
	3	Int.	□	MAS0980MB	53	97	10.0
	6	Int.	★	MAS0980LB	81	125	10.0
9.9	3	Ext.	★	MAE0990MB	53	97	10.0
	3	Int.	□	MAS0990MB	53	97	10.0
	6	Int.	★	MAS0990LB	81	125	10.0
10.0	3	Ext.	★	MAE1000MB	53	97	10.0
	3	Int.	★	MAS1000MB	53	97	10.0
	6	Int.	★	MAS1000LB	81	125	10.0
10.1	3	Ext.	□	MAE1010MB	55	101	11.0
	3	Int.	□	MAS1010MB	55	101	11.0
	6	Int.	□	MAS1010LB	89	135	11.0
10.2	3	Ext.	□	MAE1020MB	55	101	11.0
	3	Int.	□	MAS1020MB	55	101	11.0
	6	Int.	□	MAS1020LB	89	135	11.0
10.3	3	Ext.	★	MAE1030MB	55	101	11.0
	3	Int.	★	MAS1030MB	55	101	11.0
	6	Int.	★	MAS1030LB	89	135	11.0
10.4	3	Ext.	□	MAE1040MB	55	101	11.0
	3	Int.	□	MAS1040MB	55	101	11.0
	6	Int.	□	MAS1040LB	89	135	11.0
10.5	3	Ext.	★	MAE1050MB	55	101	11.0
	3	Int.	★	MAS1050MB	55	101	11.0
	6	Int.	★	MAS1050LB	89	135	11.0
10.6	3	Ext.	□	MAE1060MB	55	101	11.0
	3	Int.	□	MAS1060MB	55	101	11.0
	6	Int.	□	MAS1060LB	89	135	11.0

* : 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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10		Order Number	Dimensions (mm) L3	L1	D4
	3	Ext.	□		**MAE1070MB**	55	101	11.0
10.7	3	Int.	□		**MAS1070MB**	55	101	11.0
	6	Int.	□		**MAS1070LB**	89	135	11.0
	3	Ext.	□		**MAE1080MB**	55	101	11.0
10.8	3	Int.	□		**MAS1080MB**	55	101	11.0
	6	Int.	□		**MAS1080LB**	89	135	11.0
	3	Ext.	□		**MAE1090MB**	55	101	11.0
10.9	3	Int.	□		**MAS1090MB**	55	101	11.0
	6	Int.	□		**MAS1090LB**	89	135	11.0
	3	Ext.	★		**MAE1100MB**	55	101	11.0
11.0	3	Int.	★		**MAS1100MB**	55	101	11.0
	6	Int.	★		**MAS1100LB**	89	135	11.0
	3	Ext.	★	*	**MAE1108MB**	60	106	12.0
11.08	3	Int.	★	*	**MAS1108MB**	60	106	12.0
	6	Int.	★	*	**MAS1108LB**	94	140	12.0
	3	Ext.	□		**MAE1110MB**	60	106	12.0
11.1	3	Int.	□		**MAS1110MB**	60	106	12.0
	6	Int.	□		**MAS1110LB**	94	140	12.0
	3	Ext.	□		**MAE1120MB**	60	106	12.0
11.2	3	Int.	□		**MAS1120MB**	60	106	12.0
	6	Int.	□		**MAS1120LB**	94	140	12.0
	3	Ext.	□		**MAE1130MB**	60	106	12.0
11.3	3	Int.	□		**MAS1130MB**	60	106	12.0
	6	Int.	□		**MAS1130LB**	94	140	12.0
	3	Ext.	□		**MAE1140MB**	60	106	12.0
11.4	3	Int.	□		**MAS1140MB**	60	106	12.0
	6	Int.	□		**MAS1140LB**	94	140	12.0
	3	Ext.	□		**MAE1150MB**	60	106	12.0
11.5	3	Int.	□		**MAS1150MB**	60	106	12.0
	6	Int.	□		**MAS1150LB**	94	140	12.0
	3	Ext.	□		**MAE1160MB**	60	106	12.0
11.6	3	Int.	□		**MAS1160MB**	60	106	12.0
	6	Int.	□		**MAS1160LB**	94	140	12.0
	3	Ext.	□		**MAE1170MB**	60	106	12.0
11.7	3	Int.	□		**MAS1170MB**	60	106	12.0
	6	Int.	□		**MAS1170LB**	94	140	12.0
	3	Ext.	□		**MAE1180MB**	60	106	12.0
11.8	3	Int.	□		**MAS1180MB**	60	106	12.0
	6	Int.	□		**MAS1180LB**	94	140	12.0
	3	Ext.	□		**MAE1190MB**	60	106	12.0
11.9	3	Int.	□		**MAS1190MB**	60	106	12.0
	6	Int.	□		**MAS1190LB**	94	140	12.0
	3	Ext.	★		**MAE1200MB**	60	106	12.0
12.0	3	Int.	★		**MAS1200MB**	60	106	12.0
	6	Int.	★		**MAS1200LB**	94	140	12.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10		Order Number	Dimensions (mm) L3	L1	D4
	3	Ext.	□		**MAE1210MB**	65	115	13.0
12.1	3	Int.	□		**MAS1210MB**	65	115	13.0
	6	Int.	□		**MAS1210LB**	100	150	13.0
	3	Ext.	□		**MAE1220MB**	65	115	13.0
12.2	3	Int.	□		**MAS1220MB**	65	115	13.0
	6	Int.	□		**MAS1220LB**	100	150	13.0
	3	Ext.	□		**MAE1230MB**	65	115	13.0
12.3	3	Int.	□		**MAS1230MB**	65	115	13.0
	6	Int.	□		**MAS1230LB**	100	150	13.0
	3	Ext.	□		**MAE1240MB**	65	115	13.0
12.4	3	Int.	□		**MAS1240MB**	65	115	13.0
	6	Int.	□		**MAS1240LB**	100	150	13.0
	3	Ext.	★		**MAE1250MB**	65	115	13.0
12.5	3	Int.	★		**MAS1250MB**	65	115	13.0
	6	Int.	★		**MAS1250LB**	100	150	13.0
	3	Ext.	□		**MAE1260MB**	65	115	13.0
12.6	3	Int.	□		**MAS1260MB**	65	115	13.0
	6	Int.	□		**MAS1260LB**	100	150	13.0
	3	Ext.	□		**MAE1270MB**	65	115	13.0
12.7	3	Int.	□		**MAS1270MB**	65	115	13.0
	6	Int.	□		**MAS1270LB**	100	150	13.0
	3	Ext.	□		**MAE1280MB**	65	115	13.0
12.8	3	Int.	□		**MAS1280MB**	65	115	13.0
	6	Int.	□		**MAS1280LB**	100	150	13.0
	3	Ext.	□		**MAE1290MB**	65	115	13.0
12.9	3	Int.	□		**MAS1290MB**	65	115	13.0
	6	Int.	□		**MAS1290LB**	100	150	13.0
	3	Ext.	★	*	**MAE1296MB**	65	115	13.0
12.96	3	Int.	★	*	**MAS1296MB**	65	115	13.0
	6	Int.	★	*	**MAS1296LB**	100	150	13.0
	3	Ext.	★		**MAE1300MB**	65	115	13.0
13.0	3	Int.	★		**MAS1300MB**	65	115	13.0
	6	Int.	★		**MAS1300LB**	100	150	13.0
	3	Ext.	□		**MAE1310MB**	70	120	14.0
13.1	3	Int.	□		**MAS1310MB**	70	120	14.0
	6	Int.	□		**MAS1310LB**	110	160	14.0
	3	Ext.	□		**MAE1320MB**	70	120	14.0
13.2	3	Int.	□		**MAS1320MB**	70	120	14.0
	6	Int.	□		**MAS1320LB**	110	160	14.0
	3	Ext.	□		**MAE1330MB**	70	120	14.0
13.3	3	Int.	□		**MAS1330MB**	70	120	14.0
	6	Int.	□		**MAS1330LB**	110	160	14.0
	3	Ext.	□		**MAE1340MB**	70	120	14.0
13.4	3	Int.	□		**MAS1340MB**	70	120	14.0
	6	Int.	□		**MAS1340LB**	110	160	14.0

CUTTING CONDITIONS ➤ L127
TECHNICAL DATA ➤ N001

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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10		Order Number	Dimensions (mm) L3	L1	D4
	3	Ext.	★		MAE1350MB	70	120	14.0
13.5	3	Int.	★		MAS1350MB	70	120	14.0
	6	Int.	★		MAS1350LB	110	160	14.0
	3	Ext.	□		MAE1360MB	70	120	14.0
13.6	3	Int.	□		MAS1360MB	70	120	14.0
	6	Int.	□		MAS1360LB	110	160	14.0
	3	Ext.	□		MAE1370MB	70	120	14.0
13.7	3	Int.	□		MAS1370MB	70	120	14.0
	6	Int.	□		MAS1370LB	110	160	14.0
	3	Ext.	□		MAE1380MB	70	120	14.0
13.8	3	Int.	□		MAS1380MB	70	120	14.0
	6	Int.	□		MAS1380LB	110	160	14.0
	3	Ext.	□		MAE1390MB	70	120	14.0
13.9	3	Int.	□		MAS1390MB	70	120	14.0
	6	Int.	□		MAS1390LB	110	160	14.0
	3	Ext.	★	*	MAE1400MB	70	120	14.0
14.0	3	Int.	★	*	MAS1400MB	70	120	14.0
	6	Int.	★	*	MAS1400LB	110	160	14.0
	3	Ext.	□		MAE1410MB	72	130	15.0
14.1	3	Int.	□		MAS1410MB	72	130	15.0
	6	Int.	□		MAS1410LB	115	173	15.0
	3	Ext.	□		MAE1420MB	72	130	15.0
14.2	3	Int.	□		MAS1420MB	72	130	15.0
	6	Int.	□		MAS1420LB	115	173	15.0
	3	Ext.	□		MAE1430MB	72	130	15.0
14.3	3	Int.	□		MAS1430MB	72	130	15.0
	6	Int.	□		MAS1430LB	115	173	15.0
	3	Ext.	□		MAE1440MB	72	130	15.0
14.4	3	Int.	□		MAS1440MB	72	130	15.0
	6	Int.	□		MAS1440LB	115	173	15.0
	3	Ext.	□		MAE1450MB	72	130	15.0
14.5	3	Int.	□		MAS1450MB	72	130	15.0
	6	Int.	□		MAS1450LB	115	173	15.0
	3	Ext.	□		MAE1460MB	72	130	15.0
14.6	3	Int.	□		MAS1460MB	72	130	15.0
	6	Int.	□		MAS1460LB	115	173	15.0
	3	Ext.	□		MAE1470MB	72	130	15.0
14.7	3	Int.	□		MAS1470MB	72	130	15.0
	6	Int.	□		MAS1470LB	115	173	15.0
	3	Ext.	□		MAE1480MB	72	130	15.0
14.8	3	Int.	□		MAS1480MB	72	130	15.0
	6	Int.	□		MAS1480LB	115	173	15.0
	3	Ext.	□		MAE1490MB	72	130	15.0
14.9	3	Int.	□		MAS1490MB	72	130	15.0
	6	Int.	□		MAS1490LB	115	173	15.0
	3	Ext.	★	*	MAE1496MB	72	130	15.0
14.96	3	Int.	★	*	MAS1496MB	72	130	15.0
	6	Int.	★	*	MAS1496LB	115	173	15.0
	3	Ext.	★		MAE1500MB	72	130	15.0
15.0	3	Int.	★		MAS1500MB	72	130	15.0
	6	Int.	★		MAS1500LB	115	173	15.0
	3	Ext.	□		MAE1510MB	76	134	16.0
15.1	3	Int.	□		MAS1510MB	76	134	16.0
	6	Int.	□		MAS1510LB	120	178	16.0
	3	Ext.	□		MAE1520MB	76	134	16.0
15.2	3	Int.	□		MAS1520MB	76	134	16.0
	6	Int.	□		MAS1520LB	120	178	16.0
	3	Ext.	□		MAE1530MB	76	134	16.0
15.3	3	Int.	□		MAS1530MB	76	134	16.0
	6	Int.	□		MAS1530LB	120	178	16.0
	3	Ext.	□		MAE1540MB	76	134	16.0
15.4	3	Int.	□		MAS1540MB	76	134	16.0
	6	Int.	□		MAS1540LB	120	178	16.0
	3	Ext.	□		MAE1550MB	76	134	16.0
15.5	3	Int.	□		MAS1550MB	76	134	16.0
	6	Int.	□		MAS1550LB	120	178	16.0
	3	Ext.	□		MAE1560MB	76	134	16.0
15.6	3	Int.	□		MAS1560MB	76	134	16.0
	6	Int.	□		MAS1560LB	120	178	16.0
	3	Ext.	□		MAE1570MB	76	134	16.0
15.7	3	Int.	□		MAS1570MB	76	134	16.0
	6	Int.	□		MAS1570LB	120	178	16.0
	3	Ext.	□	*	MAE1580MB	76	134	16.0
15.8	3	Int.	□	*	MAS1580MB	76	134	16.0
	6	Int.	□	*	MAS1580LB	120	178	16.0
	3	Ext.	□		MAE1590MB	76	134	16.0
15.9	3	Int.	□		MAS1590MB	76	134	16.0
	6	Int.	□		MAS1590LB	120	178	16.0
	3	Ext.	★		MAE1600MB	76	134	16.0
16.0	3	Int.	★		MAS1600MB	76	134	16.0
	6	Int.	★		MAS1600LB	120	178	16.0

* : 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 (øD_1mm)	Hole Diameter Tolerance (ømm)		Super Burnish Drill Diameter (øD_1mm)	Hole Diameter Tolerance (ømm)	
		Max.	Min.		Max.	Min.
M4x0.7	**3.3**	3.242	3.422	**3.65**	3.65	3.7
M5x0.8	**4.2**	4.134	4.334	**4.6**	4.59	4.66
M6x1.0	**5.0**	4.917	5.153	**5.5**	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	12.21	**12.96**	12.92	13.04
M16x2	**14.0**	13.835	14.21	**14.96**	14.92	15.04

MZE/MZS

- Excellent chip disposal.
- Helical coolant hole enables high speed machining (MZS type).

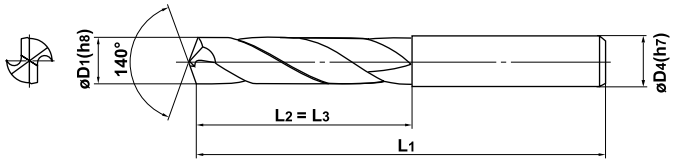
Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎	○(only MZE)	◎(MZE:○)	◎	○	○

Tolerance		.1250≤D≤.2344	.2500≤D<.3906	.4062≤D<.7031	.7188≤D<.7812
D1 (inch)		0 −0.00071	0 −0.00087	0 −0.00106	0 −0.00130
D4 (inch)	MZE	0 −0.00047	0 −0.00059	0 −0.00071	0 −0.00083
	MZS	0 −0.00031	0 −0.00035	0 −0.00043	0 −0.00051

INCH STANDARD

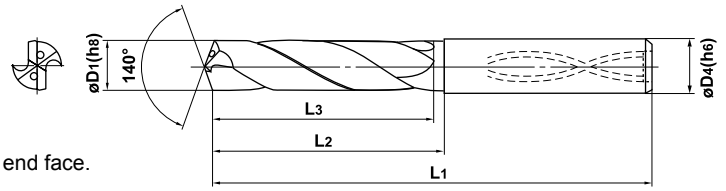
MZE (External coolant)





MZS (Internal coolant)





(Note 1) MZS type larger than ϕ.2031" have a recess in the shank end face.
(Note 2) MZS type can be used for shrink fit holders.

Drill Dia. D1 (inch)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (inch) L3	L2	L1	D4
.1250	2	Ext.	●	MZE01250SA	.703	.703	1.922	.1250
	3	Int.	▲	MZS01250MB	1.102	1.102	2.992	.1575
	5	Int.	▲	MZS01250LB	1.535	1.535	3.425	.1575
.1405	3	Int.	▲	MZS01405MB	1.260	1.260	3.150	.1575
	5	Int.	▲	MZS01405LB	1.732	1.732	3.622	.1575
.1406	2	Ext.	●	MZE01406SA	.781	.781	2.047	.1406
.1495	3	Int.	●	MZS01495MB	1.260	1.260	3.150	.1575
	5	Int.	▲	MZS01495LB	1.732	1.732	3.622	.1575
.1562	2	Ext.	●	MZE01562SA	.875	.875	2.188	.1562
	5	Int.	▲	MZS01562LB	1.732	1.732	3.622	.1575
.1590	3	Int.	●	MZS01590MB	1.417	1.417	3.386	.1969
	5	Int.	▲	MZS01590LB	1.969	1.968	3.937	.1969
.1719	2	Ext.	●	MZE01719SA	.938	.938	2.281	.1719
	3	Int.	▲	MZS01719MB	1.417	1.417	3.386	.1969
	5	Int.	▲	MZS01719LB	1.969	1.968	3.937	.1969
.1875	2	Ext.	●	MZE01875SA	1.000	1.000	2.438	.1875
	3	Int.	▲	MZS01875MB	1.575	1.574	3.543	.1969
	5	Int.	▲	MZS01875LB	2.165	2.165	4.134	.1969
.2031	2	Ext.	●	MZE02031SA	1.000	1.000	2.438	.2031
	3	Int.	▲	MZS02031MB	1.083	1.181	3.228	.2344
	5	Int.	▲	MZS02031LB	1.732	1.890	3.937	.2344
.2165	3	Int.	▲	MZS02165MB	1.083	1.181	3.228	.2344
.2188	2	Ext.	●	MZE02188SA	1.125	1.125	2.625	.2188
	3	Int.	▲	MZS02188MB	1.181	1.181	3.228	.2344
	5	Int.	▲	MZS02188LB	1.890	1.890	3.937	.2344
.2344	2	Ext.	●	MZE02344SA	1.125	1.125	2.625	.2344
	3	Int.	▲	MZS02344MB	1.181	1.181	3.228	.2344
	5	Int.	▲	MZS02344LB	1.890	1.890	3.937	.2344
.2500	3	Ext.	●	MZE02500MA	1.625	1.625	3.188	.2500
	3	Int.	▲	MZS02500MB	1.280	1.378	3.465	.2656
	5	Int.	▲	MZS02500LB	2.047	2.205	4.292	.2656

Drill Dia. D1 (inch)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (inch) L3	L2	L1	D4
.2570	3	Ext.	●	MZE02570MA	1.688	1.688	3.268	.2570
	3	Int.	▲	MZS02570MB	1.378	1.378	3.465	.2656
	5	Int.	▲	MZS02570LB	2.205	2.205	4.292	.2656
.2656	3	Ext.	●	MZE02656MA	1.688	1.688	3.250	.2656
	3	Int.	▲	MZS02656MB	1.378	1.378	3.465	.2656
	5	Int.	▲	MZS02656LB	2.205	2.205	4.292	.2656
.2720	3	Ext.	●	MZE02720MA	1.688	1.688	3.268	.2720
	3	Int.	▲	MZS02720MB	1.378	1.378	3.465	.2720
	5	Int.	▲	MZS02720LB	2.205	2.205	4.292	.2720
.2812	3	Ext.	●	MZE02812MA	1.750	1.750	3.438	.2812
	3	Int.	▲	MZS02812MB	1.476	1.575	3.701	.3125
	5	Int.	▲	MZS02812LB	2.362	2.520	4.646	.3125
.2969	3	Ext.	●	MZE02969MA	1.875	1.875	3.563	.2969
	3	Int.	▲	MZS02969MB	1.575	1.575	3.701	.3125
	5	Int.	▲	MZS02969LB	2.520	2.520	4.646	.3125
.3125	3	Ext.	●	MZE03125MA	1.875	1.875	3.563	.3125
	3	Int.	▲	MZS03125MB	1.575	1.575	3.701	.3125
	5	Int.	▲	MZS03125LB	2.520	2.520	4.646	.3125
.3281	3	Ext.	●	MZE03281MA	2.063	2.063	3.750	.3281
	3	Int.	▲	MZS03281MB	1.673	1.772	3.937	.3438
	5	Int.	▲	MZS03281LB	2.677	2.835	5.000	.3438
.3320	3	Ext.	●	MZE03320MA	2.087	2.087	3.780	.3320
	3	Int.	▲	MZS03320MB	1.673	1.772	3.937	.3438
	5	Int.	▲	MZS03320LB	2.677	2.835	5.000	.3438
.3438	3	Ext.	●	MZE03438MA	2.188	2.188	3.875	.3438
	3	Int.	▲	MZS03438MB	1.722	1.772	3.937	.3438
	5	Int.	▲	MZS03438LB	2.835	2.835	5.000	.3438
.3594	3	Ext.	●	MZE03594MA	2.281	2.281	4.000	.3594
	3	Int.	▲	MZS03594MB	1.870	1.968	4.173	.3906
	5	Int.	▲	MZS03594LB	2.992	3.150	5.355	.3906

(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.

Drill Dia. D1 (inch)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (inch) L3	L2	L1	D4
	3	Ext.	●	**MZE03680MA**	2.283	2.283	4.016	.3680
.3680	3	Int.	▲	**MZS03680MB**	1.870	1.968	4.173	.3906
	5	Int.	▲	**MZS03680LB**	2.992	3.150	5.355	.3906
	3	Ext.	●	**MZE03750MA**	2.375	2.375	4.125	.3750
.3750	3	Int.	▲	**MZS03750MB**	1.969	1.968	4.173	.3906
	5	Int.	▲	**MZS03750LB**	3.150	3.150	5.355	.3906
	3	Ext.	●	**MZE03906MA**	2.375	2.375	4.125	.3906
.3906	3	Int.	▲	**MZS03906MB**	1.969	1.968	4.173	.3906
	5	Int.	▲	**MZS03906LB**	3.150	3.150	5.355	.3906
	3	Ext.	●	**MZE04062MA**	2.625	2.625	4.406	.4062
.4062	3	Int.	▲	**MZS04062MB**	2.067	2.165	4.567	.4219
	5	Int.	▲	**MZS04062LB**	3.307	3.465	5.866	.4219
	3	Ext.	●	**MZE04219MA**	2.688	2.688	4.500	.4219
.4219	3	Int.	▲	**MZS04219MB**	2.165	2.165	4.567	.4219
	5	Int.	▲	**MZS04219LB**	3.465	3.465	5.866	.4219
	3	Ext.	●	**MZE04375MA**	2.813	2.813	4.625	.4375
.4375	3	Int.	▲	**MZS04375MB**	2.264	2.362	4.803	.4688
	5	Int.	▲	**MZS04375LB**	3.622	3.780	6.221	.4688
	3	Ext.	●	**MZE04531MA**	2.875	2.875	4.750	.4531
.4531	3	Int.	▲	**MZS04531MB**	2.362	2.362	4.803	.4688
	5	Int.	▲	**MZS04531LB**	3.780	3.780	6.221	.4688
	3	Ext.	●	**MZE04688MA**	2.875	2.875	4.750	.4688
.4688	3	Int.	▲	**MZS04688MB**	2.362	2.362	4.803	.4688
	5	Int.	▲	**MZS04688LB**	3.780	3.780	6.221	.4688
	3	Ext.	●	**MZE04844MA**	3.000	3.000	5.313	.4844
.4844	3	Int.	▲	**MZS04844MB**	2.461	2.559	5.039	.5000
	5	Int.	▲	**MZS04844LB**	3.937	4.094	6.575	.5000
	3	Ext.	▲	**MZE05000MA**	3.063	3.063	5.375	.5000
.5000	3	Int.	▲	**MZS05000MB**	2.559	2.559	5.039	.5000
	5	Int.	▲	**MZS05000LB**	4.094	4.094	6.575	.5000
	3	Ext.	▲	**MZE05050MA**	3.071	3.071	5.394	.5050
.5050	3	Int.	▲	**MZS05050MB**	2.559	2.559	5.039	.5118
	5	Int.	▲	**MZS05050LB**	4.094	4.094	6.575	.5118
	3	Ext.	▲	**MZE05118MA**	3.071	3.071	5.394	.5118
.5118	3	Int.	▲	**MZS05118MB**	2.559	2.559	5.039	.5118
	5	Int.	▲	**MZS05118LB**	4.094	4.094	6.575	.5118
	3	Ext.	▲	**MZE05156MA**	3.344	3.344	5.688	.5156
.5156	3	Int.	▲	**MZS05156MB**	2.657	2.756	5.276	.5469
	5	Int.	▲	**MZS05156LB**	4.250	4.406	6.922	.5469
	3	Ext.	▲	**MZE05312MA**	3.344	3.344	5.688	.5312
.5312	3	Int.	▲	**MZS05312MB**	2.657	2.756	5.276	.5469
	5	Int.	▲	**MZS05312LB**	4.250	4.406	6.922	.5469

Drill Dia. D1 (inch)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (inch) L3	L2	L1	D4
	3	Int.	▲	**MZS05469MB**	2.756	2.756	5.276	.5469
.5469	5	Int.	▲	**MZS05469LB**	4.406	4.406	6.922	.5469
	3	Ext.	▲	**MZE05625MA**	3.500	3.500	5.938	.5625
.5625	3	Int.	▲	**MZS05625MB**	2.854	2.953	5.512	.5781
	5	Int.	▲	**MZS05625LB**	4.563	4.718	7.281	.5781
	3	Ext.	▲	**MZE05781MA**	3.582	3.582	6.020	.5781
.5781	3	Int.	▲	**MZS05781MB**	2.953	2.953	5.512	.5781
	5	Int.	▲	**MZS05781LB**	4.719	4.718	7.281	.5781
.5937	3	Int.	▲	**MZS05937MB**	3.051	3.150	5.709	.6250
	5	Int.	▲	**MZS05937LB**	4.875	5.031	7.594	.6250
.6094	3	Int.	▲	**MZS06094MB**	3.051	3.150	5.709	.6250
	5	Int.	▲	**MZS06094LB**	4.875	5.031	7.594	.6250
	3	Ext.	▲	**MZE06250MA**	3.780	3.780	6.299	.6250
.6250	3	Int.	▲	**MZS06250MB**	3.150	3.150	5.709	.6250
	5	Int.	▲	**MZS06250LB**	5.031	5.031	7.594	.6250
	3	Ext.	▲	**MZE06330MA**	4.016	4.016	6.575	.6330
.6330	3	Int.	▲	**MZS06330MB**	3.248	3.347	5.906	.6563
	5	Int.	▲	**MZS06330LB**	5.197	5.354	7.913	.6563
.6406	3	Int.	▲	**MZS06406MB**	3.248	3.347	5.906	.6563
	5	Int.	▲	**MZS06406LB**	5.197	5.354	7.913	.6563
.6563	3	Int.	▲	**MZS06563MB**	3.346	3.347	5.906	.6563
	5	Int.	▲	**MZS06563LB**	5.354	5.354	7.913	.6563
.6718	3	Int.	▲	**MZS06718MB**	3.445	3.543	6.102	.7031
	5	Int.	▲	**MZS06718LB**	5.512	5.669	8.228	.7031
.6875	3	Int.	▲	**MZS06875MB**	3.445	3.543	6.102	.7031
	5	Int.	▲	**MZS06875LB**	5.512	5.669	8.228	.7031
.7031	3	Int.	▲	**MZS07031MB**	3.543	3.543	6.102	.7031
	5	Int.	▲	**MZS07031LB**	5.669	5.669	8.228	.7031
.7188	3	Int.	▲	**MZS07188MB**	3.642	3.740	6.299	.7344
	5	Int.	▲	**MZS07188LB**	5.827	5.984	8.543	.7344
.7344	3	Int.	▲	**MZS07344MB**	3.740	3.740	6.299	.7344
	5	Int.	▲	**MZS07344LB**	5.984	5.984	8.543	.7344
.7500	3	Int.	▲	**MZS07500MB**	3.839	3.937	6.496	.7812
	5	Int.	▲	**MZS07500LB**	6.142	6.299	8.858	.7812
.7580	3	Int.	▲	**MZS07580MB**	3.839	3.937	6.496	.7812
	5	Int.	▲	**MZS07580LB**	6.142	6.299	8.858	.7812
.7656	3	Int.	▲	**MZS07656MB**	3.839	3.937	6.496	.7812
	5	Int.	▲	**MZS07656LB**	6.142	6.299	8.858	.7812
.7812	3	Int.	▲	**MZS07812MB**	3.937	3.937	6.496	.7812
	5	Int.	▲	**MZS07812LB**	6.299	6.299	8.858	.7812

CUTTING CONDITIONS ➤ L143
TECHNICAL DATA ➤ N001

MZE/MZS

- Excellent chip disposal.
- Helical coolant hole enables high speed machining (MZS type).

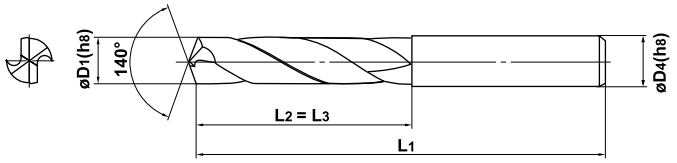
Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎	○(only MZE)	◎(MZE:○)	◎	○	○

Tolerance		D=3	3<D≤6	6<D≤10	10<D≤18	18<D≤20
D1 (mm)		0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
D4 (mm)	MZE	0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
	MZS	0 −0.006	0 −0.008	0 −0.009	0 −0.011	0 −0.013

METRIC STANDARD

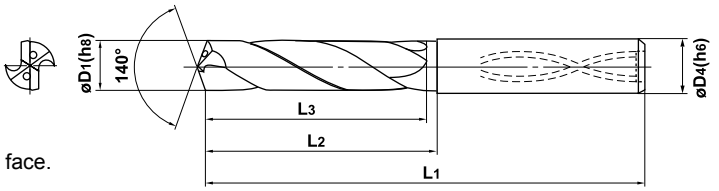
MZE (External coolant)





MZS (Internal coolant)





(Note 1) MZS type larger than ϕ5.0 have a recess in the shank end face.
(Note 2) MZS type can be used for shrink fit holders.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock Coated VP15TF	Stock Carbide HTi10	Order Number	Dimensions (mm) L3	L2	L1	D4
3.0	2	Ext.	▲	▲	MZE0300SA	16	16	55	3.0
	3	Ext.	▲	▲	MZE0300MA	21	21	60	3.0
	3	Int.	▲		MZS0300MB	24	24	72	3.0
	5	Int.	▲		MZS0300LB	33	33	81	3.0
3.1	2	Ext.	▲	▲	MZE0310SA	18	18	55	3.1
	3	Ext.	▲	▲	MZE0310MA	24	24	60	3.1
	3	Int.	▲		MZS0310MB	28	28	76	4.0
	5	Int.	▲		MZS0310LB	39	39	87	4.0
3.2	2	Ext.	▲	▲	MZE0320SA	18	18	55	3.2
	3	Ext.	▲	▲	MZE0320MA	24	24	60	3.2
	3	Int.	▲		MZS0320MB	28	28	76	4.0
	5	Int.	▲		MZS0320LB	39	39	87	4.0
3.3	2	Ext.	▲	▲	MZE0330SA	18	18	55	3.3
	3	Ext.	▲	▲	MZE0330MA	24	24	60	3.3
	3	Int.	▲		MZS0330MB	28	28	76	4.0
	5	Int.	▲		MZS0330LB	39	39	87	4.0
3.4	2	Ext.	▲	▲	MZE0340SA	20	20	55	3.4
	3	Ext.	▲	▲	MZE0340MA	24	24	60	3.4
	3	Int.	▲		MZS0340MB	28	28	76	4.0
	5	Int.	▲		MZS0340LB	39	39	87	4.0
3.5	2	Ext.	▲	▲	MZE0350SA	20	20	55	3.5
	3	Ext.	▲	▲	MZE0350MA	24	24	60	3.5
	3	Int.	▲		MZS0350MB	28	28	76	4.0
	5	Int.	▲		MZS0350LB	39	39	87	4.0
3.6	2	Ext.	▲	▲	MZE0360SA	20	20	55	3.6
	3	Ext.	▲	▲	MZE0360MA	27	27	60	3.6
	3	Int.	▲		MZS0360MB	32	32	80	4.0
	5	Int.	▲		MZS0360LB	44	44	92	4.0
3.7	2	Ext.	▲	▲	MZE0370SA	20	20	55	3.7
	3	Ext.	▲	▲	MZE0370MA	27	27	60	3.7
	3	Int.	▲		MZS0370MB	32	32	80	4.0
	5	Int.	▲		MZS0370LB	44	44	92	4.0

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock Coated VP15TF	Stock Carbide HTi10	Order Number	Dimensions (mm) L3	L2	L1	D4
3.8	2	Ext.	▲	▲	MZE0380SA	22	22	55	3.8
	3	Ext.	▲	▲	MZE0380MA	27	27	60	3.8
	3	Int.	▲		MZS0380MB	32	32	80	4.0
	5	Int.	▲		MZS0380LB	44	44	92	4.0
3.9	2	Ext.	▲	▲	MZE0390SA	22	22	55	3.9
	3	Ext.	▲	▲	MZE0390MA	27	27	60	3.9
	3	Int.	▲		MZS0390MB	32	32	80	4.0
	5	Int.	▲		MZS0390LB	44	44	92	4.0
4.0	2	Ext.	▲	▲	MZE0400SA	22	22	55	4.0
	3	Ext.	▲	▲	MZE0400MA	27	27	60	4.0
	3	Int.	▲		MZS0400MB	32	32	80	4.0
	5	Int.	▲		MZS0400LB	44	44	92	4.0
4.1	2	Ext.	▲	▲	MZE0410SA	22	22	55	4.1
	3	Ext.	▲	▲	MZE0410MA	29	29	63	4.1
	3	Int.	▲		MZS0410MB	36	36	86	5.0
	5	Int.	▲		MZS0410LB	50	50	100	5.0
4.2	2	Ext.	▲	▲	MZE0420SA	22	22	55	4.2
	3	Ext.	▲	▲	MZE0420MA	29	29	63	4.2
	3	Int.	▲		MZS0420MB	36	36	86	5.0
	5	Int.	▲		MZS0420LB	50	50	100	5.0
4.3	2	Ext.	▲	▲	MZE0430SA	24	24	58	4.3
	3	Ext.	▲	▲	MZE0430MA	29	29	63	4.3
	3	Int.	▲		MZS0430MB	36	36	86	5.0
	5	Int.	▲		MZS0430LB	50	50	100	5.0
4.4	2	Ext.	▲	▲	MZE0440SA	24	24	58	4.4
	3	Ext.	▲	▲	MZE0440MA	29	29	63	4.4
	3	Int.	▲		MZS0440MB	36	36	86	5.0
	5	Int.	▲		MZS0440LB	50	50	100	5.0
4.5	2	Ext.	▲	▲	MZE0450SA	24	24	58	4.5
	3	Ext.	▲	▲	MZE0450MA	29	29	63	4.5
	3	Int.	▲		MZS0450MB	36	36	86	5.0
	5	Int.	▲		MZS0450LB	50	50	100	5.0

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

▲: This item to be discontinued within two years.

Drill Dia. D_1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock: Coated VP15TF	Stock: Carbide HTi10	Order Number	Dimensions (mm): L_3	L_2	L_1	D_4
4.6	2	Ext.	▲	▲	MZE0460SA	24	24	58	4.6
	3	Ext.	▲	▲	MZE0460MA	32	32	68	4.6
	3	Int.	▲		MZS0460MB	40	40	90	5.0
	5	Int.	▲		MZS0460LB	55	55	105	5.0
4.7	2	Ext.	▲	▲	MZE0470SA	24	24	58	4.7
	3	Ext.	▲	▲	MZE0470MA	32	32	68	4.7
	3	Int.	▲		MZS0470MB	40	40	90	5.0
	5	Int.	▲		MZS0470LB	55	55	105	5.0
4.8	2	Ext.	▲	▲	MZE0480SA	26	26	62	4.8
	3	Ext.	▲	▲	MZE0480MA	32	32	68	4.8
	3	Int.	▲		MZS0480MB	40	40	90	5.0
	5	Int.	▲		MZS0480LB	55	55	105	5.0
4.9	2	Ext.	▲	▲	MZE0490SA	26	26	62	4.9
	3	Ext.	▲	▲	MZE0490MA	32	32	68	4.9
	3	Int.	▲		MZS0490MB	40	40	90	5.0
	5	Int.	▲		MZS0490LB	55	55	105	5.0
5.0	2	Ext.	▲	▲	MZE0500SA	26	26	62	5.0
	3	Ext.	▲	▲	MZE0500MA	32	32	68	5.0
	3	Int.	▲		MZS0500MB	27.5	30	82	6.0
	5	Int.	▲		MZS0500LB	44	48	100	6.0
5.1	2	Ext.	▲	▲	MZE0510SA	26	26	62	5.1
	3	Ext.	▲	▲	MZE0510MA	34	34	72	5.1
	3	Int.	▲		MZS0510MB	27.5	30	82	6.0
	5	Int.	▲		MZS0510LB	44	48	100	6.0
5.2	2	Ext.	▲	▲	MZE0520SA	26	26	62	5.2
	3	Ext.	▲	▲	MZE0520MA	34	34	72	5.2
	3	Int.	▲		MZS0520MB	27.5	30	82	6.0
	5	Int.	▲		MZS0520LB	44	48	100	6.0
5.3	2	Ext.	▲	▲	MZE0530SA	26	26	62	5.3
	3	Ext.	▲	▲	MZE0530MA	34	34	72	5.3
	3	Int.	▲		MZS0530MB	27.5	30	82	6.0
	5	Int.	▲		MZS0530LB	44	48	100	6.0
5.4	2	Ext.	▲	▲	MZE0540SA	28	28	66	5.4
	3	Ext.	▲	▲	MZE0540MA	34	34	72	5.4
	3	Int.	▲		MZS0540MB	27.5	30	82	6.0
	5	Int.	▲		MZS0540LB	44	48	100	6.0
5.5	2	Ext.	▲	▲	MZE0550SA	28	28	66	5.5
	3	Ext.	▲	▲	MZE0550MA	34	34	72	5.5
	3	Int.	▲		MZS0550MB	27.5	30	82	6.0
	5	Int.	▲		MZS0550LB	44	48	100	6.0
5.6	2	Ext.	▲	▲	MZE0560SA	28	28	66	5.6
	3	Ext.	▲	▲	MZE0560MA	36	36	74	5.6
	3	Int.	▲		MZS0560MB	30	30	82	6.0
	5	Int.	▲		MZS0560LB	48	48	100	6.0
5.7	2	Ext.	▲	▲	MZE0570SA	28	28	66	5.7
	3	Ext.	▲	▲	MZE0570MA	36	36	74	5.7
	3	Int.	▲		MZS0570MB	30	30	82	6.0
	5	Int.	▲		MZS0570LB	48	48	100	6.0
5.8	2	Ext.	▲	▲	MZE0580SA	28	28	66	5.8
	3	Ext.	▲	▲	MZE0580MA	36	36	74	5.8
	3	Int.	▲		MZS0580MB	30	30	82	6.0
	5	Int.	▲		MZS0580LB	48	48	100	6.0
5.9	2	Ext.	▲	▲	MZE0590SA	28	28	66	5.9
	3	Ext.	▲	▲	MZE0590MA	36	36	74	5.9
	3	Int.	▲		MZS0590MB	30	30	82	6.0
	5	Int.	▲		MZS0590LB	48	48	100	6.0
6.0	2	Ext.	▲	▲	MZE0600SA	28	28	66	6.0
	3	Ext.	▲	▲	MZE0600MA	41	41	81	6.0
	3	Int.	▲		MZS0600MB	30	30	82	6.0
	5	Int.	▲		MZS0600LB	48	48	100	6.0
6.1	2	Ext.	▲	▲	MZE0610SA	31	31	70	6.1
	3	Ext.	▲	▲	MZE0610MA	41	41	81	6.1
	3	Int.	▲		MZS0610MB	32.5	35	88	7.0
	5	Int.	▲		MZS0610LB	52	56	109	7.0
6.2	2	Ext.	▲	▲	MZE0620SA	31	31	70	6.2
	3	Ext.	▲	▲	MZE0620MA	41	41	81	6.2
	3	Int.	▲		MZS0620MB	32.5	35	88	7.0
	5	Int.	▲		MZS0620LB	52	56	109	7.0
6.3	2	Ext.	▲	▲	MZE0630SA	31	31	70	6.3
	3	Ext.	▲	▲	MZE0630MA	41	41	81	6.3
	3	Int.	▲		MZS0630MB	32.5	35	88	7.0
	5	Int.	▲		MZS0630LB	52	56	109	7.0
6.4	2	Ext.	▲	▲	MZE0640SA	31	31	70	6.4
	3	Ext.	▲	▲	MZE0640MA	41	41	81	6.4
	3	Int.	▲		MZS0640MB	32.5	35	88	7.0
	5	Int.	▲		MZS0640LB	52	56	109	7.0
6.5	2	Ext.	▲	▲	MZE0650SA	31	31	70	6.5
	3	Ext.	▲	▲	MZE0650MA	41	41	81	6.5
	3	Int.	▲		MZS0650MB	32.5	35	88	7.0
	5	Int.	▲		MZS0650LB	52	56	109	7.0
6.6	2	Ext.	▲	▲	MZE0660SA	31	31	70	6.6
	3	Ext.	▲	▲	MZE0660MA	43	43	83	6.6
	3	Int.	▲		MZS0660MB	35	35	88	7.0
	5	Int.	▲		MZS0660LB	56	56	109	7.0
6.7	2	Ext.	▲	▲	MZE0670SA	31	31	70	6.7
	3	Ext.	▲	▲	MZE0670MA	43	43	83	6.7
	3	Int.	▲		MZS0670MB	35	35	88	7.0
	5	Int.	▲		MZS0670LB	56	56	109	7.0

CUTTING CONDITIONS ➤ L143
TECHNICAL DATA ➤ N001

MZE/MZS

- Excellent chip disposal.
- Helical coolant hole enables high speed machining (MZS type).

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock Coated VP15TF	Stock Carbide HTi10	Order Number	Dimensions (mm) L3	L2	L1	D4
6.8	2	Ext.	▲	▲	MZE0680SA	34	34	74	6.8
	3	Ext.	▲	▲	MZE0680MA	43	43	83	6.8
	3	Int.	▲		MZS0680MB	35	35	88	7.0
	5	Int.	▲		MZS0680LB	56	56	109	7.0
6.9	2	Ext.	▲	▲	MZE0690SA	34	34	74	6.9
	3	Ext.	▲	▲	MZE0690MA	43	43	83	6.9
	3	Int.	▲		MZS0690MB	35	35	88	7.0
	5	Int.	▲		MZS0690LB	56	56	109	7.0
7.0	2	Ext.	▲	▲	MZE0700SA	34	34	74	7.0
	3	Ext.	▲	▲	MZE0700MA	43	43	83	7.0
	3	Int.	▲		MZS0700MB	35	35	88	7.0
	5	Int.	▲		MZS0700LB	56	56	109	7.0
7.1	2	Ext.	▲	▲	MZE0710SA	34	34	74	7.1
	3	Ext.	▲	▲	MZE0710MA	45	45	87	7.1
	3	Int.	▲		MZS0710MB	37.5	40	94	8.0
	5	Int.	▲		MZS0710LB	60	64	118	8.0
7.2	2	Ext.	▲	▲	MZE0720SA	34	34	74	7.2
	3	Ext.	▲	▲	MZE0720MA	45	45	87	7.2
	3	Int.	▲		MZS0720MB	37.5	40	94	8.0
	5	Int.	▲		MZS0720LB	60	64	118	8.0
7.3	2	Ext.	▲	▲	MZE0730SA	34	34	74	7.3
	3	Ext.	▲	▲	MZE0730MA	45	45	87	7.3
	3	Int.	▲		MZS0730MB	37.5	40	94	8.0
	5	Int.	▲		MZS0730LB	60	64	118	8.0
7.4	2	Ext.	▲	▲	MZE0740SA	34	34	74	7.4
	3	Ext.	▲	▲	MZE0740MA	45	45	87	7.4
	3	Int.	▲		MZS0740MB	37.5	40	94	8.0
	5	Int.	▲		MZS0740LB	60	64	118	8.0
7.5	2	Ext.	▲	▲	MZE0750SA	34	34	74	7.5
	3	Ext.	▲	▲	MZE0750MA	45	45	87	7.5
	3	Int.	▲		MZS0750MB	37.5	40	94	8.0
	5	Int.	▲		MZS0750LB	60	64	118	8.0
7.6	2	Ext.	▲	▲	MZE0760SA	37	37	79	7.6
	3	Ext.	▲	▲	MZE0760MA	48	48	90	7.6
	3	Int.	▲		MZS0760MB	40	40	94	8.0
	5	Int.	▲		MZS0760LB	64	64	118	8.0
7.7	2	Ext.	▲	▲	MZE0770SA	37	37	79	7.7
	3	Ext.	▲	▲	MZE0770MA	48	48	90	7.7
	3	Int.	▲		MZS0770MB	40	40	94	8.0
	5	Int.	▲		MZS0770LB	64	64	118	8.0
7.8	2	Ext.	▲	▲	MZE0780SA	37	37	79	7.8
	3	Ext.	▲	▲	MZE0780MA	48	48	90	7.8
	3	Int.	▲		MZS0780MB	40	40	94	8.0
	5	Int.	▲		MZS0780LB	64	64	118	8.0
7.9	2	Ext.	▲	▲	MZE0790SA	37	37	79	7.9
	3	Ext.	▲	▲	MZE0790MA	48	48	90	7.9
	3	Int.	▲		MZS0790MB	40	40	94	8.0
	5	Int.	▲		MZS0790LB	64	64	118	8.0
8.0	2	Ext.	▲	▲	MZE0800SA	37	37	79	8.0
	3	Ext.	▲	▲	MZE0800MA	48	48	90	8.0
	3	Int.	▲		MZS0800MB	40	40	94	8.0
	5	Int.	▲		MZS0800LB	64	64	118	8.0
8.1	2	Ext.	▲	▲	MZE0810SA	37	37	79	8.1
	3	Ext.	▲	▲	MZE0810MA	53	53	96	8.1
	3	Int.	▲		MZS0810MB	42.5	45	100	9.0
	5	Int.	▲		MZS0810LB	68	72	127	9.0
8.2	2	Ext.	▲	▲	MZE0820SA	37	37	79	8.2
	3	Ext.	▲	▲	MZE0820MA	53	53	96	8.2
	3	Int.	▲		MZS0820MB	42.5	45	100	9.0
	5	Int.	▲		MZS0820LB	68	72	127	9.0
8.3	2	Ext.	▲	▲	MZE0830SA	37	37	79	8.3
	3	Ext.	▲	▲	MZE0830MA	53	53	96	8.3
	3	Int.	▲		MZS0830MB	42.5	45	100	9.0
	5	Int.	▲		MZS0830LB	68	72	127	9.0
8.4	2	Ext.	▲	▲	MZE0840SA	37	37	79	8.4
	3	Ext.	▲	▲	MZE0840MA	53	53	96	8.4
	3	Int.	▲		MZS0840MB	42.5	45	100	9.0
	5	Int.	▲		MZS0840LB	68	72	127	9.0
8.5	2	Ext.	▲	▲	MZE0850SA	37	37	79	8.5
	3	Ext.	▲	▲	MZE0850MA	53	53	96	8.5
	3	Int.	▲		MZS0850MB	42.5	45	100	9.0
	5	Int.	▲		MZS0850LB	68	72	127	9.0
8.6	2	Ext.	▲	▲	MZE0860SA	40	40	84	8.6
	3	Ext.	▲	▲	MZE0860MA	55	55	98	8.6
	3	Int.	▲		MZS0860MB	45	45	100	9.0
	5	Int.	▲		MZS0860LB	72	72	127	9.0
8.7	2	Ext.	▲	▲	MZE0870SA	40	40	84	8.7
	3	Ext.	▲	▲	MZE0870MA	55	55	98	8.7
	3	Int.	▲		MZS0870MB	45	45	100	9.0
	5	Int.	▲		MZS0870LB	72	72	127	9.0
8.8	2	Ext.	▲	▲	MZE0880SA	40	40	84	8.8
	3	Ext.	▲	▲	MZE0880MA	55	55	98	8.8
	3	Int.	▲		MZS0880MB	45	45	100	9.0
	5	Int.	▲		MZS0880LB	72	72	127	9.0
8.9	2	Ext.	▲	▲	MZE0890SA	40	40	84	8.9
	3	Ext.	▲	▲	MZE0890MA	55	55	98	8.9
	3	Int.	▲		MZS0890MB	45	45	100	9.0
	5	Int.	▲		MZS0890LB	72	72	127	9.0

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

▲: This item to be discontinued within two years.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)			
			Coated Carbide VP15TF	Carbide HTi10		L3	L2	L1	D4
9.0	2	Ext.	▲	▲	MZE0900SA	40	40	84	9.0
	3	Ext.	▲	▲	MZE0900MA	55	55	98	9.0
	3	Int.	▲		MZS0900MB	45	45	100	9.0
	5	Int.	▲		MZS0900LB	72	72	127	9.0
9.1	2	Ext.	▲	▲	MZE0910SA	40	40	84	9.1
	3	Ext.	▲	▲	MZE0910MA	58	58	102	9.1
	3	Int.	▲		MZS0910MB	47.5	50	106	10.0
	5	Int.	▲		MZS0910LB	76	80	136	10.0
9.2	2	Ext.	▲	▲	MZE0920SA	40	40	84	9.2
	3	Ext.	▲	▲	MZE0920MA	58	58	102	9.2
	3	Int.	▲		MZS0920MB	47.5	50	106	10.0
	5	Int.	▲		MZS0920LB	76	80	136	10.0
9.3	2	Ext.	▲	▲	MZE0930SA	40	40	84	9.3
	3	Ext.	▲	▲	MZE0930MA	58	58	102	9.3
	3	Int.	▲		MZS0930MB	47.5	50	106	10.0
	5	Int.	▲		MZS0930LB	76	80	136	10.0
9.4	2	Ext.	▲	▲	MZE0940SA	40	40	84	9.4
	3	Ext.	▲	▲	MZE0940MA	58	58	102	9.4
	3	Int.	▲		MZS0940MB	47.5	50	106	10.0
	5	Int.	▲		MZS0940LB	76	80	136	10.0
9.5	2	Ext.	▲	▲	MZE0950SA	40	40	84	9.5
	3	Ext.	▲	▲	MZE0950MA	58	58	102	9.5
	3	Int.	▲		MZS0950MB	47.5	50	106	10.0
	5	Int.	▲		MZS0950LB	76	80	136	10.0
9.6	2	Ext.	▲	▲	MZE0960SA	43	43	89	9.6
	3	Ext.	▲	▲	MZE0960MA	60	60	105	9.6
	3	Int.	▲		MZS0960MB	50	50	106	10.0
	5	Int.	▲		MZS0960LB	80	80	136	10.0
9.7	2	Ext.	▲	▲	MZE0970SA	43	43	89	9.7
	3	Ext.	▲	▲	MZE0970MA	60	60	105	9.7
	3	Int.	▲		MZS0970MB	50	50	106	10.0
	5	Int.	▲		MZS0970LB	80	80	136	10.0
9.8	2	Ext.	▲	▲	MZE0980SA	43	43	89	9.8
	3	Ext.	▲	▲	MZE0980MA	60	60	105	9.8
	3	Int.	▲		MZS0980MB	50	50	106	10.0
	5	Int.	▲		MZS0980LB	80	80	136	10.0
9.9	2	Ext.	▲	▲	MZE0990SA	43	43	89	9.9
	3	Ext.	▲	▲	MZE0990MA	60	60	105	9.9
	3	Int.	▲		MZS0990MB	50	50	106	10.0
	5	Int.	▲		MZS0990LB	80	80	136	10.0
10.0	2	Ext.	▲	▲	MZE1000SA	43	43	89	10.0
	3	Ext.	▲	▲	MZE1000MA	60	60	105	10.0
	3	Int.	▲		MZS1000MB	50	50	106	10.0
	5	Int.	▲		MZS1000LB	80	80	136	10.0
10.1	2	Ext.	▲	▲	MZE1010SA	43	43	89	10.1
	3	Ext.	▲	▲	MZE1010MA	66	66	112	10.1
	3	Int.	▲		MZS1010MB	52.5	55	116	11.0
	5	Int.	▲		MZS1010LB	84	88	149	11.0
10.2	2	Ext.	▲	▲	MZE1020SA	43	43	89	10.2
	3	Ext.	▲	▲	MZE1020MA	66	66	112	10.2
	3	Int.	▲		MZS1020MB	52.5	55	116	11.0
	5	Int.	▲		MZS1020LB	84	88	149	11.0
10.3	2	Ext.	▲	▲	MZE1030SA	43	43	89	10.3
	3	Ext.	▲	▲	MZE1030MA	66	66	112	10.3
	3	Int.	▲		MZS1030MB	52.5	55	116	11.0
	5	Int.	▲		MZS1030LB	84	88	149	11.0
10.4	2	Ext.	▲	▲	MZE1040SA	43	43	89	10.4
	3	Ext.	▲	▲	MZE1040MA	66	66	112	10.4
	3	Int.	▲		MZS1040MB	52.5	55	116	11.0
	5	Int.	▲		MZS1040LB	84	88	149	11.0
10.5	2	Ext.	▲	▲	MZE1050SA	43	43	89	10.5
	3	Ext.	▲	▲	MZE1050MA	66	66	112	10.5
	3	Int.	▲		MZS1050MB	52.5	55	116	11.0
	5	Int.	▲		MZS1050LB	84	88	149	11.0
10.6	2	Ext.	▲	▲	MZE1060SA	43	43	89	10.6
	3	Ext.	▲	▲	MZE1060MA	68	68	114	10.6
	3	Int.	▲		MZS1060MB	55	55	116	11.0
	5	Int.	▲		MZS1060LB	88	88	149	11.0
10.7	2	Ext.	▲	▲	MZE1070SA	47	47	95	10.7
	3	Ext.	▲	▲	MZE1070MA	68	68	114	10.7
	3	Int.	▲		MZS1070MB	55	55	116	11.0
	5	Int.	▲		MZS1070LB	88	88	149	11.0
10.8	2	Ext.	▲	▲	MZE1080SA	47	47	95	10.8
	3	Ext.	▲	▲	MZE1080MA	68	68	114	10.8
	3	Int.	▲		MZS1080MB	55	55	116	11.0
	5	Int.	▲		MZS1080LB	88	88	149	11.0
10.9	2	Ext.	▲	▲	MZE1090SA	47	47	95	10.9
	3	Ext.	▲	▲	MZE1090MA	68	68	114	10.9
	3	Int.	▲		MZS1090MB	55	55	116	11.0
	5	Int.	▲		MZS1090LB	88	88	149	11.0
11.0	2	Ext.	▲	▲	MZE1100SA	47	47	95	11.0
	3	Ext.	▲	▲	MZE1100MA	68	68	114	11.0
	3	Int.	▲		MZS1100MB	55	55	116	11.0
	5	Int.	▲		MZS1100LB	88	88	149	11.0
11.1	2	Ext.	▲	▲	MZE1110SA	47	47	95	11.1
	3	Ext.	▲	▲	MZE1110MA	71	71	118	11.1
	3	Int.	▲		MZS1110MB	57.5	60	122	12.0
	5	Int.	▲		MZS1110LB	92	96	158	12.0

CUTTING CONDITIONS ➤ L143
TECHNICAL DATA ➤ N001

MZE/MZS

- Excellent chip disposal.
- Helical coolant hole enables high speed machining (MZS type).

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock: Coated VP15TF	Stock: Carbide HTi10	Order Number	Dimensions (mm): L3	L2	L1	D4
11.2	2	Ext.	▲	▲	MZE1120SA	47	47	95	11.2
	3	Ext.	▲	▲	MZE1120MA	71	71	118	11.2
	3	Int.	▲		MZS1120MB	57.5	60	122	12.0
	5	Int.	▲		MZS1120LB	92	96	158	12.0
11.3	2	Ext.	▲	▲	MZE1130SA	47	47	95	11.3
	3	Ext.	▲	▲	MZE1130MA	71	71	118	11.3
	3	Int.	▲		MZS1130MB	57.5	60	122	12.0
	5	Int.	▲		MZS1130LB	92	96	158	12.0
11.4	2	Ext.	▲	▲	MZE1140SA	47	47	95	11.4
	3	Ext.	▲	▲	MZE1140MA	71	71	118	11.4
	3	Int.	▲		MZS1140MB	57.5	60	122	12.0
	5	Int.	▲		MZS1140LB	92	96	158	12.0
11.5	2	Ext.	▲	▲	MZE1150SA	47	47	95	11.5
	3	Ext.	▲	▲	MZE1150MA	71	71	118	11.5
	3	Int.	▲		MZS1150MB	57.5	60	122	12.0
	5	Int.	▲		MZS1150LB	92	96	158	12.0
11.6	2	Ext.	▲	▲	MZE1160SA	47	47	95	11.6
	3	Ext.	▲	▲	MZE1160MA	73	73	121	11.6
	3	Int.	▲		MZS1160MB	60	60	122	12.0
	5	Int.	▲		MZS1160LB	96	96	158	12.0
11.7	2	Ext.	▲	▲	MZE1170SA	47	47	95	11.7
	3	Ext.	▲	▲	MZE1170MA	73	73	121	11.7
	3	Int.	▲		MZS1170MB	60	60	122	12.0
	5	Int.	▲		MZS1170LB	96	96	158	12.0
11.8	2	Ext.	▲	▲	MZE1180SA	47	47	95	11.8
	3	Ext.	▲	▲	MZE1180MA	73	73	121	11.8
	3	Int.	▲		MZS1180MB	60	60	122	12.0
	5	Int.	▲		MZS1180LB	96	96	158	12.0
11.9	2	Ext.	▲	▲	MZE1190SA	51	51	102	11.9
	3	Ext.	▲	▲	MZE1190MA	73	73	121	11.9
	3	Int.	▲		MZS1190MB	60	60	122	12.0
	5	Int.	▲		MZS1190LB	96	96	158	12.0
12.0	2	Ext.	▲	▲	MZE1200SA	51	51	102	12.0
	3	Ext.	▲	▲	MZE1200MA	73	73	121	12.0
	3	Int.	▲		MZS1200MB	60	60	122	12.0
	5	Int.	▲		MZS1200LB	96	96	158	12.0
12.1	2	Ext.	▲	▲	MZE1210SA	51	51	102	12.1
	3	Ext.	▲	▲	MZE1210MA	76	76	135	12.1
	3	Int.	▲		MZS1210MB	62.5	65	128	13.0
	5	Int.	▲		MZS1210LB	100	104	167	13.0
12.2	2	Ext.	▲	▲	MZE1220SA	51	51	102	12.2
	3	Ext.	▲	▲	MZE1220MA	76	76	135	12.2
	3	Int.	▲		MZS1220MB	62.5	65	128	13.0
	5	Int.	▲		MZS1220LB	100	104	167	13.0
12.3	2	Ext.	▲	▲	MZE1230SA	51	51	102	12.3
	3	Ext.	▲	▲	MZE1230MA	76	76	135	12.3
	3	Int.	▲		MZS1230MB	62.5	65	128	13.0
	5	Int.	▲		MZS1230LB	100	104	167	13.0
12.4	2	Ext.	▲	▲	MZE1240SA	51	51	102	12.4
	3	Ext.	▲	▲	MZE1240MA	76	76	135	12.4
	3	Int.	▲		MZS1240MB	62.5	65	128	13.0
	5	Int.	▲		MZS1240LB	100	104	167	13.0
12.5	2	Ext.	▲	▲	MZE1250SA	51	51	102	12.5
	3	Ext.	▲	▲	MZE1250MA	76	76	135	12.5
	3	Int.	▲		MZS1250MB	62.5	65	128	13.0
	5	Int.	▲		MZS1250LB	100	104	167	13.0
12.6	2	Ext.	▲	▲	MZE1260SA	51	51	102	12.6
	3	Ext.	▲	▲	MZE1260MA	78	78	137	12.6
	3	Int.	▲		MZS1260MB	65	65	128	13.0
	5	Int.	▲		MZS1260LB	104	104	167	13.0
12.7	2	Ext.	▲	▲	MZE1270SA	51	51	102	12.7
	3	Ext.	▲	▲	MZE1270MA	78	78	137	12.7
	3	Int.	▲		MZS1270MB	65	65	128	13.0
	5	Int.	▲		MZS1270LB	104	104	167	13.0
12.8	2	Ext.	▲	▲	MZE1280SA	51	51	102	12.8
	3	Ext.	▲	▲	MZE1280MA	78	78	137	12.8
	3	Int.	▲		MZS1280MB	65	65	128	13.0
	5	Int.	▲		MZS1280LB	104	104	167	13.0
12.9	2	Ext.	▲	▲	MZE1290SA	51	51	102	12.9
	3	Ext.	▲	▲	MZE1290MA	78	78	137	12.9
	3	Int.	▲		MZS1290MB	65	65	128	13.0
	5	Int.	▲		MZS1290LB	104	104	167	13.0
13.0	2	Ext.	▲	▲	MZE1300SA	51	51	102	13.0
	3	Ext.	▲	▲	MZE1300MA	78	78	137	13.0
	3	Int.	▲		MZS1300MB	65	65	128	13.0
	5	Int.	▲		MZS1300LB	104	104	167	13.0
13.1	2	Ext.	▲	▲	MZE1310SA	51	51	102	13.1
	3	Ext.	▲	▲	MZE1310MA	84	84	144	13.1
	3	Int.	▲		MZS1310MB	67.5	70	134	14.0
	5	Int.	▲		MZS1310LB	108	112	176	14.0
13.2	2	Ext.	▲	▲	MZE1320SA	51	51	102	13.2
	3	Ext.	▲	▲	MZE1320MA	84	84	144	13.2
	3	Int.	▲		MZS1320MB	67.5	70	134	14.0
	5	Int.	▲		MZS1320LB	108	112	176	14.0
13.3	2	Ext.	▲	▲	MZE1330SA	54	54	107	13.3
	3	Ext.	▲	▲	MZE1330MA	84	84	144	13.3
	3	Int.	▲		MZS1330MB	67.5	70	134	14.0
	5	Int.	▲		MZS1330LB	108	112	176	14.0

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

▲: This item to be discontinued within two years.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock		Order Number	Dimensions (mm)			
			Coated VP15TF	Carbide HTi10		L3	L2	L1	D4
13.4	2	Ext.	▲	▲	MZE1340SA	54	54	107	13.4
	3	Ext.	▲	▲	MZE1340MA	84	84	144	13.4
	3	Int.	▲		MZS1340MB	67.5	70	134	14.0
	5	Int.	▲		MZS1340LB	108	112	176	14.0
13.5	2	Ext.	▲	▲	MZE1350SA	54	54	107	13.5
	3	Ext.	▲	▲	MZE1350MA	84	84	144	13.5
	3	Int.	▲		MZS1350MB	67.5	70	134	14.0
	5	Int.	▲		MZS1350LB	108	112	176	14.0
13.6	2	Ext.	▲	▲	MZE1360SA	54	54	107	13.6
	3	Ext.	▲	▲	MZE1360MA	86	86	147	13.6
	3	Int.	▲		MZS1360MB	70	70	134	14.0
	5	Int.	▲		MZS1360LB	112	112	176	14.0
13.7	2	Ext.	▲	▲	MZE1370SA	54	54	107	13.7
	3	Ext.	▲	▲	MZE1370MA	86	86	147	13.7
	3	Int.	▲		MZS1370MB	70	70	134	14.0
	5	Int.	▲		MZS1370LB	112	112	176	14.0
13.8	2	Ext.	▲	▲	MZE1380SA	54	54	107	13.8
	3	Ext.	▲	▲	MZE1380MA	86	86	147	13.8
	3	Int.	▲		MZS1380MB	70	70	134	14.0
	5	Int.	▲		MZS1380LB	112	112	176	14.0
13.9	2	Ext.	▲	▲	MZE1390SA	54	54	107	13.9
	3	Ext.	▲	▲	MZE1390MA	86	86	147	13.9
	3	Int.	▲		MZS1390MB	70	70	134	14.0
	5	Int.	▲		MZS1390LB	112	112	176	14.0
14.0	2	Ext.	▲	▲	MZE1400SA	54	54	107	14.0
	3	Ext.	▲	▲	MZE1400MA	86	86	147	14.0
	3	Int.	▲		MZS1400MB	70	70	134	14.0
	5	Int.	▲		MZS1400LB	112	112	176	14.0
14.1	2	Ext.	▲	▲	MZE1410SA	56	56	111	14.1
	3	Ext.	▲	▲	MZE1410MA	89	89	151	14.1
	3	Int.	▲		MZS1410MB	72.5	75	140	15.0
	5	Int.	▲		MZS1410LB	116	120	185	15.0
14.2	2	Ext.	▲	▲	MZE1420SA	56	56	111	14.2
	3	Ext.	▲	▲	MZE1420MA	89	89	151	14.2
	3	Int.	▲		MZS1420MB	72.5	75	140	15.0
	5	Int.	▲		MZS1420LB	116	120	185	15.0
14.3	2	Ext.		▲	MZE1430SA	56	56	111	14.3
	3	Ext.	▲	▲	MZE1430MA	89	89	151	14.3
	3	Int.	▲		MZS1430MB	72.5	75	140	15.0
	5	Int.	▲		MZS1430LB	116	120	185	15.0
14.4	2	Ext.		▲	MZE1440SA	56	56	111	14.4
	3	Ext.	▲	▲	MZE1440MA	89	89	151	14.4
	3	Int.	▲		MZS1440MB	72.5	75	140	15.0
	5	Int.	▲		MZS1440LB	116	120	185	15.0
14.5	2	Ext.	▲	▲	MZE1450SA	56	56	111	14.5
	3	Ext.	▲	▲	MZE1450MA	89	89	151	14.5
	3	Int.	▲		MZS1450MB	72.5	75	140	15.0
	5	Int.	▲		MZS1450LB	116	120	185	15.0
14.6	2	Ext.		▲	MZE1460SA	56	56	111	14.6
	3	Ext.	▲	▲	MZE1460MA	91	91	153	14.6
	3	Int.	▲		MZS1460MB	75	75	140	15.0
	5	Int.	▲		MZS1460LB	120	120	185	15.0
14.7	2	Ext.		▲	MZE1470SA	56	56	111	14.7
	3	Ext.	▲	▲	MZE1470MA	91	91	153	14.7
	3	Int.	▲		MZS1470MB	75	75	140	15.0
	5	Int.	▲		MZS1470LB	120	120	185	15.0
14.8	2	Ext.		▲	MZE1480SA	56	56	111	14.8
	3	Ext.	▲	▲	MZE1480MA	91	91	153	14.8
	3	Int.	▲		MZS1480MB	75	75	140	15.0
	5	Int.	▲		MZS1480LB	120	120	185	15.0
14.9	2	Ext.		▲	MZE1490SA	56	56	111	14.9
	3	Ext.	▲	▲	MZE1490MA	91	91	153	14.9
	3	Int.	▲		MZS1490MB	75	75	140	15.0
	5	Int.	▲		MZS1490LB	120	120	185	15.0
15.0	2	Ext.	▲	▲	MZE1500SA	56	56	111	15.0
	3	Ext.	▲	▲	MZE1500MA	91	91	153	15.0
	3	Int.	▲		MZS1500MB	75	75	140	15.0
	5	Int.	▲		MZS1500LB	120	120	185	15.0
15.1	2	Ext.		▲	MZE1510SA	58	58	115	15.1
	3	Ext.	▲	▲	MZE1510MA	94	94	157	15.1
	3	Int.	▲		MZS1510MB	77.5	80	145	16.0
	5	Int.	▲		MZS1510LB	124	128	193	16.0
15.2	2	Ext.	▲	▲	MZE1520SA	58	58	115	15.2
	3	Ext.	▲	▲	MZE1520MA	94	94	157	15.2
	3	Int.	▲		MZS1520MB	77.5	80	145	16.0
	5	Int.	▲		MZS1520LB	124	128	193	16.0
15.3	2	Ext.		▲	MZE1530SA	58	58	115	15.3
	3	Ext.	▲	▲	MZE1530MA	94	94	157	15.3
	3	Int.	▲		MZS1530MB	77.5	80	145	16.0
	5	Int.	▲		MZS1530LB	124	128	193	16.0
15.4	2	Ext.		▲	MZE1540SA	58	58	115	15.4
	3	Ext.	▲	▲	MZE1540MA	94	94	157	15.4
	3	Int.	▲		MZS1540MB	77.5	80	145	16.0
	5	Int.	▲		MZS1540LB	124	128	193	16.0
15.5	2	Ext.	▲	▲	MZE1550SA	58	58	115	15.5
	3	Ext.	▲	▲	MZE1550MA	94	94	157	15.5
	3	Int.	▲		MZS1550MB	77.5	80	145	16.0
	5	Int.	▲		MZS1550LB	124	128	193	16.0

CUTTING CONDITIONS ➤ L143
TECHNICAL DATA ➤ N001

MZE/MZS

- Excellent chip disposal.
- Helical coolant hole enables high speed machining (MZS type).

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock: Coated VP15TF	Stock: Carbide HTi10	Order Number	Dimensions (mm): L3	L2	L1	D4
15.6	2	Ext.		▲	MZE1560SA	58	58	115	15.6
	3	Ext.	▲	▲	MZE1560MA	96	96	160	15.6
	3	Int.	▲		MZS1560MB	80	80	145	16.0
	5	Int.	▲		MZS1560LB	128	128	193	16.0
15.7	2	Ext.		▲	MZE1570SA	58	58	115	15.7
	3	Ext.	▲	▲	MZE1570MA	96	96	160	15.7
	3	Int.	▲		MZS1570MB	80	80	145	16.0
	5	Int.	▲		MZS1570LB	128	128	193	16.0
15.8	2	Ext.		▲	MZE1580SA	58	58	115	15.8
	3	Ext.	▲	▲	MZE1580MA	96	96	160	15.8
	3	Int.	▲		MZS1580MB	80	80	145	16.0
	5	Int.	▲		MZS1580LB	128	128	193	16.0
15.9	2	Ext.		▲	MZE1590SA	58	58	115	15.9
	3	Ext.	▲	▲	MZE1590MA	96	96	160	15.9
	3	Int.	▲		MZS1590MB	80	80	145	16.0
	5	Int.	▲		MZS1590LB	128	128	193	16.0
16.0	2	Ext.	▲	▲	MZE1600SA	58	58	115	16.0
	3	Ext.	▲	▲	MZE1600MA	96	96	160	16.0
	3	Int.	▲		MZS1600MB	80	80	145	16.0
	5	Int.	▲		MZS1600LB	128	128	193	16.0
16.2	2	Ext.	▲		MZE1620SA	60	60	119	16.2
16.3	2	Ext.	▲		MZE1630SA	60	60	119	16.3
16.5	2	Ext.	▲	▲	MZE1650SA	60	60	119	16.5
	3	Ext.	▲	▲	MZE1650MA	102	102	167	16.5
	3	Int.	▲		MZS1650MB	82.5	85	150	17.0
	5	Int.	▲		MZS1650LB	132	136	201	17.0
17.0	2	Ext.	▲	▲	MZE1700SA	60	60	119	17.0
	3	Ext.	▲	▲	MZE1700MA	102	102	167	17.0
	3	Int.	▲		MZS1700MB	85	85	150	17.0
	5	Int.	▲		MZS1700LB	136	136	201	17.0
17.5	2	Ext.	▲	▲	MZE1750SA	62	62	123	17.5
	3	Ext.	▲	▲	MZE1750MA	102	102	167	17.5
	3	Int.	▲		MZS1750MB	87.5	90	155	18.0
	5	Int.	▲		MZS1750LB	140	144	209	18.0
17.8	2	Ext.	▲		MZE1780SA	62	62	123	17.8
18.0	2	Ext.	▲	▲	MZE1800SA	62	62	123	18.0
	3	Ext.	▲	▲	MZE1800MA	102	102	167	18.0
	3	Int.	▲		MZS1800MB	90	90	155	18.0
	5	Int.	▲		MZS1800LB	144	144	209	18.0
18.5	2	Ext.	▲	▲	MZE1850SA	64	64	127	18.5
	3	Ext.	▲	▲	MZE1850MA	114	114	179	18.5
	3	Int.	▲		MZS1850MB	92.5	95	160	19.0
	5	Int.	▲		MZS1850LB	148	152	217	19.0
19.0	2	Ext.	▲	▲	MZE1900SA	64	64	127	19.0
	3	Ext.	▲	▲	MZE1900MA	114	114	179	19.0
	3	Int.	▲		MZS1900MB	95	95	160	19.0
	5	Int.	▲		MZS1900LB	152	152	217	19.0
19.5	2	Ext.	▲	▲	MZE1950SA	66	66	131	19.5
	3	Ext.	▲	▲	MZE1950MA	114	114	179	19.5
	3	Int.	▲		MZS1950MB	97.5	100	165	20.0
	5	Int.	▲		MZS1950LB	156	160	225	20.0
20.0	2	Ext.	▲	▲	MZE2000SA	66	66	131	20.0
	3	Ext.	▲	▲	MZE2000MA	114	114	179	20.0
	3	Int.	▲		MZS2000MB	100	100	165	20.0
	5	Int.	▲		MZS2000LB	160	160	225	20.0

(Note) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.

MZS
STEP DRILL

- Pre-hole drilling for metric screw thread.
- Helical coolant hole enables high speed machining (MZS type).

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		◎	◎	○	○

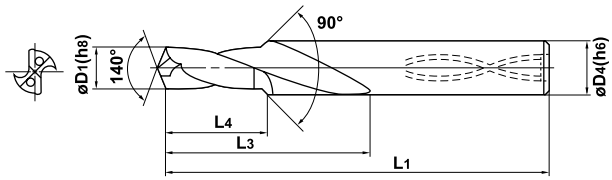
Tolerance	D_1=4.3, 5.1	D=6.8	D=8.5
D_1 (mm)	$^{0}_{-0.018}$	$^{0}_{-0.022}$	$^{1}_{-0.022}$
D_4 (mm)	$^{0}_{-0.008}$	$^{0}_{-0.009}$	$^{0}_{-0.009}$

METRIC STANDARD

MZS (Internal coolant)





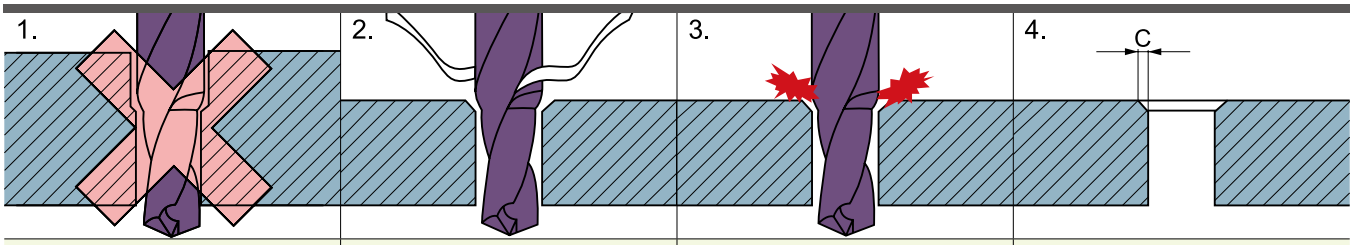


(Note 1) MZS type larger than ϕ5.0 have a recess in the shank end face.
(Note 2) Spot face drilling is not possible (chamfering only).
(Note 3) For metric coarse thread.
(Note 4) MZS type can be used for shrink fit holders.

Drill Dia. D_1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Order Number	Thread Size	Stock VP15TF	Dimensions (mm) L_4	L_3	L_1	D_4
4.3	3	Int.	**MZS0430MM05**	M5	★	15	31	84	7.0
5.1	3	Int.	**0510MM06**	M6	★	18	36	90	8.0
6.8	3	Int.	**0680MM08**	M8	★	24	48	104	10.0
8.5	3	Int.	**0850MM10**	M10	★	30	60	122	12.0

(Note) Please contact Mitsubishi Materials for special grades and geometries other than our standard products.

CAUTION FOR USE



1.	2.	3.	4.
Spot facing as shown above is not possible. The large diameter section does not have any back taper. Please contact us if spot face drill are required.	Chips from chamfer machining tend to be elongated and may cause jamming. It is recommended to peck feed to reduce the length of chips.	Cutting resistance increases on initial contact with chamfer. Reduce feed at this point.	The width of the chamfer is C1.0 for M4-M6, and C1.5 for M4-M12. For widths other than those stated above consultation is needed.

CUTTING CONDITIONS ➤ L143
TECHNICAL DATA ➤ N001

MZE/MZS

FOR TUBE SHEET DRILLING

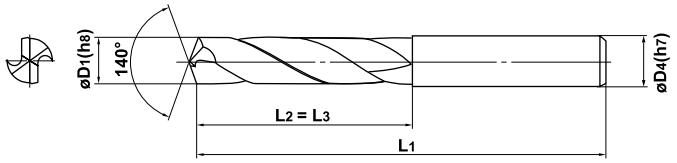
- Excellent chip disposal.
- Helical coolant hole enables high speed machining (MZS type).

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎	○(only MZE)	◎(MZE:○)	◎	○	○

Tolerance		.2500≤D≤.3906	.4062≤D<.7031	.7188≤D<.7812
D1 (inch)		0 −0.00087	0 −0.00106	0 −0.00130
D4 (inch)	MZE	0 −0.00059	0 −0.00071	0 −0.00083
	MZS	0 −0.00035	0 −0.00043	0 −0.00051

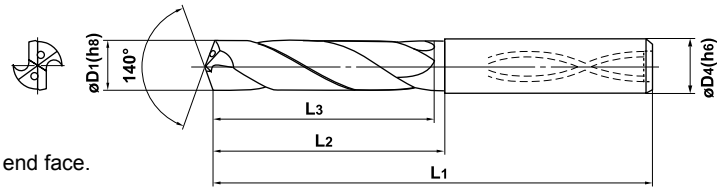
MZE (External coolant)





MZS (Internal coolant)

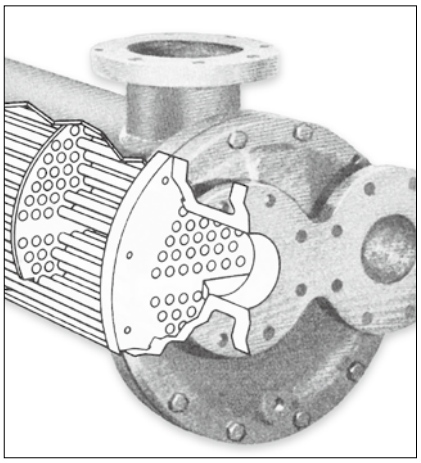




(Note 1) MZS type larger than ϕ.2031" have a recess in the shank end face.
(Note 2) MZS type can be used for shrink fit holders.

Drill Type	Order Number	Stock	Dimensions (inch)				
		VP15TF	D1	L3	L2	L1	D4
MZS Type L/D=3	**MZS0970MB**	▲	.3810	50mm	50mm	106mm	10mm
	05050MB	▲	.5050	2.559	2.559	5.039	.5118
	06330MB	▲	.6330	3.248	3.347	5.906	.6363
	1700MB	▲	.6990	85mm	85mm	150mm	17mm
	07580MB	▲	.7580	3.839	3.937	6.496	.7812
MZS Type L/D=5	**MZS0970LB**	▲	.3810	80mm	80mm	136mm	10mm
	05050LB	▲	.5050	4.094	4.094	6.575	.5118
	06330LB	▲	.6330	5.197	5.354	7.913	.6363
	1700LB	▲	.6990	136mm	136mm	201mm	17mm
	07580LB	▲	.7580	6.142	6.299	8.858	.7812
MZE Type L/D=3	**MZE0970MA**	▲	.3810	60mm	60mm	105mm	9.7mm
	05050MA	▲	.5050	3.071	3.071	5.394	.5050
	06330MA	▲	.6330	4.016	4.016	6.575	.6330
	1700MA	▲	.6690	102mm	102mm	167mm	17mm

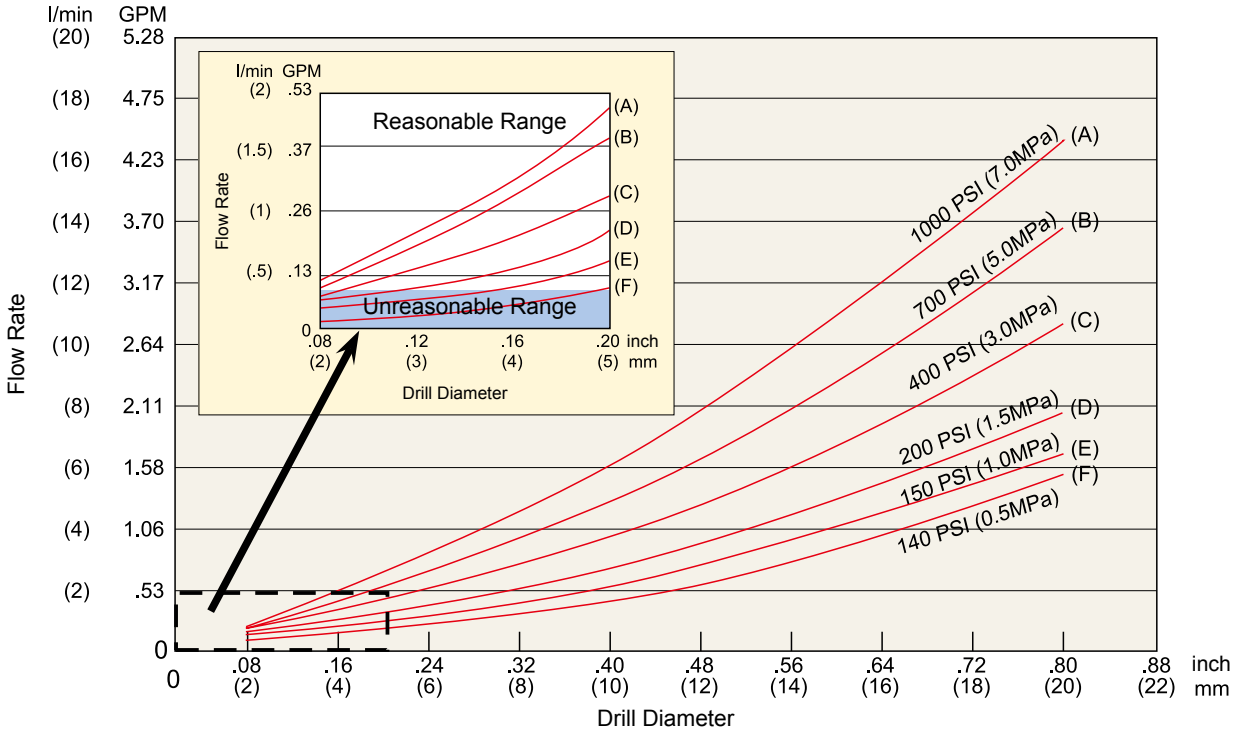
Drill diameter and dimensions appear as decimal values for inch drills and in millimeters for metric drills.



▲ : This item to be discontinued within two years.

REASONABLE COOLANT FLOW AND PRESSURE FOR MZS DRILLS

Flow Rate and Pressure



DRILLING

MICRO-MZE/MZS

- Excellent chip disposal.
- Helical through coolant hole enables high speed machining (MZS type).

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎	○(only MZE)	◎(MZE:○)	◎	○	○

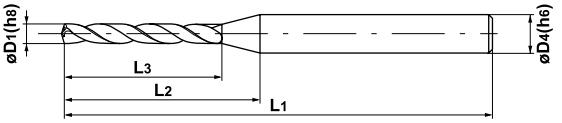
Tolerance	.0394≤D≤.1094	D=.1200
D1 (inch)	0 −0.00055	0 −0.00071
D4 (inch)	0 −0.00031	

INCH STANDARD

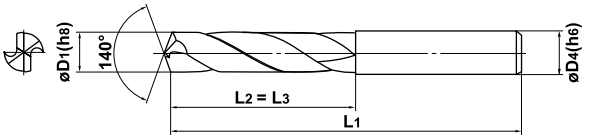
MZE (External coolant)



Type A



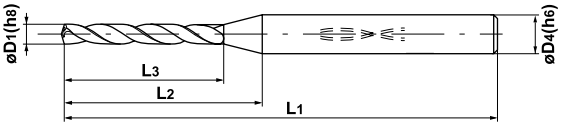
Type B



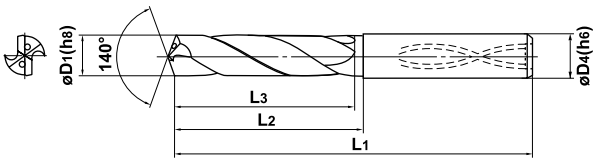
MZS (Internal coolant)



Type A



Type B



(Note) MICRO-MZE/MZS type can be used for shrink fit holders.

Drill Dia. D1 (inch)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (inch) L3	L2	L1	D4	Type
.0394	2	Ext.	●	MZE00394SB	.236	.396	2.165	.1250	A
	5	Int.	●	MZS00394LB	.433	.593	2.165	.1250	A
.0400	2	Ext.	●	MZE00400SB	.276	.435	2.165	.1250	A
	5	Int.	●	MZS00400LB	.669	.828	2.165	.1250	A
.0410	2	Ext.	●	MZE00410SB	.276	.433	2.165	.1250	A
	5	Int.	●	MZS00410LB	.669	.826	2.165	.1250	A
.0420	2	Ext.	●	MZE00420SB	.276	.431	2.165	.1250	A
	5	Int.	●	MZS00420LB	.669	.826	2.165	.1250	A
.0430	2	Ext.	●	MZE00430SB	.276	.429	2.165	.1250	A
	5	Int.	●	MZS00430LB	.669	.822	2.165	.1250	A
.0465	2	Ext.	●	MZE00465SB	.315	.461	2.165	.1250	A
	5	Int.	●	MZS00465LB	.669	.815	2.165	.1250	A
.0520	2	Ext.	●	MZE00520SB	.354	.490	2.165	.1250	A
	5	Int.	●	MZS00520LB	.669	.805	2.165	.1250	A
.0550	2	Ext.	●	MZE00550SB	.354	.485	2.165	.1250	A
	5	Int.	●	MZS00550LB	.669	.800	2.165	.1250	A
.0591	2	Ext.	●	MZE00591SB	.354	.477	2.165	.1250	A
	5	Int.	●	MZS00591LB	.669	.792	2.165	.1250	A
.0625	2	Ext.	●	MZE00625SB	.394	.511	2.165	.1250	A
	5	Int.	●	MZS00625LB	.866	.983	2.677	.1250	A
.0635	2	Ext.	●	MZE00635SB	.394	.509	2.165	.1250	A
	5	Int.	●	MZS00635LB	.866	.981	2.677	.1250	A
.0670	2	Ext.	●	MZE00670SB	.433	.541	2.165	.1250	A
	5	Int.	●	MZS00670LB	.866	.974	2.677	.1250	A
.0700	2	Ext.	●	MZE00700SB	.433	.536	2.165	.1250	A
	5	Int.	●	MZS00700LB	.866	.969	2.677	.1250	A
.0730	2	Ext.	●	MZE00730SB	.433	.530	2.165	.1250	A
	5	Int.	●	MZS00730LB	.866	.963	2.677	.1250	A
.0760	2	Ext.	●	MZE00760SB	.433	.524	2.165	.1250	A
	5	Int.	●	MZS00760LB	.866	.957	2.677	.1250	A
.0785	2	Ext.	●	MZE00785SB	.433	.520	2.165	.1250	A
	5	Int.	●	MZS00785LB	.866	.953	2.677	.1250	A
.0810	2	Ext.	●	MZE00810SB	.630	.712	2.165	.1250	A
	5	Int.	●	MZS00810LB	1.102	1.184	2.913	.1250	A
.0860	2	Ext.	●	MZE00860SB	.630	.703	2.165	.1250	A
	5	Int.	●	MZS00860LB	1.102	1.175	2.913	.1250	A
.0890	2	Ext.	●	MZE00890SB	.630	.697	2.165	.1250	A
	5	Int.	●	MZS00890LB	1.102	1.169	2.913	.1250	A
.0938	2	Ext.	●	MZE00938SB	.630	.688	2.165	.1250	A
	5	Int.	●	MZS00938LB	1.102	1.160	2.913	.1250	A
.0960	2	Ext.	●	MZE00960SB	.630	.684	2.165	.1250	A
	5	Int.	●	MZS00960LB	1.102	1.156	2.913	.1250	A
.1010	2	Ext.	●	MZE01010SB	.630	.630	2.165	.1250	B
	5	Int.	●	MZS01010LB	1.299	1.299	3.189	.1250	B
.1040	2	Ext.	●	MZE01040SB	.630	.630	2.165	.1250	B
	5	Int.	●	MZS01040LB	1.299	1.299	3.189	.1250	B
.1060	2	Ext.	●	MZE01060SB	.630	.630	2.165	.1250	B
	5	Int.	●	MZS01060LB	1.299	1.299	3.189	.1250	B
.1094	2	Ext.	●	MZE01094SB	.630	.630	2.165	.1250	B
	5	Int.	●	MZS01094LB	1.299	1.299	3.189	.1250	B
.1200	2	Ext.	●	MZE01200SB	.709	.709	2.165	.1250	B
	5	Int.	●	MZS01200LB	1.535	1.535	3.425	.1250	B

(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.

METRIC STANDARD

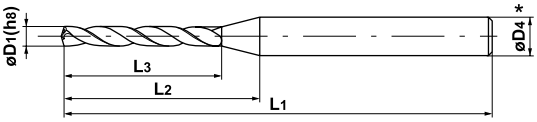
MZE (External coolant)



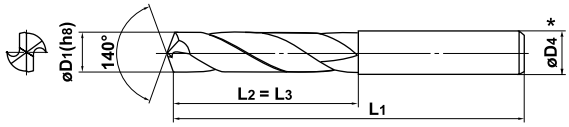
*øD4<2 : h6
øD4≥2 : h8

Tolerance		D<2	2≤D<3
D1 (mm)		0 −0.014	0 −0.014
D4 (mm)	MZE	0 −0.006	0 −0.014
	MZS	0 −0.006	0 −0.006

Type A



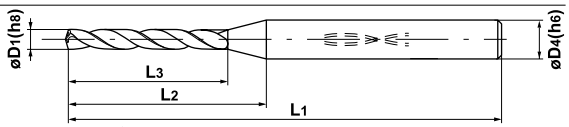
Type B



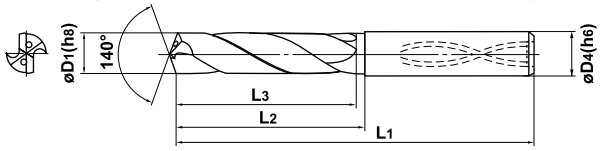
MZS (Internal coolant)



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.

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
1.0	2	Ext.	★	MZE0100SB	6	8	55	2.0	A
	5	Int.	★	MZS0100LB	11	15	55	3.0	A
1.1	2	Ext.	★	MZE0110SB	7	9	55	2.0	A
	5	Int.	★	MZS0110LB	17	21	55	3.0	A
1.2	2	Ext.	★	MZE0120SB	8	9	55	2.0	A
	5	Int.	★	MZS0120LB	17	20	55	3.0	A
1.3	2	Ext.	★	MZE0130SB	8	9	55	2.0	A
	5	Int.	★	MZS0130LB	17	20	55	3.0	A
1.4	2	Ext.	★	MZE0140SB	9	10	55	2.0	A
	5	Int.	★	MZS0140LB	17	20	55	3.0	A
1.5	2	Ext.	★	MZE0150SB	9	10	55	2.0	A
	5	Int.	★	MZS0150LB	17	20	55	3.0	A
1.6	2	Ext.	★	MZE0160SB	10	10	55	2.0	B
	5	Int.	★	MZS0160LB	22	25	68	3.0	A
1.7	2	Ext.	★	MZE0170SB	10	10	55	2.0	B
	5	Int.	★	MZS0170LB	22	24	68	3.0	A
1.8	2	Ext.	★	MZE0180SB	11	11	55	2.0	B
	5	Int.	★	MZS0180LB	22	24	68	3.0	A
1.9	2	Ext.	★	MZE0190SB	11	11	55	2.0	B
	5	Int.	★	MZS0190LB	22	24	68	3.0	A
2.0	2	Ext.	★	MZE0200SA	12	12	55	2.0	B
	3	Ext.	★	MZE0200MA	16	16	55	2.0	B
	3	Int.	★	MZS0200MB	16	18	62	3.0	A
	5	Int.	★	MZS0200LB	22	24	68	3.0	A
2.1	2	Ext.	★	MZE0210SA	12	12	55	2.1	B
	3	Ext.	★	MZE0210MA	16	16	55	2.1	B
	5	Int.	★	MZS0210LB	28	30	74	3.0	A
2.2	2	Ext.	★	MZE0220SA	13	13	55	2.2	B
	3	Ext.	★	MZE0220MA	18	18	55	2.2	B
	5	Int.	★	MZS0220LB	28	29	74	3.0	A

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock VP15TF	Order Number	Dimensions (mm) L3	L2	L1	D4	Type
2.3	2	Ext.	★	MZE0230SA	13	13	55	2.3	B
	3	Ext.	★	MZE0230MA	18	18	55	2.3	B
	3	Int.	★	MZS0230MB	20	21	66	3.0	A
	5	Int.	●	MZS0230LB	28	29	74	3.0	A
2.4	2	Ext.	●	MZE0240SA	16	16	55	2.4	B
	3	Ext.	★	MZE0240MA	20	20	55	2.4	B
	3	Int.	★	MZS0240MB	20	21	66	3.0	A
	5	Int.	●	MZS0240LB	28	29	74	3.0	A
2.5	2	Ext.	●	MZE0250SA	16	16	55	2.5	B
	3	Ext.	★	MZE0250MA	20	20	55	2.5	B
	3	Int.	★	MZS0250MB	20	21	66	3.0	A
	5	Int.	●	MZS0250LB	28	29	74	3.0	A
2.6	2	Ext.	★	MZE0260SA	16	16	55	2.6	B
	3	Ext.	★	MZE0260MA	20	20	55	2.6	B
	3	Int.	★	MZS0260MB	24	24	72	3.0	B
	5	Int.	★	MZS0260LB	33	33	81	3.0	B
2.7	2	Ext.	★	MZE0270SA	16	16	55	2.7	B
	3	Ext.	★	MZE0270MA	20	20	55	2.7	B
	3	Int.	★	MZS0270MB	24	24	72	3.0	B
	5	Int.	★	MZS0270LB	33	33	81	3.0	B
2.8	2	Ext.	●	MZE0280SA	16	16	55	2.8	B
	3	Ext.	★	MZE0280MA	21	21	60	2.8	B
	3	Int.	★	MZS0280MB	24	24	72	3.0	B
	5	Int.	●	MZS0280LB	33	33	81	3.0	B
2.9	2	Ext.	●	MZE0290SA	16	16	55	2.9	B
	3	Ext.	★	MZE0290MA	21	21	60	2.9	B
	3	Int.	★	MZS0290MB	24	24	72	3.0	B
	5	Int.	●	MZS0290LB	33	33	81	3.0	B

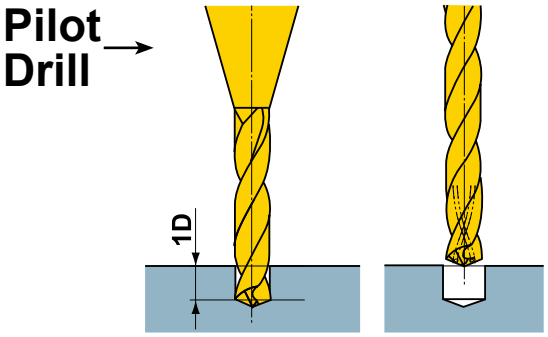
CUTTING CONDITIONS ➤ L143
TECHNICAL DATA ➤ N001

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].**

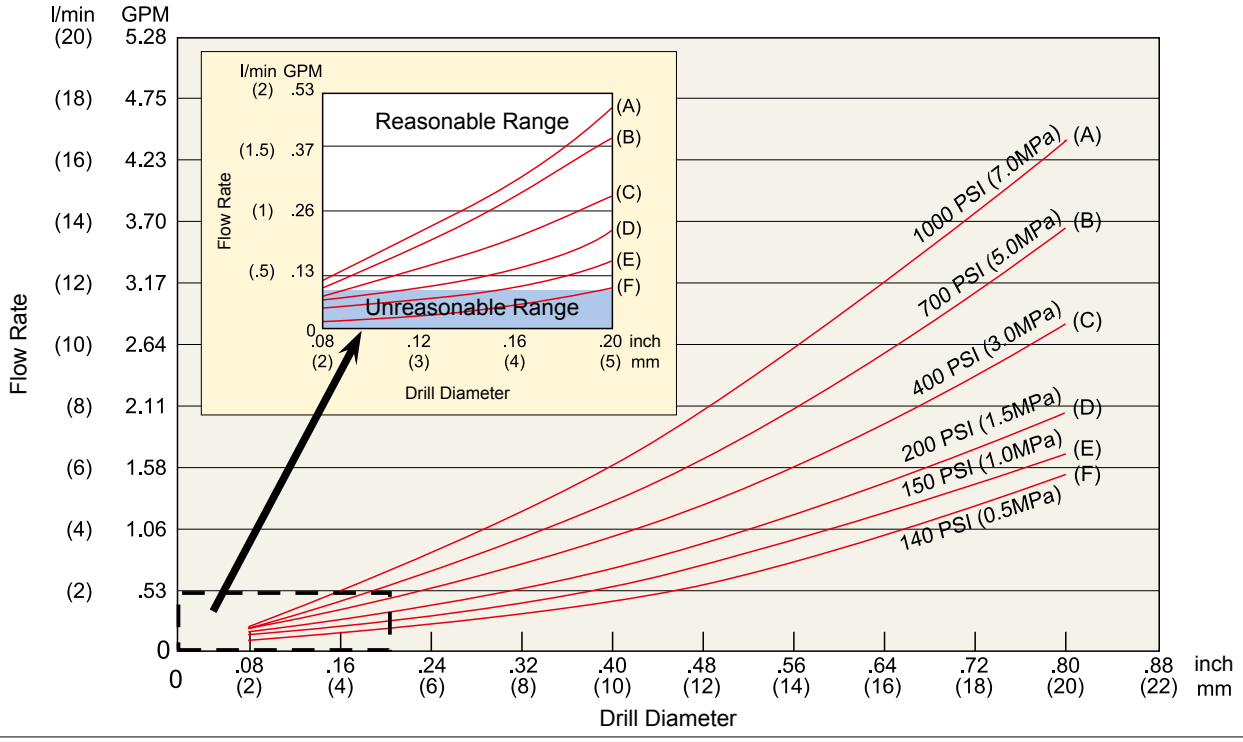
① A pilot hole must proceed application of LB drill.
② Use a SB drill with the same diameter for pilot hole.
③ Depending on cutting conditions peck feeding may be necessary.



- 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. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.0394	1.0	130	12700	.0014 (.0008—.0020)	115	11100	.0014 (.0008—.0020)
.0472	1.2	130	10600	.0018 (.0012—.0024)	110	9200	.0018 (.0012—.0024)
.0630	1.6	145	8900	.0022 (.0014—.0031)	130	7900	.0022 (.0014—.0031)
.0787	2.0	145	7100	.0028 (.0016—.0039)	130	6300	.0028 (.0016—.0039)
.0984	2.5	145	5700	.0033 (.0020—.0049)	130	5000	.0033 (.0020—.0049)
.1260	3.2	145	4400	.0039 (.0024—.0051)	130	3900	.0039 (.0024—.0051)
.1575	4.0	145	3500	.0047 (.0031—.0063)	125	3100	.0047 (.0031—.0063)
.1969	5.0	145	2800	.0059 (.0039—.0079)	130	2500	.0059 (.0039—.0079)
.2480	6.3	175	2700	.0079 (.0051—.0102)	160	2500	.0079 (.0051—.0102)
.3150	8.0	170	2100	.0091 (.0071—.0110)	155	1900	.0091 (.0071—.0110)
.3937	10.0	175	1700	.0106 (.0087—.0126)	155	1500	.0106 (.0087—.0126)
.4724	12.0	210	1700	.0118 (.0110—.0134)	185	1500	.0118 (.0110—.0134)
.6299	16.0	215	1300	.0130 (.0110—.0150)	195	1200	.0130 (.0110—.0150)
.7874	20.0	225	1100	.0138 (.0118—.0157)	205	1000	.0138 (.0118—.0157)

Work Material		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.			Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.		
Drill Dia. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.0394	1.0	100	9500	.0014 (.0008—.0020)	50	4700	.0012 (.0008—.0017)
.0472	1.2	100	7900	.0018 (.0012—.0024)	50	3900	.0016 (.0012—.0021)
.0630	1.6	110	6900	.0022 (.0014—.0031)	65	3900	.0020 (.0014—.0028)
.0787	2.0	110	5500	.0028 (.0016—.0039)	60	3100	.0024 (.0016—.0031)
.0984	2.5	110	4400	.0033 (.0020—.0049)	65	2500	.0030 (.0020—.0039)
.1260	3.2	110	3400	.0039 (.0024—.0047)	60	1900	.0031 (.0020—.0031)
.1575	4.0	110	2700	.0043 (.0028—.0055)	60	1500	.0035 (.0024—.0039)
.1969	5.0	110	2200	.0055 (.0035—.0071)	60	1200	.0043 (.0028—.0051)
.2480	6.3	140	2200	.0071 (.0043—.0094)	80	1200	.0055 (.0035—.0067)
.3150	8.0	140	1700	.0083 (.0063—.0098)	75	900	.0059 (.0039—.0071)
.3937	10.0	145	1400	.0091 (.0075—.0106)	70	700	.0063 (.0047—.0075)
.4724	12.0	170	1400	.0102 (.0091—.0114)	70	600	.0071 (.0059—.0079)
.6299	16.0	180	1100	.0110 (.0094—.0130)	65	400	.0075 (.0059—.0091)
.7874	20.0	185	900	.0118 (.0102—.0134)	60	300	.0083 (.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.

MZE/MZS

RECOMMENDED CUTTING CONDITIONS

MZE (External coolant)

Work Material		Gray Cast Iron (≤350MPa) No45B etc.			Ductile Cast Iron (≤450MPa) 60-40-8 etc.		
Drill Dia. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.0394	1.0	150	14300	.0014 (.0008-.0020)	130	12700	.0014 (.0008—.0020)
.0472	1.2	150	11900	.0018 (.0012-.0024)	130	10600	.0018 (.0012—.0024)
.0630	1.6	160	9900	.0022 (.0014-.0031)	145	8900	.0022 (.0014—.0031)
.0787	2.0	160	7900	.0028 (.0016-.0039)	145	7100	.0028 (.0016—.0039)
.0984	2.5	160	6300	.0033 (.0020-.0049)	145	5700	.0033 (.0020—.0049)
.1260	3.2	160	4900	.0039 (.0024-.0051)	145	4400	.0039 (.0024—.0051)
.1575	4.0	160	3900	.0047 (.0031-.0063)	145	3500	.0047 (.0031—.0063)
.1969	5.0	160	3100	.0059 (.0039-.0079)	145	2800	.0059 (.0039—.0079)
.2480	6.3	195	3000	.0079 (.0051-.0102)	175	2700	.0079 (.0051—.0102)
.3150	8.0	190	2300	.0098 (.0071-.0122)	170	2100	.0091 (.0071—.0110)
.3937	10.0	195	1900	.0114 (.0087-.0138)	175	1700	.0106 (.0087—.0126)
.4724	12.0	220	1800	.0126 (.0110-.0146)	210	1700	.0118 (.0110—.0134)
.6299	16.0	210	1300	.0138 (.0110-.0165)	215	1300	.0130 (.0110—.0150)
.7874	20.0	225	1100	.0146 (.0118-.0173)	225	1100	.0138 (.0118—.0157)

Work Material		Aluminium Alloy (Si<5%) ASTM A6061, A7075 etc.			Heat Resistant Alloy Inconel718 etc.		
Drill Dia. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.0394	1.0	160	15900	.0020 (.0012-.0030)	30	3100	.0008 (.0006—.0011)
.0472	1.2	160	13200	.0026 (.0018-.0035)	30	2600	.0010 (.0009—.0013)
.0630	1.6	195	11900	.0033 (.0021-.0047)	30	1900	.0012 (.0010—.0016)
.0787	2.0	195	9500	.0041 (.0024-.0059)	50	2300	.0016 (.0013—.0020)
.0984	2.5	230	8900	.0053 (.0030-.0079)	50	1900	.0020 (.0016—.0024)
.1260	3.2	260	7900	.0091 (.0024-.0051)	60	1900	.0028 (.0020—.0035)
.1575	4.0	260	6300	.0094 (.0031-.0063)	60	1500	.0035 (.0024—.0043)
.1969	5.0	260	5000	.0098 (.0039-.0079)	60	1200	.0043 (.0031—.0055)
.2480	6.3	290	4500	.0138 (.0051-.0102)	80	1200	.0051 (.0035—.0075)
.3150	8.0	290	3500	.0138 (.0071-.0110)	75	900	.0055 (.0043—.0067)
.3937	10.0	290	2800	.0197 (.0087-.0126)	70	700	.0059 (.0047—.0075)
.4724	12.0	320	2600	.0197 (.0110-.0134)	75	600	.0063 (.0051—.0071)
.6299	16.0	345	2100	.0236 (.0110-.0150)	65	400	.0071 (.0055—.0083)
.7874	20.0	350	1700	.0236 (.0118-.0157)	80	400	.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

MZE (External coolant)

Work Material		Hardened Steel (40—55HRC) AISI H13, L6 etc.		
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
inch	mm			
.0394	**1.0**	30	3100	.0008 (.0006—.0012)
.0472	**1.2**	30	2600	.0012 (.0009—.0015)
.0630	**1.6**	30	1900	.0012 (.0010—.0016)
.0787	**2.0**	50	2300	.0016 (.0013—.0020)
.0984	**2.5**	50	1900	.0020 (.0016—.0024)
.1260	**3.2**	60	1900	.0028 (.0020—.0035)
.1575	**4.0**	60	1500	.0035 (.0024—.0043)
.1969	**5.0**	60	1200	.0043 (.0031—.0055)
.2480	**6.3**	80	1200	.0055 (.0035—.0075)
.3150	**8.0**	75	900	.0055 (.0043—.0067)
.3937	**10.0**	70	700	.0063 (.0047—.0075)
.4724	**12.0**	85	600	.0063 (.0051—.0071)
.6299	**16.0**	80	500	.0071 (.0055—.0083)
.7874	**20.0**	80	400	.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.

MZE/MZS

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. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.－Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.－Max.) (IPR)
.0394	1.0	130	12700	.0014 (.0008－.0020)	100	9500	.0014 (.0008－.0020)
.0472	1.2	130	10600	.0018 (.0012－.0024)	100	7900	.0018 (.0012－.0024)
.0630	1.6	145	8900	.0022 (.0014－.0031)	110	6900	.0022 (.0014－.0031)
.0787	2.0	160	7900	.0028 (.0016－.0039)	130	6300	.0028 (.0016－.0039)
.0984	2.5	160	6300	.0033 (.0020－.0049)	145	5700	.0033 (.0020－.0049)
.1260	3.2	260	7900	.0039 (.0024－.0051)	225	6900	.0039 (.0024－.0051)
.1575	4.0	260	6300	.0047 (.0031－.0063)	260	6300	.0047 (.0031－.0063)
.1969	5.0	290	5700	.0059 (.0039－.0079)	290	5700	.0059 (.0039－.0079)
.2480	6.3	325	5000	.0079 (.0051－.0102)	290	4500	.0079 (.0051－.0102)
.3150	8.0	355	4300	.0091 (.0071－.0110)	320	3900	.0091 (.0071－.0110)
.3937	10.0	390	3800	.0106 (.0087－.0126)	360	3500	.0106 (.0087－.0126)
.4724	12.0	420	3400	.0118 (.0102－.0134)	380	3100	.0118 (.0102－.0134)
.6299	16.0	445	2700	.0130 (.0106－.0150)	410	2500	.0130 (.0106－.0150)
.7874	20.0	475	2300	.0138 (.0118－.0157)	450	2200	.0138 (.0118－.0157)

Work Material		Carbon Steel, Alloy Steel (280－350HB) AISI 4340 etc.			Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.		
Drill Dia. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.－Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.－Max.) (IPR)
.0394	1.0	100	9500	.0014 (.0008－.0020)	65	6300	.0012 (.0008－.0017)
.0472	1.2	100	7900	.0018 (.0012－.0024)	65	5300	.0016 (.0012－.0021)
.0630	1.6	110	6900	.0022 (.0014－.0031)	80	4900	.0020 (.0014－.0028)
.0787	2.0	130	6300	.0028 (.0016－.0039)	95	4700	.0024 (.0016－.0031)
.0984	2.5	130	5000	.0033 (.0020－.0049)	95	3800	.0030 (.0020－.0039)
.1260	3.2	195	5900	.0039 (.0024－.0051)	95	2900	.0031 (.0024－.0039)
.1575	4.0	210	5100	.0043 (.0028－.0055)	125	3100	.0035 (.0024－.0043)
.1969	5.0	225	4400	.0055 (.0035－.0071)	130	2500	.0043 (.0031－.0055)
.2480	6.3	225	3500	.0071 (.0043－.0094)	140	2200	.0055 (.0035－.0071)
.3150	8.0	255	3100	.0083 (.0063－.0098)	155	1900	.0059 (.0039－.0075)
.3937	10.0	255	2500	.0091 (.0075－.0106)	155	1500	.0063 (.0047－.0079)
.4724	12.0	285	2300	.0102 (.0087－.0114)	185	1500	.0071 (.0059－.0083)
.6299	16.0	280	1700	.0110 (.0091－.0130)	195	1200	.0075 (.0055－.0094)
.7874	20.0	310	1500	.0118 (.0102－.0134)	225	1100	.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.

RECOMMENDED CUTTING CONDITIONS

MZS (Internal coolant)

Work Material		Gray Cast Iron (≤350MPa) No45B etc.			Ductile Cast Iron (≤450MPa) 60-40-8 etc.		
Drill Dia. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.0394	1.0	130	12700	.0014 (.0008—.0020)	95	9500	.0014 (.0008—.0020)
.0472	1.2	130	10600	.0018 (.0012—.0024)	95	7900	.0018 (.0012—.0024)
.0630	1.6	145	8900	.0022 (.0014—.0031)	110	6900	.0022 (.0014—.0031)
.0787	2.0	160	7900	.0028 (.0016—.0039)	130	6300	.0028 (.0016—.0039)
.0984	2.5	160	6300	.0033 (.0020—.0049)	130	5000	.0033 (.0020—.0049)
.1260	3.2	260	7900	.0039 (.0024—.0051)	195	5900	.0039 (.0024—.0051)
.1575	4.0	260	6300	.0047 (.0031—.0063)	210	5100	.0047 (.0031—.0063)
.1969	5.0	290	5700	.0059 (.0039—.0079)	225	4400	.0059 (.0039—.0079)
.2480	6.3	320	5000	.0079 (.0051—.0102)	225	3500	.0079 (.0051—.0102)
.3150	8.0	355	4300	.0098 (.0071—.0122)	255	3100	.0091 (.0071—.0110)
.3937	10.0	390	3800	.0114 (.0087—.0138)	255	2500	.0106 (.0087—.0126)
.4724	12.0	420	3400	.0126 (.0102—.0146)	285	2300	.0118 (.0102—.0134)
.6299	16.0	445	2700	.0138 (.0110—.0165)	280	1700	.0130 (.0110—.0150)
.7874	20.0	475	2300	.0146 (.0118—.0173)	310	1500	.0138 (.0118—.0157)

Work Material		Aluminium Alloy (Si<5%) AISI A6061, A7075 etc.			Heat Resistant Alloy Inconel718 etc.		
Drill Dia. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.0394	1.0	195	19000	.0020 (.0012—.0030)	30	3100	.0008 (.0006—.0011)
.0472	1.2	195	15900	.0026 (.0018—.0035)	30	2600	.0010 (.0009—.0013)
.0630	1.6	230	13900	.0033 (.0021—.0047)	30	1900	.0012 (.0010—.0016)
.0787	2.0	230	11100	.0041 (.0024—.0059)	30	1500	.0016 (.0013—.0020)
.0984	2.5	260	10100	.0053 (.0030—.0079)	30	1200	.0020 (.0016—.0024)
.1260	3.2	325	9900	.0091 (.0039—.0138)	45	1400	.0028 (.0020—.0035)
.1575	4.0	325	7900	.0094 (.0047—.0138)	45	1100	.0035 (.0024—.0043)
.1969	5.0	360	7000	.0098 (.0059—.0138)	60	1200	.0043 (.0031—.0055)
.2480	6.3	390	6000	.0138 (.0079—.0197)	75	1200	.0051 (.0035—.0063)
.3150	8.0	385	4700	.0138 (.0079—.0197)	75	900	.0055 (.0043—.0067)
.3937	10.0	420	4100	.0197 (.0079—.0315)	70	700	.0059 (.0047—.0067)
.4724	12.0	480	3900	.0197 (.0079—.0315)	70	600	.0063 (.0051—.0071)
.6299	16.0	545	3300	.0236 (.0079—.0000)	80	500	.0071 (.0055—.0083)
.7874	20.0	555	2700	.0236 (.0079—.0000)	80	400	.0075 (.0059—.0087)

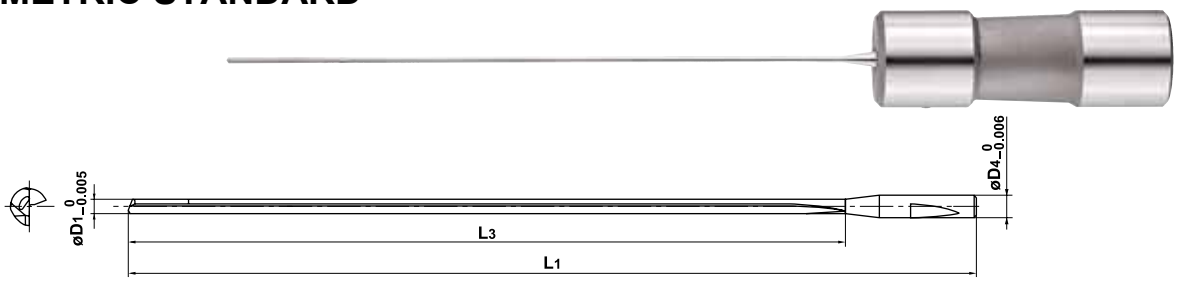
(Note) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

MICRO-MGS

- Small diameter deep hole drilling.
- High hole accuracy is possible.
- Can be used with machining and turning center.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎	○	◎	◎	◎	○

METRIC STANDARD



(Note) MGS type can be used for shrink fit holders.

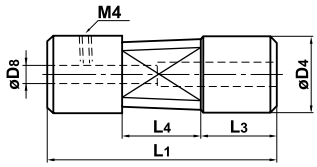
Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) L3	L1	D4
0.7	50	Int.	★	MGS0070L040B	40	80	3
	80	Int.	★	0070L060B	60	100	3
0.8	45	Int.	★	0080L040B	40	80	3
	70	Int.	★	0080L060B	60	100	3
0.9	40	Int.	★	0090L040B	40	80	3
	60	Int.	★	0090L060B	60	100	3
1.0	35	Int.	★	0100L040B	40	80	3
	55	Int.	★	0100L060B	60	100	3
	75	Int.	★	0100L080B	80	120	3
1.1	30	Int.	★	0110L040B	40	80	3
	50	Int.	★	0110L060B	60	100	3
	65	Int.	★	0110L080B	80	120	3
1.2	30	Int.	★	0120L040B	40	80	3
	45	Int.	★	0120L060B	60	100	3
	60	Int.	★	0120L080B	80	120	3
1.3	40	Int.	★	0130L060B	60	100	3
	55	Int.	★	0130L080B	80	120	3
	70	Int.	★	0130L100B	100	140	3
1.4	35	Int.	★	0140L060B	60	100	3
	50	Int.	★	0140L080B	80	120	3
	65	Int.	★	0140L100B	100	140	3
1.5	35	Int.	★	0150L060B	60	100	3
	50	Int.	★	0150L080B	80	120	3
	60	Int.	★	0150L100B	100	140	3
1.6	30	Int.	★	0160L060B	60	100	3
	45	Int.	★	0160L080B	80	120	3
	55	Int.	★	0160L100B	100	140	3
1.7	30	Int.	★	0170L060B	60	100	3
	40	Int.	★	0170L080B	80	120	3
	55	Int.	★	0170L100B	100	140	3

Drill Dia. D1 (mm)	Hole Depth (l/d)	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) L3	L1	D4
1.8	30	Int.	★	MGS0180L060B	60	100	3
	40	Int.	★	0180L080B	80	120	3
	50	Int.	★	0180L100B	100	140	3
1.9	25	Int.	★	0190L060B	60	100	3
	35	Int.	★	0190L080B	80	120	3
	45	Int.	★	0190L100B	100	140	3
2.0	25	Int.	★	0200L060B	60	100	3
	35	Int.	★	0200L080B	80	120	3
	45	Int.	★	0200L100B	100	140	3
2.1	35	Int.	★	0210L080B	80	120	3
	40	Int.	★	0210L100B	100	140	3
2.2	30	Int.	★	0220L080B	80	120	3
	40	Int.	★	0220L100B	100	140	3
2.3	30	Int.	★	0230L080B	80	120	3
	40	Int.	★	0230L100B	100	140	3
2.4	30	Int.	★	0240L080B	80	120	3
	35	Int.	★	0240L100B	100	140	3
2.5	25	Int.	★	0250L080B	80	120	3
	35	Int.	★	0250L100B	100	140	3
2.6	25	Int.	★	0260L080B	80	120	3
	35	Int.	★	0260L100B	100	140	3
2.7	25	Int.	★	0270L080B	80	120	3
	30	Int.	★	0270L100B	100	140	3
2.8	25	Int.	★	0280L080B	80	120	3
	30	Int.	★	0280L100B	100	140	3
2.9	20	Int.	★	0290L080B	80	120	3
	30	Int.	★	0290L100B	100	140	3
3.0	20	Int.	★	0300L080B	80	120	3
	30	Int.	★	0300L100B	100	140	3

(Note) Contact Mitsubishi Materials regarding coated products (***VP***, ***GP*** and ***UP*** coated carbide).

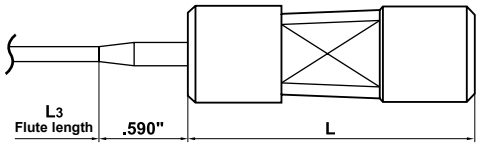
★ : Inventory maintained in Japan.

DRIVER



Order Number	Stock	Dimensions (inch)					Clamp Screw	Wrench
		D4	D8	L1	L3	L4		
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. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min-1)	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min-1)	Feed (Min.—Max.) (IPR)
.0315	**0.8**	160	19800	.0004 (.0002—.0006)	130	15900	.0004 (.0002—.0006)
.0394	**1.0**	160	15900	.0004 (.0003—.0008)	130	12700	.0004 (.0003—.0008)
.0472	**1.2**	195	15900	.0006 (.0003—.0009)	160	13200	.0006 (.0003—.0009)
.0630	**1.6**	195	11900	.0008 (.0004—.0013)	160	9900	.0008 (.0004—.0013)
.0787	**2.0**	195	9500	.0010 (.0005—.0016)	160	7900	.0010 (.0005—.0016)
.0984	**2.5**	230	8900	.0012 (.0007—.0020)	195	7600	.0012 (.0007—.0020)
.1181	**3.0**	230	7400	.0016 (.0008—.0024)	195	6300	.0016 (.0008—.0024)

Work Material	Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.			Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.		
Drill Dia. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min-1)	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min-1)	Feed (Min.—Max.) (IPR)
.0315	**0.8**	100	11900	.0002 (.0002—.0002)	100	11900	.0004 (.0002—.0006)
.0394	**1.0**	95	9500	.0002 (.0002—.0003)	95	9500	.0004 (.0003—.0008)
.0472	**1.2**	130	10600	.0002 (.0002—.0003)	95	7900	.0006 (.0003—.0009)
.0630	**1.6**	130	7900	.0004 (.0003—.0004)	130	7900	.0008 (.0004—.0013)
.0787	**2.0**	130	6300	.0004 (.0004—.0005)	130	6300	.0010 (.0005—.0016)
.0984	**2.5**	160	6300	.0006 (.0005—.0007)	130	5000	.0012 (.0007—.0020)
.1181	**3.0**	160	5300	.0006 (.0006—.0008)	130	4200	.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 ➤ L150
TECHNICAL DATA ➤ N001

MICRO-MGS

Work Material		Gray Cast Iron (≤350MPa) No45B etc.			Ductile Cast Iron (≤450MPa) 60-40-8 etc.		
Drill Dia. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.0315	**0.8**	160	19800	.0004 (.0003—.0006)	130	15900	.0002 (.0002—.0003)
.0394	**1.0**	160	15900	.0006 (.0004—.0008)	130	12700	.0002 (.0003—.0004)
.0472	**1.2**	195	15900	.0006 (.0005—.0009)	160	13200	.0004 (.0003—.0005)
.0630	**1.6**	195	11900	.0008 (.0006—.0013)	160	9900	.0004 (.0004—.0006)
.0787	**2.0**	195	9500	.0012 (.0008—.0016)	160	7900	.0006 (.0005—.0008)
.0984	**2.5**	230	8900	.0014 (.0010—.0020)	195	7600	.0008 (.0007—.0010)
.1181	**3.0**	230	7400	.0018 (.0012—.0024)	195	6300	.0010 (.0008—.0012)

Work Material		Aluminium Alloy (Si<5%) ASTM A6061, 7075 etc.			Copper, Copper alloys		
Drill Dia. inch	Drill Dia. mm	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
.0315	**0.8**	165	19800	.0004 (.0003—.0006)	130	15900	.0004 (.0003—.0006)
.0394	**1.0**	195	19000	.0006 (.0004—.0008)	165	15900	.0006 (.0004—.0008)
.0472	**1.2**	230	18500	.0006 (.0005—.0009)	195	15900	.0006 (.0005—.0009)
.0630	**1.6**	260	15900	.0008 (.0006—.0013)	230	13900	.0008 (.0006—.0013)
.0787	**2.0**	295	14300	.0012 (.0008—.0016)	260	12700	.0012 (.0008—.0016)
.0984	**2.5**	330	12700	.0014 (.0010—.0020)	295	11400	.0014 (.0010—.0020)
.1181	**3.0**	330	10600	.0018 (.0012—.0024)	330	10600	.0018 (.0012—.0024)

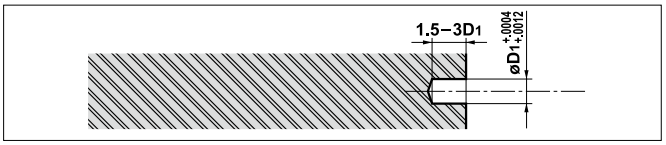
(Note 1) A pilot hole or guide bushing is required.
(Note 2) Coolant filter must be less than 5 microns. Fine filtration is necessary to prevent blockage of the coolant holes.
(Note 3) For safety and success, high pressure coolant is required. (Minimum coolant pressure=1,000PSI)
(Note 4) For the spindle 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 :

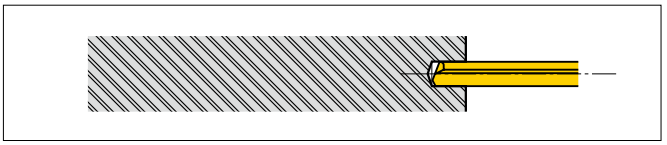
- For safety and success, high pressure coolant is required. (Minimum coolant pressure=1000PSI)
- Coolant filter must be less than 5 microns. Fine filtration is necessary to prevent blockage of the coolant holes.
- A pilot hole or guide bushing is required.

HOW TO USE

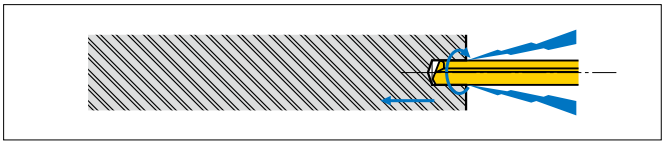
1. Pilot hole drilling.
(Mitsubishi's MZE, MZS, MWE or MWS is recommended.)



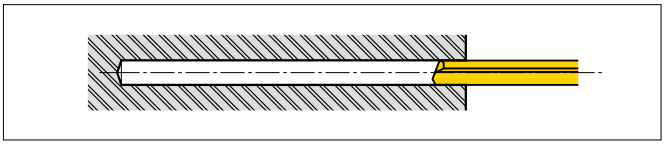
2. Drill is inserted into the pilot hole.
(Drill is not rotating.)



3. Coolant is turned ON, raise cutting speed and feed to the recommended cutting condition.



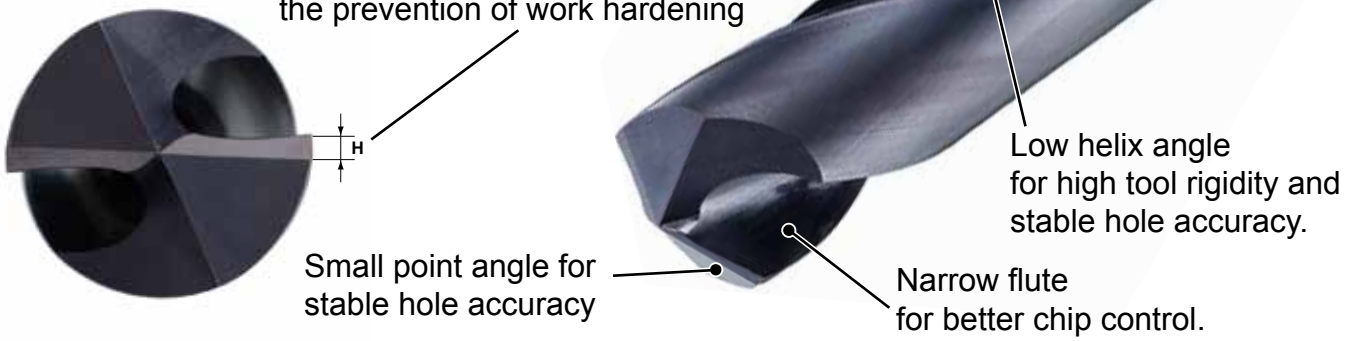
4. Return to "Pos 2" after drilling end, coolant turned OFF and drill rotation is stopped.



MHE (Drill for WHEEL HUB)

- **Designed for machining of wheel hub.**
- **Drill diameter range : From .394" to .591"**
- **Drill length : For 1 x D_1 (D_1:Drill diameter)**
- **Non stock, produced as special order only.**

FEATURES

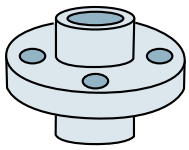


RECOMMENDED CUTTING CONDITIONS

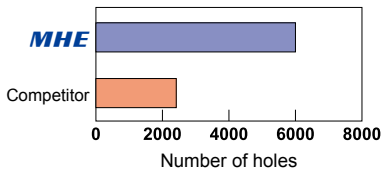
Work Material		Hardness	ϕ.394" – ϕ.591"	
			Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel	<180HB	245 (195–295)	.010 (.006–.012)

(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

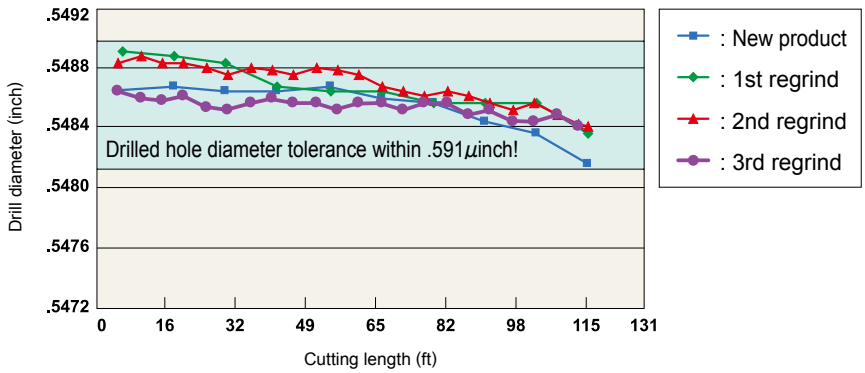


Tool : ϕ.500" x 4" x ϕ.500"
Component : Hub
Workpiece : Carbon steel
Cutting speed : 195 SFM
Feed : .006 IPR
Coolant : WSO



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

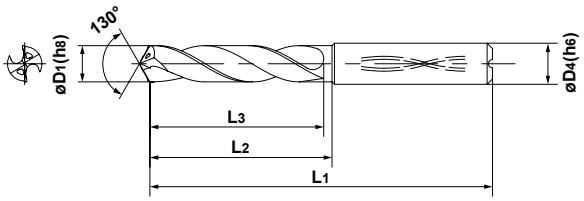
- For high accuracy and efficient drilling of CFRP.
- Unique diamond coating produces, excellent wear resistance and smooth hole surface.

CFRP	CFRP with Aluminum stack
◎	◎

Tolerance	.1719≤D≤.2362	.2510≤D≤.3937	.4380≤D≤.5512
D_1 (inch)	$^{0}_{-0.00071}$	$^{0}_{-0.00087}$	$^{0}_{-0.00106}$
D_4 (inch)	$^{0}_{-0.00031}$	$^{0}_{-0.00035}$	$^{0}_{-0.00043}$

INCH STANDARD





(Note) MCS type can be used for shrink fit holders.

Drill Dia. D1 (inch)	Hole Depth (l/d)	Coolant	Stock DD2010	Order Number	Dimensions (inch) L3	L2	L1	D4
.1719	3	Int.	★	**MCS01719X3DB**	.906	1.102	2.559	.2362
.1915	3	Int.	★	**01915X3DB**	1.063	1.102	2.559	.2362
.2510	3	Int.	★	**02510X3DB**	1.299	1.614	3.071	.3150
.3125	3	Int.	★	**03125X3DB**	1.575	1.614	3.071	.3150
.3760	3	Int.	★	**03760X3DB**	1.772	1.811	3.425	.3937
.3765	3	Int.	★	**03765X3DB**	1.772	1.811	3.425	.3937
.4380	3	Int.	★	**04380X3DB**	2.087	2.126	3.937	.4724
.5010	3	Int.	★	**05010X3DB**	2.284	2.323	4.134	.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.

RECOMMENDED CUTTING CONDITIONS

DD2010

Work Material		CFRP			Stacking board of CFRP and Aluminum alloy ASTM A7075 etc.		
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
inch	mm						
.1719	**4.366**	275	6100	.0016 (.0012—.0031)	180	4000	.0016 (.0012—.0024)
.1915	**4.864**	275	5500	.0016 (.0012—.0031)	175	3500	.0016 (.0012—.0024)
.2510	**6.375**	310	4700	.0020 (.0012—.0039)	210	3200	.0020 (.0012—.0028)
.3125	**7.938**	310	3800	.0020 (.0012—.0039)	210	2600	.0020 (.0012—.0028)
.3760	**9.550**	305	3100	.0028 (.0016—.0047)	205	2100	.0024 (.0016—.0031)
.3765	**9.563**	305	3100	.0028 (.0016—.0047)	205	2100	.0024 (.0016—.0031)
.4380	**11.125**	320	2800	.0039 (.0020—.0059)	230	2000	.0028 (.0020—.0039)
.5010	**12.725**	325	2500	.0039 (.0020—.0059)	220	1700	.0031 (.0020—.0047)

TF15

Work Material		Stacking board of CFRP and Titanium alloy Ti-6Al-4V etc.		
Drill Dia.		Cutting Speed (SFM)	Revolution (min^{-1})	Feed (Min.—Max.) (IPR)
inch	mm			
.1719	**4.366**	25	500	.0012 (.0008—.0016)
.1915	**4.864**	25	500	.0012 (.0008—.0016)
.2510	**6.375**	25	300	.0012 (.0008—.0016)
.3125	**7.938**	25	300	.0012 (.0008—.0016)
.3760	**9.550**	30	300	.0016 (.0012—.0020)
.3765	**9.563**	30	300	.0016 (.0012—.0020)
.4380	**11.125**	30	200	.0016 (.0012—.0020)
.5010	**12.725**	30	200	.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

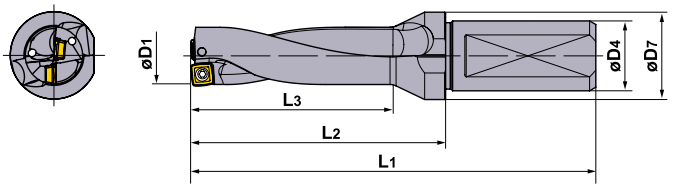
Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		○	◎		

	Reference of Hole Diameter (mm)
l/d=2–3	+0.25 0.00
l/d=4–5	+0.35 0.00
l/d=6	+0.45 0.00

METRIC STANDARD

Internal Coolant





Side Coolant Not Available.

Drill Dia. D1 (mm)	Hole Depth (L/D)	Order Number	Stock	No. of Insert	Dimensions (mm) L3	L2	L1	D4	D7	Adjustment of Radial (max.)	Insert No.	* Insert Screw	Wrench
	2	**MVX1700X2F20**	★	2	41	56	99	20	25	0.5	**SOMX063005-UM**	TPS25	TIP07F
	3	**1700X3F20**	★	2	58	73	116	20	25	0.5	**063005-UM**	TPS25	TIP07F
17.0	4	**1700X4F20**	★	2	75	90	133	20	25	0.5	**063005-UM**	TPS25	TIP07F
	5	**1700X5F20**	★	2	92	107	150	20	25	0.5	**063005-UM**	TPS25	TIP07F
	6	**1700X6F20**	★	2	109	124	167	20	25	0.5	**063005-UM**	TPS25	TIP07F
	2	**1750X2F25**	★	2	42	62	112	25	32	0.45	**063005-UM**	TPS25	TIP07F
	3	**1750X3F25**	★	2	59.5	79.5	129.5	25	32	0.45	**063005-UM**	TPS25	TIP07F
17.5	4	**1750X4F25**	★	2	77	97	147	25	32	0.45	**063005-UM**	TPS25	TIP07F
	5	**1750X5F25**	★	2	94.5	114.5	164.5	25	32	0.45	**063005-UM**	TPS25	TIP07F
	6	**1750X6F25**	★	2	112	132	182	25	32	0.45	**063005-UM**	TPS25	TIP07F
	2	**1800X2F25**	★	2	43	63	113	25	32	0.4	**063005-UM**	TPS25	TIP07F
	3	**1800X3F25**	★	2	61	81	131	25	32	0.4	**063005-UM**	TPS25	TIP07F
18.0	4	**1800X4F25**	★	2	79	99	149	25	32	0.4	**063005-UM**	TPS25	TIP07F
	5	**1800X5F25**	★	2	97	117	167	25	32	0.4	**063005-UM**	TPS25	TIP07F
	6	**1800X6F25**	★	2	115	135	185	25	32	0.4	**063005-UM**	TPS25	TIP07F
	2	**1850X2F25**	★	2	44	64	114	25	32	0.35	**063005-UM**	TPS25	TIP07F
	3	**1850X3F25**	★	2	62.5	82.5	132.5	25	32	0.35	**063005-UM**	TPS25	TIP07F
18.5	4	**1850X4F25**	★	2	81	101	151	25	32	0.35	**063005-UM**	TPS25	TIP07F
	5	**1850X5F25**	★	2	99.5	119.5	169.5	25	32	0.35	**063005-UM**	TPS25	TIP07F
	6	**1850X6F25**	★	2	118	138	188	25	32	0.35	**063005-UM**	TPS25	TIP07F
	2	**1900X2F25**	★	2	45	65	115	25	32	0.3	**063005-UM**	TPS25	TIP07F
	3	**1900X3F25**	★	2	64	84	134	25	32	0.3	**063005-UM**	TPS25	TIP07F
19.0	4	**1900X4F25**	★	2	83	103	153	25	32	0.3	**063005-UM**	TPS25	TIP07F
	5	**1900X5F25**	★	2	102	122	172	25	32	0.3	**063005-UM**	TPS25	TIP07F
	6	**1900X6F25**	★	2	121	141	191	25	32	0.3	**063005-UM**	TPS25	TIP07F
	2	**1950X2F25**	★	2	46	66	116	25	32	0.25	**063005-UM**	TPS25	TIP07F
	3	**1950X3F25**	★	2	65.5	85.5	135.5	25	32	0.25	**063005-UM**	TPS25	TIP07F
19.5	4	**1950X4F25**	★	2	85	105	155	25	32	0.25	**063005-UM**	TPS25	TIP07F
	5	**1950X5F25**	★	2	104.5	124.5	174.5	25	32	0.25	**063005-UM**	TPS25	TIP07F
	6	**1950X6F25**	★	2	124	144	194	25	32	0.25	**063005-UM**	TPS25	TIP07F
	2	**2000X2F25**	★	2	47	67	117	25	32	0.6	**073505-UM**	TPS3	TIP10F
	3	**2000X3F25**	★	2	67	87	137	25	32	0.6	**073505-UM**	TPS3	TIP10F
20.0	4	**2000X4F25**	★	2	87	107	157	25	32	0.6	**073505-UM**	TPS3	TIP10F
	5	**2000X5F25**	★	2	107	127	177	25	32	0.6	**073505-UM**	TPS3	TIP10F
	6	**2000X6F25**	★	2	127	147	197	25	32	0.6	**073505-UM**	TPS3	TIP10F

* Clamp Torque (lbf-in) : TPS3=8.9, TPS25=8.9

★ : Inventory maintained in Japan.

Drill Dia. D_1 (mm)	Hole Depth (L/D)	Order Number	Stock	No. of Insert	Dimensions (mm)					Adjustment of Radial (max.)	Insert No.	* Insert Screw	Wrench
					L_3	L_2	L_1	D_4	D_7				
20.5	2	MVX2050X2F25	★	2	48	68	118	25	32	0.55	SOMX073505-UM	TPS3	TIP10F
	3	2050X3F25	★	2	68.5	88.5	138.5	25	32	0.55	073505-UM	TPS3	TIP10F
21.0	2	2100X2F25	★	2	49	69	119	25	32	0.5	073505-UM	TPS3	TIP10F
	3	2100X3F25	★	2	70	90	140	25	32	0.5	073505-UM	TPS3	TIP10F
	4	2100X4F25	★	2	91	111	161	25	32	0.5	073505-UM	TPS3	TIP10F
	5	2100X5F25	★	2	112	132	182	25	32	0.5	073505-UM	TPS3	TIP10F
	6	2100X6F25	★	2	133	153	203	25	32	0.5	073505-UM	TPS3	TIP10F
21.5	2	2150X2F25	★	2	50	70	120	25	32	0.45	073505-UM	TPS3	TIP10F
	3	2150X3F25	★	2	71.5	91.5	141.5	25	32	0.45	073505-UM	TPS3	TIP10F
22.0	2	2200X2F25	★	2	51	71	121	25	32	0.4	073505-UM	TPS3	TIP10F
	3	2200X3F25	★	2	73	93	143	25	32	0.4	073505-UM	TPS3	TIP10F
	4	2200X4F25	★	2	95	115	165	25	32	0.4	073505-UM	TPS3	TIP10F
	5	2200X5F25	★	2	117	137	187	25	32	0.4	073505-UM	TPS3	TIP10F
	6	2200X6F25	★	2	139	159	209	25	32	0.4	073505-UM	TPS3	TIP10F
22.5	2	2250X2F25	★	2	52	72	122	25	32	0.35	073505-UM	TPS3	TIP10F
	3	2250X3F25	★	2	74.5	94.5	144.5	25	32	0.35	073505-UM	TPS3	TIP10F
23.0	2	2300X2F25	★	2	53	73	123	25	32	0.8	084005-UM	TPS351	TIP10F
	3	2300X3F25	★	2	76	96	146	25	32	0.8	084005-UM	TPS351	TIP10F
	4	2300X4F25	★	2	99	119	169	25	32	0.8	084005-UM	TPS351	TIP10F
	5	2300X5F25	★	2	122	142	192	25	32	0.8	084005-UM	TPS351	TIP10F
	6	2300X6F25	★	2	145	165	215	25	32	0.8	084005-UM	TPS351	TIP10F
23.5	2	2350X2F25	★	2	54	74	124	25	32	0.75	084005-UM	TPS351	TIP10F
	3	2350X3F25	★	2	77.5	97.5	147.5	25	32	0.75	084005-UM	TPS351	TIP10F
24.0	2	2400X2F25	★	2	55	75	125	25	32	0.7	084005-UM	TPS351	TIP10F
	3	2400X3F25	★	2	79	99	149	25	32	0.7	084005-UM	TPS351	TIP10F
	4	2400X4F25	★	2	103	123	173	25	32	0.7	084005-UM	TPS351	TIP10F
	5	2400X5F25	★	2	127	147	197	25	32	0.7	084005-UM	TPS351	TIP10F
	6	2400X6F25	★	2	151	171	221	25	32	0.7	084005-UM	TPS351	TIP10F
24.5	2	2450X2F25	★	2	56	76	126	25	32	0.65	084005-UM	TPS351	TIP10F
	3	2450X3F25	★	2	80.5	100.5	150.5	25	32	0.65	084005-UM	TPS351	TIP10F
25.0	2	2500X2F25	★	2	57	77	127	25	32	0.6	084005-UM	TPS351	TIP10F
	3	2500X3F25	★	2	82	102	152	25	32	0.6	084005-UM	TPS351	TIP10F
	4	2500X4F25	★	2	107	127	177	25	32	0.6	084005-UM	TPS351	TIP10F
	5	2500X5F25	★	2	132	152	202	25	32	0.6	084005-UM	TPS351	TIP10F
	6	2500X6F25	★	2	157	177	227	25	32	0.6	084005-UM	TPS351	TIP10F
25.5	2	2550X2F25	★	2	58	78	128	25	32	0.6	084005-UM	TPS351	TIP10F
	3	2550X3F25	★	2	83.5	103.5	153.5	25	32	0.6	084005-UM	TPS351	TIP10F
26.0	2	2600X2F32	★	2	59	79	134	32	42	0.5	084005-UM	TPS351	TIP10F
	3	2600X3F32	★	2	85	105	160	32	42	0.5	084005-UM	TPS351	TIP10F
	4	2600X4F32	★	2	111	131	186	32	42	0.5	084005-UM	TPS351	TIP10F
	5	2600X5F32	★	2	137	157	212	32	42	0.5	084005-UM	TPS351	TIP10F
	6	2600X6F32	★	2	163	183	238	32	42	0.5	084005-UM	TPS351	TIP10F
26.5	2	2650X2F32	★	2	60	80	135	32	42	0.5	084005-UM	TPS351	TIP10F
	3	2650X3F32	★	2	86.5	106.5	161.5	32	42	0.5	084005-UM	TPS351	TIP10F
27.0	2	2700X2F32	★	2	61	81	136	32	42	0.45	084005-UM	TPS351	TIP10F
	3	2700X3F32	★	2	88	108	163	32	42	0.45	084005-UM	TPS351	TIP10F
	4	2700X4F32	★	2	115	135	190	32	42	0.45	084005-UM	TPS351	TIP10F
	5	2700X5F32	★	2	142	162	217	32	42	0.45	084005-UM	TPS351	TIP10F
	6	2700X6F32	★	2	169	189	244	32	42	0.45	084005-UM	TPS351	TIP10F

* Clamp Torque (lbf-in) : TPS3=8.9, TPS351=22

INSERTS ➤ L156
CUTTING CONDITIONS ➤ L157
TECHNICAL DATA ➤ N001

MVX NEW

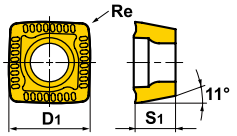
Drill Dia. D1 (mm)	Hole Depth (L/D)	Order Number	Stock	No. of Insert	Dimensions (mm) L3	L2	L1	D4	D7	Adjustment of Radial (max.)	Insert No.	* Insert Screw	Wrench
27.5	2	MVX2750X2F32	★	2	62	82	137	32	42	0.4	SOMX084005-UM	TPS351	TIP10F
	3	2750X3F32	★	2	89.5	109.5	164.5	32	42	0.4	084005-UM	TPS351	TIP10F
28.0	2	2800X2F32	★	2	63	83	138	32	42	0.85	094506-UM	TPS4	TIP15W
	3	2800X3F32	★	2	91	111	166	32	42	0.85	094506-UM	TPS4	TIP15W
	4	2800X4F32	★	2	119	139	194	32	42	0.85	094506-UM	TPS4	TIP15W
	5	2800X5F32	★	2	147	167	222	32	42	0.85	094506-UM	TPS4	TIP15W
	6	2800X6F32	★	2	175	195	250	32	42	0.85	094506-UM	TPS4	TIP15W
28.5	2	2850X2F32	★	2	64	84	139	32	42	0.8	094506-UM	TPS4	TIP15W
	3	2850X3F32	★	2	92.5	112.5	167.5	32	42	0.8	094506-UM	TPS4	TIP15W
29.0	2	2900X2F32	★	2	65	85	140	32	42	0.75	094506-UM	TPS4	TIP15W
	3	2900X3F32	★	2	94	114	169	32	42	0.75	094506-UM	TPS4	TIP15W
	4	2900X4F32	★	2	123	143	198	32	42	0.75	094506-UM	TPS4	TIP15W
	5	2900X5F32	★	2	152	172	227	32	42	0.75	094506-UM	TPS4	TIP15W
	6	2900X6F32	★	2	181	201	256	32	42	0.75	094506-UM	TPS4	TIP15W
29.5	2	2950X2F32	★	2	66	86	141	32	42	0.7	094506-UM	TPS4	TIP15W
	3	2950X3F32	★	2	95.5	115.5	170.5	32	42	0.7	094506-UM	TPS4	TIP15W
30.0	2	3000X2F32	★	2	67	87	142	32	42	0.65	094506-UM	TPS4	TIP15W
	3	3000X3F32	★	2	97	117	172	32	42	0.65	094506-UM	TPS4	TIP15W
	4	3000X4F32	★	2	127	147	202	32	42	0.65	094506-UM	TPS4	TIP15W
	5	3000X5F32	★	2	157	177	232	32	42	0.65	094506-UM	TPS4	TIP15W
	6	3000X6F32	★	2	187	207	262	32	42	0.65	094506-UM	TPS4	TIP15W
30.5	3	3050X3F32	★	2	98.5	118.5	173.5	32	42	0.6	094506-UM	TPS4	TIP15W
31.0	2	3100X2F40	★	2	69	89	154	40	50	0.55	094506-UM	TPS4	TIP15W
	3	3100X3F40	★	2	100	120	185	40	50	0.55	094506-UM	TPS4	TIP15W
	4	3100X4F40	★	2	131	151	216	40	50	0.55	094506-UM	TPS4	TIP15W
	5	3100X5F40	★	2	162	182	247	40	50	0.55	094506-UM	TPS4	TIP15W
	6	3100X6F40	★	2	193	213	278	40	50	0.55	094506-UM	TPS4	TIP15W
31.5	3	3150X3F40	★	2	101.5	121.5	186.5	40	50	0.55	094506-UM	TPS4	TIP15W
32.0	2	3200X2F40	★	2	71	91	156	40	50	0.45	094506-UM	TPS4	TIP15W
	3	3200X3F40	★	2	103	123	188	40	50	0.45	094506-UM	TPS4	TIP15W
	4	3200X4F40	★	2	135	155	220	40	50	0.45	094506-UM	TPS4	TIP15W
	5	3200X5F40	★	2	167	187	252	40	50	0.45	094506-UM	TPS4	TIP15W
	6	3200X6F40	★	2	199	219	284	40	50	0.45	094506-UM	TPS4	TIP15W
32.5	3	3250X3F40	★	2	104.5	124.5	189.5	40	50	0.45	094506-UM	TPS4	TIP15W
33.0	2	3300X2F40	★	2	73	93	158	40	50	0.4	094506-UM	TPS4	TIP15W
	3	3300X3F40	★	2	106	126	191	40	50	0.4	094506-UM	TPS4	TIP15W
	4	3300X4F40	★	2	139	159	224	40	50	0.4	094506-UM	TPS4	TIP15W
	5	3300X5F40	★	2	172	192	257	40	50	0.4	094506-UM	TPS4	TIP15W
	6	3300X6F40	★	2	205	225	290	40	50	0.4	094506-UM	TPS4	TIP15W

* Clamp Torque (lbf-in) : TPS4=31, TPS351=22

INSERTS

Shape	Drill Diameter	Order Number	Dimensions (mm) D1	S1	Re	Stock VP15TF	MC1020	MC5020	Geometry
UM	ø17—ø19.5	SOMX063005-UM	6	3	0.5	●	●	●	
	ø20—ø22.5	073505-UM	7	3.5	0.5	●	●	●	
	ø23—ø27.5	084005-UM	8.3	4	0.5	●	●	●	
	ø28—ø33	094506-UM	9.7	4.5	0.6	●	●	●	





*MC1020 and MC5020 are the outer insert only.

● : Inventory maintained. ★ : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Recommended Grade		ϕ17—ϕ19.5mm				ϕ20—ϕ23.5mm			
					Cutting Speed (SFM)	Feed (IPR)			Cutting Speed (SFM)	Feed (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	Carbon Steel Alloy Steel	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**	460 (375—590)	.0024 (.0016—.0031)	.0020 (.0016—.0024)	.0016 (.0016—.0020)	460 (375—590)	.0031 (.0024—.0047)	.0028 (.0024—.0031)	.0024 (.0024—.0028)
M	Austenitic Stainless Steel	>200HB	**MC1020**	**VP15TF**	460 (375—590)	.0024 (.0016—.0031)	.0020 (.0016—.0024)	.0016 (.0016—.0020)	460 (375—590)	.0031 (.0024—.0047)	.0028 (.0024—.0031)	.0024 (.0024—.0028)
M	Ferritic, Martensitic Stainless Steel	≤200HB	**MC1020**	**VP15TF**	460 (375—540)	.0024 (.0016—.0031)	.0020 (.0016—.0024)	.0016 (.0016—.0020)	460 (375—540)	.0035 (.0024—.0055)	.0028 (.0024—.0035)	.0024 (.0024—.0028)
M	Ferritic, Martensitic Stainless Steel	>200HB	**MC1020**	**VP15TF**	460 (375—540)	.0024 (.0016—.0031)	.0020 (.0016—.0024)	.0016 (.0016—.0020)	460 (375—540)	.0035 (.0024—.0055)	.0028 (.0024—.0035)	.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	Ductile Cast Iron	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	Recommended Grade		ϕ24—ϕ29.5mm				ϕ30—ϕ33mm			
					Cutting Speed (SFM)	Feed (IPR)			Cutting Speed (SFM)	Feed (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	Carbon Steel Alloy Steel	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**	460 (375—590)	.0035 (.0024—.0047)	.0031 (.0024—.0035)	.0028 (.0024—.0031)	460 (375—590)	.0043 (.0024—.0063)	.0031 (.0024—.0043)	.0028 (.0024—.0039)
M	Austenitic Stainless Steel	>200HB	**MC1020**	**VP15TF**	460 (375—590)	.0035 (.0024—.0047)	.0031 (.0024—.0035)	.0028 (.0024—.0031)	460 (375—590)	.0043 (.0024—.0063)	.0031 (.0024—.0043)	.0028 (.0024—.0039)
M	Ferritic, Martensitic Stainless Steel	≤200HB	**MC1020**	**VP15TF**	460 (375—540)	.0039 (.0024—.0055)	.0031 (.0024—.0035)	.0028 (.0024—.0031)	460 (375—540)	.0043 (.0024—.0063)	.0035 (.0024—.0043)	.0031 (.0024—.0039)
M	Ferritic, Martensitic Stainless Steel	>200HB	**MC1020**	**VP15TF**	460 (375—540)	.0039 (.0024—.0055)	.0031 (.0024—.0035)	.0028 (.0024—.0031)	460 (375—540)	.0043 (.0024—.0063)	.0035 (.0024—.0043)	.0031 (.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	Ductile Cast Iron	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 use VP15TF for outer insert.
2) Recommend maximum drilling depth L/D≤3 for using outer coolant system.
3) Spindle throuh & high pressue coolant system is recommended to make stable holes for stainless steel.

TAFM

- Highly rigid drill body.
- 4 corner insert.
- Various grades and chip breakers.

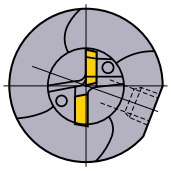
Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		◎	◎	◎	

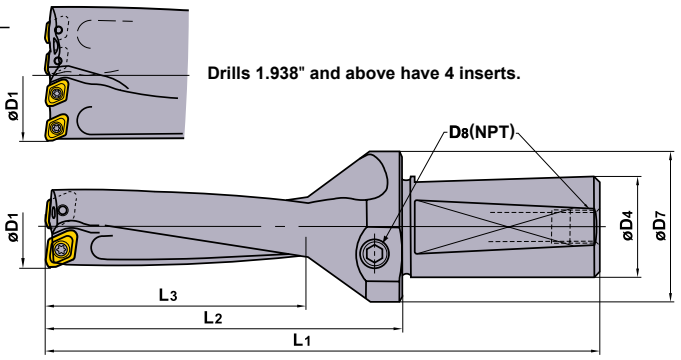
INCH STANDARD

L/D=3

Internal Coolant







Order Number	Stock	Dimensions (inch)							No. of Inserts	Insert No.	* Insert Screw	①② Wrench
		D1	L3	L2	L1	D4	D7	D8				
TAFM0468	●	.468	1.60	2.47	4.22	.750	1.02	1/8	2	**GCMT040204-U○**	TS2	①TKY06F
0500	●	.500	1.70	2.56	4.31	.750	1.02	1/8	2	**040204-U○**	TS2	①TKY06F
0531	●	.531	1.79	2.66	4.41	.750	1.02	1/8	2	**040204-U○**	TS2	①TKY06F
0562	●	.562	1.89	2.75	4.50	.750	1.02	1/8	2	**040204-U○**	TS2	①TKY06F
0593	●	.593	1.98	2.84	4.59	.750	1.02	1/8	2	**GPMT 060204-U○**	TS2	①TKY06F
0625	●	.625	2.13	3.31	6.31	1.000	1.73	1/4	2	**060204-U○**	TS2	①TKY06F
0687	●	.687	2.34	3.49	6.49	1.000	1.73	1/4	2	**060204-U○**	TS2	①TKY06F
0750	●	.750	2.55	3.68	6.68	1.000	1.73	1/4	2	**070204-U○**	TS25	①TKY08F
0812	●	.812	2.76	3.87	6.87	1.000	1.73	1/4	2	**070204-U○**	TS25	①TKY08F
0875	●	.875	2.98	4.06	7.06	1.000	1.73	1/4	2	**070204-U○**	TS25	①TKY08F
0937	●	.937	3.19	4.24	7.24	1.000	1.73	1/4	2	**090304-U○**	TS3	①TKY08F
1000	●	1.000	3.40	4.43	7.43	1.250	1.89	1/4	2	**090304-U○**	TS3	①TKY08F
1062	●	1.062	3.61	4.62	7.62	1.250	1.89	1/4	2	**090304-U○**	TS3	①TKY08F
1125	●	1.125	3.83	4.77	7.77	1.250	1.89	1/4	2	**11T308-U○**	TS4	②TKY15D
1187	●	1.187	4.04	5.14	8.14	1.500	2.09	1/4	2	**11T308-U○**	TS4	②TKY15D
1250	●	1.250	4.25	5.33	8.33	1.500	2.09	1/4	2	**11T308-U○**	TS4	②TKY15D
1312	●	1.312	4.46	5.52	8.52	1.500	2.09	1/4	2	**11T308-U○**	TS4	②TKY15D
1375	●	1.375	4.68	5.71	8.71	1.500	2.28	1/4	2	**140408-U○**	TS55	②TKY25D
1437	●	1.437	4.89	5.89	8.89	1.500	2.28	1/4	2	**140408-U○**	TS55	②TKY25D
1500	●	1.500	5.10	6.08	9.08	1.500	2.28	1/4	2	**140408-U○**	TS55	②TKY25D
1562	●	1.562	5.31	6.27	9.27	1.500	2.28	1/4	2	**140408-U○**	TS55	②TKY25D
1625	●	1.625	5.53	6.46	9.46	1.500	2.28	1/4	2	**140408-U○**	TS55	②TKY25D
1687	●	1.687	5.74	6.65	9.65	1.500	2.28	1/4	2	**140408-U○**	TS55	②TKY25D
1750	●	1.750	5.95	6.83	9.83	1.500	2.28	1/4	2	**140408-U○**	TS55	②TKY25D
1812	●	1.812	6.16	7.02	10.02	1.500	2.48	1/4	2	**140408-U○**	TS55	②TKY25D
1875	●	1.875	6.37	7.21	10.21	1.500	2.48	1/4	2	**140408-U○**	TS55	②TKY25D
1937	●	1.937	6.59	7.43	10.43	1.500	2.48	1/4	4	**090304-U○**	TS3	①TKY08F
2000	●	2.000	6.80	7.61	10.61	1.500	2.48	1/4	4	**090304-U○**	TS3	①TKY08F
2062	●	2.062	7.01	7.81	10.81	1.500	2.48	1/4	4	**090304-U○**	TS3	①TKY08F
2125	●	2.125	7.22	7.99	10.99	1.500	2.48	1/4	4	**090304-U○**	TS3	①TKY08F
2187	●	2.187	7.44	8.19	11.19	1.500	2.48	1/4	4	**090304-U○**	TS3	①TKY08F
2250	●	2.250	7.65	8.39	11.39	1.500	2.48	1/4	4	**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.

● : **Inventory maintained.**

TAFS

- Highly rigid drill body.
- 4 corner insert.
- Various grades and chip breakers.

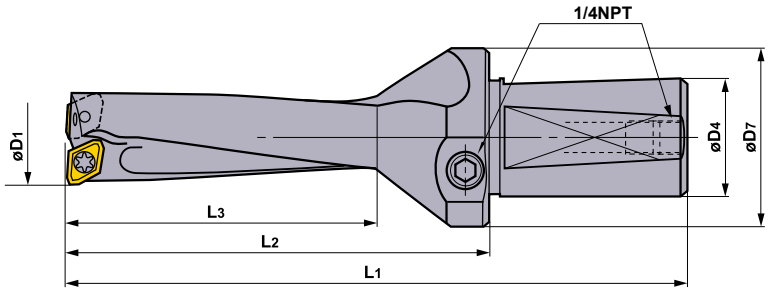
Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		◎	◎	◎	

INCH STANDARD

L/D=2

Internal Coolant





Order Number	Stock	Dimensions (inch)						No. of Inserts	Insert No.	* Insert Screw	①② Wrench
		D1	L3	L2	L1	D4	D7				
TAFS0625	●	.625	1.51	2.69	5.69	1.000	1.73	2	**GPMT060204-U○**	TS2	①TKY06F
0750	●	.750	1.80	2.93	5.93	1.000	1.73	2	**070204-U○**	TS25	①TKY08F
0875	●	.875	2.11	3.19	6.19	1.000	1.73	2	**070204-U○**	TS25	①TKY08F
1000	●	1.000	2.40	3.43	6.43	1.250	1.89	2	**090304-U○**	TS3	①TKY08F
1125	●	1.125	2.71	3.65	6.65	1.250	1.89	2	**11T308-U○**	TS4	②TKY15D
1250	●	1.250	3.00	4.08	7.08	1.500	2.09	2	**11T308-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.

INSERTS ➤ L165
CUTTING CONDITIONS ➤ L166
TECHNICAL DATA ➤ N001

TAFL

- Highly rigid drill body.
- 4 corner insert.
- Various grades and chip breakers.

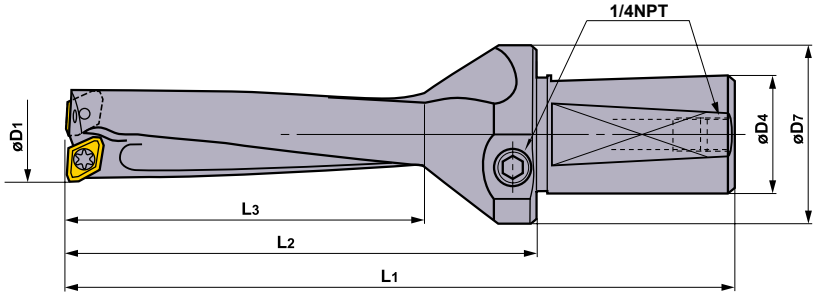
Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		◎	◎	◎	

INCH STANDARD

L/D=4

Internal Coolant





Order Number	Stock	Dimensions (inch)						No. of Inserts	Insert No.	* Insert Screw	①② Wrench
		D1	L3	L2	L1	D4	D7				
TAFL0625	●	.625	2.76	3.94	6.94	1.000	1.73	2	**GPMT060204-U○**	TS2	①TKY06F
0750	●	.750	3.30	4.43	7.43	1.000	1.73	2	**070204-U○**	TS25	①TKY08F
0875	●	.875	3.86	4.94	7.94	1.000	1.73	2	**070204-U○**	TS25	①TKY08F
1000	●	1.000	4.40	5.43	8.43	1.250	1.89	2	**090304-U○**	TS3	①TKY08F
1125	●	1.125	4.96	5.90	8.90	1.250	1.89	2	**11T308-U○**	TS4	②TKY15D
1250	●	1.250	5.50	6.58	9.58	1.500	2.09	2	**11T308-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.

● : Inventory maintained. ★ : Inventory maintained in Japan.

TAFS/TAFM/TAFL

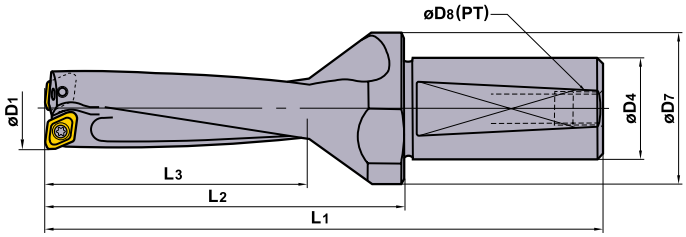
- Highly rigid drill body.
- 4 corner insert.
- Various grades and chip breakers.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		◎	◎	◎	

METRIC STANDARD

Internal Coolant





Side Coolant Not Available.

Drill Dia. D1 (mm)	Hole Depth (L/D)	Order Number	Stock	Dimensions (mm) L3	L2	L1	D4	D7	D8	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	040204-U○	TS2	TKY06F
12.5	2	TAFS1250F20	★	29	39	82	20	25	1/8	2	040204-U○	TS2	TKY06F
	3	TAFM1250F20	★	41	51	94	20	25	1/8	2	040204-U○	TS2	TKY06F
13.0	2	TAFS1300F20	★	31	41	84	20	25	1/8	2	040204-U○	TS2	TKY06F
	3	TAFM1300F20	★	44	54	97	20	25	1/8	2	040204-U○	TS2	TKY06F
13.5	2	TAFS1350F20	★	31	41	84	20	25	1/8	2	040204-U○	TS2	TKY06F
	3	TAFM1350F20	★	44	54	97	20	25	1/8	2	040204-U○	TS2	TKY06F
14.0	2	TAFS1400F20	★	33	43	86	20	25	1/8	2	040204-U○	TS2	TKY06F
	3	TAFM1400F20	★	47	57	100	20	25	1/8	2	040204-U○	TS2	TKY06F
14.5	2	TAFS1450F20	★	33	43	86	20	25	1/8	2	040204-U○	TS2	TKY06F
	3	TAFM1450F20	★	47	57	100	20	25	1/8	2	040204-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	060204-U○	TS2	TKY06F
15.5	2	TAFS1550F20	★	35	45	88	20	25	1/8	2	060204-U○	TS2	TKY06F
	3	TAFM1550F20	★	50	60	103	20	25	1/8	2	060204-U○	TS2	TKY06F
16.0	2	TAFS1600F25	★	38	57	107	25	35	1/8	2	060204-U○	TS2	TKY06F
	3	TAFM1600F25	★	54	73	123	25	35	1/8	2	060204-U○	TS2	TKY06F
	4	TAFL1600F25	★	70	89	139	25	35	1/8	2	060204-U○	TS2	TKY06F
16.5	2	TAFS1650F25	★	38	57	107	25	35	1/8	2	060204-U○	TS2	TKY06F
	3	TAFM1650F25	★	54	73	123	25	35	1/8	2	060204-U○	TS2	TKY06F
17.0	2	TAFS1700F25	★	41	59	109	25	35	1/8	2	060204-U○	TS2	TKY06F
	3	TAFM1700F25	★	58	76	126	25	35	1/8	2	060204-U○	TS2	TKY06F
	4	TAFL1700F25	★	75	93	143	25	35	1/8	2	060204-U○	TS2	TKY06F
17.5	2	TAFS1750F25	★	41	59	109	25	35	1/8	2	060204-U○	TS2	TKY06F
	3	TAFM1750F25	★	58	76	126	25	35	1/8	2	060204-U○	TS2	TKY06F
18.0	2	TAFS1800F25	★	43	61	111	25	35	1/8	2	070204-U○	TS25	TKY08F
	3	TAFM1800F25	★	61	79	129	25	35	1/8	2	070204-U○	TS25	TKY08F
	4	TAFL1800F25	★	79	97	147	25	35	1/8	2	070204-U○	TS25	TKY08F
18.5	2	TAFS1850F25	★	43	61	111	25	35	1/8	2	070204-U○	TS25	TKY08F
	3	TAFM1850F25	★	61	79	129	25	35	1/8	2	070204-U○	TS25	TKY08F
19.0	2	TAFS1900F25	★	46	63	113	25	35	1/8	2	070204-U○	TS25	TKY08F
	3	TAFM1900F25	★	65	82	132	25	35	1/8	2	070204-U○	TS25	TKY08F
	4	TAFL1900F25	★	84	101	151	25	35	1/8	2	070204-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 ➤ L165

CUTTING CONDITIONS ➤ L166

TECHNICAL DATA ➤ N001

TAFS/TAFM/TAFL

- Highly rigid drill body.
- 4 corner insert.
- Various grades and chip breakers.

Side Coolant Not Available.

Drill Dia. D1 (mm)	Hole Depth (L/D)	Order Number	Stock	Dimensions (mm) L3	L2	L1	D4	D7	D8	No. of Insert	Insert No.	* Insert Screw	①② Wrench
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	070204-U○	TS25	①TKY08F
20.0	2	TAFS2000F25	★	48	65	115	25	35	1/8	2	070204-U○	TS25	①TKY08F
	3	TAFM2000F25	★	68	85	135	25	35	1/8	2	070204-U○	TS25	①TKY08F
	4	TAFL2000F25	★	88	105	155	25	35	1/8	2	070204-U○	TS25	①TKY08F
20.5	2	TAFS2050F25	★	48	65	115	25	35	1/8	2	070204-U○	TS25	①TKY08F
	3	TAFM2050F25	★	68	85	135	25	35	1/8	2	070204-U○	TS25	①TKY08F
21.0	2	TAFS2100F25	★	50	67	117	25	35	1/8	2	070204-U○	TS25	①TKY08F
	3	TAFM2100F25	★	71	88	138	25	35	1/8	2	070204-U○	TS25	①TKY08F
	4	TAFL2100F25	★	92	109	159	25	35	1/8	2	070204-U○	TS25	①TKY08F
21.5	2	TAFS2150F25	★	50	67	117	25	35	1/8	2	070204-U○	TS25	①TKY08F
	3	TAFM2150F25	★	71	88	138	25	35	1/8	2	070204-U○	TS25	①TKY08F
22.0	2	TAFS2200F25	★	53	69	119	25	35	1/8	2	070204-U○	TS25	①TKY08F
	3	TAFM2200F25	★	75	91	141	25	35	1/8	2	070204-U○	TS25	①TKY08F
	4	TAFL2200F25	★	97	113	163	25	35	1/8	2	070204-U○	TS25	①TKY08F
22.5	2	TAFS2250F25	★	53	69	119	25	35	1/8	2	070204-U○	TS25	①TKY08F
	3	TAFM2250F25	★	75	91	141	25	35	1/8	2	070204-U○	TS25	①TKY08F
23.0	2	TAFS2300F25	★	55	71	121	25	35	1/8	2	090304-U○	TS3	①TKY08F
	3	TAFM2300F25	★	78	94	144	25	35	1/8	2	090304-U○	TS3	①TKY08F
	4	TAFL2300F25	★	101	117	167	25	35	1/8	2	090304-U○	TS3	①TKY08F
23.5	2	TAFS2350F25	★	55	71	121	25	35	1/8	2	090304-U○	TS3	①TKY08F
	3	TAFM2350F25	★	78	94	144	25	35	1/8	2	090304-U○	TS3	①TKY08F
24.0	2	TAFS2400F25	★	58	73	123	25	35	1/8	2	090304-U○	TS3	①TKY08F
	3	TAFM2400F25	★	82	97	147	25	35	1/8	2	090304-U○	TS3	①TKY08F
	4	TAFL2400F25	★	106	121	171	25	35	1/8	2	090304-U○	TS3	①TKY08F
24.5	2	TAFS2450F25	★	58	73	123	25	35	1/8	2	090304-U○	TS3	①TKY08F
	3	TAFM2450F25	★	82	97	147	25	35	1/8	2	090304-U○	TS3	①TKY08F
25.0	2	TAFS2500F32	★	60	75	130	32	42	1/8	2	090304-U○	TS3	①TKY08F
	3	TAFM2500F32	★	85	100	155	32	42	1/8	2	090304-U○	TS3	①TKY08F
	4	TAFL2500F32	★	110	125	180	32	42	1/8	2	090304-U○	TS3	①TKY08F
25.5	2	TAFS2550F32	★	60	75	130	32	42	1/8	2	090304-U○	TS3	①TKY08F
	3	TAFM2550F32	★	85	100	155	32	42	1/8	2	090304-U○	TS3	①TKY08F
26.0	2	TAFS2600F32	★	62	77	132	32	42	1/8	2	090304-U○	TS3	①TKY08F
	3	TAFM2600F32	★	88	103	158	32	42	1/8	2	090304-U○	TS3	①TKY08F
	4	TAFL2600F32	★	114	129	184	32	42	1/8	2	090304-U○	TS3	①TKY08F
26.5	2	TAFS2650F32	★	62	77	132	32	42	1/8	2	090304-U○	TS3	①TKY08F
	3	TAFM2650F32	★	88	103	158	32	42	1/8	2	090304-U○	TS3	①TKY08F
27.0	2	TAFS2700F32	★	65	79	134	32	42	1/8	2	090304-U○	TS3	①TKY08F
	3	TAFM2700F32	★	92	106	161	32	42	1/8	2	090304-U○	TS3	①TKY08F
	4	TAFL2700F32	★	119	133	188	32	42	1/8	2	090304-U○	TS3	①TKY08F
27.5	2	TAFS2750F32	★	65	79	134	32	42	1/8	2	090304-U○	TS3	①TKY08F
	3	TAFM2750F32	★	92	106	161	32	42	1/8	2	090304-U○	TS3	①TKY08F
28.0	2	TAFS2800F32	★	67	81	136	32	42	1/8	2	11T308-U○	TS4	②TKY15D
	3	TAFM2800F32	★	95	109	164	32	42	1/8	2	11T308-U○	TS4	②TKY15D
	4	TAFL2800F32	★	123	137	192	32	42	1/8	2	11T308-U○	TS4	②TKY15D
28.5	2	TAFS2850F32	★	67	81	136	32	42	1/8	2	11T308-U○	TS4	②TKY15D
	3	TAFM2850F32	★	95	109	164	32	42	1/8	2	11T308-U○	TS4	②TKY15D

* Clamp Torque (lbf-in) : TS25=8.9, TS3=8.9

(Note) Please contact Mitsubishi Materials for special grades and geometries other than our standard products.

★ : Inventory maintained in Japan.

Side Coolant Not Available.

Drill Dia. D_1 (mm)	Hole Depth (L/D)	Order Number	Stock	Dimensions (mm)						No. of Insert	Insert No.	* Insert Screw	Wrench
				L_3	L_2	L_1	D_4	D_7	D_8				
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	11T308-U○	TS4	TKY15D
	4	TAFL2900F32	★	128	141	196	32	42	1/8	2	11T308-U○	TS4	TKY15D
29.5	2	TAFS2950F32	★	70	83	138	32	42	1/8	2	11T308-U○	TS4	TKY15D
	3	TAFM2950F32	★	99	112	167	32	42	1/8	2	11T308-U○	TS4	TKY15D
30.0	2	TAFS3000F40	★	72	90	155	40	50	1/4	2	11T308-U○	TS4	TKY15D
	3	TAFM3000F40	★	102	120	185	40	50	1/4	2	11T308-U○	TS4	TKY15D
	4	TAFL3000F40	★	132	150	215	40	50	1/4	2	11T308-U○	TS4	TKY15D
31.0	2	TAFS3100F40	★	74	92	157	40	50	1/4	2	11T308-U○	TS4	TKY15D
	3	TAFM3100F40	★	105	123	188	40	50	1/4	2	11T308-U○	TS4	TKY15D
	4	TAFL3100F40	★	136	154	219	40	50	1/4	2	11T308-U○	TS4	TKY15D
32.0	2	TAFS3200F40	★	77	94	159	40	50	1/4	2	11T308-U○	TS4	TKY15D
	3	TAFM3200F40	★	109	126	191	40	50	1/4	2	11T308-U○	TS4	TKY15D
	4	TAFL3200F40	★	141	158	223	40	50	1/4	2	11T308-U○	TS4	TKY15D
33.0	2	TAFS3300F40	★	79	96	161	40	50	1/4	2	11T308-U○	TS4	TKY15D
	3	TAFM3300F40	★	112	129	194	40	50	1/4	2	11T308-U○	TS4	TKY15D
	4	TAFL3300F40	★	145	162	227	40	50	1/4	2	11T308-U○	TS4	TKY15D
34.0	2	TAFS3400F40	★	82	98	163	40	50	1/4	2	11T308-U○	TS4	TKY15D
	3	TAFM3400F40	★	116	132	197	40	50	1/4	2	11T308-U○	TS4	TKY15D
	4	TAFL3400F40	★	150	166	231	40	50	1/4	2	11T308-U○	TS4	TKY15D
35.0	2	TAFS3500F40	★	84	100	165	40	50	1/4	2	140408-U○	TS55	TKY25D
	3	TAFM3500F40	★	119	135	200	40	50	1/4	2	140408-U○	TS55	TKY25D
36.0	2	TAFS3600F40	★	86	102	167	40	50	1/4	2	140408-U○	TS55	TKY25D
	3	TAFM3600F40	★	122	138	203	40	50	1/4	2	140408-U○	TS55	TKY25D
37.0	2	TAFS3700F40	★	89	104	169	40	50	1/4	2	140408-U○	TS55	TKY25D
	3	TAFM3700F40	★	126	141	206	40	50	1/4	2	140408-U○	TS55	TKY25D
38.0	2	TAFS3800F40	★	91	106	171	40	50	1/4	2	140408-U○	TS55	TKY25D
	3	TAFM3800F40	★	129	144	209	40	50	1/4	2	140408-U○	TS55	TKY25D
39.0	2	TAFS3900F40	★	94	108	173	40	50	1/4	2	140408-U○	TS55	TKY25D
	3	TAFM3900F40	★	133	147	212	40	50	1/4	2	140408-U○	TS55	TKY25D
40.0	2	TAFS4000F40	★	96	110	175	40	50	1/4	2	140408-U○	TS55	TKY25D
	3	TAFM4000F40	★	136	150	215	40	50	1/4	2	140408-U○	TS55	TKY25D
41.0	2	TAFS4100F40	★	98	112	177	40	50	1/4	2	140408-U○	TS55	TKY25D
	3	TAFM4100F40	★	139	153	218	40	50	1/4	2	140408-U○	TS55	TKY25D
42.0	2	TAFS4200F40	★	101	114	179	40	50	1/4	2	140408-U○	TS55	TKY25D
	3	TAFM4200F40	★	143	156	221	40	50	1/4	2	140408-U○	TS55	TKY25D
43.0	2	TAFS4300F40	★	103	116	181	40	50	1/4	2	140408-U○	TS55	TKY25D
	3	TAFM4300F40	★	146	159	224	40	50	1/4	2	140408-U○	TS55	TKY25D
44.0	2	TAFS4400F40	★	106	118	183	40	50	1/4	2	140408-U○	TS55	TKY25D
	3	TAFM4400F40	★	150	162	227	40	50	1/4	2	140408-U○	TS55	TKY25D
45.0	2	TAFS4500F40	★	108	120	185	40	54	1/4	2	140408-U○	TS55	TKY25D
	3	TAFM4500F40	★	153	165	230	40	54	1/4	2	140408-U○	TS55	TKY25D
46.0	2	TAFS4600F40	★	110	122	187	40	54	1/4	2	140408-U○	TS55	TKY25D
	3	TAFM4600F40	★	156	168	233	40	54	1/4	2	140408-U○	TS55	TKY25D
47.0	2	TAFS4700F40	★	113	124	189	40	54	1/4	2	140408-U○	TS55	TKY25D
	3	TAFM4700F40	★	160	171	236	40	54	1/4	2	140408-U○	TS55	TKY25D
48.0	2	TAFS4800F40	★	115	126	191	40	54	1/4	2	140408-U○	TS55	TKY25D
	3	TAFM4800F40	★	163	174	239	40	54	1/4	2	140408-U○	TS55	TKY25D

* Clamp Torque (lbf-in) : TS3=8.9, TS4=31, TS55=66

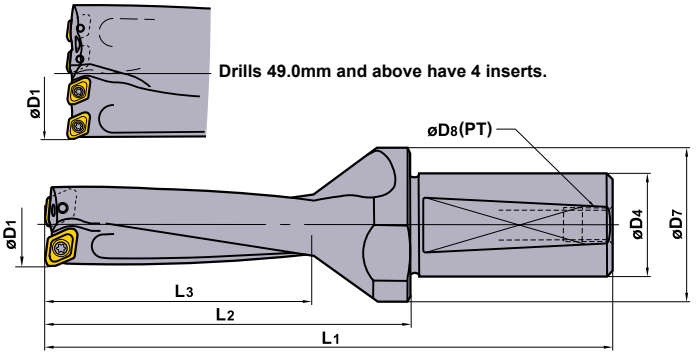
DRILLING

CUTTING CONDITIONS ➤ L166
INSERTS ➤ L165
TECHNICAL DATA ➤ N001

TAFS/TAFM/TAFL

- Highly rigid drill body.
- 4 corner insert.
- Various grades and chip breakers.





Side Coolant Not Available.

Drill Dia. D1 (mm)	Hole Depth (L/D)	Order Number	Stock	Dimensions (mm) L3	L2	L1	D4	D7	D8	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	090304-U○	TS3	TKY08F
50.0	2	TAFS5000F40	★	120	135	200	40	58	1/4	4	090304-U○	TS3	TKY08F
	3	TAFM5000F40	★	170	185	250	40	58	1/4	4	090304-U○	TS3	TKY08F
51.0	2	TAFS5100F40	★	122	137	202	40	58	1/4	4	090304-U○	TS3	TKY08F
	3	TAFM5100F40	★	173	188	253	40	58	1/4	4	090304-U○	TS3	TKY08F
52.0	2	TAFS5200F40	★	125	139	204	40	58	1/4	4	090304-U○	TS3	TKY08F
	3	TAFM5200F40	★	177	191	256	40	58	1/4	4	090304-U○	TS3	TKY08F
53.0	2	TAFS5300F40	★	127	141	206	40	63	1/4	4	090304-U○	TS3	TKY08F
	3	TAFM5300F40	★	180	194	259	40	63	1/4	4	090304-U○	TS3	TKY08F
54.0	2	TAFS5400F40	★	128	143	208	40	63	1/4	4	090304-U○	TS3	TKY08F
	3	TAFM5400F40	★	182	197	262	40	63	1/4	4	090304-U○	TS3	TKY08F
55.0	2	TAFS5500F40	★	130	145	210	40	63	1/4	4	090304-U○	TS3	TKY08F
	3	TAFM5500F40	★	185	200	265	40	63	1/4	4	090304-U○	TS3	TKY08F
56.0	2	TAFS5600F40	★	132	147	212	40	63	1/4	4	090304-U○	TS3	TKY08F
	3	TAFM5600F40	★	188	203	268	40	63	1/4	4	090304-U○	TS3	TKY08F

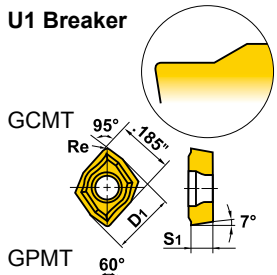
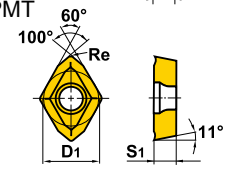
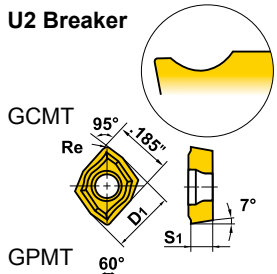
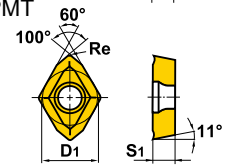
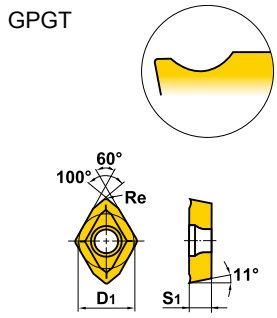
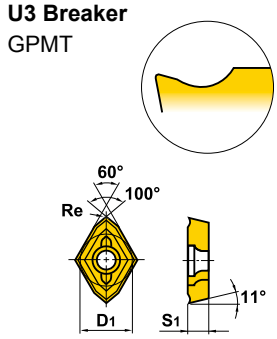
⁎ Clamp Torque (lbf-in) : TS3=8.9, TS55=66

(Note) Please contact Mitsubishi Materials for special grades and geometries other than our standard products.

● : Inventory maintained. ★ : Inventory maintained in Japan.
▲ : 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	D1	S1	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	**070204-U1**	▲		●				.250	.094	.016
		.938—1.063inch ★1.938—2.188inch 23.0—27.5mm ★49.0—56.0mm	**090304-U1**	▲		●				.313	.125	.016
		1.125—1.313inch ★2.250inch 28.0—34.0mm	**11T308-U1**	▲		●				.375	.156	.031
		1.375—1.875inch 35.0—48.0mm	**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	**070204-U2**	▲		●	●	●		.250	.094	.016
		.938—1.063inch ★1.938—2.188inch 23.0—27.5mm ★49.0—56.0mm	**090304-U2**	▲		●	●	●		.313	.125	.016
		1.125—1.313inch ★2.250inch 28.0—34.0mm	**11T308-U2**	▲		●	●	●		.375	.156	.031
		1.375—1.875inch 35.0—48.0mm	**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	**070204-U2**						●	.250	.094	.016
		.938—1.063inch ★1.938—2.188inch 23.0—27.5mm ★49.0—56.0mm	**090304-U2**						●	.313	.125	.016
		1.125—1.313inch ★2.250inch 28.0—34.0mm	**11T308-U2**						●	.375	.156	.031
		1.375—1.875inch 35.0—48.0mm	**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	**070204-U3**	▲		●	●			.250	.094	.016
		.938—1.063inch ★1.938—2.188inch 23.0—27.5mm ★49.0—56.0mm	**090304-U3**	▲		●	●			.313	.125	.016
		1.125—1.313inch ★2.250inch 28.0—34.0mm	**11T308-U3**	▲		●	●			.375	.156	.031
		1.375—1.875inch 35.0—48.0mm	**140408-U3**	▲		●	●			.500	.188	.031

★ : Drill has 4 inserts.

DRILLING

CUTTING CONDITIONS ➤ L166
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)

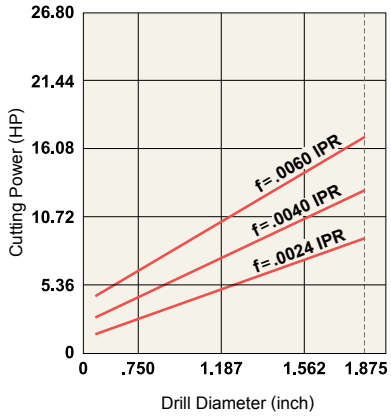
	Work Material	Hardness	Cutting Speed (SFM) L/D = 2, L/D = 3 ϕ.469"–ϕ.594" ϕ12.0–ϕ14.5mm	Cutting Speed (SFM) L/D = 2, L/D = 3 ϕ.625"–ϕ2.250" ϕ15.0–ϕ56.0mm	Cutting Speed (SFM) L/D = 4 ϕ.625"–ϕ1.250" ϕ18.0–ϕ340mm	Chip Breaker	Feed (inch/rev) Drill Diameter D1 ϕ.469"–ϕ.594" ϕ12.0–ϕ14.5mm	ϕ.625"–ϕ.875" ϕ15.0–ϕ22.5mm	ϕ.938"–ϕ1.313" ϕ23.0–ϕ34.0mm	ϕ1.375"–ϕ1.813" ϕ35.0–ϕ48.0mm	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–.001)	.007 (.004–.001)	.007 (.004–.001)
						U3	–	.006 (.004–.007)	.007 (.004–.001)	.007 (.004–.001)	.007 (.004–.001)
	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)

CUTTING PERFORMANCE

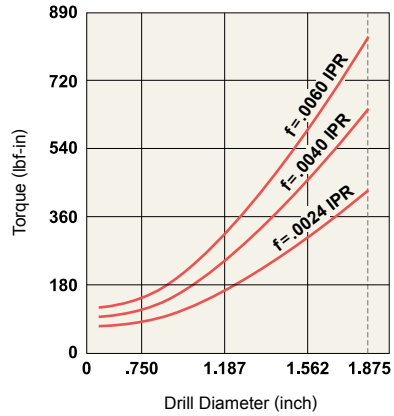
CUTTING RESISTANCE

Workpiece : AISI 4140 (200HB—220HB) Cutting Speed : 490 SFM

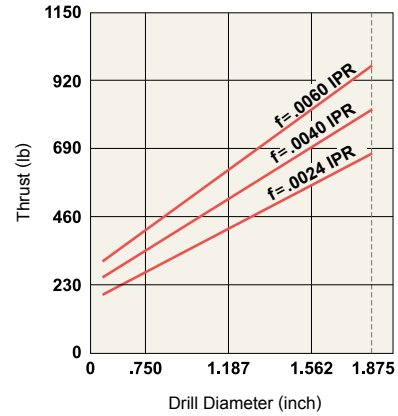
Cutting Power (HP)



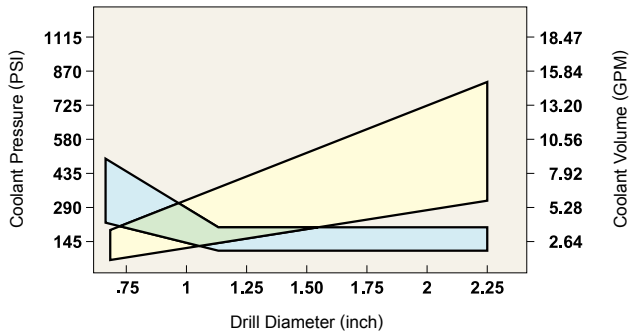
Torque (lbf-in)



Thrust (lb)



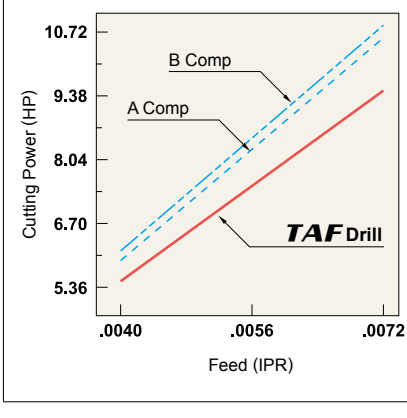
COOLANT VOLUME AND PRESSURE



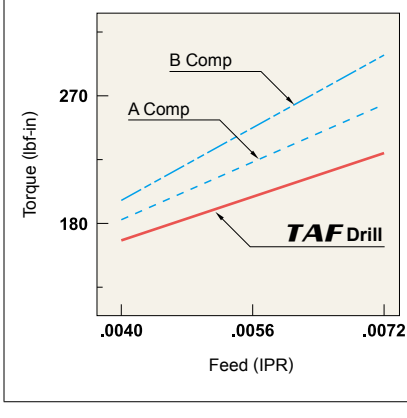
CUTTING RESISTANCE

Workpiece : AISI 4140 (200HB—220HB) Cutting Speed : 490 SFM Drill Diameter : ϕ1.00

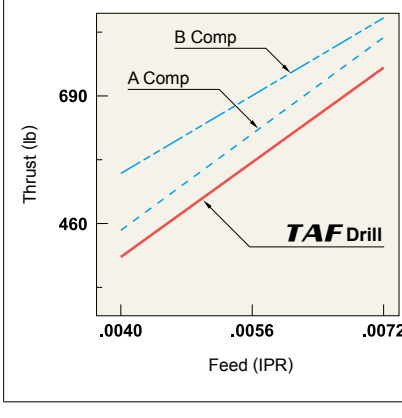
Cutting Power (HP)



Torque (lbf-in)



Thrust (lb)



DRILLING

STAW

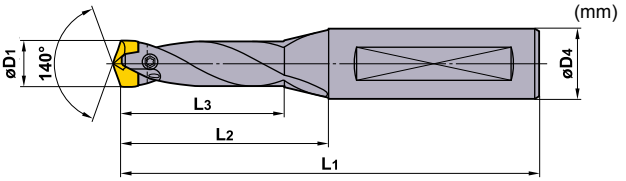
- Wavy cutting edge design for good chip control.
- Highly rigid clamping system offers stability and reliability for small hole drilling.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		○	◎	○	

D1=10	10<D1<14
0 −0.022	0 −0.027

METRIC STANDARD





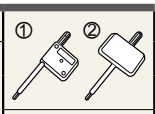
HOLDERS

Drill Dia. Range D1 (mm)	Hole Depth (l/d)	Holder Order Number	Stock	Dimensions (mm) L3	L2	L1	D4	Wrench	Insert Drill Dia. D1 (mm)	Insert Order Number	Stock VP15TF	Stock DP5010
10.0 | 10.4	NEW 1.5	STAWSS1000S16	★	22	32	80	16	TIP06F	10.0	STAWN1000TH	★	
										STAWK1000TG		★
	3	STAWSN1000S16	★	37	47	95	16	TIP06F	10.1	STAWN1010TH	★	
										STAWK1010TG		★
	5	STAWMN1000S16	★	57	67	115	16	TIP06F	10.2	STAWN1020TH	★	
										STAWK1020TG		★
	NEW 8	STAWLN1000S16	★	87	97	145	16	TIP06F	10.3	STAWN1030TH	★	
										STAWK1030TG		★
									10.4	STAWN1040TH	★	
										STAWK1040TG		★
10.5 | 10.9	NEW 1.5	STAWSS1050S16	★	22	32	80	16	TIP06F	10.5	STAWN1050TH	★	
										STAWK1050TG		★
	3	STAWSN1050S16	★	37	47	95	16	TIP06F	10.6	STAWN1060TH	★	
										STAWK1060TG		★
	5	STAWMN1050S16	★	57	67	115	16	TIP06F	10.7	STAWN1070TH	★	
										STAWK1070TG		★
	NEW 8	STAWLN1050S16	★	87	97	145	16	TIP06F	10.8	STAWN1080TH	★	
										STAWK1080TG		★
									10.9	STAWN1090TH	★	
										STAWK1090TG		★
11.0 | 11.4	NEW 1.5	STAWSS1100S16	★	25	36	84	16	TIP06F	11.0	STAWN1100TH	★	
										STAWK1100TG		★
	3	STAWSN1100S16	★	41	52	100	16	TIP06F	11.1	STAWN1110TH	★	
										STAWK1110TG		★
	5	STAWMN1100S16	★	66	77	125	16	TIP06F	11.2	STAWN1120TH	★	
										STAWK1120TG		★
	NEW 8	STAWLN1100S16	★	96	107	155	16	TIP06F	11.3	STAWN1130TH	★	
										STAWK1130TG		★
									11.4	STAWN1140TH	★	
										STAWK1140TG		★
11.5 | 11.9	NEW 1.5	STAWSS1150S16	★	25	36	84	16	TIP06F	11.5	STAWN1150TH	★	
										STAWK1150TG		★
	3	STAWSN1150S16	★	41	52	100	16	TIP06F	11.6	STAWN1160TH	★	
										STAWK1160TG		★
	5	STAWMN1150S16	★	66	77	125	16	TIP06F	11.7	STAWN1170TH	★	
										STAWK1170TG		★
	NEW 8	STAWLN1150S16	★	96	107	155	16	TIP06F	11.8	STAWN1180TH	★	
										STAWK1180TG		★
									11.9	STAWN1190TH	★	
										STAWK1190TG		★
12.0 | 12.4	NEW 1.5	STAWSS1200S16	★	27	39	87	16	TIP06F	12.0	STAWN1200TH	★	
										STAWK1200TG		★
	3	STAWSN1200S16	★	45	57	105	16	TIP06F	12.1	STAWN1210TH	★	
										STAWK1210TG		★
	5	STAWMN1200S16	★	70	82	130	16	TIP06F	12.2	STAWN1220TH	★	
										STAWK1220TG		★
	NEW 8	STAWLN1200S16	★	105	117	165	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 L1, L2, and L3 dimensions listed in the table above, are measured using the VP15TF insert.
When using the DP5010 insert, the L1, L2 and L3 dimensions will be slightly reduced.

★ : Inventory maintained in Japan.

<One insert in one case>

Drill Dia. Range D_1 (mm)	Hole Depth (l/d)	Holder		Dimensions (mm)				①  ②	Insert			
		Order Number	Stock	L_3	L_2	L_1	D_4	Wrench	Drill Dia. D_1 (mm)	Order Number	Stock VP15TF	Stock DP5010
12.5 – 12.9	NEW 1.5	STAWSS1250S16	★	27	39	87	16	①TIP06F	12.5	STAWN1250TH	★	
										STAWK1250TG		★
	3	STAWSN1250S16	★	45	57	105	16	①TIP06F	12.6	STAWN1260TH	★	
										STAWK1260TG		★
	5	STAWMN1250S16	★	70	82	130	16	①TIP06F	12.7	STAWN1270TH	★	
										STAWK1270TG		★
	NEW 8	STAWLN1250S16	★	105	117	165	16	①TIP06F	12.8	STAWN1280TH	★	
										STAWK1280TG		★
									12.9	STAWN1290TH	★	
										STAWK1290TG		★
13.0 – 13.4	NEW 1.5	STAWSS1300S16	★	30	43	91	16	②TIP08W	13.0	STAWN1300TH	★	
										STAWK1300TG		★
	3	STAWSN1300S16	★	49	62	110	16	②TIP08W	13.1	STAWN1310TH	★	
										STAWK1310TG		★
	5	STAWMN1300S16	★	74	87	135	16	②TIP08W	13.2	STAWN1320TH	★	
										STAWK1320TG		★
	NEW 8	STAWLN1300S16	★	114	127	175	16	②TIP08W	13.3	STAWN1330TH	★	
										STAWK1330TG		★
									13.4	STAWN1340TH	★	
										STAWK1340TG		★
13.5 – 13.9	NEW 1.5	STAWSS1350S16	★	30	43	91	16	②TIP08W	13.5	STAWN1350TH	★	
										STAWK1350TG		★
	3	STAWSN1350S16	★	49	62	110	16	②TIP08W	13.6	STAWN1360TH	★	
										STAWK1360TG		★
	5	STAWMN1350S16	★	74	87	135	16	②TIP08W	13.7	STAWN1370TH	★	
										STAWK1370TG		★
	NEW 8	STAWLN1350S16	★	114	127	175	16	②TIP08W	13.8	STAWN1380TH	★	
										STAWK1380TG		★
									13.9	STAWN1390TH	★	
										STAWK1390TG		★
14.0 – 14.4	NEW 1.5	STAWSS1400S16	★	31	45	93	16	②TIP08W	14.0	STAWN1400TH	★	
										STAWK1400TG		★
	3	STAWSN1400S16	★	53	67	115	16	②TIP08W	14.1	STAWN1410TH	★	
										STAWK1410TG		★
	5	STAWMN1400S16	★	83	97	145	16	②TIP08W	14.2	STAWN1420TH	★	
										STAWK1420TG		★
	NEW 8	STAWLN1400S16	★	122	137	185	16	②TIP08W	14.3	STAWN1430TH	★	
										STAWK1430TG		★
									14.4	STAWN1440TH	★	
										STAWK1440TG		★
14.5 – 14.9	NEW 1.5	STAWSS1450S16	★	31	45	93	16	②TIP08W	14.5	STAWN1450TH	★	
										STAWK1450TG		★
	3	STAWSN1450S16	★	53	67	115	16	②TIP08W	14.6	STAWN1460TH	★	
										STAWK1460TG		★
	5	STAWMN1450S16	★	83	97	145	16	②TIP08W	14.7	STAWN1470TH	★	
										STAWK1470TG		★
	NEW 8	STAWLN1450S16	★	122	137	185	16	②TIP08W	14.8	STAWN1480TH	★	
										STAWK1480TG		★
									14.9	STAWN1490TH	★	
										STAWK1490TG		★
15.0 – 15.4	NEW 1.5	STAWSS1500S20	★	33	48	98	20	②TIP08W	15.0	STAWN1500TH	★	
										STAWK1500TG		★
	3	STAWSN1500S20	★	60	75	125	20	②TIP08W	15.1	STAWN1510TH	★	
										STAWK1510TG		★
	5	STAWMN1500S20	★	90	105	155	20	②TIP08W	15.2	STAWN1520TH	★	
										STAWK1520TG		★
	NEW 8	STAWLN1500S20	★	130	148	198	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 L_1, L_2, and L_3 dimensions listed in the table above, are measured using the VP15TF insert.
When using the DP5010 insert, the L_1, L_2 and L_3 dimensions will be slightly reduced.

INSERTS ➤ L172
CUTTING CONDITIONS ➤ L176
HOW TO USE ➤ L177
TECHNICAL DATA ➤ N001

STAW

Drill Dia. Range D_1 (mm)	Hole Depth (l/d)	Holder Order Number	Stock	L_3	L_2	L_1	D_4	Wrench	Insert Drill Dia. D_1 (mm)	Insert Order Number	Stock VP15TF	Stock DP5010
15.5 – 16.4	NEW 1.5	STAWSS1600S20	★	34	50	100	20	TIP10W	15.5	STAWN1550T	★	
										STAWK1550TG		★
									15.6	STAWN1560T	★	
										STAWK1560TG		★
									15.7	STAWN1570T	★	
										STAWK1570TG		★
	NEW 3	STAWSN1600S20	★	60	80	130	20	TIP10W	15.8	STAWN1580T	★	
										STAWK1580TG		★
									15.9	STAWN1590T	★	
										STAWK1590TG		★
	NEW 5	STAWMN1600S20	★	90	115	165	20	TIP10W	16.0	STAWN1600T	★	
										STAWK1600TG		★
									16.1	STAWN1610T	★	
										STAWK1610TG		★
									16.2	STAWN1620T	★	
										STAWK1620TG		★
	NEW 8	STAWLN1600S20	★	138	158	208	20	TIP10W	16.3	STAWN1630T	★	
										STAWK1630TG		★
									16.4	STAWN1640T	★	
										STAWK1640TG		★
16.5 – 17.4	NEW 1.5	STAWSS1700S20	★	36	53	103	20	TIP10W	16.5	STAWN1650T	★	
										STAWK1650TG		★
									16.6	STAWN1660T	★	
										STAWK1660TG		★
									16.7	STAWN1670T	★	
										STAWK1670TG		★
	NEW 3	STAWSN1700S20	★	61	85	135	20	TIP10W	16.8	STAWN1680T	★	
										STAWK1680TG		★
									16.9	STAWN1690T	★	
										STAWK1690TG		★
	NEW 5	STAWMN1700S20	★	95	120	170	20	TIP10W	17.0	STAWN1700T	★	
										STAWK1700TG		★
									17.1	STAWN1710T	★	
										STAWK1710TG		★
									17.2	STAWN1720T	★	
										STAWK1720TG		★
	NEW 8	STAWLN1700S20	★	146	166	216	20	TIP10W	17.3	STAWN1730T	★	
										STAWK1730TG		★
									17.4	STAWN1740T	★	
										STAWK1740TG		★
17.5 – 18.4	NEW 1.5	STAWSS1800S20	★	37	55	105	20	TIP10W	17.5	STAWN1750T	★	
										STAWK1750TG		★
									17.6	STAWN1760T	★	
										STAWK1760TG		★
									17.7	STAWN1770T	★	
										STAWK1770TG		★
	NEW 3	STAWSN1800S20	★	64	90	140	20	TIP10W	17.8	STAWN1780T	★	
										STAWK1780TG		★
									17.9	STAWN1790T	★	
										STAWK1790TG		★
	NEW 5	STAWMN1800S20	★	100	125	175	20	TIP10W	18.0	STAWN1800T	★	
										STAWK1800TG		★
									18.1	STAWN1810T	★	
										STAWK1810TG		★
									18.2	STAWN1820T	★	
										STAWK1820TG		★
	NEW 8	STAWLN1800S20	★	154	174	224	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 L_1, L_2, and L_3 dimensions listed in the table above, are measured using the VP15TF insert.
When using the DP5010 insert, the L_1, L_2 and L_3 dimensions will be slightly reduced.

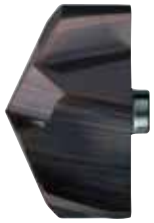
★ : Inventory maintained in Japan.
<One insert in one case>

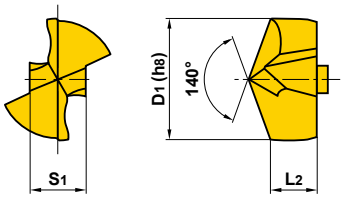
Memo

STAW

INSERTS

(For General Use)





Order Number	Stock		Dimensions (mm)			Applicable Holder
	VP15TF		D1	L2	S1	
STAWN1000TH	★		10.0	3.8	4.6	STAWSS1000S16 STAWSN1000S16 STAWMN1000S16 STAWLN1000S16
1010TH	★		10.1	3.8	4.6	
1020TH	★		10.2	3.8	4.6	
1030TH	★		10.3	3.8	4.6	
1040TH	★		10.4	3.8	4.6	
1050TH	★		10.5	4.0	4.8	STAWSS1050S16 STAWSN1050S16 STAWMN1050S16 STAWLN1050S16
1060TH	★		10.6	4.0	4.8	
1070TH	★		10.7	4.0	4.8	
1080TH	★		10.8	4.0	4.8	
1090TH	★		10.9	4.0	4.8	
1100TH	★		11.0	4.2	5.1	STAWSS1100S16 STAWSN1100S16 STAWMN1100S16 STAWLN1100S16
1110TH	★		11.1	4.2	5.1	
1120TH	★		11.2	4.2	5.1	
1130TH	★		11.3	4.2	5.1	
1140TH	★		11.4	4.2	5.1	
1150TH	★		11.5	4.4	5.3	STAWSS1150S16 STAWSN1150S16 STAWMN1150S16 STAWLN1150S16
1160TH	★		11.6	4.4	5.3	
1170TH	★		11.7	4.4	5.3	
1180TH	★		11.8	4.4	5.3	
1190TH	★		11.9	4.4	5.3	
1200TH	★		12.0	4.6	5.5	STAWSS1200S16 STAWSN1200S16 STAWMN1200S16 STAWLN1200S16
1210TH	★		12.1	4.6	5.5	
1220TH	★		12.2	4.6	5.5	
1230TH	★		12.3	4.6	5.5	
1240TH	★		12.4	4.6	5.5	
1250TH	★		12.5	4.8	5.8	STAWSS1250S16 STAWSN1250S16 STAWMN1250S16 STAWLN1250S16
1260TH	★		12.6	4.8	5.8	
1270TH	★		12.7	4.8	5.8	
1280TH	★		12.8	4.8	5.8	
1290TH	★		12.9	4.8	5.8	
1300TH	★		13.0	4.9	6.0	STAWSS1300S16 STAWSN1300S16 STAWMN1300S16 STAWLN1300S16
1310TH	★		13.1	4.9	6.0	
1320TH	★		13.2	4.9	6.0	
1330TH	★		13.3	4.9	6.0	
1340TH	★		13.4	4.9	6.0	
1350TH	★		13.5	5.1	6.2	STAWSS1350S16 STAWSN1350S16 STAWMN1350S16 STAWLN1350S16
1360TH	★		13.6	5.1	6.2	
1370TH	★		13.7	5.1	6.2	
1380TH	★		13.8	5.1	6.2	
1390TH	★		13.9	5.1	6.2	

★ : Inventory maintained in Japan.
<One insert in one case>

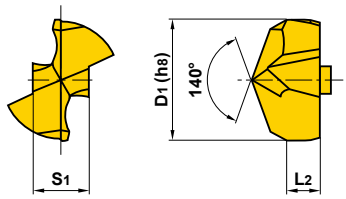
Order Number	Stock		Dimensions (mm)			Applicable Holder
	VP15TF		D_1	L_2	S_1	
STAWN1400TH	★		14.0	5.3	6.4	STAWSS1400S16 STAWSN1400S16 STAWMN1400S16 STAWLN1400S16
1410TH	★		14.1	5.3	6.4	
1420TH	★		14.2	5.3	6.4	
1430TH	★		14.3	5.3	6.4	
1440TH	★		14.4	5.3	6.4	
1450TH	★		14.5	5.5	6.7	STAWSS1450S16 STAWSN1450S16 STAWMN1450S16 STAWLN1450S16
1460TH	★		14.6	5.5	6.7	
1470TH	★		14.7	5.5	6.7	
1480TH	★		14.8	5.5	6.7	
1490TH	★		14.9	5.5	6.7	
1500TH	★		15.0	5.7	6.9	STAWSS1500S20 STAWSN1500S20 STAWMN1500S20 STAWLN1500S20
1510TH	★		15.1	5.7	6.9	
1520TH	★		15.2	5.7	6.9	
1530TH	★		15.3	5.7	6.9	
1540TH	★		15.4	5.7	6.9	
NEW **1550T**	★		15.5	5.9	7.1	STAWSS1600S20 STAWSN1600S20 STAWMN1600S20 STAWLN1600S20
NEW **1560T**	★		15.6	5.9	7.1	
NEW **1570T**	★		15.7	5.9	7.1	
NEW **1580T**	★		15.8	5.9	7.1	
NEW **1590T**	★		15.9	5.9	7.1	
NEW **1600T**	★		16.0	5.9	7.1	
NEW **1610T**	★		16.1	5.9	7.1	
NEW **1620T**	★		16.2	5.9	7.1	
NEW **1630T**	★		16.3	5.9	7.1	
NEW **1640T**	★		16.4	5.9	7.1	
NEW **1650T**	★		16.5	6.3	7.6	STAWSS1700S20 STAWSN1700S20 STAWMN1700S20 STAWLN1700S20
NEW **1660T**	★		16.6	6.3	7.6	
NEW **1670T**	★		16.7	6.3	7.6	
NEW **1680T**	★		16.8	6.3	7.6	
NEW **1690T**	★		16.9	6.3	7.6	
NEW **1700T**	★		17.0	6.3	7.6	
NEW **1710T**	★		17.1	6.3	7.6	
NEW **1720T**	★		17.2	6.3	7.6	
NEW **1730T**	★		17.3	6.3	7.6	
NEW **1740T**	★		17.4	6.3	7.6	
NEW **1750T**	★		17.5	6.7	8.1	STAWSS1800S20 STAWSN1800S20 STAWMN1800S20 STAWLN1800S20
NEW **1760T**	★		17.6	6.7	8.1	
NEW **1770T**	★		17.7	6.7	8.1	
NEW **1780T**	★		17.8	6.7	8.1	
NEW **1790T**	★		17.9	6.7	8.1	
NEW **1800T**	★		18.0	6.7	8.1	
NEW **1810T**	★		18.1	6.7	8.1	
NEW **1820T**	★		18.2	6.7	8.1	
NEW **1830T**	★		18.3	6.7	8.1	
NEW **1840T**	★		18.4	6.7	8.1	

STAW

INSERTS

(For Cast Iron)





Order Number	Stock DP5010		Dimensions (mm) D1	L2	S1	Applicable Holder
NEW STAWK1000TG	★		10.0	3.3	4.6	STAWSS1000S16 STAWSN1000S16 STAWMN1000S16 STAWLN1000S16
NEW 1010TG	★		10.1	3.3	4.6	
NEW 1020TG	★		10.2	3.3	4.6	
NEW 1030TG	★		10.3	3.3	4.6	
NEW 1040TG	★		10.4	3.3	4.6	
NEW 1050TG	★		10.5	3.5	4.8	STAWSS1050S16 STAWSN1050S16 STAWMN1050S16 STAWLN1050S16
NEW 1060TG	★		10.6	3.5	4.8	
NEW 1070TG	★		10.7	3.5	4.8	
NEW 1080TG	★		10.8	3.5	4.8	
NEW 1090TG	★		10.9	3.5	4.8	
NEW 1100TG	★		11.0	3.7	5.1	STAWSS1100S16 STAWSN1100S16 STAWMN1100S16 STAWLN1100S16
NEW 1110TG	★		11.1	3.7	5.1	
NEW 1120TG	★		11.2	3.7	5.1	
NEW 1130TG	★		11.3	3.7	5.1	
NEW 1140TG	★		11.4	3.7	5.1	
NEW 1150TG	★		11.5	3.9	5.3	STAWSS1150S16 STAWSN1150S16 STAWMN1150S16 STAWLN1150S16
NEW 1160TG	★		11.6	3.9	5.3	
NEW 1170TG	★		11.7	3.9	5.3	
NEW 1180TG	★		11.8	3.9	5.3	
NEW 1190TG	★		11.9	3.9	5.3	
NEW 1200TG	★		12.0	4.1	5.5	STAWSS1200S16 STAWSN1200S16 STAWMN1200S16 STAWLN1200S16
NEW 1210TG	★		12.1	4.1	5.5	
NEW 1220TG	★		12.2	4.1	5.5	
NEW 1230TG	★		12.3	4.1	5.5	
NEW 1240TG	★		12.4	4.1	5.5	
NEW 1250TG	★		12.5	4.2	5.8	STAWSS1250S16 STAWSN1250S16 STAWMN1250S16 STAWLN1250S16
NEW 1260TG	★		12.6	4.2	5.8	
NEW 1270TG	★		12.7	4.2	5.8	
NEW 1280TG	★		12.8	4.2	5.8	
NEW 1290TG	★		12.9	4.2	5.8	
NEW 1300TG	★		13.0	4.4	6.0	STAWSS1300S16 STAWSN1300S16 STAWMN1300S16 STAWLN1300S16
NEW 1310TG	★		13.1	4.4	6.0	
NEW 1320TG	★		13.2	4.4	6.0	
NEW 1330TG	★		13.3	4.4	6.0	
NEW 1340TG	★		13.4	4.4	6.0	
NEW 1350TG	★		13.5	4.6	6.2	STAWSS1350S16 STAWSN1350S16 STAWMN1350S16 STAWLN1350S16
NEW 1360TG	★		13.6	4.6	6.2	
NEW 1370TG	★		13.7	4.6	6.2	
NEW 1380TG	★		13.8	4.6	6.2	
NEW 1390TG	★		13.9	4.6	6.2	

★ : Inventory maintained in Japan.
<One insert in one case>

Order Number	Stock		Dimensions (mm)			Applicable Holder
	DP5010		D_1	L_2	S_1	
NEW **STAWK1400TG**	★		14.0	4.8	6.4	STAWSS1400S16 STAWSN1400S16 STAWMN1400S16 STAWLN1400S16
NEW **1410TG**	★		14.1	4.8	6.4	
NEW **1420TG**	★		14.2	4.8	6.4	
NEW **1430TG**	★		14.3	4.8	6.4	
NEW **1440TG**	★		14.4	4.8	6.4	
NEW **1450TG**	★		14.5	5.0	6.7	STAWSS1450S16 STAWSN1450S16 STAWMN1450S16 STAWLN1450S16
NEW **1460TG**	★		14.6	5.0	6.7	
NEW **1470TG**	★		14.7	5.0	6.7	
NEW **1480TG**	★		14.8	5.0	6.7	
NEW **1490TG**	★		14.9	5.0	6.7	
NEW **1500TG**	★		15.0	5.2	6.9	STAWSS1500S20 STAWSN1500S20 STAWMN1500S20 STAWLN1500S20
NEW **1510TG**	★		15.1	5.2	6.9	
NEW **1520TG**	★		15.2	5.2	6.9	
NEW **1530TG**	★		15.3	5.2	6.9	
NEW **1540TG**	★		15.4	5.2	6.9	
NEW **1550TG**	★		15.5	5.3	7.1	STAWSS1600S20 STAWSN1600S20 STAWMN1600S20 STAWLN1600S20
NEW **1560TG**	★		15.6	5.3	7.1	
NEW **1570TG**	★		15.7	5.3	7.1	
NEW **1580TG**	★		15.8	5.3	7.1	
NEW **1590TG**	★		15.9	5.3	7.1	
NEW **1600TG**	★		16.0	5.3	7.1	
NEW **1610TG**	★		16.1	5.3	7.1	
NEW **1620TG**	★		16.2	5.3	7.1	
NEW **1630TG**	★		16.3	5.3	7.1	
NEW **1640TG**	★		16.4	5.3	7.1	
NEW **1650TG**	★		16.5	5.7	7.6	STAWSS1700S20 STAWSN1700S20 STAWMN1700S20 STAWLN1700S20
NEW **1660TG**	★		16.6	5.7	7.6	
NEW **1670TG**	★		16.7	5.7	7.6	
NEW **1680TG**	★		16.8	5.7	7.6	
NEW **1690TG**	★		16.9	5.7	7.6	
NEW **1700TG**	★		17.0	5.7	7.6	
NEW **1710TG**	★		17.1	5.7	7.6	
NEW **1720TG**	★		17.2	5.7	7.6	
NEW **1730TG**	★		17.3	5.7	7.6	
NEW **1740TG**	★		17.4	5.7	7.6	
NEW **1750TG**	★		17.5	6.0	8.1	STAWSS1800S20 STAWSN1800S20 STAWMN1800S20 STAWLN1800S20
NEW **1760TG**	★		17.6	6.0	8.1	
NEW **1770TG**	★		17.7	6.0	8.1	
NEW **1780TG**	★		17.8	6.0	8.1	
NEW **1790TG**	★		17.9	6.0	8.1	
NEW **1800TG**	★		18.0	6.0	8.1	
NEW **1810TG**	★		18.1	6.0	8.1	
NEW **1820TG**	★		18.2	6.0	8.1	
NEW **1830TG**	★		18.3	6.0	8.1	
NEW **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		Drill Diameter / 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 1.5D depth of hole, it is possible to increase the feed rate by approx. 20%.
(Note 2) When using a drill for 8D depth of hole, please decrease the cutting speed by approx. 20%.
(Note 3) When using a drill for 8D 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

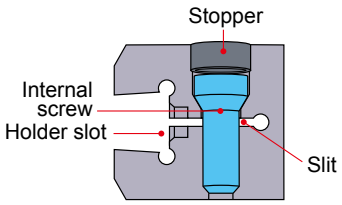
Applicable Holder	Pack Order Number (Internal screw & stopper)	 Internal Screw	 Stopper
STAWSS/SN/MN/LN1000S16	WS203107TPS-35LH	WS203107TPS	WS35LH
STAWSS/SN/MN/LN1050S16	WS203107TPS-35LH	WS203107TPS	WS35LH
STAWSS/SN/MN/LN1100S16	WS203108TPS-35LH	WS203108TPS	WS35LH
STAWSS/SN/MN/LN1150S16	WS203108TPS-35LH	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.

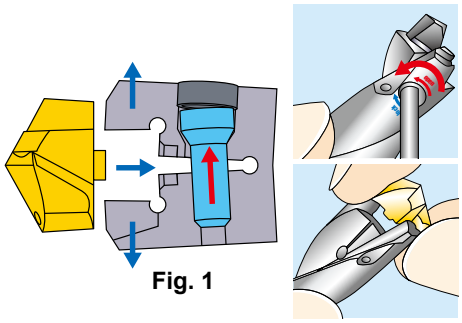


Fig. 1

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.

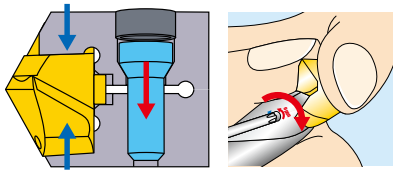
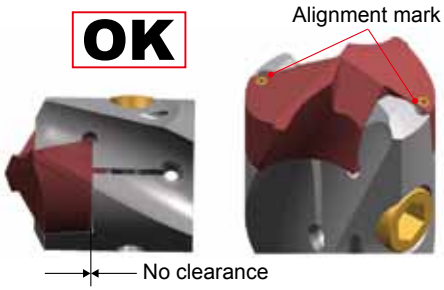


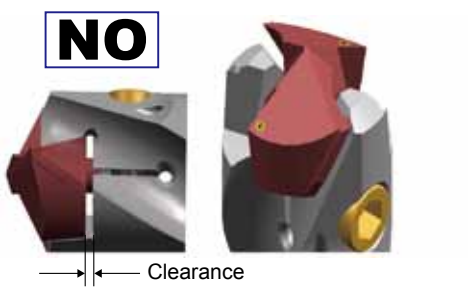
Fig. 2

Tighten clamp screws referring to the table for torque.

Drill Diameter (mm)	Clamping Force	
	lbf-in	N · m
10—12.5	8.9	1
13—15	17.7	2
16—18	22.1	2.5

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.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		◎	◎		

.5625≤D1≤.6875	.7031≤D1≤1.1719	D1=1.1875
−.00063 −.00134	−.00079 −.00161	−.00098 −.00197

(inch)

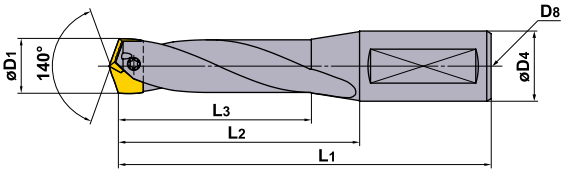
INCH STANDARD

L/D=3

Internal Coolant







Holder		Dimensions (inch)					*	① ②			Drill Dia.	Insert	
Order Number	Stock	L3	L2	L1	D4	D8	Insert Screw	Wrench	Plate	Anti-seize Lubricant	D1 (inch)	Order Number	Stock VP15TF
TAWSNH0036	●	2.008	2.638	4.513	.625	1/8-27	WS254012T	①TKY08W	WPT4405	MK1KS	.5625	TAWNH0036T	●
0037	●	2.126	2.953	4.828	.625	1/8-27	WS254013T	①TKY08W	WPT4405	MK1KS	.5781	TAWNH0037T	●
0039	●	2.126	2.953	4.953	.750	1/8-27	WS254013T	①TKY08W	WPT4405	MK1KS	.5938	TAWNH0038T	●
											.6094	TAWNH0039T	●
TAWSN0041	●	2.283	3.150	5.150	.750	1/8-27	WS254014T	①TKY08W	WPT4405	MK1KS	.6250	TAWNH0040T	●
											.6406	TAWNH0041T	●
0044	●	2.402	3.346	5.346	.750	1/8-27	WS254015T	①TKY08W	WPT4405	MK1KS	.6563	TAWNH0042T	●
											.6719	TAWNH0043T	●
											.6875	TAWNH0044T	●
0045	●	2.559	3.543	5.543	.750	1/8-27	WS254016T	①TKY08W	WPT4405	MK1KS	.7031	TAWNH0045T	●
0046	●	2.559	3.543	5.793	1.000	1/8-27	WS254016T	①TKY08W	WPT4405	MK1KS	.7188	TAWNH0046T	●
0049	●	2.677	3.898	6.148	1.000	1/8-27	WS304517T	②TKY10T	WPT4405	MK1KS	.7344	TAWNH0047T	●
											.7500	TAWNH0048T	●
											.7656	TAWNH0049T	●
0051	●	2.835	3.898	6.148	1.000	1/8-27	WS304518T	②TKY10T	WPT4405	MK1KS	.7813	TAWNH0050T	●
											.7969	TAWNH0051T	●
0054	●	2.953	3.898	6.148	1.000	1/8-27	WS304518T	②TKY10T	WPT4405	MK1KS	.8125	TAWNH0052T	●
											.8281	TAWNH0053T	●
											.8438	TAWNH0054T	●
0056	●	3.110	4.094	6.344	1.000	1/8-27	WS355520T	②TKY15T	WPT4405	MK1KS	.8594	TAWNH0055T	●
											.8750	TAWNH0056T	●

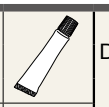
* Clamp Torque (lbf-in) : WS254012T=18, WS254013T=18, WS254014T=18, WS254015T=18, WS254016T=18, WS304517T=31, WS304518T=31, WS355520T=49

(Note 1) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).

The L1,L2, and L3 dimensions listed in the table above, are measured using the VP15TF insert.

When using the DP5010 insert, the L1, L2 and L3 dimensions will be slightly reduced.

● : Inventory maintained.

Holder		Dimensions (inch)					 *				Drill Dia.	Insert	
Order Number	Stock	L_3	L_2	L_1	D_4	D_8	Insert Screw	Wrench	Plate	Anti-seize Lubricant	D_1 (inch)	Order Number	Stock VP15TF
TAWSN0059	●	3.228	4.094	6.344	1.000	1/8-27	WS355521T	②TKY15T	WPT4405	MK1KS	.8906	**TAWNH0057T**	●
											.9063	**TAWNH0058T**	●
											.9219	**TAWNH0059T**	●
0061	●	3.386	4.331	6.706	1.250	1/4-18	WS355521T	②TKY15T	WPT4405	MK1KS	.9375	**TAWNH0060T**	●
											.9531	**TAWNH0061T**	●
0100	●	3.465	4.331	6.706	1.250	1/4-18	WS406023T	②TKY25T	WPT4405	MK1KS	.9688	**TAWNH0062T**	●
											.9844	**TAWNH0063T**	●
											1.0000	**TAWNH0100T**	●
0102	●	3.622	4.528	6.903	1.250	1/4-18	WS406024T	②TKY25T	WPT4405	MK1KS	1.0156	**TAWNH0101T**	●
											1.0313	**TAWNH0102T**	●
0105	●	3.701	4.528	6.903	1.250	1/4-18	WS406024T	②TKY25T	WPT4405	MK1KS	1.0469	**TAWNH0103T**	●
											1.0625	**TAWNH0104T**	●
											1.0781	**TAWNH0105T**	●
0107	●	3.819	4.724	7.099	1.250	1/4-18	WS508026T	②TKY27T	WPT4405	MK1KS	1.0938	**TAWNH0106T**	●
											1.1094	**TAWNH0107T**	●
0110	●	3.937	4.921	7.296	1.250	1/4-18	WS508027T	②TKY27T	WPT4405	MK1KS	1.1250	**TAWNH0108T**	●
											1.1406	**TAWNH0109T**	●
											1.1563	**TAWNH0110T**	●
0112	●	4.094	4.921	7.296	1.250	1/4-18	WS508027T	②TKY27T	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 L_1,L_2, and L_3 dimensions listed in the table above, are measured using the VP15TF insert.
When using the DP5010 insert, the L_1, L_2 and L_3 dimensions will be slightly reduced.

DRILLING

INSERTS ➤ L190
CUTTING CONDITIONS ➤ L189
HOW TO USE ➤ L189
TECHNICAL DATA ➤ N001

TAW

- Wavy cutting edge design for good chip control.
- Serration geometry for accurate insert location.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		◎	◎		

.5625≤D1≤.6875	.7031≤D1≤1.1719	D1=1.1875
−.00063 −.00134	−.00079 −.00161	−.00098 −.00197

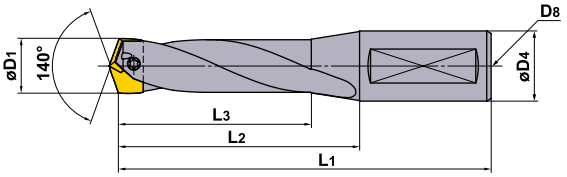
(inch)

INCH STANDARD

L/D=5

Internal Coolant





Holder		Dimensions (inch)					*	①			Drill Dia.	Insert	
Order Number	Stock	L3	L2	L1	D4	D8	Insert Screw	Wrench	Plate	Anti-seize Lubricant	D1 (inch)	Order Number	Stock VP15TF
TAWMNH0036	●	3.150	3.819	5.694	.625	1/8-27	WS254012T	①TKY08W	WPT4405	MK1KS	.5625	**TAWNH0036T**	●
0037	●	3.346	4.134	6.009	.625	1/8-27	WS254013T	①TKY08W	WPT4405	MK1KS	.5781	**TAWNH0037T**	●
0039	●	3.346	4.134	6.134	.750	1/8-27	WS254013T	①TKY08W	WPT4405	MK1KS	.5938	**TAWNH0038T**	●
											.6094	**TAWNH0039T**	●
TAWMN0041	●	3.583	4.528	6.528	.750	1/8-27	WS254014T	①TKY08W	WPT4405	MK1KS	.6250	**TAWNH0040T**	●
											.6406	**TAWNH0041T**	●
0044	●	3.780	4.724	6.724	.750	1/8-27	WS254015T	①TKY08W	WPT4405	MK1KS	.6563	**TAWNH0042T**	●
											.6719	**TAWNH0043T**	●
											.6875	**TAWNH0044T**	●
0045	●	4.016	4.921	6.921	.750	1/8-27	WS254016T	①TKY08W	WPT4405	MK1KS	.7031	**TAWNH0045T**	●
0046	●	4.016	4.921	7.171	1.000	1/8-27	WS254016T	①TKY08W	WPT4405	MK1KS	.7188	**TAWNH0046T**	●
0049	●	4.213	5.276	7.526	1.000	1/8-27	WS304517T	②TKY10T	WPT4405	MK1KS	.7344	**TAWNH0047T**	●
											.7500	**TAWNH0048T**	●
											.7656	**TAWNH0049T**	●
0051	●	4.449	5.472	7.722	1.000	1/8-27	WS304518T	②TKY10T	WPT4405	MK1KS	.7813	**TAWNH0050T**	●
											.7969	**TAWNH0051T**	●
0054	●	4.646	5.472	7.722	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 L1,L2, and L3 dimensions listed in the table above, are measured using the VP15TF insert.

When using the DP5010 insert, the L1, L2 and L3 dimensions will be slightly reduced.

● : Inventory maintained.

Holder		Dimensions (inch)					*				Drill Dia.	Insert	
Order Number	Stock	L_3	L_2	L_1	D_4	D_8	Insert Screw	Wrench	Plate	Anti-seize Lubricant	D_1 (inch)	Order Number	Stock VP15TF
TAWMN0056	●	4.882	5.669	7.919	1.000	1/8-27	WS355520T	TKY15T	WPT4405	MK1KS	.8594	**TAWNH0055T**	●
											.8750	**TAWNH0056T**	●
0059	●	5.079	6.063	8.313	1.000	1/8-27	WS355521T	TKY15T	WPT4405	MK1KS	.8906	**TAWNH0057T**	●
											.9063	**TAWNH0058T**	●
											.9219	**TAWNH0059T**	●
0061	●	5.315	6.299	8.674	1.250	1/4-18	WS355521T	TKY15T	WPT4405	MK1KS	.9375	**TAWNH0060T**	●
											.9531	**TAWNH0061T**	●
0100	●	5.512	6.496	8.871	1.250	1/4-18	WS406023T	TKY25T	WPT4405	MK1KS	.9688	**TAWNH0062T**	●
											.9844	**TAWNH0063T**	●
											1.0000	**TAWNH0100T**	●
0102	●	5.748	6.693	9.068	1.250	1/4-18	WS406024T	TKY25T	WPT4405	MK1KS	1.0156	**TAWNH0101T**	●
											1.0313	**TAWNH0102T**	●
0105	●	5.945	6.890	9.265	1.250	1/4-18	WS406024T	TKY25T	WPT4405	MK1KS	1.0469	**TAWNH0103T**	●
											1.0625	**TAWNH0104T**	●
											1.0781	**TAWNH0105T**	●
0107	●	6.181	7.087	9.462	1.250	1/4-18	WS508026T	TKY27T	WPT4405	MK1KS	1.0938	**TAWNH0106T**	●
											1.1094	**TAWNH0107T**	●
0110	●	6.378	7.283	9.658	1.250	1/4-18	WS508027T	TKY27T	WPT4405	MK1KS	1.1250	**TAWNH0108T**	●
											1.1406	**TAWNH0109T**	●
											1.1563	**TAWNH0110T**	●
0112	●	6.575	7.677	10.052	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 L_1,L_2, and L_3 dimensions listed in the table above, are measured using the VP15TF insert.
When using the DP5010 insert, the L_1, L_2 and L_3 dimensions will be slightly reduced.

DRILLING

INSERTS ➤ L190
CUTTING CONDITIONS ➤ L189
HOW TO USE ➤ L189
TECHNICAL DATA ➤ N001

TAW

- Wavy cutting edge design for good chip control.
- Serration geometry for accurate insert location.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		◎	◎		

.5625≤D1≤.6875	.7031≤D1≤1.1719	D1=1.1875
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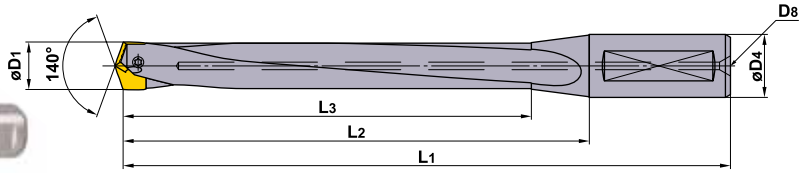
(inch)

INCH STANDARD

L/D=8

Internal Coolant





Holder		Dimensions (inch)					*	①			Drill Dia.	Insert	
Order Number	Stock	L3	L2	L1	D4	D8	Insert Screw	Wrench	Plate	Anti-seize Lubricant	D1 (inch)	Order Number	Stock VP15TF
TAWLNH0036	●	4.803	5.394	7.268	.625	1/8-27	WS254012T	①TKY08W	WPT4405	MK1KS	.5625	**TAWNH0036T**	●
0037	●	5.118	5.827	7.701	.625	1/8-27	WS254013T	①TKY08W	WPT4405	MK1KS	.5781	**TAWNH0037T**	●
0039	●	5.118	5.827	7.827	.750	1/8-27	WS254013T	①TKY08W	WPT4405	MK1KS	.5938	**TAWNH0038T**	●
											.6094	**TAWNH0039T**	●
TAWLN0041	●	5.433	6.220	8.220	.750	1/8-27	WS254014T	①TKY08W	WPT4405	MK1KS	.6250	**TAWNH0040T**	●
											.6406	**TAWNH0041T**	●
0044	●	5.748	6.535	8.535	.750	1/8-27	WS254015T	①TKY08W	WPT4405	MK1KS	.6563	**TAWNH0042T**	●
											.6719	**TAWNH0043T**	●
											.6875	**TAWNH0044T**	●
0045	●	6.063	6.850	8.850	.750	1/8-27	WS254016T	①TKY08W	WPT4405	MK1KS	.7031	**TAWNH0045T**	●
0046	●	6.063	6.850	9.102	1.000	1/8-27	WS254016T	①TKY08W	WPT4405	MK1KS	.7188	**TAWNH0046T**	●
0049	●	6.378	7.283	9.535	1.000	1/8-27	WS304517T	②TKY10T	WPT4405	MK1KS	.7344	**TAWNH0047T**	●
											.7500	**TAWNH0048T**	●
											.7656	**TAWNH0049T**	●
0051	●	6.693	7.598	9.850	1.000	1/8-27	WS304518T	②TKY10T	WPT4405	MK1KS	.7813	**TAWNH0050T**	●
											.7969	**TAWNH0051T**	●
0054	●	7.008	7.953	10.205	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 L1,L2, and L3 dimensions listed in the table above, are measured using the VP15TF insert.

When using the DP5010 insert, the L1, L2 and L3 dimensions will be slightly reduced.

● : Inventory maintained.

Holder		Dimensions (inch)					*				Drill Dia.	Insert	
Order Number	Stock	L_3	L_2	L_1	D_4	D_8	Insert Screw	Wrench	Plate	Anti-seize Lubricant	D_1 (inch)	Order Number	Stock VP15TF
TAWLN0056	●	7.323	8.268	10.520	1.000	1/8-27	WS355520T	TKY15T	WPT4405	MK1KS	.8594	**TAWNH0055T**	●
											.8750	**TAWNH0056T**	●
0059	●	7.638	8.780	10.031	1.000	1/8-27	WS355521T	TKY15T	WPT4405	MK1KS	.8906	**TAWNH0057T**	●
											.9063	**TAWNH0058T**	●
											.9219	**TAWNH0059T**	●
0061	●	7.953	9.134	11.508	1.250	1/4-18	WS355521T	TKY15T	WPT4405	MK1KS	.9375	**TAWNH0060T**	●
											.9531	**TAWNH0061T**	●
0100	●	8.268	9.449	11.823	1.250	1/4-18	WS406023T	TKY25T	WPT4405	MK1KS	.9688	**TAWNH0062T**	●
											.9844	**TAWNH0063T**	●
											1.0000	**TAWNH0100T**	●
0102	●	8.583	9.764	12.138	1.250	1/4-18	WS406024T	TKY25T	WPT4405	MK1KS	1.0156	**TAWNH0101T**	●
											1.0313	**TAWNH0102T**	●
0105	●	8.898	10.079	12.453	1.250	1/4-18	WS406024T	TKY25T	WPT4405	MK1KS	1.0469	**TAWNH0103T**	●
											1.0625	**TAWNH0104T**	●
											1.0781	**TAWNH0105T**	●
0107	●	9.213	10.394	12.768	1.250	1/4-18	WS508026T	TKY27T	WPT4405	MK1KS	1.0938	**TAWNH0106T**	●
											1.1094	**TAWNH0107T**	●
0110	●	9.528	10.709	13.083	1.250	1/4-18	WS508027T	TKY27T	WPT4405	MK1KS	1.1250	**TAWNH0108T**	●
											1.1406	**TAWNH0109T**	●
											1.1563	**TAWNH0110T**	●
0112	●	9.843	11.220	13.594	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 L_1,L_2, and L_3 dimensions listed in the table above, are measured using the VP15TF insert.
When using the DP5010 insert, the L_1, L_2 and L_3 dimensions will be slightly reduced.

DRILLING

INSERTS ➤ L190
CUTTING CONDITIONS ➤ L189
HOW TO USE ➤ L189
TECHNICAL DATA ➤ N001

TAW

- Wavy cutting edge design for good chip control.
- Serration geometry for accurate insert location.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		◎	◎		

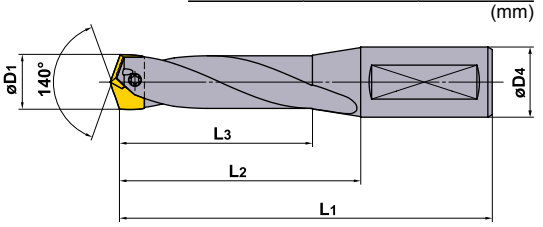
14≤D1≤18	18<D1≤30	30<D1≤40
0 −0.018	0 −0.021	0 −0.025

(mm)

METRIC STANDARD

Internal Coolant





Hole depth (l/d)	Holder Order Number	Stock	Dimensions (mm) L3	L2	L1	D4	* Insert Screw	Wrench	Plate	Anti-seize Lubricant	Drill Dia. D1 (mm)	Insert Order Number	Stock VP15TF	DP5010
3	**TAWSNH1400S16**	▲	51	67	115	16	WS254012T	TKY08W	WPT4405	MK1KS	14.0	**TAWNH1400T**	▲	
												TAWKH1400TG		▲
5	**MNH1400S16**	▲	80	97	145	16	WS254012T	TKY08W	WPT4405	MK1KS	14.1	**TAWNH1410T**	▲	
												TAWKH1410TG		▲
8	**LNH1400S16**	▲	122	137	185	16	WS254012T	TKY08W	WPT4405	MK1KS	14.2	**TAWNH1420T**	▲	
												TAWKH1420TG		▲
											14.3	**TAWNH1430T**	▲	
												TAWKH1430TG		▲
											14.4	**TAWNH1440T**	▲	
												TAWKH1440TG		▲
3	**TAWSNH1500S20**	▲	54	75	125	20	WS254013T	TKY08W	WPT4405	MK1KS	14.5	**TAWNH1450T**	▲	
												TAWKH1450TG		▲
											14.6	**TAWNH1460T**	▲	
												TAWKH1460TG		▲
											14.7	**TAWNH1470T**	▲	
												TAWKH1470TG		▲
											14.8	**TAWNH1480T**	▲	
												TAWKH1480TG		▲
5	**MNH1500S20**	▲	85	105	155	20	WS254013T	TKY08W	WPT4405	MK1KS	14.9	**TAWNH1490T**	▲	
												TAWKH1490TG		▲
											15.0	**TAWNH1500T**	▲	
												TAWKH1500TG		▲
											15.1	**TAWNH1510T**	▲	
												TAWKH1510TG		▲
8	**LNH1500S20**	▲	130	148	198	20	WS254013T	TKY08W	WPT4405	MK1KS	15.2	**TAWNH1520T**	▲	
												TAWKH1520TG		▲
											15.3	**TAWNH1530T**	▲	
												TAWKH1530TG		▲
											15.4	**TAWNH1540T**	▲	
												TAWKH1540TG		▲

* Clamp Torque (lbf-in) : WS254012T=18, WS254013T=18

(Note) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).
The L1,L2, and L3 dimensions listed in the table above, are measured using the VP15TF insert.
When using the DP5010 insert, the L1, L2 and L3 dimensions will be slightly reduced.

▲ : This item to be discontinued within two years.

Hole depth (l/d)	Holder		Dimensions (mm)				*				Drill Dia.	Insert		
	Order Number	Stock	L_3	L_2	L_1	D_4	Insert Screw	Wrench	Plate	Anti-seize Lubricant	D_1 (mm)	Order Number	Stock VP15TF	Stock DP5010
3	**TAWSN1600S20**	▲	58	80	130	20	WS254014T	TKY08W	WPT4405	MK1KS	15.5	**TAWNH1550T**	▲	
												TAWKH1550TG		▲
											15.6	**TAWNH1560T**	▲	
												TAWKH1560TG		▲
											15.7	**TAWNH1570T**	▲	
												TAWKH1570TG		▲
5	**MN1600S20**	▲	91	115	165	20	WS254014T	TKY08W	WPT4405	MK1KS	15.8	**TAWNH1580T**	▲	
												TAWKH1580TG		▲
											15.9	**TAWNH1590T**	▲	
												TAWKH1590TG		▲
											16.0	**TAWNH1600T**	▲	
												TAWKH1600TG		▲
											16.1	**TAWNH1610T**	▲	
												TAWKH1610TG		▲
8	**LN1600S20**	▲	138	158	208	20	WS254014T	TKY08W	WPT4405	MK1KS	16.2	**TAWNH1620T**	▲	
												TAWKH1620TG		▲
											16.3	**TAWNH1630T**	▲	
												TAWKH1630TG		▲
											16.4	**TAWNH1640T**	▲	
												TAWKH1640TG		▲
3	**TAWSN1700S20**	▲	61	85	135	20	WS254015T	TKY08W	WPT4405	MK1KS	16.5	**TAWNH1650T**	▲	
												TAWKH1650TG		▲
											16.6	**TAWNH1660T**	▲	
												TAWKH1660TG		▲
											16.7	**TAWNH1670T**	▲	
												TAWKH1670TG		▲
5	**MN1700S20**	▲	96	120	170	20	WS254015T	TKY08W	WPT4405	MK1KS	16.8	**TAWNH1680T**	▲	
												TAWKH1680TG		▲
											16.9	**TAWNH1690T**	▲	
												TAWKH1690TG		▲
											17.0	**TAWNH1700T**	▲	
												TAWKH1700TG		▲
8	**LN1700S20**	▲	146	166	216	20	WS254015T	TKY08W	WPT4405	MK1KS	17.1	**TAWNH1710T**	▲	
												TAWKH1710TG		▲
											17.2	**TAWNH1720T**	▲	
												TAWKH1720TG		▲
											17.3	**TAWNH1730T**	▲	
												TAWKH1730TG		▲
											17.4	**TAWNH1740T**	▲	
												TAWKH1740TG		▲

* Clamp Torque (lbf-in) : WS254014T=18, WS254015T=18

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The L_1,L_2, and L_3 dimensions listed in the table above, are measured using the VP15TF insert.
When using the DP5010 insert, the L_1, L_2 and L_3 dimensions will be slightly reduced.

DRILLING

TAW

- Wavy cutting edge design for good chip control.
- Serration geometry for accurate insert location.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		◎	◎		

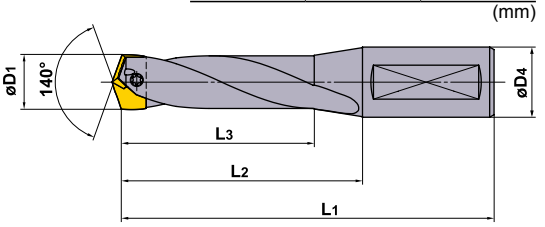
14≤D1≤18	18<D1≤30	30<D1≤40
0 −0.018	0 −0.021	0 −0.025

(mm)

METRIC STANDARD

Internal Coolant





Hole depth (l/d)	Holder Order Number	Holder Stock	Dimensions (mm) L3	L2	L1	D4	* Insert Screw	Wrench	Plate	Anti-seize Lubricant	Drill Dia. D1 (mm)	Insert Order Number	Insert Stock VP15TF	DP5010
3	TAWSN1800S20	▲	65	90	140	20	WS254016T	TKY08W	WPT4405	MK1KS	17.5	TAWNH1750T	▲	
												TAWKH1750TG		▲
											17.6	TAWNH1760T	▲	
												TAWKH1760TG		▲
											17.7	TAWNH1770T	▲	
												TAWKH1770TG		▲
5	MN1800S20	▲	102	125	175	20	WS254016T	TKY08W	WPT4405	MK1KS	17.8	TAWNH1780T	▲	
												TAWKH1780TG		▲
											17.9	TAWNH1790T	▲	
												TAWKH1790TG		▲
											18.0	TAWNH1800T	▲	
												TAWKH1800TG		▲
											18.1	TAWNH1810T	▲	
												TAWKH1810TG		▲
8	LN1800S20	▲	154	174	224	20	WS254016T	TKY08W	WPT4405	MK1KS	18.2	TAWNH1820T	▲	
												TAWKH1820TG		▲
											18.3	TAWNH1830T	▲	
												TAWKH1830TG		▲
											18.4	TAWNH1840T	▲	
												TAWKH1840TG		▲

* Clamp Torque (lbf-in) : WS254016T=18

(Note) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).
The L1,L2, and L3 dimensions listed in the table above, are measured using the VP15TF insert.
When using the DP5010 insert, the L1, L2 and L3 dimensions will be slightly reduced.

● : Inventory maintained. ★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.

Hole depth (l/d)	Holder		Dimensions (mm)				*				Drill Dia.	Insert		
	Order Number	Stock	L_3	L_2	L_1	D_4	Insert Screw	Wrench	Plate	Anti-seize Lubricant	D_1 (mm)	Order Number	Stock VP15TF	Stock DP5010
3	**TAWSN1900S25**	★	68	99	155	25	WS304517T	TKY10T	WPT4405	MK1KS	18.5	**TAWNH1850T**	●	
												TAWKH1850TG		★
											18.6	**TAWNH1860T**	●	
												TAWKH1860TG		★
											18.7	**TAWNH1870T**	●	
												TAWKH1870TG		★
5	**MN1900S25**	★	107	134	190	25	WS304517T	TKY10T	WPT4405	MK1KS	18.8	**TAWNH1880T**	●	
												TAWKH1880TG		★
											18.9	**TAWNH1890T**	●	
												TAWKH1890TG		★
											19.0	**TAWNH1900T**	●	
												TAWKH1900TG		★
8	**LN1900S25**	★	162	185	241	25	WS304517T	TKY10T	WPT4405	MK1KS	19.1	**TAWNH1910T**	●	
												TAWKH1910TG		★
											19.2	**TAWNH1920T**	●	
												TAWKH1920TG		★
											19.3	**TAWNH1930T**	●	
												TAWKH1930TG		★
											19.4	**TAWNH1940T**	●	
												TAWKH1940TG		★
3	**TAWSN2000S25**	★	72	99	155	25	WS304518T	TKY10T	WPT4405	MK1KS	19.5	**TAWNH1950T**	●	
												TAWKH1950TG		★
											19.6	**TAWNH1960T**	●	
												TAWKH1960TG		★
5	**MN2000S25**	★	113	139	195	25	WS304518T	TKY10T	WPT4405	MK1KS	19.7	**TAWNH1970T**	●	
												TAWKH1970TG		★
											19.8	**TAWNH1980T**	●	
												TAWKH1980TG		★
8	**LN2000S25**	★	170	193	249	25	WS304518T	TKY10T	WPT4405	MK1KS	19.9	**TAWNH1990T**	●	
												TAWKH1990TG		★
											20.0	**TAWNH2000T**	●	
												TAWKH2000TG		★
3	**TAWSN2100S25**	★	75	99	155	25	WS304518T	TKY10T	WPT4405	MK1KS	20.5	**TAWNH2050T**	●	
5	**MN2100S25**	★	118	139	195	25	WS304518T	TKY10T	WPT4405	MK1KS		**TAWKH2050TG**		★
8	**LN2100S25**	★	178	202	258	25	WS304518T	TKY10T	WPT4405	MK1KS	21.0	**TAWNH2100T**	●	
												TAWKH2100TG		★
3	**TAWSN2200S25**	★	79.3	104.3	160.3	25	WS355520T	TKY15T	WPT4405	MK1KS	21.5	**TAWNH2150T**	●	
5	**MN2200S25**	★	124.3	144.3	200.3	25	WS355520T	TKY15T	WPT4405	MK1KS		**TAWKH2150TG**		★
8	**LN2200S25**	★	186	210	266	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 L_1,L_2, and L_3 dimensions listed in the table above, are measured using the VP15TF insert.
When using the DP5010 insert, the L_1, L_2 and L_3 dimensions will be slightly reduced.

TAW

- Wavy cutting edge design for good chip control.
- Serration geometry for accurate insert location.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		◎	◎		

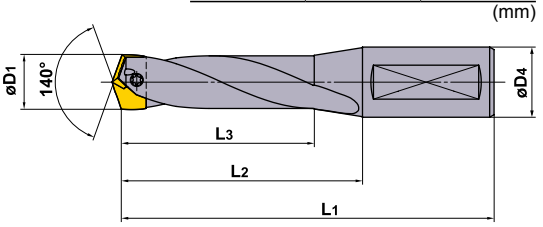
14≤D1≤18	18<D1≤30	30<D1≤40
0 −0.018	0 −0.021	0 −0.025

(mm)

METRIC STANDARD

Internal Coolant





Hole depth (l/d)	Holder Order Number	Stock	Dimensions (mm) L3	L2	L1	D4	* Insert Screw	Wrench	Plate	Anti-seize Lubricant	Drill Dia. D1 (mm)	Insert Order Number	Stock VP15TF	DP5010
3	TAWSN2300S25	★	82.3	104.3	160.3	25	WS355521T	TKY15T	WPT4405	MK1KS	22.5	TAWNH2250T	●	
5	MN2300S25	★	129.3	154.3	210.3	25	WS355521T	TKY15T	WPT4405	MK1KS		TAWKH2250TG		★
8	LN2300S25	★	194	223	279	25	WS355521T	TKY15T	WPT4405	MK1KS	23.0	TAWNH2300T	●	
												TAWKH2330TG		★
3	TAWSN2400S32	★	86.3	110.3	170.3	32	WS355521T	TKY15T	WPT4405	MK1KS	23.5	TAWNH2350T	●	
5	MN2400S32	★	135.3	160.3	220.3	32	WS355521T	TKY15T	WPT4405	MK1KS		TAWKH2350TG		★
8	LN2400S32	★	202	232	292	32	WS355521T	TKY15T	WPT4405	MK1KS	24.0	TAWNH2400T	●	
												TAWKH2400TG		★
3	TAWSN2500S32	★	88.6	110.6	170.6	32	WS406023T	TKY25T	WPT4405	MK1KS	24.5	TAWNH2450T	●	
5	MN2500S32	★	140.6	165.6	225.6	32	WS406023T	TKY25T	WPT4405	MK1KS		TAWKH2450TG		★
8	LN2500S32	★	210	240	300	32	WS406023T	TKY25T	WPT4405	MK1KS	25.0	TAWNH2500T	●	
												TAWKH2500TG		★
3	TAWSN2600S32	★	92.6	115.6	175.6	32	WS406024T	TKY25T	WPT4405	MK1KS	25.5	TAWNH2550T	●	
5	MN2600S32	★	146.6	170.6	230.6	32	WS406024T	TKY25T	WPT4405	MK1KS		TAWKH2550TG		★
8	LN2600S32	★	218	248	308	32	WS406024T	TKY25T	WPT4405	MK1KS	26.0	TAWNH2600T	●	
												TAWKH2600TG		★
3	TAWSN2700S32	★	94.6	115.6	175.6	32	WS406024T	TKY25T	WPT4405	MK1KS	26.5	TAWNH2650T	●	
5	MN2700S32	★	151.6	175.6	235.6	32	WS406024T	TKY25T	WPT4405	MK1KS		TAWKH2650TG		★
8	LN2700S32	★	226	256	316	32	WS406024T	TKY25T	WPT4405	MK1KS	27.0	TAWNH2700T	●	
												TAWKH2700TG		★
3	TAWSN2800S32	★	97.2	120.2	180.2	32	WS508026T	TKY27T	WPT4405	MK1KS	27.5	TAWNH2750T	●	
5	MN2800S32	★	157.2	180.2	240.2	32	WS508026T	TKY27T	WPT4405	MK1KS		TAWKH2750TG		★
8	LN2800S32	★	234	264	324	32	WS508026T	TKY27T	WPT4405	MK1KS	28.0	TAWNH2800T	●	
												TAWKH2800TG		★
3	TAWSN2900S32	★	100.2	125.2	185.2	32	WS508027T	TKY27T	WPT4405	MK1KS	28.5	TAWNH2850T	●	
5	MN2900S32	★	162.2	185.2	245.2	32	WS508027T	TKY27T	WPT4405	MK1KS		TAWKH2850TG		★
8	LN2900S32	★	242	272	332	32	WS508027T	TKY27T	WPT4405	MK1KS	29.0	TAWNH2900T	●	
												TAWKH2900TG		★
3	TAWSN3000S32	★	104.2	125.2	185.2	32	WS508027T	TKY27T	WPT4405	MK1KS	29.5	TAWNH2950T	●	
5	MN3000S32	★	167.2	195.2	255.2	32	WS508027T	TKY27T	WPT4405	MK1KS		TAWKH2950TG		★
8	LN3000S32	★	250	285	345	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 L1,L2, and L3 dimensions listed in the table above, are measured using the VP15TF insert.
When using the DP5010 insert, the L1, L2 and L3 dimensions will be slightly reduced.

● : Inventory maintained. ★ : Inventory maintained in Japan.

RECOMMENDED CUTTING CONDITIONS

Work Material		Drill Diameter D1 / Conditions / Hardness	ϕ.5625"—ϕ.6094" ϕ14.0—ϕ15.4mm		ϕ.6250"—ϕ.7188" ϕ15.5—ϕ18.4mm		ϕ.7344"—ϕ.8438" ϕ18.5—ϕ21.4mm	
			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		Drill Diameter D1 / Conditions / Hardness	ϕ.8594"—ϕ.9531" ϕ21.5—ϕ24.4mm		ϕ.9688"—ϕ1.0781" ϕ24.5—ϕ27.4mm		ϕ1.0938"—ϕ1.1875" ϕ27.5—ϕ30.4mm	
			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)

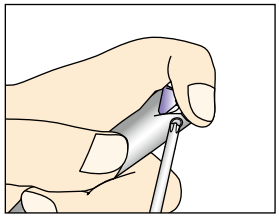


Figure 1

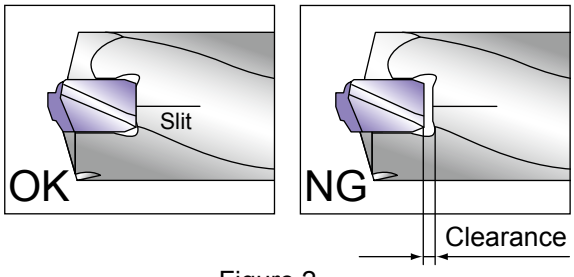


Figure 2

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 ➤ L190
TECHNICAL DATA ➤ N001

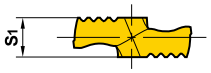
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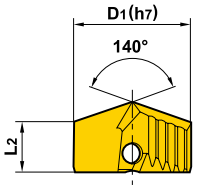
INSERTS

INCH STANDARD

Geometry	Order Number	Stock	Dimensions (inch)			Applicable Holder	
		VP15TF	D_1	L_2	S_1	Inch	Metric
For General Use	TAWNH0036T	●	.5625	.299	.197	TAWS/M/LNH0036	TAWS/M/LNH1400S16
	0037T	●	.5781	.295	.197	TAWS/M/LNH0037	TAWS/M/LNH1500S20
	0038T	●	.5938	.291	.197	TAWS/M/LNH0039	
	0039T	●	.6094	.291	.197		
	0040T	●	.6250	.311	.236	TAWS/M/LN0041	TAWS/M/LN1600S20
	0041T	●	.6406	.307	.236		
	0042T	●	.6563	.303	.236	TAWS/M/LN0044	TAWS/M/LN1700S20
	0043T	●	.6719	.299	.236		
	0044T	●	.6875	.299	.236		
	0045T	●	.7031	.295	.236	TAWS/M/LN0045	TAWS/M/LN1800S20
	0046T	●	.7188	.291	.236	TAWS/M/LN0046	
	0047T	●	.7344	.366	.276	TAWS/M/LN0049	TAWS/M/LN1900S25
	0048T	●	.7500	.362	.276		
	0049T	●	.7656	.362	.276		
	0050T	●	.7813	.358	.276	TAWS/M/LN0051	TAWS/M/LN2000S25
	0051T	●	.7969	.354	.276		
	0052T	●	.8125	.350	.276	TAWS/M/LN0054	TAWS/M/LN2100S25
	0053T	●	.8281	.346	.276		
	0054T	●	.8438	.346	.276		
	0055T	●	.8594	.417	.315	TAWS/M/LN0056	TAWS/M/LN2200S25
	0056T	●	.8750	.413	.315		
	0057T	●	.8906	.409	.315	TAWS/M/LN0059	TAWS/M/LN2300S25
	0058T	●	.9063	.406	.315		
	0059T	●	.9219	.406	.315		
	0060T	●	.9375	.402	.315	TAWS/M/LN0061	TAWS/M/LN2400S32
	0061T	●	.9531	.398	.315		
	0062T	●	.9688	.461	.354	TAWS/M/LN0100	TAWS/M/LN2500S32
	0063T	●	.9844	.457	.354		
	0100T	●	1.0000	.457	.354		
	0101T	●	1.0156	.453	.354	TAWS/M/LN0102	TAWS/M/LN2600S32
	0102T	●	1.0313	.449	.354		
	0103T	●	1.0469	.445	.354	TAWS/M/LN0105	TAWS/M/LN2700S32
	0104T	●	1.0625	.445	.354		
	0105T	●	1.0781	.441	.354		
	0106T	●	1.0938	.484	.394	TAWS/M/LN0107	TAWS/M/LN2800S32
	0107T	●	1.1094	.480	.394		
	0108T	●	1.1250	.476	.394	TAWS/M/LN0110	TAWS/M/LN2900S32
	0109T	●	1.1406	.476	.394		
	0110T	●	1.1563	.472	.394		
	0111T	●	1.1719	.469	.394	TAWS/M/LN0112	TAWS/M/LN3000S32
	0112T	●	1.1875	.465	.394		







DRILLING

CUTTING CONDITIONS ➤ L189
HOW TO USE ➤ L189
TECHNICAL DATA ➤ N001

● : Inventory maintained.

Memo

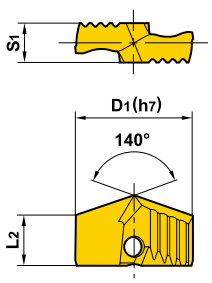
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INSERTS

METRIC STANDARD

Geometry	Order Number	Stock	Dimensions (mm)			Applicable Holder	
		VP15TF	D_1	L_2	S_1	Inch	Metric
For General Use	**TAWNH1400T**	▲	14.0	7.6	5.0		
	1410T	▲	14.1	7.6	5.0	TAWSNH0036	TAWSNH1400S16
	1420T	▲	14.2	7.6	5.0	TAWMNH0036	TAWMNH1400S16
	1430T	▲	14.3	7.6	5.0	TAWLNH0036	TAWLNH1400S16
	1440T	▲	14.4	7.6	5.0		
	1450T	▲	14.5	7.5	5.0		
	1460T	▲	14.6	7.5	5.0		
	1470T	▲	14.7	7.5	5.0	TAWSNH0037	
	1480T	▲	14.8	7.5	5.0	TAWMNH0037	
	1490T	▲	14.9	7.5	5.0	TAWLNH0037	TAWSNH1500S20
	1500T	▲	15.0	7.4	5.0	TAWSNH0039	TAWMNH1500S20
	1510T	▲	15.1	7.4	5.0	TAWMNH0039	TAWLNH1500S20
	1520T	▲	15.2	7.4	5.0	TAWLNH0039	
	1530T	▲	15.3	7.4	5.0		
	1540T	▲	15.4	7.4	5.0		
	1550T	▲	15.5	7.9	6.0		
	1560T	▲	15.6	7.9	6.0		
	1570T	▲	15.7	7.9	6.0		
	1580T	▲	15.8	7.9	6.0		
	1590T	▲	15.9	7.9	6.0	TAWSN0041	TAWSN1600S20
	1600T	▲	16.0	7.8	6.0	TAWMN0041	TAWMN1600S20
	1610T	▲	16.1	7.8	6.0	TAWLN0041	TAWLN1600S20
	1620T	▲	16.2	7.8	6.0		
	1630T	▲	16.3	7.8	6.0		
	1640T	▲	16.4	7.8	6.0		
	1650T	▲	16.5	7.7	6.0		
	1660T	▲	16.6	7.7	6.0		
	1670T	▲	16.7	7.7	6.0		
	1680T	▲	16.8	7.7	6.0		
	1690T	▲	16.9	7.7	6.0	TAWSN0044	TAWSN1700S20
	1700T	▲	17.0	7.6	6.0	TAWMN0044	TAWMN1700S20
	1710T	▲	17.1	7.6	6.0	TAWLN0044	TAWLN1700S20
	1720T	▲	17.2	7.6	6.0		
	1730T	▲	17.3	7.6	6.0		
	1740T	▲	17.4	7.6	6.0		
	1750T	▲	17.5	7.5	6.0		
	1760T	▲	17.6	7.5	6.0		
	1770T	▲	17.7	7.5	6.0	TAWSN0045	
	1780T	▲	17.8	7.5	6.0	TAWMN0045	TAWSN1800S20
	1790T	▲	17.9	7.5	6.0	TAWLN0045	TAWMN1800S20
	1800T	▲	18.0	7.4	6.0	TAWSN0046	TAWLN1800S20
	1810T	▲	18.1	7.4	6.0	TAWMN0046	
	1820T	▲	18.2	7.4	6.0	TAWLN0046	
	1830T	▲	18.3	7.4	6.0		
	1840T	▲	18.4	7.4	6.0		

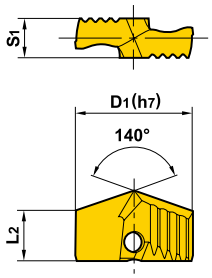




● : Inventory maintained. ▲ : This item to be discontinued within two years.
<One insert in one case>

Geometry	Order Number	Stock	Dimensions (mm)			Applicable Holder	
		VP15TF	D_1	L_2	S_1	Inch	Metric
For General Use	**TAWNH1850T**	●	18.5	9.3	7.0		
	1860T	●	18.6	9.3	7.0		
	1870T	●	18.7	9.3	7.0		
	1880T	●	18.8	9.3	7.0	TAWSN0049 TAWMN0049 TAWLN0049	TAWSN1900S25 TAWMN1900S25 TAWLN1900S25
	1890T	●	18.9	9.3	7.0		
	1900T	●	19.0	9.2	7.0		
	1910T	●	19.1	9.2	7.0		
	1920T	●	19.2	9.2	7.0		
	1930T	●	19.3	9.2	7.0		
	1940T	●	19.4	9.2	7.0		
	1950T	●	19.5	9.1	7.0		
	1960T	●	19.6	9.1	7.0		
	1970T	●	19.7	9.1	7.0	TAWSN0051 TAWMN0051 TAWLN0051	TAWSN2000S25 TAWMN2000S25 TAWLN2000S25
	1980T	●	19.8	9.1	7.0		
	1990T	●	19.9	9.1	7.0		
	2000T	●	20.0	9.0	7.0		
	2050T	●	20.5	8.9	7.0	TAWSN0054 TAWMN0054 TAWLN0054	TAWSN2100S25 TAWMN2100S25 TAWLN2100S25
	2100T	●	21.0	8.8	7.0		
	2150T	●	21.5	10.6	8.0	TAWSN0056 TAWMN0056 TAWLN0056	TAWSN2200S25 TAWMN2200S25 TAWLN2200S25
	2200T	●	22.0	10.5	8.0		
	2250T	●	22.5	10.4	8.0	TAWSN0059 TAWMN0059 TAWLN0059	TAWSN2300S25 TAWMN2300S25 TAWLN2300S25
	2300T	●	23.0	10.3	8.0		
	2350T	●	23.5	10.2	8.0	TAWSN0061 TAWMN0061 TAWLN0061	TAWSN2400S32 TAWMN2400S32 TAWLN2400S32
	2400T	●	24.0	10.1	9.0		
	2450T	●	24.5	11.7	9.0	TAWSN0100 TAWMN0100 TAWLN0100	TAWSN2500S32 TAWMN2500S32 TAWLN2500S32
	2500T	●	25.0	11.6	9.0		
	2550T	●	25.5	11.5	9.0	TAWSN0102 TAWMN0102 TAWLN0102	TAWSN2600S32 TAWMN2600S32 TAWLN2600S32
	2600T	●	26.0	11.4	9.0		
	2650T	●	26.5	11.3	9.0	TAWSN0105 TAWMN0105 TAWLN0105	TAWSN2700S32 TAWMN2700S32 TAWLN2700S32
	2700T	●	27.0	11.2	9.0		
	2750T	●	27.5	12.3	10.0	TAWSN0107 TAWMN0107 TAWLN0107	TAWSN2800S32 TAWMN2800S32 TAWLN2800S32
	2800T	●	28.0	12.2	10.0		
	2850T	●	28.5	12.1	10.0	TAWSN0110 TAWMN0110 TAWLN0110	TAWSN2900S32 TAWMN2900S32 TAWLN2900S32
	2900T	●	29.0	12.0	10.0		
	2950T	●	29.5	11.9	10.0	TAWSN0112 TAWMN0112 TAWLN0112	TAWSN3000S32 TAWMN3000S32 TAWLN3000S32
	3000T	●	30.0	11.8	10.0		





DRILLING

CUTTING CONDITIONS ➤ L189
HOW TO USE ➤ L189
TECHNICAL DATA ➤ N001

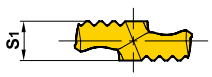
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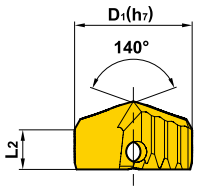
INSERTS

METRIC STANDARD

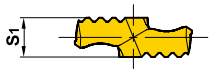
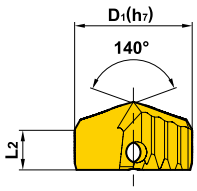
Geometry	Order Number	Stock	Dimensions (mm)			Applicable Holder	
		DP5010	D_1	L_2	S_1	Inch	Metric
For Cast Iron	TAWKH1400TG	▲	14.0	7.1	5.0		
	1410TG	▲	14.1	7.1	5.0	TAWSNH0036	TAWSNH1400S16
	1420TG	▲	14.2	7.1	5.0	TAWMNH0036	TAWMNH1400S16
	1430TG	▲	14.3	7.1	5.0	TAWLNH0036	TAWLNH1400S16
	1440TG	▲	14.4	7.1	5.0		
	1450TG	▲	14.5	7.0	5.0		
	1460TG	▲	14.6	7.0	5.0		
	1470TG	▲	14.7	7.0	5.0	TAWSNH0037	
	1480TG	▲	14.8	7.0	5.0	TAWMNH0037	
	1490TG	▲	14.9	7.0	5.0	TAWLNH0037	TAWSNH1500S20
	1500TG	▲	15.0	6.9	5.0	TAWSNH0039	TAWMNH1500S20
	1510TG	▲	15.1	6.9	5.0	TAWMNH0039	TAWLNH1500S20
	1520TG	▲	15.2	6.9	5.0	TAWLNH0039	
	1530TG	▲	15.3	6.9	5.0		
	1540TG	▲	15.4	6.9	5.0		
	1550TG	▲	15.5	7.3	6.0		
	1560TG	▲	15.6	7.3	6.0		
	1570TG	▲	15.7	7.3	6.0		
	1580TG	▲	15.8	7.3	6.0		
	1590TG	▲	15.9	7.3	6.0	TAWSN0041	TAWSN1600S20
	1600TG	▲	16.0	7.2	6.0	TAWMN0041	TAWMN1600S20
	1610TG	▲	16.1	7.2	6.0	TAWLN0041	TAWLN1600S20
	1620TG	▲	16.2	7.2	6.0		
	1630TG	▲	16.3	7.2	6.0		
	1640TG	▲	16.4	7.2	6.0		
	1650TG	▲	16.5	7.1	6.0		
	1660TG	▲	16.6	7.1	6.0		
	1670TG	▲	16.7	7.1	6.0		
	1680TG	▲	16.8	7.1	6.0		
	1690TG	▲	16.9	7.1	6.0	TAWSN0044	TAWSN1700S20
	1700TG	▲	17.0	7.0	6.0	TAWMN0044	TAWMN1700S20
	1710TG	▲	17.1	7.0	6.0	TAWLN0044	TAWLN1700S20
	1720TG	▲	17.2	7.0	6.0		
	1730TG	▲	17.3	7.0	6.0		
	1740TG	▲	17.4	7.0	6.0		
	1750TG	▲	17.5	6.8	6.0		
	1760TG	▲	17.6	6.8	6.0		
	1770TG	▲	17.7	6.8	6.0	TAWSN0045	
	1780TG	▲	17.8	6.8	6.0	TAWMN0045	
	1790TG	▲	17.9	6.8	6.0	TAWLN0045	TAWSN1800S20
	1800TG	▲	18.0	6.8	6.0	TAWSN0046	TAWMN1800S20
	1810TG	▲	18.1	6.8	6.0	TAWMN0046	TAWLN1800S20
	1820TG	▲	18.2	6.8	6.0	TAWLN0046	
	1830TG	▲	18.3	6.8	6.0		
	1840TG	▲	18.4	6.8	6.0		







★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.

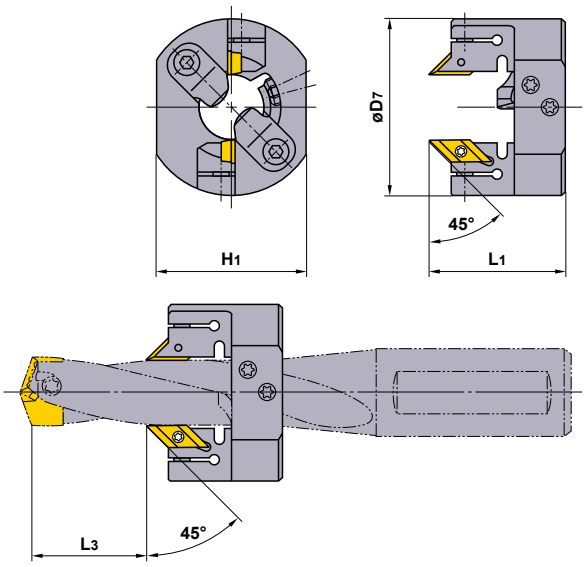
Geometry	Order Number	Stock	Dimensions (mm)			Applicable Holder	
		DP5010	D_1	L_2	S_1	Inch	Metric
For Cast Iron	**TAWKH1850TG**	★	18.5	8.6	7.0	TAWSN0049 TAWMN0049 TAWLN0049	TAWSN1900S25 TAWMN1900S25 TAWLN1900S25
	1860TG	★	18.6	8.6	7.0		
	1870TG	★	18.7	8.6	7.0		
	1880TG	★	18.8	8.6	7.0		
	1890TG	★	18.9	8.6	7.0		
	1900TG	★	19.0	8.5	7.0		
	1910TG	★	19.1	8.5	7.0		
	1920TG	★	19.2	8.5	7.0		
	1930TG	★	19.3	8.5	7.0		
	**1940TG**	★	19.4	8.5	7.0		
	1950TG	★	19.5	8.4	7.0	TAWSN0051 TAWMN0051 TAWLN0051	TAWSN2000S25 TAWMN2000S25 TAWLN2000S25
	1960TG	★	19.6	8.4	7.0		
	1970TG	★	19.7	8.4	7.0		
	1980TG	★	19.8	8.4	7.0		
	1990TG	★	19.9	8.4	7.0		
	2000TG	★	20.0	8.3	7.0		
	2050TG	★	20.5	8.2	7.0	TAWSN0054 TAWMN0054 TAWLN0054	TAWSN2100S25 TAWMN2100S25 TAWLN2100S25
	2100TG	★	21.0	8.1	7.0		
	2150TG	★	21.5	9.8	8.0	TAWSN0056 TAWMN0056 TAWLN0056	TAWSN2200S25 TAWMN2200S25 TAWLN2200S25
	2200TG	★	22.0	9.7	8.0		
	**2250TG**	★	22.5	9.6	8.0	TAWSN0059 TAWMN0059 TAWLN0059	TAWSN2300S25 TAWMN2300S25 TAWLN2300S25
	2300TG	★	23.0	9.5	8.0		
	**2350TG**	★	23.5	9.4	8.0	TAWSN0061 TAWMN0061 TAWLN0061	TAWSN2400S32 TAWMN2400S32 TAWLN2400S32
	2400TG	★	24.0	9.3	9.0		
	2450TG	★	24.5	10.8	9.0	TAWSN0100 TAWMN0100 TAWLN0100	TAWSN2500S32 TAWMN2500S32 TAWLN2500S32
	2500TG	★	25.0	10.7	9.0		
	2550TG	★	25.5	10.6	9.0	TAWSN0102 TAWMN0102 TAWLN0102	TAWSN2600S32 TAWMN2600S32 TAWLN2600S32
	2600TG	★	26.0	10.5	9.0		
	2650TG	★	26.5	10.4	9.0	TAWSN0105 TAWMN0105 TAWLN0105	TAWSN2700S32 TAWMN2700S32 TAWLN2700S32
	2700TG	★	27.0	10.3	9.0		
	2750TG	★	27.5	11.3	10.0	TAWSN0107 TAWMN0107 TAWLN0107	TAWSN2800S32 TAWMN2800S32 TAWLN2800S32
	2800TG	★	28.0	11.2	10.0		
	2850TG	★	28.5	11.1	10.0	TAWSN0110 TAWMN0110 TAWLN0110	TAWSN2900S32 TAWMN2900S32 TAWLN2900S32
	2900TG	★	29.0	11.0	10.0		
	2950TG	★	29.5	10.9	10.0	TAWSN0112 TAWMN0112 TAWLN0112	TAWSN3000S32 TAWMN3000S32 TAWLN3000S32
	3000TG	★	30.0	10.8	10.0		

CUTTING CONDITIONS ➤ L189
HOW TO USE ➤ L189
TECHNICAL DATA ➤ N001

CHAMFER RING

- Drilling and chamfering can be done at the same time.
- Chamfering position can be changed according to the machining depth.
- Maximum chamfer width: 4mm





Tool Holder Number	Stock	Dimensions (mm)			Maximum chamfer width	Drilled Depth L3 (min.–max.)			Suitable TAW Type Drill
		L1	D7	H1		TAWS	TAWM	TAWL	
TAW200R-90	▲	40	53	44	4	12—29	29—70	70—127	TAWS/M/L2000S25
210R-90	▲	40	54	46	4	12—32	32—75	75—135	TAWS/M/L2100S25
220R-90	▲	40	55	46	4	14—36	36—81	81—143	TAWS/M/L2200S25
230R-90	▲	40	56	48	4	14—39	39—86	86—151	TAWS/M/L2300S25
240R-90	▲	40	57	48	4	14—43	43—92	92—159	TAWS/M/L2400S32
250R-90	▲	42	58	50	4	15—43	43—95	95—165	TAWS/M/L2500S32
260R-90	▲	42	59	50	4	15—47	47—101	101—173	TAWS/M/L2600S32
270R-90	▲	42	60	52	4	15—49	49—106	106—181	TAWS/M/L2700S32
280R-90	▲	42	61	52	4	15—52	52—112	112—189	TAWS/M/L2800S32
290R-90	▲	45	62	54	4	15—52	52—114	114—194	TAWS/M/L2900S32
300R-90	▲	45	63	54	4	15—56	56—119	119—202	TAWS/M/L3000S32

(Note) For cutting conditions, refer to the recommended cutting conditions for the TAW drill on page L189.
If tears or vibrations occur, reduce the feed or cutting speed.

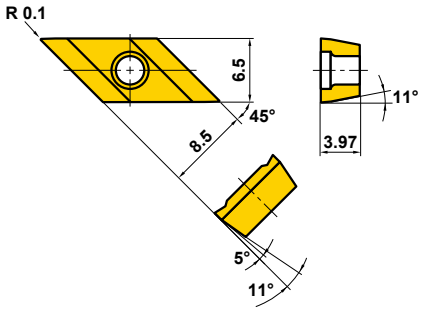
SPARE PARTS

Tool Holder Number	Clamp Screw (Insert)	Guide Plate	Screw (Guide Plate)	Set screw (Chamfer Ring)	Run-out adjust Screw	Wrench	Insert
TAW200R-90	TS254	TAWP20-21	HSC04008	TSR06011S	TSR05008S		
210R-90	TS254	TAWP20-21	HSC04008	TSR06011S	TSR05008S		
220R-90	TS254	TAWP22-24	HSC04008	TSR06011S	TSR05008S		
230R-90	TS254	TAWP22-24	HSC04008	TSR06011S	TSR05008S		
240R-90	TS254	TAWP22-24	HSC04008	TSR06011S	TSR05008S	①TKY20R	
250R-90	TS254	TAWP25-26	HSC04008	TSR06011S	TSR05008S	①TKY10R	TAWC12T301-45GM
260R-90	TS254	TAWP25-26	HSC04008	TSR06011S	TSR05008S	②TKY08F	
270R-90	TS254	TAWP27-28	HSC04008	TSR06011S	TSR05008S		
280R-90	TS254	TAWP27-28	HSC04008	TSR06011S	TSR05008S		
290R-90	TS254	TAWP29-30	HSC04008	TSR06011S	TSR05008S		
300R-90	TS254	TAWP29-30	HSC04008	TSR06011S	TSR05008S		

(Note) The above parts are provided with the chamfer ring except insert.

★ : Inventory maintained in Japan. ▲ : This item to be discontinued within two years.

INSERTS

Shape	Order Number	Stock VP15TF	Geometry (mm)
	**TAWC12T301-45GM**	★	

CHAMFER RING INSTALLATION

1. Loosen the set screws (A) and run-out adjusting screws (B) on the chamfer ring.
2. Install the guide plates into the pockets provided and tighten the guide plate mounting screws.
3. Remove the TAW drill insert and, if necessary, the insert clamp screw.
4. Install the chamfer ring from the insert end of the drill oriented as shown in fig. 1.
   Note: Prior to locking the ring in its axial position rotate the ring so the Guide Plates contact the drill flutes on the side of the flute as indicated in fig. 1.
5. Position the chamfer ring at the proper axial position and secure with the 2 set screws (A).
   Tighten the set screws to 53 lbf-in.
6. Tighten the run-out adjust screws (B) until the chamfering insert contacts the TAW drill body as shown in fig. 2.
   Note: Stop tightening the run-out adjusting screw when chamfering insert contacts the TAW drill body.
   If the run-out adjusting screws are over tightened the chamfering insert may be damaged.
   Maximum torque for the run-out adjusting screw is 18 lbf-in.

Fig. 1

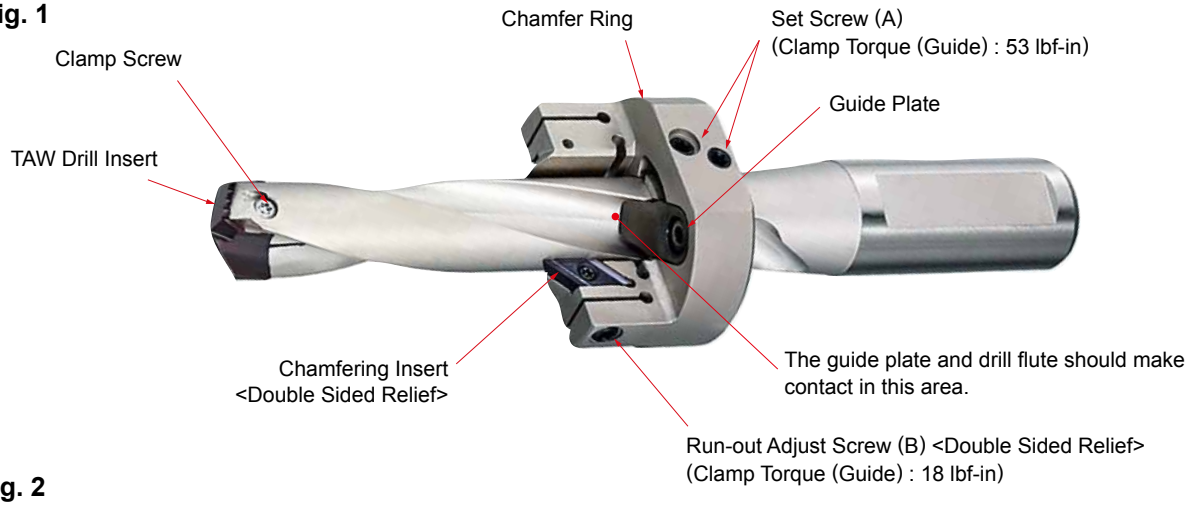
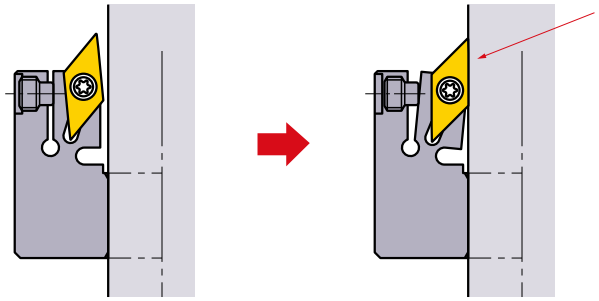


Fig. 2



Make the chamfering insert contact with the TAW drill.
(When detaching or moving the chamfer ring,
ensure there is a clearance between the inserts and the body.)

DRILLING(BRAZED TYPE)

BRA
NEW POINT DRILL

- Low thrust due to absence of a chisel edge.
- Easy regrinding.

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		○	○		

.3125"≤D1≤.3906"	.4063"≤D1≤.7031"	.7188"≤D1≤1.1719"	1.1875"≤D1≤1.2500"
8≤D1≤10mm	10<D1≤18mm	18<D1≤30mm	
$^{0}_{-.00059}$	$^{0}_{-.00071}$	$^{0}_{-.00083}$	$^{0}_{-.00098}$

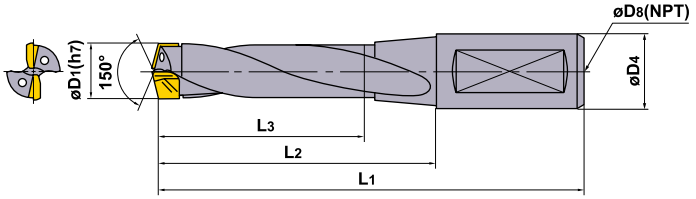
(inch)

General Use (Carbon Steel, Alloy Steel, Stainless Steel)

L/D=3

Internal Coolant





Helix Angle : 20°

INCH STANDARD

Order Number	Stock UP20M	Dimensions (inch) D1	L3	L2	L1	D4	D8
BRA0020	●	.3125	.859	1.375	3.250	.625	1/8
0021	●	.3281	.859	1.375	3.250	.625	1/8
0022	●	.3438	1.049	1.578	3.906	.625	1/8
0023	●	.3594	1.049	1.578	3.906	.625	1/8
0024	●	.3750	1.312	1.765	3.640	.625	1/8
0025	●	.3906	1.312	1.765	3.640	.625	1/8
0026	●	.4063	1.312	1.765	3.640	.625	1/8
0027	●	.4219	1.468	1.968	3.843	.625	1/8
0028	●	.4375	1.468	1.968	3.843	.625	1/8
0029	●	.4531	1.984	2.531	4.406	.625	1/8
0030	●	.4688	1.984	2.531	4.406	.625	1/8
0031	●	.4844	1.984	2.531	4.406	.625	1/8
0032	●	.5000	2.140	2.734	4.609	.625	1/8
0033	●	.5156	2.140	2.734	4.609	.625	1/8
0034	●	.5313	2.140	2.734	4.609	.625	1/8
0035	●	.5469	2.297	2.937	4.812	.625	1/8
0036	●	.5625	2.297	2.937	4.812	.625	1/8
0037	●	.5781	2.453	3.140	5.015	.625	1/8
0038	●	.5938	2.453	3.140	5.140	.750	1/8
0039	●	.6094	2.453	3.140	5.140	.750	1/8
0040	●	.6250	2.609	3.328	5.328	.750	1/8
0041	●	.6406	2.609	3.328	5.328	.750	1/8
0042	●	.6563	2.765	3.546	5.546	.750	1/8
0043	●	.6719	2.765	3.546	5.546	.750	1/8
0044	●	.6875	2.765	3.546	5.546	.750	1/8
0045	●	.7031	2.921	3.734	5.734	.750	1/8
0046	●	.7188	2.921	3.734	5.984	1.000	1/8
0047	●	.7344	3.109	3.953	6.203	1.000	1/8
0048	●	.7500	3.109	3.953	6.203	1.000	1/8
0049	●	.7656	3.109	3.953	6.203	1.000	1/8
0050	●	.7813	3.265	4.140	6.390	1.000	1/8

Order Number	Stock UP20M	Dimensions (inch) D1	L3	L2	L1	D4	D8
BRA0051	●	.7969	3.265	4.140	6.390	1.000	1/8
0052	●	.8125	3.421	4.359	6.609	1.000	1/8
0053	●	.8281	3.421	4.359	6.609	1.000	1/8
0054	●	.8438	3.421	4.359	6.609	1.000	1/8
0055	●	.8594	3.578	4.546	6.769	1.000	1/8
0056	●	.8750	3.578	4.546	6.769	1.000	1/8
0057	●	.8906	3.734	4.765	7.015	1.000	1/8
0058	●	.9063	3.734	4.765	7.015	1.000	1/8
0059	●	.9219	3.734	4.765	7.015	1.000	1/8
0060	●	.9375	3.890	4.953	7.328	1.250	1/4
0061	●	.9531	3.890	4.953	7.328	1.250	1/4
0062	●	.9688	4.046	5.171	7.546	1.250	1/4
0063	●	.9844	4.046	5.171	7.546	1.250	1/4
0100	●	1.0000	4.046	5.171	7.546	1.250	1/4
0101	●	1.0156	4.046	5.359	7.734	1.250	1/4
0102	●	1.0313	4.203	5.359	7.734	1.250	1/4
0103	●	1.0469	4.359	5.578	7.953	1.250	1/4
0104	●	1.0625	4.359	5.578	7.953	1.250	1/4
0105	●	1.0781	4.359	5.578	7.953	1.250	1/4
0106	●	1.0938	4.515	5.765	8.140	1.250	1/4
0107	●	1.1094	4.515	5.765	8.140	1.250	1/4
0108	●	1.1250	4.671	5.984	8.359	1.250	1/4
0109	●	1.1406	4.671	5.984	8.359	1.250	1/4
0110	●	1.1563	4.671	5.984	8.359	1.250	1/4
0111	●	1.1719	4.828	6.172	8.546	1.250	1/4
0112	●	1.1875	4.828	6.172	8.546	1.250	1/4
0113	□	1.2031	5.000	6.781	9.140	1.500	1/4
0114	□	1.2188	5.000	6.781	9.140	1.500	1/4
0115	□	1.2344	5.000	6.781	9.140	1.500	1/4
0116	□	1.2500	5.172	6.609	9.359	1.500	1/4

● : Inventory maintained. ★ : Inventory maintained in Japan.
□ : Non stock, produced to order only.

METRIC STANDARD

Order Number	Stock UP20M	Dimensions (mm) D1	L3	L2	L1	D4
BRA0800S16	★	8.0	23	35	83	16
0850S16	★	8.5	23	35	83	16
0900S16	★	9.0	28	40	88	16
0950S16	★	9.5	28	40	88	16
1000S16	★	10.0	35	45	93	16
1050S16	★	10.5	35	45	93	16
1100S16	★	11.0	40	51	99	16
1150S16	★	11.5	40	51	99	16
1200S16	★	12.0	44	56	104	16
1250S16	★	12.5	44	56	104	16
1300S16	★	13.0	48	61	109	16
1350S16	★	13.5	48	61	109	16
1400S16	★	14.0	52	66	114	16
1450S16	★	14.5	52	66	114	16
1500S20	★	15.0	61	76	126	20
1550S20	★	15.5	61	76	126	20
1600S20	★	16.0	65	81	131	20
1650S20	★	16.5	65	81	131	20
1700S20	★	17.0	69	86	136	20
1750S20	★	17.5	69	86	136	20
1800S20	★	18.0	73	91	141	20
1850S20	★	18.5	73	91	141	20
1900S25	★	19.0	77	101	157	25

Order Number	Stock UP20M	Dimensions (mm) D1	L3	L2	L1	D4
1950S25	★	19.5	77	101	157	25
2000S25	★	20.0	81	101	157	25
2050S25	★	20.5	81	101	157	25
2100S25	★	21.0	80	101	157	25
2150S25	★	21.5	80	101	157	25
2200S25	★	22.0	84	106	162	25
2250S25	★	22.5	84	106	162	25
2300S25	★	23.0	83	106	162	25
2350S25	★	23.5	83	106	162	25
2400S32	★	24.0	87	111	171	32
2450S32	★	24.5	87	111	171	32
2500S32	★	25.0	86	111	171	32
2550S32	★	25.5	86	111	171	32
2600S32	★	26.0	90	116	176	32
2650S32	★	26.5	90	116	176	32
2700S32	★	27.0	89	116	176	32
2750S32	★	27.5	89	116	176	32
2800S32	★	28.0	93	121	181	32
2850S32	★	28.5	93	121	181	32
2900S32	★	29.0	97	126	186	32
2950S32	★	29.5	97	126	186	32
3000S32	★	30.0	96	126	186	32

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Drill Dia. **ϕ.3125" – ϕ.5156" ϕ8.0 – ϕ13.0mm** Cutting Speed (SFM)	Feed (inch/rev)	Drill Dia. **ϕ.5313" – ϕ.7031" ϕ13.5 – ϕ18.0mm** Cutting Speed (SFM)	Feed (inch/rev)	Drill Dia. **≥ϕ.7031" ≥ϕ18.5mm** 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

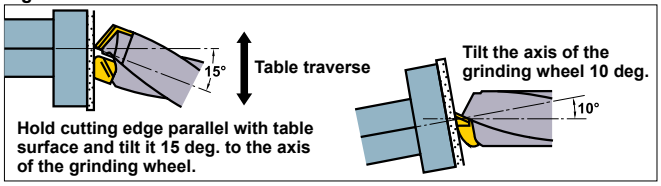
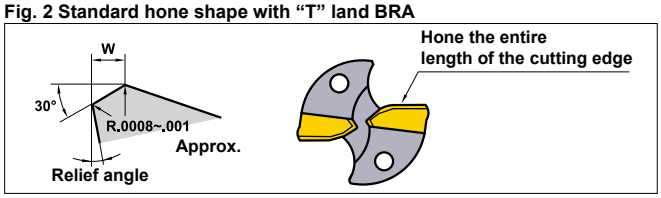


Fig. 2 Standard hone shape with "T" land BRA



Work Material	W (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

DRILLING(BRAZED TYPE)

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)

Carbon Steel Alloy Steel	Hardened Steel	Stainless Steel	Cast Iron	Light Alloy	Heat Resistant Alloy
◎		◎	○		

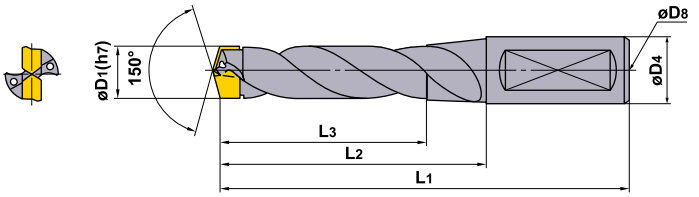
.5000"≤D1≤.7031"	.7188"≤D1≤1.1719"	D1=1.1875"
14<D1≤18mm	18<D1≤30mm	
0 −.00071	0 −.00083	0 −.00098

(inch)

L/D=3

Internal Coolant





Helix Angle : 30°

INCH STANDARD

Order Number	Stock UP20M	Dimensions (inch) D1	L3	L2	L1	D4	D8
BRS0032	●	.5000	2.140	2.734	4.609	.625	1/8
0033	●	.5156	2.140	2.734	4.609	.625	1/8
0034	●	.5313	2.140	2.734	4.609	.625	1/8
0035	●	.5469	2.297	2.937	4.812	.625	1/8
0036	●	.5625	2.297	2.937	4.812	.625	1/8
0037	●	.5781	2.453	3.140	5.015	.625	1/8
0038	●	.5938	2.453	3.140	5.140	.750	1/8
0039	●	.6094	2.453	3.140	5.140	.750	1/8
0040	●	.6250	2.609	3.328	5.328	.750	1/8
0041	●	.6406	2.609	3.328	5.328	.750	1/8
0042	●	.6563	2.765	3.546	5.546	.750	1/8
0043	●	.6719	2.765	3.546	5.546	.750	1/8
0044	●	.6875	2.765	3.546	5.546	.750	1/8
0045	●	.7031	2.921	3.734	5.734	.750	1/8
0046	●	.7188	2.921	3.734	5.984	1.000	1/8
0047	●	.7344	3.109	3.953	6.203	1.000	1/8
0048	●	.7500	3.109	3.953	6.203	1.000	1/8
0049	●	.7656	3.109	3.953	6.203	1.000	1/8
0050	●	.7813	3.265	4.140	6.390	1.000	1/8
0051	●	.7969	3.265	4.140	6.390	1.000	1/8
0052	●	.8125	3.421	4.359	6.609	1.000	1/8
0053	●	.8281	3.421	4.359	6.609	1.000	1/8
0054	●	.8438	3.421	4.359	6.609	1.000	1/8

Order Number	Stock UP20M	Dimensions (inch) D1	L3	L2	L1	D4	D8
BRS0055	●	.8594	3.578	4.546	6.796	1.000	1/8
0056	●	.8750	3.578	4.546	6.796	1.000	1/8
0057	●	.8906	3.734	4.765	7.015	1.000	1/8
0058	●	.9063	3.734	4.765	7.015	1.000	1/8
0059	●	.9219	3.734	4.765	7.015	1.000	1/8
0060	●	.9375	3.890	4.953	7.328	1.250	1/4
0061	●	.9531	3.890	4.953	7.328	1.250	1/4
0062	●	.9688	4.046	5.171	7.546	1.250	1/4
0063	●	.9844	4.046	5.171	7.546	1.250	1/4
0100	●	1.0000	4.046	5.171	7.546	1.250	1/4
0101	●	1.0156	4.203	5.359	7.734	1.250	1/4
0102	●	1.0313	4.203	5.359	7.734	1.250	1/4
0103	●	1.0469	4.359	5.578	7.953	1.250	1/4
0104	●	1.0625	4.359	5.578	7.953	1.250	1/4
0105	●	1.0781	4.359	5.578	7.953	1.250	1/4
0106	●	1.0938	4.515	5.765	8.140	1.250	1/4
0107	●	1.1094	4.515	5.765	8.140	1.250	1/4
0108	●	1.1250	4.671	5.984	8.359	1.250	1/4
0109	●	1.1406	4.671	5.984	8.359	1.250	1/4
0110	●	1.1563	4.671	5.984	8.359	1.250	1/4
0111	●	1.1719	4.828	6.172	8.546	1.250	1/4
0112	●	1.1875	4.828	6.172	8.546	1.250	1/4

● : Inventory maintained. ★ : Inventory maintained in Japan.

METRIC STANDARD

Order Number	Stock UP20M	Dimensions (mm) D1	L3	L2	L1	D4
BRS1400S16	★	14.0	52	66	114	16
1450S16	★	14.5	52	66	114	16
1500S20	★	15.0	61	76	126	20
1550S20	★	15.5	61	76	126	20
1600S20	★	16.0	65	81	131	20
1650S20	★	16.5	65	81	131	20
1700S20	★	17.0	69	86	136	20
1750S20	★	17.5	69	86	136	20
1800S20	★	18.0	73	91	141	20
1850S20	★	18.5	73	91	141	20
1900S25	★	19.0	77	101	157	25
1950S25	★	19.5	77	101	157	25
2000S25	★	20.0	81	101	157	25
2050S25	★	20.5	81	101	157	25
2100S25	★	21.0	80	101	157	25
2150S25	★	21.5	80	101	157	25
2200S25	★	22.0	84	106	162	25

Order Number	Stock UP20M	Dimensions (mm) D1	L3	L2	L1	D4
BRS2250S25	★	22.5	84	106	162	25
2300S25	★	23.0	83	106	162	25
2350S25	★	23.5	83	106	162	25
2400S32	★	24.0	87	111	171	32
2450S32	★	24.5	87	111	171	32
2500S32	★	25.0	86	111	171	32
2550S32	★	25.5	86	111	171	32
2600S32	★	26.0	90	116	176	32
2650S32	★	26.5	90	116	176	32
2700S32	★	27.0	89	116	176	32
2750S32	★	27.5	89	116	176	32
2800S32	★	28.0	93	121	181	32
2850S32	★	28.5	93	121	181	32
2900S32	★	29.0	97	126	186	32
2950S32	★	29.5	97	126	186	32
3000S32	★	30.0	96	126	186	32

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Drill Dia. **ϕ.5000" – ϕ.7813" ϕ14.0 – ϕ20.0mm** Cutting Speed (SFM)	Feed (inch/rev)	Drill Dia. **ϕ.7969" – ϕ1.1875" ϕ20.5 – ϕ30.0mm** 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.

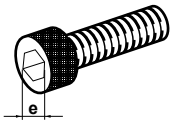
Memo

SPARE PARTS

IDENTIFICATION M002
SPARE PARTS
- CLAMP SCREW M003
- SET BOLT M007
- SHIM M009
- PIN/RING/CLAMP LEVER 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

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	
BH	Button Head
BHA	
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

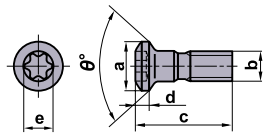
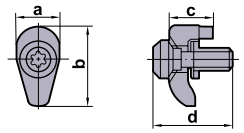
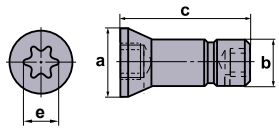
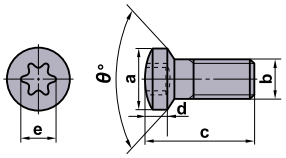
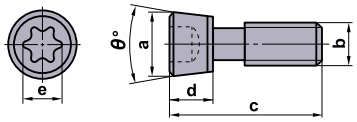
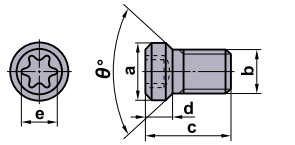
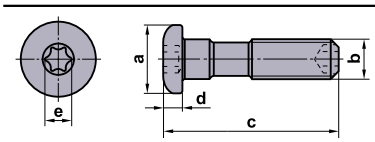
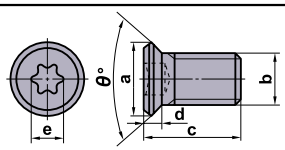
Torx plus® Wrench

Symbol	e	Size
06	.071	6IP
07	.083	7IP
08	.094	8IP
10	.110	10IP
15	.134	15IP

R	Standard L Wrench
L	Long L Wrench
T	T Wrench
F FS	Flag Wrench
W	Flag Wrench
D DS	Driver

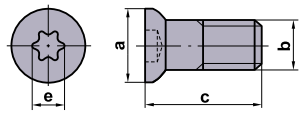
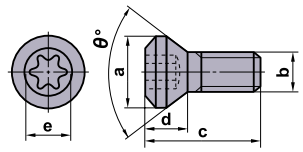
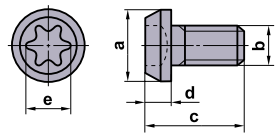
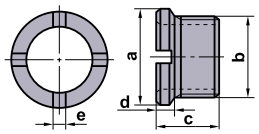
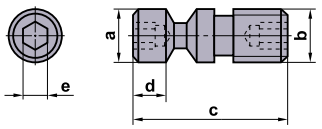
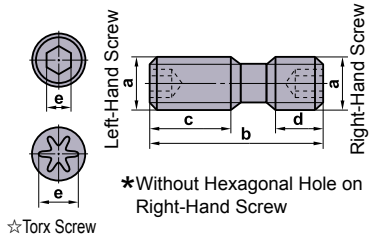
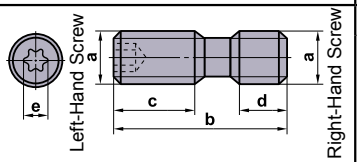
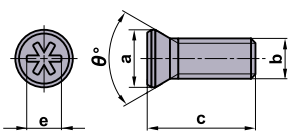
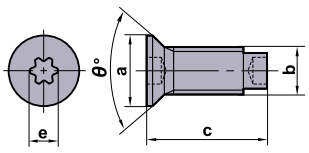
SPARE PARTS

CLAMP SCREW

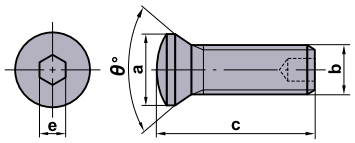
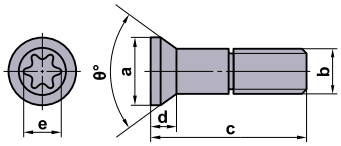
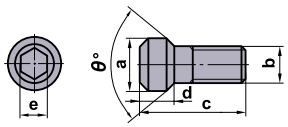
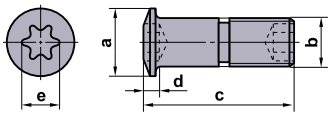
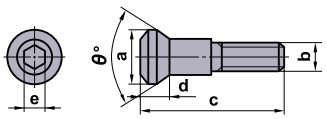
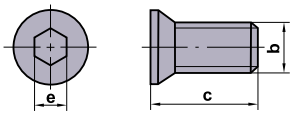
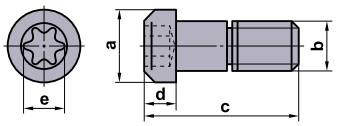
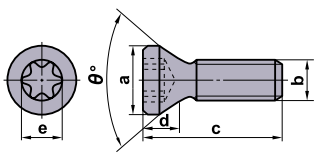
Geometry	Order Number	Dimensions (inch) a	b	c	d	e	θ°	Torque (lbf-in)	Tool Holder
	**AJS3010T10**	.197	M3×0.5	.394	.059	T10	120	22	**DOUBLE CLAMP** Type Holder **AJX** Type Cutter **PMC** Type Cutter
	4012T15	.276	M4×0.7	.472	.087	T15	120	31	
	5014T25	.315	M5×0.8	.551	.106	T25	120	66	
	**BC5**	.354	.717	.335	.669	T20	—	44	**F** Type Boring Bar
	**BLS02**	.165	M3	.270	—	T08	—	18	**MBN** Type **MBD** Type
	03	.235	M4	.335	—	T15	—	27	
	04	.268	M5	.356	—	T20	—	35	
	05	.294	M5	.504	—	T20	—	44	
	06	.317	M5	.610	—	T20	—	53	
	08	.375	M6	.803	—	T30	—	58	
	12	.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
	300790TS	.185	M3×0.5	.276	.089	T10	90	18	
	300890T	.161	M3×0.5	.315	.081	T8	90	8.9	
	✱ **350760T**	.217	M3.5×0.6	.276	.157	T15	60	31	
	350790T	.189	M3.5×0.6	.276	.093	T10	90	22	
	✱ **350860T**	.217	M3.5×0.6	.331	.157	T15	60	31	
	350990T	.189	M3.5×0.6	.354	.093	T10	90	22	
	400990T	.236	M4×0.7	.354	.110	T15	90	31	
	401160T	.224	M4×0.7	.433	.177	T15	60	31	
	451190T	.248	M4.5×0.75	.433	.114	T20	90	44	
	501290T	.276	M5×0.8	.433	.138	T25	90	66	
	✱ **5015060T**	.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
	0621T	.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

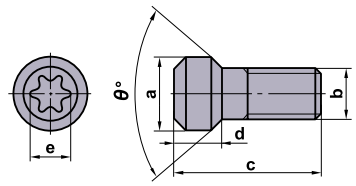
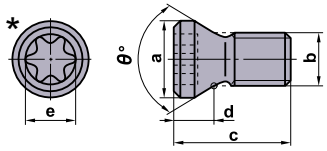
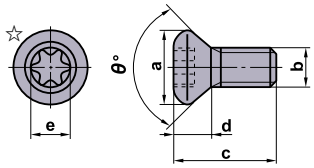
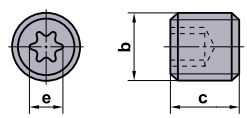
Geometry	Order Number	Dimensions (inch) a	b	c	d	e	θ°	Torque (lbf-in)	Tool Holder
	**GTS1**	.220	6-40UNF	.500	—	T10	—	14	**MTVO** Type Tool Holder **STHN** Type Boring Bar
	2	.310	10-32UNF	.750	—	T20	—	45	
	3	.350	10-32UNF	.750	—	T20	—	45	
	**GY05016S**	.343	M5×0.8	.630	.138	T20	90	40	**GY** Holder
	**GY06013M**	.472	M6×1.0	.709	.197	T30	—	53	**GY** Holder
	**JSS6**	.272	M6×0.75	.177	.059	.031	—	—	**SP** Type Holder
	7	.315	M7×0.75	.173	.059	.039	—	—	
	**LLCS106**	.236	M6×1	.650	.138	.098	—	19	**HSK-T** Tool Holder
	108	.315	M8×1.25	.827	.256	.118	—	29	
	✱ **LS21**	M10×1.5	1.260	.472	.472	.197	—	80	**UG** Holder **MILLING TOOLS** Series
	✱ **24**	M8×1.25	.945	.335	.335	.157	—	73	
	☆ **10T**	M7×0.75	.551	.236	.197	T25	—	75	
	☆ **15T**	M7×0.75	.709	.276	.276	T25	—	75	
	☆ **19T**	M6×0.75	.433	.157	.157	T15	—	44	
	☆ **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**
	401	.228	M4×0.7	.236	—	.142	60	31	
	**NS402W**	.230	M4×0.7	.394	—	.087	60	6.2	**SMALL TOOLS**
	403W	.230	M4×0.7	.472	—	.087	60	6.2	
	404W	.228	M4×0.7	.394	—	.087	90	6.2	

CLAMP SCREW

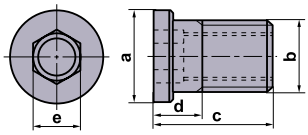
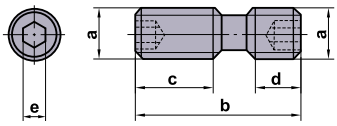
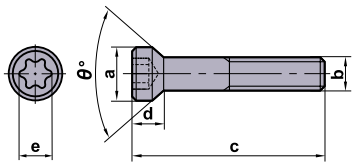
Geometry	Order Number	Dimensions (inch) a	b	c	d	e	θ°	Torque (lbf-in)	Tool Holder
	**NS501W**	.315	M5×0.8	.630	—	.098	120	19	**SMALL TOOLS**
	502W	.315	M5×0.8	.787	—	.098	120	19	
	**RS3008TS**	.169	M3×0.35	.331	.079	T8	61	13	**SRF** Type Cutter
	3008T	.169	M3×0.35	.339	.079	T8	61	13	
	3510T	.197	M3.5×0.35	.394	.091	T10	61	22	
	4015T	.236	M4×0.5	.551	.106	T15	61	29	
	5020T	.319	M5×0.5	.646	.142	T20	61	44	
	6025T	.374	M6×0.75	.846	.165	T25	61	66	
	8030T	.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
	61	.315	M6×1	.787	.071	T20	—	44	**MMTE** Type Holder **MMTI** Type Holder
	**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
	22	.118	M2.2×0.45	.185	.063	7IP	60	5.3	
	22S	.118	M2.2×0.45	.165	.063	7IP	60	5.3	
	25	.130	M2.5×0.45	.217	.067	7IP	60	8.9	
	25-1	.130	M2.5×0.45	.256	.067	7IP	60	8.9	
	3	.154	M3×0.5	.264	.055	10IP	60	8.9	**MVX** Type Cutter
	35	.209	M3.5×0.6	.453	.110	15IP	60	31	
	351	.189	M3.5×0.6	.281	.055	10IP	60	22	**MVX** Type Cutter
	4	.209	M4×0.7	.315	.102	15IP	60	31	
	4S	.209	M4×0.7	.276	.102	15IP	60	31	
	43	.209	M4×0.7	.394	.102	15IP	60	31	

SPARE PARTS

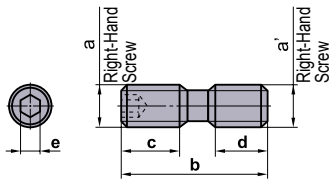
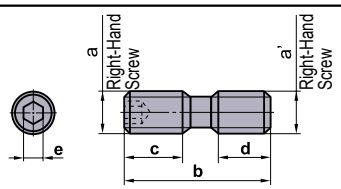
CLAMP SCREW

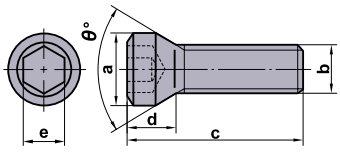
Geometry	Order Number	Dimensions (inch) a	b	c	d	e	θ°	Torque (lbf-in)	Tool Holder
	* **TS16**	.098	M1.6×0.35	.126	.063	T6	60	5.3	**SP** Type Tool Holder
	2	.106	M2×0.4	.181	.055	T6	60	5.3	**DOUBLE CLAMP** Type Holder
	* **2A**	.106	M2×0.4	.177	.047	T6	60	5.3	**AL** Type Tool Holder
	2C	.106	M2×0.4	.150	.055	T6	60	5.3	**SR** Type Tool Holder
	☆ **2D**	.150	M2×0.4	.209	.076	T6	82	5.3	**SMALL TOOLS**
	21	.106	M2×0.4	.134	.055	T6	60	5.3	**DIMPLE BAR**
	* **22**	.118	M2.2×0.45	.197	.047	T6	60	5.3	**S Type** Boring Bar
	* **25**	.130	M2.5×0.45	.217	.067	T8	60	8.9	**MICRO-DEX**
	☆ **25D**	.172	M2.5×0.45	.244	.087	T8	82	8.9	**GY** Holder
	* **25H**	.142	M2.5×0.45	.217	.079	T8	60	8.9	**MMTI** Type Holder
	202	.106	M2×0.4	.217	.071	T6	60	5.3	**F Type** Boring Bar
	253	.130	M2.5×0.45	.177	.067	T8	60	8.9	**HSK-T** Tool Holder
	254	.130	M2.5×0.45	.276	.067	T8	60	8.9	**MILLING TOOLS** Series
	* **255**	.138	M2.5×0.45	.295	.063	T8	60	8.9	**TAF** Drill
	3	.154	M3×0.5	.236	.079	T8	60	8.9	
	3D	.197	M3×0.5	.236	.091	T10	82	22	
	3SB	.173	M3×0.5	.315	.079	T8	80	13	
	31D	.189	M3×0.5	.283	.087	T10	82	22	
	* **32**	.154	M3×0.5	.295	.079	T8	60	8.9	
	* **33**	.154	M3×0.5	.264	.079	T8	60	8.9	
	35	.189	M3.5×0.6	.256	.094	T10	60	22	
	* **35D**	.209	M3.5×0.6	.472	.110	T15	60	31	
	**351**	.189	M3.5×0.6	.283	.094	T10	60	22	
	352	.189	M3.5×0.6	.394	.118	T10	60	22	
	4S	.213	M4×0.7	.276	.093	T15	80	31	
	* **4SL**	.213	M4×0.7	.315	.096	T15	80	35	
	4	.213	M4×0.7	.315	.102	T15	60	31	
	4D	.220	M4×0.7	.303	.098	T15	82	31	
	4SB	.228	M4×0.7	.354	.105	T15	80	31	
	* **4SBL**	.228	M4×0.7	.413	.105	T15	80	31	
	* **4SBLL**	.228	M4×0.7	.571	.105	T15	80	31	
	42	.213	M4×0.7	.236	.102	T15	60	31	
	43	.213	M4×0.7	.394	.102	T15	60	31	
	44	.213	M4×0.7	.472	.102	T15	60	31	
	406	.213	M4×0.7	.610	.102	T15	60	31	
	407	.213	M4×0.7	.354	.102	T15	60	31	
	450	.232	M4.5×0.75	.512	.142	T20	60	44	
	5S	.268	M5×0.8	.354	.115	T25	80	66	
	5	.268	M5×0.8	.354	.126	T25	60	66	
	5L	.268	M5×0.8	.591	.115	T25	80	66	
	52	.268	M5×0.8	.315	.126	T25	60	66	
	53	.268	M5×0.8	.630	.126	T25	60	66	
	54	.268	M5×0.8	.472	.126	T25	60	66	
	55	.268	M5×0.8	.413	.126	T25	60	66	
	* **6S**	.335	M6×1.0	.512	.173	T30	60	89	
	* **6**	.335	M6×1.0	.630	.173	T30	60	89	
	**TSS04005**	—	M4×0.7	.197	—	T8	—	—	**PMF** Type Cutter

CLAMP SCREW

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
	36	10-32UNF	.750	.250	.250	.094	—	30	
	46	1/4-28UNF	.750	.310	.310	.125	—	45	
	47	1/4-28UNF	.875	.280	.280	.125	—	45	
	48	1/4-28UNF	1.000	.370	.370	.125	—	45	
	58	5/16-24UNF	1.000	.500	.280	.156	—	70	
	59	5/16-24UNF	1.120	.470	.410	.156	—	70	
	510	5/16-24UNF	1.125	.500	.500	.156	—	70	
	610	3/8-24UNF	1.250	.500	.500	.188	—	135	
	**WS254012T**	.157	M2.5×0.45	.453	.087	T8	80	18	**TAW** Drill
	254013T	.157	M2.5×0.45	.492	.087	T8	80	18	
	254014T	.157	M2.5×0.45	.531	.087	T8	80	18	
	254015T	.157	M2.5×0.45	.571	.087	T8	80	18	
	254016T	.157	M2.5×0.45	.610	.087	T8	80	18	
	304517T	.177	M3×0.5	.650	.134	T10	60	31	
	304518T	.177	M3×0.5	.689	.134	T10	60	31	
	355520T	.217	M3.5×0.6	.768	.154	T15	60	49	
	355521T	.217	M3.5×0.6	.807	.154	T15	60	49	
	406023T	.236	M4×0.7	.866	.173	T25	60	75	
	406024T	.236	M4×0.7	.906	.173	T25	60	75	
	508026T	.315	M5×0.8	.984	.205	T27	60	110	
	508027T	.315	M5×0.8	1.024	.205	T27	60	110	

SET BOLT

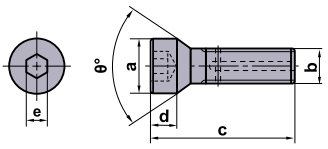
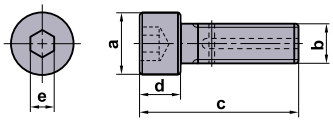
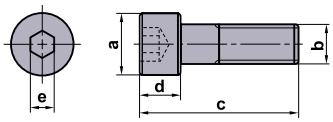
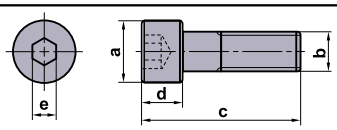
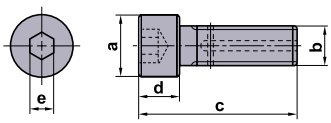
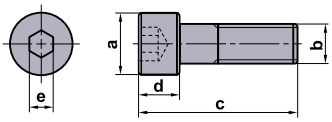
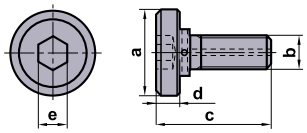
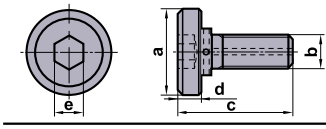
Geometry	Order Number	Dimensions (inch) a	a'	b	c	d	e	Torque (lbf-ft)	Tool Holder
	**HDS10031**	M10x1.0	M10x1.5	1.220	.551	.472	.197	6.6	**PMF** Type Cutter
	**HDSU37513**	5/16-32UNEF	3/8-24UNF	1.260	.472	.433	.156	6.1	**BOE** Type Cutter **BRP** Type Cutter

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

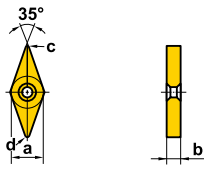
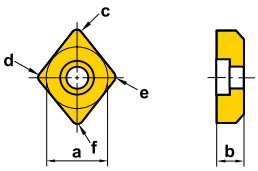
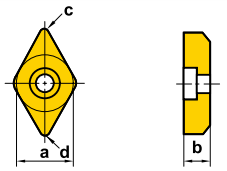
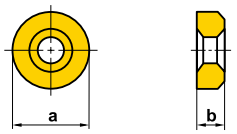
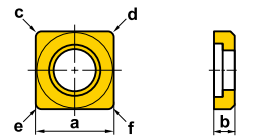
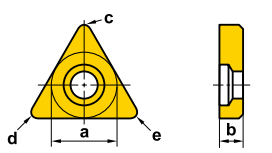
SPARE PARTS

SPARE PARTS

SET BOLT

Geometry	Order Number	Dimensions (inch) a	b	c	d	e	θ°	Torque (lbf-ft)	Tool Holder
	**HFF08043H**	.433	M8×1.25	1.693	.197	.197	90	6.1	**AXD4000** Type Cutter **BXD4000** Type Cutter
	**HSCU25014H**	.370	1/4-28UNF	1.647	.250	.156	—	10	**AJX** Type Cutter
	37513H	.562	3/8-24UNF	1.625	.375	.250	—	29	**APX3000** Type Cutter
	50014H	.750	1/2-20UNF	1.875	.500	.375	—	59	**APX4000** Type Cutter
	62516H	.938	5/8-18UNF	2.250	.625	.500	—	80	**AXD7000** Type Cutter
	75016H	1.125	3/4-16UNF	2.375	.750	.625	—	110	**BAP3500** Type Cutter **BXD4000** Type Cutter
	**HSCUF25013**	.375	1/4-28UNF	1.500	.250	.188	—	10	**APX4000** Type Cutter
	37513	.562	3/8-24UNF	1.625	.375	.313	—	29	**SPX** Type Cutter
	37520	.562	3/8-24UNF	2.375	.375	.313	—	29	
	50014	.750	1/2-20UNF	1.875	.500	.375	—	59	
	50028	.750	1/2-20UNF	3.248	.500	.375	—	59	
	62518	.938	5/8-18UNF	2.375	.625	.500	—	80	
	62528	.938	5/8-18UNF	3.373	.625	.500	—	80	
	75018	1.125	3/4-16UNF	2.500	.750	.625	—	110	
	**HSCUC62523**	.938	5/8-11UNS	2.875	.625	.500	—	80	
	75025	1.125	3/4-10UNS	3.250	.750	.625	—	110	
	**HSC08030H**	.512	M8×1.25	1.496	.315	.197	—	18	**APX3000/4000 • AJX** Type Cutter
	08040	.512	M8×1.25	1.890	.315	.197	—	18	**APX4000** Type Cutter
	08050	.512	M8×1.25	2.283	.315	.197	—	18	**AXD4000** Type Cutter
	10030H	.630	M10×1.5	1.575	.394	.236	—	29	**AXD7000** Type Cutter
	10035	.630	M10×1.5	1.772	.394	.236	—	29	**APX3000/4000 • AJX** Type Cutter
	10045	.630	M10×1.5	2.165	.394	.236	—	29	**BXD** Type Cutter
	10055	.630	M10×1.5	2.559	.394	.236	—	29	**VFX5/6** Type Cutter
	12035	.709	M12×1.75	1.850	.472	.394	—	59	
	12035H	.709	M12×1.75	1.850	.472	.394	—	59	**APX3000/4000 • AJX** Type Cutter
	12045	.709	M12×1.75	2.244	.472	.394	—	59	
	12070	.709	M12×1.75	3.228	.472	.394	—	59	
	16040	.945	M16×2	2.205	.630	.551	—	110	
	16040H	.945	M16×2	2.205	.630	.551	—	110	**APX3000/4000 • AJX** Type Cutter
	16080	.945	M16×2	3.780	.630	.551	—	110	
	20040	1.181	M20×2.5	2.362	.787	.669	—	236	
	20090	1.181	M20×2.5	4.331	.787	.669	—	236	
	**HSC10035**	.630	M10×1.5	1.772	.394	.315	—	29	**APX4000** Type Cutter
	10050	.630	M10×1.5	2.362	.394	.315	—	29	**PMF** Type Cutter
	12035	.709	M12×1.75	1.850	.472	.394	—	59	**PMR** Type Cutter
	12040	.709	M12×1.75	2.047	.472	.394	—	59	**SPX** Type Cutter
	12045	.709	M12×1.75	2.244	.472	.394	—	59	**VFX6** Type Cutter
	12070	.709	M12×1.75	3.228	.472	.394	—	59	
	16040	.945	M16×2.0	2.205	.630	.551	—	110	
	16065	.945	M16×2.0	3.189	.630	.551	—	110	
	16080	.945	M16×2.0	3.780	.630	.551	—	110	
	20040	1.181	M20×2.5	2.362	.787	.669	—	236	
	20090	1.181	M20×2.5	4.331	.787	.669	—	236	
	**MBAU75016H**	2.000	3/4-16UNF	2.188	.563	.625	—	236	**AJX** Type Cutter
	100016H	2.593	1-14UNS	2.188	.563	.625	—	384	**AXD7000** Type Cutter
	**MBA16033H**	1.575	M16×2	1.693	.394	.551	—	110	**AJX** Type Cutter
	20040H	1.969	M20×2.5	2.126	.551	.669	—	236	**APX4000** Type Cutter
	24045H	2.559	M24×3.0	2.323	.551	.669	—	384	**AXD4000** Type Cutter **AXD7000** Type Cutter **BXD4000** Type Cutter

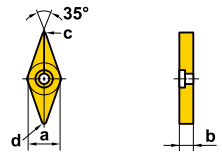
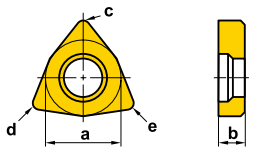
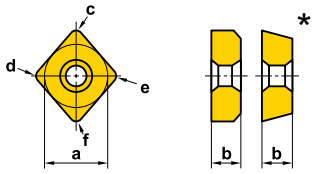
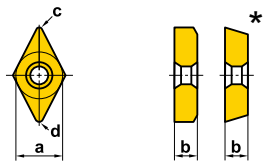
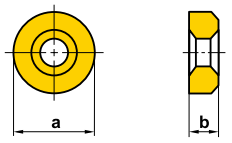
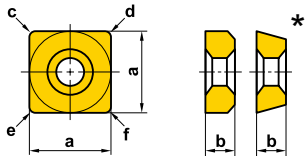
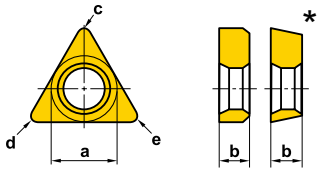
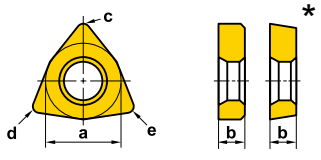
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Geometry	Order Number	Dimensions (inch)						Tool Holder
		a	b	c	d	e	f	
	**DCSVN32**	.375	.125	.031	.047	—	—	**DOUBLE CLAMP** Type Holder **DOUBLE CLAMP DIMPLE BAR**
	**ICSN322**	.375	.125	.031	.031	.031	.031	**M** Type Tool Holder **M** Type Boring Bar
	432	.500	.188	.031	.031	.031	.031	
	433	.500	.188	.047	.047	.047	.047	
	533	.625	.188	.047	.047	.047	.047	
	633	.750	.188	.047	.047	.047	.047	
	**IDSN322**	.375	.125	.031	.031	—	—	**M** Type Tool Holder **M** Type Boring Bar
	433	.500	.188	.047	.047	—	—	
	533	.625	.188	.047	.047	—	—	
	543	.625	.250	.047	.047	—	—	
	**IRSN32**	.375	.125	—	—	—	—	**M** Type Tool Holder
	43	.500	.188	—	—	—	—	
	44	.500	.250	—	—	—	—	
	63	.750	.188	—	—	—	—	
	**ISSN322**	.375	.125	.031	.031	.031	.031	**M** Type Tool Holder **M** Type Boring Bar
	323	.375	.125	.047	.047	.047	.047	
	433	.500	.188	.047	.047	.047	.047	
	434	.500	.188	.063	.063	.063	.063	
	443	.500	.250	.047	.047	.047	.047	
	533	.625	.188	.047	.047	.047	.047	
	633	.750	.188	.047	.047	.047	.047	
	634	.750	.188	.063	.063	.063	.063	
	643	.750	.250	.047	.047	.047	.047	
	644	.750	.250	.063	.063	.063	.063	
	846	1.000	.250	.094	.094	.094	.094	
	**ITSN322**	.375	.125	.031	.031	.031	—	**M** Type Tool Holder **M** Type Boring Bar
	323	.375	.125	.047	.047	.047	—	
	324	.375	.125	.063	.063	.063	—	
	332	.375	.188	.031	.031	.031	—	
	333	.375	.188	.047	.047	.047	—	
	334	.375	.188	.063	.063	.063	—	
	432	.500	.188	.031	.031	.031	—	
	434	.500	.188	.063	.063	.063	—	
	438	.500	.188	.125	.125	.125	—	
	533	.625	.188	.047	.047	.047	—	
	534	.625	.188	.063	.063	.063	—	
	633	.750	.188	.047	.047	.047	—	
	636	.750	.188	.094	.094	.094	—	

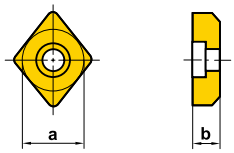
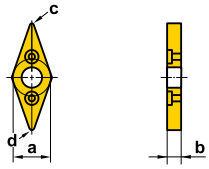
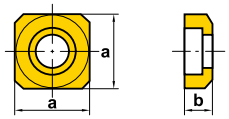
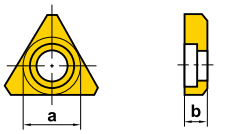
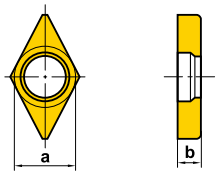
SPARE PARTS

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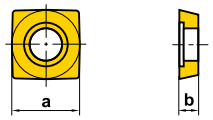
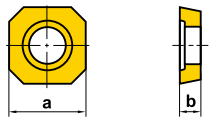
Geometry	Order Number	Dimensions (inch) a	b	c	d	e	f	Tool Holder
	**IVSN322**	.375	.125	.031	.031	—	—	**M** Type Tool Holder **M** Type Boring Bar
	432	.500	.188	.031	.031	—	—	
	433	.500	.188	.047	.047	—	—	
	**IWSN322**	.375	.125	.031	.031	.031	—	**M** Type Tool Holder **M** Type Boring Bar
	432	.500	.188	.031	.031	.031	—	
	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
	33	.375	.188	.016	.016	.031	.031	
	42	.500	.125	.031	.031	.047	.047	
	***** **LLSCP32**	.375	.125	.016	.016	.031	.031	
	***** **42**	.500	.125	.031	.031	.047	.047	
	**LLSDN32**	.375	.125	.031	.047	—	—	**DOUBLE CLAMP** Type Holder **DOUBLE CLAMP DIMPLE BAR** **HSK-T** Tool Holder
	42	.500	.125	.031	.047	—	—	
	43	.500	.188	.031	.047	—	—	
	***** **LLSDP42**	.500	.125	.031	.047	—	—	
	**LLSRN123**	.386	.125	—	—	—	—	**DOUBLE CLAMP** Type Holder **HSK-T** Tool Holder
	**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**
	33	.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**
	33	.375	.188	.016	.031	.047	—	
	42	.500	.125	.016	.031	.047	—	
	***** **LLSWP42**	.500	.125	.016	.031	.047	—	

SHIM

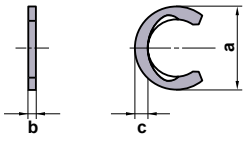
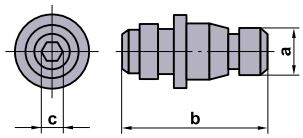
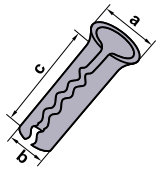
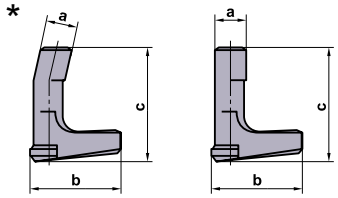
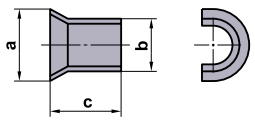
Geometry	Order Number	Dimensions (inch)				Tool Holder
		a	b	c	d	
	**SPSCN42**	.500	.125	—	—	**SP** Type Tool Holder
	**SPSVN32**	.317	.125	.012	.012	**SP** Type Tool Holder **HSK-T** Tool Holder
	**SPSSN42**	.468	.125	—	—	**SP** Type Tool Holder
	**SPSTN32**	.352	.125	—	—	**SP** Type Tool Holder
	**SPSDN32**	.342	.125	—	—	**SP** Type Tool Holder

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Geometry	Order Number	Dimensions (inch)		Tool Holder
		a	b	
	**STASX400N**	.433	.118	**ASX400** Type Cutter
	**STASX445N**	.424	.118	**ASX445** Type Cutter

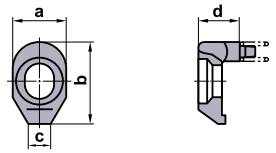
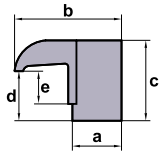
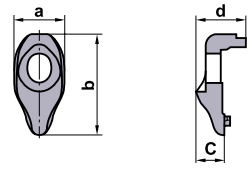
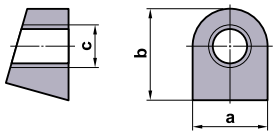
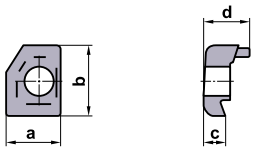
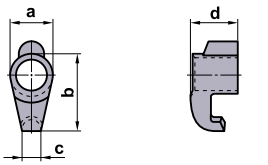
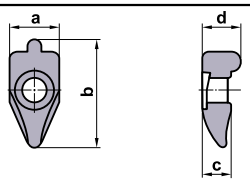
PIN / RING / CLAMP LEVER

Geometry	Order Number	Dimensions (inch) a	b	c	Tool Holder
	**CR4**	.262	.016	.041	**MMTE** Type Holder **HSK-T** Tool Holder
	5	.304	.026	.045	
	**NL23**	8—32	.313	.063	**M** Type Tool Holder **M** Type Boring Bar
	33	10—32	.347	.078	
	33L	10—32	.406	.078	
	34	10—32	.453	.078	
	34L	10—32	.500	.078	
	43	10—32	.422	.078	
	44	.250—28	.516	.094	
	46	.250—28	.688	.094	
	56	.313—24	.703	.125	
	58	.313—24	.844	.125	
	68	.375—24	.875	.141	
	68L	.375—24	.938	.141	
	810	.438—20	.813	.156	
	**BCP141**	.118	.055	.220	**SP** Type Holder **HSK-T** Tool Holder
	**LLCL14**	.185	.528	.520	**HSK-T** Tool Holder
	24	.185	.638	.583	
	* **112**	.138	.512	.531	
	**LLP14**	.285	.258	.228	**DOUBLE CLAMP** Type Holder **DOUBLE CLAMP DIMPLE BAR** **HSK-T** Tool Holder
	23	.219	.191	.268	
	24	.285	.258	.358	

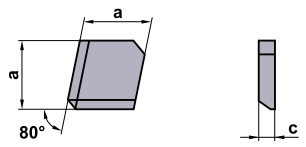
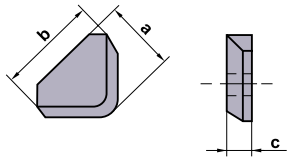
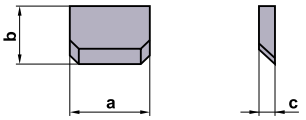
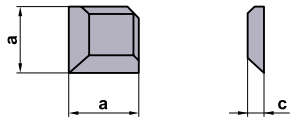
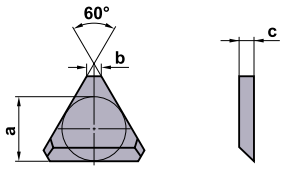
SPARE PARTS

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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
	4	.354	.531	.118	.150	—	
	5	.394	.590	.136	.197	—	
	**CL6**	.310	.580	.440	.062	.094	**M** Type Tool Holder **M** Type Boring Bar **MTVO** Type Tool Holder
	7	.310	.640	.310	.062	—	
	9	.430	.750	.660	.344	.125	
	12	.430	.880	.660	.344	.125	
	19	.310	.550	.310	.187	—	
	20	.375	.730	.380	.125	—	
	24	.491	1.000	.785	.453	.136	
	30	.430	1.000	.660	.344	.125	
	**DCK2211**	.433	.866	.259	.357	—	**DOUBLE CLAMP** Holder **DOUBLE CLAMP DIMPLE BAR** **HSK-T** Tool Holder
	2613	.512	1.043	.289	.407	—	
	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
	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**	.370	.315	.059	.375	.059	**M** Type Tool Holder **M** Type Boring Bar
	4	.496	.362	.098	.500	.138	
	**CBS3D**	.315	—	.059	.375	.059	**M** Type Tool Holder
	4D	.402	—	.098	.500	.098	
	**CBT3**	.283	.055	.098	.375	.138	**M** Type Tool Holder **M** Type Boring Bar

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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TOOL WEAR AND DAMAGE N027
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SURFACE ROUGHNESS N032
HARDNESS COMPARISON TABLE N033
CUTTING TOOL MATERIALS N034
GRADE CHAIN N035
GRADE COMPARISON TABLE N036
INSERT CHIP BREAKER COMPARISION TABLE N041

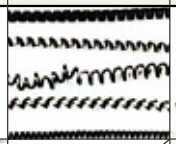
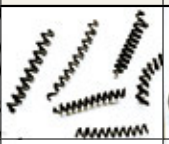
TROUBLE SHOOTING FOR TURNING

Trouble		Factors	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												↗ ●	↗ ●						

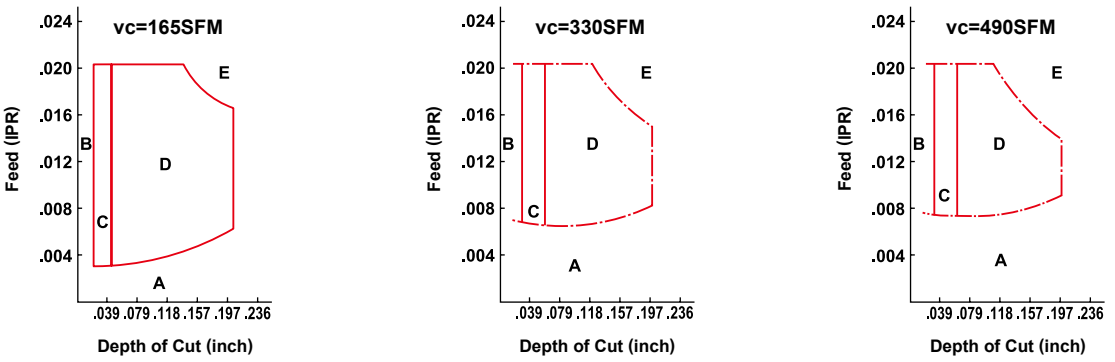
CHIP CONTROL FOR TURNING

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

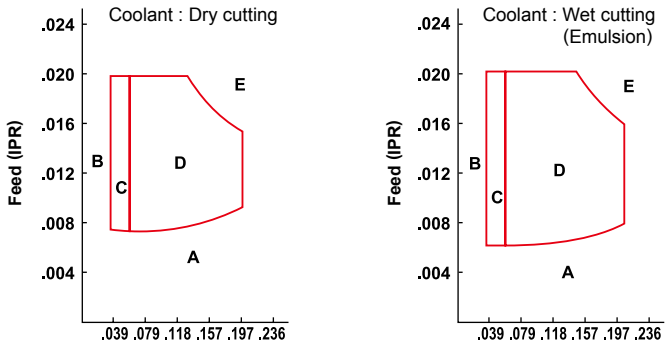
In general, when cutting speed increases, the chip control range tends to become narrower.



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**

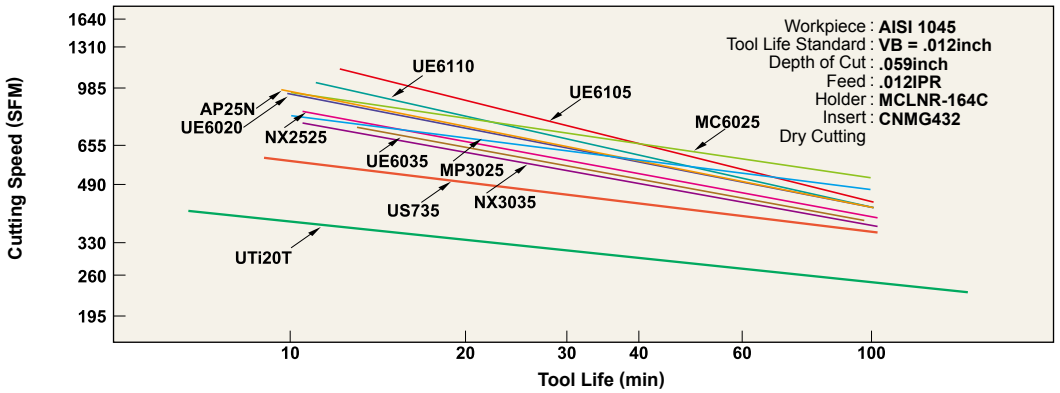
EFFECTS OF CUTTING CONDITIONS FOR TURNING

EFFECTS OF CUTTING CONDITIONS

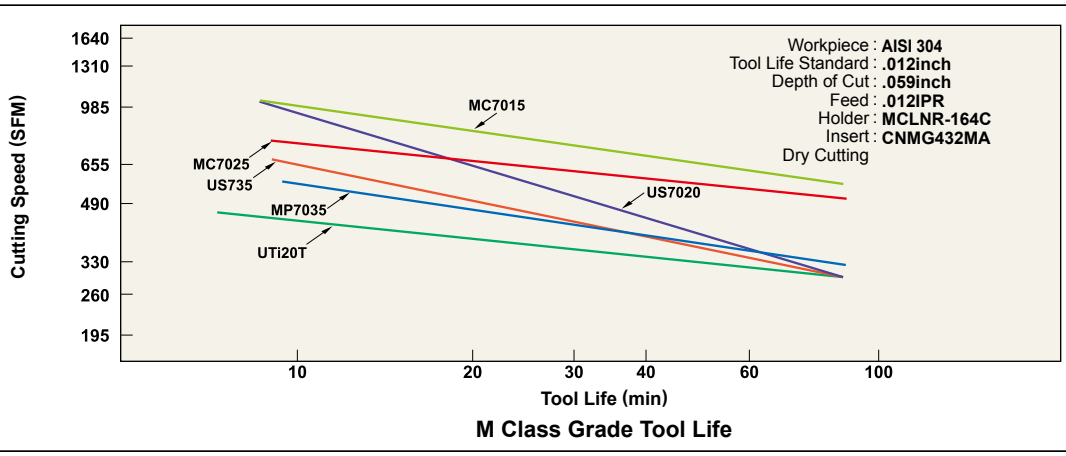
Ideal conditions for cutting are short cutting time, long tool life, and high cutting accuracy. In order to obtain these conditions, selection of efficient cutting conditions and tool, based on work material, hardness, shape and machine capability is necessary.

CUTTING SPEED

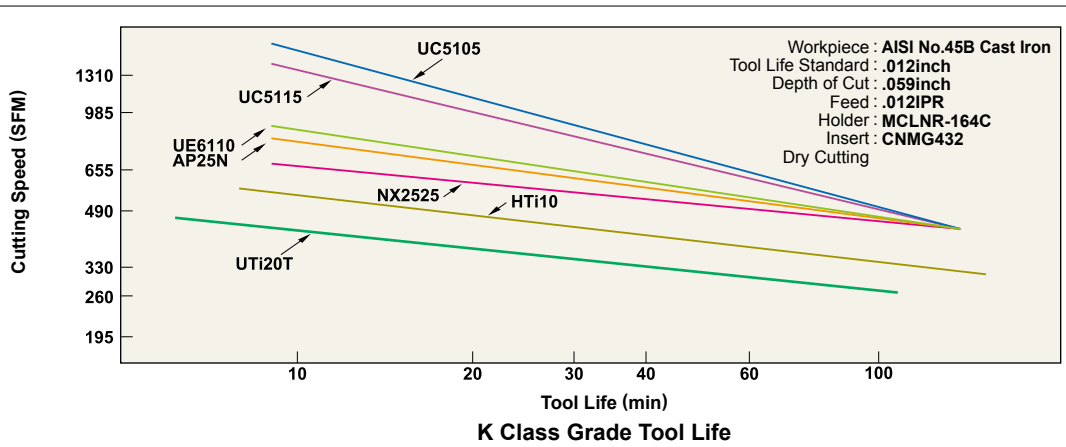
Cutting speed effects tool life greatly. Increasing cutting speed increases cutting temperature and results in shortening tool life. Cutting speed varies depending on the type and hardness of the work material. Selecting a tool grade suitable for the cutting speed is necessary.



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.

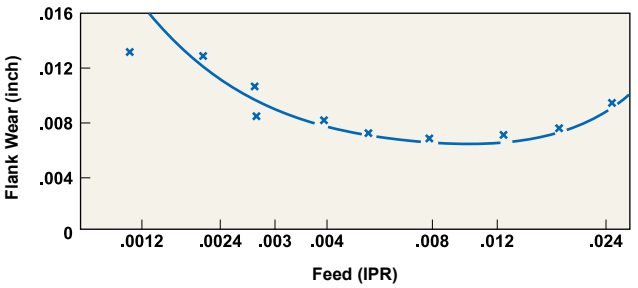
EFFECTS OF CUTTING CONDITIONS FOR TURNING

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 : STi10T
Depth of Cut ap=.040(inch) Cutting Speed vc=660(SFM)
Cutting Time Tc=10min

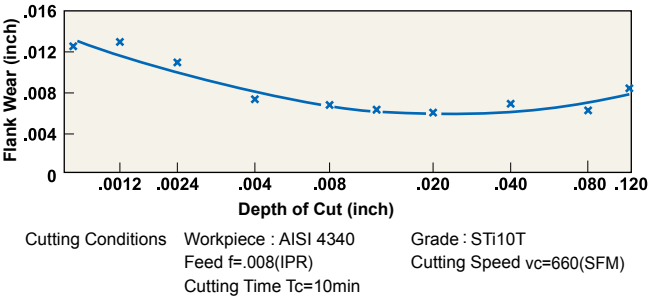
Feed and Flank Wear Relationship in Steel Turning

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.

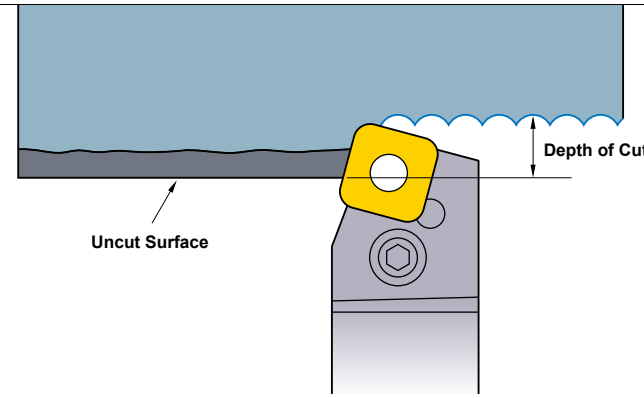
Effects of Depth of Cut

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 : STi10T
Feed f=.008(IPR) Cutting Speed vc=660(SFM)
Cutting Time Tc=10min

Depth of Cut and Flank Wear Relationship in Steel Turning

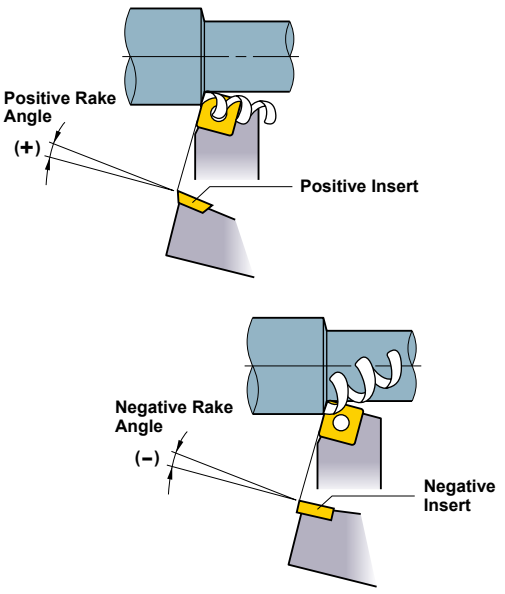


Roughing of Surface Layer that Includes Uncut Surface

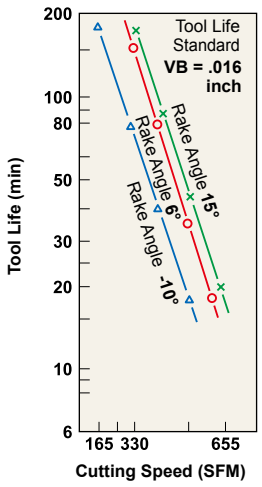
FUNCTION OF TOOL FEATURES FOR TURNING

RAKE ANGLE

Rake angle is a cutting edge angle that has large effects on cutting resistance, chip disposal, cutting temperature and tool life.

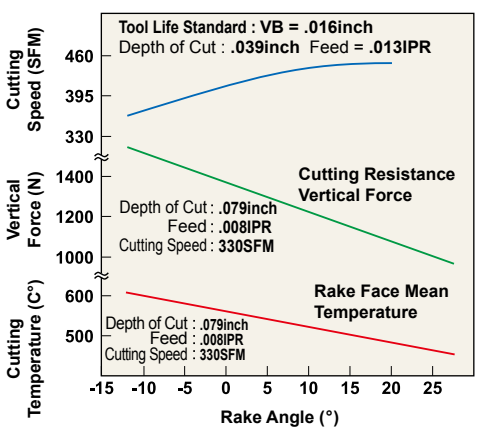


Chip Disposal and Rake Angle



Cutting Conditions
Grade : **STi10**
Depth of Cut : **.039inch**
Feed : **.013IPR**
Workpiece : **Alloy steel**

Rake Angle and Tool Life



Cutting Conditions
Workpiece : **Alloy steel** Grade : **STi10T**
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

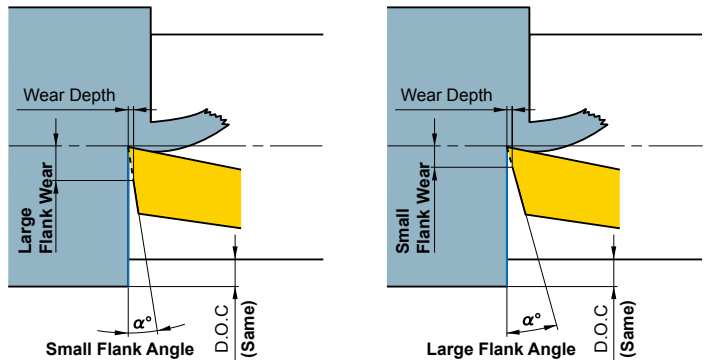
- ○ **Hard workpiece.**
- ○ **When cutting edge strength is required such as in interrupted cutting and uncut surface cutting.**

When to Increase Rake Angle in the Positive (+) Direction

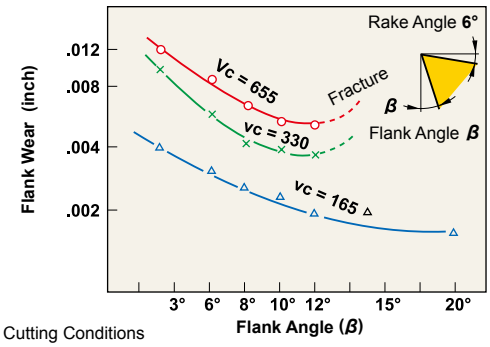
- ○ **Soft workpiece.**
- ○ **Workpiece is easily machined.**
- ○ **When workpiece or the machine have poor rigidity.**

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 : **STi20** 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.**

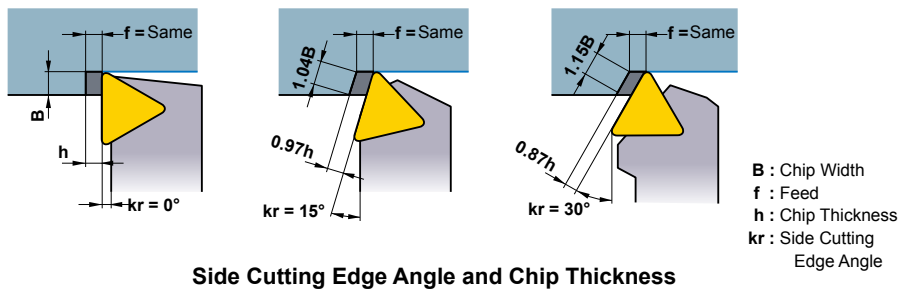
When to Increase Flank Angle

- ○ **Soft workpieces.**
- ○ **Workpieces suffer from work hardening easily.**

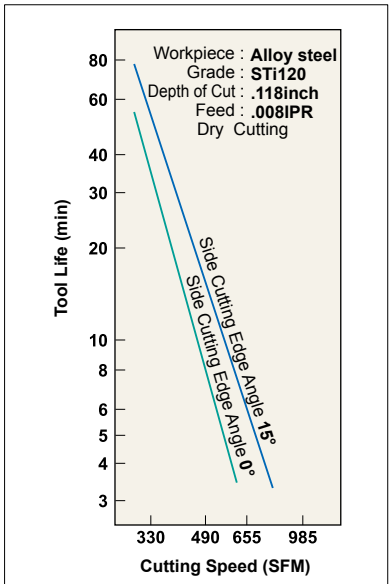
FUNCTION OF TOOL FEATURES FOR TURNING

SIDE CUTTING EDGE ANGLE (LEAD ANGLE)

Side cutting edge angle lower impact load and effect feed force, back force, and chip thickness.



Side Cutting Edge Angle and Chip Thickness

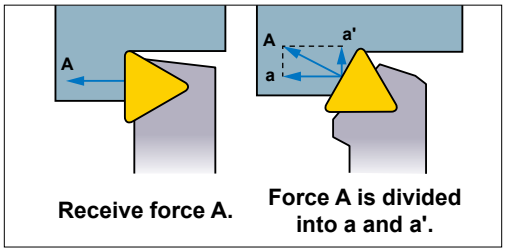


Side Cutting Edge and Tool Life

Effects of Side Cutting Edge Angle (Lead Angle)

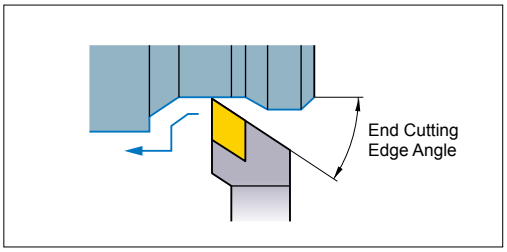
1. At the same feed rate, increasing the side cutting edge angle increases the chip contact length and decreases chip thickness. As a result, the cutting force is dispersed on a longer cutting edge and tool life is prolonged. (Refer to the chart.)
2. Increasing the side cutting edge angle increases force 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.



END CUTTING EDGE ANGLE

End cutting edge angle prevents wear on tool and workpiece surface and is usually 5°– 15°.

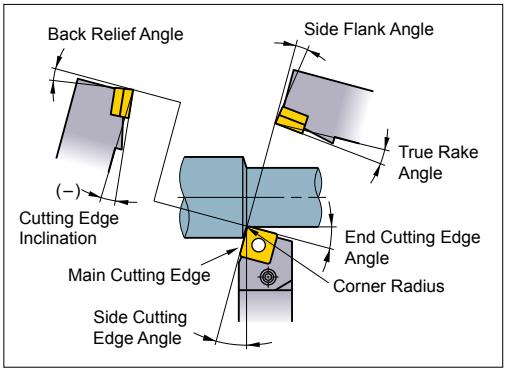


Effects of End Cutting Edge Angle

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.

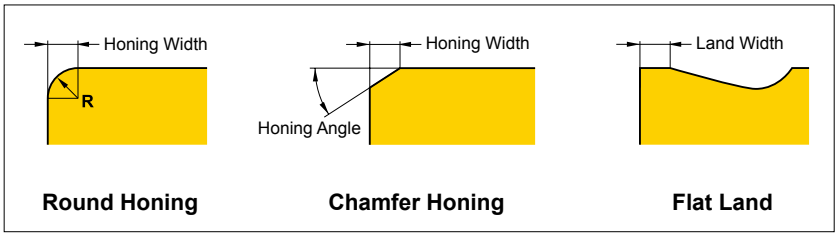


Effects of Cutting Edge Inclination

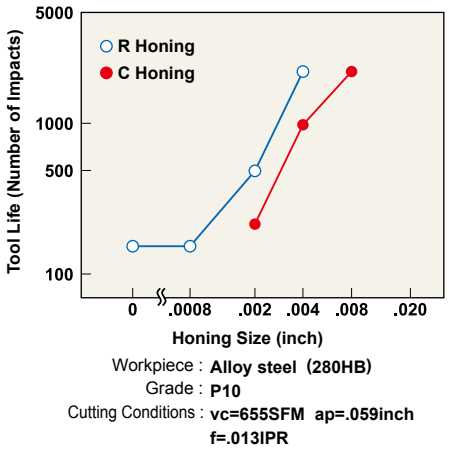
1. Negative (-) cutting edge inclination disposes chips in the workpiece direction, and positive (+) disposes chips in the opposite direction.
2. Negative (-) cutting edge inclination increases cutting edge strength, but it also increases back force of cutting resistance. Thus, chattering easily occurs.

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.

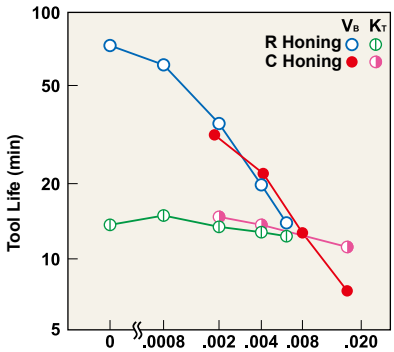


Round Honing **Chamfer Honing** **Flat Land**



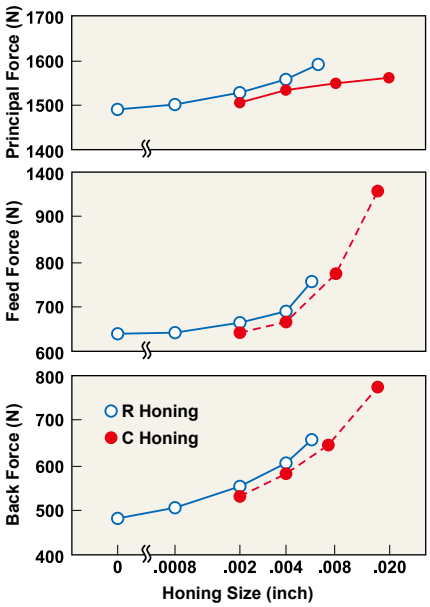
Workpiece : **Alloy steel (280HB)**
Grade : **P10**
Cutting Conditions : **vc=655SFM ap=.059inch f=.013IPR**

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

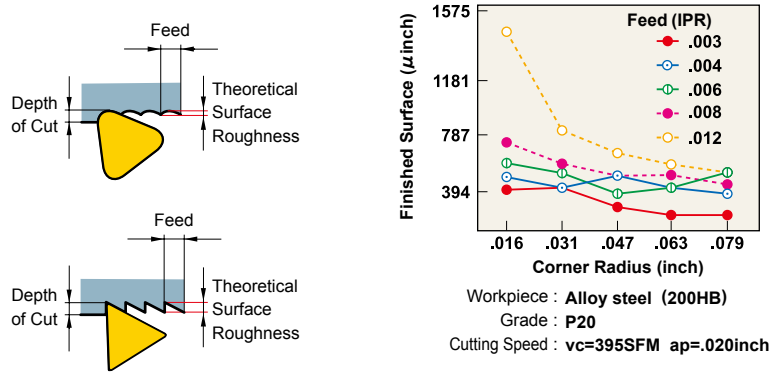
1.Enlarging the honing increases cutting edge strength, and reduces fracturing.
2.Enlarging the honing increases flank wear occurrence. Honing size doesn't affect rake wear.
3.Enlarging the honing increases cutting resistance and chattering.

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

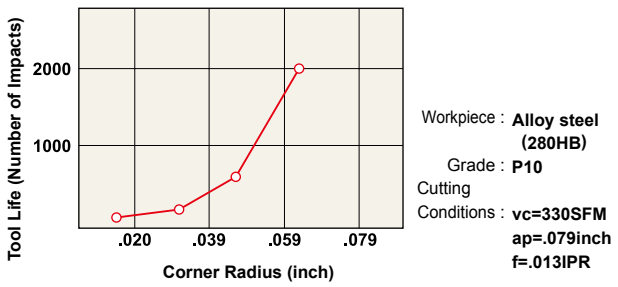
CORNER RADIUS

Corner radius effects the cutting edge strength and finished surface. In general, a corner radius 2 – 3 times the feed is recommended.



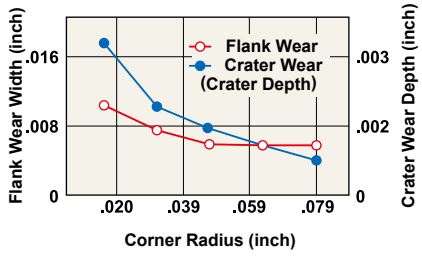
Workpiece : **Alloy steel (200HB)**
Grade : **P20**
Cutting Speed : **vc=395SFM ap=.020inch**

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.

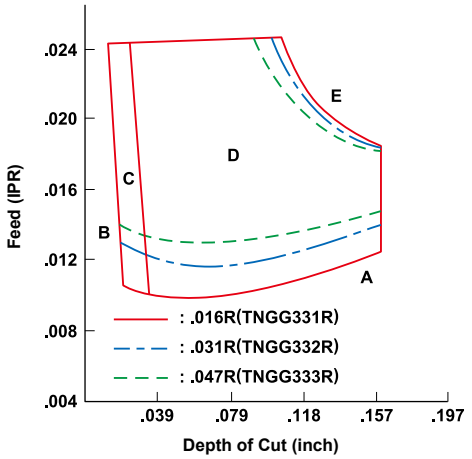
When to Decrease Corner Radius

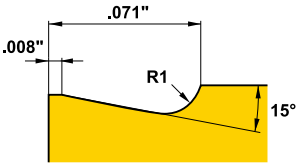
- ○ **Finishing with small depth of cut.**
- ○ **Thin, long workpieces.**
- ○ **When the machine has poor rigidity.**

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 (STi10T)**
(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)

$$vc = \frac{\pi \cdot Dm \cdot n}{12} \text{ (SFM)}$$

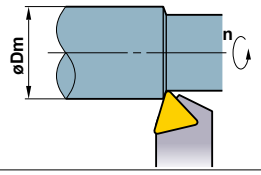
vc (SFM) : Cutting Speed
Dm (inch) : Workpiece Diameter
π (3.14) : Pi
n (min^{-1}) : Main Axis Spindle Speed

(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.

$$vc = \frac{\pi \cdot Dm \cdot n}{12} = \frac{3.14 \times 2 \times 700}{12} = 365SFM$$

Cutting speed is 365SFM.



FEED (f)

$$f = \frac{I}{n} \text{ (IPR)}$$

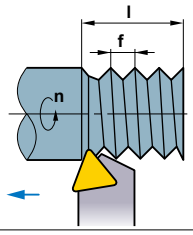
f (IPR) : Feed per Revolution
I (inch/min) : Cutting Length per Min.
n (min^{-1}) : Main Axis Spindle Speed

(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, I=4.72 into the formula.

$$f = \frac{I}{n} = \frac{4.72}{500} = .009IPR$$

The answer is .009IPR.



CUTTING TIME (Tc)

$$Tc = \frac{lm}{I} \text{ (min)}$$

Tc (min) : Cutting Time
lm (inch) : Workpiece Length
I (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.

$$I = f \times n = .008 \times 1000 = 8inch/min$$

Substitute the answer above into the formula.

$$Tc = \frac{lm}{I} = \frac{4}{8} = 0.5min$$

0.5×60=30 (sec.) The answer is 30 sec.

THEORETICAL FINISHED SURFACE ROUGHNESS (h)

$$h = \frac{f^2}{8Re} \times 1000^2 (\mu inch)$$

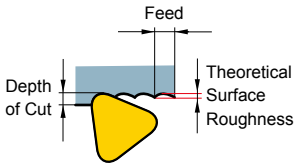
h (μinch) : Finished Surface Roughness
f (IPR) : Feed per Revolution
Re (inch) : Insert Corner Radius

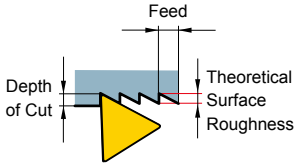
(Problem) What is the theoretical finished surface roughness when the insert corner radius is .031inch and feed is .008IPR ?

(Answer) Substitute f= .008 IPR, R= .031 into the formula.

$$h = \frac{(.008)^2}{8 \times .031} \times 1000^2 = 258 \ \mu inch$$

The theoretical finished surface roughness is 258μinch.



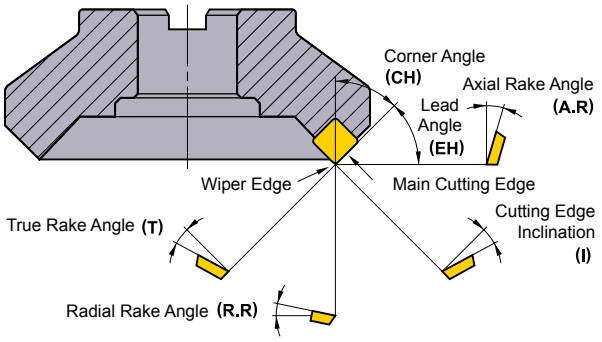


TROUBLE SHOOTING FOR MILLING

Trouble	Factors	Solutions: Insert Grade Selection — Select a Harder Grade	Select a Tougher Grade	Select a Grade with Better Thermal Shock Resistance	Select a Grade with Better Adhesion Resistance	Cutting Conditions — Cutting Speed (Up ↗ / Down ↘)	Feed Rate (Up ↗ / Down ↘)	Depth of Cut (Up ↗ / Down ↘)	Engage Angle (↗ Up)	Cutting Fluids — Do Not Use Water-soluble Cutting Fluid	Cutting Fluids — Determine Dry or Wet Cutting	Style and Design of the Tool — Rake Angle (Up ↗ / Down ↘)	Corner Angle (Up ↗ / Down ↘)	Honing Strengthens the Cutting Edge (Up ↗ / Down ↘)	Cutter Diameter (Up ↗ / Down ↘)	Decrease the Number of Teeth	Wider Chip Pocket	Use of a Wiper Insert	Run-out Accuracy	Improve Cutter Rigidity	Machine and Installation of Tool — Installation of the Tool and Workpiece	Shorten Tool Overhang	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 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

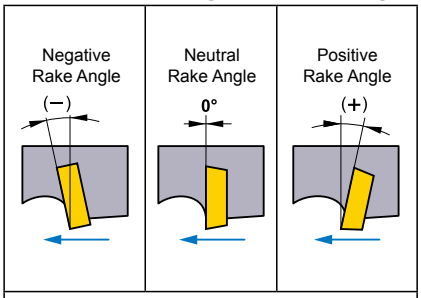


Each Cutting Edge Angle in Face Milling

Type of Angle	Symbol	Function	Effect
Axial Rake Angle	A.R	Determines chip disposal direction.	**Positive** : Excellent machinability.
Radial Rake Angle	R.R	Determines sharpness.	**Negative** : Excellent chip disposal.
Corner Angle	CH	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.

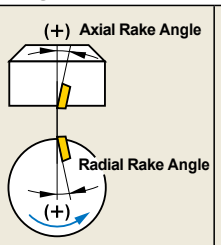
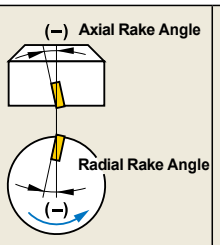
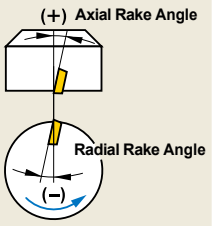
STANDARD INSERTS

Positive and Negative Rake Angle

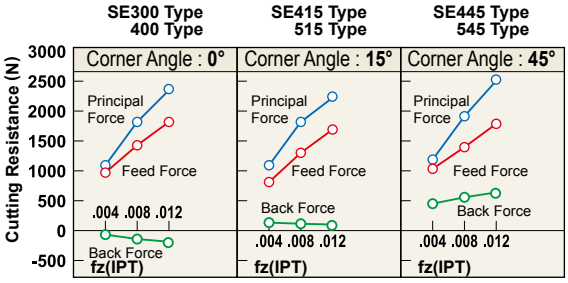


- Insert shape whose cutting edge precedes is a positive rake angle.
- Insert shape whose cutting edge follows is a negative rake angle.

Standard Cutting Edge Shape

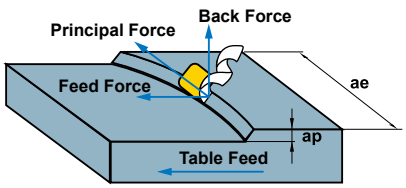
Standard Cutting Edge Combinations		 Double Positive (DP Edge Type)	 Double Negative (DN Edge Type)	 Negative/Positive (NP Edge Type)
Axial Rake Angle (A.R.)		Positive (+)	Negative (−)	Positive (+)
Radial Rake Angel (R.R.)		Positive (+)	Negative (−)	Negative (−)
Insert Used		Positive Insert (One Sided Use)	Negative Insert (Double Sided Use)	Positive Insert (One Sided Use)
Work Material	Steel	●	–	●
	Cast Iron	–	●	●
	Aluminum Alloy	●	–	–
	Difficult-to-Cut Material	●	–	●

CORNER ANGLE (CH) AND CUTTING RESISTANCE



Workpiece : **Alloy Steel (281HB)**
Tool : **ø4" Single Insert**
Cutting Conditions : **vc=410SFM ap=.157inch ae=4.33inch**

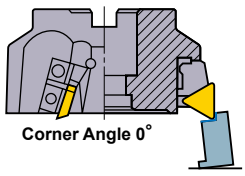
Cutting Resistance Comparison between Different Insert Shapes



Three Cutting Resistance Forces in Milling

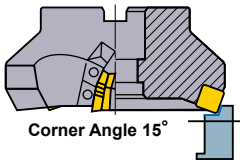
Corner Angle 0°

Back force is in the minus direction. Lifts the workpiece when workpiece clamp rigidity is low.



Corner Angle 15°

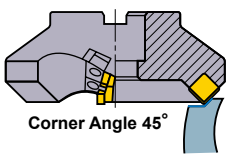
Corner angle 15° is recommended for face milling of workpieces with low rigidity such as thin workpieces.



Corner Angle 45°

The largest back force. Bends thin workpieces and lowers cutting accuracy.

✱ Prevents workpiece edge chipping in cast iron cutting.



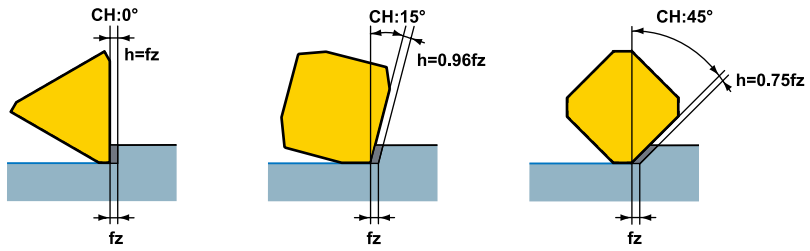
✱ Principal force: Force is in the opposite direction of face milling rotation.
✱ Back force: Force that pushes in the axial direction.
✱ Feed Force: Force is in the feed direction and is caused by table feed.

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 (CH) is, then the thinner the chip thickness (h) becomes (for a 45° CH, it is approx. 75% that of a 0° CH). This can be seen in below. Therefore as the CH 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

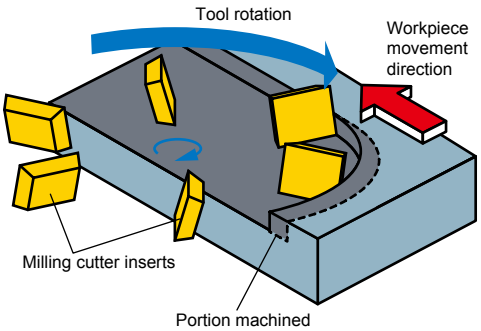
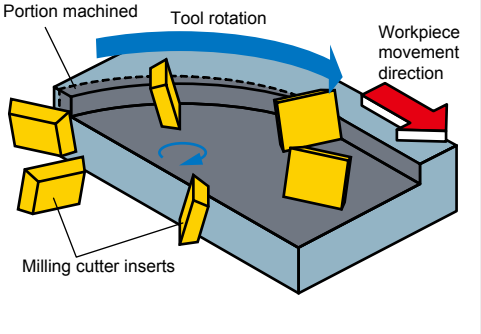
Below shows wear patterns for different corner angles. When comparing crater wear for 0° and 45° corner angles, it can be clearly seen that the crater wear for 0° corner angle is larger. This is because if the chip thickness is relatively large, the cutting resistance increases and so promotes crater 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 : **D1=4.92inch**
Insert : **M20**
Cutting Conditions : **ap=.118inch**
ae=4.33inch
fz=.008IPT
Coolant : Dry Cutting

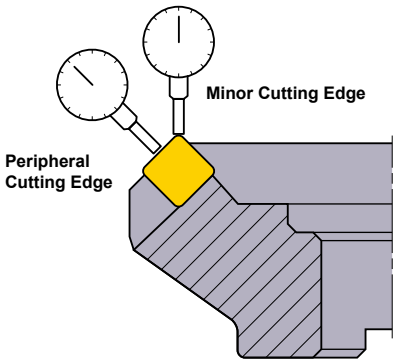
UP CUT AND DOWN CUT MILLING

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**
	

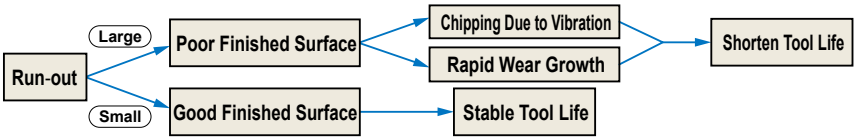
FINISHED SURFACE

Cutting Edge Run-out Accuracy

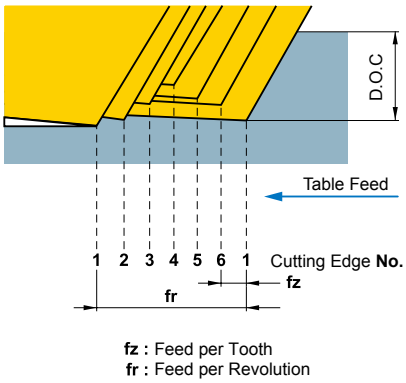


Cutting Edge Run-out and Accuracy in Face Milling

Cutting edge run-out accuracy of indexable inserts on the cutter body greatly affects the surface finish and tool life.



Improve Finished Surface Roughness

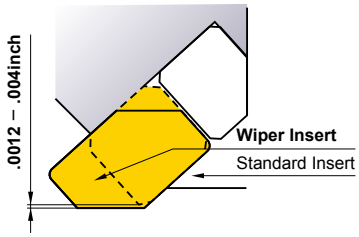


Sub Cutting Edge Run-out and Finished Surface

Mitsubishi Materials' normal minor cutting edge wiper flat width is .055 inch. 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.

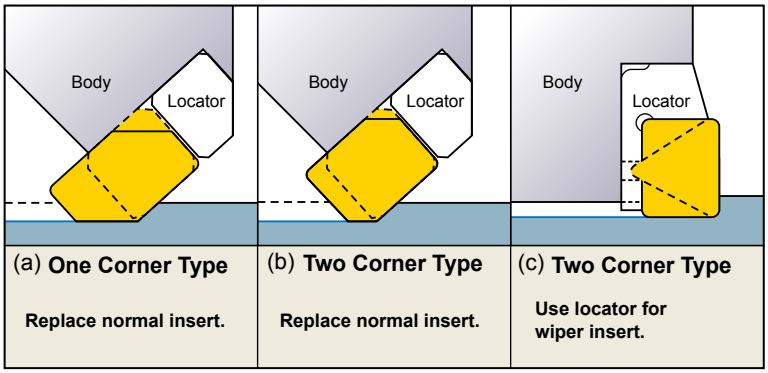
Actual Problems	Countermeasure
· Cutting edge run-out. · Minor cutting edge inclination. · Cutter body accuracy. · Spare parts accuracy. · Welding, vibration, chattering.	Wiper Insert

*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.

How to Set a Wiper Insert



(a) One Corner Type	(b) Two Corner Type	(c) Two Corner Type
Replace normal insert.	Replace normal insert.	Use locator for wiper insert.

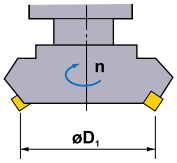
· Minor cutting edge length has to be larger than the feed per revolution.
*But, too long minor cutting edge can also cause chattering.
· When the cutter diameter is large and feed per revolution is longer than the minor cutting edge of the wiper insert, the use of two or three wiper inserts is possible.
· When using more than 1 wiper inserts, eliminate run-out of wiper inserts.
· Use a high hardness grade (high wear resistance) for wiper inserts.

FORMULAS FOR MILLING

CUTTING SPEED (vc)

$$vc = \frac{\pi \cdot D_1 \cdot n}{12} \text{ (SFM)}$$

vc (SFM) : Cutting Speed
D_1 (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, D=5", n=350 into the formula.

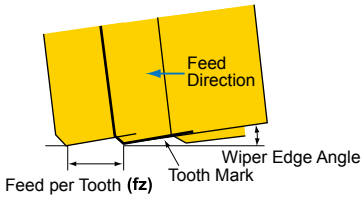
$$vc = \frac{\pi \cdot D \cdot n}{12} = \frac{3.14 \times 5" \times 350}{12} = 457.9 \text{ SFM}$$

The cutting speed 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.

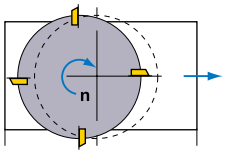
$$fz = \frac{Vf}{z \times n} = \frac{20}{10 \times 500} = .004 \text{ IPT}$$

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.

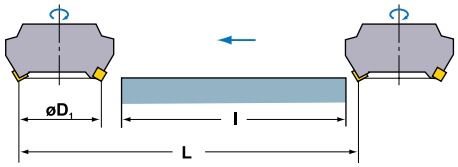
vf = fz x z x n = .004IPT x 10 x 500 = 20inch/min

The table feed 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(D_1))



(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.

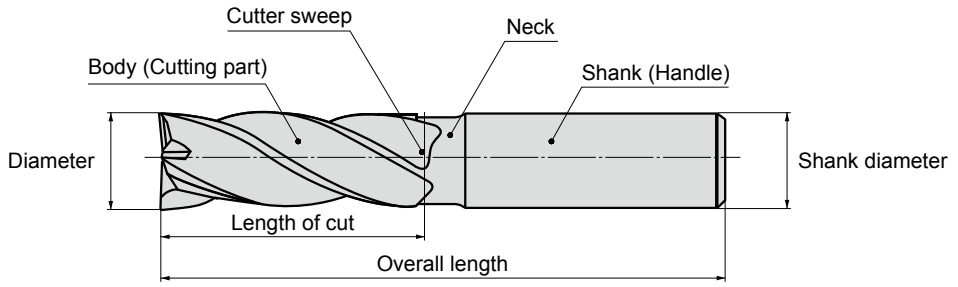
TROUBLE SHOOTING FOR END MILLING

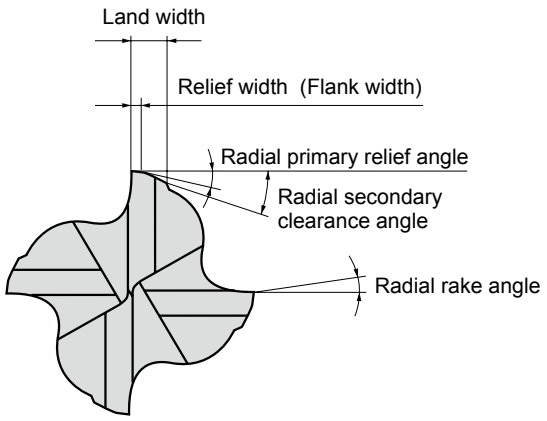
Trouble	Factors	Solutions	Insert Grade Selection	Cutting Conditions									Style and Design of the Tool						Machine and Installation of Tool					
			Coated Tool	Cutting Speed (Up ↗ / Down ↘)	Feed Rate (Up ↗ / Down ↘)	Depth of Cut (Up ↗ / Down ↘)	Decrease Pick Feed Rate	Down Cut	Air Blow	Cutting Fluids: 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												↘●				●						

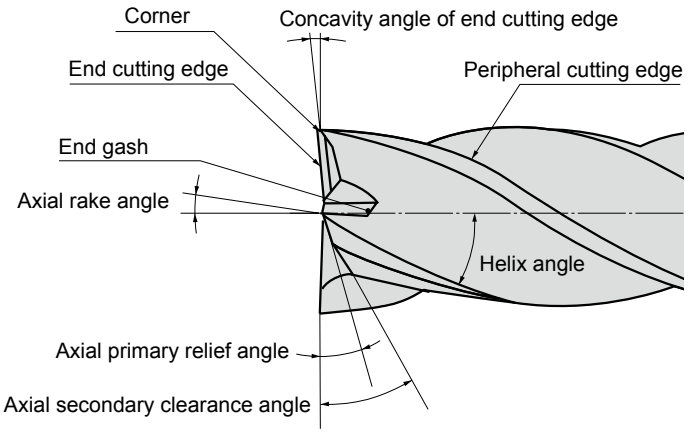
TECHNICAL DATA

END MILL FEATURES AND SPECIFICATION

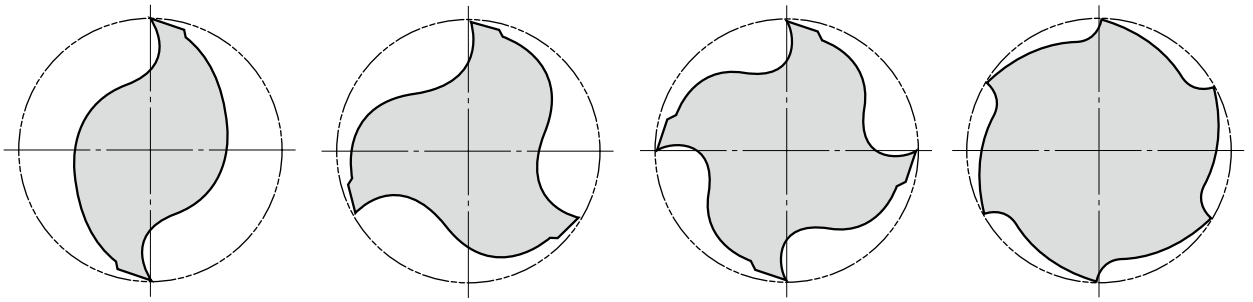
NOMENCLATURE







COMPARISON OF SECTIONAL AREA OF CHIP POCKET



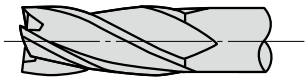
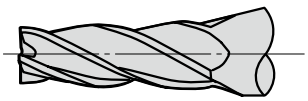
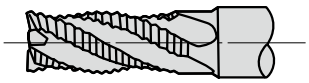
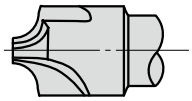
2-flutes 50% | 3-flutes 45% | 4-flutes 40% | 6-flutes 20%

CHARACTERISTICS AND APPLICATIONS OF DIFFERENT-NUMBER-OF-FLUTE END MILLS

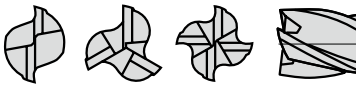
		2-flutes	3-flutes	4-flutes	6-flutes
Feature	Advantage	Effective chip disposal. Horizontal feed milling possible.	Effective chip disposal. Horizontal feed milling possible.	High rigidity.	High rigidity. Superior cutting edge durability.
	Fault	Low rigidity.	Diameter is not measured easily.	Chip disposal 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

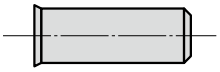
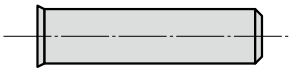
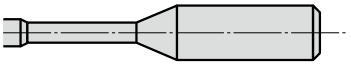
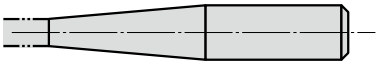
PERIPHERAL CUTTING EDGE

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

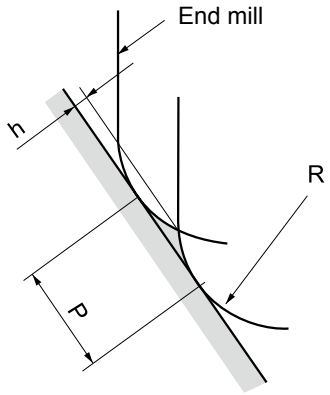
Type	Shape	Feature
Square End (With Center Hole)		Generally used for side milling, slotting and shoulder milling. Plunge cutting is not possible due to the center hole that is used to ensure accurate grinding and regrinding of the tool.
Square End (Center Cut)		Generally used for side milling, slotting 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 mould 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, Corner Radius

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

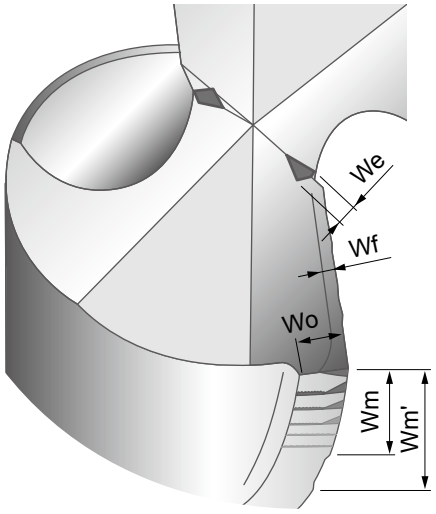
Trouble		Factors \ Solutions	Cutting Conditions: Cutting Speed (Up ↗ / Down ↘)	Cutting Conditions: Feed Rate (Up ↗ / Down ↘)	Cutting Conditions: Lower the Feed at Initial Entry	Cutting Conditions: Lower the Feed when Exiting	Cutting Conditions: Step Feed	Cutting Conditions: Increase the Accuracy and the Depth of the Pre-hole	Cutting Conditions: Cutting Fluids: Increase Oil Ratio	Cutting Conditions: Cutting Fluids: Increase Volume	Cutting Conditions: Cutting Fluids: Increase Coolant Pressure	Style and Design of the Tool: Chisel Width (Large ↗ / Small ↘)	Style and Design of the Tool: Honing Width (Large ↗ / Small ↘)	Style and Design of the Tool: Core Thickness (Large ↗ / Small ↘)	Style and Design of the Tool: Shorten the Flute Length	Style and Design of the Tool: Decrease the Lip Height	Style and Design of the Tool: Use a Drill with Coolant Holes	Style and Design of the Tool: Change to a Drill with X Type Thinning	Machine and Installation of Tool: Tool Installation Accuracy	Machine and Installation of Tool: Shorten Tool Overhang	Machine and Installation of Tool: Flatten the Workpiece Face	Machine and Installation of Tool: Workpiece Installation Accuracy	Machine and Installation of Tool: 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 tem. 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 tem. 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)

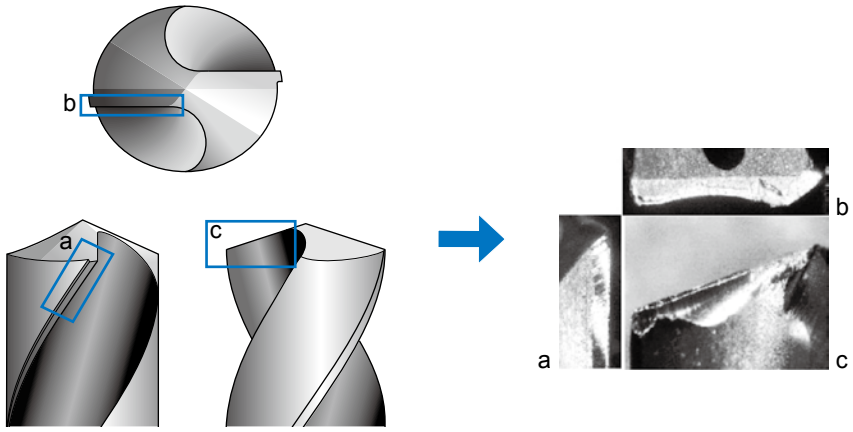
Wo : Outer corner wear width

Wm : Margin wear width

Wm' : Margin wear width (Leading edge)

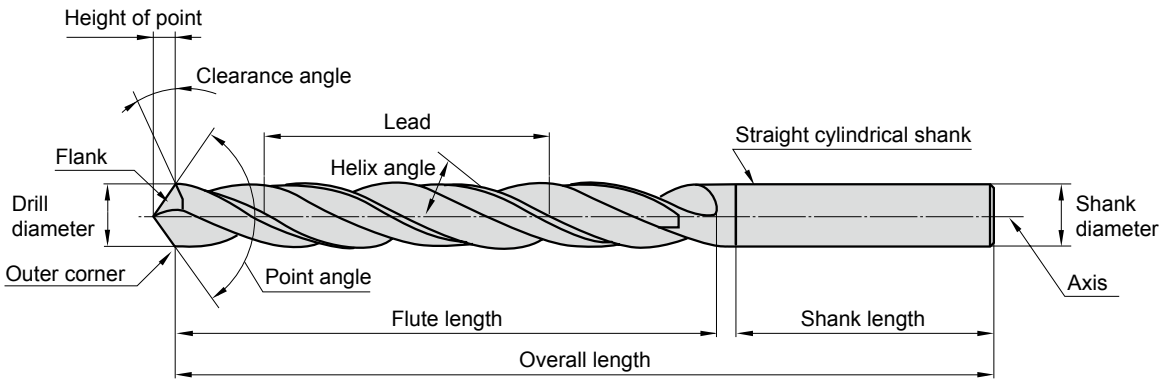
CUTTING EDGE DAMAGE

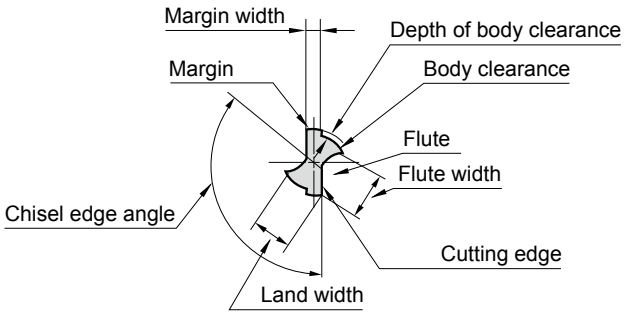
When drilling, the cutting edge of the drill can suffer from chipping, fracture and abnormal damage. In such cases it is important to take a closer look at the damage, investigate the cause and take countermeasures.



DRILL TERMINOLOGY AND CUTTING CHARACTERISTICS

NAMES OF EACH PART OF A DRILL





SHAPE SPECIFICATION AND CUTTING CHARACTERISTICS

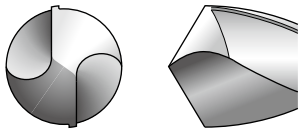
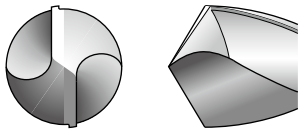
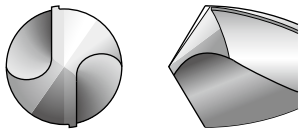
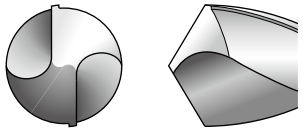
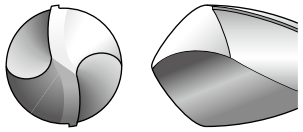
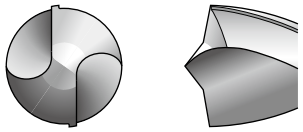
Helix Angle	Is the inclination of the flute with respect to the axial direction of a drill, which corresponds to the rake angle. The rake angle of a drill differs according to the position along the cutting edge. The rake angle is largest at the periphery and smallest towards the center of the cutting 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 with in 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

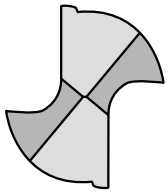
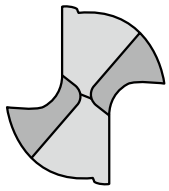
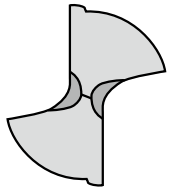
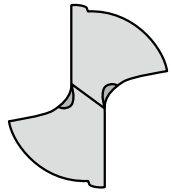
As shown in table below, it is possible to select the most suitable cutting edge geometry for different applications. If the most suitable cutting edge geometry is selected then higher machining efficiency and higher hole accuracy can be obtained.

Typical Cutting Edge Geometries

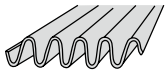
Grinding Name	Geometry	Features and Effect	Use
Conical		• The flank is conical and the clearance angle increases toward the center of the drill.	• For general use.
Flat		• The flank is flat and facilitates cutting.	• Mainly for small diameter drills.
Three Rake Angles		• As there is no chisel edge, the 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
Geometría				
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.

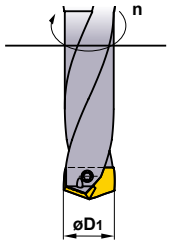
FORMULAS FOR DRILLING

CUTTING SPEED (vc)

$$vc = \frac{\pi \cdot D_1 \cdot n}{12} \text{ (SFM)}$$

vc (SFM) : Cutting Speed **D1(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, D1=.500inch, n=1350 into the formula

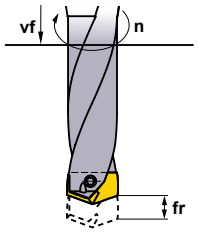
$$vc = \frac{\pi \cdot D_1 \cdot n}{12} = \frac{3.14 \times .500 \times 1350}{12} = 176.6\text{SFM}$$

The cutting speed 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

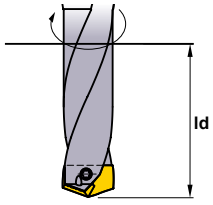
vf = fr×n = .008×1350 = 10.8inch/min

The spindle feed 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 $n = \frac{165 \times 12}{.59 \times 3.14} = 1068.8\text{min}^{-1}$

$$Tc = \frac{1.2 \times 1}{1068.8 \times .006} = .187$$

$$= .187 \times 60 \fallingdotseq 11.2 \text{ sec}$$

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 shape 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
H13 ASTM H13	SKD61	1.2344	X40CrMoV51 X40CrMoV51	BH13	–	Z40CDV5	X35CrMoV05KU X40CrMoV51KU	X40CrMoV5	2242	40CrMoV5
A2	SKD12	1.2363	X100CrMoV51	BA2	–	Z100CDV5	X100CrMoV51KU	X100CrMoV5	2260	100CrMoV5
–	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

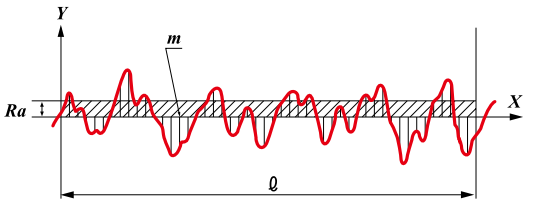
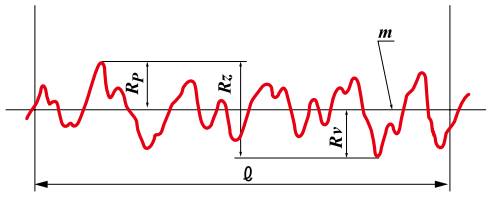
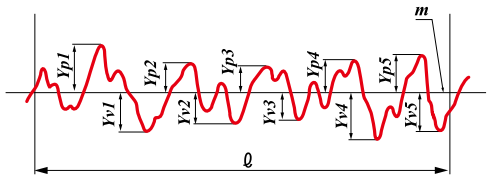
MALLEABLE CAST IRON

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

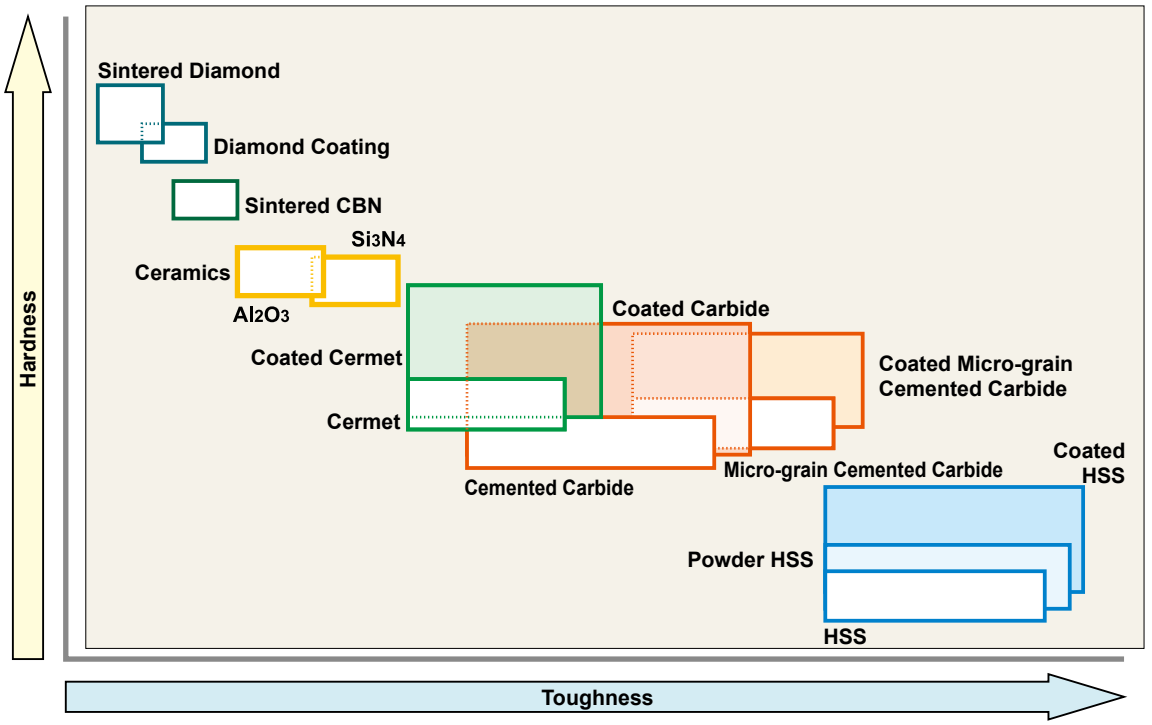
(Note 1) The above list is the same as that of AMS Metals Hand book with tensile strength in approximate metric value and Brinell hardness over a recommended range.

(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 high balance of hardness and toughness.

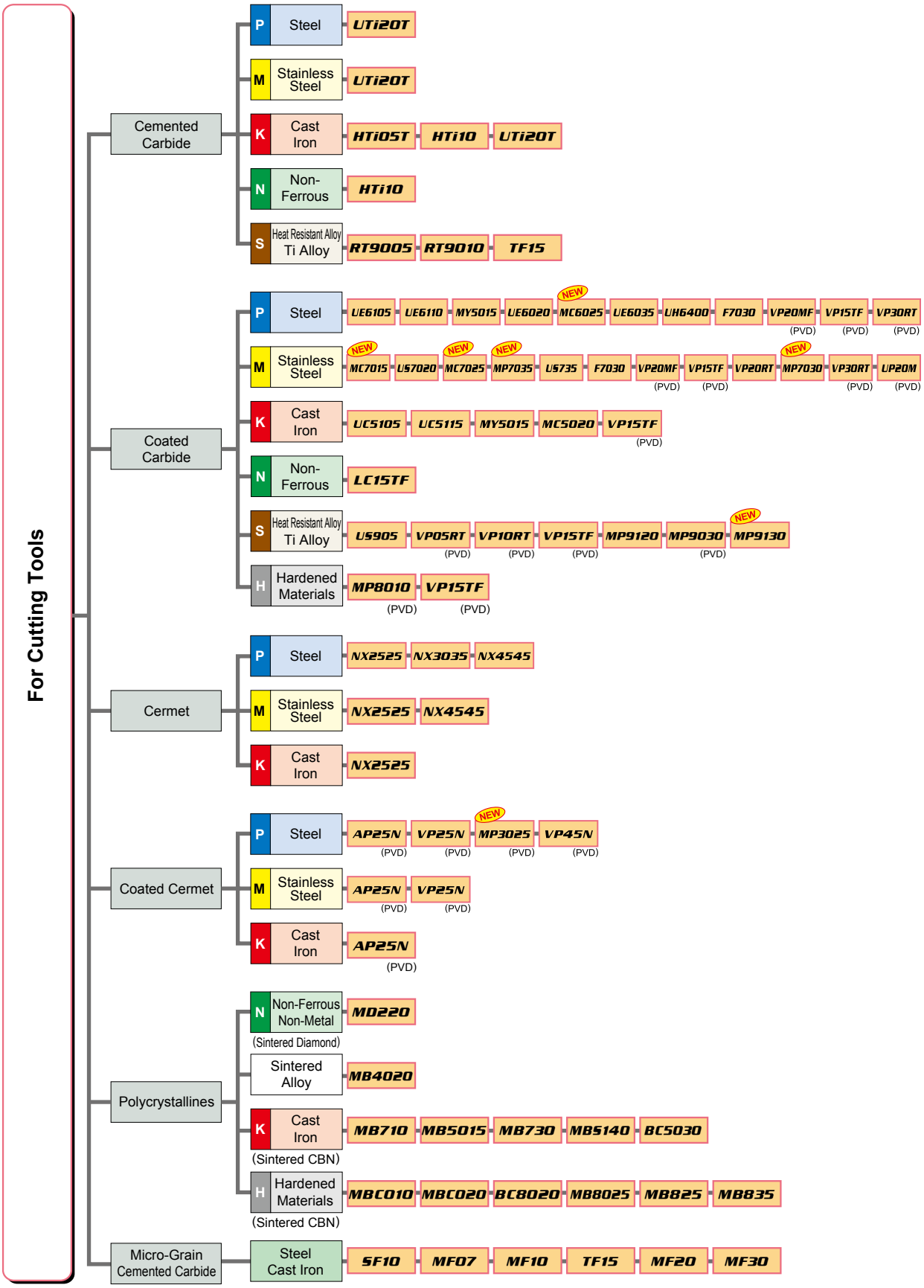


GRADE CHARACTERISTICS

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
TF15
Coated Carbide
P Steel
UE6105
UE6110
MY5015
UE6020
NEW
MC6025
UE6035
UH6400
F7030
VP20MF (PVD)
VP15TF (PVD)
VP30RT (PVD)
M Stainless Steel
NEW
MC7015
US7020
NEW
MC7025
NEW
MP7035
US735
F7030
VP20MF (PVD)
VP15TF (PVD)
VP20RT
NEW
MP7030
VP30RT (PVD)
UP20M (PVD)
K Cast Iron
UC5105
UC5115
MY5015
MC5020
VP15TF (PVD)
N Non-Ferrous
LC15TF
S Heat Resistant Alloy Ti Alloy
US905
VP05RT (PVD)
VP10RT (PVD)
VP15TF (PVD)
MP9120
MP9030 (PVD)
NEW
MP9130
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)
NEW
MP3025 (PVD)
VP45N (PVD)
M Stainless Steel
AP25N (PVD)
VP25N (PVD)
K Cast Iron
AP25N (PVD)
Polycrystallines
N Non-Ferrous Non-Metal
MD220
(Sintered Diamond)
Sintered Alloy
MB4020
K Cast Iron
MB710
MB5015
MB730
MB5140
BC5030
(Sintered CBN)
H Hardened Materials
MBC010
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	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		H3F H6F PN90		F0	F MD08F MD1508			IN05S
		Z10	HTi10 MF20		H10F	890	XF1 F1 AFU	M MD10 MD05F MD07F	FW30		IN05S
		Z20	TF15 MF30		H15F	890 883	AF0 SF2 AF1	MD20 BM10			IN05S
		Z30			H15F	883	A1 CC	UM			

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*	KT125 KT315	CT5015 GC1525*	TP1020 TP1030 CM CMP*	IC20N IC520N* IC530N*	T1200A T2000Z* T1500A T1500Z*	NS520 AT530 GT720* GT730*	TN60 TN6010 PV60* PV7010*	WCE10	CT3000 PV3010* PV3030* IN60C
		P20	NX2525 AP25N* VP25N* NX3035 MP3025*	KT5020 KT325 KT1120	GC1525*	TP1020 TP1030	IC20N IC75T IC30N IC520N* IC530N*	T1200A T2000Z* T3000Z* T1500A T1500Z*	NS530 AT530 GT530* GT730* NS730	TN60 TN6020 PV60* PV7020* PV7025*	WCE10	
		P30	MP3025* VP45N*				IC75T IC30N	T3000Z*		TN7025* PV90*		
	M	M10	NX2525* AP25N VP25N	KT125	GC1525*	CM CMP*		T110A T1000A T2000Z* T1500Z*	NS520 AT530* GT530* GT720*	TN60 TN6020 PV60* 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*	TN6010 TN30 PV30* PV7005* PV7010*		
		K10	NX2525 AP25N*	KT125 KT325	CT5015			T1200A T2000Z* T1500A T1500Z*	NS520 GT730* NS730	TN60 TN6020 PV60* 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	CA5505	WPP01	TT1500
		P10	UE6105 UE6110 MY5015	KCP10 KCP25 KC9110	GC4215 GC4015	TP1500 TP2500	IC9150 IC9015 IC8150 IC8250	AC810P AC700G AC2000 AC820P	T9105 T9005 T9115	CA5505 CA5515	WPP01 WPP05	TT1500
		P20	UE6110 UE6020 MC6025 MY5015	KCP25 KC9125	GC4215 GC4225 GC4015 GC4025	TP2500	IC9015 IC8250 IC9025 IC9250 IC8350	AC2000 AC820P AC830P	T9115 T9125	CA5515 CA5525 CR9025	WPP10S WPP20S	TT3500
		P30	MC6025 UE6020 UE6035 UH6400	KCP30 KCP40 KC8050	GC4225 GC4235 GC4025 GC4035	TP3500 TP3000	IC8350 IC9250 IC9350	AC830P AC630M	T9125 T9035 T9135	CA5525 CA5535 CR9025	WPP30S	TT5100 KT450
		P40	UE6035 UH6400	KCP30 KCP40 KC9140 KC9040 KC9240 KC9245	GC4235 GC4035	TP3500 TP3000	IC9350	AC630M	T9135 T9035	CA5535		KT450
	M	M10	US7020 MC7015	KCM15	GC2015	TM2000	IC9250 IC6015 IC8250	AC610M	T9115	CA6515	WAM20	
		M20	US7020 MC7015 MC7025	KCM15 KC9225	GC2015	TM2000	IC9250 IC6015 IC9025 IC656	AC610M AC630M	T6020 T9125	CA6515 CA6525		TT5100
		M30	US735 MC7025	KCM25 KC9230	GC2025	TM4000	IC9350 IC6025 IC635	AC630M	T6030	CA6525		
		M40	US735	KCM35 KC9240 KC9245	GC2025	TM4000	IC6025 IC9350	AC630M				
	K	K01	UC5105	KCK05	GC3205 GC3210	TH1500 TK1001 TK1000	IC5005 IC9007	AC405K AC410K	T5105	CA4505 CA4010	WAK10	
		K10	UC5115 MY5015	KCK15 KCK20 KC9315	GC3205 GC3210 GC3215	TK1001 TK1000 TK2000 TK2001	IC5005 IC5010 IC9150 IC428 IC4028	AC405K AC410K AC420K AC700G AC415K	T5115	CA4515 CA4010 CA4115	WAK20	TT1300 TT1500
		K20	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							
Milling	P	P10				MP1500	IC9080 IC4100 IC9015				WKP25	IN6515
		P20	FH7020 F7030		GC4220	MP1500 MP2500	IC5100 IC520M	ACP100	T3130		WKP35	IN6530
		P30	F7030	KC930M	GC4230	MP2500	IC4050	ACP100	T3130			
		P40		KC935M	GC4240							
	M	M10					IC9250					
		M20	F7030	KC925M		MP2500	IC520M IC9350	ACP100	T3130			IN6530
		M30	F7030	KC930M	GC2040	MP2500	IC9350 IC4050	ACP100	T3130			
		M40		KC930M KC935M			IC635					
	K	K01										
		K10	MC5020					ACK100	T1115 T1015		WAK15	
		K20	MC5020	KC915M	GC3220 K20W	MK1500	IC5100 IC9150	ACK200	T1115 T1015		WKP25	IN6515
		K30		KC920M KC925M KC930M KC935M	GC3040	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		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		AH725 AH120 SH730 GH730 GH130 AH740 J740			TT7220
		P40		KC7040 KC7140 KC7030		CP500	IC228 IC328 IC330 IC528 IC1008 IC1028 IC3028		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	AC510U	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		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	VP05RT				IC507 IC907		AH905		WSM10	
		S10	VP05RT VP10RT VP20RT	KC5010 KC5410 KC5510	GC1105 GC1005 GC1025	CP200 CP250 TS2000 TS2500	IC507 IC903	AC510U	AH905 SH730 AH110 AH120		WSM20	
		S20	VP10RT VP20RT VP15TF	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	ACP100 ACP200		PR730 PR830 PR1025 PR1225		
		P20	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

	ISO Classification	ISO Symbol	Mitsubishi Materials	Kennametal	Sandvik	Seco Tools	Iscar	Sumitomo Electric	Tungaloy	Kyocera	Walter	Ingersoll
Milling	P	P30	**VP15TF 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	ACP200		PR730 PR1025 PR1225	WSM35	
		M20	**VP15TF VP20RT**	KC730 KC522M KC525M	GC1025 GC1030 GC1040 GC2030	F25M MP3000	IC250 IC300 IC808 IC830 IC900 IC908 IC928 IC1008	ACP200 ACP300	AH725 AH120 GH330 AH330 GH110	PR730 PR660 PR1025 PR1225	WSP45	
		M30	**VP15TF VP20RT VP30RT MP7035**	KC725M KC735M	GC1040 GC2030	F30M F40M MP3000	IC250 IC300 IC328 IC330 IC830 IC928 IC1008	ACP300	AH120 AH725 AH130 AH140 GH130 AH730 GH340	PR660 PR1510	WXM35	IN1515 IN1530 IN2005 IN2505
		M40	**VP30RT**			F40M		ACP300	AH140			
	K	K01							AH110 GH110 AH330			
		K10		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	**VP15TF**	KC510M	C1025		IC903	EH520Z EH20Z		PR905		
		S20	**VP15TF MP9030 MP9130**	KC522M KC525M	GC1025 GC2030		IC300 IC908 IC808 IC900 IC830 IC928 IC328 IC330	EH520Z EH20Z ACK300		PR905	WXM35 WSM35	
		S30		KC725M	GC2030 S30T	F40M	IC830 IC928	ACK300				
	H	H01	**MP8010**				IC903				WXH15	
		H10	**VP15TF**	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	Element Six	Sumitomo Electric	Tungaloy	Kyocera	Dijet
Turning	H	H01	**MBC010 MB810**		CBN050C	DBC50	BNC100 BNX10	BXM10 BXC30 BX310	KBN05M KBN10M KBN10C KBN510	
		H10	**MBC020 BC8020 MB8025**	CB7015 CB20	CBN10 CBN100 CBN100P CBN150	DCC500	BNC160 BNX20 BN2000	BXM20 BXA30 BX330	KBN25M KBN25C KBN525	JBN300
		H20	**BC8020 MB8025 MB825**	CB7025 CB7050 CB50	CBN150 CBN200 CBN300 CBN300P	DCN450	BNC200 BNX25 BN2000 BN250	BXM20 BXA40 BX360	KBN30M	JBN245
		H30	**BC8020 MB835**		CBN350	DCX650	BNC300 BN350	BXC50 BX380	KBN35M	
	S	S01	**MB730**				BN700	BX450 BX950 BX480		
		S10								
		S20								
		S30								
	K	K01	**MB710 MB5015**	CB50 CB7050			BN500	BX930	KBN60M	JBN795
		K10	**MB710 MB5015 MB730**		CBN300 CBN300P	DBA80	BN700	BX950	KBN60M KBN900	JBN330
		K20	**MB730 MBS140 BC5030**		CBN200	DBW85 DBS900 AMB90	BN700 BNS800	BXC90 BX90S	KBN900	
		K30	**MBS140 BC5030**		CBN350		BNS800	BXC90 BX90S		
	Sintered Alloy		**MB4020 MB835**		CBN200	DBW85 DBS900	BN7500 BN700	BX470 BX480	KBN65B KBN65M KBN70M	

PCD

	ISO Classification	ISO Symbol	Mitsubishi Materials	Sandvik	DIAMOND INNOVATIONS	Element Six	Sumitomo Electric	Tungaloy	Kyocera	Dijet
Turning	N	N01	**MD205**	CD10	1800	CTH025	DA90	DX180 DX160	KPD001	JDA30 JDA735
		N10	**MD205 MD220**		1500	CTB010	DA150	DX140	KPD001 KPD010	JDA40 JDA745
		N20	**MD220 MD230**		1300	CTB002	DA2200	DX120	KPD230	JDA10 JDA715
		N30	**MD230**		1600		DA1000	DX110		

(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 Tool	Walter	Taegu Tec	Sumitomo Electric	Tungaloy	Kyocera	Walter	Ingersoll
P	Finish	PK* FH FY	UF, FF	QF LC	FF1, FF2	FP5	FA	FA FL	01* TF ZF	DP* GP, VF, PP XP, XP-T, XF	FP5	FA
	Light	LP C SA, SH	LF, FN	XF PF	MF2	MP3 NF3, NF4	FG	SU LU SX, SE	NS, 27 TSF, AS	PQ HQ, CQ	MP3 NF3, NF4	FG
	Light (Mild Steel)	SY							17	XQ, XS		
	Light (With Wiper)	SW	FW	WL, WF	W-MF2	NF	WS	LUW, SEW	AFW, ASW	WP, WQ	NF	WS
	Medium	MP MA MH	P MN	PM QM, XM	MF3 MF5, M3 M5	MP5	MP MT SM	GU UG GE, UX	NM, ZM TM DM, 33, 37, 38	CJ, GS PS, HS PT, CS	MP5	MC MP MT
	Medium (With Wiper)	MW	MW, RW	WMX, WM	W-M3, W-MF5	NM	WT	GUW			NM	WT
	Rough	RP GH Std.	RN, RP, MG	PR, HM XMR	MR6, MR7	RP5 NM6, NM9	RT	MU, MX, ME UZ	TH Std.	PH GT, HT 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	NR6, NRF NRR	RH HT	MP HG, HP HU, HW, HF	57, THS 65, TU TUS	PX	NR6, NRF NRR	RH
M	Finish Light	SH, LM	FP	MF	MF1	NF4	SF	SU	SS	MQ, GU	NF4	SF
	Medium	MS, GM MM, MA ES	MP	MM K	MF4	NM4	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	NR4, NR5		MU MP	TH, SH		NR4, NR5	RH
K	Finish Light	MA	FN	KF	MF5, M3, M4				CF			
	Medium	Std.	RP,UM	KM	M5	NM5		UZ, GZ, UX	CM, Std.	Std., C, ZS, GC	NM5	Std.
	Heavy	Flat Top		KR	MR3, MR4, MR7 Flat Top			Flat Top	CH, Flat Top	Flat Top		
S	Finish	FJ*	FS	SF	MF1			EF		MQ		
	Light	MJ, MJ*	MS	SGF*	MF4, MF5	NF4, NFT	EA	SU*			NF4, NFT	
	Medium	MS	UP, P, NGP*	NGP*, 23, SM	M1	NMS, NMT		EG, EX, UP	SA, HMM	MS, MU, TK	NMS, NMT	
	Heavy	GJ	RP	SR, SMR	M5, MR3, MR4	NRS, NRT	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 Tool	Walter	Taegu Tec	Sumitomo Electric	Tungaloy	Kyocera	Walter	Ingersoll
P	Finish	SMG*	LF*	UM*				FC*, SC*	JS*, 01*	CF*, CK* GQ*, GF*		
	Finish Light	FV, FP SV, LP	UF LF, FP	PF, UF	FF1 F1	PF4	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 Std., MP	MF, MP	PM, UM	F2, MF2, M5	PS5 PM5	MT	MU	23 PM, 24	HQ XQ, GK	PS5 PM5	MT
	Medium (With Wiper)	MW	MW	WM	W-F2	PM	WT				PM	WT
M	Finish—Light	FM LM	FP	MF	F1, F2			FC* LU SU	SS*	CF*, CK* GQ*, GF*		
	Medium	Std., MM	MP	MM				MU	PM	HQ, GK		
K	Medium	Std., Flat Top		KF, KM, KR	F1, M3, M5			MU, Flat Top	Flat Top, CM	Flat Top*		
N	Medium	AZ*	HP*	AL*	AL*	PM2*	FL*	AG*, AW*	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 Tool	Walter	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	SS* 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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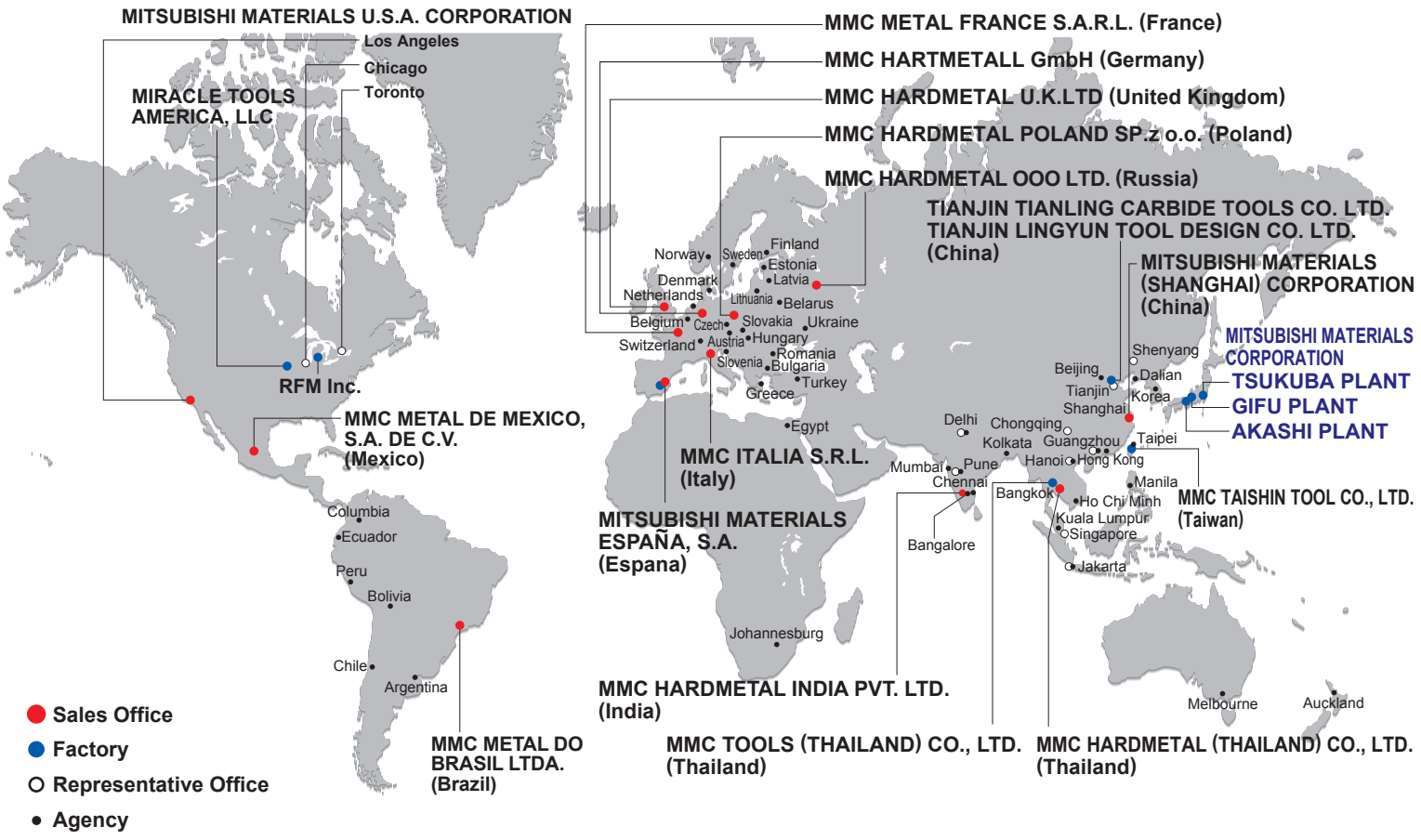
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The Scope of the Registration:
Design, development and manufacturing of metal cutting tools and blanks of cemented carbide and other hard materials



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