HOW TO READ THE STANDARD OF INDEXABLE MILLING

●How this section page is organised

①Organised according to the face milling cutting mode.
(Refer to the index on the next page.)

SCOPE OF AVAILABLE WORKPIECE MATERIAL
provides a graph depicting the scope of the available workpiece material for machining.

PRODUCT FEATURES

CORNER ANGLE ICON

APPLICATION ICON
represents available machining applications, such as finishing and roughing.

TYPE/ NAME OF PRODUCT

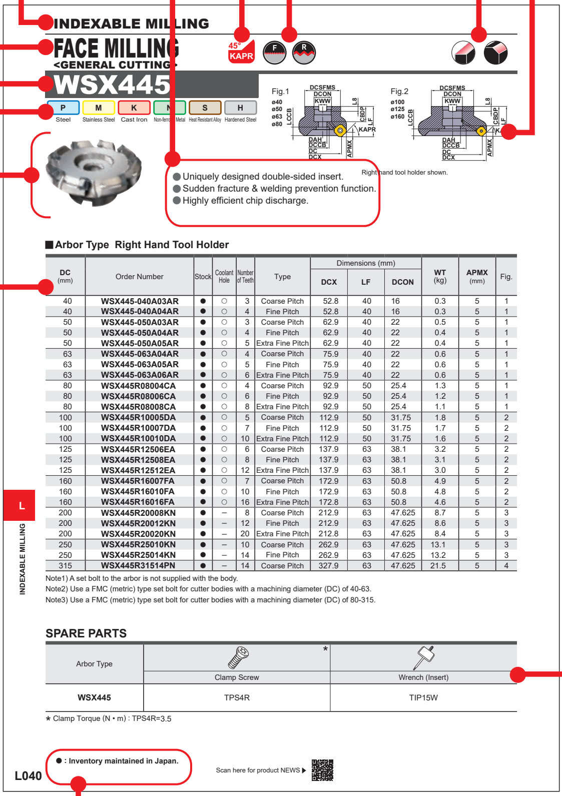
APPLICATION

CUTTING MODE ICON
represents available cutting modes, such as face milling and shoulder milling.

STANDARDS FOR APPLICABLE INSERTS
indicates stock status, dimensions, etc. for applicable inserts.

PRODUCT SECTION

GEOMETRY


INDEXABLE MILLING

FACE MILLING
<GENERAL CUTTING>

WSX445

Right hand tool holder shown.

- Uniquely designed double-sided insert.
- Sudden fracture & welding prevention function.
- Highly efficient chip discharge.

■Arbor Type Right Hand Tool Holder

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Type	Dimensions (mm)			WT (kg)	APMX (mm)	Fig.
						DCX	LF	DCON			
40	**WSX445-040A03AR**	●	○	3	Coarse Pitch	52.8	40	16	0.3	5	1
40	**WSX445-040A04AR**	●	○	4	Fine Pitch	52.8	40	16	0.3	5	1
50	**WSX445-050A03AR**	●	○	3	Coarse Pitch	62.9	40	22	0.5	5	1
50	**WSX445-050A04AR**	●	○	4	Fine Pitch	62.9	40	22	0.4	5	1
50	**WSX445-050A05AR**	●	○	5	Extra Fine Pitch	62.9	40	22	0.4	5	1
63	**WSX445-063A04AR**	●	○	4	Coarse Pitch	75.9	40	22	0.6	5	1
63	**WSX445-063A05AR**	●	○	5	Fine Pitch	75.9	40	22	0.6	5	1
63	**WSX445-063A06AR**	●	○	6	Extra Fine Pitch	75.9	40	22	0.6	5	1
80	**WSX445R08004CA**	●	○	4	Coarse Pitch	92.9	50	25.4	1.3	5	1
80	**WSX445R08006CA**	●	○	6	Fine Pitch	92.9	50	25.4	1.2	5	1
80	**WSX445R08008CA**	●	○	8	Extra Fine Pitch	92.9	50	25.4	1.1	5	1
100	**WSX445R10005DA**	●	○	5	Coarse Pitch	112.9	50	31.75	1.8	5	2
100	**WSX445R10007DA**	●	○	7	Fine Pitch	112.9	50	31.75	1.7	5	2
100	**WSX445R10010DA**	●	○	10	Extra Fine Pitch	112.9	50	31.75	1.6	5	2
125	**WSX445R12506EA**	●	○	6	Coarse Pitch	137.9	63	38.1	3.2	5	2
125	**WSX445R12508EA**	●	○	8	Fine Pitch	137.9	63	38.1	3.1	5	2
125	**WSX445R12512EA**	●	○	12	Extra Fine Pitch	137.9	63	38.1	3.0	5	2
160	**WSX445R16007FA**	●	○	7	Coarse Pitch	172.9	63	50.8	4.9	5	2
160	**WSX445R16010FA**	●	○	10	Fine Pitch	172.9	63	50.8	4.8	5	2
160	**WSX445R16016FA**	●	○	16	Extra Fine Pitch	172.8	63	50.8	4.6	5	2
200	**WSX445R20008KN**	●	–	8	Coarse Pitch	212.9	63	47.625	8.7	5	3
200	**WSX445R20012KN**	●	–	12	Fine Pitch	212.9	63	47.625	8.6	5	3
200	**WSX445R20020KN**	●	–	20	Extra Fine Pitch	212.8	63	47.625	8.4	5	3
250	**WSX445R25010KN**	●	–	10	Coarse Pitch	262.9	63	47.625	13.1	5	3
250	**WSX445R25014KN**	●	–	14	Fine Pitch	262.9	63	47.625	13.2	5	3
315	**WSX445R31514PN**	●	–	14	Coarse Pitch	327.9	63	47.625	21.5	5	4

Note1) A set bolt to the arbor is not supplied with the body.
Note2) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 40-63.
Note3) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 80-315.

L

INDEXABLE MILLING

SPARE PARTS

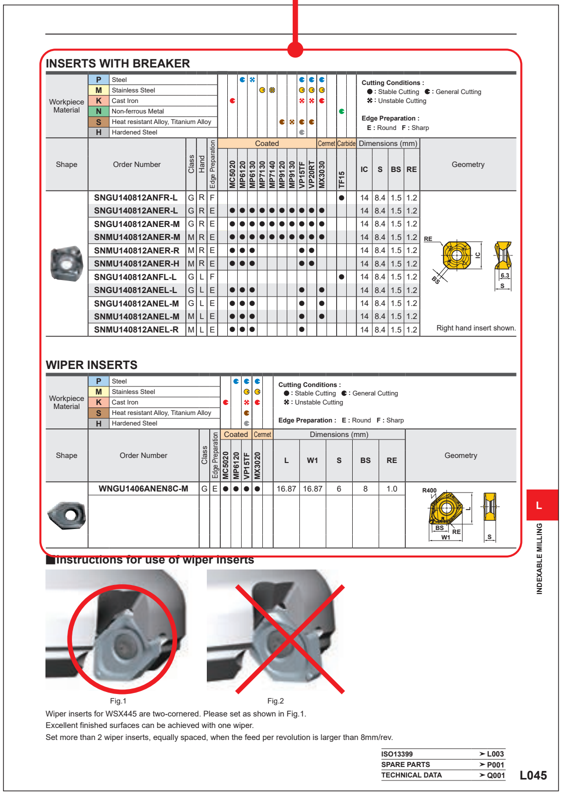
Arbor Type	Clamp Screw *	Wrench (Insert)
WSX445	TPS4R	TIP15W

⁎ Clamp Torque (N • m) : TPS4R=3.5

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

L040


INSERTS WITH BREAKER

Workpiece Material			MC5020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP20RT	MX3030		TF15	
	P	Steel		◐	✤					◐	◐	◐			
	M	Stainless Steel				◐	✤			◐	◐	◐			
	K	Cast Iron	◐							✤	✤	◐			
	N	Non-ferrous Metal												◐	
	S	Heat resistant Alloy, Titanium Alloy						◐	✤	◐	◐				
	H	Hardened Steel								◐					

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

Edge Preparation :
E : Round F : Sharp

Shape	Order Number	Class	Hand	Edge Preparation	Coated									Cermet		Carbide		Dimensions (mm)				Geometry
					MC5020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP20RT	MX3030		TF15		IC	S	BS	RE	
	SNGU140812ANFR-L	G	R	F												●		14	8.4	1.5	1.2	
	SNGU140812ANER-L	G	R	E	●	●	●	●	●	●	●	●	●	●				14	8.4	1.5	1.2	
	SNGU140812ANER-M	G	R	E	●	●	●	●	●	●	●	●	●	●				14	8.4	1.5	1.2	
	SNMU140812ANER-M	M	R	E	●	●	●	●	●	●	●	●	●	●				14	8.4	1.5	1.2	
	SNMU140812ANER-R	M	R	E	●	●	●					●	●					14	8.4	1.5	1.2	
	SNMU140812ANER-H	M	R	E	●	●	●					●	●					14	8.4	1.5	1.2	
	SNGU140812ANFL-L	G	L	F												●		14	8.4	1.5	1.2	
	SNGU140812ANEL-L	G	L	E	●	●	●					●		●				14	8.4	1.5	1.2	
	SNGU140812ANEL-M	G	L	E	●	●	●					●		●				14	8.4	1.5	1.2	
	SNMU140812ANEL-M	M	L	E	●	●	●					●		●				14	8.4	1.5	1.2	
	SNMU140812ANEL-R	M	L	E	●	●	●					●						14	8.4	1.5	1.2	Right hand insert shown.

WIPER INSERTS

Workpiece Material			MC5020	MP6120	VP15TF	MX3020	
	P	Steel		◐	◐	◐	
	M	Stainless Steel			◐	◐	
	K	Cast Iron	◐		✤	◐	
	S	Heat resistant Alloy, Titanium Alloy			◐		
	H	Hardened Steel			◐		

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

Edge Preparation : E : Round F : Sharp

Shape	Order Number	Class	Edge Preparation	Coated			Cermet		Dimensions (mm)					Geometry
				MC5020	MP6120	VP15TF	MX3020		L	W1	S	BS	RE	
	WNGU1406ANEN8C-M	G	E	●	●	●	●		16.87	16.87	6	8	1.0	

L

INDEXABLE MILLING

■Instructions for use of wiper inserts

Fig.1 Fig.2

Wiper inserts for WSX445 are two-cornered. Please set as shown in Fig.1.
Excellent finished surfaces can be achieved with one wiper.
Set more than 2 wiper inserts, equally spaced, when the feed per revolution is larger than 8mm/rev.

ISO13399 ➢ L003
SPARE PARTS ➢ P001
TECHNICAL DATA ➢ Q001

L045

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

SPARE PARTS FOR MIILING TOOLS
indicates the names of the applicable spare parts.

PRODUCT STANDARDS
indicates tool types, order numbers, stock status (per right/left hand), dimensions, etc.

PHOTO OF PRODUCT

●To Order :	For title product,	please specify ①order number and hand of tool (right/left).
	For insert,	please specify ①insert number and ②grade.

MILLING TOOLS

INDEXABLE MILLING

*Arranged by Alphabetical order

SYMBOL DESCRIPTIONS

KAPR (Cutting Edge Angle) List

15° KAPR	15°
30° KAPR	30°
35° KAPR	35°
42° KAPR	42°
45° KAPR	45°
50° KAPR	50°
60° KAPR	60°
84° KAPR	84°
86° KAPR	86°
90° KAPR	90°
94° KAPR	94°
R KAPR	R

● : Inventory maintained.
▲: Inventory maintained.
To be replaced by new products.
☐ : Non stock, produced to order only.

Application

- **Face Milling**
- **Chamfer Milling**
- **Shoulder Milling with R**
- **Face Milling Near the Wall**
- **Shoulder Milling**
- **Wall Milling**
- **Slot Milling**
- **Step Milling**
- **Pocket Milling**
- **Slot Milling with R**
- **Copy Milling**
- **T-Slot Milling**
- **Spot Milling**
- **Helical Drilling**

Accuracy

F **Finish Cutting**

PF **Medium Cutting**

R **Rough Cutting**

Workpiece Material Range

1st Recommendation

P M K N S H

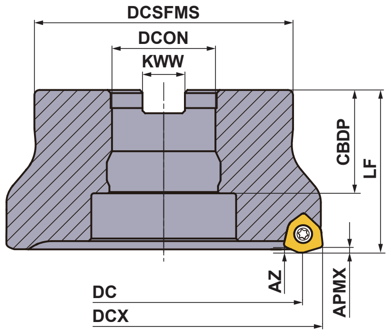
2nd Recommendation

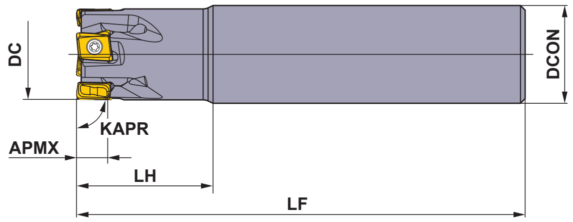
P M K N S H

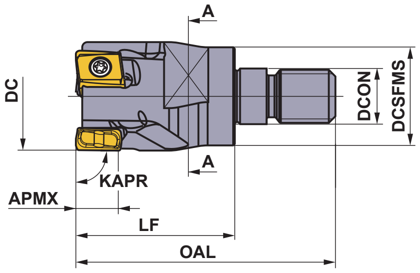
GUIDE FOR ISO13399 SYMBOLS

Symbol	Content	Symbol	Content
APMX	Depth of cut maximum	**DCX**	Cutting diameter maximum
AZ	Plunge depth maximum	**H**	Shank height
BD	Body diameter	**KWW**	Keyway length
BDX	Body diameter maximum	**LBX**	Body length maximum
BS	Wiper edge length	**LE**	Cutting edge effective length
CBDP	Connection bore depth	**LF**	Functional length
CRKS	Connection retention knob thread size	**LH**	Head length
CW	Cutting width	**LU**	Usable length
DC	Cutting diameter	**OAL**	Overall length
DCB	Connection bore diameter	**RE**	Corner radius
DCON	Connection diameter	**RMPX**	Ramping angle maximum
DCSFMS	Contact surface diameter machine side	**WT**	Weight of item

*There are exceptions other than those listed above. For more details, please refer to the technical data (page Q002).







CLASSIFICATION

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
For General Cutting **WSX445**  45° KAPR	5	●Uniquely designed double-sided insert. ●Sudden fracture & welding prevention function. ●Highly efficient chip discharge. Info	Ø40 — Ø315	P M K N S H	L040
For General Cutting **ASX445**  45° KAPR	6	●Precision inexpensive moulded type 20° positive insert. ●Screw-on type. ●A wide range of chip breakers. ●High rigidity due to carbide shim. Info	Ø50 — Ø315	P M K N S H	L054
For General Cutting **AHX440S**  50° KAPR	3	●Heptagonal double-sided insert. ●Economical 14 cutting edge inserts. ●Multi insert design for high feed machining. Info	Ø40 — Ø160	P M K H	L060 L062
For High Feed Cutting **AHX475S**  15° KAPR	1.6	●Heptagonal double-sided insert. ●Economical 14 cutting edge inserts. ●Multi insert design for high feed machining. ●With through coolant holes. Info	Ø50 — Ø160	P K H	L060 L067
For General Cutting **AHX640S**  50° KAPR	6	●Heptagonal double-sided insert. ●Economical 14 cutting edge inserts. ●Multi insert design for high feed machining. Info	Ø63 — Ø200	P M K S H	L060 L071
For High Feed Cutting for Cast Iron **AHX640W**  50° KAPR	6	●Heptagonal double-sided insert. ●Economical 14 cutting edge inserts. ●Multi insert design for high feed machining. Info	Ø80 — Ø315	K	L079
For High Efficiency Cutting for Cast Iron **WSF406W** NEW  84° KAPR	7	●Uniquely designed double-sided insert. ●Adjustable cutting edge run-out system ●Improved surface finish ●Suppression of edge chipping Info	Ø80 — Ø250	K	L084
For High Efficiency Cutting for Cast Iron **AOX445**  45° KAPR	8	●Solid CBN octagonal double-sided insert. ●Economical 16 cutting edge inserts. (When the depth of cut is 3mm) ●For high efficiency roughing through to finishing. ●Easy operation and cleansing. Info	Ø63 — Ø160	K	L087
For High Feed Finishing **FMAX**  90° KAPR	2	●Feed Maximum (FMAX) milling cutter for ultra efficient and accurate finishing. ●The combination of aluminium alloy and a special steel alloy achieves a light weight, high rigidity body. ●With through coolant holes. Info	Ø40 — Ø160	K N	L089
High-Speed Finishing for Aluminium Alloy and Cast Iron **NF10000**  90° KAPR	4	●Suitable for light alloy and cast iron finishing. ●Adjustable cutting edge run-out function. Info	Ø80 — Ø125	K N	L096
High Feed Finishing **FF3000**  90° KAPR	0.3	●11°positive insert. ●1000–3000mm/min high feed machining. ●For finishing of steel machining. ●Adjustable cutting edge run-out function.	Ø125 — Ø250	P M K N	L098

Product Name · Shape	**APMX** (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
High Feed Cutting for Cast Iron **FP490**  90° KAPR	**0.5**	●11°positive insert. ●Suitable for cast iron finishing. ●Multi-insert design. ●For high feed cutting. ●Easy tool exchange. *Cutter bodies are only available through special orders.	**Ø80 — Ø500**	**K**	**L334**
High Feed Cutting for Cast Iron **FP590**  90° KAPR	**0.5**	●11°positive insert. ●Suitable for cast iron finishing. ●Multi-insert design. ●For high feed cutting. ●Easy tool exchange. *Cutter bodies are only available through special orders.	**Ø125 — Ø500**	**K**	**L336**
High Feed Cutting for Aluminium **FE404**  86° KAPR	**9**	●21°positive insert. ●High rake and relief angle. ●Multi-insert design. ●Suitable for light alloy machining. ●Easy tool exchange. *Cutter bodies are only available through special orders.	**Ø100 — Ø500**	**N**	**L338**
Multi-Functional Milling **WJX09** NEW 	**1.2**	●Negative inserts. ●Stable clamp with dovetail structure. ●Suitable for high feed machining. ●Special insert design with 6 cutting edges. ●With through coolant holes. Info	**Ø40 — Ø66**	**P** **M** **K** **S** **H**	**L242**
Multi-Functional Milling **WJX14** 	**2**	●Negative inserts. ●Stable clamp with dovetail structure. ●Suitable for high feed machining. ●Special insert design with 6 cutting edges. ●With through coolant holes. Info	**Ø50 — Ø160**	**P** **M** **K** **S** **H**	**L250**
Multi-Functional Milling **AJX** 	**1.2**	●15°positive insert. ●High rigidity double clamp structure. ●Suitable for high feed machining. ●Special insert design with 3 cutting edges. ●With through coolant holes. Info	**Ø32 — Ø160**	**P** **M** **K** **S** **H**	**L228**
Multi-Functional Milling of Difficult-to-cut Materials **ARP**  R KAPR	**6**	●Run-out does not occur easily when changing sections. ●Solid clamping system. ●Standardized stock of extra fine pitch. ●With through coolant holes. Info	**Ø40 — Ø100**	**M** **S**	**L264**
Multi-Functional Milling **BRP**  R KAPR	**8**	●11°positive insert. ●Round shape insert with a strong cutting edge. ●Wide range of tools available. ●Suitable for mould machining. Info	**Ø40 — Ø100**	**P** **M** **K** **S** **H**	**L276**
Multi-Functional Milling **OCTACUT**  42° KAPR	**9**	●20°positive insert. ●For octagonal and round type inserts. ●Multi-functional machining.	**Ø40 — Ø160**	**P** **M** **K** **H**	**L259**
For General Cutting **WWX400** NEW  90° KAPR	**8.2**	●High-stability clamping and high-quality machining. ●The optimised “X-type” insert meets the demand for greater strength. ●Economical double-sided 6 corners. Info	**Ø80 — Ø250**	**P** **M** **K** **N** **S** **H**	**L100**
For Cast Iron **VOX400**  90° KAPR	**10**	●Vertical inserts with high strength cutting edge. ●Economical 8 cutting edge inserts. ●Screw-on type. Info	**Ø50 — Ø250**	**K**	**L112**

CLASSIFICATION

Product Name · Shape	**APMX** (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
For General Cutting **ASX400**  90° KAPR	10	● High accuracy, high-quality vertical wall. ● Low cutting force insert. ● With through air & coolant holes. Info	Ø50 — Ø250	P M K N S H	L116
For Multi-Functional Cutting **APX3000**  90° KAPR	10	● Low cutting force insert. ● High accuracy, high-quality vertical wall. ● With through air & coolant holes. Info	Ø32 — Ø100	P M K N S H	L137
For Multi-Functional Cutting **APX4000**  90° KAPR	15	● Low cutting force insert. ● High accuracy, high-quality vertical wall. ● With through air & coolant holes. Info	Ø40 — Ø160	P M K S H	L147
Multi-Functional Milling for High Efficiency Machining **VPX200**  90° KAPR	8	● Special insert design with 4 cutting edges. ● High precision, high-quality insert cutting edge with finishing blade. ● With through coolant holes. Info	Ø32 — Ø63	P M K N S H	L158
Multi-Functional Milling for High Efficiency Machining **VPX300**  90° KAPR	11	● Special insert design with 4 cutting edges. ● High precision, high-quality insert cutting edge with finishing blade. ● With through coolant holes. Info	Ø40 — Ø80	P M K N S H	L164
Aluminium Alloy to Difficult-to-cut Material Cutting **AXD4000**  90° KAPR	15.5	● Low resistance chipbreaker. ● Low resistance insert and high rigidity design for excellent performance. ● For high-speed machining. ● Multi-functional machining. ● With through coolant holes. Info	Ø40 — Ø125	P N S	L195
Ultra-high Speed, Efficient Machining of Aluminium Alloys **AXD4000A** NEW  90° KAPR	15.5	● Low resistance chipbreaker. ● Low resistance insert and high rigidity design for excellent performance. ● For high-speed machining. ● Multi-functional machining. ● With through coolant holes. Info	Ø50	N	L202
Aluminium Alloy to Difficult-to-cut Material Cutting **AXD7000**  90° KAPR	21	● Low resistance chipbreaker. ● Low resistance insert and high rigidity design for excellent performance. ● For high-speed machining. ● Multi-functional machining. ● With through coolant holes. Info	Ø50 — Ø125	P N S	L208
Aluminium Alloy to Difficult-to-cut Material Cutting **BXD4000**  90° KAPR	15	● Curved cutting edge and high rigidity holder produce high wall accuracy. ● Low resistance insert and high rigidity design for excellent performance. ● With through coolant holes to ensure smooth chip discharge. ● For high-speed machining. ● With through coolant holes. Info	Ø40 — Ø125	P M N S H	L216

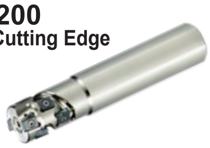
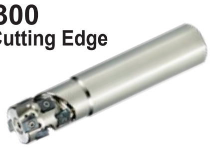
CLASSIFICATION OF SIDE CUTTERS

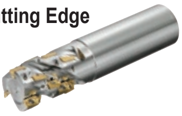
Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
VAS300 **Side Cutter** NEW  90° KAPR	8.6	● Insert with 4 cutting edges secure clamping. ● Excellent sharpness with low cutting resistance insert. ● Holders can load all corner R. *Cutter bodies are only available through special orders. Info	Ø80 — Ø160	P K	L126
VAS400 **Side Cutter**  90° KAPR	12.2	● Insert with 4 cutting edges secure clamping. ● Excellent sharpness with low cutting resistance insert. ● Holders can load all corner R. *Cutter bodies are only available through special orders. Info	Ø80 — Ø160	P K	L128
VAS500 **Side Cutter**  90° KAPR	16.2	● Insert with 4 cutting edges secure clamping. ● Excellent sharpness with low cutting resistance insert. ● Holders can load all corner R. *Cutter bodies are only available through special orders. Info	Ø100 — Ø200	P K	L130
VOS400 **Side Cutter**  90° KAPR	10	● For cast iron. ● Cutter body with high rigidity design. ● Innovative vertical insert. ● Economical 8 cutting edge inserts. *Cutter bodies are only available through special orders. Info	Ø80 — Ø160	K	L134
ASX400 **Side Cutter**  90° KAPR	10	● High precision non-grinding insert. ● Economical 4 cutting edge inserts. ● Excellent wall surface precision with curved cutting edges and high precision body. *Cutter bodies are only available through special orders. Info	Ø80 — Ø160	P M K	L135

CLASSIFICATION OF BORE BORING TOOLS

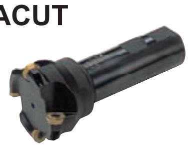
Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
BMR  35° KAPR	—	● Double positive breaker. ● 12-corner type with right hand. ● Body with peripheral cutting edge run-out regulator. *Cutter bodies are only available through special orders. Info	—	K	L332

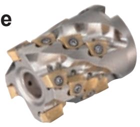
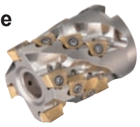
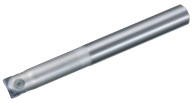
CLASSIFICATION

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
WSX445  45° KAPR	5	●Unique design both sides insert. ●Sudden fracture & welding prevention function. ●Highly efficient chip discharge. ●With through coolant holes. Info	Ø40 — Ø80	P M K N S H	L044
ASX445  45° KAPR	6	●Precision inexpensive moulded type 20°positive insert. ●Screw-on type. ●A wide range of chip breakers. ●High rigidity due to carbide shim. Info	Ø50 — Ø80	P M K N S H	L056
AOX445  45° KAPR	8	●Solid CBN octagonal double-sided insert. ●Economical 16 cutting edge inserts. (when the depth of cut is 3mm) ●For high efficiency roughing through to finishing. ●Easy operation and cleansing. Info	Ø50 Ø63	K	L087
AJX 	1.2	●13° and 15° positive inserts. ●High rigidity double clamp structure. ●Suitable for high feed machining. ●Special insert design with 3 cutting edges. ●With through coolant holes. Info	Ø16 — Ø63	P M K S H	L231
WWX400 NEW  90° KAPR	8.2	●High-stability clamping and high-quality machining. ●The optimised “X-type” insert meets the demand for greater strength. ●Economical double-sided 6 corners. Info	Ø50 — Ø80	P M K N S H	L103
ASX400  90° KAPR	10	●High tolerance M-class inserts. ●Economical 4 cutting edge inserts. ●Curved cutting edge and high rigidity holder. ●Screw-on type. Info	Ø40 — Ø80	P M K N S H	L118
VPX200  90° KAPR	8	●Special insert design with 4 cutting edges. ●High precision, high-quality insert cutting edge with finishing blade. ●With through coolant holes. Info	Ø16 — Ø50	P M K N S H	L156
VPX200 **Long Cutting Edge** NEW  90° KAPR	42	●Special insert design with 4 cutting edges. ●High precision, high-quality insert cutting edge with finishing blade. ●With through coolant holes. Info	Ø20 — Ø40	P M K N S	L159
VPX200 **Shell Type** NEW  90° KAPR	42	●Special insert design with 4 cutting edges. ●High precision, high-quality insert cutting edge with finishing blade. ●With through coolant holes. Info	Ø32 — Ø50	P M K N S	L160
VPX300  90° KAPR	11	●Special insert design with 4 cutting edges. ●High precision, high-quality insert cutting edge with finishing blade. ●With through coolant holes. Info	Ø25 — Ø50	P M K N S H	L162
VPX300 **Long Cutting Edge** NEW  90° KAPR	42	●Special insert design with 4 cutting edges. ●High precision, high-quality insert cutting edge with finishing blade. ●With through coolant holes. Info	Ø40	P M K N S	L165

Product Name · Shape	**APMX** (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
VPX300 **Shell Type** NEW  90° KAPR	63	●Special insert design with 4 cutting edges. ●High precision, high-quality insert cutting edge with finishing blade. ●With through coolant holes. Info	Ø40 — Ø80	P M K N S	L166
APX3000  90° KAPR	10	●High accuracy, high-quality vertical wall. ●Low cutting force insert. ●With through coolant holes. Info	Ø12 — Ø63	P M K N S H	L136
APX3000 **Long Cutting Edge**  90° KAPR	55	●High accuracy, high-quality vertical wall. ●Low cutting force insert. Info	Ø20 — Ø40	P M K N S	L142
APX3000 **Shell Type**  90° KAPR	46	●High accuracy, high-quality vertical wall. ●Low cutting force insert. ●With through coolant holes. Info	Ø40 Ø50	P M K N S	L143
BAP300  90° KAPR	9	●11° positive insert. ●Inserts with wiper edges produce optimal finished surface. ●Multi insert design for high feed machining. Info	Ø10 — Ø63	P M K N S H	L122
APX4000  90° KAPR	15	●High accuracy, high-quality vertical wall. ●Low cutting force insert. ●With through air & coolant holes. Info	Ø25 — Ø63	P M K S H	L146
APX4000 **Long Cutting Edge**  90° KAPR	84	●High accuracy, high-quality vertical wall. ●Low cutting force insert. ●With through air & coolant holes. Info	Ø40 Ø50	P M K S	L152
APX4000 **Shell Type**  90° KAPR	56	●High accuracy, high-quality vertical wall. ●Low cutting force insert. ●With through coolant holes. Info	Ø50 Ø63	P M K S	L153
AXD4000  90° KAPR	15.5	●Low resistance chipbreaker. ●Low resistance insert and high rigidity design for excellent performance. ●For high-speed machining. ●Multi-functional machining. ●With through coolant holes. Info	Ø20 — Ø40	P N S	L194
AXD7000  90° KAPR	21	●Low resistance chipbreaker. ●Low resistance insert and high rigidity design for excellent performance. ●For high-speed machining. ●Multi-functional machining. ●With through coolant holes. Info	Ø32 — Ø50	P N S	L208
BXD4000  90° KAPR	15	●Curved cutting edge and high rigidity holder produce high wall accuracy. ●Low resistance insert and high rigidity design for excellent performance. ●With through coolant holes to ensure smooth chip discharge. ●For high-speed machining. ●With through coolant holes. Info	Ø20 — Ø40	P M N S H	L218

CLASSIFICATION

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
AQX  90° KAPR	55	● The centre bottom cutting edge enables drilling without previously formed hole. ● With through coolant holes.	Ø16 — Ø50	P M K N S H	L220
ARP  R KAPR	6	● Run-out does not occur easily when changing sections. ● Solid clamping system. ● Standardized stock of extra fine pitch. ● With through coolant holes.	Ø25 — Ø50	M S	L266
ARX  R KAPR	3.5	● 15°positive, high tolerance M-class insert. ● Effective for various machining applications. ● With through coolant holes.	Ø10 — Ø25	P M K H	L270
WJX09 NEW 	1.2	● Multi-functional milling. ● Negative inserts. ● Stable clamp with dovetail structure. ● Suitable for high feed machining. ● Special insert design with 6 cutting edges. ● With through coolant holes.	Ø25 — Ø40	P M K S H	L244
WJX14 	2	● Multi-functional milling. ● Negative inserts. ● Stable clamp with dovetail structure. ● Suitable for high feed machining. ● Special insert design with 6 cutting edges. ● With through coolant holes.	Ø50	P M K S H	L252
OCTACUT  42° KAPR	9	● 20°positive insert. ● For octagonal and round type inserts. ● Multi-functional machining.	Ø32 — Ø63	P M K H	L258
BRP  R KAPR	8	● 11°positive insert. ● Round shape insert with a strong cutting edge. ● Wide range of tools available. ● Suitable for mould machining.	Ø12 — Ø63	P M K S H	L274
DCCC  90° KAPR	93	● Different helical flute angles prevents chattering.	Ø25 — Ø50	P M K	L280
SPX  90° KAPR	261	● Low cutting resistance due to the use of wavy inserts. ● Suitable for heavy cutting due to holder rigidity.	Ø50 Ø63	P M K S	L283
SPX **Shell Type**  90° KAPR	58	● Low cutting resistance due to the use of wavy inserts. ● Suitable for heavy cutting due to holder rigidity.	Ø63 Ø80	P M K S	L284
ASPX **Shell Type** NEW  90° KAPR	75	● Highly reliable clamping mechanism. ● Low cutting resistance due to the use of wavy inserts. ● Suitable for heavy cutting due to holder rigidity.	Ø50 — Ø80	S	L288

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
ASPX NEW  90° KAPR	127	● Highly reliable clamping mechanism. ● Low cutting resistance due to the use of wavy inserts. ● Suitable for heavy cutting due to holder rigidity. Info	Ø80	S	L289
VFX5 **Shell Type**  90° KAPR	75	● High performance titanium alloy milling. ● High rigidity design. ● Highly reliable clamping mechanism. ● With through coolant holes. Info	Ø40 — Ø80	S	L292
VFX6 **Shell Type**  90° KAPR	90	● High performance titanium alloy milling. ● High rigidity design. ● Highly reliable clamping mechanism. ● With through coolant holes. Info	Ø63 — Ø100	S	L296
SRF/SRB  R KAPR	17	● 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. Info	Ø10 — Ø32	P K N H	L300
SUF  R KAPR	5.2	● Highly accurate corner radius tolerance allows for high precision finishing. ● Seamless gash. Info	Ø10 — Ø32	P M K H	L304
SRM2  R KAPR	44	● Suitable for roughing to semi-finishing of small and medium moulds. ● High rigidity body design. ● Low resistance chipbreaker. ● Through coolant hole type. Info	Ø16 — Ø30	P M K S H	L308
SRM2 ϕ40/ϕ50  R KAPR	54 63	● Best for roughing of moulds. ● Low resistance chipbreaker. ● Highly rigid body. Info	Ø40 Ø50	P K	L316
CESP•CFSP•CGSP  30° KAPR 45° KAPR 60° KAPR	5.9 | 10.2	● Covers 5 cutting modes. ● Excellent sharpness with 11°positive inserts. ● 30°, 45° and 60° chamfer series.	Ø8 — Ø32	P K	L318
TSMP  90° KAPR	18	● T-groove order number 14, 18 and 22 are available. ● 86° rhombic shape 11° positive insert. ● Shoulder milling and inversed spot facing are also possible.	Ø25 — Ø40	P K	L320
CBJP•CBMP  94° KAPR	—	● Capable of spot facing machining, boring and interpolation. ● For seat machining of hexagon socket head bolt (M8-M30). ● 86°rhombic shape 11°positive insert.	Ø14 — Ø48	P M K	L322
KSMG 	4.5	● Side face grooving tool for machining centres. ● The minimum cutting diameter is ϕ25mm for internal grooving. ● For groove widths of 1.25mm — 6.0mm.	Ø25 Ø40	P K	L324

CLASSIFICATION

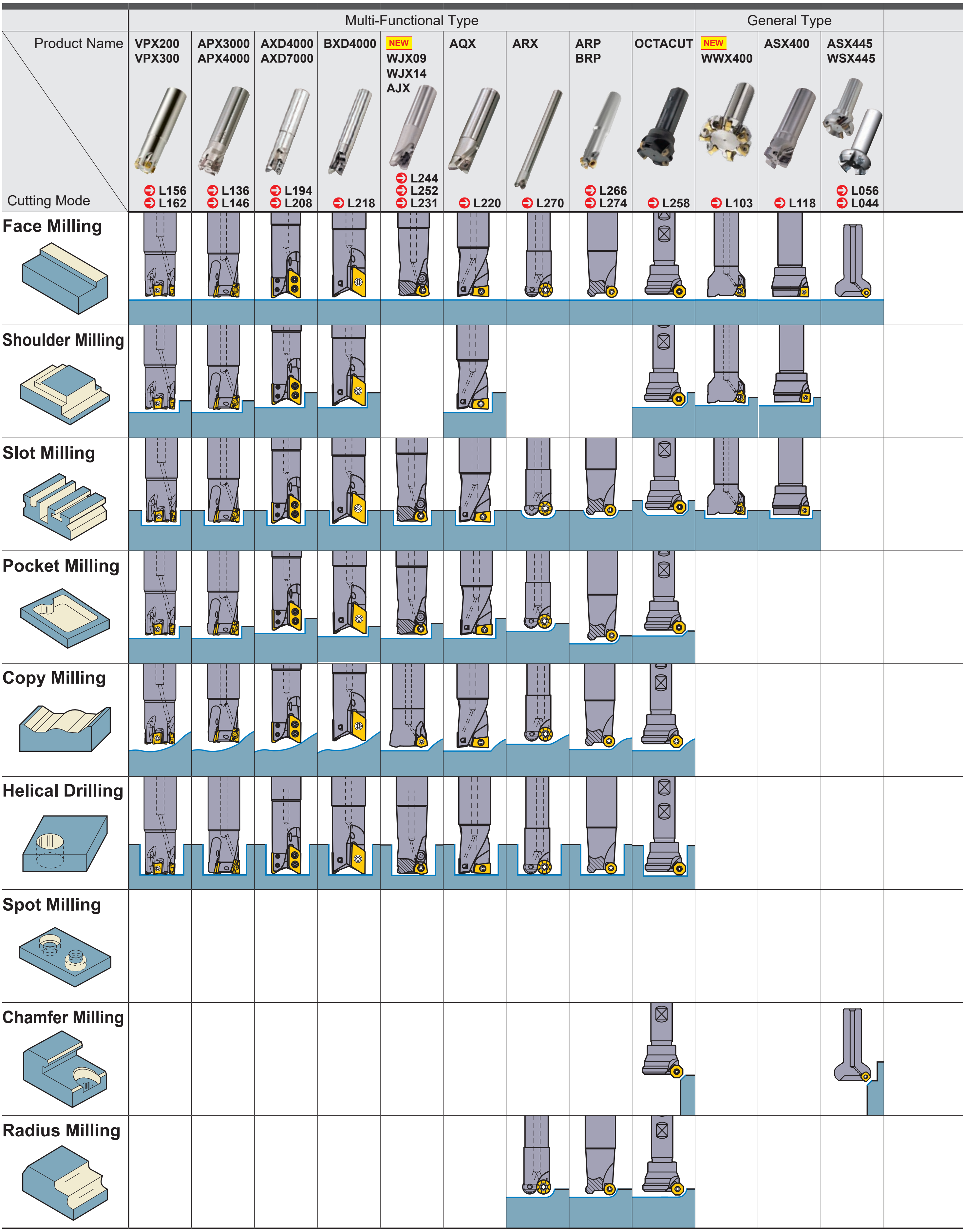
Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
PMF 	—	●2 directional cutting with large overhang. ●Excellent straightness. ●Excellent wall accuracy.	**Ø50 — Ø80**	P K	**L328**
PMR 	**11**	●1 directional cutting with large overhang. ●Horizontal feed cutting and oblique cutting are also possible. ●Unique shape of curved edge gives high rigidity and low resistance.	**Ø50 — Ø80**	P K	**L330**

CLASSIFICATION OF SCREW-IN TOOLS

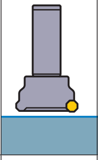
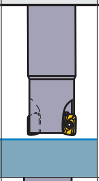
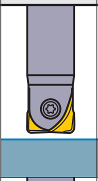
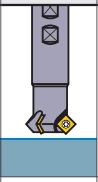
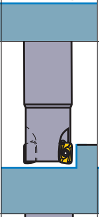
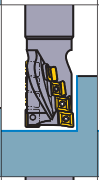
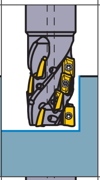
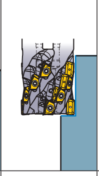
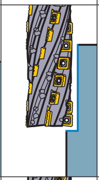
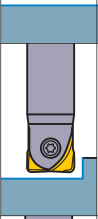
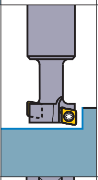
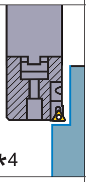
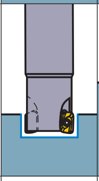
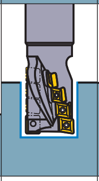
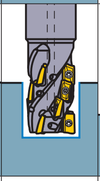
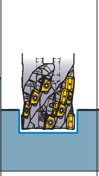
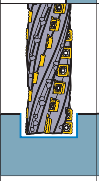
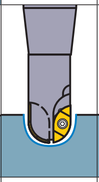
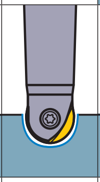
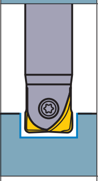
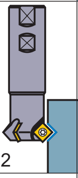
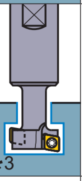
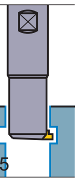
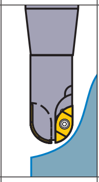
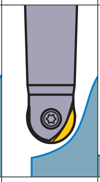
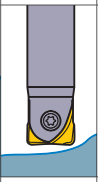
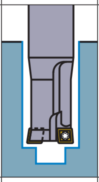
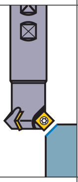
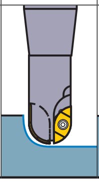
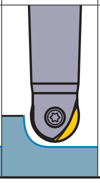
Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
ASX400  90° KAPR	**10**	●High tolerance M-class inserts. ●Economical 4 cutting edge inserts. ●Curved cutting edge and high rigidity holder. ●Screw-on type. ●With through coolant holes. Info	**Ø32** **Ø40**	P M K N S H	**L119**
APX3000  90° KAPR	**10**	●High accuracy, high-quality vertical wall. ●Low cutting force insert. ●With through air & coolant holes. Info	**Ø16 — Ø40**	P M K N S H	**L138**
APX4000  90° KAPR	**15**	●High accuracy, high-quality vertical wall. ●Low cutting force insert. ●With through air & coolant holes. Info	**Ø25 — Ø40**	P M K S H	**L148**
AQX  90° KAPR	**18**	●The centre bottom cutting edge enables drilling without previously formed hole. ●With through coolant holes. Info	**Ø16 — Ø40**	P M K N S H	**L222**
VPX200  90° KAPR	**8**	●Special insert design with 4 cutting edges. ●High precision, high-quality insert cutting edge with finishing blade. ●With through coolant holes. Info	**Ø16 — Ø40**	P M K N S H	**L157**
VPX300  90° KAPR	**11**	●Special insert design with 4 cutting edges. ●High precision, high-quality insert cutting edge with finishing blade. ●With through coolant holes. Info	**Ø25 — Ø40**	P M K N S H	**L163**
AJX 	**1.2**	●13° and 15° positive inserts. ●High rigidity double clamp structure. ●Suitable for high feed machining. ●Special insert design with 3 cutting edges. ●With through coolant holes. Info	**Ø16 — Ø40**	P M K S H	**L233**

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Workpiece Material	Page
WJX09 NEW 	1.2	●Multi-functional milling. ●Negative inserts. ●Stable clamp with dovetail structure. ●Suitable for high feed machining. ●Special insert design with 6 cutting edges. ●With through coolant holes. Info	**Ø25 — Ø40**	P M K S H	**L244**
ARP  R KAPR	6	●Run-out does not occur easily when changing sections. ●Solid clamping system. ●With through coolant holes. Info	**Ø25 — Ø40**	M S	**L267**
ARX  R KAPR	3	●15°positive, high tolerance M-class insert. ●Effective for various machining applications. ●With through air & coolant holes. Info	**Ø16 — Ø25**	P M K H	**L271**
SRF/SRB  R KAPR	17	●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. ●With through coolant holes. Info	**Ø16 — Ø32**	P K N H	**L301**
SUF  R KAPR	5.2	●Highly accurate corner radius tolerance allows for high precision finishing. ●Seamless gash. ●With through coolant holes. Info	**Ø16 — Ø32**	P M K H	**L305**
SRM2  R KAPR	44	●Suitable for roughing to semi-finishing of small and medium moulds. ●High rigidity body design. ●Low resistance chipbreaker. ●With through coolant holes. Info	**Ø16 — Ø32**	P M K S H	**L310**
PMC 	3.5	●For under-cutting trimmed part of press mould. ●2 directional cutting with large overhang. ●With through coolant holes. Info	**Ø25 — Ø40**	P K	**L326**

CLASSIFICATION



Product Name / Cutting Mode	VPX200 VPX300	APX3000 APX4000	AXD4000 AXD7000	BXD4000	NEW WJX09 WJX14 AJX	AQX	ARX	ARP BRP	OCTACUT	NEW WWX400	ASX400	ASX445 WSX445	
	Multi-Functional Type									General Type			
	L156 L162	L136 L146	L194 L208	L218	L244 L252 L231	L220	L270	L266 L274	L258	L103	L118	L056 L044	
Face Milling	●	●	●	●	●	●	●	●	●	●	●	●	
Shoulder Milling	●	●	●	●		●			●	●	●		
Slot Milling	●	●	●	●	●	●	●	●	●	●	●		
Pocket Milling	●	●	●	●	●	●	●	●	●				
Copy Milling	●	●	●	●	●	●	●	●	●				
Helical Drilling	●	●	●	●	●	●	●	●	●				
Spot Milling													
Chamfer Milling									●			●	
Radius Milling							●	●	●				

	General Type		Long Cutting Edge Type				Ball/Radius Type			Special Purpose Type				
	AOX445	**BAP300**	**DCCC**	NEW **VPX200** **VPX300** **APX3000** **APX4000** Long Cutting Edge Type	**VFX5** **VFX6**	NEW **ASPX** **SPX**	**SRM2**	**SRF/SRB** For Finishing	**SUF** For Finishing	**CESP** **CFSP** **CGSP**	**TSMP**	**CBJP** **CBMP**	**PMC** *1 **PMF** **PMR**	**KSMG**
	 ➲ L087	 ➲ L122	 ➲ L280	 ➲ L159 ➲ L165 ➲ L142 ➲ L152	 ➲ L292 ➲ L296	 ➲ L288 ➲ L283	 ➲ L308 ➲ L316	 ➲ L300	 ➲ L304	 ➲ L318	 ➲ L320	 ➲ L322	 ➲ L326 ➲ L328 ➲ L330	 ➲ L324
														
													 *4	
										 *2	 *3			 *5
														
														
														
														

*1 Vertical Feed Milling *2 V-Slot Milling *3 T-Slot Milling *4 Plunging *5 Slot Milling

IDENTIFICATION

Symbol	Insert Shape	
6	Special Design	—
N	Heptagonal	⬣
O	Octagonal	⯃
S	Square	■
T	Triangular	▲
C	Rhombic80°	▰
M	Rhombic86°	▰
A	Parallelogram85°	▰
R	Round	●
L	Rectangular	▬
J	Special Design	—
X	Special Design	—
W	Wiper	—

① Insert Shape

Symbol	Normal Clearance **AN**	
C	**7°**	
D	**15°**	
E	**20°**	
F	**25°**	
G	**30°**	
N	**0°**	
P	**11°**	
O	Other Normal Clearance	
X	Other Normal Clearance	

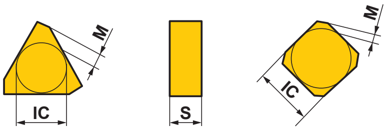
② Normal Clearance

①

S **E** **E** **R**

② ③ ④

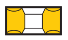
③ Tolerance Class



Symbol	Tolerance of Nose Height **M** (mm)	Tolerance of Inscribed Circle **IC** (mm)	Tolerance of Thickness **S** (mm)
A	±0.005	±0.025	±0.025
C	±0.013	±0.025	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
K*	±0.013	±0.05—±0.15	±0.025
M*	±0.08—±0.18	±0.05—±0.15	±0.13
N*	±0.08—±0.18	±0.05—±0.15	±0.025

The surface of insert with * mark is sintered.

④ Fixing and/or for Chip Breaker

Symbol	Hole	Hole Configuration	Chip Breaker	Figure
W	With Hole	Cylindrical Hole + One Countersink (40°—60°)	No	
T	With Hole		Single Sided	
U	With Hole	Cylindrical Hole + One Countersink (40°—60°)	Double Sided	
B	With Hole	Cylindrical Hole + One Countersink (70°—90°)	No	
N	Without Hole	—	No	
R	Without Hole	—	Single Sided	
X	—	—	—	Special Design

Symbol				Diameter of Inscribed Circle
R	C	S	T	
	06	06	11	6.35
	08	07	13	7.94
	09	09	16	9.525
10				10.00
12				12.00
	12	12	22	12.70
	16	15	27	15.875
20				20.00

⑤ Insert Size

Symbol	Insert Thickness (mm)
03	3.18
T3	3.97
04	4.76

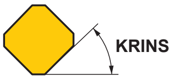
⑥ Insert Thickness

Symbol	Edge Preparation(Honing)
F	 Sharp
E	 Round
T	 Chamfer
S	 Chamfer + Round

⑨ Cutting Edge Condition

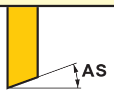
⑤	⑥	⑦	⑧	⑨	⑩	⑪		⑫
12	03	A	F	E	R	1	-	JS

⑦ Wiper Insert Cutting Angle



Symbol	Wiper Insert Cutting Angle
A	45°
E	75°
P	90°
Z	Other Angle

⑧ Clearance of Wiper Insert

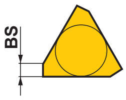


Symbol	Clearance Angle
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°

⑩ Hand Tool Holder

Symbol	Hand Tool Holder
L	Left Hand Tool Holder
N	For Both Right and Left Hand Tool Holder
R	Right Hand Tool Holder

⑪ Width of Wiper Insert



Symbol	Width of Wiper Insert
1	1.4 (1.94 only for TEKN)
2	2.0 (2.4 for SFAN,SFCN)

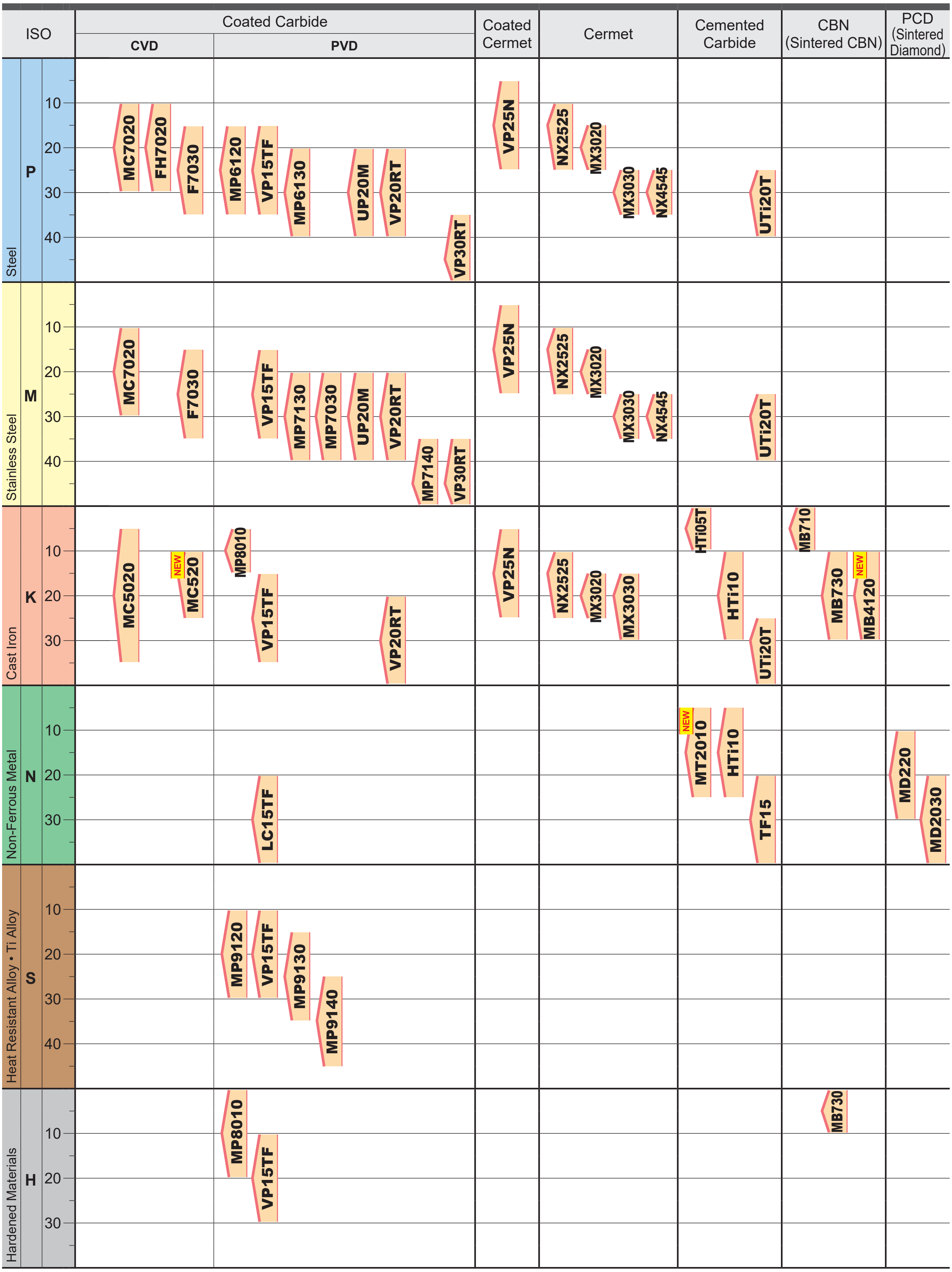
⑫ Chip Breaker

Symbol	Name
FT	FT Breaker
HS	HS Breaker
JH	JH Breaker
JM	JM Breaker
JP	JP Breaker
JS	JS Breaker
LS	LS Breaker
MM	MM Breaker
MS	MS Breaker

The above table shown as reference example.

GRADES FOR MILLING

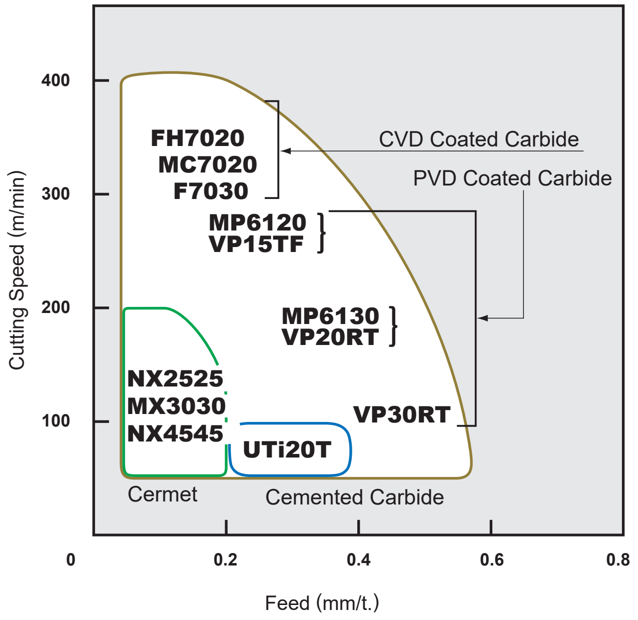
●INDEXABLE INSERT GRADES FOR MILLING



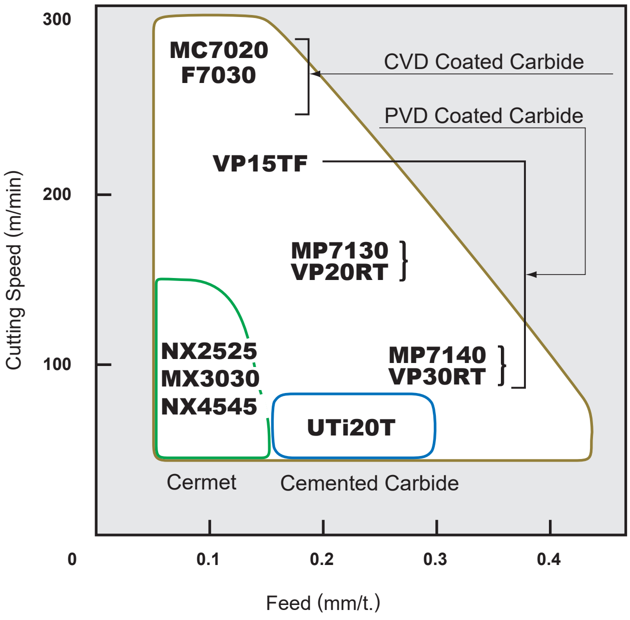
ISO		Coated Carbide CVD	Coated Carbide PVD	Coated Cermet	Cermet	Cemented Carbide	CBN (Sintered CBN)	PCD (Sintered Diamond)
Steel	P	MC7020 FH7020 F7030	MP6120 VP15TF MP6130 UP20M VP20RT VP30RT	VP25N	NX2525 MX3020 MX3030 NX4545	UTi20T		
Stainless Steel	M	MC7020 F7030	VP15TF MP7130 MP7030 UP20M VP20RT MP7140 VP30RT	VP25N	NX2525 MX3020 MX3030 NX4545	UTi20T		
Cast Iron	K	MC5020 NEW MC520	MP8010 VP15TF VP20RT	VP25N	NX2525 MX3020 MX3030	HTi05T HTi10 UTi20T	MB710 MB730 NEW MB4120	
Non-Ferrous Metal	N		LC15TF			NEW MT2010 HTi10 TF15		MD220 MD2030
Heat Resistant Alloy • Ti Alloy	S		MP9120 VP15TF MP9130 MP9140					
Hardened Materials	H		MP8010 VP15TF				MB730	

MILLING APPLICATION RANGE

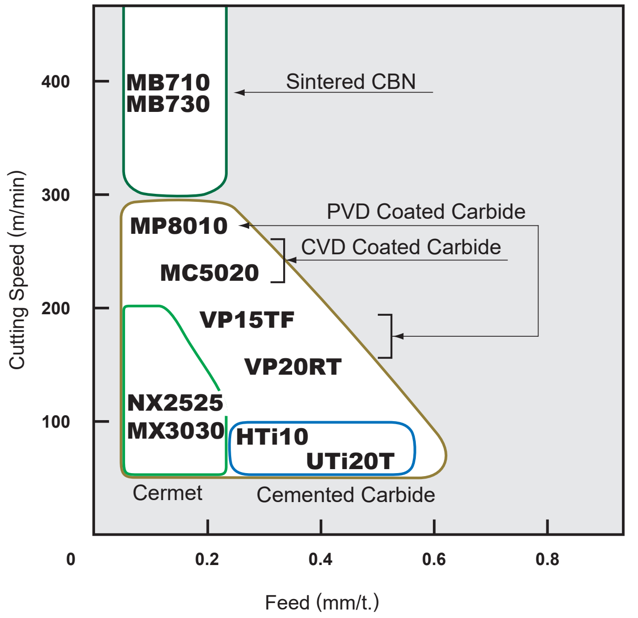
P STEEL



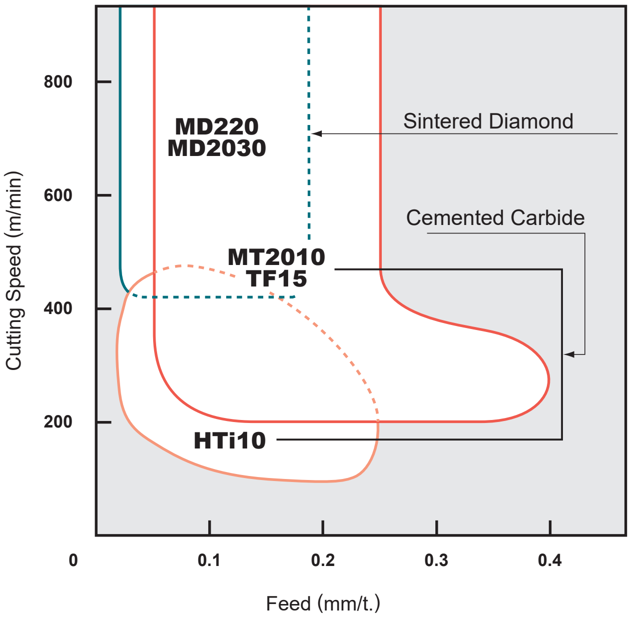
M STAINLESS STEEL



K CAST IRON

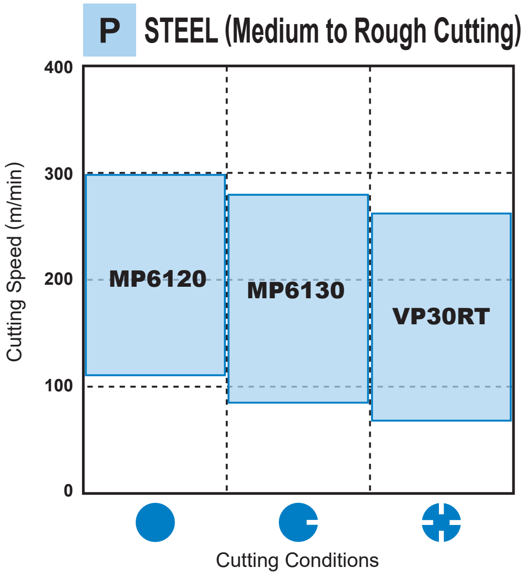


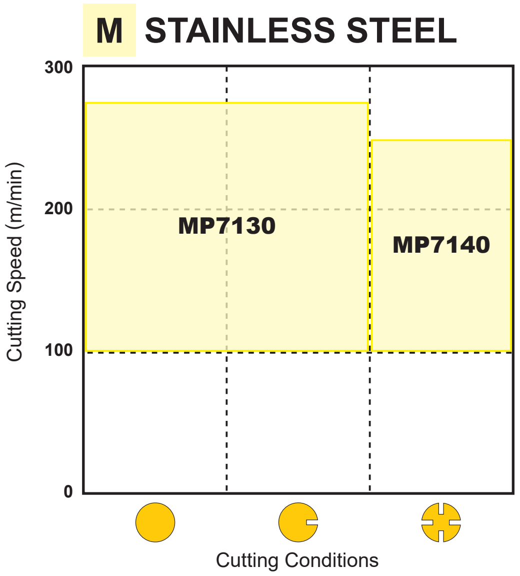
N NON-FERROUS METAL

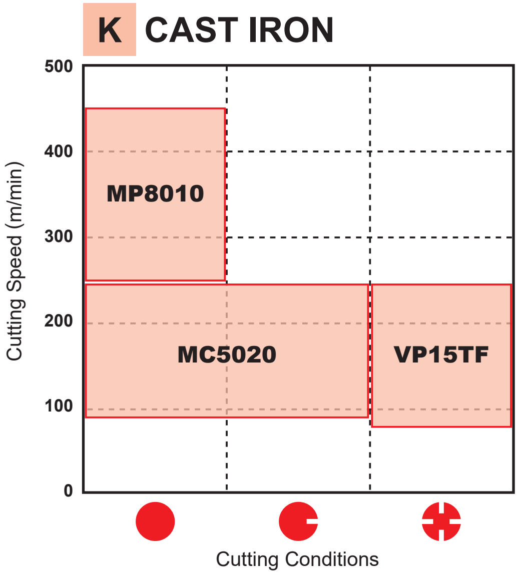


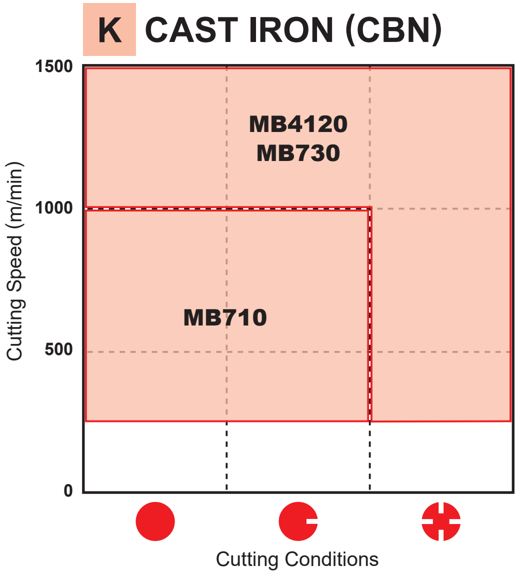
MILLING APPLICATION RANGE

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





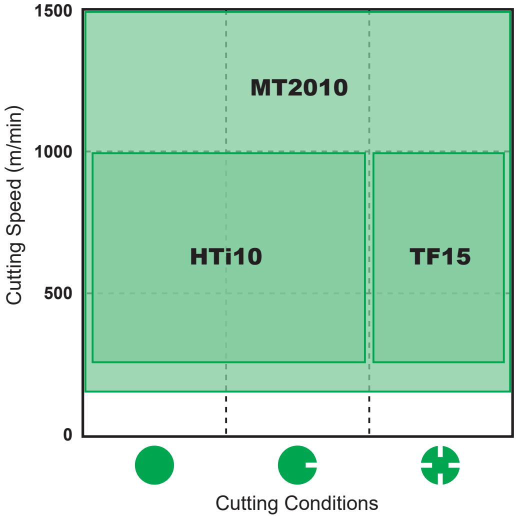




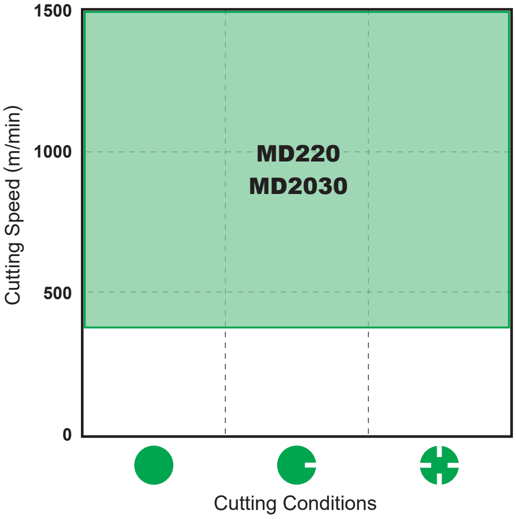
CUTTING CONDITIONS

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

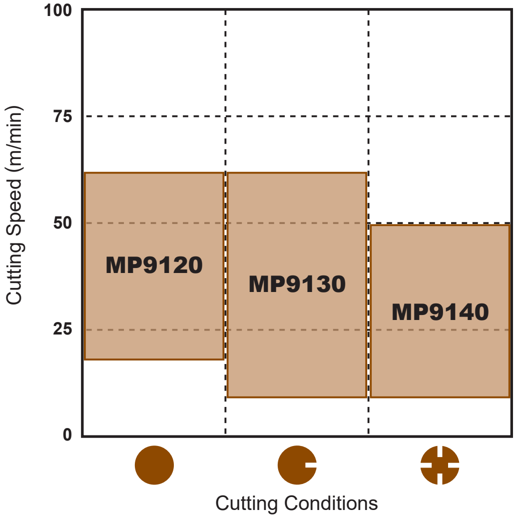
N NON-FERROUS METAL



N NON-FERROUS METAL (PCD)



S HEAT RESISTANT ALLOY, TITANIUM ALLOY



COATED CARBIDE
(CVD&PVD)

<CVD>

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

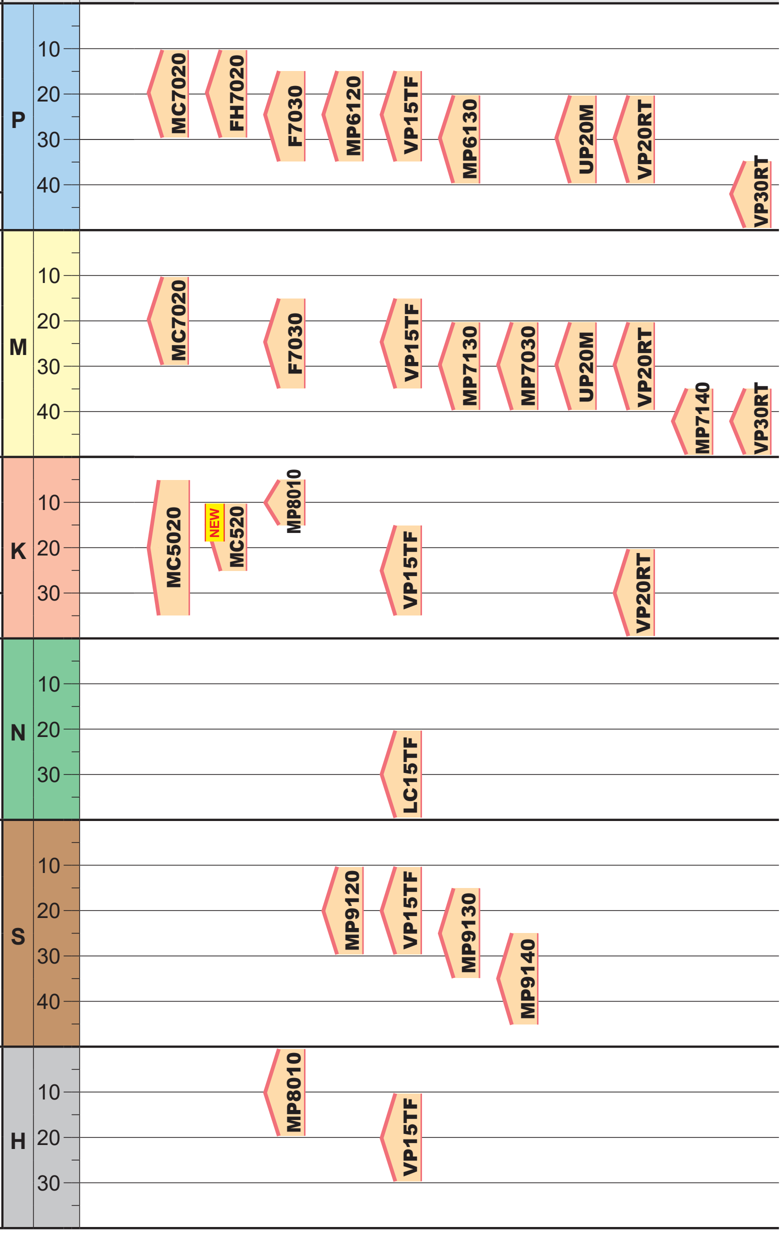
<PVD>

- PVD coating prolongs tool life when compared to cemented carbide under the same cutting conditions.
- Coating of tools with sharp edges is possible without softening or changing the quality of the substrate.

■SELECTION STANDARD

Workpiece Material	Recommended Grade	ISO
P Steel	**F7030** **MC7020** **MP6120** **MP6130** **VP15TF**	P
M Stainless Steel	**F7030** **MC7020** **MP7030** **MP7130** **MP7140** **VP15TF**	M
K Cast Iron	**MC5020** NEW **MC520** **VP15TF**	K
N Aluminium Alloy	**LC15TF**	N
S Heat Resistant Alloy Ti Alloy	**MP9120** **VP15TF** **MP9130** **MP9140**	S
H Hardened Materials	**MP8010** **VP15TF**	H

Application Range



GRADE CHARACTERISTICS

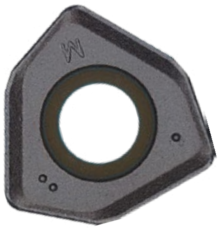
Grade	Substrate	Coating Layer	
	Hardness (HRA)	Composition	Thickness
MC5020	91.0	TiCN-Al_2O_3-Ti Compound	Thick
NEW **MC520**	91.0	TiCN-Al_2O_3-Ti Compound	Thick
MC7020	88.8	TiCN-Al_2O_3-Ti Compound	Thick
FH7020	89.0	TiCN-Al_2O_3-Ti Compound	Thick
F7030	88.8	TiCN-Al_2O_3-TiN	Thin
MP6120	91.5	(Al,Ti,Cr)N	Thin
MP6130	90.5	(Al,Ti,Cr)N	Thin
MP7030	90.5	(Al,Ti)N-Ti Compound	Thin
MP7130	90.5	(Al,Ti)N-Ti Compound	Thin
MP7140	88.8	(Al,Ti)N-Ti Compound	Thin

Grade	Substrate	Coating Layer	
	Hardness (HRA)	Composition	Thickness
MP8010	93.5	(Al,Ti,Si)N	Thin
MP9120	91.5	(Al,Ti,Cr)N	Thin
MP9130	90.5	(Al,Ti,Cr)N	Thin
MP9140	89.0	(Al,Ti)N	Thin
VP15TF	91.5	(Al,Ti)N	Thin
VP20RT	90.5	(Al,Ti)N	Thin
VP30RT	88.8	(Al,Ti)N	Thin
UP20M	90.5	TiN-TiCN-TiN	Thin

Note 1) The hardness values shown represent the typical values of the internal hardness.

For machining of steels and stainless steels

MC7020

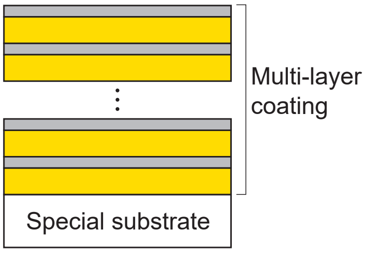


The micro-grain wear resistant Al_2O_3 and fibrous TiCN layers deliver excellent wear resistance in high-speed cutting. Use of a specially developed cemented carbide that provides superior resistance to fracture and thermal cracking prevents the cutting edge from sudden fracturing.

For machining of stainless steel

MP7130

MP7130 has a multi-layer coating based on a newly developed Ti-compound. It provides superior wear and fracture resistance in stainless steel machining. A special tough cemented carbide substrate gives excellent performance in machining of difficult-to-cut materials such as stainless steel.



Heat resistant Alloy, Cutting For Titanium Alloy

MP9130

An enhanced super fine cemented carbide substrate has increased toughness while maintaining hardness. The Al-Ti-Cr-N accumulative coating ensures optimum heat and wear resistance. The combination of these properties gives excellent fracture resistance and welding resistance because of low coefficient of friction when machining titanium alloys.

MP9140

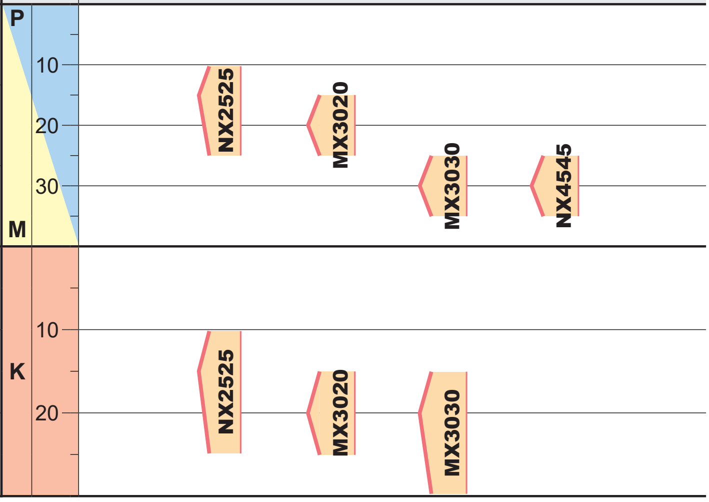
The new technology Al-(Al, Ti)N coating provides stabilisation of the high hardness phase and succeeds in dramatically improving wear, crater and welding resistance.

CERMET

- ●NX2525 for high-speed milling.
- ●NX4545, MX3030 for general milling.

■SELECTION STANDARD

MILLING

Workpiece Material		Recommended Grade	ISO	Application Range
P M	Steel Stainless Steel	NX2525	P M	
		MX3020		
		MX3030 NX4545		
K	Cast Iron	NX2525	K	
		MX3020		
		MX3030		

Note 1) In case of wet cutting, please use coated carbide VP15TF for steel cutting and coated carbide MC5020 for cast iron cutting.

■GRADE CHARACTERISTICS

Grade	Hardness (HRA)
NX2525	92.2
MX3030	91.0
NX4545	90.0

Note 1) The hardness values shown represent the typical values of the internal hardness.

CEMENTED CARBIDE

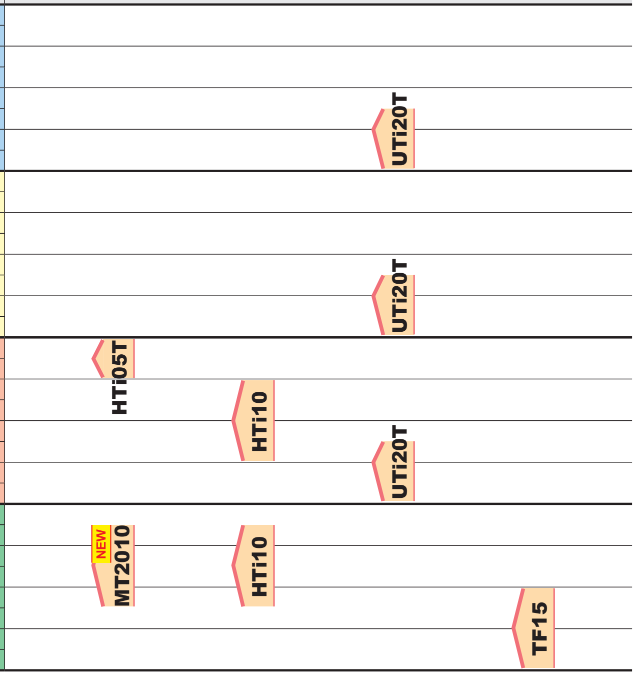
- **Available grade series are UTi20T for steel and cast iron, and HTi10 for cast iron, non-ferrous metal and non-metal.**

SELECTION STANDARD

MILLING

	Workpiece Material	Recommended Grade	ISO
P	Steel	**UTi20T**	P 10 20 30
M	Stainless Steel	**UTi20T**	M 10 20 30
K	Cast Iron	**HTi05T**	K 10 20 30
		HTi10	
		UTi20T	
N	Non-Ferrous Metal	**HTi10**	N 10 20 30
		NEW **MT2010**	
		TF15	

Application Range



MAIN COMPONENT AND APPLICATION

ISO	Main Component	Characteristics	Workpiece Material
P M	WC-TiC-TaC-Co	Heat / 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)
P M	**UTi20T**	90.5
K N	**HTi05T**	92.5
	HTi10	92.0
N	**MT2010**	91.8
	TF15	91.5

Note 1) The hardness values shown represent the typical values of the internal hardness.

CBN (SINTERED CBN)

- MB4120, MB710 and MB730 for cast iron cutting.
- MB4120 for high efficiency machining of cast iron.
- BC5030 for high-speed machining of cast irons available.
- The combination of the BC5030 insert geometry and the AOX allows the use of up to 16 corners per insert, enabling cost effective, high efficiency machining.

■SELECTION STANDARD / RECOMMENDED CUTTING CONDITIONS

Recommended Cutter : NF10000, OCTACUT, PMF, ASX445

Workpiece Material		Structure	Cutting Speed (m/min) 250 500 750 1000 1250	Feed (mm/t.)	Depth of Cut (mm)	Coolant
Grey Cast Iron	**JIS FC250**	Ferritic + Pearilitic	 **MB710** **MB730**	−0.3	−0.5	Dry
	JIS FC300	Pearilitic				

Recommended Cutter : FMAX

Workpiece Material		Structure	Cutting Speed (m/min) 250 500 750 1000 1250	Feed (mm/t.)	Depth of Cut (mm)	Coolant
Grey Cast Iron	**JIS FC300**	Pearilitic	 **MB4120**	−0.15	−0.5	Dry

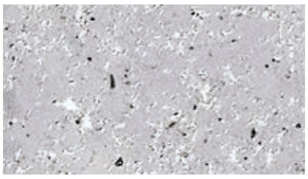
Recommended Cutter : AOX445

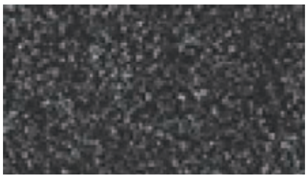
Workpiece Material		Structure	Cutting Speed (m/min) 250 500 1000 1500 2000	Feed (mm/t.)	Depth of Cut (mm)	Coolant
Grey Cast Iron	**JIS FC250**	Pearilitic	 **BC5030**	−0.15	−3.0	Dry

■FEATURES AND BASE

Grade	Application	Features	Main Component	Coating Layer
NEW **MB4120**	For High Efficiency Machining For High-Speed Cutting For interrupted Cutting	Fine CBN particles increase cutting edge toughness. The high fracture resistance allows stable performance even during interrupted machining. Optimised grade prevents fracture, edge chipping and thermal cracks under both dry cutting conditions and when cutting workpieces following the wet cutting process.	CBN Co Base Alloy	–
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	For 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 coated grade for easy recognition of used corners.	CBN AlN	TiN

PCD (SINTERED DIAMOND)


Micro-Structure of **MD220**


Micro-Structure of **MD2030**

- **Suitable for cutting of non-ferrous metals such as aluminium alloys.**
- **Suitable for extremely high-speed finishing.**

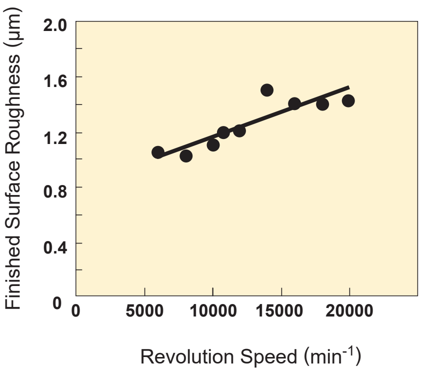
■GRADE FEATURES

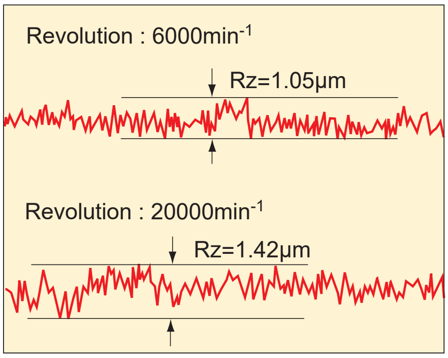
Grade	Features
MD220	Excellent in the balance between wear resistance and fracture resistance. For a wide range of tooling applications.
MD2030	Improved fracture resistance when used in unstable applications. The stability of the cutting edge can meet a wide variety of workpiece material and cutting conditions.

■RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Cutting Speed (m/min)	Grade	Feed per Tooth (mm/t)	Depth of Cut (mm)
Aluminium Alloy (Si ≤12%)	2000—3000	**MD220** **MD2030**	—0.2	—3.0
Aluminium Alloy (Si ≥13%)	400—800			

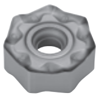
■CUTTING PERFORMANCE



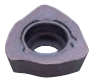
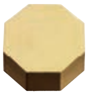


<Cutting Conditions>
Workpiece : JIS A7075-T6
Insert : NP-GDCW1240PDFR2
Grade : MD220
Tool : V10000R0406D
Feed : 0.2mm/t
Depth of Cut : 0.5mm
Width of Cut : 80mm
Dry Cutting

CLASSIFICATION

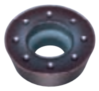
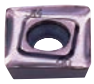
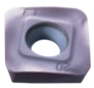
Cutter Type Shape	Order Number	Page
AF5000 	LDCN190412R	L350
AHX440S **AHX475S** 	NNMU130508ZER-L NNMU130508ZEN-M NNMU130532ZEN-M NNMU130532ZEN-R	L062 L067
	WNEU1305ZEN4C-M	L062
AHX640S 	NNMU200708ZEN-M	L071
	NNMU200708ZEN-MP	L071
	NNMU200712ZER-L	L071
	NNMU200712ZER-MM	L071

Cutter Type Shape	Order Number	Page
AHX640S 	WNEU2007ZEN7C-M	L071
	WNEU2007ZEN7C-WP	L071
	NNMU200608ZEN-MK	L071
	NNMU200608ZEN-HK	L071
	WNEU2006ZEN7C-WK	L071
AHX640W 	NNMU200608ZEN-MK	L079
	NNMU200608ZEN-HK	L079

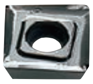
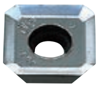
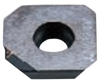
Cutter Type Shape	Order Number	Page
AHX640W 	WNEU2006ZEN7C-WK	L079
AJX **PMC** 	JOMW06T215ZZSR-FT JOMW080320ZZSR-FT JDMW09T320ZDSR-FT JDMW120420ZDSR-FT JDMW140520ZDSR-FT	L228 L326
	JOMT06T215ZZSR-JM JOMT080320ZZSR-JM JDMT09T320ZDSR-JM JDMT120420ZDSR-JM JDMT140520ZDSR-JM	L228 L326
	JDMT120420ZDSR-ST JDMT140520ZDSR-ST	L228 L326
	JOMT06T216ZZER-JL JOMT080322ZZER-JL JDMT09T323ZDER-JL JDMT120423ZDER-JL JDMT140523ZDER-JL	L228
AOX445 	SL-ONEN120404ASN	L087

Cutter Type Shape	Order Number	Page
APX3000 **APX3000** Long Cutting Edge Type 	AOGT123602PEFR-GM	L136 L142
	AOGT123604PEFR-GM	
	AOGT123608PEFR-GM	
	AOMT123602PEER-M	L136 L142
	AOMT123604PEER-M	
	AOMT123608PEER-M	
	AOMT123610PEER-M	
	AOMT123612PEER-M	
	AOMT123616PEER-M	
	AOMT123620PEER-M	
	AOMT123624PEER-M	
	AOMT123630PEER-M	
	AOMT123632PEER-M	
	AOMT123604PEER-H	L136 L142
	AOMT123608PEER-H	
	AOMT123616PEER-H	
APX4000 **APX4000** Long Cutting Edge Type 	AOMT184804PEER-H	L146 L152
	AOMT184808PEER-H	
	AOMT184816PEER-H	
	AOMT184832PEER-H	
	AOMT184840PEER-H	
	AOMT184850PEER-H	
	AOMT184864PEER-H	
	AOMT184804PEER-M	L146 L152
	AOMT184808PEER-M	
	AOMT184810PEER-M	
	AOMT184812PEER-M	
	AOMT184816PEER-M	
	AOMT184820PEER-M	

Cutter Type Shape	Order Number	Page
AQX 	QOMT0830R-M2	L220
	QOMT1035R-M2	
	QOMT1342R-M2	
	QOMT1651R-M2	
	QOMT1856R-M2	
	QOMT2062R-M2	
	QOMT2576R-M2	
	QOGT0830R-G1	L220
	QOGT1035R-G1	
	QOGT1342R-G1	
	QOGT1651R-G1	
	QOGT1856R-G1	
	QOGT2062R-G1	
	QOGT2576R-G1	
ARP 	RPHT1040M0E4-L	L264
	RPMT1040M0E4-L	
	NEW RPMT1040M0E8-L1	
	NEW RPMT1040M0E4-L2	
	RPHT1040M0E4-M	
	RPMT1040M0E4-M	
	NEW RPMT1040M0E8-M1	
	NEW RPMT1040M0E4-M2	
	RPHT1040M0E4-R	
	RPMT1040M0E4-R	
	NEW RPMT1040M0E8-R1	
	RPHT1248M0E4-L	L264
	RPMT1248M0E4-L	
	NEW RPMT1248M0E8-L1	
	NEW RPMT1248M0E4-L2	
	RPHT1248M0E4-M	
	RPMT1248M0E4-M	
	NEW RPMT1248M0E8-M1	
	NEW RPMT1248M0E4-M2	
	RPHT1248M0E4-R	
	RPMT1248M0E4-R	
	NEW RPMT1248M0E8-R1	

Cutter Type Shape	Order Number	Page
ARX 	RDMW0517M0E	L270
	RDMW0620M0E	
	RDMW0724M0E	
ASPX NEW 	JPGX1404080PPER-JM	L288
	JPGX1404120PPER-JM	
	JPGX1404160PPER-JM	
	JPGX1404240PPER-JM	
	JPGX1404320PPER-JM	
	JPGX1404400PPER-JM	
	JPGX1404500PPER-JM	
	JPGX1404635PPER-JM	
NEW 	SPGX1204100PPER-JM	L288
ASX400 **ASX400** **Side Cutter** 	SOET12T308PEER-JL	L116
	SOMT12T308PEER-JM	L116 L135
	SOMT12T308PEEL-JM	
	SOMT12T308PEER-JH	L116
	SOMT12T320PEER-FT	L116

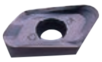
CLASSIFICATION

Cutter Type Shape	Order Number	Page
ASX400 **ASX400** **Side Cutter** 	SOGT12T308PEFR-JP	L116
	WOEW12T308PEER8C WOEW12T308PETR8C	L116
ASX445 	SEET13T3AGEN-JL	L054
	SEMT13T3AGSN-JM	L054
	SEMT13T3AGSN-JH	L054
	SEMT13T3AGSN-FT	L054
	SEGT13T3AGFN-JP	L054
	WEEW13T3AGER8C WEEW13T3AGTR8C	L054
	WEEW13T3AGFR3C WEEW13T3AGTR3C	L054

Cutter Type Shape	Order Number	Page
AXD4000 **AXD4000A** 	XDGX175004PDFR-GL XDGX175008PDFR-GL XDGX175012PDFR-GL XDGX175016PDFR-GL XDGX175020PDFR-GL XDGX175024PDFR-GL XDGX175030PDFR-GL XDGX175032PDFR-GL XDGX175040PDFR-GL XDGX175050PDFR-GL	L194 L202
	XDGX175004PDER-GM XDGX175008PDER-GM XDGX175012PDER-GM XDGX175016PDER-GM XDGX175020PDER-GM XDGX175024PDER-GM XDGX175030PDER-GM XDGX175032PDER-GM XDGX175040PDER-GM XDGX175050PDER-GM	L194 L202
	XDGX175004PDFR-GM XDGX175008PDFR-GM XDGX175012PDFR-GM XDGX175016PDFR-GM XDGX175020PDFR-GM XDGX175024PDFR-GM XDGX175030PDFR-GM XDGX175032PDFR-GM XDGX175040PDFR-GM XDGX175050PDFR-GM	L194 L202

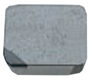
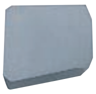
Cutter Type Shape	Order Number	Page
AXD7000 	XDGX227008PDFR-GL XDGX227016PDFR-GL XDGX227020PDFR-GL XDGX227030PDFR-GL XDGX227032PDFR-GL XDGX227040PDFR-GL XDGX227050PDFR-GL	L208
	XDGX227008PDER-GLA XDGX227016PDER-GLA XDGX227020PDER-GLA XDGX227024PDER-GLA XDGX227030PDER-GLA XDGX227032PDER-GLA XDGX227040PDER-GLA XDGX227050PDER-GLA	L208
BAE 	AEMW150304ER AEMW150308ER AEMW19T304ER AEMW19T308ER	L344
BAP300 **BAP300** Long Cutting Edge Type 	APMT1135PDER-H1 APMT1135PDER-H2 APMT1135PDER-H3 APMT1135PDER-H4 APMT1135PDER-H6	L122 L344
	APMT1135PDER-M0 APMT1135PDER-M1 APMT1135PDER-M2	L122 L344
	APGT1135PDFR-G2	L122 L344

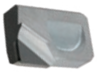
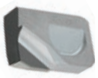
Cutter Type Shape	Order Number	Page
BAP400 	APMT1604PDER-H1	L344
	APMT1604PDER-H2	
	APMT1604PDER-H4	
	APMT1604PDER-H6	
	APMT1604PDER-H8	
	APMT1604PDER-M2	L344
	APGT1604PDFR-G2	L344
BF407 QBF407 	SFAN1203ZFFR2	L346
	SFAN1203ZFFL2	
	SFCN1203ZFFR2	
	SFCN1203ZFFL2	
BMR 	HNMX1206EN06-R	L332
	HNMX1206ER12-R	L332
BN425 DN 	SNC43B2G	L346
	SNC43B2S	
	SNMF43B2G	L347

Cutter Type Shape	Order Number	Page
BRP 	RPMW08T2M0T	L274
	RPMW10T3M0E	
	RPMW10T3M0T	
	RPMW1204M0E	
	RPMW1204M0T	
	RPMW1606M0E	
	RPMW1606M0T	
	RPMT08T2M0E-JS	L274
	RPMT10T3M0E-JS	
	RPMT1204M0E-JS	
	RPMT1606M0E-JS	
BXD4000 	XDGT1550PDER-G04	L216
	XDGT1550PDER-G08	
	XDGT1550PDER-G12	
	XDGT1550PDER-G16	
	XDGT1550PDER-G20	
	XDGT1550PDER-G30	
	XDGT1550PDER-G32	
	XDGT1550PDER-G40	
	XDGT1550PDER-G50	
	XDGT1550PDFR-G04	L216
	XDGT1550PDFR-G08	
	XDGT1550PDFR-G12	
	XDGT1550PDFR-G16	
	XDGT1550PDFR-G20	
	XDGT1550PDFR-G30	
	XDGT1550PDFR-G32	
	XDGT1550PDFR-G40	
	XDGT1550PDFR-G50	
	XDGT1550PDFR-GL04	L216
	XDGT1550PDFR-GL08	

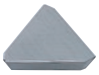
Cutter Type Shape	Order Number	Page
CBJP TAB 	JPMT060204-E	L322 L345
CBMP ECMP TAB 	MPMT070308	L322 L345
	MPMT090308	
	MPMT120408	
CESP CFSP CGSP 	SPMW090304	L318
	SPMW090308	
	SPMW120304	
	SPMW120308	
DCCC 	CCMX083508EN-A	L280
	CCMX09T308EN-A	
	CCMX09T308EN-B	L280
	ZCMX083508ER-A	L280
	ZCMX09T308ER-A	
	ZCMX09T308ER-B	L280

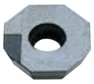
CLASSIFICATION

Cutter Type Shape	Order Number	Page
E404 **FE404** 	**SEA42C10GR** **SEA42C10GL**	**L338** **L345**
FBP415 **QBP415** 	**SPEN1203EEER1** **SPEN1203EEEL1** **SPNN1203EEER1** **SPNN1203EEEL1**	**L347**
	**SPER1203EEER-JS**	**L347**
	**SPEN1203EETR1**	**L350**
	**WPC42EEER10C** **WPC42EEEL10C**	**L349**
FF3000 	**SPCA53Z**	**L098**
	**SPCG53Z**	**L098**

Cutter Type Shape	Order Number	Page
FMAX 	**GOER1404PXFR2** **GOER1408PXFR2**	**L089**
NEW 	**NP-GOEN1404PXSR05** **NP-GOEN1408PXSR05**	**L089**
	**GOER1408PXFR2-8**	**L089**
	**GOER1401ZXFR2**	**L089**
FMSD 	**SDEN1203AEN**	**L345**
FP490 	**SPEN424A**	**L334**
FP590 	**SPEN535A**	**L336**

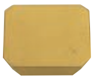
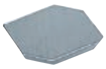
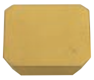
Cutter Type Shape	Order Number	Page
NF10000 	**GDCN2004PDFR3**	**L096**
	**NP-GDCN2004PDSR3**	**L096**
MG200 	**MGEEW1035PFTR**	**L345**
MG300 	**MGEEW1242PFTR**	**L345**
MG400 	**MGEEW1650PFTR**	**L345**
MG245 	**MGEEW1035AFTR**	**L345**
MG345 	**MGEEW1242AFTR**	**L345**

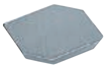
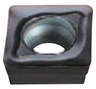
Cutter Type Shape	Order Number	Page
MG445 	MGEEW1650AFTR	L345
NSE300 SE300 	TEEN1603PEFR1	L348
	TEEN1603PEER1	
	TEEN1603PETR1	
	TEEN1603PESR1	
	TECN1603PEFR1W	L348
	TECN1603PEER1W	
	TECN1603PETR1W	
	TEER1603PEER-JS	L348
NSE400 SE400 	TECN2204PEFR1	L348
	TECN2204PEER1	
	TECN2204PETR1	
	TEEN2204PEFR1	
	TEEN2204PEER1	
	TEEN2204PETR1	
	TEEN2204PESR1	
	TEER2204PEER-JS	L348

Cutter Type Shape	Order Number	Page
OCTACUT 	OEMX12T3ETR1	L258
	OEMX12T3ESR1	
	OEMX1705ESR1	
	OEMX1705ETR1	
	OEMX12T3ETR1	L258
	OEMX12T3EER1-JS	L258
	OEMX1705EER1-JS	
	OEMX1705ETR1-JS	
	REMX1705SN	L258
	REMX12T3EN-JS	L258
	REMX1705EN-JS	
PMF 	TPEW1303ZPER2	L328
	TPEW1303ZPTR2	L328

Cutter Type Shape	Order Number	Page
PMR 	CPMT1205ZPEN-M2	L330 L344
	CPMT1205ZPEN-M3	
	CPMT1906ZPEN-M2	
	CPMT1906ZPEN-M3	
S400 	SPMN120304	L347
	SPMN120304T	
	SPMN120308	
	SPMN120312	
	SPMN120408	
	SPMN120412	
	SPGN120304	
	SPGN120308	
	SPGN120312	
S500 	SPMN150408	L347
	SPMN150412	
	SPGN150404	
	SPGN150408	
SE415 QSE415 	SEEN1203EFFR1	L346
	SEEN1203EFER1	
	SEEN1203EFTR1	
	SEEN1203EFSR1	
	SEER1203EFER-JS	L346
	WEC42EFER5C	L349
	WEC42EFTR5C	

CLASSIFICATION

Cutter Type Shape	Order Number	Page
SE445 LSE445 	SECN1203AFTN1 SEEN1203AFFN1 SEEN1203AFEN1 SEEN1203AFTN1 SEEN1203AFSN1	L345
	SEER1203AFEN-JS	L346
	WEC42AFTR5C	L349
SE515 	SECN1504EFTR1 SEEN1504EFER1 SEEN1504EFSR1 SEEN1504EFTR1	L346
	WEC53EFTR5C	L349
SE545 	SEEN1504AFEN1 SEEN1504AFSN1 SEEN1504AFTN1	L346
	SEER1504AFEN-JS	L346

Cutter Type Shape	Order Number	Page
SE545 	WEC53AFER5C WEC53AFTR5C	L349
SG20 	RGEN2004M0EN RGEN2004M0SN	L345
SPX 	JPMX140412-JM JPMX190412-JM	L283
	JPMX140412-WH JPMX190412-WH	L283
	MPMX120412-JM	L283
	MPMX120412-WH	L283
	SPMX120408-JM	L283
	SPMX120408-WH	L283
SRB 	SRBT10 SRBT12 SRBT16 SRBT20 SRBT25 SRBT30 SRBT32	L300

Cutter Type Shape	Order Number	Page
SRF 	SRFT10 SRFT12 SRFT16 SRFT20 SRFT25 SRFT30 SRFT32	L300
SRM2 	SRM16C-M SRM20C-M SRM25C-M SRM30C-M SRM32C-M	L308
	SRM16E-M SRM20E-M SRM25E-M SRM30E-M SRM32E-M	L308
	SRG16C SRG20C SRG25C SRG30C SRG32C	L308
	SRG16E SRG20E SRG25E SRG30E SRG32E	L308
	APMT1135PDER-H2 APMT1604PDER-H2	L308
	APMT1135PDER-M2 APMT1604PDER-M2	L308

Cutter Type Shape	Order Number	Page
SRM2φ40 φ50 	SRG40C	L316
	SRG50C	
	SRG40E	L316
	SRG50E	
	APMT1604PDER-H2	L316
	APMT1604PDER-M2	L316
SUF 	SUFT10R05	L304
	SUFT10R10	
	SUFT10R20	
	SUFT12R05	
	SUFT12R10	
	SUFT12R20	
	SUFT12R30	
	SUFT16R05	
	SUFT16R10	
	SUFT16R15	
	SUFT16R20	
	SUFT16R30	
	SUFT20R05	
	SUFT20R10	
	SUFT20R15	
	SUFT20R20	
	SUFT20R30	
	SUFT25R05	
	SUFT25R10	

Cutter Type Shape	Order Number	Page
SUF 	SUFT25R20	L304
	SUFT25R30	
	SUFT30R05	
	SUFT30R10	
	SUFT30R20	
	SUFT30R30	
	SUFT32R05	
	SUFT32R10	
	SUFT32R20	
TBE1 	SPMT120408-A	L348
TSMP 	MPMW070308	L320
	MPMW090308	
	MPMW120408	
V10000 	NP-GDCW1240PDFR2	L350
VAS300 Side Cutter NEW 	LNGU090604PNER-M	L126
	LNGU090604PNEL-M	
	LNGU090608PNER-M	
	LNGU090608PNEL-M	
	LNGU090612PNER-M	
	LNGU090612PNEL-M	
	LNGU090616PNER-M	
	LNGU090616PNEL-M	
	LNGU090620PNER-M	
	LNGU090620PNEL-M	
	LNGU090624PNER-M	
	LNGU090624PNEL-M	
	LNGU090630PNER-M	
	LNGU090630PNEL-M	
	LNGU090640PNER-M	
	LNGU090640PNEL-M	

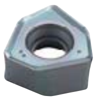
Cutter Type Shape	Order Number	Page
VAS400 Side Cutter 	LNGU130804PNER-M	L128
	LNGU130804PNEL-M	
	LNGU130808PNER-M	
	LNGU130808PNEL-M	
	LNGU130812PNER-M	
	LNGU130812PNEL-M	
	LNGU130816PNER-M	
	LNGU130816PNEL-M	
	LNGU130820PNER-M	
	LNGU130820PNEL-M	
	LNGU130824PNER-M	
	LNGU130824PNEL-M	
	LNGU130830PNER-M	
	LNGU130830PNEL-M	
	LNGU130840PNER-M	
	LNGU130840PNEL-M	
	LNGU130850PNER-M	
	LNGU130850PNEL-M	
	LNGU130804PNER-R	L128
	LNGU130804PNEL-R	
	LNGU130808PNER-R	
	LNGU130808PNEL-R	
	LNGU130812PNER-R	
	LNGU130812PNEL-R	
	LNGU130816PNER-R	
	LNGU130816PNEL-R	
	LNGU130820PNER-R	
	LNGU130820PNEL-R	
	LNGU130824PNER-R	
	LNGU130824PNEL-R	
	LNGU130830PNER-R	
	LNGU130830PNEL-R	
	LNGU130840PNER-R	
	LNGU130840PNEL-R	
	LNGU130850PNER-R	
	LNGU130850PNEL-R	

CLASSIFICATION

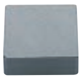
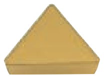
Cutter Type Shape	Order Number	Page
VAS500 Side Cutter 	LNGU171004PNER-R	L130
	LNGU171004PNEL-R	
	LNGU171008PNER-R	
	LNGU171008PNEL-R	
	LNGU171012PNER-R	
	LNGU171012PNEL-R	
	LNGU171016PNER-R	
	LNGU171016PNEL-R	
	LNGU171020PNER-R	
	LNGU171020PNEL-R	
	LNGU171024PNER-R	
	LNGU171024PNEL-R	
	LNGU171030PNER-R	
	LNGU171030PNEL-R	
	LNGU171040PNER-R	
	LNGU171040PNEL-R	
	LNGU171050PNER-R	
	LNGU171050PNEL-R	
	LNGU171060PNER-R	
	LNGU171060PNEL-R	
	LNGU171070PNER-R	
	LNGU171070PNEL-R	
VFX5 	XNMU160708R-MS	L292
	XNMU160712R-MS	
	XNMU160716R-MS	
	XNMU160724R-MS	
	XNMU160732R-MS	
	XNMU160740R-MS	
	XNMU160708R-HS	L292
	XNMU160708R-LS	L292

Cutter Type Shape	Order Number	Page
VFX6 	XNMU190912R-MS	L296
	XNMU190916R-MS	
	XNMU190924R-MS	
	XNMU190932R-MS	
	XNMU190940R-MS	
	XNMU190950R-MS	
	XNMU190912R-HS	L296
	XNMU190912R-LS	L296
VOX400 VOS400 Side Cutter 	SONX1206PER	L112 L134
	SONX1206PEL	
	WOEX1206PER5C	L112
VPX200 VPX200 Long Cutting Edge Type 	LOGU0904020PNER-L	L156 L159
	LOGU0904040PNER-L	
	LOGU0904080PNER-L	
	LOGU0904100PNER-L	
	LOGU0904120PNER-L	
	LOGU0904160PNER-L	
	LOGU0904020PNFR-L	
	LOGU0904040PNFR-L	
	LOGU0904080PNFR-L	
	LOGU0904100PNFR-L	
	LOGU0904120PNFR-L	
	LOGU0904160PNFR-L	

Cutter Type Shape	Order Number	Page
VPX200 VPX200 Long Cutting Edge Type 	LOGU0904020PNER-M	L156 L159
	LOGU0904040PNER-M	
	LOGU0904080PNER-M	
	LOGU0904100PNER-M	
	LOGU0904120PNER-M	
	LOGU0904160PNER-M	
	LOGU0904020PNFR-M	
	LOGU0904040PNFR-M	
	LOGU0904080PNFR-M	
	LOGU0904100PNFR-M	
	LOGU0904120PNFR-M	
	LOGU0904160PNFR-M	
VPX300 VPX300 Long Cutting Edge Type NEW 	LOGU1207020PNER-L	L162 L165
	LOGU1207040PNER-L	
	LOGU1207080PNER-L	
	LOGU1207100PNER-L	
	LOGU1207120PNER-L	
	LOGU1207160PNER-L	
	LOGU1207200PNER-L	
	LOGU1207240PNER-L	
	LOGU1207300PNER-L	
	LOGU1207320PNER-L	
NEW 	LOGU1207020PNFR-L	L162 L165
	LOGU1207040PNFR-L	
	LOGU1207080PNFR-L	
	LOGU1207100PNFR-L	
	LOGU1207120PNFR-L	
	LOGU1207160PNFR-L	
	LOGU1207200PNFR-L	
	LOGU1207240PNFR-L	
	LOGU1207300PNFR-L	
	LOGU1207320PNFR-L	

Cutter Type Shape	Order Number	Page
VPX300 **VPX300** Long Cutting Edge Type 	LOGU1207020PNER-M	L162 L165
	LOGU1207040PNER-M	
	LOGU1207080PNER-M	
	LOGU1207100PNER-M	
	LOGU1207120PNER-M	
	LOGU1207160PNER-M	
	LOGU1207200PNER-M	
	LOGU1207240PNER-M	
	LOGU1207300PNER-M	
	LOGU1207320PNER-M	
	LOGU1207020PNFR-M	L162 L165
	LOGU1207040PNFR-M	
	LOGU1207080PNFR-M	
	LOGU1207100PNFR-M	
	LOGU1207120PNFR-M	
	LOGU1207160PNFR-M	
	LOGU1207200PNFR-M	
	LOGU1207240PNFR-M	
	LOGU1207300PNFR-M	
	LOGU1207320PNFR-M	
WJX09 NEW 	JOMU090512ZZER-L	L242
	JOMU090512ZZER-M	
	JOMU090512ZZER-R	
WJX14 	NEW JOMU140715ZZER-L	L250
	JOMU140715ZZER-M	
	NEW JOMU140715ZZER-R	

Cutter Type Shape	Order Number	Page
WSF406W NEW 	SNMU1206C05ZNER-M	L084
NEW 	WNGU1206ZNER5C-M	L084
WSX445 	SNGU140812ANFR-L	L040
	SNGU140812ANER-L	
	SNGU140812ANER-M	
	SNMU140812ANER-M	
	SNMU140812ANER-R	
	SNMU140812ANER-H	
	SNGU140812ANFL-L	
	SNGU140812ANEL-L	
	SNGU140812ANEL-M	
	SNMU140812ANEL-M	
	SNMU140812ANEL-R	
	WNGU1406ANEN8C-M	L040
WWX400 NEW 	6NGU1409040PNER-L	L100
	6NGU1409080PNER-L	
	6NGU1409040PNFR-L	
	6NGU1409080PNFR-L	
	6NGU1409040PNER-M	
	6NGU1409080PNER-M	
	6NMU1409040PNER-M	
	6NMU1409080PNER-M	
	6NMU1409080PNER-R	

Cutter Type Shape	Order Number	Page
WWX400 NEW 	2NGU1406ZNER6C-M	L100
Corner Angle 0° 11° Positive 	TPEN1603PPR	L348
	TPEN2204PDR	
Corner Angle 15° 11° Positive 	SPEN1203EDR	L347
Negative 	SNMN120408	L347
	SNMN120412	
11° Positive 	TPMN160304	L348
	TPMN160308	
	TPMN160312	
	TPMN220404	
	TPMN220408	
	TPMN220412	

LIST OF CUTTING EDGE DIAMETER TOLERANCES

Cutter Type	Cutting Edge Diameter Tolerance (mm)
AJX	−0.1 −0.4
APX3000 Arbor Type	−0.1 −0.4
APX3000 Shank Type	−0.1 −0.2
APX3000 Long Cutting Edge Type	−0.1 −0.3
APX4000 Arbor Type	−0.1 −0.4
APX4000 Shank Type	−0.1 −0.2
APX4000 Long Cutting Edge Type	−0.1 −0.3
AQX	−0.1 −0.3
ARP Arbor Type	−0.1 −0.3
ARP Shank Type	−0.1 −0.2
ARX	−0.05 −0.15
ASPX	−0.1 −0.3
ASX400	0 −0.3
AXD4000 Arbor Type	−0.1 −0.4
AXD4000 Shank Type	−0.1 −0.2
AXD4000A	−0.2 −0.4
AXD7000 Arbor Type	−0.1 −0.4
AXD7000 Shank Type	−0.1 −0.2
BAP300	0 −0.3
BRP	−0.1 −0.3
BXD4000 Arbor Type	−0.1 −0.4

Cutter Type	Cutting Edge Diameter Tolerance (mm)
BXD4000 Shank Type	−0.1 −0.2
CBJP	0 −0.3
CBMP	0 −0.3
OCTACUT	0 −0.3
PMC	±0.05
PMF	0 −0.3
PMR	0 −0.3
SPX	−0.1 −0.3
SRF	0 −0.027
SRM	−0.10 −0.30
SUF	0 −0.02
TSMP	−0.1 −0.3
VAS300	0 −0.3
VFX5, VFX6 Shell Type	−0.1 −0.3
VOX400	−0.1 −0.4
VPX200,VPX300 Arbor Type	−0.1 −0.3
VPX200,VPX300 Shank Type	−0.1 −0.2
VPX200,VPX300 Long Cutting Edge Type	−0.1 −0.3
WJX	−0.1 −0.3
WSF406W	±0.1
WWX400	−0.1 −0.3

Note 1) Cutting edge diameter tolerance when the gauge insert is set.
Note 2) When setting the insert available, the insert tolerance is added to the above tolerance.
(Tolerance when setting the insert for SRF.)

MAXIMUM ALLOWABLE REVOLUTION FOR CUTTER

Diameter (mm)	WSX445		ASX445		AOX445		ASX400		WSF406W		WJX14	
	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)
40	19000	3.5	—	—	—	—	—	—	—	—	—	—
50	17000	3.5	18000	3.5	13000	8	18000	3.5	—	—	5000	5.0
52	—	—	—	—	—	—	—	—	—	—	5000	5.0
63	15000	3.5	16000	3.5	12000	8	16000	3.5	—	—	18200	5.0
66	—	—	—	—	—	—	—	—	—	—	17700	5.0
80	14000	3.5	14000	3.5	11000	8	14000	3.5	7800	6.0	15600	5.0
100	12000	3.5	13000	3.5	9300	8	13000	3.5	7000	6.0	13500	5.0
125	11000	3.5	12000	3.5	8300	8	12000	3.5	6250	6.0	11600	5.0
160	9500	3.5	10000	3.5	7200	8	10000	3.5	5500	6.0	9900	5.0
200	8500	3.5	9000	3.5	6400	8	9000	3.5	4900	6.0	—	—
250	7500	—	8000	3.5	—	—	8000	3.5	4400	6.0	—	—
315	6500	—	6500	3.5	—	—	—	—	—	—	—	—

Diameter (mm)	FMAX		NF10000		AHX440S		AHX475S		AHX640S		AHX640W	
	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)
40	30000	—	—	—	21000	3.5	—	—	—	—	—	—
50	30000	3.5	—	—	19800	3.5	18300	3.5	—	—	—	—
63	27000	3.5	—	—	18300	3.5	17200	3.5	12000	5	—	—
80	24500	3.5	16000	8.5	16500	3.5	15700	3.5	10000	5	8900	6
100	22000	3.5	14000	8.5	14600	3.5	14000	3.5	8700	5	7800	6
125	19600	3.5	12000	8.5	12600	3.5	12200	3.5	7500	5	6600	6
160	—	—	—	—	10200	3.5	9900	3.5	6100	5	5300	6
200	—	—	—	—	—	—	—	—	5100	5	4100	6
250	—	—	—	—	—	—	—	—	—	—	2900	6
315	—	—	—	—	—	—	—	—	—	—	1700	6

Diameter (mm)	AXD4000		AXD7000		BXD4000		VPX200		VPX300		WJX09	
	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)	Max. Allowable Revolution (min^{-1})	Clamp Torque (N • m)
16	—	—	—	—	—	—	37900	1.0	—	—	—	—
18	—	—	—	—	—	—	35300	1.0	—	—	—	—
20	15000	1.5	—	—	15000	4	33200	1.0	—	—	—	—
22	—	—	—	—	—	—	31400	1.0	—	—	—	—
25	49000	1.5	—	—	38000	4	29000	1.0	24100	3.0	33500	2.0
28	48500	1.5	—	—	—	—	27200	1.0	22500	3.0	30300	2.0
30	—	—	—	—	—	—	26000	1.0	21500	3.0	—	—
32	48000	1.5	41000	3.5	33000	4	25100	1.0	20600	3.0	27300	2.0
35	45000	1.5	—	—	31000	4	23800	1.0	19500	3.0	25500	2.0
40	41000	1.5	36000	3.5	29000	4	22000	1.0	17900	3.0	23200	2.0
50	35000	1.5	30000	3.5	24000	4	19200	1.0	15500	3.0	20000	2.0
52	—	—	—	—	—	—	—	—	—	—	19500	2.0
63	30000	1.5	25000	3.5	21000	4	16700	1.0	13400	3.0	17300	2.0
66	—	—	—	—	—	—	—	—	—	—	16800	2.0
80	27000	1.5	23000	3.5	19000	4	—	—	11500	3.0	—	—
100	23000	1.5	19000	3.5	16000	4	—	—	—	—	—	—
125	20000	1.5	16000	3.5	14000	4	—	—	—	—	—	—

Note 1) All values shown on this chart are based on the insert being properly seated in pocket and torqued to the recommended values.

FACE MILLING
<GENERAL CUTTING>

45° KAPR

WSX445

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel

Fig.1

ø40
ø50
ø63
ø80

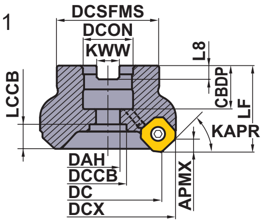
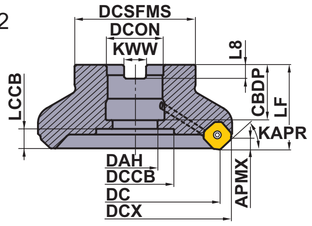


Fig.2

ø100
ø125
ø160



Right hand tool holder shown.

- Uniquely designed double-sided insert.
- Sudden fracture & welding prevention function.
- Highly efficient chip discharge.

■Arbor Type Right Hand Tool Holder

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Type	Dimensions (mm)			WT (kg)	APMX (mm)	Fig.
						DCX	LF	DCON			
40	**WSX445-040A03AR**	●	○	3	Coarse Pitch	52.8	40	16	0.3	5	1
40	**WSX445-040A04AR**	●	○	4	Fine Pitch	52.8	40	16	0.3	5	1
50	**WSX445-050A03AR**	●	○	3	Coarse Pitch	62.9	40	22	0.5	5	1
50	**WSX445-050A04AR**	●	○	4	Fine Pitch	62.9	40	22	0.4	5	1
50	**WSX445-050A05AR**	●	○	5	Extra Fine Pitch	62.9	40	22	0.4	5	1
63	**WSX445-063A04AR**	●	○	4	Coarse Pitch	75.9	40	22	0.6	5	1
63	**WSX445-063A05AR**	●	○	5	Fine Pitch	75.9	40	22	0.6	5	1
63	**WSX445-063A06AR**	●	○	6	Extra Fine Pitch	75.9	40	22	0.6	5	1
80	**WSX445R08004CA**	●	○	4	Coarse Pitch	92.9	50	25.4	1.3	5	1
80	**WSX445R08006CA**	●	○	6	Fine Pitch	92.9	50	25.4	1.2	5	1
80	**WSX445R08008CA**	●	○	8	Extra Fine Pitch	92.9	50	25.4	1.1	5	1
100	**WSX445R10005DA**	●	○	5	Coarse Pitch	112.9	50	31.75	1.8	5	2
100	**WSX445R10007DA**	●	○	7	Fine Pitch	112.9	50	31.75	1.7	5	2
100	**WSX445R10010DA**	●	○	10	Extra Fine Pitch	112.9	50	31.75	1.6	5	2
125	**WSX445R12506EA**	●	○	6	Coarse Pitch	137.9	63	38.1	3.2	5	2
125	**WSX445R12508EA**	●	○	8	Fine Pitch	137.9	63	38.1	3.1	5	2
125	**WSX445R12512EA**	●	○	12	Extra Fine Pitch	137.9	63	38.1	3.0	5	2
160	**WSX445R16007FA**	●	○	7	Coarse Pitch	172.9	63	50.8	4.9	5	2
160	**WSX445R16010FA**	●	○	10	Fine Pitch	172.9	63	50.8	4.8	5	2
160	**WSX445R16016FA**	●	○	16	Extra Fine Pitch	172.8	63	50.8	4.6	5	2
200	**WSX445R20008KN**	●	–	8	Coarse Pitch	212.9	63	47.625	8.7	5	3
200	**WSX445R20012KN**	●	–	12	Fine Pitch	212.9	63	47.625	8.6	5	3
200	**WSX445R20020KN**	●	–	20	Extra Fine Pitch	212.8	63	47.625	8.4	5	3
250	**WSX445R25010KN**	●	–	10	Coarse Pitch	262.9	63	47.625	13.1	5	3
250	**WSX445R25014KN**	●	–	14	Fine Pitch	262.9	63	47.625	13.2	5	3
315	**WSX445R31514PN**	●	–	14	Coarse Pitch	327.9	63	47.625	21.5	5	4

Note1) A set bolt to the arbor is not supplied with the body.
Note2) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 40-63.
Note3) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 80-315.

SPARE PARTS

Arbor Type	 * Clamp Screw	 Wrench (Insert)
WSX445	TPS4R	TIP15W

⁎ Clamp Torque (N • m) : TPS4R=3.5

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

Fig.3

ø200
ø250

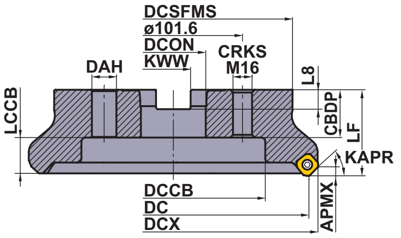
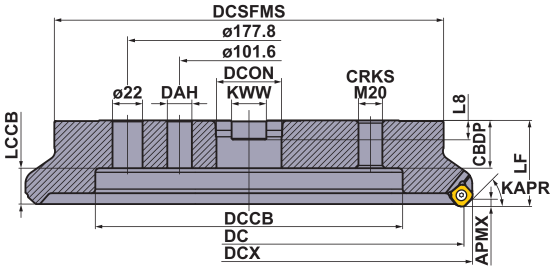


Fig.4

ø315



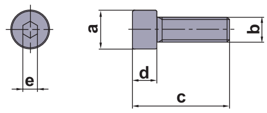
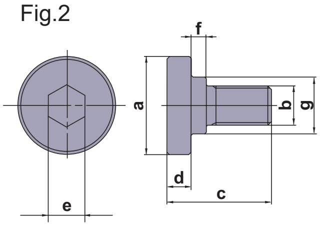
Right hand tool holder shown.

■Arbor Type Left Hand Tool Holder

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Type	Dimensions (mm)			WT (kg)	APMX (mm)	Fig.
						DCX	LF	DCON			
80	**WSX445L08004CA**	●	○	4	Coarse Pitch	92.9	50	25.4	1.3	5	1
100	**WSX445L10005DA**	●	○	5	Coarse Pitch	112.9	50	31.75	1.8	5	2
125	**WSX445L12506EA**	●	○	6	Coarse Pitch	137.9	63	38.1	3.2	5	2
160	**WSX445L16007FA**	●	○	7	Coarse Pitch	172.9	63	50.8	4.9	5	2
200	**WSX445L20008KN**	●	–	8	Coarse Pitch	212.9	63	47.625	8.7	5	3
250	**WSX445L25010KN**	●	–	10	Coarse Pitch	262.9	63	47.625	13.1	5	3

Note1) A set bolt to the arbor is not supplied with the body.
Note2) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 80-250.

SET BOLT (SOLD SEPARATELY)

Arbor Type	Set Bolt		Fig.	Reference Dimensions (mm)							Geometry
	With Coolant Hole	Without Coolant Hole									
	Order Number	Order Number		a	b	c	d	e	f	g	
WSX445-040A◌◌AR	HSC08025H	HSC08025	1	13	M8×1.25	33	8	5	–	–	Fig.1  Fig.2 
WSX445-050A◌◌AR	HSC10030H	HSC10030	1	16	M10×1.5	40	10	6	–	–	
WSX445-063A◌◌AR	HSC10030H	HSC10030	1	16	M10×1.5	40	10	6	–	–	
WSX445-080A◌◌A◌	HSC12035H	HSC12035	1	18	M12×1.75	47	12	10	–	–	
WSX445-100B◌◌A◌	MBA16033H	—	2	40	M16×2	43	10	14	6	23	
WSX445-125B◌◌A◌	MBA20040H	—	2	50	M20×2.5	54	14	17	6	27	
WSX445-160C◌◌N◌	MBA20040H	—	2	50	M20×2.5	54	14	17	6	27	
WSX445-200C◌◌NR	—	—	1	24	M16×2	61–	16	14	–	–	
WSX445-250C◌◌NR	—	—	1	24	M16×2	61–	16	14	–	–	
WSX445-315C◌◌NR	—	—	1	24	M16×2	61–	16	14	–	–	
WSX445◌080◌◌CA	HSC12035H	HSC12035	1	18	M12×1.75	47	12	10	–	–	
WSX445◌100◌◌DA	MBA16033H	—	2	40	M16×2	43	10	14	6	23	
WSX445◌125◌◌EA	MBA20040H	—	2	50	M20×2.5	54	14	17	6	27	
WSX445◌160◌◌FA	MBA24045H	—	2	65	M24×3	59	14	17	10	37	
WSX445◌200◌◌KN	—	—	1	24	M16×2	61–	16	14	–	–	
WSX445◌250◌◌KN	—	—	1	24	M16×2	61–	16	14	–	–	
WSX445◌315◌◌PN	—	—	1	30	M20×2.5	68–	20	17	–	–	

Note 1) Please purchase the appropriate set bolt after confirming the reference dimensions.
The items with an order number listed under the Set Bolt columns are also sold by Mitsubishi Materials.
Note 2) Internal coolant is necessary with the set bolt.

ISO13399 ➢ L003
MOUNTING DIMENSION ➢ L046
SPARE PARTS ➢ P001
TECHNICAL DATA ➢ Q001

Metric Standard

The cutter bore diameter DCON is indicated in millimetres.

Fig.1

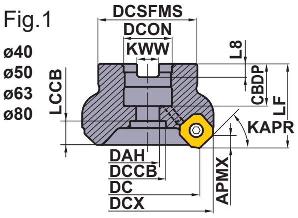
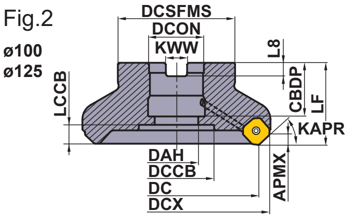


Fig.2



Right hand tool holder shown.

■Arbor Type Right Hand Tool Holder

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Type	Dimensions (mm)			WT (kg)	APMX (mm)	Fig.
						DCX	LF	DCON			
40	**WSX445-040A03AR**	●	○	3	Coarse Pitch	52.8	40	16	0.3	5	1
40	**WSX445-040A04AR**	●	○	4	Fine Pitch	52.8	40	16	0.3	5	1
50	**WSX445-050A03AR**	●	○	3	Coarse Pitch	62.9	40	22	0.5	5	1
50	**WSX445-050A04AR**	●	○	4	Fine Pitch	62.9	40	22	0.4	5	1
50	**WSX445-050A05AR**	●	○	5	Extra Fine Pitch	62.9	40	22	0.4	5	1
63	**WSX445-063A04AR**	●	○	4	Coarse Pitch	75.9	40	22	0.6	5	1
63	**WSX445-063A05AR**	●	○	5	Fine Pitch	75.9	40	22	0.6	5	1
63	**WSX445-063A06AR**	●	○	6	Extra Fine Pitch	75.9	40	22	0.6	5	1
80	**WSX445-080A04AR**	●	○	4	Coarse Pitch	92.9	50	27	1.3	5	1
80	**WSX445-080A06AR**	●	○	6	Fine Pitch	92.9	50	27	1.2	5	1
80	**WSX445-080A08AR**	●	○	8	Extra Fine Pitch	92.9	50	27	1.1	5	1
100	**WSX445-100B05AR**	●	○	5	Coarse Pitch	112.9	50	32	1.9	5	2
100	**WSX445-100B07AR**	●	○	7	Fine Pitch	112.9	50	32	1.9	5	2
100	**WSX445-100B10AR**	●	○	10	Extra Fine Pitch	112.9	50	32	1.8	5	2
125	**WSX445-125B06AR**	●	○	6	Coarse Pitch	137.9	63	40	3.4	5	2
125	**WSX445-125B08AR**	●	○	8	Fine Pitch	137.9	63	40	3.4	5	2
125	**WSX445-125B12AR**	●	○	12	Extra Fine Pitch	137.9	63	40	3.2	5	2
160	**WSX445-160C07NR**	●	–	7	Coarse Pitch	172.9	63	40	4.9	5	3
160	**WSX445-160C10NR**	●	–	10	Fine Pitch	172.9	63	40	4.8	5	3
160	**WSX445-160C16NR**	●	–	16	Extra Fine Pitch	172.8	63	40	4.6	5	3
200	**WSX445-200C08NR**	●	–	8	Coarse Pitch	212.9	63	60	7.5	5	4
200	**WSX445-200C12NR**	●	–	12	Fine Pitch	212.9	63	60	7.4	5	4
200	**WSX445-200C20NR**	●	–	20	Extra Fine Pitch	212.8	63	60	7.2	5	4

Note1) A set bolt to the arbor is not supplied with the body.
Note2) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 40-100.
Note3) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 125-200.

SPARE PARTS

Arbor Type	 *	
	Clamp Screw	Wrench (Insert)
WSX445	TPS4R	TIP15W

∗ Clamp Torque (N • m) : TPS4R=3.5

● : Inventory maintained in Japan.

Fig.3

ø160

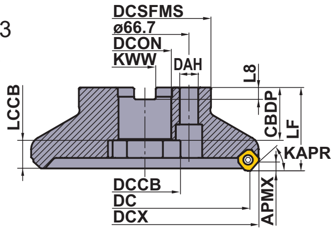
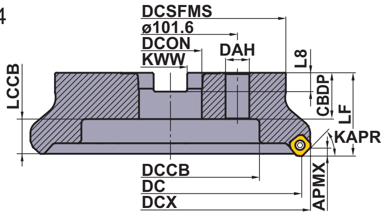


Fig.4

ø200



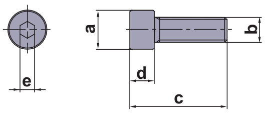
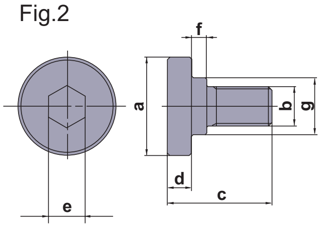
Right hand tool holder shown.

■Arbor Type Left Hand Tool Holder

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Type	Dimensions (mm)			WT (kg)	APMX (mm)	Fig.
						DCX	LF	DCON			
80	**WSX445-080A04AL**	●	○	4	Coarse Pitch	92.9	50	27	1.3	5	1
100	**WSX445-100B05AL**	●	○	5	Coarse Pitch	112.9	50	32	1.9	5	2
125	**WSX445-125B06AL**	●	○	6	Coarse Pitch	137.9	63	40	3.4	5	2
160	**WSX445-160C07NL**	●	–	7	Coarse Pitch	172.9	63	40	4.9	5	3

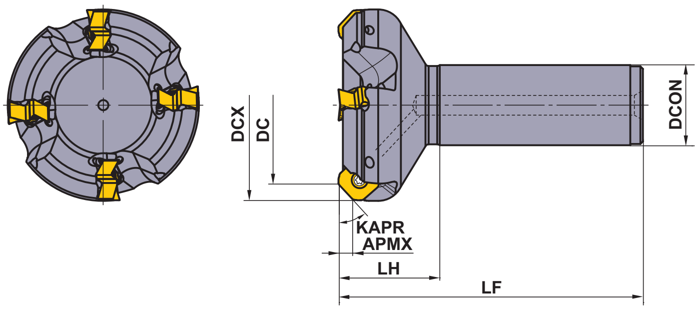
Note1) A set bolt to the arbor is not supplied with the body.
Note2) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 80-100.
Note3) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 125-160.

SET BOLT (SOLD SEPARATELY)

Arbor Type	Set Bolt		Fig.	Reference Dimensions (mm)							Geometry
	With Coolant Hole	Without Coolant Hole									
	Order Number	Order Number		a	b	c	d	e	f	g	
WSX445-040A◌◌AR	HSC08025H	HSC08025	1	13	M8×1.25	33	8	5	–	–	Fig.1  Fig.2 
WSX445-050A◌◌AR	HSC10030H	HSC10030	1	16	M10×1.5	40	10	6	–	–	
WSX445-063A◌◌AR	HSC10030H	HSC10030	1	16	M10×1.5	40	10	6	–	–	
WSX445-080A◌◌A◌	HSC12035H	HSC12035	1	18	M12×1.75	47	12	10	–	–	
WSX445-100B◌◌A◌	MBA16033H	—	2	40	M16×2	43	10	14	6	23	
WSX445-125B◌◌A◌	MBA20040H	—	2	50	M20×2.5	54	14	17	6	27	
WSX445-160C◌◌N◌	MBA20040H	—	2	50	M20×2.5	54	14	17	6	27	
WSX445-200C◌◌NR	—	—	1	24	M16×2	61–	16	14	–	–	

Note 1) Please purchase the appropriate set bolt after confirming the reference dimensions.
The items with an order number listed under the Set Bolt columns are also sold by Mitsubishi Materials.
Note 2) Internal coolant is necessary with the set bolt.

ISO13399 ➤L003
MOUNTING DIMENSION ➤L046
SPARE PARTS ➤P001
TECHNICAL DATA ➤Q001

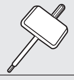


Right hand tool holder only.

■SHANK TYPE

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Type	Dimensions (mm)				WT (kg)	APMX (mm)
						DCX	**LF**	**DCON**	**LH**		
40	**WSX445R4003SA32M**	●	○	3	Coarse Pitch	52.8	125	32	40	0.8	5
40	**WSX445R4004SA32M**	●	○	4	Fine Pitch	52.8	125	32	40	0.8	5
50	**WSX445R5003SA32M**	●	○	3	Coarse Pitch	62.9	125	32	40	1.0	5
50	**WSX445R5004SA32M**	●	○	4	Fine Pitch	62.9	125	32	40	1.0	5
63	**WSX445R6304SA32M**	●	○	4	Coarse Pitch	75.9	125	32	40	1.2	5
63	**WSX445R6305SA32M**	●	○	5	Fine Pitch	75.9	125	32	40	1.2	5
80	**WSX445R8004SA32M**	●	○	4	Coarse Pitch	92.9	125	32	40	1.6	5
80	**WSX445R8006SA32M**	●	○	6	Fine Pitch	92.9	125	32	40	1.5	5

SPARE PARTS

Arbor Type	 *	
	Clamp Screw	Wrench (Insert)
WSX445	TPS4R	TIP15W

⁎ Clamp Torque (N • m) : TPS4R=3.5

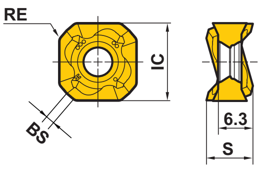
● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS WITH BREAKER

Workpiece Material			MC5020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP20RT	MX3030	TF15
	P	Steel		◐	✣					◐	◐	◐	
	M	Stainless Steel				◐	✣			◐	◐	◐	
	K	Cast Iron	◐							✣	✣	◐	
	N	Non-ferrous Metal											◐
	S	Heat resistant Alloy, Titanium Alloy						◐	✣	◐	◐		
	H	Hardened Steel								◐			

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

Edge Preparation :
E : Round F : Sharp

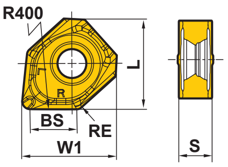
Shape	Order Number	Class	Hand	Edge Preparation	Coated									Cermet	Carbide	Dimensions (mm)				Geometry
					MC5020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP20RT	MX3030	TF15	IC	S	BS	RE	
	**SNGU140812ANFR-L**	G	R	F											●	14	8.4	1.5	1.2	
	SNGU140812ANER-L	G	R	E	●	●	●	●	●	●	●	●	●	●		14	8.4	1.5	1.2	
	SNGU140812ANER-M	G	R	E	●	●	●	●	●	●	●	●	●	●		14	8.4	1.5	1.2	
	SNMU140812ANER-M	M	R	E	●	●	●	●	●	●	●	●	●	●		14	8.4	1.5	1.2	
	SNMU140812ANER-R	M	R	E	●	●	●					●	●			14	8.4	1.5	1.2	
	SNMU140812ANER-H	M	R	E	●	●	●					●	●			14	8.4	1.5	1.2	
	SNGU140812ANFL-L	G	L	F											●	14	8.4	1.5	1.2	
	SNGU140812ANEL-L	G	L	E	●	●	●					●		●		14	8.4	1.5	1.2	
	SNGU140812ANEL-M	G	L	E	●	●	●					●		●		14	8.4	1.5	1.2	
	SNMU140812ANEL-M	M	L	E	●	●	●					●		●		14	8.4	1.5	1.2	
	SNMU140812ANEL-R	M	L	E	●	●	●					●				14	8.4	1.5	1.2	Right hand insert shown.

WIPER INSERTS

Workpiece Material			MC5020	MP6120	VP15TF	MX3020
	P	Steel		◐	◐	◐
	M	Stainless Steel			◐	◐
	K	Cast Iron	◐		✣	◐
	S	Heat resistant Alloy, Titanium Alloy			◐	
	H	Hardened Steel			◐	

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

Edge Preparation : E : Round F : Sharp

Shape	Order Number	Class	Edge Preparation	Coated			Cermet	Dimensions (mm)					Geometry
				MC5020	MP6120	VP15TF	MX3020	L	W1	S	BS	RE	
	**WNGU1406ANEN8C-M**	G	E	●	●	●	●	16.87	16.87	6	8	1.0	

■Instructions for use of wiper inserts

Fig.1

Fig.2

Wiper inserts for WSX445 are two-cornered. Please set as shown in Fig.1.
Excellent finished surfaces can be achieved with one wiper.
Set more than 2 wiper inserts, equally spaced, when the feed per revolution is larger than 8mm/rev.

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

Arbor Type Mounting Dimensions

Fig.1

ø40
ø50
ø63
ø80

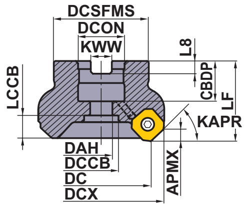


Fig.2

ø100
ø125
ø160

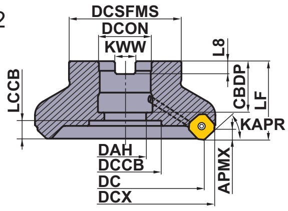
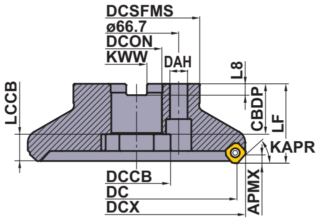


Fig.3

ø160



Right hand insert shown.

DC (mm)	Order Number	Dimensions (mm)								Fig.
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
40	**WSX445-040A03AR**	16	18	9	14	13.3	37	8.4	5.6	1
40	**WSX445-040A04AR**	16	18	9	14	13.3	37	8.4	5.6	1
50	**WSX445-050A03AR**	22	20	11	17	11.3	47	10.4	6.3	1
50	**WSX445-050A04AR**	22	20	11	17	11.3	47	10.4	6.3	1
50	**WSX445-050A05AR**	22	20	11	17	11.3	47	10.4	6.3	1
63	**WSX445-063A04AR**	22	20	11	17	11.3	50	10.4	6.3	1
63	**WSX445-063A05AR**	22	20	11	17	11.3	50	10.4	6.3	1
63	**WSX445-063A06AR**	22	20	11	17	11.3	50	10.4	6.3	1
80	**WSX445R08004CA**	25.4	26	13	20	14.3	56	9.5	6	1
80	**WSX445R08006CA**	25.4	26	13	20	14.3	56	9.5	6	1
80	**WSX445R08008CA**	25.4	26	13	20	14.3	56	9.5	6	1
80	**WSX445L08004CA**	25.4	26	13	20	14.3	56	9.5	6	1
80	**WSX445-080A04AR**	27	23	13	20	14.3	56	12.4	7	1
80	**WSX445-080A06AR**	27	23	13	20	14.3	56	12.4	7	1
80	**WSX445-080A08AR**	27	23	13	20	14.3	56	12.4	7	1
80	**WSX445-080A04AL**	27	23	13	20	14.3	56	12.4	7	1
100	**WSX445R10005DA**	31.75	32	26	45	11.3	70	12.7	8	2
100	**WSX445R10007DA**	31.75	32	26	45	11.3	70	12.7	8	2
100	**WSX445R10010DA**	31.75	32	26	45	11.3	70	12.7	8	2
100	**WSX445L10005DA**	31.75	32	26	45	11.3	70	12.7	8	2
100	**WSX445-100B05AR**	32	26	26	45	16.3	78	14.4	8	2
100	**WSX445-100B07AR**	32	26	26	45	16.3	78	14.4	8	2
100	**WSX445-100B10AR**	32	26	26	45	16.3	78	14.4	8	2
100	**WSX445-100B05AL**	32	26	26	45	16.3	78	14.4	8	2
125	**WSX445R12506EA**	38.1	36	30	56	19.3	80	15.9	10	2
125	**WSX445R12508EA**	38.1	36	30	56	19.3	80	15.9	10	2
125	**WSX445R12512EA**	38.1	36	30	56	19.3	80	15.9	10	2
125	**WSX445L12506EA**	38.1	36	30	56	19.3	80	15.9	10	2
125	**WSX445-125B06AR**	40	28	30	56	21.3	89	16.4	9	2
125	**WSX445-125B08AR**	40	28	30	56	21.3	89	16.4	9	2
125	**WSX445-125B12AR**	40	28	30	56	21.3	89	16.4	9	2
125	**WSX445-125B06AL**	40	28	30	56	21.3	89	16.4	9	2

Fig.4

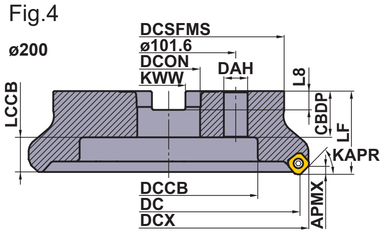


Fig.5

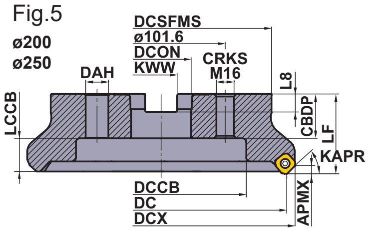
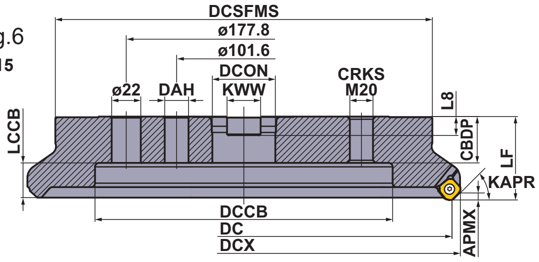


Fig.6



Right hand insert shown.

DC (mm)	Order Number	Dimensions (mm)								Fig.
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
160	**WSX445-160C07NR**	40	40	14	56	21.3	100	16.4	9	3
160	**WSX445-160C10NR**	40	40	14	56	21.3	100	16.4	9	3
160	**WSX445-160C16NR**	40	40	14	56	21.3	100	16.4	9	3
160	**WSX445-160C07NL**	40	40	14	56	21.3	100	16.4	9	3
160	**WSX445R16007FA**	50.8	38	40	72	16.3	100	19.1	11	2
160	**WSX445R16010FA**	50.8	38	40	72	16.3	100	19.1	11	2
160	**WSX445R16016FA**	50.8	38	40	72	16.3	100	19.1	11	2
160	**WSX445L16007FA**	50.8	38	40	72	16.3	100	19.1	11	2
200	**WSX445R20008KN**	47.625	35	18	135	26.3	175	25.4	14.22	5
200	**WSX445R20012KN**	47.625	35	18	135	26.3	175	25.4	14.22	5
200	**WSX445R20020KN**	47.625	35	18	135	26.3	175	25.4	14.22	5
200	**WSX445L20008KN**	47.625	35	18	135	26.3	175	25.4	14.22	5
200	**WSX445-200C08NR**	60	32	18	135	29.3	160	25.7	14.22	4
200	**WSX445-200C12NR**	60	32	18	135	29.3	160	25.7	14.22	4
200	**WSX445-200C20NR**	60	32	18	135	29.3	160	25.7	14.22	4
250	**WSX445R25010KN**	47.625	35	18	180	26.3	220	25.4	14.22	5
250	**WSX445R25014KN**	47.625	35	18	180	26.3	220	25.4	14.22	5
250	**WSX445L25010KN**	47.625	35	18	180	26.3	220	25.4	14.22	5
315	**WSX445R31514PN**	47.625	35	18	225	26.3	285	25.4	14.22	6

RECOMMENDED CUTTING CONDITIONS

■ Dry cutting

	Workpiece Material	Hardness	1st Recommendation	2nd Recommendation	**vc** (m/min)	Finish Cutting	
						fz (mm/t)	**ap**
P						L Breaker	
	Mild Steel	≤ 180HB	MP6120	VP15TF	250 (200—300)	0.15 (0.1—0.2)	≤ 1.0
			MP6130	VP20RT	240 (190—290)	0.15 (0.1—0.2)	≤ 1.0
			MX3030	—	180 (130—230)	0.15 (0.1—0.2)	≤ 1.0
	Carbon Steel Alloy Steel	180—350HB	MP6120	VP15TF	220 (170—270)	0.15 (0.1—0.2)	≤ 1.0
			MP6130	VP20RT	200 (150—250)	0.15 (0.1—0.2)	≤ 1.0
			MX3030	—	150 (120—180)	0.15 (0.1—0.2)	≤ 1.0
	Alloy Tool Steel	≤ 350HB (Annealing)	MP6120	VP15TF	220 (170—270)	0.15 (0.1—0.2)	≤ 1.0
			MP6130	VP20RT	200 (150—250)	0.15 (0.1—0.2)	≤ 1.0
			MX3030	—	150 (120—180)	0.15 (0.1—0.2)	≤ 1.0
	Pre-Hardened Steel	35—45HRC	MP6120	VP15TF	140 (100—180)	0.15 (0.1—0.2)	≤ 1.0
			MP6130	VP20RT	120 (90—150)	0.15 (0.1—0.2)	≤ 1.0
M						L Breaker	
	Austenitic Stainless Steel	≤ 200HB	MP7130	VP15TF	200 (150—250)	0.15 (0.1—0.2)	≤ 1.0
			MP7140	VP20RT	200 (150—250)	0.15 (0.1—0.2)	≤ 1.0
			MX3030	—	130 (100—180)	0.15 (0.1—0.2)	≤ 1.0
	Austenitic Stainless Steel	>200HB	MP7130	VP15TF	170 (120—220)	0.15 (0.1—0.2)	≤ 1.0
			MP7140	VP20RT	170 (120—220)	0.15 (0.1—0.2)	≤ 1.0
	Two-phase Stainless Steel	≤ 280HB	MP7130	VP15TF	160 (110—210)	0.15 (0.1—0.2)	≤ 1.0
			MP7140	VP20RT	160 (110—210)	0.15 (0.1—0.2)	≤ 1.0
	Precipitation-Hardening Stainless Steel	≤ 450HB	MP7130	VP15TF	150 (100—200)	0.15 (0.1—0.2)	≤ 1.0
			MP7140	VP20RT	150 (100—200)	0.15 (0.1—0.2)	≤ 1.0
K						L Breaker	
	Gray Cast Iron	Tensile Strength ≤ 350MPa	MC5020	—	220 (200—270)	0.15 (0.1—0.2)	≤ 1.0
			VP15TF	—	180 (130—250)	0.15 (0.1—0.2)	≤ 1.0
			VP20RT	—	170 (120—240)	0.15 (0.1—0.2)	≤ 1.0
			MX3030	—	150 (120—180)	0.15 (0.1—0.2)	≤ 1.0
	Ductile Cast Iron	Tensile Strength ≤ 450MPa	MC5020	—	200 (180—250)	0.15 (0.1—0.2)	≤ 1.0
			VP15TF	VP20RT	160 (110—240)	0.15 (0.1—0.2)	≤ 1.0
	Ductile Cast Iron	Tensile Strength ≤ 800MPa	MC5020	—	200 (180—250)	0.15 (0.1—0.2)	≤ 1.0
			VP15TF	—	160 (110—240)	0.15 (0.1—0.2)	≤ 1.0
			VP20RT	—	150 (100—200)	0.15 (0.1—0.2)	≤ 1.0
H						M Breaker	
	Hardened Steel	40—55HRC	VP15TF	—	50 (30—70)	0.05 (0.05—0.1)	≤ 1.0
	Hardened Steel	55—62HRC	VP15TF	—	40 (20—50)	0.05 (0.05—0.1)	≤ 1.0

Note 1) Refer to the table above and set the cutting conditions to match the application.

Note 2) Wet cutting is recommended, when focusing on the surface finish. (Tool life is lower than when dry cutting.)

(mm)

Feed per revolution by machining area **fz**(mm/t) and the depth of cut **ap**								
	Light Cutting		Medium Cutting		Rough Cutting		Heavy Cutting	
	fz (mm/t)	**ap**	**fz** (mm/t)	**ap**	**fz** (mm/t)	**ap**	**fz** (mm/t)	**ap**
	L,M Breaker		M Breaker		M,R Breaker		R,H Breaker	
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	L,M Breaker		M Breaker					
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	—	—	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	L,M Breaker		M Breaker		M,R Breaker		R,H Breaker	
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	M,R Breaker		R,H Breaker					
	0.05 (0.05—0.1)	≤ 1.5	0.1 (0.05—0.15)	≤ 2.0	—	—	—	—
	0.05 (0.05—0.1)	≤ 1.5	0.1 (0.05—0.15)	≤ 2.0	—	—	—	—

RECOMMENDED CUTTING CONDITIONS

■ Wet Cutting

Workpiece Material	Hardness	1st Recommendation	2nd Recommendation	**vc** (m/min)	Finish Cutting	
					fz (mm/t)	**ap**
P					L Breaker	
Mild Steel	≤ 180HB	MP6120	VP15TF	150 (100−200)	0.15 (0.1−0.2)	≤ 1.0
		MP6130	VP20RT	150 (100−200)	0.15 (0.1−0.2)	≤ 1.0
Carbon Steel Alloy Steel	180−350HB	MP6120	VP15TF	120 (80−160)	0.15 (0.1−0.2)	≤ 1.0
		MP6130	VP20RT	120 (80−160)	0.15 (0.1−0.2)	≤ 1.0
Alloy Tool Steel	≤ 350HB (Annealing)	MP6120	VP15TF	120 (80−160)	0.15 (0.1−0.2)	≤ 1.0
		MP6130	VP20RT	120 (80−160)	0.15 (0.1−0.2)	≤ 1.0
Pre-Hardened Steel	35−45HRC	MP6120	VP15TF	100 (80−120)	0.15 (0.1−0.2)	≤ 1.0
		MP6130	VP20RT	100 (80−120)	0.15 (0.1−0.2)	≤ 1.0
M					L Breaker	
Austenitic Stainless Steel	≤ 200HB	MP7130	VP15TF	130 (80−180)	0.15 (0.1−0.2)	≤ 1.0
		MP7140	VP20RT	130 (80−180)	0.15 (0.1−0.2)	≤ 1.0
Austenitic Stainless Steel	> 200HB	MP7130	VP15TF	100 (80−150)	0.15 (0.1−0.2)	≤ 1.0
		MP7140	VP20RT	100 (80−150)	0.15 (0.1−0.2)	≤ 1.0
Two-phase Stainless Steel	≤ 280HB	MP7130	VP15TF	100 (80−150)	0.15 (0.1−0.2)	≤ 1.0
		MP7140	VP20RT	100 (80−150)	0.15 (0.1−0.2)	≤ 1.0
Precipitation-Hardening Stainless Steel	< 450HB	MP7130	VP15TF	90 (50−140)	0.15 (0.1−0.2)	≤ 1.0
		MP7140	VP20RT	90 (50−140)	0.15 (0.1−0.2)	≤ 1.0
K					L Breaker	
Gray Cast Iron	Tensile Strength ≤ 350MPa	MC5020	−	180 (160−200)	0.15 (0.1−0.2)	≤ 1.0
		VP15TF	VP20RT	130 (100−160)	0.15 (0.1−0.2)	≤ 1.0
Ductile Cast Iron	Tensile Strength ≤ 450MPa	MC5020	−	180 (160−200)	0.15 (0.1−0.2)	≤ 1.0
		VP15TF	VP20RT	130 (100−160)	0.15 (0.1−0.2)	≤ 1.0
Ductile Cast Iron	Tensile Strength ≤ 800MPa	MC5020	−	180 (160−200)	0.15 (0.1−0.2)	≤ 1.0
		VP15TF	VP20RT	110 (80−140)	0.15 (0.1−0.2)	≤ 1.0
N					L Breaker	
Aluminium Alloy	−	TF15	−	≥ 300	0.15 (0.1−0.2)	≤ 1.0
S					L Breaker	
Titanium Alloy	−	MP9120	VP15TF	50 (40−60)	0.05 (0.05−0.1)	≤ 1.0
		MP9130	VP20RT	50 (40−60)	0.05 (0.05−0.1)	≤ 1.0
Heat Resistant Alloy	−	MP9120	VP15TF	40 (20−50)	0.05 (0.05−0.1)	≤ 1.0
		MP9130	VP20RT	40 (20−50)	0.05 (0.05−0.1)	≤ 1.0

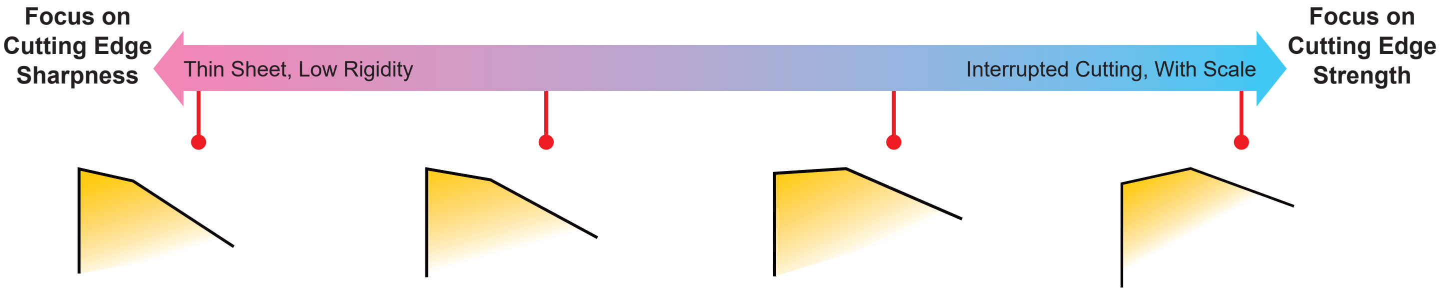
Note 1) Refer to the table above and set the cutting conditions to match the application.
Note 2) Wet cutting is recommended, when focusing on the surface finish. (Tool life is lower than when dry cutting.)

(mm)

Feed per revolution by machining area **fz**(mm/t) and the depth of cut **ap**								
	Light Cutting		Medium Cutting		Rough Cutting		Heavy Cutting	
	fz (mm/t)	**ap**	**fz** (mm/t)	**ap**	**fz** (mm/t)	**ap**	**fz** (mm/t)	**ap**
	L,M Breaker		M Breaker		M,R Breaker		R,H Breaker	
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	L,M Breaker		M Breaker					
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	—	—	—	—
	L,M Breaker		M Breaker		M,R Breaker		R,H Breaker	
	0.15 (0.1—0.2)	≤ 2.0	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	0.15 (0.1—0.2)	≤ 2.0	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	L Breaker		L Breaker		L Breaker		L Breaker	
	0.15 (0.1—0.2)	≤ 2.0	0.2 (0.15—0.25)	≤ 3.0	0.2 (0.15—0.25)	≤ 4.0	0.25 (0.2—0.3)	≤ 5.0
	L,M Breaker		M Breaker					
	0.05 (0.05—0.1)	≤ 1.5	0.1 (0.05—0.15)	≤ 2.0	—	—	—	—
	0.05 (0.05—0.1)	≤ 1.5	0.1 (0.05—0.15)	≤ 2.0	—	—	—	—
	0.05 (0.05—0.1)	≤ 1.5	0.1 (0.05—0.15)	≤ 2.0	—	—	—	—
	0.05 (0.05—0.1)	≤ 1.5	0.1 (0.05—0.15)	≤ 2.0	—	—	—	—

Breaker System

Breaker Series for Varied Cutting Conditions



L Breaker

Focus on cutting edge sharpness
Low resistance type
- For machining difficult-to-cut materials
- For when the machine or the workpiece rigidity is low

M Breaker

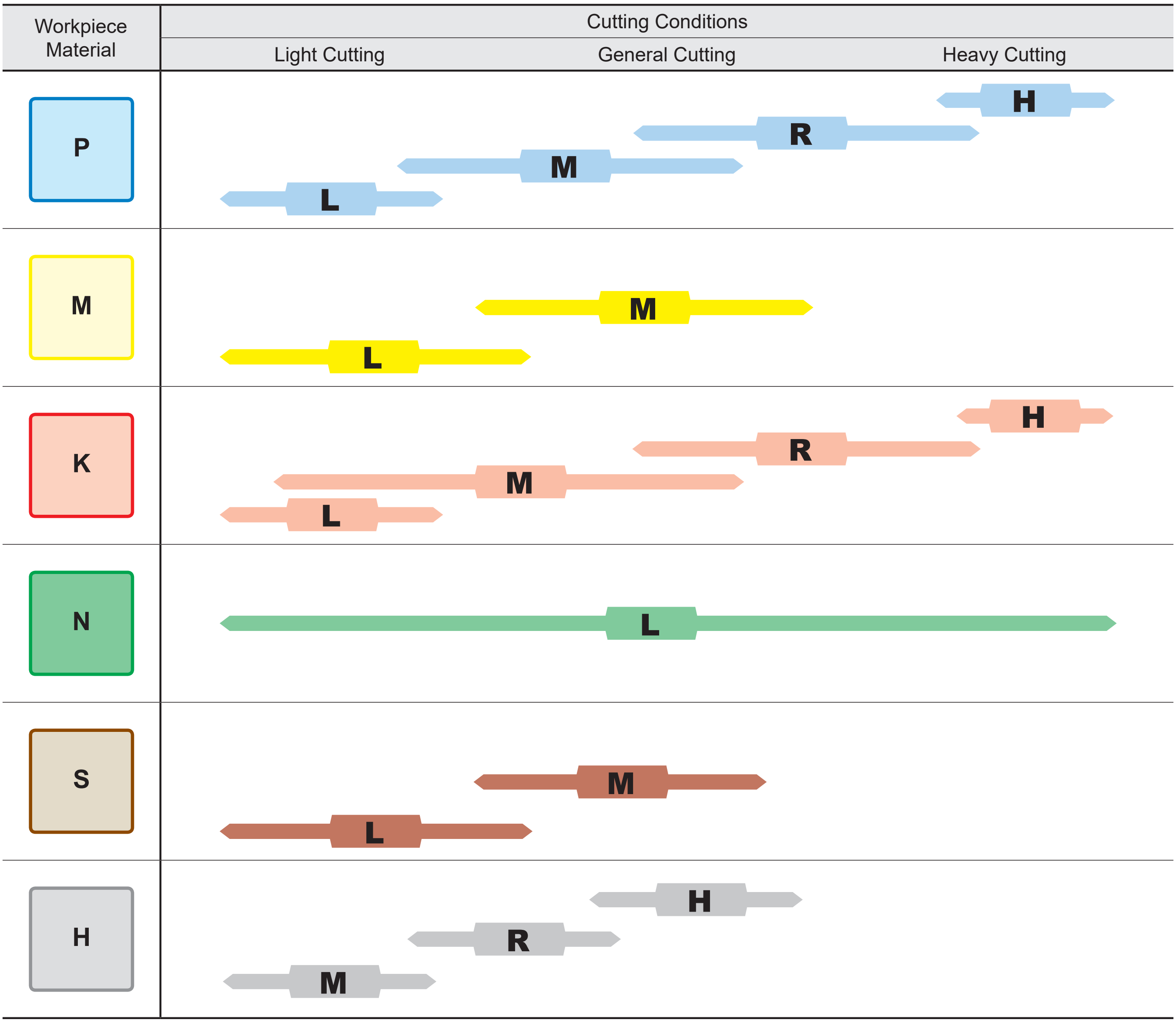
1st Recommendation
All-around
- For general cutting

R Breaker

For unstable applications
Reinforced edge type
- For interrupted cutting

H Breaker

For demanding applications
Reinforced edge type
- For heavy interrupted cutting



Memo

FACE MILLING
<GENERAL CUTTING>

45° KAPR F R

ASX445

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel

- Precision inexpensive moulded type 20°positive insert.
- Screw-on type.
- A wide range of chip breakers.
- High rigidity due to carbide shim.

Fig.1
ø50
ø63

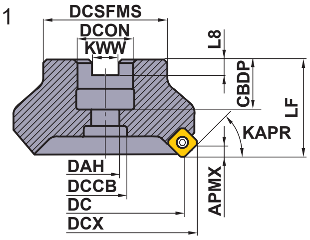


Fig.2
ø80
ø100
ø125
ø160

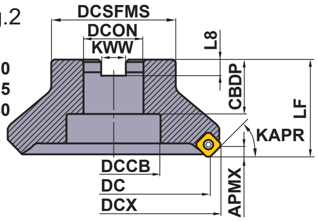


Fig.3
ø200
ø250

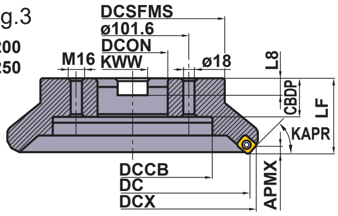
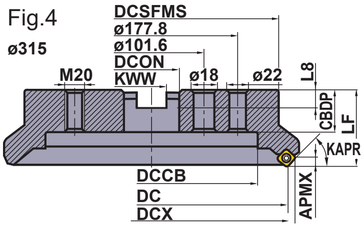


Fig.4
ø315



Right hand tool holder only.

ARBOR TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions(mm)										WT (kg)	APMX (mm)	Fig.
		R		DC	DCX	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8			
Coarse Pitch	ASX445-050A03R	●	3	50	63.0	40	22	20	11	17	45	10.4	6.3	0.5	6	1
	ASX445-063A04R	●	4	63	75.9	40	22	20	11	17	50	10.4	6.3	0.7	6	1
	ASX445R08004C	●	4	80	93.2	50	25.4	26	—	38	56	9.5	6	1.1	6	2
	ASX445R10005D	●	5	100	113.2	50	31.75	32	—	45	70	12.7	8	1.8	6	2
	ASX445R12506E	●	6	125	138.0	63	38.1	35	—	60	80	15.9	10	2.9	6	2
	ASX445R16007F	●	7	160	173.0	63	50.8	38	—	80	100	19.1	11	4.7	6	2
	ASX445R20008K	●	8	200	212.9	63	47.625	35	—	140	175	25.4	14.22	7.9	6	3
	ASX445R25010K	●	10	250	262.9	63	47.625	35	—	180	220	25.4	14.22	12.9	6	3
	ASX445R31514P	●	14	315	327.9	63	47.625	40	—	245	285	25.4	14.22	22.4	6	4
Fine Pitch	ASX445-050A04R	●	4	50	63.0	40	22	20	11	17	45	10.4	6.3	0.4	6	1
	ASX445-063A05R	●	5	63	75.9	40	22	20	11	17	50	10.4	6.3	0.6	6	1
	ASX445R08006C	●	6	80	93.2	50	25.4	26	—	38	56	9.5	6	1.0	6	2
	ASX445R10007D	●	7	100	113.2	50	31.75	32	—	45	70	12.7	8	1.7	6	2
	ASX445R12508E	●	8	125	138.0	63	38.1	35	—	60	80	15.9	10	2.8	6	2
	ASX445R16010F	●	10	160	173.0	63	50.8	38	—	80	100	19.1	11	4.6	6	2
	ASX445R20012K	●	12	200	212.9	63	47.625	35	—	140	175	25.4	14.22	7.8	6	3
	ASX445R25014K	●	14	250	262.9	63	47.625	35	—	180	220	25.4	14.22	12.8	6	3
	ASX445R31518P	●	18	315	327.9	63	47.625	40	—	245	285	25.4	14.22	22.2	6	4
Extra Fine Pitch	ASX445-050A05R	●	5	50	63.0	40	22	20	11	17	45	10.4	6.3	0.4	6	1
	ASX445-063A06R	●	6	63	75.9	40	22	20	11	17	50	10.4	6.3	0.6	6	1
	ASX445R08008C	●	8	80	93.2	50	25.4	26	—	38	56	9.5	6	1.1	6	2
	ASX445R10010D	●	10	100	113.2	50	31.75	32	—	45	70	12.7	8	1.8	6	2
	ASX445R12512E	●	12	125	138.0	63	38.1	35	—	60	80	15.9	10	2.9	6	2
	ASX445R16016F	●	16	160	173.0	63	50.8	38	—	80	100	19.1	11	4.7	6	2
	ASX445R20020K	●	20	200	212.9	63	47.625	35	—	140	175	25.4	14.22	7.8	6	3
	ASX445R25024K	●	24	250	262.9	63	47.625	35	—	180	220	25.4	14.22	12.8	6	3
	ASX445R31528P	●	28	315	327.9	63	47.625	40	—	245	285	25.4	14.22	21.8	6	4

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

Fig.1
ø50
ø63

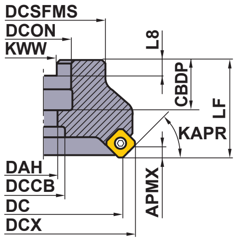


Fig.2
ø80
ø100

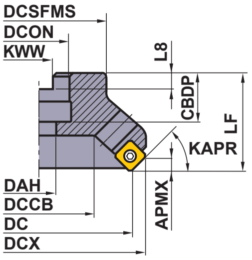
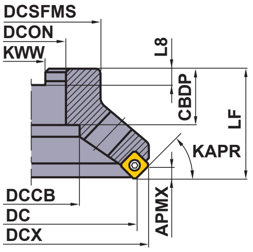


Fig.3
ø125



For metric arbor

The cutter bore diameter DCON is indicated in millimetre.

ø50, ø63

Over ø80

Fig.4
ø160

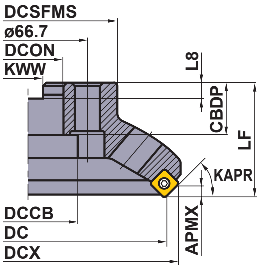
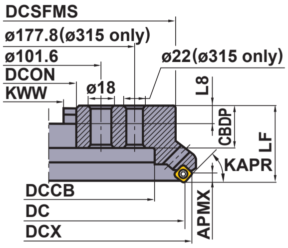


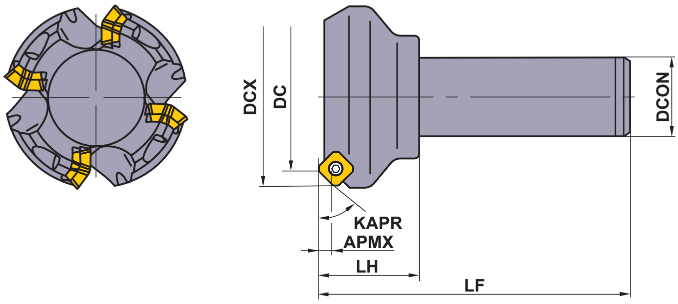
Fig.5
ø200
ø250
ø315



ARBOR TYPE

Right hand tool holder only.

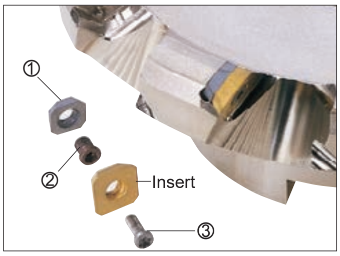
Type	Order Number	Stock	Number of Teeth	Dimensions(mm)										WT (kg)	APMX (mm)	Fig.
		R		DC	DCX	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8			
Coarse Pitch	**ASX445-050A03R**	●	3	50	63.0	40	22	20	11	17	45	10.4	6.3	0.5	6	1
	ASX445-063A04R	●	4	63	75.9	40	22	20	11	17	50	10.4	6.3	0.7	6	1
	ASX445-080A04R	●	4	80	93.2	50	27	23	13	37.84	56	12.4	7	1.0	6	2
	ASX445-100A05R	●	5	100	113.2	50	32	26	17	56.92	70	14.4	8	1.6	6	2
	ASX445-125B06R	●	6	125	138.0	63	40	32	—	56	80	16.4	9	2.4	6	3
	ASX445-160C07R	●	7	160	173.0	63	40	29	—	56	100	16.4	9	3.9	6	4
	ASX445-200C08R	●	8	200	212.9	63	60	32	—	135	155	25.7	14.22	6.7	6	5
	ASX445-250C10R	●	10	250	262.9	63	60	32	—	174	200	25.7	14.22	10.5	6	5
	ASX445-315C14R	●	14	315	327.9	80	60	57	—	256.8	285	25.7	14.22	22.4	6	5
Fine Pitch	**ASX445-050A04R**	●	4	50	63.0	40	22	20	11	17	45	10.4	6.3	0.4	6	1
	ASX445-063A05R	●	5	63	75.9	40	22	20	11	17	50	10.4	6.3	0.6	6	1
	ASX445-080A06R	●	6	80	93.2	50	27	23	13	37.84	56	12.4	7	0.9	6	2
	ASX445-100A07R	●	7	100	113.2	50	32	26	17	56.92	70	14.4	8	1.5	6	2
	ASX445-125B08R	●	8	125	138.0	63	40	32	—	56	80	16.4	9	2.3	6	3
	ASX445-160C10R	●	10	160	173.0	63	40	29	—	56	100	16.4	9	3.6	6	4
	ASX445-200C12R	●	12	200	212.9	63	60	32	—	135	155	25.7	14.22	5.8	6	5
	ASX445-250C14R	●	14	250	262.9	63	60	32	—	174	200	25.7	14.22	10.6	6	5
	ASX445-315C18R	●	18	315	327.9	80	60	57	—	256.8	285	25.7	14.22	22.2	6	5
Extra Fine Pitch	**ASX445-050A05R**	●	5	50	63.0	40	22	20	11	17	45	10.4	6.3	0.4	6	1
	ASX445-063A06R	●	6	63	75.9	40	22	20	11	17	50	10.4	6.3	0.6	6	1
	ASX445-080A08R	●	8	80	93.2	50	27	23	13	37.84	56	12.4	7	0.9	6	2
	ASX445-100A10R	●	10	100	113.2	50	32	26	17	56.92	70	14.4	8	1.5	6	2
	ASX445-125B12R	●	12	125	138.0	63	40	32	—	56	80	16.4	9	2.3	6	3
	ASX445-160C16R	●	16	160	173.0	63	40	29	—	56	100	16.4	9	3.6	6	4
	ASX445-200C20R	●	20	200	212.9	63	60	32	—	135	155	25.7	14.22	6.5	6	5
	ASX445-250C24R	●	24	250	262.9	63	60	32	—	174	200	25.7	14.22	10.3	6	5
	ASX445-315C28R	●	28	315	327.9	80	60	57	—	256.8	285	25.7	14.22	21.8	6	5



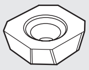
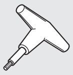
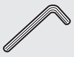
Right hand tool holder only.

SHANK TYPE

Order Number	Stock	Number of Teeth	Dimensions(mm)					APMX (mm)
	R		DC	DCX	LF	DCON	LH	
ASX445R503S32	●	3	50	63.0	125	32	40	6
ASX445R634S32	●	4	63	75.9	125	32	40	6
ASX445R804S32	●	4	80	93.2	125	32	40	6



SPARE PARTS

Tool Holder Number	① 	②  *	③  *		
	Shim	Shim Screw	Clamp Screw	Wrench (Insert)	Wrench (Shim)
ASX445	STASX445N	WCS503507H	TPS35	TIP15T	HKY35R

* Clamp Torque (N • m) : WCS503507H=5.0, TPS35=3.5

Wrench	1. Wrench The ASX445 uses a TORXPLUS clamp screw. The attached wrench is for the exclusive use of this screw. To ensure the effectiveness of TORXPLUS only use the attached wrench. 2. Hexagonal wrench The attached hexagonal wrench is for use with the seat and the shim. The wrench size is 3.5mm.
Spare Parts	Only use the original parts that were supplied when purchased. If other parts are used the performance and safety can not be assured.

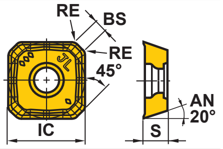
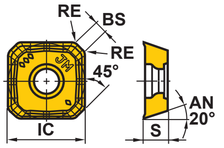
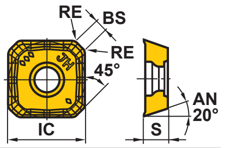
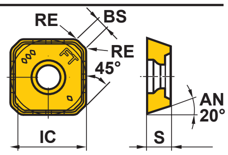
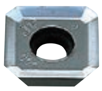
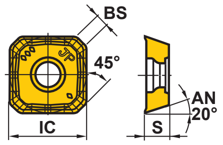
● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material			F7030	MC5020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT	NX4545		HTi10	
	P	Steel	◐		◐	✤					◐	✤	◐			
	M	Stainless Steel	◐				◐	✤			◐	✤	◐			
	K	Cast Iron		◐							✤					
	N	Non-ferrous Metal													◐	
	S	Heat resistant Alloy, Titanium Alloy							◐	✤	◐					
	H	Hardened Steel									◐					

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp
S : Chamfer + Round **T :** Chamfer

Application	Shape	Order Number	Class	Edge Preparation	Coated										Cermet		Carbide		Dimensions(mm)				Geometry
					F7030	MC5020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT	NX4545		HTi10		IC	S	BS	RE	
Finish–Light Cutting	**JL** Breaker 	**SEET13T3AGEN-JL**	E	E	●		●	●	●	●	●	●	●	●	●				13.4	3.97	1.9	1.5	
Light–Rough Cutting	**JM** Breaker 	**SEMT13T3AGSN-JM**	M	S	●	●	●	●	●	●	●	●	●	●	●				13.4	3.97	1.9	1.5	
Medium–Heavy Cutting	**JH** Breaker 	**SEMT13T3AGSN-JH**	M	S	●	●	●	●	●	●	●	●	●	●					13.4	3.97	1.9	1.5	
Roughing For Cast Iron	**FT** Breaker 	**SEMT13T3AGSN-FT**	M	S		●													13.4	3.97	1.9	1.5	
For Aluminium Alloy	**JP** Breaker 	**SEGT13T3AGFN-JP**	G	F													●		13.4	3.97	2.2	–	

■ Instructions for use of the JP breaker

Note1) The JP breaker has sharp cutting edges.
Wear gloves when handling.

Note2) When machining aluminium alloy, welding to the cutting edge tends to occur, often leading to insert failure.

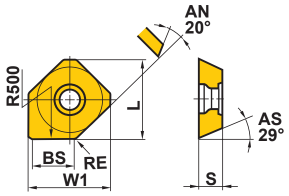
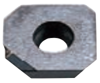
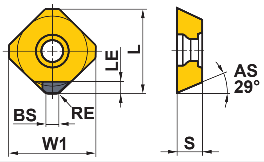
Note3) Wet cutting is recommended.

WIPER INSERTS

Workpiece Material		MC5020	VP15TF	NX2525	VP25N	HTi05T	MB710	MD220
P	Steel		◐	◐	◐			
M	Stainless Steel		◐	◐	◐			
K	Cast Iron	◐	✣	◐	◐	◐	◐	
N	Non-ferrous Metal					◐		◐
S	Heat resistant Alloy, Titanium Alloy		◐					
H	Hardened Steel		◐					

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp
S : Chamfer + Round **T :** Chamfer

Shape	Order Number	Class	Edge Preparation	Coated MC5020	Coated VP15TF	Cermet NX2525	Coated Cermet VP25N	Carbide HTi05T	CBN MB710	PCD MD220	Dimensions(mm) L	LE	W1	S	BS	RE	Geometry
	WEEW13T3AGER8C	E	E	●	●			●			16.6	—	16.48	3.97	7.5	1.5	
	WEEW13T3AGTR8C	E	T			●	●				16.6	—	16.48	3.97	7.5	1.5	
	WEEW13T3AGFR3C	E	F							●	16.6	1.8	16.48	3.97	3.0	1.5	
	WEEW13T3AGTR3C	E	T						▲		16.6	1.8	16.48	3.97	3.0	1.5	

*Wiper inserts are single-cornered.
*CBN grade MB710 is for cast iron.
*PCD grade MD220 is for aluminium alloy.

■Instructions for use of wiper inserts

Fig.1

Fig.2

Note 1) These wiper inserts are single-cornered.
Note 2) Install the insert so that the cutting edge is located as shown in Fig. 1.
Do not install the wiper insert as shown in Fig. 2. (The insert may be damaged by a too heavy cutting load.)
Note 3) Recommended depth of cutting is ap=0.2-0.5(mm). (Be aware of the cutting load if the depth of cut is over the recommendation.)
Note 4) The major cutting edge of a wiper insert is set more inside than a general tooth.
This is to prevent heavy loads on the wiper insert. (To prevent fracture set the feed under 0.2 mm/t)
Note 5) Excellent finished surface can be obtained with one wiper insert.
Note 6) When the feed per revolution is larger than the width of the wiper edge, install 2 or more wiper inserts equally inside the cutting body.

RECOMMENDED CUTTING CONDITIONS WHEN USING A WIPER INSERT

Workpiece Material	Grade	Recommended Cutting Speed (m/min)
P	**VP25N**	200 (80—250)
	VP15TF	180 (80—250)
M	**VP15TF**	120—270
K	**MC5020**	130—250
	VP15TF	
	MB710	
S	**VP15TF**	20—50
H	**VP15TF**	40—80
N	**MD220**	650 (300—1000)

●Recommended depth of cut (ap) is 0.2mm-0.5mm and feed per tooth (fz) is up to 0.2mm/t.

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains one CBN/PCD insert per case.)

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Finish—Light Cutting		Light—Rough Cutting		Medium—Heavy Cutting	
					Feed per Tooth (mm/t)	Breaker	Feed per Tooth (mm/t)	Breaker	Feed per Tooth (mm/t)	Breaker
P	Mild Steel	≤180HB	**F7030**	280 (210—350)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			MP6120 **VP15TF**	250 (200—300)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			MP6130	240 (190—290)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			VP30RT	230 (180—280)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			NX4545	180 (130—230)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	—	—
	Carbon Steel Alloy Steel	180—280HB	**F7030**	250 (200—300)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			MP6120 **VP15TF**	220 (170—270)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			MP6130	200 (150—230)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			VP30RT	150 (120—180)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			NX4545	150 (120—180)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	—	—
		280—350HB	**F7030**	180 (130—230)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			MP6120 **VP15TF**	140 (100—180)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			MP6130	120 (90—150)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			VP30RT	100 (80—160)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			NX4545	100 (80—160)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	—	—
M	Stainless Steel	≤270HB	**MP7130** **VP15TF**	220 (170—270)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			MP7140 **VP30RT**	200 (150—250)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			NX4545	150 (120—180)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	—	—
K	Cast Iron Ductile Cast Iron	Tensile Strength ≤450MPa	**MC5020**	200 (150—250)	—	—	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH** **FT**
			VP15TF	180 (130—250)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
		Tensile Strength ≥450MPa	**MC5020**	110 (80—150)	—	—	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH** **FT**
N	Aluminium Alloy	—	**HTi10**	650 (300—1000)	0.15 (0.1—0.2)	**JP**	0.2 (0.1—0.3)	**JP**	0.3 (0.2—0.4)	**JP**
S	Titanium Alloy	—	**MP9120** **VP15TF**	50 (40—60)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			MP9130	45 (30—55)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
	Heat Resistant Alloy (Inconel718 etc.)	—	**MP9120** **VP15TF**	40 (20—50)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
			MP9130	35 (15—45)	0.15 (0.1—0.2)	**JL**	0.2 (0.1—0.3)	**JM**	0.3 (0.2—0.4)	**JH**
H	Hardened Steel	40—55HRC	**VP15TF**	80 (60—100)	0.1 (0.05—0.15)	**JL**	0.15 (0.1—0.2)	**JM**	0.2 (0.1—0.3)	**JH**

●Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC) ●Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

FACE MILLING

<GENERAL CUTTING>

AHX440S/475S/640S

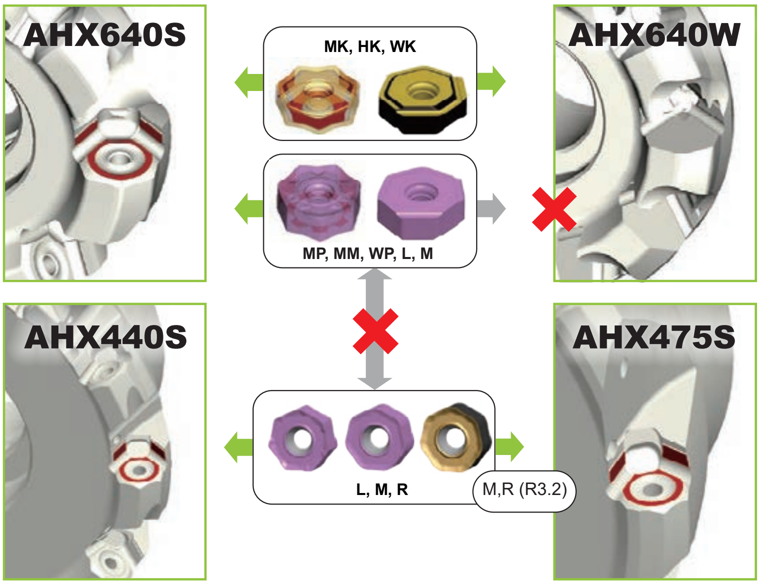
Selection Reference Table (Cutting Edge Count and Cutting Conditions)

DC	Type	Number of Teeth	AHX440S			AHX475S			AHX640S		
			General Cutting			High Feed Machining			General Cutting		
			Stock	**fr** (mm/rev)	**APMX**	Stock	**fr** (mm/rev)	**APMX**	Stock	**fr** (mm/rev)	**APMX**
40	Fine Pitch	3	●	0.6−1.2	3						
	Extra Fine Pitch	4	●	0.8−1.6	3						
50	Fine Pitch	4	●	0.8−1.6	3	●	2.4−4.0	1.6			
	Extra Fine Pitch	5	●	1.0−2.0	3	●	3.0−5.0	1.6			
	Super Extra Fine Pitch	6	●	1.2−2.4	3						
63	Coarse Pitch	4							●	0.8−1.6	6
	Fine Pitch	5	●	1.0−2.0	3	●	3.0−5.0	1.6	●	1.0−2.0	6
	Extra Fine Pitch	6	●	1.2−2.4	3	●	3.6−6.0	1.6			
	Super Extra Fine Pitch	8	●	1.6−3.2	3						
80	Coarse Pitch	4							●	0.8−1.6	6
	Fine Pitch	6	●	1.2−2.4	3	●	3.6−6.0	1.6	●	1.2−2.4	6
	Extra Fine Pitch	8	●	1.6−3.2	3	●	4.8−8.0	1.6			
	Super Extra Fine Pitch	10	●	2.0−4.0	3						
100	Coarse Pitch	5							●	1.0−2.0	6
	Fine Pitch	7	●	1.4−2.8	3	●	4.2−7.0	1.6	●	1.4−2.8	6
	Extra Fine Pitch	9				●	5.4−9.0	1.6			
		10	●	2.0−4.0	3						
	Super Extra Fine Pitch	12	●	2.4−4.8	3						
125	Coarse Pitch	6							●	1.2−2.4	6
	Fine Pitch	8	●	1.6−3.2	3	●	4.8−8.0	1.6	●	1.6−3.2	6
	Extra Fine Pitch	10				●	6.0−10.0	1.6			
		12	●	2.4−4.8	3						
	Super Extra Fine Pitch	14	●	2.8−5.6	3						
160	Coarse Pitch	7							●	1.4−2.8	6
	Fine Pitch	10	●	2.0−4.0	3	●	6.0−10.0	1.6	●	2.0−4.0	6
	Extra Fine Pitch	12				●	7.2−12.0	1.6			
		14	●	2.8−5.6	3						
	Super Extra Fine Pitch	16	●	3.2−6.4	3						
200	Coarse Pitch	8							●	1.6−3.2	6
	Fine Pitch	12							●	2.4−4.8	6

Note 1) fr : Feed rate per revolution (AHX475S : the feed rate per cutter (fz) will be limited by the cutting width ae. Please refer to page L069 for details.)
Note 2) APMX : Maximum depths of cut (AHX440S : the maximum depths of cut will vary depending on the breaker)
Note 3) The depths of cut and feed rate are identical to the recommended conditions for carbon steel and alloy steel.

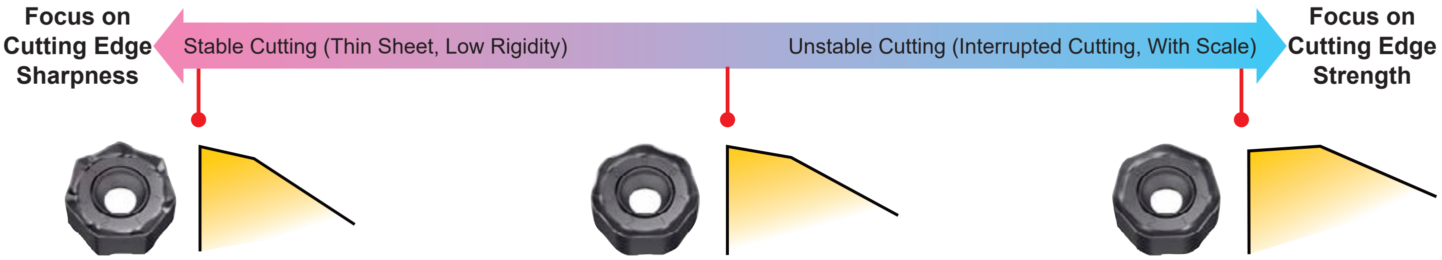
Compatibility with Inserts for AHX Series

The RE = 3.2 mm insert for use with AHX440S can be mounted on AHX475S.
All inserts for use with AHX640 can be mounted on AHX640S (note, however, that the set height will differ).
The inserts for mounting on AHX640W are the MK, HK, and WK breakers for casting.



Breaker System

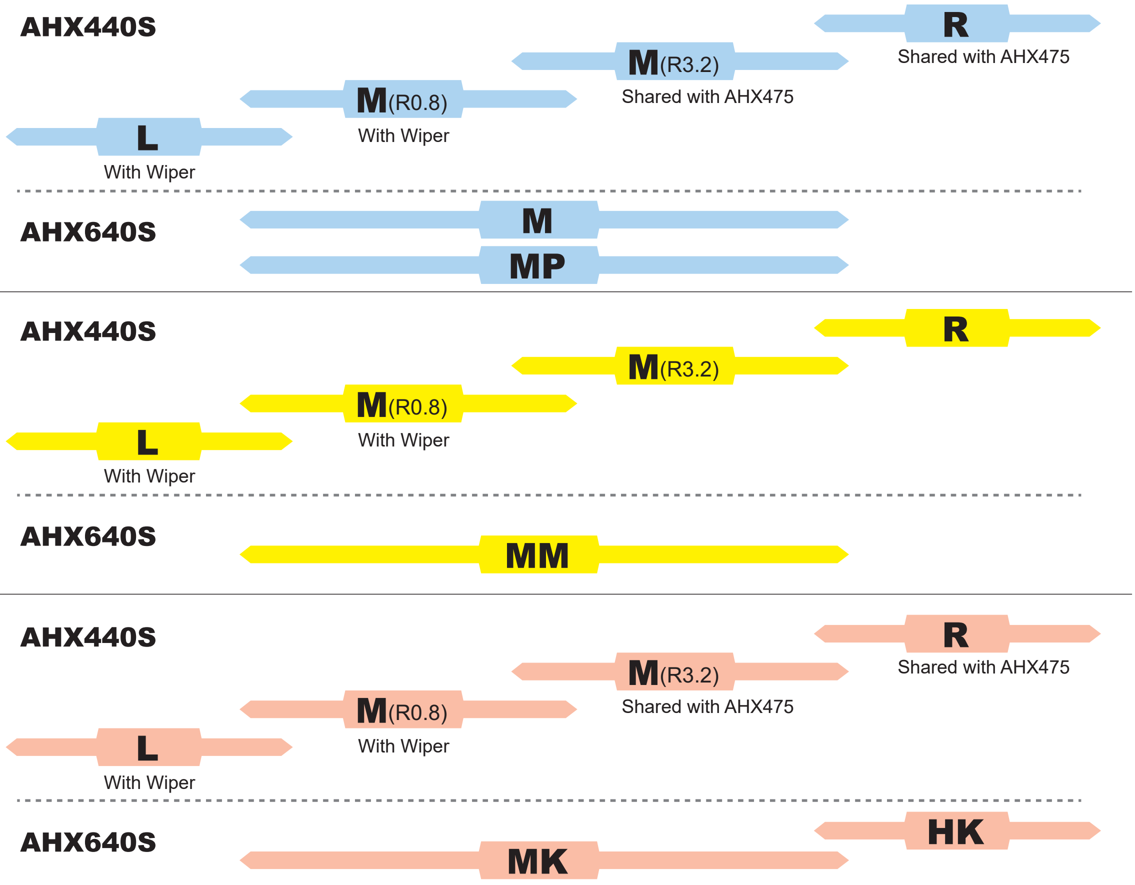
Breaker Series for Varied Cutting Conditions



L Breaker
Focus on cutting edge sharpness
Low resistance type

M Breaker
1st Recommendation
All-around

R Breaker
Focused on fracture resistance
Reinforced edge type



Workpiece Material		Cutting Conditions		
		Stable Cutting	General Cutting	Unstable Cutting
P	AHX440S			**R** Shared with AHX475
			M(R3.2) Shared with AHX475	
			M(R0.8) With Wiper	
		L With Wiper		
	AHX640S		**M**	
			MP	
M	AHX440S			**R**
			M(R3.2)	
			M(R0.8) With Wiper	
		L With Wiper		
	AHX640S		**MM**	
K	AHX440S			**R** Shared with AHX475
			M(R3.2) Shared with AHX475	
			M(R0.8) With Wiper	
		L With Wiper		
	AHX640S			**HK**
			MK	

Wiper Insert of AHX640S

Based on the number of inserts and the cutting conditions, use of wiper inserts can improve overall surface finishes.

P — **WP** + combination with **MP**
Right-hand 2 corners, left-hand 2 corners.

K — **WK** + combination with **MK**
Right-hand 2 corners, left-hand 2 corners.

FACE MILLING

<GENERAL CUTTING>

50° KAPR

AHX440S

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			Hardened Steel

Fig. 1

ø40
ø50
ø63
ø80

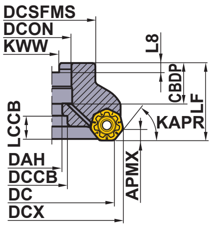


Fig. 2

ø100
ø125
ø160

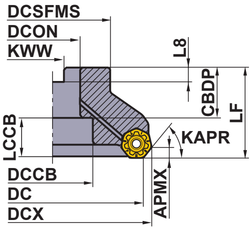
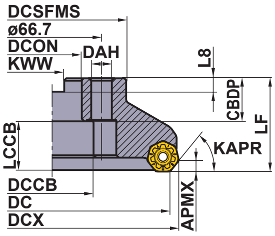


Fig. 3

ø160



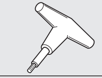
Right hand tool holder only.

DCON＝Inch size

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)			Fig.	WT (kg)	APMX (mm)
					LF	DCX	DCON			
40	**AHX440S-040A03AR**	●	○	3	40	48.4	16	1	0.3	3
	AHX440S-040A04AR	●	○	4	40	48.4	16	1	0.2	3
50	**AHX440S-050A04AR**	●	○	4	40	58.4	22	1	0.4	3
	AHX440S-050A05AR	●	○	5	40	58.4	22	1	0.4	3
	AHX440S-050A06AR	●	○	6	40	58.4	22	1	0.4	3
63	**AHX440S-063A05AR**	●	○	5	40	71.4	22	1	0.6	3
	AHX440S-063A06AR	●	○	6	40	71.4	22	1	0.6	3
	AHX440S-063A08AR	●	○	8	40	71.4	22	1	0.5	3
80	**AHX440SR08006CA**	●	○	6	50	88.4	25.4	1	1.1	3
	AHX440SR08008CA	●	○	8	50	88.4	25.4	1	1.1	3
	AHX440SR08010CA	●	○	10	50	88.4	25.4	1	1.1	3
100	**AHX440SR10007DA**	●	○	7	50	108.4	31.75	2	1.6	3
	AHX440SR10010DA	●	○	10	50	108.4	31.75	2	1.6	3
	AHX440SR10012DA	●	○	12	50	108.3	31.75	2	1.6	3
125	**AHX440SR12508EA**	●	○	8	63	133.4	38.1	2	3.0	3
	AHX440SR12512EA	●	○	12	63	133.4	38.1	2	3.0	3
	AHX440SR12514EA	●	○	14	63	133.3	38.1	2	2.9	3
160	**AHX440SR16010FA**	●	○	10	63	168.4	50.8	2	4.8	3
	AHX440SR16014FA	●	○	14	63	168.4	50.8	2	4.6	3
	AHX440SR16016FA	●	○	16	63	168.4	50.8	2	4.7	3

Note 1) The cutter body does not have a set bolt for an arbor.
Note 2) The above "APMX" will vary depending on the breaker insert.

SPARE PARTS

Tool Holder Number	 *	
	Clamp Screw	Wrench (Insert)
AHX440S	TS35R	TKY15T

＊ Clamp Torque (N • m) : TS35R=3.5

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

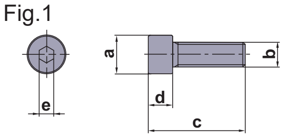
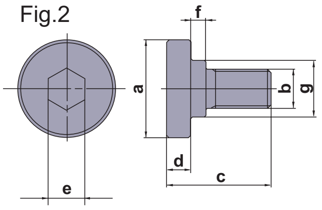
Metric Standard

DCON = mm size

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)			Fig.	WT (kg)	APMX (mm)
					LF	DCX	DCON			
40	**AHX440S-040A03AR**	●	○	3	40	48.4	16	1	0.3	3
	AHX440S-040A04AR	●	○	4	40	48.4	16	1	0.2	3
50	**AHX440S-050A04AR**	●	○	4	40	58.4	22	1	0.4	3
	AHX440S-050A05AR	●	○	5	40	58.4	22	1	0.4	3
	AHX440S-050A06AR	●	○	6	40	58.4	22	1	0.4	3
63	**AHX440S-063A05AR**	●	○	5	40	71.4	22	1	0.6	3
	AHX440S-063A06AR	●	○	6	40	71.4	22	1	0.6	3
	AHX440S-063A08AR	●	○	8	40	71.4	22	1	0.5	3
80	**AHX440S-080A06AR**	●	○	6	50	88.4	27	1	1.1	3
	AHX440S-080A08AR	●	○	8	50	88.4	27	1	1.1	3
	AHX440S-080A10AR	●	○	10	50	88.4	27	1	1.1	3
100	**AHX440S-100B07AR**	●	○	7	50	108.4	32	2	1.6	3
	AHX440S-100B10AR	●	○	10	50	108.4	32	2	1.6	3
	AHX440S-100B12AR	●	○	12	50	108.3	32	2	1.6	3
125	**AHX440S-125B08AR**	●	○	8	63	133.4	40	2	3.0	3
	AHX440S-125B12AR	●	○	12	63	133.4	40	2	3.0	3
	AHX440S-125B14AR	●	○	14	63	133.3	40	2	2.9	3
160	**AHX440S-160C10NR**	●	–	10	63	168.4	40	3	4.8	3
	AHX440S-160C14NR	●	–	14	63	168.4	40	3	4.6	3
	AHX440S-160C16NR	●	–	16	63	168.4	40	3	4.7	3

Note 1) The cutter body does not have a set bolt for an arbor.Please refer to the table below,when ordering.
Note 2) The above "APMX" will vary depending on the breaker insert.

SET BOLT (SOLD SEPARATELY)

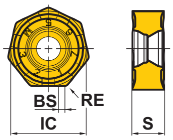
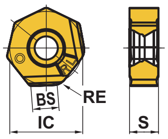
Tool Holder Number	Set Bolt		Fig.	Reference Dimensions (mm)							Geometry
	With Coolant Hole	Without Coolant Hole									
	Order Number	Order Number		a	b	c	d	e	f	g	
AHX440S-040A◌◌AR	HSC08025H	HSC08025	1	13	M8×1.25	33	8	5	–	–	Fig.1 
AHX440S-050A◌◌AR	HSC10030H	HSC10030	1	16	M10×1.5	40	10	6	–	–	
AHX440S-063A◌◌AR	HSC10030H	HSC10030	1	16	M10×1.5	40	10	6	–	–	
AHX440S-080A◌◌AR	HSC12035H	HSC12035	1	18	M12×1.75	47	12	10	–	–	
AHX440S-100B◌◌AR	MBA16033H	–	2	40	M16×2	43	10	14	6	23	
AHX440S-125B◌◌AR	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	Fig.2 
AHX440S-160C◌◌NR	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
AHX440SR080◌◌CA	HSC12035H	HSC12035	1	18	M12×1.75	47	12	10	–	–	
AHX440SR100◌◌DA	MBA16033H	–	2	40	M16×2	43	10	14	6	23	
AHX440SR125◌◌EA	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
AHX440SR160◌◌FA	MBA24045H	–	2	65	M24×3	59	14	17	10	37	

Note 1) Please purchase the appropriate set bolt after confirming the reference dimensions.
The items with an order number listed under the Set Bolt columns are also sold by Mitsubishi Materials.
Note 2) Internal coolant is necessary with the set bolt.

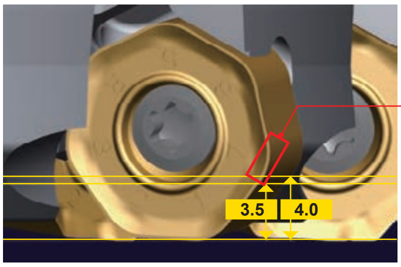
INSERTS

Workpiece Material			MP6120	MP6130	MP7130	MP7140	MC5020	VP15TF
	P	Steel	◐	✤				◐
	M	Stainless Steel			◐	✤		◐
	K	Cast Iron					◐	◐
	H	Hardened Steel						◐

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting
Edge Preparation :
E : Round

Application	Shape	Order Number	Class	Edge Preparation	Coated						Dimensions (mm)					Geometry
					MP6120	**MP6130**	**MP7130**	**MP7140**	**MC5020**	**VP15TF**	**IC**	**RE**	**BS**	**S**	**APMX**	
Stable Cutting		**NNMU130508ZER-L**	M	E	●	●	●	●	●	●	13.4	0.8	1	5.09	3	
General Cutting		**NNMU130508ZEN-M**	M	E	●	●	●	●	●	●	13.4	0.8	1	5.09	*1 4	
		NNMU130532ZEN-M	M	E	●	●	●	●	●	●	13.4	3.2	—	5.09	*1 4	
Unstable Cutting		**NNMU130532ZEN-R**	M	E	●	●	●	●	●	●	13.4	3.2	—	5.09	*1 4	
Finish Cutting	 Wiper	**WNEU1305ZEN4C-M**	E	E	●				●	●	13.4	2.7	4	5.09	0.5	

*1 When not using the Wiper, APMX = 3.5mm



Corner R on Opposite Side

If using corner R on the opposite side, APMX = 4.0 mm
If not using the opposite corner, APMX = 3.5 mm

■Instructions for Use of Wiper Inserts

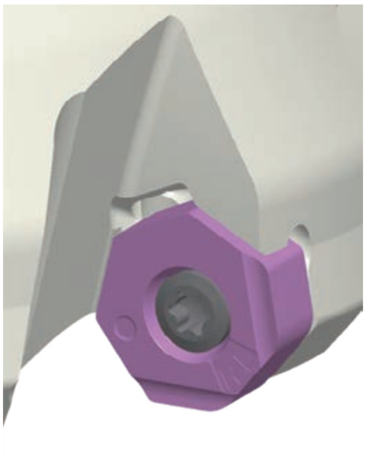


Fig.1

Fig.2

Note 1) The specifications for these wipers are right hand body 2 corners and left hand body 2 corners. Refer to Figure 1.
Note 2) Satisfactory finish surface can be achieved with one wiper insert.
However, if the feed rate per revolution will be equal to or greater than the width of the wiper edge, it is recommended to install the second and further wiper inserts spaced evenly within the cutting body.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

RECOMMENDED CUTTING CONDITIONS

■Dry Cutting

	Workpiece Material	Hardness	Grade	vc (m/min)	fz (mm/t)	ap (mm)
P	Mild Steel	≦180HB	**MP6120,VP15TF**	250(200−300)	0.3(0.2−0.4)	≦3
			MP6130	240(190−290)	0.3(0.2−0.4)	≦3
	Carbon Steel,Alloy Steel	180−280HB	**MP6120,VP15TF**	220(170−270)	0.3(0.2−0.4)	≦3
			MP6130	200(150−250)	0.3(0.2−0.4)	≦3
	Carbon Steel,Alloy Steel	280−350HB	**MP6120,VP15TF**	140(100−180)	0.3(0.2−0.4)	≦3
			MP6130	120(90−150)	0.3(0.2−0.4)	≦3
	Alloy Tool Steel	≦350HB (Annealing)	**MP6120,VP15TF**	140(100−180)	0.15(0.1−0.2)	≦1
			MP6130	120(90−150)	0.15(0.1−0.2)	≦1
	Pre-hardened Steel	35−45HRC	**MP6120,VP15TF**	140(100−180)	0.15(0.1−0.2)	≦1
			MP6130	120(90−150)	0.15(0.1−0.2)	≦1
M	Austenitic Stainless Steel	≦200HB	**MP7130,VP15TF**	200(150−250)	0.2(0.1−0.3)	≦3
			MP7140	180(120−230)	0.2(0.1−0.3)	≦3
		> 200HB	**MP7130,VP15TF**	150(100−200)	0.2(0.1−0.3)	≦3
			MP7140	130(80−180)	0.2(0.1−0.3)	≦3
	Ferritic and Maltensitic Stainless Steel	≦200HB	**MP7130,VP15TF**	200(150−250)	0.2(0.1−0.3)	≦3
			MP7140	180(120−230)	0.2(0.1−0.3)	≦3
		> 200HB	**MP7130,VP15TF**	150(100−200)	0.2(0.1−0.3)	≦3
			MP7140	130(80−180)	0.2(0.1−0.3)	≦3
	Two-phase Stainless Steel	≦280HB	**MP7130,VP15TF**	140(100−180)	0.15(0.05−0.25)	≦3
			MP7140	120(80−160)	0.15(0.05−0.25)	≦3
	Precipitation-Hardening Stainless Steel	< 450HB	**MP7130,VP15TF**	130(100−160)	0.15(0.05−0.25)	≦3
			MP7140	110(80−140)	0.15(0.05−0.25)	≦3
K	Gray Cast Iron	Tensile Strength ≦350MPa	**MC5020**	220(150−300)	0.3(0.2−0.4)	≦3
			VP15TF	180(130−230)	0.3(0.2−0.4)	≦3
	Ductile Cast Iron	Tensile Strength ≦450MPa	**MC5020**	200(150−250)	0.2(0.1−0.3)	≦3
			VP15TF	170(120−220)	0.2(0.1−0.3)	≦3
	Ductile Cast Iron	Tensile Strength ≦800MPa	**MC5020**	170(150−200)	0.2(0.1−0.3)	≦3
			VP15TF	140(100−180)	0.2(0.1−0.3)	≦3
H	Hardened Steel	40−55HRC	**VP15TF**	80(60−100)	0.15(0.1−0.2)	≦1

■Wet Cutting

	Workpiece Material	Hardness	Grade	vc (m/min)	fz (mm/t)	ap (mm)
M	Austenitic Stainless Steel	≦200HB	**MP7130,VP15TF**	125(100−150)	0.15(0.1−0.2)	≦3
			MP7140	100(80−140)	0.15(0.1−0.2)	≦3
		> 200HB	**MP7130,VP15TF**	100(75−125)	0.15(0.1−0.2)	≦3
			MP7140	80(55−105)	0.15(0.1−0.2)	≦3
	Ferritic and Maltensitic Stainless Steel	≦200HB	**MP7130,VP15TF**	125(100−150)	0.15(0.1−0.2)	≦3
			MP7140	100(80−140)	0.15(0.1−0.2)	≦3
		> 200HB	**MP7130,VP15TF**	100(75−125)	0.15(0.1−0.2)	≦3
			MP7140	80(55−105)	0.15(0.1−0.2)	≦3
	Two-phase Stainless Steel	≦280HB	**MP7130,VP15TF**	80(60−100)	0.1(0.05−0.15)	≦3
			MP7140	60(40−80)	0.1(0.05−0.15)	≦3
	Precipitation-Hardening Stainless Steel	< 450HB	**MP7130,VP15TF**	70(50−90)	0.1(0.05−0.15)	≦3
			MP7140	50(30−70)	0.1(0.05−0.15)	≦3

RECOMMENDED CUTTING CONDITIONS

Cutting Conditions with Wiper Insert

	Workpiece Material	Hardness	Grade	vc (m/min)	fz (mm/t)	ap (mm)
P	Mild Steel	≤180HB	**MP6120,VP15TF**	250(200−300)	0.3(0.2−0.4)	≤0.5
	Carbon Steel,Alloy Steel	180−280HB	**MP6120,VP15TF**	220(170−270)	0.3(0.2−0.4)	≤0.5
		280−350HB	**MP6120,VP15TF**	140(100−180)	0.3(0.2−0.4)	≤0.5
	Alloy Tool Steel	≤350HB (Annealing)	**MP6120,VP15TF**	140(100−180)	0.15(0.1−0.2)	≤0.5
	Pre-hardened Steel	35−45HRC	**MP6120,VP15TF**	140(100−180)	0.15(0.1−0.2)	≤0.5
M	Austenitic Stainless Steel	≤200HB	**VP15TF**	125(100−150)	0.15(0.1−0.2)	≤0.5
		> 200HB	**VP15TF**	100(75−125)	0.15(0.1−0.2)	≤0.5
	Ferritic and Maltensitic Stainless Steel	≤200HB	**VP15TF**	125(100−150)	0.15(0.1−0.2)	≤0.5
		> 200HB	**VP15TF**	100(75−125)	0.15(0.1−0.2)	≤0.5
	Two-phase Stainless Steel	≤280HB	**VP15TF**	80(60−100)	0.1(0.05−0.15)	≤0.5
	Precipitation-Hardening Stainless Steel	< 450HB	**VP15TF**	70(50−90)	0.1(0.05−0.15)	≤0.5
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020**	320(250−400)	0.3(0.2−0.4)	≤0.5
			VP15TF	220(150−300)	0.3(0.2−0.4)	≤0.5
	Ductile Cast Iron	Tensile Strength ≤450MPa	**MC5020**	250(200−300)	0.2(0.1−0.3)	≤0.5
			VP15TF	200(150−250)	0.2(0.1−0.3)	≤0.5
		Tensile Strength ≤800MPa	**MC5020**	220(200−250)	0.2(0.1−0.3)	≤0.5
			VP15TF	170(150−200)	0.2(0.1−0.3)	≤0.5
H	Hardened Steel	40−55HRC	**VP15TF**	80(60−100)	0.15(0.1−0.2)	≤0.5

Note 1) Refer to the table above and set up cutting conditions according to cutting applications.
Note 2) When placing emphasis on surface finish quality, wet cutting is recommended. (Tool life is lower when compared to dry cutting)
Note 3) The recommended depth of cut differs according to insert geometry.
Note 4) When clamp rigidity is low and tool overhang is long, please adjust the cutting speed and feed rather according to the table above.
Note 5) Recommended wet cutting for good surface finishing of stainless steel.

FACE MILLING
<HIGH FEED CUTTING>

15° KAPR

AHX475S

P	M	K	N	S	H
Steel		Cast Iron			Hardened Steel

Fig.1

ø50
ø63
ø80
ø100

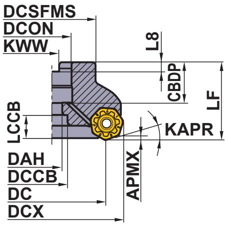
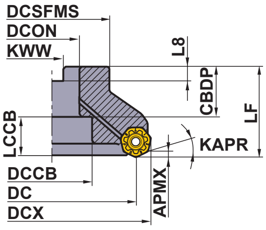


Fig.2

ø125
ø160



Right hand tool holder only.

DCON = Inch size

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)			Fig.	WT (kg)	APMX (mm)
					LF	DCX	DCON			
50	**AHX475S-050A04AR**	●	○	4	50	65.7	22	1	0.6	1.6
	AHX475S-050A05AR	●	○	5	50	65.7	22	1	0.6	1.6
63	**AHX475S-063A05AR**	●	○	5	50	78.7	22	1	1.0	1.6
	AHX475S-063A06AR	●	○	6	50	78.7	22	1	1.0	1.6
80	**AHX475SR08006DA**	●	○	6	63	95.6	31.75	1	2.0	1.6
	AHX475SR08008DA	●	○	8	63	95.6	31.75	1	2.0	1.6
100	**AHX475SR10007DA**	●	○	7	63	115.6	31.75	1	3.2	1.6
	AHX475SR10009DA	●	○	9	63	115.6	31.75	1	3.2	1.6
125	**AHX475SR12508EA**	●	○	8	63	140.6	38.1	2	4.0	1.6
	AHX475SR12510EA	●	○	10	63	140.6	38.1	2	4.0	1.6
160	**AHX475SR16010FA**	●	○	10	63	175.6	50.8	2	5.5	1.6
	AHX475SR16012FA	●	○	12	63	175.6	50.8	2	5.5	1.6

Note 1) The cutter body does not have a set bolt for an arbor.

Metric Standard

DCON = mm size

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)			Fig.	WT (kg)	APMX (mm)
					LF	DCX	DCON			
50	**AHX475S-050A04AR**	●	○	4	50	65.7	22	1	0.6	1.6
	AHX475S-050A05AR	●	○	5	50	65.7	22	1	0.6	1.6
63	**AHX475S-063A05AR**	●	○	5	50	78.7	22	1	1.0	1.6
	AHX475S-063A06AR	●	○	6	50	78.7	22	1	1.0	1.6
80	**AHX475S-080A06AR**	●	○	6	50	95.6	27	1	1.6	1.6
	AHX475S-080A08AR	●	○	8	50	95.6	27	1	1.6	1.6
100	**AHX475S-100A07AR**	●	○	7	63	115.6	32	1	3.3	1.6
	AHX475S-100A09AR	●	○	9	63	115.6	32	1	3.3	1.6
125	**AHX475S-125B08AR**	●	○	8	63	140.6	40	2	4.0	1.6
	AHX475S-125B10AR	●	○	10	63	140.6	40	2	4.0	1.6
160	**AHX475S-160B10AR**	●	○	10	63	175.6	40	2	6.0	1.6
	AHX475S-160B12AR	●	○	12	63	175.6	40	2	6.0	1.6

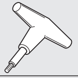
Note 1) The cutter body does not have a set bolt for an arbor.

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

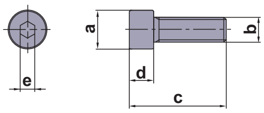
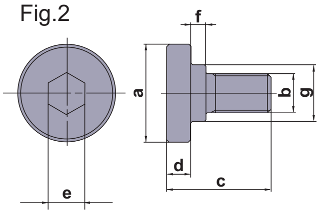
ISO13399 ➤ L003
MOUNTING DIMENSION ➤ L077
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

SPARE PARTS

Tool Holder Number	 Clamp Screw *	 Wrench (Insert)
AHX475S	TS35R	TKY15T

* Clamp Torque (N • m) : TS35R=3.5

SET BOLT (SOLD SEPARATELY)

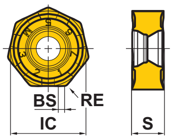
Tool Holder Number	Set Bolt		Fig.	Reference Dimensions (mm)							Geometry
	With Coolant Hole	Without Coolant Hole									
	Order Number	Order Number		a	b	c	d	e	f	g	
AHX475S-050A◌◌AR	HSC10030H	HSC10030	1	16	M10×1.5	40	10	6	–	–	Fig.1 
AHX475S-063A◌◌AR	HSC10030H	HSC10030	1	16	M10×1.5	40	10	6	–	–	
AHX475S-080A◌◌AR	HSC12035H	HSC12035	1	18	M12×1.75	47	12	10	–	–	
AHX475S-100B◌◌AR	HSC16040H	–	1	24	M16×2	56	16	14	–	–	
AHX475S-125B◌◌AR	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	Fig.2 
AHX475S-160B◌◌AR	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
AHX475SR080◌◌DA	HSC16040H	–	1	24	M16×2	56	16	14	–	–	
AHX475SR100◌◌DA	HSC16040H	–	1	24	M16×2	56	16	14	–	–	
AHX475SR125◌◌EA	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
AHX475SR160◌◌FA	MBA24045H	–	2	65	M24×3	59	14	17	10	37	

Note 1) Please purchase the appropriate set bolt after confirming the reference dimensions.
The items with an order number listed under the Set Bolt columns are also sold by Mitsubishi Materials.
Note 2) Internal coolant is necessary with the set bolt.

INSERTS

Workpiece Material			MP6120	MP6130	MC5020	VP15TF
	P	Steel	◐	✣		◐
	K	Cast Iron			◐	◐
	H	Hardened Steel				◐

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
Edge Preparation : E : Round

Application	Shape	Order Number	Class	Edge Preparation	Coated				Dimensions (mm)					Geometry
					MP6120	**MP6130**	**MC5020**	**VP15TF**	**IC**	**RE**	**BS**	**S**	**APMX**	
General Cutting		**NNMU130532ZEN-M**	M	E	●	●	●	●	13.4	3.2	–	5.09	1.6	
Unstable Cutting		**NNMU130532ZEN-R**	M	E	●	●	●	●	13.4	3.2	–	5.09	1.6	

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

RECOMMENDED CUTTING CONDITIONS

■Dry Cutting

	Workpiece Material	Hardness	Grade	Breaker	vc (m/min)	fz (mm/t)	ap (mm)	ae (mm)
P	Mild Steel	≤180HB	**MP6120**	**R**	150(100−200)	0.6	≤1.6	≤0.5DC
			MP6120	**R**	150(100−200)	0.8	≤1.6	0.5−0.8DC
			MP6120	**M**	150(100−200)	1	≤1.6	0.8−1DC
			MP6130	**R**	130(80−180)	0.6	≤1.6	≤0.5DC
			MP6130	**R**	130(80−180)	0.8	≤1.6	0.5−0.8DC
			MP6130	**M**	130(80−180)	1	≤1.6	0.8−1DC
	Carbon Steel,Alloy Steel	180−280HB	**MP6120**	**R**	130(80−180)	0.6	≤1.6	≤0.5DC
			MP6120	**R**	130(80−180)	0.8	≤1.6	0.5−0.8DC
			MP6120	**M**	130(80−180)	1	≤1.6	0.8−1DC
			MP6130	**R**	110(60−160)	0.6	≤1.6	≤0.5DC
			MP6130	**R**	110(60−160)	0.8	≤1.6	0.5−0.8DC
			MP6130	**M**	110(60−160)	1	≤1.6	0.8−1DC
	Carbon Steel,Alloy Steel	280−350HB	**MP6120**	**R**	100(50−150)	0.5	≤1.6	≤0.5DC
			MP6120	**R**	100(50−150)	0.6	≤1.6	0.5−0.8DC
			MP6120	**R**	100(50−150)	0.7	≤1.6	0.8−1DC
			MP6130	**R**	80(30−130)	0.5	≤1.6	≤0.5DC
			MP6130	**R**	80(30−130)	0.6	≤1.6	0.5−0.8DC
			MP6130	**R**	80(30−130)	0.7	≤1.6	0.8−1DC
	Alloy Tool Steel	≤350HB (Annealing)	**MP6120**	**R**	100(50−150)	0.5	≤1.6	≤0.5DC
			MP6120	**R**	100(50−150)	0.6	≤1.6	0.5−0.8DC
			MP6120	**R**	100(50−150)	0.7	≤1.6	0.8−1DC
			MP6130	**R**	80(30−120)	0.5	≤1.6	≤0.5DC
			MP6130	**R**	80(30−120)	0.6	≤1.6	0.5−0.8DC
			MP6130	**R**	80(30−120)	0.7	≤1.6	0.8−1DC
	Pre-hardened Steel	35−45HRC	**MP6120**	**R**	100(70−130)	0.5	≤1.6	≤0.5DC
			MP6120	**R**	100(70−130)	0.6	≤1.6	0.5−0.8DC
			MP6120	**R**	100(70−130)	0.7	≤1.6	0.8−1DC
			MP6130	**R**	80(50−110)	0.5	≤1.6	≤0.5DC
			MP6130	**R**	80(50−110)	0.6	≤1.6	0.5−0.8DC
			MP6130	**R**	80(50−110)	0.7	≤1.6	0.8−1DC
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020**	**R**	150(100−200)	0.6	≤1.6	≤0.5DC
			MC5020	**R**	150(100−200)	0.8	≤1.6	0.5−0.8DC
			MC5020	**M**	150(100−200)	1	≤1.6	0.8−1DC
			VP15TF	**M**	120(80−160)	0.6	≤1.6	≤0.5DC
			VP15TF	**M**	120(80−160)	0.8	≤1.6	0.5−0.8DC
			VP15TF	**M**	120(80−160)	1	≤1.6	0.8−1DC
	Ductile Cast Iron	Tensile Strength ≤450MPa	**MC5020**	**R**	150(100−200)	0.6	≤1.6	≤0.5DC
			MC5020	**R**	150(100−200)	0.8	≤1.6	0.5−0.8DC
			MC5020	**M**	150(100−200)	1	≤1.6	0.8−1DC
			VP15TF	**R**	120(80−160)	0.6	≤1.6	≤0.5DC
			VP15TF	**R**	120(80−160)	0.8	≤1.6	0.5−0.8DC
			VP15TF	**M**	120(80−160)	1	≤1.6	0.8−1DC
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MC5020**	**R**	150(100−200)	0.5	≤1.6	≤0.5DC
			MC5020	**R**	150(100−200)	0.6	≤1.6	0.5−0.8DC
			MC5020	**R**	150(100−200)	0.7	≤1.6	0.8−1DC
			VP15TF	**R**	120(80−160)	0.5	≤1.6	≤0.5DC
			VP15TF	**R**	120(80−160)	0.6	≤1.6	0.5−0.8DC
			VP15TF	**R**	120(80−160)	0.7	≤1.6	0.8−1DC
H	Hardened Steel	40−55HRC	**VP15TF**	**R**	70(50−90)	0.4	≤1.6	≤0.5DC
			VP15TF	**R**	70(50−90)	0.5	≤1.6	0.5−0.8DC
			VP15TF	**R**	70(50−90)	0.6	≤1.6	0.8−1DC

Note 1) When clamp rigidity is low and tool overhang is long, please adjust the cutting speed and feed rather according to the table above.

Memo

FACE MILLING
<GENERAL CUTTING>

50° KAPR

F R

AHX640S

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron		Heat Resistant Alloy	Hardened Steel

Fig. 1

ø63
ø80

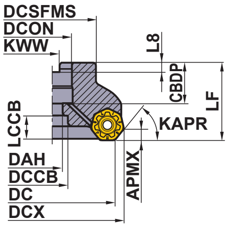


Fig. 2

ø100
ø125
ø160

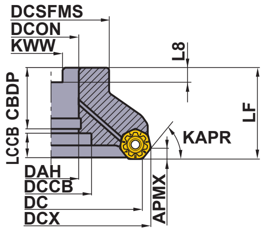
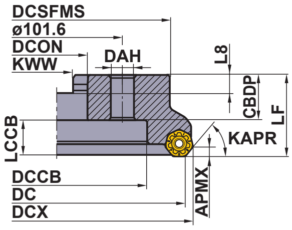
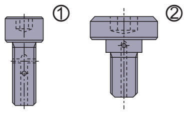


Fig. 3

ø200



Right hand tool holder only.

DC(mm)	Set Bolt	Geometry	
ϕ63	HSC10030H	①	 ① ② With Coolant Hole
ϕ80	HSC12035H		
ϕ100	MBA16033H	②	
ϕ125	MBA20040H		
ϕ160	MBA24045H		
ϕ200	—	—	

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)			Fig.	**WT** (kg)	**APMX** (mm)
					LF	**DCX**	**DCON**			
63	**AHX640S-063A04AR**	●	○	4	50	75.55	22	1	0.7	6
	AHX640S-063A05AR	●	○	5	50	75.55	22	1	0.6	6
80	**AHX640SR08004CA**	●	○	4	50	92.55	25.4	1	1.1	6
	AHX640SR08006CA	●	○	6	50	92.55	25.4	1	1.0	6
100	**AHX640SR10005DA**	●	○	5	50	112.55	31.75	2	1.7	6
	AHX640SR10007DA	●	○	7	50	112.55	31.75	2	1.5	6
125	**AHX640SR12506EA**	●	○	6	63	137.55	38.1	2	3.0	6
	AHX640SR12508EA	●	○	8	63	137.55	38.1	2	2.9	6
160	**AHX640SR16007FA**	●	○	7	63	172.55	50.8	2	4.9	6
	AHX640SR16010FA	●	○	10	63	172.55	50.8	2	4.7	6
200	**AHX640SR20008KN**	●	–	8	63	212.55	47.625	3	8.2	6
	AHX640SR20012KN	●	–	12	63	212.55	47.625	3	7.9	6

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

ISO13399 ➤ **L003**
MOUNTING DIMENSION ➤ **L077**
SPARE PARTS ➤ **P001**
TECHNICAL DATA ➤ **Q001**

Fig. 1

ø63
ø80

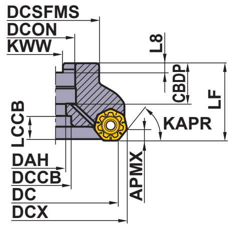


Fig. 2

ø100
ø125

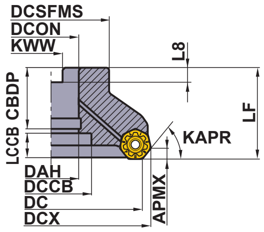


Fig. 3

ø160

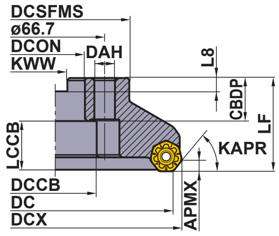
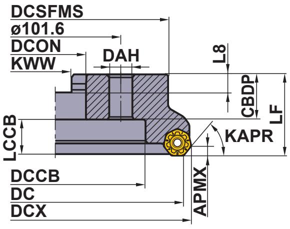
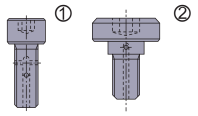


Fig. 4

ø200



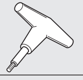
Right hand tool holder only.

DC(mm)	Set Bolt	Geometry	
ϕ63	HSC10030H	①	 With Coolant Hole
ϕ80	HSC12035H		
ϕ100	MBA16033H	②	
ϕ125	MBA20040H		
ϕ160	—	—	
ϕ200	—	—	

Metric Standard

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)			Fig.	**WT** (kg)	**APMX** (mm)
					LF	**DCX**	**DCON**			
63	**AHX640S-063A04AR**	●	○	4	50	75.55	22	1	0.7	6
	AHX640S-063A05AR	●	○	5	50	75.55	22	1	0.6	6
80	**AHX640S-080A04AR**	●	○	4	50	92.55	27	1	1.1	6
	AHX640S-080A06AR	●	○	6	50	92.55	27	1	1.0	6
100	**AHX640S-100B05AR**	●	○	5	50	112.55	32	2	1.7	6
	AHX640S-100B07AR	●	○	7	50	112.55	32	2	1.6	6
125	**AHX640S-125B06AR**	●	○	6	63	137.55	40	2	3.1	6
	AHX640S-125B08AR	●	○	8	63	137.55	40	2	3.0	6
160	**AHX640S-160C07NR**	●	–	7	63	172.55	40	3	5.4	6
	AHX640S-160C10NR	●	–	10	63	172.55	40	3	5.2	6
200	**AHX640S-200C08NR**	●	–	8	63	212.55	60	4	7.8	6
	AHX640S-200C12NR	●	–	12	63	212.55	60	4	7.5	6

SPARE PARTS

Tool Holder Number	 *	
	Clamp Screw	Wrench (Insert)
AHX640S	CS5015060T	TKY20T

⋆ Clamp Torque (N • m) : CS5015060T=5.0

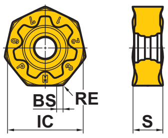
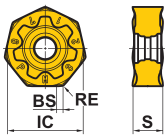
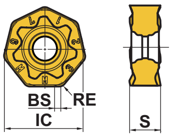
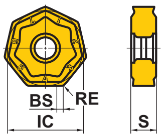
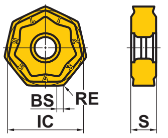
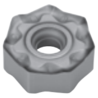
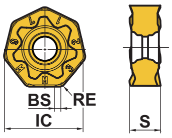
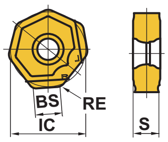
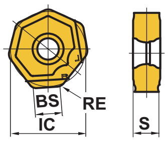
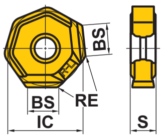
● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Edge Preparation :
E : Round

Workpiece Material		MP6120	MP6130	MP7030	MP9120	MP9130	MC5020	VP15TF	VP20RT
P	Steel	◐	✤					◐	◐
M	Stainless Steel			◐				◐	◐
K	Cast Iron						◐	✤	✤
N	Non-ferrous Metal								
S	Heat resistant Alloy, Titanium Alloy			◐	◐	✤		◐	◐
H	Hardened Steel							◐	

Application	Shape	Order Number	Class	Edge Preparation	Coated								Dimensions (mm)					Geometry
					MP6120	MP6130	MP7030	MP9120	MP9130	MC5020	VP15TF	VP20RT	IC	RE	BS	S	APMX	
For Steel General Cutting		**NNMU200708ZEN-M**	M	E	●	●							20	0.8	1	7.28	6	
For Steel General Cutting		**NNMU200708ZEN-MP**	M	E							●		20	0.8	1	7.28	6	
For Stainless Steel		**NNMU200712ZER-MM**	M	E			●						20	1.2	1	7.28	6	
For Cast Iron General Cutting		**NNMU200608ZEN-MK**	M	E						●	●	●	20	0.8	1	6.1	6	
For Cast Iron Strong Cutting Edge Type		**NNMU200608ZEN-HK**	M	E						●	●	●	20	0.8	1	6.1	6	
For Titanium Alloy and Heat Resistant Alloy		**NNMU200712ZER-L**	M	E				●	●				20	1.2	1	7.24	6	
For Steel	 Wiper	**WNEU2007ZEN7C-M**	E	E	●								20	0.8	7.2	6.85	0.5	
General Cutting	 Wiper	**WNEU2007ZEN7C-WP**	E	E							●		20	0.8	7.1	6.85	0.5	
For Cast Iron	 Wiper	**WNEU2006ZEN7C-WK**	E	E						●			20	0.8	7.4	6.55	0.5	

Note 1) The height of cutter when setting MK, HK inserts are different from when setting MP, MM inserts.

ISO13399 ➤ L003
MOUNTING DIMENSION ➤ L077
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

■Instructions for Use of Wiper Iinserts

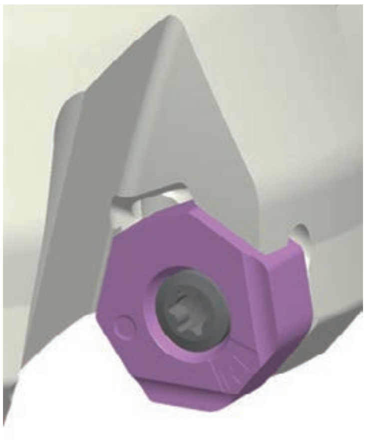


Fig.1

Fig.2

Note 1) The specifications for these wipers are right hand body 2 corners and left hand body 2 corners. Refer to Figure 1.

Note 2) Satisfactory finish surface can be achieved with one wiper insert.
However, if the feed rate per revolution will be equal to or greater than the width of the wiper edge, it is recommended to install the second and further wiper inserts spaced evenly within the cutting body.

RECOMMENDED CUTTING CONDITIONS

■Dry Cutting

	Workpiece Material	Hardness	Grade	Breaker	vc (m/min)	fz (mm/t)	ap (mm)	ae (mm)
P	Mild Steel	≤180HB	**MP6120**	**M**	250(200−300)	0.3(0.2−0.4)	≤5	≤0.8DC
			VP15TF	**MP**	250(200−300)	0.3(0.2−0.4)	≤5	≤0.8DC
			MP6130	**M**	220(170−270)	0.4(0.3−0.5)	≤5	≤0.8DC
	Carbon Steel,Alloy Steel	180−280HB	**MP6120**	**M**	220(170−270)	0.3(0.2−0.4)	≤5	≤0.8DC
			VP15TF	**MP**	220(170−270)	0.3(0.2−0.4)	≤5	≤0.8DC
			MP6130	**M**	190(140−240)	0.4(0.3−0.5)	≤5	≤0.8DC
	Carbon Steel,Alloy Steel	280−350HB	**MP6120**	**M**	140(100−180)	0.3(0.2−0.4)	≤5	≤0.8DC
			VP15TF	**MP**	140(100−180)	0.3(0.2−0.4)	≤5	≤0.8DC
			MP6130	**M**	110(70−150)	0.4(0.3−0.5)	≤5	≤0.8DC
	Alloy Tool Steel	≤350HB (Annealing)	**MP6120**	**M**	140(100−180)	0.15(0.1−0.2)	≤3	≤0.8DC
			VP15TF	**MP**	140(100−180)	0.15(0.1−0.2)	≤3	≤0.8DC
			MP6130	**M**	110(70−150)	0.25(0.2−0.3)	≤3	≤0.8DC
	Pre-hardened Steel	35−45HRC	**MP6120**	**M**	140(100−180)	0.15(0.1−0.2)	≤3	≤0.8DC
			VP15TF	**MP**	140(100−180)	0.15(0.1−0.2)	≤5	≤0.8DC
			MP6130	**M**	110(70−150)	0.25(0.2−0.3)	≤3	≤0.8DC
M	Austenitic Stainless Steel	≤200HB	**MP7030**	**MM**	200(150−250)	0.2(0.1−0.3)	≤5	≤0.8DC
	Austenitic Stainless Steel	> 200HB	**MP7030**	**MM**	150(100−200)	0.2(0.1−0.3)	≤5	≤0.8DC
	Two-phase Stainless Steel	≤280HB	**MP7030**	**MM**	140(100−180)	0.15(0.05−0.25)	≤5	≤0.8DC
	Ferritic and Maltensitic Stainless Steel	≤200HB	**MP7030**	**MM**	200(150−250)	0.2(0.1−0.3)	≤5	≤0.8DC
	Ferritic and Maltensitic Stainless Steel	> 200HB	**MP7030**	**MM**	150(100−200)	0.2(0.1−0.3)	≤5	≤0.8DC
	Precipitation-Hardening Stainless Steel	< 450HB	**MP7030**	**MM**	130(100−160)	0.15(0.05−0.25)	≤5	≤0.8DC
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020**	**MK,HK**	220(150−300)	0.3(0.2−0.4)	≤5	≤0.8DC
			VP15TF,VP20RT	**MK,HK**	180(130−230)	0.3(0.2−0.4)	≤5	≤0.8DC
			VP15TF	**MP**	180(130−230)	0.3(0.2−0.4)	≤5	≤0.8DC
	Ductile Cast Iron	Tensile Strength ≤450MPa	**MC5020**	**MK,HK**	200(150−250)	0.2(0.1−0.3)	≤5	≤0.8DC
			VP15TF,VP20RT	**MK,HK**	170(120−220)	0.2(0.1−0.3)	≤5	≤0.8DC
			VP15TF	**MP**	170(120−220)	0.2(0.1−0.3)	≤5	≤0.8DC
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MC5020**	**MK,HK**	170(150−200)	0.2(0.1−0.3)	≤5	≤0.8DC
			VP15TF,VP20RT	**MK,HK**	140(100−180)	0.2(0.1−0.3)	≤5	≤0.8DC
			VP15TF	**MP**	140(100−180)	0.2(0.1−0.3)	≤5	≤0.8DC
H	Hardened Steel	40−55HRC	**VP15TF**	**MP**	80(60−100)	0.15(0.1−0.2)	≤3	≤0.8DC

Note1) Recommended wet cutting for good surface finishing of stainless steel. (Tool life is short compared to wet cutting.)
Note2) Wet cutting is recommended with internal coolant for titanium alloys and heat resistant alloys.
Note3) When clamp rigidity is low and tool overhang is long, please adjust the cutting speed and feed rather according to the table above.

Wet Cutting

	Workpiece Material	Hardness	Breaker	Grade	vc (m/min)	fz (mm/t)	ap (mm)	ae (mm)
M	Austenitic Stainless Steel	≤200HB	**MP7030**	**MM**	125(100−150)	0.15(0.1−0.2)	≤5	≤0.8DC
	Austenitic Stainless Steel	> 200HB	**MP7030**	**MM**	100(75−125)	0.15(0.1−0.2)	≤5	≤0.8DC
	Two-phase Stainless Steel	≤280HB	**MP7030**	**MM**	80(60−100)	0.1(0.05−0.15)	≤5	≤0.8DC
	Ferritic and Maltensitic Stainless Steel	≤200HB	**MP7030**	**MM**	125(100−150)	0.15(0.1−0.2)	≤5	≤0.8DC
	Ferritic and Maltensitic Stainless Steel	> 200HB	**MP7030**	**MM**	100(75−125)	0.15(0.1−0.2)	≤5	≤0.8DC
	Precipitation-Hardening Stainless Steel	< 450HB	**MP7030**	**MM**	70(50−90)	0.1(0.05−0.15)	≤5	≤0.8DC
S	Titanium Alloy	−	**MP7030**	**MM**	40(20−50)	0.15(0.1−0.2)	≤3	≤0.6DC
		−	**MP9120**	**L**	60(50−70)	0.1(0.05−0.15)	≤3	≤0.6DC
		−	**MP9130**	**L**	40(20−50)	0.15(0.1−0.2)	≤3	≤0.6DC
	Heat Resistant Alloy	−	**MP7030**	**MM**	40(20−50)	0.15(0.1−0.2)	≤3	≤0.6DC
		−	**MP9120**	**L**	40(20−50)	0.15(0.1−0.2)	≤3	≤0.6DC
		−	**MP9130**	**L**	40(20−50)	0.15(0.1−0.2)	≤3	≤0.6DC

Note1) Recommended wet cutting for good surface finishing of stainless steel. (Tool life is short compared to wet cutting.)
Note2) Wet cutting is recommended with internal coolant for titanium alloys and heat resistant alloys.
Note3) When clamp rigidity is low and tool overhang is long, please adjust the cutting speed and feed rather according to the table above.

Cutting Conditions with Wiper Insert

	Workpiece Material	Hardness	Main Insert	Grade	Wiper Insert	Grade	vc (m/min)	fz (mm/t)	ap (mm)	ae (mm)
P	Mild Steel	≤180HB	**VP15TF**	**MP**	**VP15TF**	**WP**	250(200−300)	0.3(0.2−0.4)	≤0.5	≤0.8DC
			MP6120	**M**	**MP6120**	**M**	250(200−300)	0.3(0.2−0.4)	≤0.5	≤0.8DC
	Carbon Steel,Alloy Steel	180−280HB	**VP15TF**	**MP**	**VP15TF**	**WP**	220(170−270)	0.3(0.2−0.4)	≤0.5	≤0.8DC
			MP6120	**M**	**MP6120**	**M**	220(170−270)	0.3(0.2−0.4)	≤0.5	≤0.8DC
	Carbon Steel,Alloy Steel	280−350HB	**VP15TF**	**MP**	**VP15TF**	**WP**	140(100−180)	0.3(0.2−0.4)	≤0.5	≤0.8DC
			MP6120	**M**	**MP6120**	**M**	140(100−180)	0.3(0.2−0.4)	≤0.5	≤0.8DC
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020**	**MK,HK**	**MC5020**	**WK**	320(250−400)	0.3(0.2−0.4)	≤0.5	≤0.8DC
			VP15TF	**MP**	**VP15TF**	**WP**	220(150−300)	0.3(0.2−0.4)	≤0.5	≤0.8DC
	Ductile Cast Iron	Tensile Strength ≤450MPa	**MC5020**	**MK,HK**	**MC5020**	**WK**	250(200−300)	0.2(0.1−0.3)	≤0.5	≤0.8DC
			VP15TF	**MP**	**VP15TF**	**WP**	200(150−250)	0.2(0.1−0.3)	≤0.5	≤0.8DC
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MC5020**	**MK,HK**	**MC5020**	**WK**	220(200−250)	0.2(0.1−0.3)	≤0.5	≤0.8DC
			VP15TF	**MP**	**VP15TF**	**WP**	170(150−200)	0.2(0.1−0.3)	≤0.5	≤0.8DC
S	Heat Resistant Alloy	−	**VP15TF**	**MP**	**VP15TF**	**WP**	40(20−50)	0.15(0.1−0.2)	≤0.5	≤0.8DC
H	Hardened Steel	40−55HRC	**VP15TF**	**MP**	**VP15TF**	**WP**	80(60−100)	0.15(0.1−0.2)	≤0.5	≤0.8DC

Note 1) When clamp rigidity is low and tool overhang is long, please adjust the cutting speed and feed rather according to the table above.
Note 2) Please use a WP breaker in combination with a MP breaker, and a WK breaker with a MK/HK breaker.

AHX440S, AHX475S, AHX640S Mounting Dimensions

Fig. 1

ø40
ø50
ø63
ø80

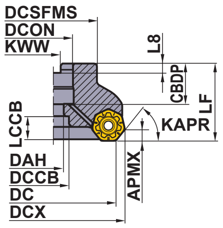


Fig. 2

ø100
ø125
ø160

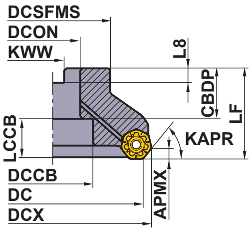
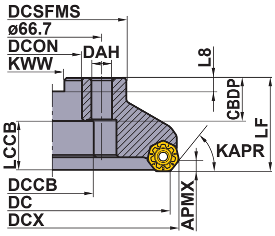


Fig. 3

ø160



Right hand tool holder only.

DCON (mm)	**DC** (mm)	Order Number	Dimensions(mm)							Fig.
			CBDP	**DAH**	**DCCB**	**LCCB**	**DCSFMS**	**KWW**	**L8**	
16	40	**AHX440S-040A03AR**	18	9	14	13.9	37	8.4	5.6	1
16	40	**AHX440S-040A04AR**	18	9	14	13.9	37	8.4	5.6	1
22	50	**AHX440S-050A04AR**	20	11	17	11.9	47	10.4	6.3	1
22	50	**AHX440S-050A05AR**	20	11	17	11.9	47	10.4	6.3	1
22	50	**AHX440S-050A06AR**	20	11	17	11.9	47	10.4	6.3	1
22	50	**AHX475S-050A04AR**	20	11	17	16.7	47	10.4	6.3	5
22	50	**AHX475S-050A05AR**	20	11	17	16.7	47	10.4	6.3	5
22	63	**AHX440S-063A05AR**	20	11	17	11.9	50	10.4	6.3	1
22	63	**AHX440S-063A06AR**	20	11	17	11.9	50	10.4	6.3	1
22	63	**AHX440S-063A08AR**	20	11	17	11.9	50	10.4	6.3	1
22	63	**AHX475S-063A05AR**	20	11	17	16.7	60	10.4	6.3	5
22	63	**AHX475S-063A06AR**	20	11	17	16.7	60	10.4	6.3	5
22	63	**AHX640S-063A04AR**	20	11	17	16.2	50	10.4	6.3	1
22	63	**AHX640S-063A05AR**	20	11	17	16.2	50	10.4	6.3	1
25.4	80	**AHX440SR08006CA**	26	13	20	14.9	56	9.5	6	1
25.4	80	**AHX440SR08008CA**	26	13	20	14.9	56	9.5	6	1
25.4	80	**AHX440SR08010CA**	26	13	20	14.9	56	9.5	6	1
25.4	80	**AHX640SR08004CA**	26	13	20	14.2	56	9.5	6	1
25.4	80	**AHX640SR08006CA**	26	13	20	14.2	56	9.5	6	1
27	80	**AHX440S-080A06AR**	23	13	20	14.9	56	12.4	7	1
27	80	**AHX440S-080A08AR**	23	13	20	14.9	56	12.4	7	1
27	80	**AHX440S-080A10AR**	23	13	20	14.9	56	12.4	7	1
27	80	**AHX475S-080A06AR**	23	13	20	14.7	76	12.4	7	5
27	80	**AHX475S-080A08AR**	23	13	20	14.7	76	12.4	7	5
27	80	**AHX640S-080A04AR**	23	13	20	15.2	56	12.4	7	1
27	80	**AHX640S-080A06AR**	23	13	20	15.2	56	12.4	7	1
31.75	80	**AHX475SR08006DA**	32	17	26	19.7	76	12.7	8	5
31.75	80	**AHX475SR08008DA**	32	17	26	19.7	76	12.7	8	5
31.75	100	**AHX440SR10007DA**	37	—	45	11.9	70	12.7	8	2
31.75	100	**AHX440SR10010DA**	37	—	45	11.9	70	12.7	8	2
31.75	100	**AHX440SR10012DA**	37	—	45	11.9	70	12.7	8	2
31.75	100	**AHX475SR10007DA**	32	17	26	19.7	96	12.7	8	5
31.75	100	**AHX475SR10009DA**	32	17	26	19.7	96	12.7	8	5
31.75	100	**AHX640SR10005DA**	35	—	45	13.2	70	12.7	8	2
31.75	100	**AHX640SR10007DA**	35	—	45	13.2	70	12.7	8	2

Fig. 4

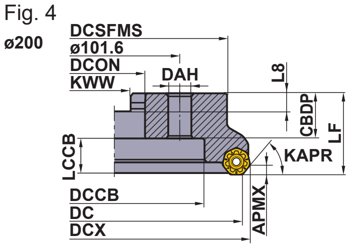


Fig.5

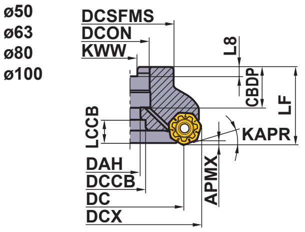
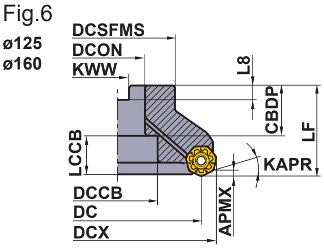


Fig.6



Right hand tool holder only.

DCON (mm)	DC (mm)	Order Number	Dimensions(mm)							Fig.
			CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
32	100	**AHX440S-100B07AR**	32	–	45	16.9	78	14.4	8	2
32	100	**AHX440S-100B10AR**	32	–	45	16.9	78	14.4	8	2
32	100	**AHX440S-100B12AR**	32	–	45	16.9	78	14.4	8	2
32	100	**AHX475S-100A07AR**	26	17	26	25.7	96	14.4	8	5
32	100	**AHX475S-100A09AR**	26	17	26	25.7	96	14.4	8	5
32	100	**AHX640S-100B05AR**	32	–	45	16.2	78	14.4	8	2
32	100	**AHX640S-100B07AR**	32	–	45	16.2	78	14.4	8	2
38.1	125	**AHX440SR12508EA**	42	–	56	19.9	80	15.9	10	2
38.1	125	**AHX440SR12512EA**	42	–	56	19.9	80	15.9	10	2
38.1	125	**AHX440SR12514EA**	42	–	56	19.9	80	15.9	10	2
38.1	125	**AHX475SR12508EA**	42	–	56	19.7	100	15.9	10	6
38.1	125	**AHX475SR12510EA**	42	–	56	19.7	100	15.9	10	6
38.1	125	**AHX640SR12506EA**	42	–	56	19.2	80	15.9	10	2
38.1	125	**AHX640SR12508EA**	42	–	56	19.2	80	15.9	10	2
40	125	**AHX440S-125B08AR**	40	–	56	21.9	89	16.4	9	2
40	125	**AHX440S-125B12AR**	40	–	56	21.9	89	16.4	9	2
40	125	**AHX440S-125B14AR**	40	–	56	21.9	89	16.4	9	2
40	125	**AHX475S-125B08AR**	40	–	56	21.7	100	16.4	9	6
40	125	**AHX475S-125B10AR**	40	–	56	21.7	100	16.4	9	6
40	125	**AHX640S-125B06AR**	42	–	56	19.2	89	16.4	9	2
40	125	**AHX640S-125B08AR**	42	–	56	19.2	89	16.4	9	2
40	160	**AHX440S-160C10NR**	40	14	56	21.9	100	16.4	9	3
40	160	**AHX440S-160C14NR**	40	14	56	21.9	100	16.4	9	3
40	160	**AHX440S-160C16NR**	40	14	56	21.9	100	16.4	9	3
40	160	**AHX475S-160B10AR**	40	–	56	21.7	100	16.4	9	6
40	160	**AHX475S-160B12AR**	40	–	56	21.7	100	16.4	9	6
40	160	**AHX640S-160C07NR**	29	14	56	32.2	120	16.4	9	3
40	160	**AHX640S-160C10NR**	29	14	56	32.2	120	16.4	9	3
47.625	200	**AHX640SR20008KN**	35	18	140	26.2	175	25.4	14.22	4
47.625	200	**AHX640SR20012KN**	35	18	140	26.2	175	25.4	14.22	4
50.8	160	**AHX440SR16010FA**	45	–	72	16.9	100	19.1	11	2
50.8	160	**AHX440SR16014FA**	45	–	72	16.9	100	19.1	11	2
50.8	160	**AHX440SR16016FA**	45	–	72	16.9	100	19.1	11	2
50.8	160	**AHX475SR16010FA**	45	–	72	16.7	100	19.1	11	6
50.8	160	**AHX475SR16012FA**	45	–	72	16.7	100	19.1	11	6
50.8	160	**AHX640SR16007FA**	43	–	72	18.2	100	19.1	11	2
50.8	160	**AHX640SR16010FA**	43	–	72	18.2	100	19.1	11	2
60	200	**AHX640S-200C08NR**	32	18	140	29.2	175	25.7	14.22	4
60	200	**AHX640S-200C12NR**	32	18	140	29.2	175	25.7	14.22	4

ISO13399 ➢L003

50° KAPR

AHX640W

P | M | **K** | N | S | H

Cast Iron

Fig.1

ø80

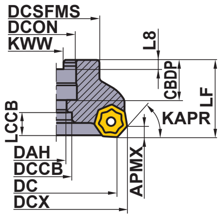


Fig.2

ø100
ø125
ø160

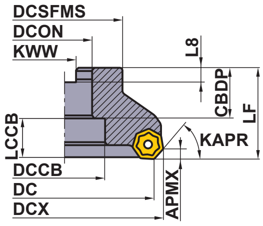


Fig.3

ø200
ø250

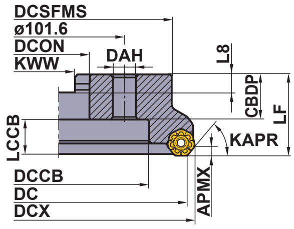
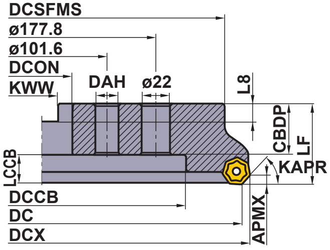


Fig.4

ø315



Right hand tool holder shown.

Right Hand Tool Holder

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)			Fig.	WT (kg)	APMX (mm)
					LF	DCX	DCON			
80	**AHX640WR08008C**	●	–	8	50	92.6	25.4	1	1.5	6
	AHX640WR08010C	●	–	10	50	92.6	25.4	1	1.5	6
100	**AHX640WR10010D**	●	–	10	50	112.6	31.75	2	2.1	6
	AHX640WR10014D	●	–	14	50	112.6	31.75	2	2.1	6
125	**AHX640WR12512E**	●	–	12	63	137.6	38.1	2	3.5	6
	AHX640WR12518E	●	–	18	63	137.6	38.1	2	3.5	6
160	**AHX640WR16016F**	●	–	16	63	172.6	50.8	2	5.6	6
	AHX640WR16022F	●	–	22	63	172.6	50.8	2	5.6	6
200	**AHX640WR20020K**	●	–	20	63	212.6	47.625	3	9.0	6
	AHX640WR20028K	●	–	28	63	212.6	47.625	3	9.0	6
250	**AHX640WR25024K**	●	–	24	63	262.6	47.625	3	14.4	6
	AHX640WR25036K	●	–	36	63	262.6	47.625	3	14.4	6
315	**AHX640WR31528P**	●	–	28	63	327.6	47.625	4	23.8	6
	AHX640WR31544P	●	–	44	63	327.6	47.625	4	23.8	6

Left Hand Tool Holder

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)			Fig.	WT (kg)	APMX (mm)
					LF	DCX	DCON			
80	**AHX640WL08008C**	●	–	8	50	92.6	25.4	1	1.5	6
	AHX640WL08010C	●	–	10	50	92.6	25.4	1	1.5	6
100	**AHX640WL10010D**	●	–	10	50	112.6	31.75	2	2.1	6
	AHX640WL10014D	●	–	14	50	112.6	31.75	2	2.1	6
125	**AHX640WL12512E**	●	–	12	63	137.6	38.1	2	3.5	6
	AHX640WL12518E	●	–	18	63	137.6	38.1	2	3.5	6
160	**AHX640WL16016F**	●	–	16	63	172.6	50.8	2	5.6	6
	AHX640WL16022F	●	–	22	63	172.6	50.8	2	5.6	6
200	**AHX640WL20020K**	●	–	20	63	212.6	47.625	3	9.0	6
	AHX640WL20028K	●	–	28	63	212.6	47.625	3	9.0	6
250	**AHX640WL25024K**	●	–	24	63	262.6	47.625	3	14.4	6
	AHX640WL25036K	●	–	36	63	262.6	47.625	3	14.4	6
315	**AHX640WL31528P**	●	–	28	63	327.6	47.625	4	23.8	6
	AHX640WL31544P	●	–	44	63	327.6	47.625	4	23.8	6

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

ISO13399 ➤ **L003**
MOUNTING DIMENSION ➤ **L082**
SPARE PARTS ➤ **P001**
TECHNICAL DATA ➤ **Q001**

Fig.1
ø80

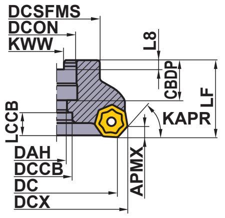


Fig.2
ø100
ø125

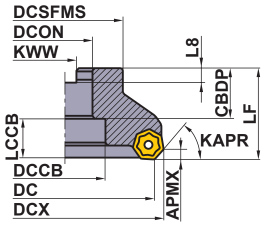


Fig.3
ø160

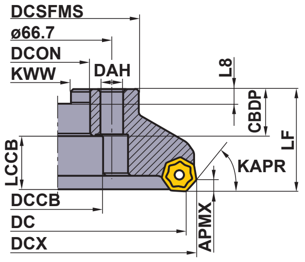


Fig.4
ø200
ø250

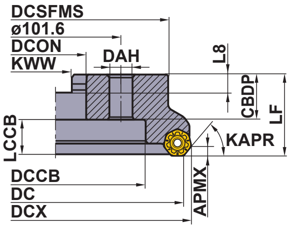
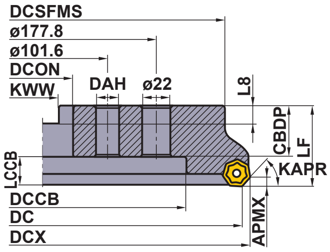


Fig.5
ø315



Right hand tool holder shown.

Metric Standard

Right Hand Tool Holder

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)			Fig.	WT (kg)	APMX (mm)
					LF	DCX	DCON			
80	**AHX640W-080A08R**	●	–	8	50	92.6	27	1	1.5	6
	AHX640W-080A10R	●	–	10	50	92.6	27	1	1.5	6
100	**AHX640W-100B10R**	●	–	10	50	112.6	32	2	2.1	6
	AHX640W-100B14R	●	–	14	50	112.6	32	2	2.1	6
125	**AHX640W-125B12R**	●	–	12	63	137.6	40	2	3.1	6
	AHX640W-125B18R	●	–	18	63	137.6	40	2	3.1	6
160	**AHX640W-160C16R**	●	–	16	63	172.6	40	3	5.6	6
	AHX640W-160C22R	●	–	22	63	172.6	40	3	5.6	6
200	**AHX640W-200C20R**	●	–	20	63	212.6	60	4	8	6
	AHX640W-200C28R	●	–	28	63	212.6	60	4	8	6
250	**AHX640W-250C24R**	●	–	24	63	262.6	60	4	12.6	6
	AHX640W-250C36R	●	–	36	63	262.6	60	4	12.6	6
315	**AHX640W-315C28R**	●	–	28	80	327.6	60	5	31.5	6
	AHX640W-315C44R	●	–	44	80	327.6	60	5	31.5	6

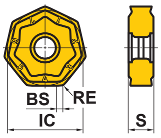
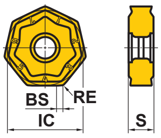
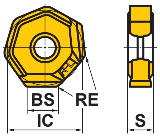
Left Hand Tool Holder

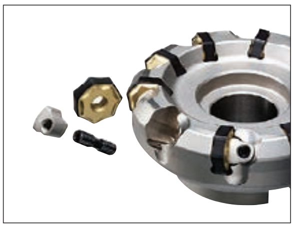
DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)			Fig.	WT (kg)	APMX (mm)
					LF	DCX	DCON			
80	**AHX640W-080A08L**	●	–	8	50	92.6	27	1	1.5	6
	AHX640W-080A10L	●	–	10	50	92.6	27	1	1.5	6
100	**AHX640W-100B10L**	●	–	10	50	112.6	32	2	2.1	6
	AHX640W-100B14L	●	–	14	50	112.6	32	2	2.1	6
125	**AHX640W-125B12L**	●	–	12	63	137.6	40	2	3.1	6
	AHX640W-125B18L	●	–	18	63	137.6	40	2	3.1	6
160	**AHX640W-160C16L**	●	–	16	63	172.6	40	3	5.6	6
	AHX640W-160C22L	●	–	22	63	172.6	40	3	5.6	6
200	**AHX640W-200C20L**	●	–	20	63	212.6	60	4	8.0	6
	AHX640W-200C28L	●	–	28	63	212.6	60	4	8.0	6
250	**AHX640W-250C24L**	●	–	24	63	262.6	60	4	12.6	6
	AHX640W-250C36L	●	–	36	63	262.6	60	4	12.6	6
315	**AHX640W-315C28L**	●	–	28	80	327.6	60	5	31.5	6
	AHX640W-315C44L	●	–	44	80	327.6	60	5	31.5	6

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

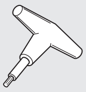
INSERTS

Cutting Conditions (Guide) : ● : Stable Cutting ◖ : General Cutting ✻ : Unstable Cutting
Edge Preparation : **E :** Round

Shape	Order Number	Class	Edge Preparation	MC5020	VP15TF	VP20RT	IC	RE	BS	S	APMX	Geometry
Workpiece Material	**K** Cast Iron			◖	●	✻						
				Coated			Dimensions(mm)					
 General Cutting	**NNMU200608ZEN-MK**	M	E	●	●	●	20	0.8	1.0	6.1	6	
 Strong Cutting Edge Type	**NNMU200608ZEN-HK**	M	E	●	●	●	20	0.8	1.0	6.1	6	
 Wiper	**WNEU2006ZEN7C-WK**	E	E	●			20	0.8	7.4	6.55	0.5	



SPARE PARTS

Tool Holder Number	 Wedge	 Clamp Screw *	 Wrench
AHX640W	CWAHX640WN	LS0622T	TKY15T

∗ Clamp Torque (N • m) : LS0622T=6.0

RECOMMENDED CUTTING CONDITIONS

■ Dry·Wet Cutting

Workpiece Material		Tensile Strength	Grade	**vc** (m/min)	**fz** (mm/t)
K	Gray Cast Iron	≤350MPa	**MC5020**	220 (150—300)	0.3 (0.2—0.4)
			VP15TF **VP20RT**	180 (130—250)	0.3 (0.2—0.4)
	Ductile Cast Iron	≤450MPa	**MC5020**	200 (150—250)	0.2 (0.1—0.3)
			VP15TF **VP20RT**	170 (120—220)	0.2 (0.1—0.3)
		≤800MPa	**MC5020**	170 (150—200)	0.2 (0.1—0.3)
			VP15TF **VP20RT**	140 (100—180)	0.2 (0.1—0.3)

■ Finishing (Use of Wiper Inserts)

Workpiece Material		Grade	**ap** (mm)	**vc** (m/min)	**fz** (mm/t)
K	Gray Cast Iron	**MC5020**	<0.5	320 (250—400)	0.2 (0.1—0.3)
			0.5—3	270 (200—350)	
	Ductile Cast Iron		<0.5	270 (200—350)	
			0.5—3	220 (200—250)	

∗Please use 2-3 wiper inserts if the feed per revolution is exceeds 6mm/rev.

Note 1) With reference to the above examples, adjust the cutting conditions according to the cutting environment.
Note 2) Tool life when wet cutting is short compared to dry cutting.

ISO13399 ➤ **L003**
MOUNTING DIMENSION ➤ **L082**
SPARE PARTS ➤ **P001**
TECHNICAL DATA ➤ **Q001**

AHX640W Mounting Dimensions

Fig.1

ø80

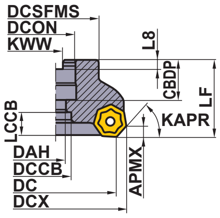
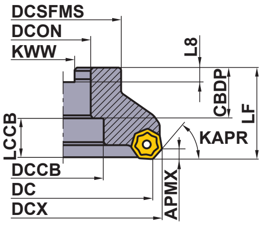


Fig.2

ø100
ø125
ø160



Right hand tool holder shown.

DCON (mm)	**DC** (mm)	Order Number	Dimensions(mm)							Fig.
			CBDP	**DAH**	**DCCB**	**LCCB**	**DCSFMS**	**KWW**	**L8**	
25.4	80	**AHX640WL08008C**	26	13	20	14.8	56	9.5	6	1
25.4	80	**AHX640WL08010C**	26	13	20	14.8	56	9.5	6	1
25.4	80	**AHX640WR08008C**	26	13	20	14.8	56	9.5	6	1
25.4	80	**AHX640WR08010C**	26	13	20	14.8	56	9.5	6	1
27	80	**AHX640W-080A08L**	23	13	20	14.8	56	12.4	7	1
27	80	**AHX640W-080A08R**	23	13	20	14.8	56	12.4	7	1
27	80	**AHX640W-080A10L**	23	13	20	14.8	56	12.4	7	1
27	80	**AHX640W-080A10R**	23	13	20	14.8	56	12.4	7	1
31.75	100	**AHX640WL10010D**	32	—	45	16.8	70	12.7	8	2
31.75	100	**AHX640WL10014D**	32	—	45	16.8	70	12.7	8	2
31.75	100	**AHX640WR10010D**	32	—	45	16.8	70	12.7	8	2
31.75	100	**AHX640WR10014D**	32	—	45	16.8	70	12.7	8	2
32	100	**AHX640W-100B10L**	32	—	45	16.8	70	14.4	8	2
32	100	**AHX640W-100B10R**	32	—	45	16.8	70	14.4	8	2
32	100	**AHX640W-100B14L**	32	—	45	16.8	70	14.4	8	2
32	100	**AHX640W-100B14R**	32	—	45	16.8	70	14.4	8	2
38.1	125	**AHX640WL12512E**	35	—	56	26.8	80	15.9	10	2
38.1	125	**AHX640WL12518E**	35	—	56	26.8	80	15.9	10	2
38.1	125	**AHX640WR12512E**	35	—	56	26.8	80	15.9	10	2
38.1	125	**AHX640WR12518E**	35	—	56	26.8	80	15.9	10	2
40	125	**AHX640W-125B12L**	32	—	56	29.8	80	16.4	9	2
40	125	**AHX640W-125B12R**	32	—	56	29.8	80	16.4	9	2
40	125	**AHX640W-125B18L**	32	—	56	29.8	80	16.4	9	2
40	125	**AHX640W-125B18R**	32	—	56	29.8	80	16.4	9	2
40	160	**AHX640W-160C16L**	29	14	56	32.8	100	16.4	9	3
40	160	**AHX640W-160C16R**	29	14	56	32.8	100	16.4	9	3
40	160	**AHX640W-160C22L**	29	14	56	32.8	100	16.4	9	3
40	160	**AHX640W-160C22R**	29	14	56	32.8	100	16.4	9	3

Fig.3

ø160

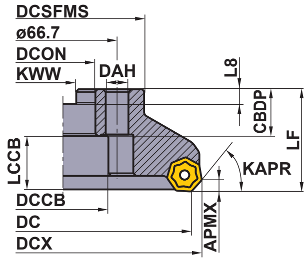


Fig.4

ø200
ø250

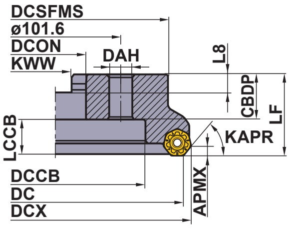
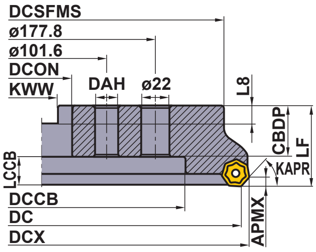


Fig.5

ø315



Right hand tool holder shown.

DCON (mm)	DC (mm)	Order Number	Dimensions(mm)							Fig.
			CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
47.625	200	**AHX640WL20020K**	35	18	140	26.8	175	25.4	14.22	4
47.625	200	**AHX640WL20028K**	35	18	140	26.8	175	25.4	14.22	4
47.625	200	**AHX640WR20020K**	35	18	140	26.8	175	25.4	14.22	4
47.625	200	**AHX640WR20028K**	35	18	140	26.8	175	25.4	14.22	4
47.625	250	**AHX640WL25024K**	35	18	180	26.8	220	25.4	14.22	4
47.625	250	**AHX640WL25036K**	35	18	180	26.8	220	25.4	14.22	4
47.625	250	**AHX640WR25024K**	35	18	180	26.8	220	25.4	14.22	4
47.625	250	**AHX640WR25036K**	35	18	180	26.8	220	25.4	14.22	4
47.625	315	**AHX640WL31528P**	40	18	225	21.8	285	25.4	14.22	5
47.625	315	**AHX640WL31544P**	40	18	225	21.8	285	25.4	14.22	5
47.625	315	**AHX640WR31528P**	40	18	225	21.8	285	25.4	14.22	5
47.625	315	**AHX640WR31544P**	40	18	225	21.8	285	25.4	14.22	5
50.8	160	**AHX640WL16016F**	38	–	72	23.8	100	19.1	11	2
50.8	160	**AHX640WL16022F**	38	–	72	23.8	100	19.1	11	2
50.8	160	**AHX640WR16016F**	38	–	72	23.8	100	19.1	11	2
50.8	160	**AHX640WR16022F**	38	–	72	23.8	100	19.1	11	2
60	200	**AHX640W-200C20L**	32	18	135	29.8	155	25.7	14.22	4
60	200	**AHX640W-200C20R**	32	18	135	29.8	155	25.7	14.22	4
60	200	**AHX640W-200C28L**	32	18	135	29.8	155	25.7	14.22	4
60	200	**AHX640W-200C28R**	32	18	135	29.8	155	25.7	14.22	4
60	250	**AHX640W-250C24L**	32	18	180	29.8	200	25.7	14.22	4
60	250	**AHX640W-250C24R**	32	18	180	29.8	200	25.7	14.22	4
60	250	**AHX640W-250C36L**	32	18	180	29.8	200	25.7	14.22	4
60	250	**AHX640W-250C36R**	32	18	180	29.8	200	25.7	14.22	4
60	315	**AHX640W-315C28L**	57	18	225	21.8	285	25.7	14.22	5
60	315	**AHX640W-315C28R**	57	18	225	21.8	285	25.7	14.22	5
60	315	**AHX640W-315C44L**	57	18	225	21.8	285	25.7	14.22	5
60	315	**AHX640W-315C44R**	57	18	225	21.8	285	25.7	14.22	5

FACE MILLING

<HIGH EFFICIENCY CUTTING FOR CAST IRON>

84° KAPR F R

WSF406W NEW

P M **K** N S H

Cast Iron

Fig. 1

ø80

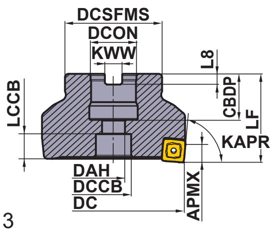


Fig. 2

ø100
ø125
ø160

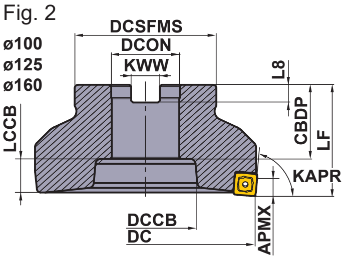
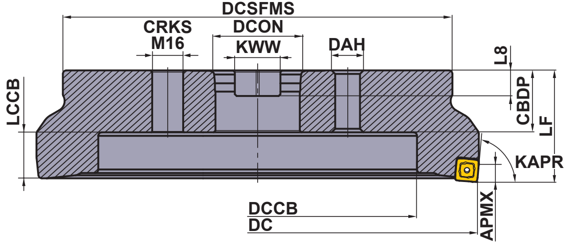


Fig. 3

ø200
ø250



Right hand tool holder only.

■ARBOR TYPE

DCON = Inch size, No coolant hole

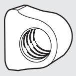
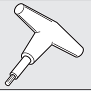
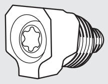
DC (mm)	Order Number	Stock	Number of Teeth	Dimensions (mm)		WT (kg)	APMX (mm)	RPMX (min^{-1})	Fig.
		R		LF	DCON				
80	**WSF406WR08006CN**	●	6	50	25.4	1.2	7.0	7800	1
80	**WSF406WR08009CN**	●	9	50	25.4	1.2	7.0	7800	1
100	**WSF406WR10008DN**	●	8	50	31.75	1.7	7.0	7000	2
100	**WSF406WR10012DN**	●	12	50	31.75	1.7	7.0	7000	2
125	**WSF406WR12510EN**	●	10	63	38.1	3.3	7.0	6250	2
125	**WSF406WR12516EN**	●	16	63	38.1	3.2	7.0	6250	2
160	**WSF406WR16014FN**	●	14	63	50.8	5	7.0	5500	2
160	**WSF406WR16020FN**	●	20	63	50.8	4.9	7.0	5500	2
200	**WSF406WR20016KN**	●	16	63	47.625	8.6	7.0	4900	3
200	**WSF406WR20024KN**	●	24	63	47.625	8.5	7.0	4900	3
250	**WSF406WR25022KN**	●	22	63	47.625	14	7.0	4400	3
250	**WSF406WR25032KN**	●	32	63	47.625	13.9	7.0	4400	3

Note1) A set bolt for the arbor is not supplied with the body. Please refer to page L085 to find the correct type of set bolt to order.

Mounting Dimensions

DC (mm)	Order Number	Dimensions (mm)								Fig.
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
80	**WSF406WR080**	25.4	34	13	20	14	55	9.5	6	1
100	**WSF406WR100**	31.75	32	–	46	16	70	12.7	8	2
125	**WSF406WR125**	38.1	42	–	56	19	80	15.9	10	2
160	**WSF406WR160**	50.8	45	–	80	16	100	19.1	11	2
200	**WSF406WR200**	47.625	35	18	140	26	175	25.4	14.22	3
250	**WSF406WR250**	47.625	35	18	180	26	220	25.4	14.22	3

SPARE PARTS

Tool Holder Type	 Wedge	 Clamp Screw *	 Wrench	 Adjustable Run-Out System
WSF406W	CWSF406N	LS0622T	TKY15T	ADW04

* Clamp Torque (N • m) : LS6022T = 6.0

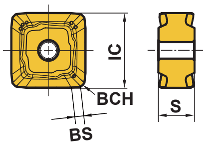
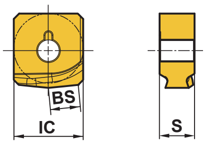
● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

Scan here for product NEWS ▶

INSERTS

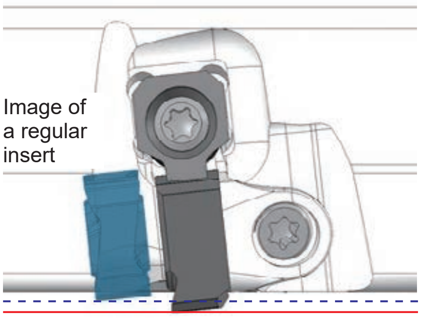
Workpiece Material	K	Cast Irons	◐

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting
Edge Preparation :
E : Round

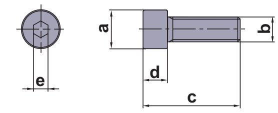
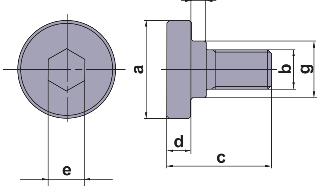
Shape	Order Number	Class	Edge Preparation	Coated				Dimensions (mm)				Geometry
					MC520			**IC**	**S**	**BS**	**BCH**	
	**SNMU1206C05ZNER-M**	M	E		●			12.7	6.2	1.6	0.5	
 Wiper	**WNGU1206ZNER5C-M**	G	E		●			12.3	6.2	5.3	–	

How to Use Wiper Insert for Best Results

- The WSF406W can obtain a good surface finish when using a standard insert due to the adjustable run-out system, but by using a wiper insert an excellent surface finish can be achieved without having to set a high accuracy face run-out. When a wiper insert is mounted, aim to set the standard insert run-out accuracy to within 0.04mm.
- Just one wiper insert is enough to achieve excellent finished surfaces.
  However, if the feed per revolution is greater than 5.0mm/rev, attach two or more wiper inserts so that they are evenly spaced in the cutter body and set the run-out accuracy between multiple wiper inserts to within 0.003mm before use.



SET BOLT (SOLD SEPARATELY)

Tool Holder Type	Set Bolt	Fig.	Reference Dimensions (mm)							Geometry
	Order Number		a	b	c	d	e	f	g	
WSF406WR080	HSC12035	1	18	M12x1.75	47	12	10	–	–	Fig.1 
WSF406WR100	–	2	40	M16x2	43	10	14	6	23	
WSF406WR125	–	2	50	M20x2.5	54	14	17	6	27	
WSF406WR160	–	2	65	M24x3	59	14	17	10	37	
WSF406WR200	–	1	24	M16x2	61–	16	14	–	–	Fig.2 
WSF406WR250	–	1	24	M16x2	61–	16	14	–	–	

Note 1) Please purchase the appropriate set bolt after confirming the reference dimensions.
The items with an order number listed under the Set Bolt columns are also sold by Mitsubishi Materials.

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✜ : Unstable Cutting

RECOMMENDED CUTTING CONDITIONS

Dry Cutting

(mm)

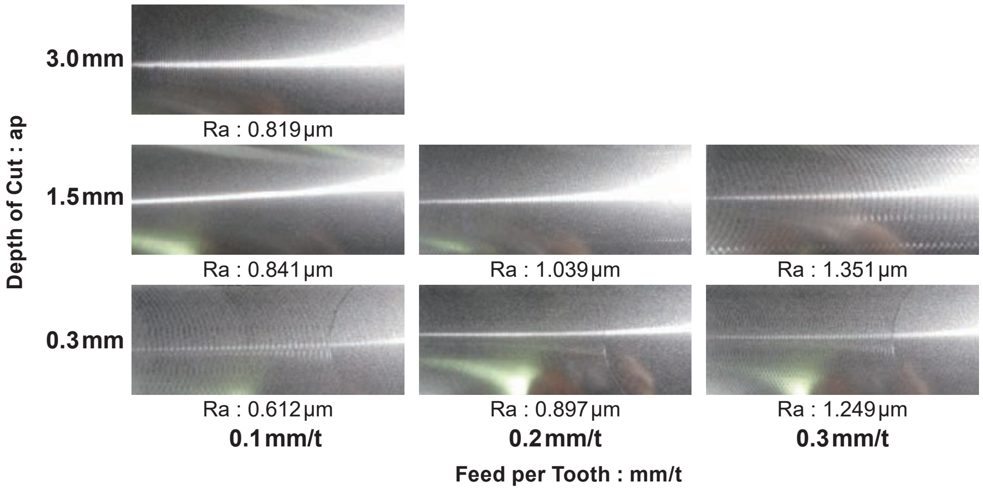
Workpiece Material		Characteristics	Cutting Conditions	Depth of Cut **ap**	Insert	Cutting Speed **vc** (m/min)	Feed per Tooth **fz** (mm/t)	Width of Cut **ae**
K	Gray Cast Irons	Tensile Strength ≤350MPa	●	ap≤0.5	MC520	300(250—300)	0.13(0.08—0.20)	≤0.8DC
				ap≤2.0	MC520	250(210—300)	0.15(0.10—0.25)	≤0.8DC
				2.0<ap≤4.0	MC520	220(190—260)	0.13(0.10—0.20)	≤0.8DC
				4.0<ap≤7.5	MC520	200(180—230)	0.10(0.08—0.15)	≤0.8DC
			◐	ap≤0.5	MC520	250(210—300)	0.13(0.08—0.20)	≤0.8DC
				ap≤2.0	MC520	220(190—260)	0.15(0.10—0.25)	≤0.8DC
				2.0<ap≤4.0	MC520	200(180—230)	0.13(0.10—0.20)	≤0.8DC
				4.0<ap≤7.5	MC520	180(160—210)	0.10(0.08—0.15)	≤0.8DC
			✜	ap≤0.5	MC520	220(190—260)	0.13(0.08—0.20)	≤0.8DC
				ap≤2.0	MC520	200(180—230)	0.15(0.10—0.25)	≤0.8DC
				2.0<ap≤4.0	MC520	180(160—210)	0.13(0.10—0.20)	≤0.8DC
				4.0<ap≤7.5	MC520	150(100—180)	0.10(0.08—0.15)	≤0.8DC
	Ductile Cast Irons	Tensile Strength ≤450MPa	●	ap≤0.5	MC520	230(200—250)	0.13(0.08—0.20)	≤0.8DC
				ap≤2.0	MC520	200(170—230)	0.15(0.10—0.25)	≤0.8DC
				2.0<ap≤4.0	MC520	180(150—210)	0.13(0.10—0.20)	≤0.8DC
				4.0<ap≤7.5	MC520	160(130—190)	0.10(0.08—0.15)	≤0.8DC
			◐	ap≤0.5	MC520	200(170—230)	0.13(0.08—0.20)	≤0.8DC
				ap≤2.0	MC520	180(150—210)	0.15(0.10—0.25)	≤0.8DC
				2.0<ap≤4.0	MC520	160(130—190)	0.13(0.10—0.20)	≤0.8DC
				4.0<ap≤7.5	MC520	140(110—170)	0.10(0.08—0.15)	≤0.8DC
			✜	ap≤0.5	MC520	180(150—200)	0.13(0.08—0.20)	≤0.8DC
				ap≤2.0	MC520	160(130—190)	0.15(0.10—0.25)	≤0.8DC
				2.0<ap≤4.0	MC520	140(110—170)	0.13(0.10—0.20)	≤0.8DC
				4.0<ap≤7.5	MC520	120(90—150)	0.10(0.08—0.15)	≤0.8DC
	Ductile Cast Irons	Tensile Strength ≤800MPa	●	ap≤0.5	MC520	230(200—250)	0.13(0.08—0.20)	≤0.8DC
				ap≤2.0	MC520	200(170—230)	0.15(0.10—0.25)	≤0.8DC
				2.0<ap≤4.0	MC520	180(150—210)	0.13(0.10—0.20)	≤0.8DC
				4.0<ap≤7.5	MC520	160(130—190)	0.10(0.08—0.15)	≤0.8DC
			◐	ap≤0.5	MC520	200(170—230)	0.13(0.08—0.20)	≤0.8DC
				ap≤2.0	MC520	180(150—210)	0.15(0.10—0.25)	≤0.8DC
				2.0<ap≤4.0	MC520	160(130—190)	0.13(0.10—0.20)	≤0.8DC
				4.0<ap≤7.5	MC520	140(110—170)	0.10(0.08—0.15)	≤0.8DC
			✜	ap≤0.5	MC520	180(150—210)	0.13(0.08—0.20)	≤0.8DC
				ap≤2.0	MC520	160(130—190)	0.15(0.10—0.25)	≤0.8DC
				2.0<ap≤4.0	MC520	140(110—170)	0.13(0.10—0.20)	≤0.8DC
				4.0<ap≤7.5	MC520	120(90—150)	0.10(0.08—0.15)	≤0.8DC

Note 1) Set the cutting conditions according to the usage written on the table above.
Note 2) When using a wiper insert, the cutting conditions for the finishing area are ap≤0.5mm.

CUTTING PERFORMANCE

Comparison of Surface Finishes for Each Depth of Cut and Feed: JIS FC300

Achieves an Ra of 1.6μm or less for a wide range of feeds and depth of cut.



<Cutting Conditions>
Workpiece Material : FC300
Tool : WSF406WR12516EN
Insert : SNMU1206C05ZNER-M (MC520)
Cutting Speed : vc=250m/min
Width of Cut : ae=100mm
Cutting Mode : Dry Cutting
Minor Cutting Edge Run-out Accuracy=3μm

FACE MILLING

<HIGH EFFICIENCY CUTTING FOR CAST IRON>

AOX445

P M **K** N S H

Cast Iron

- Solid CBN octagonal double-sided insert.
- Economical 16 cutting edge inserts.
  (when the depth of cut is 3mm)
- For high efficiency roughing through to finishing.
- Easy operation and cleansing.

Fig.1

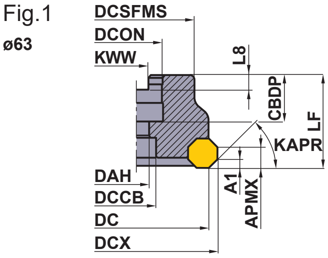
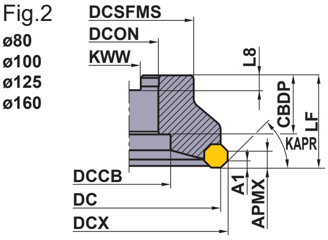


Fig.2

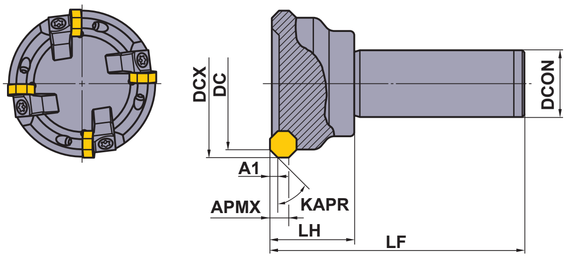


ARBOR TYPE

Right hand tool holder only.

Type	Order Number	Stock	Number of Teeth	Dimensions(mm)										WT (kg)	A1 (mm)	APMX (mm)	Max. Allowable Revolution (min^{-1})	Fig.
		R		DC	DCX	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8					
Coarse Pitch	**AOX445-063A04R**	●	4	63	70.8	40	22	20	11	17	50	10.4	6.3	0.6	3	8	12000	1
	AOX445R08006C	●	6	80	87.8	50	25.4	26	—	38	60	9.5	6	1.2	3	8	11000	2
	AOX445R10008D	●	8	100	107.8	50	31.75	32	—	45	70	12.7	8	1.8	3	8	9300	2
	AOX445R12510E	●	10	125	132.8	63	38.1	35	—	60	80	15.9	10	3.0	3	8	8300	2
	AOX445R16012F	●	12	160	167.8	63	50.8	38	—	80	100	19.1	11	4.9	3	8	7200	2

Note 1) When machining with a depth of cut of 8mm, 16 corners cannot be used.



SHANK TYPE

Right hand tool holder only.

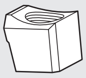
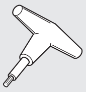
Type	Order Number	Stock	Number of Teeth	Dimensions(mm)					WT (kg)	A1 (mm)	APMX (mm)	Max. Allowable Revolution (min^{-1})
		R		DC	DCX	LF	DCON	LH				
Coarse Pitch	**AOX445R503S32**	●	3	50	57.8	125	32	40	1.1	3	8	13000
	AOX445R634S32	●	4	63	70.8	125	32	40	1.4	3	8	12000

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

SPARE PARTS

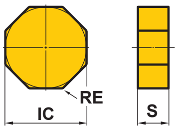
Tool Holder Number	 Wedge	 * Clamp Screw	 Wrench
AOX445	CWAOX445N	LS15T	TKY25T

* Clamp Torque (N • m) : LS15T=8.0

INSERTS

Workpiece Material	K	Cast Iron	◐	

Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting
Edge Preparation : E : Round

Shape	Order Number	Edge Preparation	CBN		Dimensions(mm)			Geometry
			BC5030		**IC**	**RE**	**S**	
	**SL-ONEN120404ASN**	E	●		12.7	0.4	4.76	

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Tensile Strength	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
K	Gray Cast Iron	≤200MPa	**BC5030**	1000 (800−1500)	0.1 (0.05−0.15)
		250−350 MPa			

Note 1) Dry cutting is recommended.

● : Inventory maintained in Japan.
(Contains one CBN insert per case.)

FACE MILLING

<FOR HIGH FEED FINISHING>

90° KAPR F

FMAX

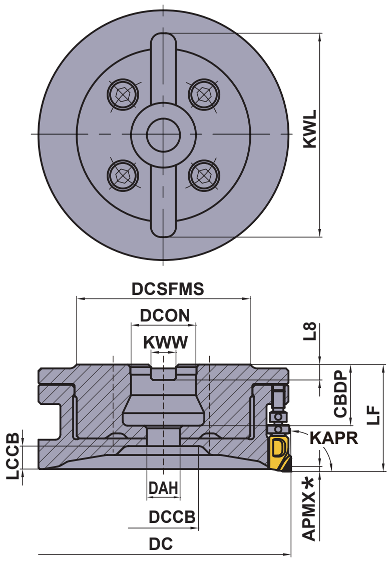
For Compact and Smaller Machining Centres **NEW**

P M **K** **N** S H

Cast Iron Non-ferrous Metal

- **Feed Maximum (FMAX) milling cutter for ultra efficient and accurate finishing.**
- **The combination of aluminium alloy and a special steel alloy achieves a light weight, high rigidity body.**
- **Precise run-out adjustment of cutting edge (5μm or less) for high precision cutting**

Fig.1
ø100
ø125



Right hand tool holder only.

■ARBOR TYPE

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)		WT (kg)	RPMX (min-1)	Fig.
					LF	DCON			
100	**FMAXR10010CLW**	●	○	10	42	25.4	1.06	22000	1
100	**FMAXR10016CLW**	●	○	16	42	25.4	1.11	22000	1
125	**FMAXR12514CLW**	●	○	14	42	25.4	1.44	19600	1
125	**FMAXR12520CLW**	●	○	20	42	25.4	1.48	19600	1

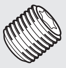
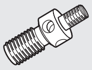
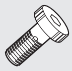
∗ For the maximum depth of cut (APMX), please refer to recommended cutting conditions (ap).

Note 1) The maximum depth of cut for should be 2mm or less for ultra high efficiency machining with table feed (vf ≥ 20000mm/min).

Mounting Dimensions

DCON (mm)	DC (mm)	Order Number	Dimensions (mm)								Fig.
			CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	
25.4	100	**FMAXR10010CLW**	24	13	27	9	68	9.5	6	80	1
25.4	100	**FMAXR10016CLW**	24	13	27	9	68	9.5	6	80	1
25.4	125	**FMAXR12514CLW**	24	13	52	9	68	9.5	6	80	1
25.4	125	**FMAXR12520CLW**	24	13	52	9	68	9.5	6	80	1

SPARE PARTS

Insert Clamp Screw *	Micro Adjustment Nut	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
					
TSS04505S	KSN3	KSS2	HSCX12030H	TKY10T	RKY25S

∗ Clamp Torque (N • m) : TSS04505S = 3.5

Note 1) Please refer to the instruction manual included in the cutter body for how to locate the insert and adjust the run-out and the balance.

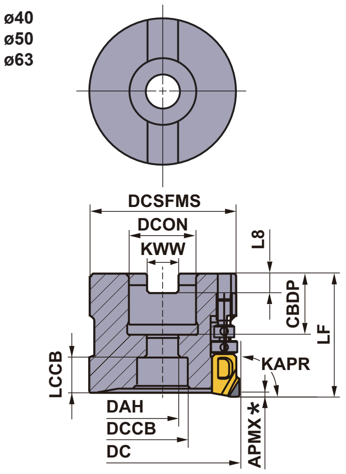
Scan here for product NEWS ▶

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

FMAX-40/50/63

P	M	K	N	S	H
		Cast Iron	Non-ferrous Metal		

Fig.1



Right hand tool holder only.

■ARBOR TYPE

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)		WT (kg)	RPMX (min^{-1})	Fig.
					LF	DCON			
40	**FMAX-040A04R**	●	○	4	40	16	0.24	30000	1
40	**FMAX-040A06R**	●	○	6	40	16	0.23	30000	1
50	**FMAX-050A08R**	●	○	8	40	22	0.37	30000	1
50	**FMAX-050A10R**	●	○	10	40	22	0.35	30000	1
63	**FMAX-063A10R**	●	○	10	40	22	0.67	27000	1
63	**FMAX-063A12R**	●	○	12	40	22	0.66	27000	1

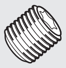
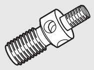
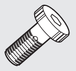
＊ For the maximum depth of cut (APMX), please refer to recommended cutting conditions (ap).

Note 1) The maximum depth of cut for should be 2mm or less for ultra high efficiency machining with table feed (vf ≥ 20000mm/min).

Mounting Dimensions

DCON (mm)	DC (mm)	Order Number	Dimensions (mm)								Fig.
			CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	
16	40	**FMAX-040A04R**	18	9	14	10	37	8.4	5.6	—	1
16	40	**FMAX-040A06R**	18	9	14	10	37	8.4	5.6	—	1
22	50	**FMAX-050A08R**	20	11	17	12	47	10.4	6.3	—	1
22	50	**FMAX-050A10R**	20	11	17	12	47	10.4	6.3	—	1
22	63	**FMAX-063A10R**	20	11	17	12	60	10.4	6.3	—	1
22	63	**FMAX-063A12R**	20	11	17	12	60	10.4	6.3	—	1

SPARE PARTS

DC (mm)	Tool Holder Type	Insert Clamp Screw ＊	Micro Adjustment Nut	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
							
40	**FMAX-040**	TSS04505S	KSN3	KSS2	HSC08030H	TKY10T	RKY25S
50	**FMAX-050**	TSS04505S	KSN3	KSS2	HSC10030H	TKY10T	RKY25S
63	**FMAX-063**	TSS04505S	KSN3	KSS2	HSC10030H	TKY10T	RKY25S

＊ Clamp Torque (N • m) : TSS04505S = 3.5

Note 1) Please refer to the instruction manual included in the cutter body for how to locate the insert and adjust the run-out and the balance.

● : Inventory maintained in Japan.

FMAX

P M **K** **N** S H

Cast Iron Non-ferrous Metal

Fig.1

ø80
ø160

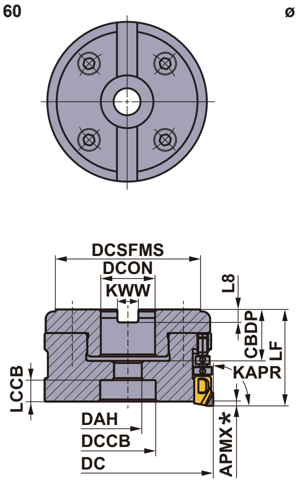
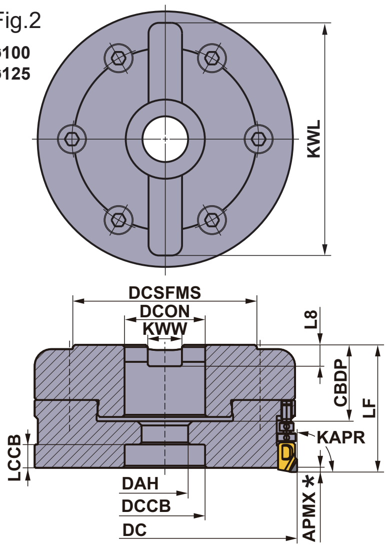


Fig.2

ø100
ø125



Right hand tool holder only.

■Arbor Type

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)		WT (kg)	RPMX (min^{-1})	Fig.
					LF	DCON			
80	**FMAXR08010C**	●	○	10	45	25.4	1.11	24500	1
80	**FMAXR08014C**	●	○	14	45	25.4	1.09	24500	1
100	**FMAXR10012D**	●	○	12	50	31.75	1.85	22000	2
100	**FMAXR10018D**	●	○	18	50	31.75	1.81	22000	2
125	**FMAXR12516E**	●	○	16	60	38.1	3.33	19600	2
125	**FMAXR12524E**	●	○	24	60	38.1	3.27	19600	2
160	**FMAXR16016D**	●	○	16	63	31.75	3.30	10000	1
160	**FMAXR16024D**	●	○	24	63	31.75	3.39	10000	1

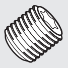
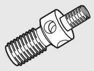
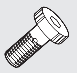
⋆ For the maximum depth of cut (APMX), please refer to recommended cutting conditions (ap).

Note 1) The maximum depth of cut for should be 2mm or less for ultra high efficiency machining with table feed (vf ≥ 20000mm/min).

Mounting Dimensions

DCON (mm)	DC (mm)	Order Number	Dimensions (mm)								Fig.
			CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	
25.4	80	**FMAXR08010C**	24	13	26	11	68	9.5	6	—	1
25.4	80	**FMAXR08014C**	24	13	26	11	68	9.5	6	—	1
31.75	100	**FMAXR10012D**	32	17	32	10	79	12.7	8	90	2
31.75	100	**FMAXR10018D**	32	17	32	10	79	12.7	8	90	2
38.1	125	**FMAXR12516E**	36	22	38	12	88	15.9	10	112	2
38.1	125	**FMAXR12524E**	36	22	38	12	88	15.9	10	112	2
31.75	160	**FMAXR16016D**	38	17	53	10	75	12.7	8	—	1
31.75	160	**FMAXR16024D**	38	17	53	10	75	12.7	8	—	1

SPARE PARTS

DC (mm)	Tool Holder Type	Insert Clamp Screw ⋆	Micro Adjustment Nut	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
							
80	**FMAXR080**	TSS04505S	KSN3	KSS2	HSCX12030H	TKY10T	RKY25S
100	**FMAXR100**	TSS04505S	KSN3	KSS2	HSCX16035H	TKY10T	RKY25S
125	**FMAXR125**	TSS04505S	KSN3	KSS2	HSCX20035H	TKY10T	RKY25S
160	**FMAXR160**	TSS04505S	KSN3	KSS2	HSCX16045H	TKY10T	RKY25S

⋆ Clamp Torque (N • m) : TSS04505S = 3.5

Note 1) Please refer to the instruction manual included in the cutter body for how to locate the insert and adjust the run-out and the balance.

Metric Standard

The cutter bore diameter DCON is indicated in millimetres.

Fig.1
ø80

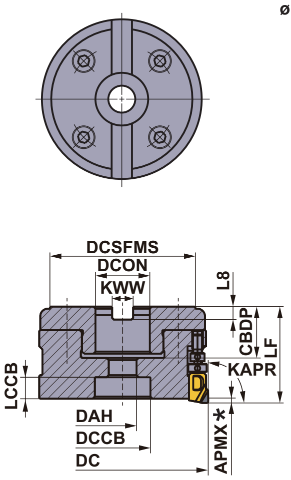
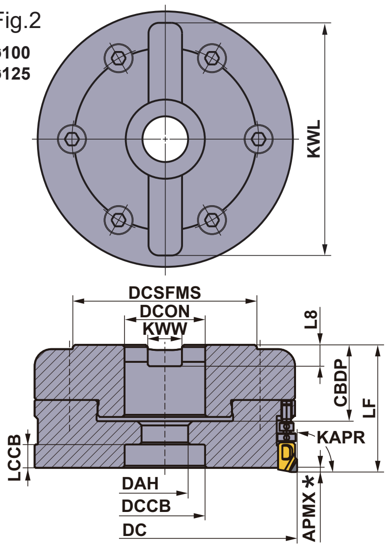


Fig.2
ø100
ø125



Right hand tool holder only.

■Arbor Type

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)		WT (kg)	RPMX (min^{-1})	Fig.
					LF	DCON			
80	**FMAX-080B14R**	●	○	14	45	27	1.08	24500	1
100	**FMAX-100B18R**	●	○	18	50	32	1.81	22000	2
125	**FMAX-125B24R**	●	○	24	60	40	3.26	19600	2

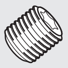
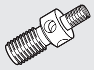
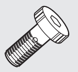
＊ For the maximum depth of cut (APMX), please refer to recommended cutting conditions (ap).

Note 1) The maximum depth of cut for should be 2mm or less for ultra high efficiency machining with table feed (vf ≥ 20000mm/min).

Mounting Dimensions

DCON (mm)	DC (mm)	Order Number	Dimensions (mm)								Fig.
			CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	
27	80	**FMAX-080B14R**	24	13	26	11	68	12.4	7	–	1
32	100	**FMAX-100B18R**	32	17	32	10	79	14.4	8	90	2
40	125	**FMAX-125B24R**	36	22	38	12	88	16.4	9	112	2

SPARE PARTS

DC (mm)	Tool Holder Type	Insert Clamp Screw ＊	Micro Adjustment Nut	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
							
80	**FMAX-080**	TSS04505S	KSN3	KSS2	HSCX12030H	TKY10T	RKY25S
100	**FMAX-100**	TSS04505S	KSN3	KSS2	HSCX16035H	TKY10T	RKY25S
125	**FMAX-125**	TSS04505S	KSN3	KSS2	HSCX20035H	TKY10T	RKY25S

＊ Clamp Torque (N • m) : TSS04505S = 3.5

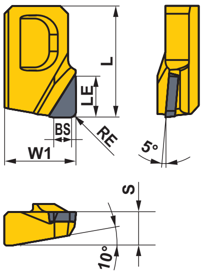
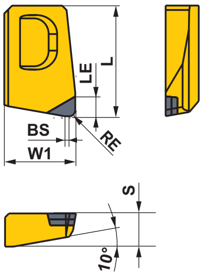
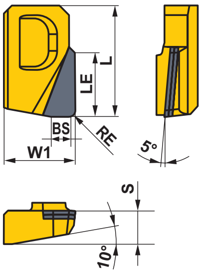
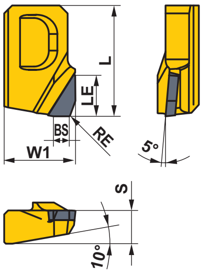
Note 1) Please refer to the instruction manual included in the cutter body for how to locate the insert and adjust the run-out and the balance.

● : Inventory maintained in Japan.
(Contains one piece per case.)

INSERTS

Workpiece Material			MD220	MD2030	MB4120
	K	Cast Iron			◐
	N	Non-ferrous Metal	◐	◐	

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

Shape	Order Number	MD220	MD2030	MB4120	Dimensions (mm) L	LE	W1	S	BS	RE	Geometry
For Aluminium Alloys  General Purpose	**GOER1404PXFR2**	●	●		14.0	5.0	9.0	4.2	2.0	0.4	
	GOER1408PXFR2	●	●		14.0	5.0	9.0	4.2	2.0	0.8	
For Gray Cast Irons  General Purpose	NEW **NP-GOEN1404PXSR05**			●	14.0	2.5	9.0	4.2	0.5	0.4	
	NEW **NP-GOEN1408PXSR05**			●	14.0	2.5	9.0	4.2	0.5	0.8	
For Aluminium Alloys  Long Edge	**GOER1408PXFR2-8**	●			14.0	8.0	9.0	4.2	2.0	0.8	
For Aluminium Alloys  Burr Prevention	**GOER1401ZXFR2**	●			14.0	5.0	9.0	4.2	2.0	0.1	

For Aluminium Alloys : Sharp Edge
For Gray Cast Irons : Chamfered and Rounded (0.13mmx15°+R0.01)

Note 1) If general purpose inserts (RE = 0.4mm, 0.8mm), burr prevention inserts and long edge inserts are used together, they will not be able to sufficiently display their full performance. Inserts of the same shape should be used according to the application.
Note 2) The cutting diameter will change depending on the shape.
Be particularly careful when cutting near vertical walls, since there is a possibility of interference with the holder.
Note 3) The long edge inserts corresponds to the gate remainder and can not be used for constant depth cutting.

ISO13399 ➤ **L003**
SPARE PARTS ➤ **P001**
TECHNICAL DATA ➤ **Q001**

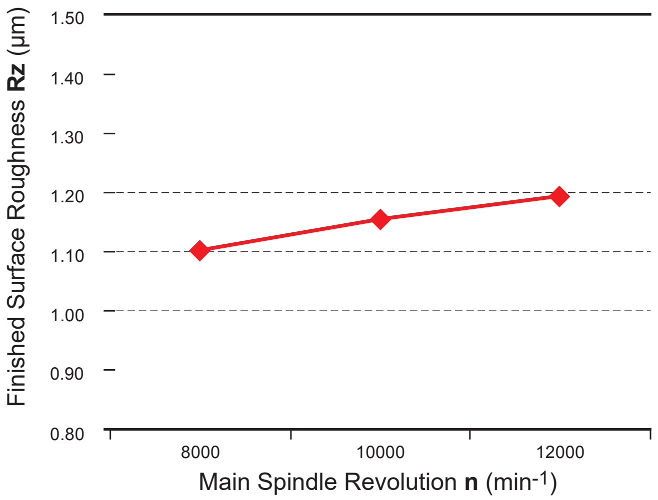
RECOMMENDED CUTTING CONDITIONS

Workpiece material		Characteristics	Grade	Cutting Speed **vc** (m/min)	Depth of Cut		Feed per Tooth **fz** (mm/t)	Cutting Mode
					ae (mm)	**ap** (mm)		
K	Gray Cast Irons	Tensile Strength ≦350MPa	**MB4120**	1000 (700—1300)	≤ 0.8 DC	≤ 0.5	0.07 (0.05—0.15)	Dry Cutting
N	Aluminium Alloys	Content Si < 5%	**MD2030** **MD220**	2500 (2000—3000)	≤ 0.2 DC	≤ 3.0 (0.5—3.0)	0.08 (0.05—0.2)	Wet Cutting
					≤ 0.5 DC	≤ 2.5 (0.5—2.5)		
					≤ 0.8 DC	≤ 2.0 (0.5—2.0)		
		Content 5% ≤ Si ≤ 10%	**MD2030** **MD220**	2500 (2000—3000)	≤ 0.2 DC	≤ 3.0 (0.5—3.0)	0.08 (0.05—0.2)	Wet Cutting
					≤ 0.5 DC	≤ 2.5 (0.5—2.5)		
					≤ 0.8 DC	≤ 2.0 (0.5—2.0)		
		Content 10% < Si < 15%	**MD220** **MD2030**	600 (400—800)	≤ 0.2 DC	≤ 3.0 (0.5—3.0)	0.08 (0.05—0.2)	Wet Cutting
					≤ 0.5 DC	≤ 2.5 (0.5—2.5)		
					≤ 0.8 DC	≤ 2.0 (0.5—2.0)		
		Content Si ≥ 15%	**MD220** **MD2030**	600 (400—800)	≤ 0.2 DC	≤ 3.0 (0.5—3.0)	0.08 (0.05—0.2)	Wet Cutting
					≤ 0.5 DC	≤ 2.5 (0.5—2.5)		
					≤ 0.8 DC	≤ 2.0 (0.5—2.0)		

Note 1) Please adjust the depth of cut (ap) depending on the width of cut (ae).
Note 2) When using the long edge insert, please select the conditions depending on depths of cut (ap) excluding the length of the gate.

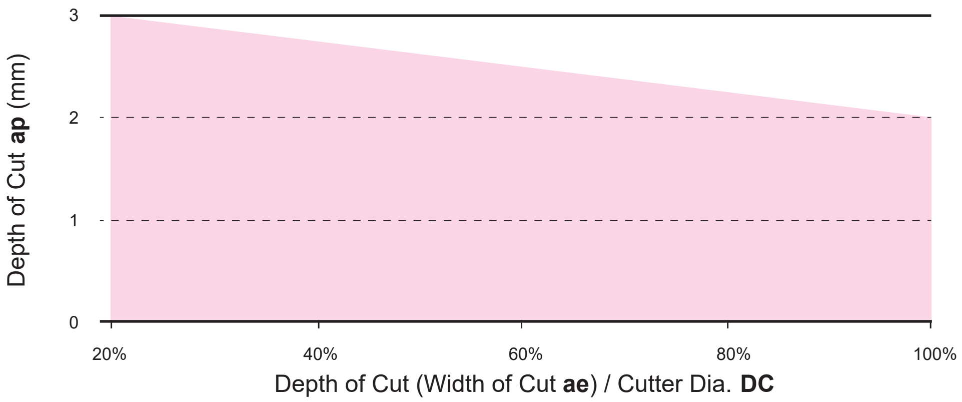
CUTTING PERFORMANCE

Aluminium Alloy Finished Surface Roughness (Rz) Comparison by PCD Grade

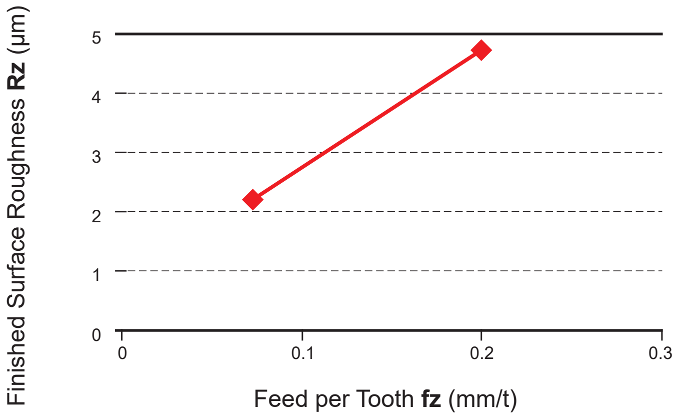


<Cutting Conditions>
Workpiece material : ADC12 Cylinder Head
Tool : FMAXR12524E
Insert : GOER1408PXFR2
Grade : MD2030
Revolution : n = 8000–12000 min^{-1}
Feed per Tooth : fz = 0.08 mm/t
Depth of Cut : ap = 2.0 mm
: ae = 68 mm x 3
Cutting Mode : Internal Coolant 4MPa

Aluminium Alloy Effective Chip Disposal Range Comparison by PCD Grade



Gray Cast Iron Finished Surface Roughness (Rz) Comparison by CBN Grade



<Cutting Conditions>
Workpiece material : FC250
Tool : FMAXR12524E
Insert : NP-GOEN1408PXSR05
Grade : MB4120
Revolution : n = 2546 min^{-1}
Feed per Tooth : fz = 0.07 mm/t 0.20mm/t
Depth of Cut : ap = 0.5 mm
Cutting Mode : Dry Cutting

FACE MILLING

<FOR ALUMINIUM ALLOY AND CAST IRON / HIGH FEED RATE AND FINISHING>

90° KAPR

F

NF10000

P	M	K	N	S	H
		Cast Iron	Non-ferrous Metal		

- Suitable for high-speed finishing of light alloy and cast iron.
- Adjustable cutting edge run-out function.

Fig.1
ø80
ø100

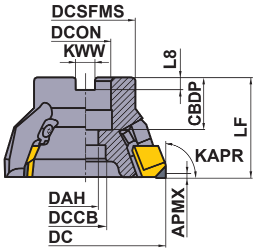
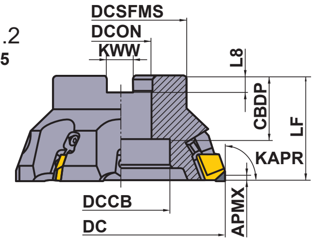


Fig.2
ø125



Right hand tool holder only.

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)									WT (kg)	APMX (mm)		Max. Allowable Revolution (min^{-1}) *	Fig.
		R		DC	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8		PCD	CBN		
Coarse Pitch	**NF10000R0305C**	▲	5	80	50	25.4	26	13	20	50	9.5	6	1.0	4.0	1.0	16000	1
	NF10000R0406D	▲	6	100	63	31.75	32	17	25	60	12.7	8	1.8	4.0	1.0	14000	1
	NF10000R0508E	▲	8	125	63	38.1	38	—	60	80	15.9	10	2.7	4.0	1.0	12000	2
Fine Pitch	**NF10000R0306C**	▲	6	80	50	25.4	26	13	20	50	9.5	6	1.0	4.0	1.0	16000	1
	NF10000R0408D	▲	8	100	63	31.75	32	17	25	60	12.7	8	1.8	4.0	1.0	14000	1
	NF10000R0510E	▲	10	125	63	38.1	38	—	60	80	15.9	10	2.7	4.0	1.0	12000	2

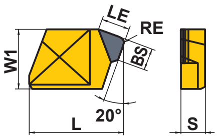
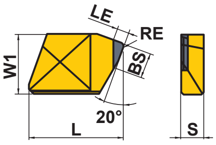
* Ensure max. spindle speed is achieved under the conditions that the cutter is clamped by a machine clamping force of 18kN with a standard type arbor. (HSK 63A-FMA○○○-60) The figure varies in actual machining depending on cutting conditions, such as the length of overhang or if there is insufficient drawing force from the arbor.

Scan here for product NEWS ▶

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.

(Contains one piece per case.)

INSERTS

Workpiece Material			PCD		CBN		Cutting Conditions (Guide) :						
	K	Cast Iron			◐		● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting						
	N	Non-ferrous Metal	◐										
Shape	Order Number	Class	PCD		CBN		Dimensions(mm)						Geometry
			MD220		MB730		L	W1	S	BS	LE	RE	
	**GDCN2004PDFR3**	C	●				20	12.7	4.76	3	5	1.2	
	**NP-GDCN2004PDSR3**	C			▲		20	12.7	4.76	3	2.5	0.8	

SPARE PARTS

Tool Holder Number	 Wedge	 Clamp Screw *	 Wrench
NF10000R0305C ı **NF10000R0510E**	CWAF10R1	LS10T	TKY25T

* Clamp Torque (N • m) : LS10T=8.0

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
K	Gray Cast Iron	**MB730**	1000 (800—1500)	0.15 (0.05—0.5)
N	Aluminium Alloy	**MD220**	3500 (1000—4500)	0.12 (0.05—0.20)

● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)

● Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

FACE MILLING

<GENERAL HIGH FEED FINISHING>

90° KAPR

F

FF3000

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal		

- 11°positive insert.
- 1000−3000mm/min high feed machining.
- For finishing of steel.
- Adjustable cutting edge run-out function.

Fig.1

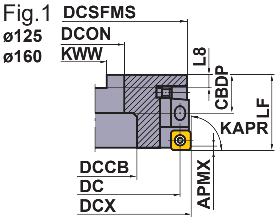
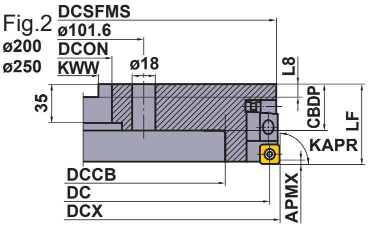


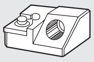
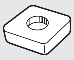
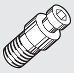
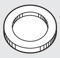
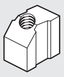
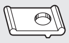
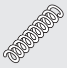
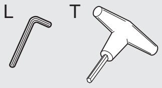
Fig.2



Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (mm)									WT (kg)	APMX (mm)	Fig.
	R		DC	DCX	LF	DCON	CBDP	DCCB	DCSFMS	KWW	L8			
FF3000R0502E	●	2	125	140.4	75	38.1	38	60	85	15.9	10	5.8	0.3	1
FF3000R0602F	●	2	160	175.4	75	50.8	38	80	110	19.1	11	9.0	0.3	1
FF3000R0802K	●	2	200	215.4	75	47.625	45	134	130	25.4	14	12.6	0.3	2
FF3000R1002K	●	2	250	265.4	75	47.625	45	182	130	25.4	14	19.5	0.3	2

SPARE PARTS

Tool Holder Number			* 	* 		
	Cartridge	Shim	Lock Pin	Cartridge Clamp Screw	Washer	Radial Spring
FF3000R0502E **I** **FF3000R1002K**	FFCSR	FFSS	FFP	HBH08040	FFW	FFRP
						 L T
	Adjusting Wedge	Adjusting Screw	Lever	Lever Screw	Axial Spring	Wrench
	FFAWR	LS3	FFL	FFLB	HP3	HKY25L HKY40T

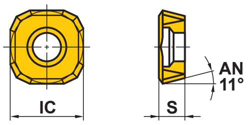
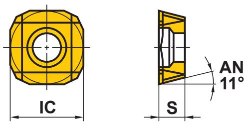
* Clamp Torque (N • m) : FFP=2.2, HBH08040=9.5

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material			NX2525		HTi05T	
	P	Steel	●			
	M	Stainless Steel	●			
	K	Cast Iron	●		●	
	N	Non-ferrous Metal			●	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Shape	Order Number	Class	Cermet NX2525		Carbide HTi05T		Dimensions(mm) IC	 S	Geometry
	**SPCA53Z**	C	●				15.88	4.8	
	**SPCG53Z**	C	●		●		15.88	4.8	

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
P	Mild Steel	≤180HB	**NX2525 (SPCG)**	280 (250—300)	2.25 (2—2.5)
	Carbon Steel Alloy Steel	180—280HB	**NX2525 (SPCG)**	180 (150—220)	2.25 (2—2.5)
	High Alloy Steel	200—280HB	**NX2525 (SPCA)**	120 (80—150)	2.25 (2—2.5)
M	Stainless Steel	≤200HB	**NX2525 (SPCA)**	250 (230—280)	3.0 (2.5—3.5)
K	Cast Iron	Tensile Strength ≤450MPa	**NX2525 (SPCG)**	180 (130—200)	2.25 (2—2.5)
			HTi05T	120 (100—150)	
N	Aluminium Alloy	—	**HTi05T**	≤500	0.85 (0.7—1.0)

- ● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
- ● Table Feed (mm/min)
  =Feed per Tooth x Number of Teeth x Cutter Revolution

SHOULDER MILLING

<GENERAL CUTTING>

90° KAPR F R

WWX400

NEW

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel

ø50

Fig.1

ø50

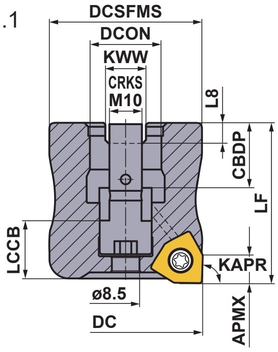
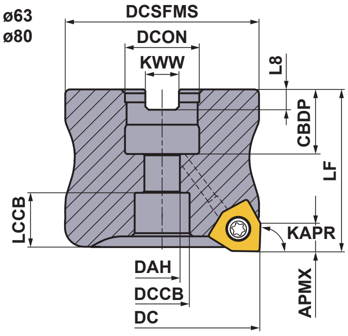


Fig.2

ø63
ø80



Right hand tool holder only.

ARBOR TYPE

DCON = Inch size

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)		WT (kg)	APMX (mm)	RMPX	RPMX (min^{-1})	Fig.
		R			LF	DCON					
80	**WWX400R08004CA**	●	○	4	50	25.4	1.0	8.2	0.16°	12200	2
80	**WWX400R08005CA**	●	○	5	50	25.4	1.0	8.2	0.16°	12200	2
80	**WWX400R08007CA**	●	○	7	50	25.4	0.9	8.2	0.16°	12200	2
100	**WWX400R10005DA**	●	○	5	50	31.75	1.4	8.2	–	10700	3
100	**WWX400R10007DA**	●	○	7	50	31.75	1.4	8.2	–	10700	3
100	**WWX400R10009DA**	●	○	9	50	31.75	1.3	8.2	–	10700	3
125	**WWX400R12506EA**	●	○	6	63	38.1	2.8	8.2	–	9500	3
125	**WWX400R12508EA**	●	○	8	63	38.1	2.8	8.2	–	9500	3
125	**WWX400R12512EA**	●	○	12	63	38.1	2.7	8.2	–	9500	3
160	**WWX400R16008FA**	●	○	8	63	50.8	4.5	8.2	–	8300	3
160	**WWX400R16010FA**	●	○	10	63	50.8	4.4	8.2	–	8300	3
160	**WWX400R16014FA**	●	○	14	63	50.8	4.3	8.2	–	8300	3
200	**WWX400R20010KN**	●	–	10	63	47.625	8.1	8.2	–	7300	5
200	**WWX400R20012KN**	●	–	12	63	47.625	8.1	8.2	–	7300	5
200	**WWX400R20016KN**	●	–	16	63	47.625	8.0	8.2	–	7300	5
250	**WWX400R25012KN**	●	–	12	63	47.625	12.1	8.2	–	6400	5
250	**WWX400R25014KN**	●	–	14	63	47.625	12.1	8.2	–	6400	5
250	**WWX400R25018KN**	●	–	18	63	47.625	12.0	8.2	–	6400	5

Note 1) A set bolt for the arbor is not supplied with the body. Please refer to page L102 to find the correct type of set bolt to order.
Note 2) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 80-250.

● : Inventory maintained in Japan.

Fig.3

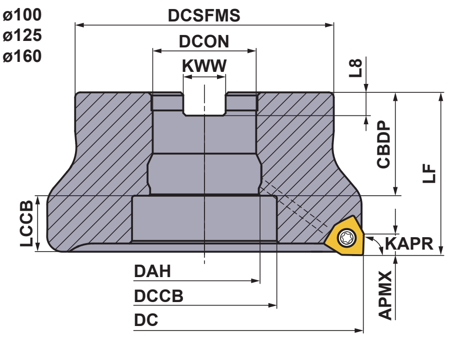


Fig.4

ø160 (DCON = mm size)

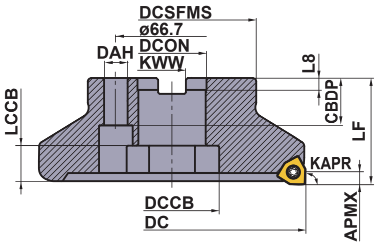
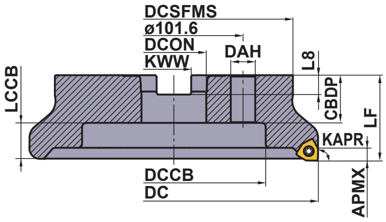


Fig.5

ø200
ø250



Right hand tool holder only.

ARBOR TYPE

DCON = mm size

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)		WT (kg)	APMX (mm)	RMPX	RPMX (min^{-1})	Fig.
		R			LF	DCON					
50	**WWX400-050A03AR**	●	○	3	55	22	0.5	8.2	0.4°	5000	1
50	**WWX400-050A04AR**	●	○	4	55	22	0.5	8.2	0.4°	5000	1
63	**WWX400-063A03AR**	●	○	3	40	22	0.5	8.2	0.26°	14100	2
63	**WWX400-063A04AR**	●	○	4	40	22	0.5	8.2	0.26°	14100	2
63	**WWX400-063A05AR**	●	○	5	40	22	0.5	8.2	0.26°	14100	2
80	**WWX400-080A04AR**	●	○	4	50	27	1.0	8.2	0.16°	12200	2
80	**WWX400-080A05AR**	●	○	5	50	27	1.0	8.2	0.16°	12200	2
80	**WWX400-080A07AR**	●	○	7	50	27	0.9	8.2	0.16°	12200	2
100	**WWX400-100B05AR**	●	○	5	50	32	1.6	8.2	–	10700	3
100	**WWX400-100B07AR**	●	○	7	50	32	1.5	8.2	–	10700	3
100	**WWX400-100B09AR**	●	○	9	50	32	1.5	8.2	–	10700	3
125	**WWX400-125B06AR**	●	○	6	63	40	3.0	8.2	–	9500	3
125	**WWX400-125B08AR**	●	○	8	63	40	3.0	8.2	–	9500	3
125	**WWX400-125B12AR**	●	○	12	63	40	2.9	8.2	–	9500	3
160	**WWX400-160C08NR**	●	–	8	63	40	4.5	8.2	–	8300	4
160	**WWX400-160C10NR**	●	–	10	63	40	4.4	8.2	–	8300	4
160	**WWX400-160C14NR**	●	–	14	63	40	4.4	8.2	–	8300	4
200	**WWX400-200C10NR**	●	–	10	63	60	6.7	8.2	–	7300	5
200	**WWX400-200C12NR**	●	–	12	63	60	6.7	8.2	–	7300	5
200	**WWX400-200C16NR**	●	–	16	63	60	6.6	8.2	–	7300	5
250	**WWX400-250C12NR**	●	–	12	63	60	11.5	8.2	–	6400	5
250	**WWX400-250C14NR**	●	–	14	63	60	11.5	8.2	–	6400	5
250	**WWX400-250C18NR**	●	–	18	63	60	11.4	8.2	–	6400	5

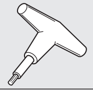
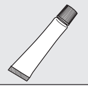
Note 1) A set bolt for the arbor is not supplied with the body. Please refer to page L102 to find the correct type of set bolt to order.

Note 2) The milling cutter with cutting diameter DC=50 mm has a built-in set bolt. The set bolt cannot be replaced.
Therefore, absolutely do not disassemble the milling cutter.

Note 3) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 63-100.

Note 4) Use a FMC (metric) type set bolt for cutter bodies with a machining diameter (DC) of 125-250.

SPARE PARTS

Tool Holder Type	 *		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WWX400	TS5R	TKY20T	MK1KS

* Clamp Torque (N • m) : TS5R = 5.0

ISO13399 ➤ **L003**
MOUNTING DIMENSION ➤ **L102**
SPARE PARTS ➤ **P001**
TECHNICAL DATA ➤ **Q001**

Mounting Dimensions

DC (mm)	Order Number	Dimensions (mm)								Fig.
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
50	**WWX400-050A03AR**	22	20	—	—	12.2	47	10.4	6.3	1
50	**WWX400-050A04AR**	22	20	—	—	12.2	47	10.4	6.3	1
63	**WWX400-063A03AR**	22	20	11	17	11.2	50	10.4	6.3	2
63	**WWX400-063A04AR**	22	20	11	17	11.2	50	10.4	6.3	2
63	**WWX400-063A05AR**	22	20	11	17	11.2	50	10.4	6.3	2
80	**WWX400R08004CA**	25.4	26	13	20	14.2	56	9.5	6	2
80	**WWX400R08005CA**	25.4	26	13	20	14.2	56	9.5	6	2
80	**WWX400R08007CA**	25.4	26	13	20	14.2	56	9.5	6	2
80	**WWX400-080A04AR**	27	23	13	20	14.2	56	12.4	7	2
80	**WWX400-080A05AR**	27	23	13	20	14.2	56	12.4	7	2
80	**WWX400-080A07AR**	27	23	13	20	14.2	56	12.4	7	2
100	**WWX400R10005DA**	31.75	37	31.75	45	11.2	70	12.7	8	3
100	**WWX400R10007DA**	31.75	37	31.75	45	11.2	70	12.7	8	3
100	**WWX400R10009DA**	31.75	37	31.75	45	11.2	70	12.7	8	3
100	**WWX400-100B05AR**	32	32	32	45	16.2	78	14.4	8	3
100	**WWX400-100B07AR**	32	32	32	45	16.2	78	14.4	8	3
100	**WWX400-100B09AR**	32	32	32	45	16.2	78	14.4	8	3
125	**WWX400R12506EA**	38.1	42	38.1	56	19.2	80	15.9	10	3
125	**WWX400R12508EA**	38.1	42	38.1	56	19.2	80	15.9	10	3
125	**WWX400R12512EA**	38.1	42	38.1	56	19.2	80	15.9	10	3
125	**WWX400-125B06AR**	40	40	40	56	21.2	89	16.4	9	3
125	**WWX400-125B08AR**	40	40	40	56	21.2	89	16.4	9	3
125	**WWX400-125B12AR**	40	40	40	56	21.2	89	16.4	9	3
160	**WWX400-160C08NR**	40	40	14	56	21.2	100	16.4	9	4
160	**WWX400-160C10NR**	40	40	14	56	21.2	100	16.4	9	4
160	**WWX400-160C14NR**	40	40	14	56	21.2	100	16.4	9	4
160	**WWX400R16008FA**	50.8	45	50.8	72	16.2	100	19.1	11	3
160	**WWX400R16010FA**	50.8	45	50.8	72	16.2	100	19.1	11	3
160	**WWX400R16014FA**	50.8	45	50.8	72	16.2	100	19.1	11	3
200	**WWX400R20010KN**	47.625	35	18	135	26.2	175	25.4	14.22	5
200	**WWX400R20012KN**	47.625	35	18	135	26.2	175	25.4	14.22	5
200	**WWX400R20016KN**	47.625	35	18	135	26.2	175	25.4	14.22	5
200	**WWX400-200C10NR**	60	32	18	135	29.2	160	25.7	14.22	5
200	**WWX400-200C12NR**	60	32	18	135	29.2	160	25.7	14.22	5
200	**WWX400-200C16NR**	60	32	18	135	29.2	160	25.7	14.22	5
250	**WWX400R25012KN**	47.625	35	18	180	26.2	210	25.4	14.22	5
250	**WWX400R25014KN**	47.625	35	18	180	26.2	210	25.4	14.22	5
250	**WWX400R25018KN**	47.625	35	18	180	26.2	210	25.4	14.22	5
250	**WWX400-250C12NR**	60	32	18	180	29.2	210	25.7	14.22	5
250	**WWX400-250C14NR**	60	32	18	180	29.2	210	25.7	14.22	5
250	**WWX400-250C18NR**	60	32	18	180	29.2	210	25.7	14.22	5

SET BOLT (SOLD SEPARATELY)

Tool Holder Type	Set Bolt		Fig.	Reference Dimensions (mm)							Geometry
	With Coolant Hole	Without Coolant Hole									
	Order Number	Order Number		a	b	c	d	e	f	g	
WWX400R080◌◌CA	HSC12035H	HSC12035	1	18	M12×1.75	47	12	10	–	–	
WWX400R100◌◌DA	MBA16033H	–	2	40	M16×2	43	10	14	6	23	
WWX400R125◌◌EA	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
WWX400R160◌◌FA	MBA24045H	–	2	65	M24×3	59	14	17	10	37	
WWX400R200◌◌KN	–	–	1	24	M16×2	61–	16	14	–	–	
WWX400R250◌◌KN	–	–	1	24	M16×2	61–	16	14	–	–	
WWX400-063A◌◌AR	HSC10030H	HSC10035	1	16	M10×1.5	40	10	6	–	–	
WWX400-080A◌◌AR	HSC12035H	HSC12035	1	18	M12×1.75	47	12	10	–	–	
WWX400-100B◌◌AR	MBA16033H	–	2	40	M16×2	43	10	14	6	23	
WWX400-125B◌◌AR	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
WWX400-160C◌◌NR	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
WWX400-200C◌◌NR	–	–	1	24	M16×2	61–	16	14	–	–	
WWX400-250C◌◌NR	–	–	1	24	M16×2	61–	16	14	–	–	

Fig.1

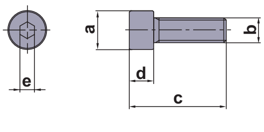
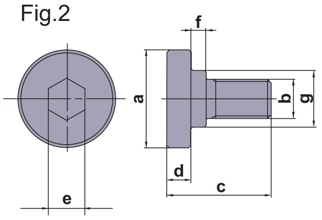
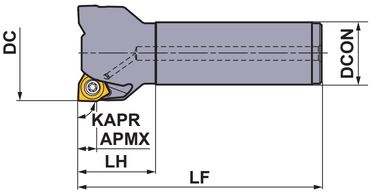


Fig.2



Note 1) Please purchase the appropriate set bolt after confirming the reference dimensions.
The items with an order number listed under the Set Bolt columns are also sold by Mitsubishi Materials.
Note 2) Internal coolant is necessary with the set bolt.
Note 3) The milling cutter with cutting diameter DC=50 mm has a built-in set bolt.
Please use a 7 mm Allen wrench to tighten/loosen the set bolt.



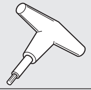
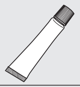
Right hand tool holder only.

SHANK TYPE

With Coolant Hole

DC (mm)	Order Number	Stock	Number of Teeth	Dimensions (mm)			WT (kg)	APMX (mm)	RMPX	RPMX (min^{-1})
		R		LF	DCON	LH				
50	**WWX400R5003SA32M**	●	3	125	32	40	0.8	8.2	0.4°	16000
50	**WWX400R5004SA32M**	●	4	125	32	40	0.8	8.2	0.4°	16000
63	**WWX400R6303SA32M**	●	3	125	32	40	1.0	8.2	0.26°	14100
63	**WWX400R6304SA32M**	●	4	125	32	40	1.0	8.2	0.26°	14100
63	**WWX400R6305SA32M**	●	5	125	32	40	1.0	8.2	0.26°	14100
80	**WWX400R8004SA32M**	●	4	125	32	40	1.3	8.2	0.16°	12200
80	**WWX400R8005SA32M**	●	5	125	32	40	1.3	8.2	0.16°	12200
80	**WWX400R8007SA32M**	●	7	125	32	40	1.2	8.2	0.16°	12200

SPARE PARTS

Tool Holder Type	 *		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WWX400	TS5R	TKY20T	MK1KS

* Clamp Torque (N • m) : TS5R = 5.0

● : Inventory maintained in Japan.

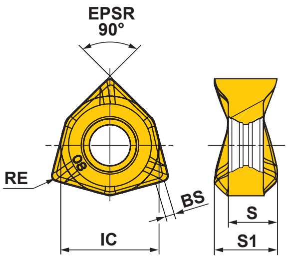
ISO13399 ➢ L003
SPARE PARTS ➢ P001
TECHNICAL DATA ➢ Q001

INSERTS

Workpiece Material		MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	TF15
P	Steels		●	◐				✤	
M	Stainless Steels				●			◐	
K	Cast Irons	◐						✤	
N	Non-ferrous Metals								◐
S	Heat Resistant Alloys, Titanium Alloys					●	◐		
H	Hardened Steels							◐	

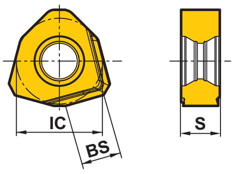
Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp

Shape	Order Number	Class	Edge Preparation	Coated							Carbide	Dimensions (mm)					Geometry
				MC5020	**MP6120**	**MP6130**	**MP7130**	**MP9120**	**MP9130**	**VP15TF**	**TF15**	**IC**	**S**	**S1**	**BS**	**RE**	
	**6NGU1409040PNER-L**	G	E	●	●	●	●	●	●	●		14	7	9	1.7	0.4	
	6NGU1409080PNER-L	G	E	●	●	●	●	●	●	●		14	7	9	1.3	0.8	
	6NGU1409040PNFR-L	G	F								●	14	7	9	1.7	0.4	
	6NGU1409080PNFR-L	G	F								●	14	7	9	1.3	0.8	
	6NGU1409040PNER-M	G	E	●	●	●	●	●	●	●		14	7	9	1.7	0.4	
	6NGU1409080PNER-M	G	E	●	●	●	●	●	●	●		14	7	9	1.3	0.8	
	6NMU1409040PNER-M	M	E	●	●	●	●	●	●	●		14	7	9	1.7	0.4	
	6NMU1409080PNER-M	M	E	●	●	●	●	●	●	●		14	7	9	1.3	0.8	
	6NMU1409080PNER-R	M	E	●	●	●		●	●	●		14	7	9	1.3	0.8	

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

Wiper Inserts

Shape	Order Number	Class	Edge Preparation	Coated					Dimensions (mm)			Geometry
				MC5020	**MP6120**	**VP15TF**			**IC**	**S**	**BS**	
	**2NGU1406ZNER6C-M**	G	E	●	●	●			14	6.3	6.5	

Instructions for Use of Wiper Inserts

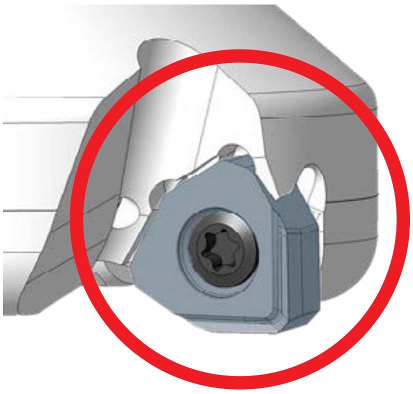


Fig.1

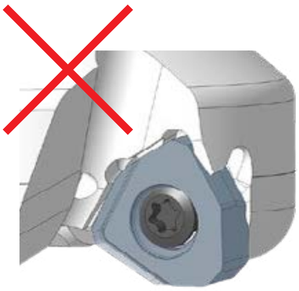


Fig.2

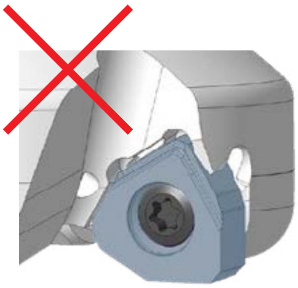


Fig.3

Wiper inserts for WWX400 are two-cornered. Please set as shown in Fig.1.
Excellent surface finish can be achieved with one wiper.
Set more than 2 wiper inserts, equally spaced, when the feed per revolution is larger than 6.5mm/rev.
For a wiper insert, select a general insert that has similar cutting conditions.

RECOMMENDED CUTTING CONDITIONS

■ Dry cutting

Cutting Speed

(mm)

Workpiece Material		Properties	Cutting Conditions	Grade	ae		
					0.5DC≥	0.8DC≥	DC(Slot)
					vc (m/min)		
P	Mild Steels	Hardness ≤180HB	●	MP6120	240(200—280)	220(180—260)	200(160—240)
			◐	MP6130	230(190—270)	210(170—250)	190(150—230)
			✣	MP6130,VP15TF	210(170—250)	190(150—230)	170(130—210)
	Carbon Steels Alloy Steels	Hardness 180—280HB	●	MP6120	210(170—250)	190(150—230)	170(130—210)
			◐	MP6130	200(160—240)	180(140—220)	160(120—200)
			✣	MP6130,VP15TF	180(140—220)	160(120—200)	140(100—180)
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 280—350HB ≤350HB (Annealing)	●	MP6120	200(160—240)	180(140—220)	160(120—200)
			◐	MP6130	190(150—230)	170(130—210)	150(110—190)
			✣	MP6130,VP15TF	170(130—210)	150(110—190)	130(90—170)
	Pre-hardened Steels	Hardness 35—45HRC	●	MP6120	140(120—160)	—	—
			◐	MP6130	120(100—140)	—	—
			✣	MP6130,VP15TF	110(90—130)	—	—
M	Austenitic Stainless Steels	Hardness ≤200HB	●	MP7130	180(160—200)	160(140—180)	—
			◐	MP7130,VP15TF	170(150—190)	150(130—170)	—
			✣	MP7130,VP15TF	150(130—170)	130(110—150)	—
	Austenitic Stainless Steels	Hardness >200HB	●	MP7130	170(150—190)	150(130—170)	—
			◐	MP7130,VP15TF	160(140—180)	140(120—160)	—
			✣	MP7130,VP15TF	140(120—160)	120(100—140)	—
	Ferritic and Martensitic Stainless Steels	Hardness ≤200HB	●	MP7130	180(160—200)	160(140—180)	—
			◐	MP7130,VP15TF	170(150—190)	150(130—170)	—
			✣	MP7130,VP15TF	150(130—170)	130(110—150)	—
	Duplex Stainless Steels	Hardness ≤280HB	●	MP7130	160(140—180)	140(120—160)	—
			◐	MP7130,VP15TF	150(130—170)	130(110—150)	—
			✣	MP7130,VP15TF	130(110—150)	110(90—130)	—
	Precipitation-Hardening Stainless Steel	Hardness <450HB	●	MP7130	140(120—160)	—	—
			◐	MP7130,VP15TF	130(110—150)	—	—
			✣	MP7130,VP15TF	110(90—130)	—	—
K	Gray Cast Irons	Tensile Strength ≤350MPa	●	MC5020	250(210—290)	230(190—270)	210(170—250)
			◐	MC5020	240(200—280)	220(180—260)	200(160—240)
			◐	VP15TF	240(200—280)	220(180—260)	—
			✣	MC5020,VP15TF	220(180—260)	200(160—240)	180(140—220)
	Ductile Cast Irons	Tensile Strength ≤450MPa	●	MC5020	220(180—260)	200(160—240)	180(140—220)
			◐	MC5020	210(170—250)	190(150—230)	170(130—210)
			◐	VP15TF	210(170—250)	190(150—230)	—
			✣	MC5020,VP15TF	190(150—230)	170(130—210)	150(110—190)
	Ductile Cast Irons	Tensile Strength ≤800MPa	●	MC5020	180(140—220)	160(120—200)	140(100—180)
			◐	MC5020	170(130—210)	150(110—190)	130(90—170)
			◐	VP15TF	170(130—210)	150(110—190)	—
			✣	MC5020,VP15TF	150(110—190)	130(90—170)	110(70—150)
H	Hardened Steels	Hardness 40—55HRC	●	VP15TF	50(30—70)	—	—
			◐	VP15TF	50(30—70)	—	—

Note 1) The recommended cutting speed has been calculated for a depth of cut 2mm. Please reduce the cutting speed by an appropriate amount corresponding to the increase in cutting depth.

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

■ Wet Cutting
Cutting Speed

(mm)

	Workpiece Material	Properties	Cutting Conditions	Grade	ae		
					0.5DC≥	0.8DC≥	DC(Slot)
					vc (m/min)		
P	Mild Steels	Hardness ≤180HB	●	MP6120	150(140–160)	130(120–140)	120(110–130)
			◐	MP6130	140(130–150)	120(110–130)	110(100–120)
			✤	MP6130,VP15TF	120(110–130)	100(90–110)	90(80–100)
	Carbon Steels Alloy Steels	Hardness 180–280HB	●	MP6120	150(140–160)	130(120–140)	120(110–130)
			◐	MP6130	140(130–150)	120(110–130)	110(100–120)
			✤	MP6130,VP15TF	120(110–130)	100(90–110)	90(80–100)
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 280–350HB ≤350HB (Annealing)	●	MP6120	140(130–150)	120(110–130)	110(100–120)
			◐	MP6130	130(120–140)	110(100–120)	100(90–110)
			✤	MP6130,VP15TF	110(100–120)	90(80–100)	80(70–90)
	Pre-hardened Steels	Hardness 35–45HRC	●	MP6120	110(100–120)	–	–
			◐	MP6130	100(90–110)	–	–
			✤	MP6130,VP15TF	80(70–90)	–	–
M	Austenitic Stainless Steels	Hardness ≤200HB	●	MP7130	130(120–140)	110(100–120)	–
			◐	MP7130,VP15TF	120(110–130)	100(90–110)	–
			✤	MP7130,VP15TF	100(90–110)	80(70–90)	–
	Austenitic Stainless Steels	Hardness >200HB	●	MP7130	130(120–140)	110(100–120)	–
			◐	MP7130,VP15TF	120(110–130)	100(90–110)	–
			✤	MP7130,VP15TF	100(90–110)	80(70–90)	–
	Ferritic and Martensitic Stainless Steels	Hardness ≤200HB	●	MP7130	130(120–140)	110(100–120)	–
			◐	MP7130,VP15TF	120(110–130)	100(90–110)	–
			✤	MP7130,VP15TF	100(90–110)	80(70–90)	–
	Duplex Stainless Steels	Hardness ≤280HB	●	MP7130	120(110–130)	100(90–110)	–
			◐	MP7130,VP15TF	110(100–120)	90(80–100)	–
			✤	MP7130,VP15TF	90(80–100)	70(60–80)	–
	Precipitation-Hardening Stainless Steel	Hardness <450HB	●	MP7130	120(110–130)	–	–
			◐	MP7130,VP15TF	110(100–120)	–	–
			✤	MP7130,VP15TF	90(80–100)	–	–
K	Gray Cast Irons	Tensile Strength ≤350MPa	●	MC5020	170(150–190)	150(130–170)	130(110–150)
			◐	MC5020	160(140–180)	140(120–160)	120(100–140)
			◐	VP15TF	160(140–180)	140(120–160)	–
			✤	MC5020,VP15TF	140(120–160)	120(100–140)	100(80–120)
	Ductile Cast Irons	Tensile Strength ≤450MPa	●	MC5020	170(150–190)	150(130–170)	130(110–150)
			◐	MC5020	160(140–180)	140(120–160)	120(100–140)
			◐	VP15TF	160(140–180)	140(120–160)	–
			✤	MC5020,VP15TF	140(120–160)	120(100–140)	100(80–120)
	Ductile Cast Irons	Tensile Strength ≤800MPa	●	MC5020	160(150–170)	140(130–150)	120(110–130)
			◐	MC5020	150(140–160)	130(120–140)	110(100–120)
			◐	VP15TF	150(140–160)	130(120–140)	–
			✤	MC5020,VP15TF	130(120–140)	110(100–120)	90(80–100)
N	Aluminium Alloys	Content Si<5%	●	TF15	500(300–900)	500(300–900)	500(300–900)
			◐	TF15	500(300–900)	500(300–900)	500(300–900)
			✤	TF15	400(200–800)	400(200–800)	400(200–800)
S	Titanium Alloys	–	●	MP9120	80(60–100)	–	–
			◐	MP9120	70(50–90)	–	–
			✤	MP9130	60(40–80)	–	–
	Heat Resistant Alloys	–	●	MP9120	60(50–70)	–	–
			◐	MP9120	50(30–60)	–	–
			✤	MP9130	40(20–40)	–	–
H	Hardened Steels	Hardness 40–55HRC	●	VP15TF	50(30–70)	–	–
			◐	VP15TF	50(30–70)	–	–

Note 1) Set the cutting conditions according to the usage written on the table above.

RECOMMENDED CUTTING CONDITIONS

Depth of Cut / Feed per Tooth

	Workpiece Material	Properties	Cutting Conditions	Grade	ae		
					0.5DC≥		
					Breaker	**ap**	**fz** (mm/t)
P	Mild Steels	Hardness ≤180HB	●	MP6120	L,M	≤4.0	0.13(0.10—0.15)
			◐	MP6130	L,M	≤4.0	0.13(0.10—0.15)
			◐		M,R	≤4.0	0.16(0.10—0.20)
			✤	MP6130,VP15TF	M,R	≤4.0	0.13(0.10—0.15)
	Carbon Steels Alloy Steels	Hardness 180—280HB	●	MP6120	L,M	≤4.0	0.13(0.10—0.15)
			◐	MP6130	L,M	≤4.0	0.13(0.10—0.15)
			◐		M,R	≤4.0	0.16(0.10—0.20)
			✤	MP6130,VP15TF	M,R	≤4.0	0.13(0.10—0.15)
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 280—350HB ≤350HB (Annealing)	●	MP6120	L,M	≤3.0	0.13(0.10—0.15)
			◐	MP6130	L,M	≤3.0	0.13(0.10—0.15)
			◐		M,R	≤3.0	0.16(0.10—0.20)
			✤	MP6130,VP15TF	M,R	≤3.0	0.13(0.10—0.15)
	Pre-hardened Steels	Hardness 35—45HRC	●	MP6120	L,M	≤2.0	0.13(0.10—0.15)
			◐	MP6130	L,M	≤2.0	0.13(0.10—0.15)
			◐		M,R	≤2.0	0.16(0.10—0.20)
			✤	MP6130,VP15TF	M,R	≤2.0	0.13(0.10—0.15)
M	Austenitic Stainless Steels	Hardness ≤200HB	● ◐	MP7130	L,M	≤4.0	0.13(0.10—0.15)
			◐	VP15TF	M	≤4.0	0.16(0.10—0.20)
			✤	MP7130,VP15TF	M	≤4.0	0.13(0.10—0.15)
	Austenitic Stainless Steels	Hardness >200HB	●	MP7130	L,M	≤4.0	0.13(0.10—0.15)
			◐	MP7130	L,M	≤3.0	0.13(0.10—0.15)
			◐	VP15TF	M	≤3.0	0.16(0.10—0.20)
			✤	MP7130,VP15TF	M	≤3.0	0.13(0.10—0.15)
	Ferritic and Martensitic Stainless Steels	Hardness ≤200HB	● ◐	MP7130	L,M	≤4.0	0.13(0.10—0.15)
			◐	VP15TF	M	≤4.0	0.16(0.10—0.20)
			✤	MP7130,VP15TF	M	≤3.0	0.13(0.10—0.15)
	Duplex Stainless Steels	Hardness ≤280HB	● ◐	MP7130	L,M	≤3.0	0.13(0.10—0.15)
			● ◐	MP7130	L,M	≤4.0	0.13(0.10—0.15)
			◐	VP15TF	M	≤3.0	0.16(0.10—0.20)
			◐	VP15TF	M	≤4.0	0.16(0.10—0.20)
			✤	MP7130,VP15TF	M	≤3.0	0.13(0.10—0.15)
			✤	MP7130,VP15TF	M	≤4.0	0.13(0.10—0.15)
	Precipitation-Hardening Stainless Steel	Hardness <450HB	●	MP7130	L,M	≤2.0	0.13(0.10—0.15)
			◐	MP7130	L,M	≤2.0	0.13(0.10—0.15)
			◐	VP15TF	M	≤2.0	0.16(0.10—0.20)
			✤	MP7130,VP15TF	M	≤2.0	0.13(0.10—0.15)
K	Gray Cast Irons	Tensile Strength ≤350MPa	● ◐	MC5020	L,M	≤4.0	0.13(0.10—0.15)
			◐	VP15TF	M,R	≤4.0	0.16(0.10—0.20)
			✤	MC5020,VP15TF	M,R	≤4.0	0.13(0.10—0.15)
	Ductile Cast Irons	Tensile Strength ≤800MPa	● ◐	MC5020	L,M	≤4.0	0.13(0.10—0.15)
			◐	VP15TF	M,R	≤4.0	0.16(0.10—0.20)
			✤	MC5020,VP15TF	M,R	≤4.0	0.13(0.10—0.15)
N	Aluminium Alloys	Content Si<5%	● ◐ ✤	TF15	L	≤4.0	0.13(0.10—0.15)
S	Titanium Alloys	—	● ◐	MP9120	L,M	≤2.0	0.10(0.05—0.13)
			✤	MP9130	L,M	≤2.0	0.10(0.05—0.13)
	Heat Resistant Alloys	—	● ◐	MP9120	L,M	≤2.0	0.10(0.05—0.13)
			✤	MP9130	L,M	≤2.0	0.10(0.05—0.13)
H	Hardened Steels	Hardness 40—55HRC	●	VP15TF	M	≤2.0	0.05(0.05—0.10)
			◐	VP15TF	M,R	≤2.0	0.05(0.05—0.10)

Note 1) Set the cutting conditions according to the usage written on the table above.

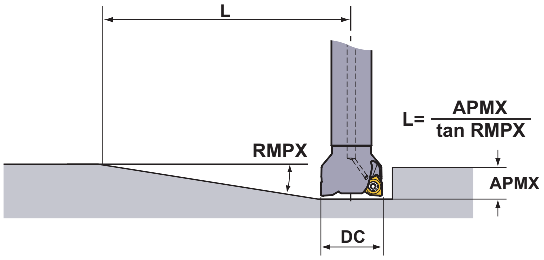
Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

(mm)

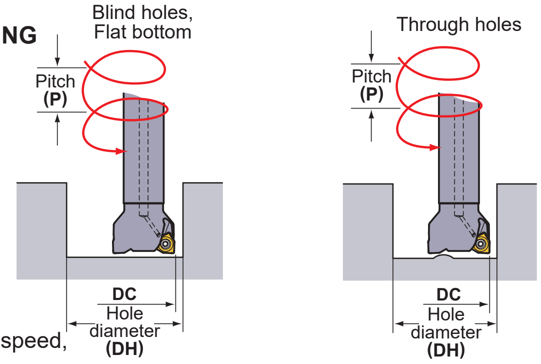
ae						Cutting Mode
0.8DC≥			DC(Slot)			
Breaker	**ap**	**fz** (mm/t)	Breaker	**ap**	**fz** (mm/t)	
L,M	≤3.0	0.13(0.10—0.15)	L,M	≤2.0	0.13(0.10—0.15)	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	L,M	≤2.0	0.13(0.10—0.15)	Dry, Wet
M,R	≤3.0	0.16(0.10—0.20)	—	—	—	Dry, Wet
M,R	≤3.0	0.13(0.10—0.15)	M	≤2.0	0.13(0.10—0.15)	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	L,M	≤2.0	0.13(0.10—0.15)	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	L,M	≤2.0	0.13(0.10—0.15)	Dry, Wet
M,R	≤3.0	0.16(0.10—0.20)	—	—	—	Dry, Wet
M,R	≤3.0	0.13(0.10—0.15)	M	≤2.0	0.13(0.10—0.15)	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	L,M	≤3.0	0.13(0.10—0.15)	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	L,M	≤2.0	0.13(0.10—0.15)	Dry, Wet
M,R	≤3.0	0.16(0.10—0.20)	—	—	—	Dry, Wet
M,R	≤3.0	0.13(0.10—0.15)	M	≤2.0	0.13(0.10—0.15)	Dry, Wet
—	—	—	—	—	—	Dry, Wet
—	—	—	—	—	—	Dry, Wet
—	—	—	—	—	—	Dry, Wet
—	—	—	—	—	—	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	—	—	—	Dry, Wet
M	≤3.0	0.16(0.10—0.20)	—	—	—	Dry, Wet
M	≤3.0	0.13(0.10—0.15)	—	—	—	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	—	—	—	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	—	—	—	Dry, Wet
M	≤3.0	0.16(0.10—0.20)	—	—	—	Dry, Wet
M	≤3.0	0.13(0.10—0.15)	—	—	—	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	—	—	—	Dry, Wet
M	≤3.0	0.16(0.10—0.20)	—	—	—	Dry, Wet
M	≤3.0	0.13(0.10—0.15)	—	—	—	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	—	—	—	Dry
L,M	≤3.0	0.13(0.10—0.15)	—	—	—	Wet
M	≤3.0	0.16(0.10—0.20)	—	—	—	Dry
M	≤3.0	0.16(0.10—0.20)	—	—	—	Wet
M	≤3.0	0.16(0.10—0.20)	—	—	—	Dry
M	≤3.0	0.13(0.10—0.15)	—	—	—	Wet
—	—	—	—	—	—	Dry, Wet
—	—	—	—	—	—	Dry, Wet
—	—	—	—	—	—	Dry, Wet
—	—	—	—	—	—	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	L,M	≤2.0	0.13(0.10—0.15)	Dry, Wet
M,R	≤3.0	0.16(0.10—0.20)	—	—	—	Dry, Wet
M,R	≤3.0	0.13(0.10—0.15)	M,R	≤2.0	0.13(0.10—0.15)	Dry, Wet
L,M	≤3.0	0.13(0.10—0.15)	L,M	≤2.0	0.13(0.10—0.15)	Dry, Wet
M,R	≤3.0	0.16(0.10—0.20)	—	—	—	Dry, Wet
M,R	≤3.0	0.13(0.10—0.15)	M,R	≤2.0	0.13(0.10—0.15)	Dry, Wet
L	≤3.0	0.13(0.10—0.15)	L	≤2.0	0.13(0.10—0.15)	Wet
—	—	—	—	—	0.10(0.05—0.13)	Wet
—	—	—	—	—	0.10(0.05—0.13)	Wet
—	—	—	—	—	0.10(0.05—0.13)	Wet
—	—	—	—	—	0.10(0.05—0.13)	Wet
—	—	—	—	—	0.05(0.05—0.10)	Dry, Wet
—	—	—	—	—	0.05(0.05—0.10)	Dry, Wet

RAMPING/HELICAL CUTTING

● RAMPING



● HELICAL CUTTING



Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

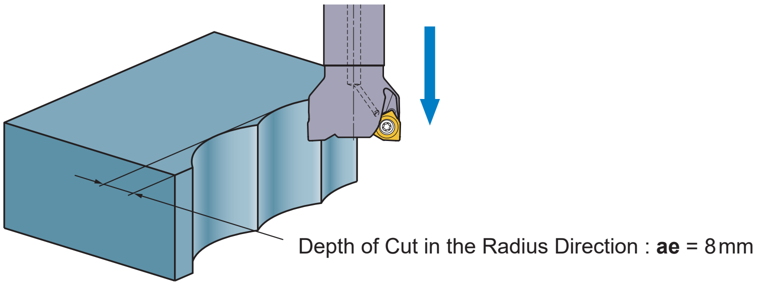
(mm)

DC	RE	APMX	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
			Maximum Ramping Angle **RMPX**	Minimum Distance * **L**	Maximum Hole Diameter **DH max.**	Maximum Pitch **P max.**	Minimum Hole Diameter **DH min.**	Maximum Pitch **P max.**	Minimum Hole Diameter **DH min.**	Maximum Pitch **P max.**
50	0.4	8	0.40°	1175	98.5	1.06	95.2	0.99	82.5	0.7
50	0.8	8	0.40°	1175	97.7	1.05	95.2	0.99	82.5	0.7
63	0.4	8	0.26°	1807	124.5	0.88	121.2	0.83	108.6	0.6
63	0.8	8	0.26°	1807	123.7	0.87	121.2	0.83	108.6	0.6
80	0.4	8	0.16°	2936	158.5	0.69	155.2	0.66	142.6	0.5
80	0.8	8	0.16°	2936	157.7	0.68	155.3	0.66	142.6	0.5

Note 1) When ramping and helical milling, it is recommended to reduce the feed per tooth.
Note 2) When ramping and helical milling, long continuous chips may be scattered so please be careful.
* L (=8.2 / tan RMPX). Cutters' moving distance until depth of cut reaches 8.2mm at a maximum ramping angle.

<Helical Milling>
To obtain a flat bottom surface when helical milling, "the uncut part" in the centre of the workpiece material needs to be removed during the final pass.
When helical milling, make sure that the depth of cut per helical pass doesn’t exceed the maximum depth of cut (**APMX**).

● Plunging



Memo

SHOULDER MILLING

<FOR CAST IRON>

90° KAPR

VOX400

P M **K** N S H

Cast Iron

- Vertical inserts with high strength cutting edge.
- Economical 8 cutting edge inserts.
- Screw-on type.

Fig.1

ø50
ø63
ø80

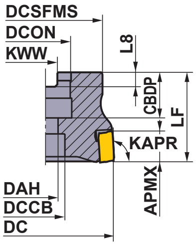


Fig.2

ø100
ø125
ø160

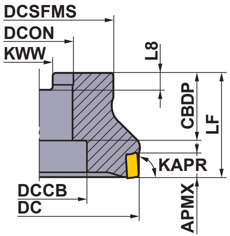
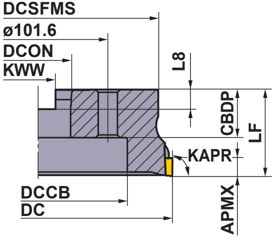


Fig.3

ø200
ø250



Right hand tool holder only.

ARBOR TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions(mm)									WT (kg)	APMX (mm)	Fig.	*	
		R		DC	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8				Clamp Screw	Wrench
Coarse Pitch	**VOX400-050A03R**	●	3	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1	CS401160T	TKY15T
	VOX400-063A04R	●	4	63	40	22	20	11	17	50	10.4	6.3	0.6	10	1	CS401160T	TKY15T
	VOX400R08004C	●	4	80	50	25.4	26	13	20	55	9.5	6	1.0	10	1	CS401160T	TKY15T
	VOX400R10006D	●	6	100	50	31.75	32	—	45	70	12.7	8	1.5	10	2	CS401160T	TKY15T
	VOX400R12508E	●	8	125	63	38.1	40	—	60	80	15.9	10	2.7	10	2	CS401160T	TKY15T
	VOX400R16010F	●	10	160	63	50.8	43	—	80	120	19.1	11	5.3	10	2	CS401160T	TKY15T
	VOX400R20012K	●	12	200	63	47.625	35	—	130	175	25.4	14.22	8.5	10	3	CS401160T	TKY15T
	VOX400R25016K	●	16	250	63	47.625	35	—	180	220	25.4	14.22	13.3	10	3	CS401160T	TKY15T
Fine Pitch	**VOX400-050A05R**	●	5	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1	CS401160T	TKY15T
	VOX400-063A06R	●	6	63	40	22	20	11	17	50	10.4	6.3	0.6	10	1	CS401160T	TKY15T
	VOX400R08008C	●	8	80	50	25.4	26	13	20	55	9.5	6	1.0	10	1	CS401160T	TKY15T
	VOX400R10010D	●	10	100	50	31.75	32	—	45	70	12.7	8	1.5	10	2	CS401160T	TKY15T
	VOX400R12512E	●	12	125	63	38.1	40	—	60	80	15.9	10	2.7	10	2	CS401160T	TKY15T
	VOX400R16016F	●	16	160	63	50.8	43	—	80	120	19.1	11	5.3	10	2	CS401160T	TKY15T
	VOX400R20020K	●	20	200	63	47.625	35	—	130	175	25.4	14.22	8.5	10	3	CS401160T	TKY15T
	VOX400R25024K	●	24	250	63	47.625	35	—	180	220	25.4	14.22	13.3	10	3	CS401160T	TKY15T
Extra Fine Pitch	**VOX400-063A08R**	●	8	63	40	22	20	11	17	50	10.4	6.3	0.5	10	1	CS401160T	TKY15T
	VOX400R08010C	●	10	80	50	25.4	26	13	20	55	9.5	6	1.0	10	1	CS401160T	TKY15T
	VOX400R10012D	●	12	100	50	31.75	32	—	45	70	12.7	8	1.4	10	2	CS401160T	TKY15T
	VOX400R12516E	●	16	125	63	38.1	40	—	60	80	15.9	10	2.6	10	2	CS401160T	TKY15T
	VOX400R16020F	●	20	160	63	50.8	43	—	80	120	19.1	11	5.1	10	2	CS401160T	TKY15T
	VOX400R20026K	●	26	200	63	47.625	35	—	130	175	25.4	14.22	8.2	10	3	CS401160T	TKY15T
	VOX400R25034K	●	34	250	63	47.625	35	—	180	220	25.4	14.22	13.0	10	3	CS401160T	TKY15T

* Clamp Torque (N • m) : CS401160T=3.5

L

INDEXABLE MILLING

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

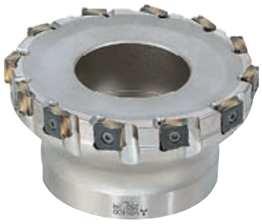


Fig.1

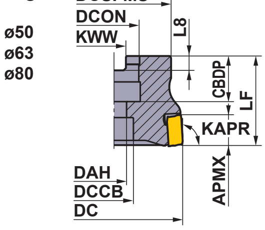


Fig.2

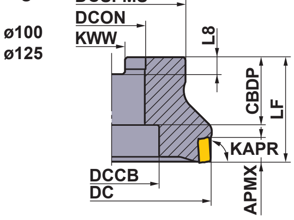
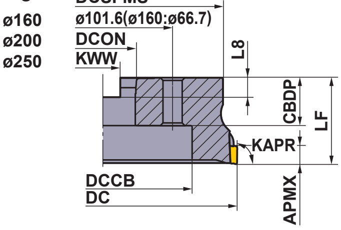


Fig.3



Right hand tool holder only.

For metric arbor

The cutter bore diameter DCON is indicated in millimetre.

■ARBOR TYPE

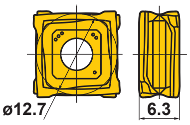
Type	Order Number	Stock	Number of Teeth	Dimensions(mm)									WT (kg)	APMX (mm)	Fig.	* Clamp Screw	Wrench
		R		DC	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8					
Coarse Pitch	**VOX400-050A03R**	●	3	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1	CS401160T	TKY15T
	VOX400-063A04R	●	4	63	40	22	20	11	17	50	10.4	6.3	0.6	10	1	CS401160T	TKY15T
	VOX400-080A04R	●	4	80	50	27	23	13	20	56	12.4	7	1	10	1	CS401160T	TKY15T
	VOX400-100B06R	●	6	100	50	32	32	—	45	78	14.4	8	1.7	10	2	CS401160T	TKY15T
	VOX400-125B08R	●	8	125	63	40	32	—	56	89	16.4	9	3	10	2	CS401160T	TKY15T
	VOX400-160C10R	●	10	160	63	40	29	—	56	120	16.4	9	5.4	10	3	CS401160T	TKY15T
	VOX400-200C12R	●	12	200	63	60	32	—	130	175	25.7	14.22	8.1	10	3	CS401160T	TKY15T
	VOX400-250C16R	●	16	250	63	60	32	—	180	210	25.7	14.22	11.8	10	3	CS401160T	TKY15T
Fine Pitch	**VOX400-050A05R**	●	5	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1	CS401160T	TKY15T
	VOX400-063A06R	●	6	63	40	22	20	11	17	50	10.4	6.3	0.6	10	1	CS401160T	TKY15T
	VOX400-080A08R	●	8	80	50	27	23	13	20	56	12.4	7	1	10	1	CS401160T	TKY15T
	VOX400-100B10R	●	10	100	50	32	32	—	45	78	14.4	8	1.7	10	2	CS401160T	TKY15T
	VOX400-125B12R	●	12	125	63	40	32	—	56	89	16.4	9	3	10	2	CS401160T	TKY15T
	VOX400-160C16R	●	16	160	63	40	29	—	56	120	16.4	9	5.4	10	3	CS401160T	TKY15T
	VOX400-200C20R	●	20	200	63	60	32	—	130	175	25.7	14.22	8.1	10	3	CS401160T	TKY15T
	VOX400-250C24R	●	24	250	63	60	32	—	180	210	25.7	14.22	11.8	10	3	CS401160T	TKY15T
Extra Fine Pitch	**VOX400-063A08R**	●	8	63	40	22	20	11	17	50	10.4	6.3	0.5	10	1	CS401160T	TKY15T
	VOX400-080A10R	●	10	80	50	27	23	13	20	56	12.4	7	1.0	10	1	CS401160T	TKY15T
	VOX400-100B12R	●	12	100	50	32	32	—	45	78	14.4	8	1.6	10	2	CS401160T	TKY15T
	VOX400-125B16R	●	16	125	63	40	32	—	56	89	16.4	9	2.8	10	2	CS401160T	TKY15T
	VOX400-160C20R	●	20	160	63	40	29	—	56	120	16.4	9	5.2	10	3	CS401160T	TKY15T
	VOX400-200C26R	●	26	200	63	60	32	—	130	175	25.7	14.22	7.9	10	3	CS401160T	TKY15T
	VOX400-250C34R	●	34	250	63	60	32	—	180	210	25.7	14.22	11.5	10	3	CS401160T	TKY15T

* Clamp Torque (N • m) : CS401160T=3.5

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

INSERTS

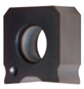
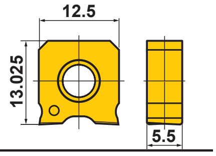
Workpiece Material	K	Cast Iron	◐	✤	Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Shape	Order Number	Class	Edge Preparation	Coated MC5020	Coated VP15TF	Geometry
	**SONX1206PER**	N	E	●	●	 ø12.7 6.3 Right hand tool holder shown.
	SONX1206PEL	N	E		●	

* Left hand insert use for the side cutter (special products).
Please refer to the TOOL NEWS B242G Side Cutter Series.

WIPER INSERTS

Workpiece Material	K	Cast Iron	◐		Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Shape	Order Number	Class	Edge Preparation	Coated VP15TF		Geometry
	**WOEX1206PER5C**	E	E	●		 12.5 13.025 5.5

RECOMMENDED CUTTING CONDITIONS

VOX400 (Standard Pitch)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (m/min)	ϕ50−ϕ250 Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)
K	Gray Cast Iron	≤200MPa	MC5020	300(250−350)	≤DC	≤10	0.4(0.3−0.5)
			VP15TF	250(200−300)	≤DC	≤10	0.4(0.3−0.5)
		≤350MPa	MC5020	220(150−300)	≤DC	≤10	0.3(0.2−0.4)
			VP15TF	200(150−300)	≤DC	≤10	0.3(0.2−0.4)
	Ductile Cast Iron	≤450MPa	MC5020	200(150−250)	≤DC	≤10	0.3(0.2−0.4)
			VP15TF	170(150−200)	≤DC	≤10	0.3(0.2−0.4)
		≤800MPa	MC5020	170(150−200)	≤DC	≤10	0.2(0.1−0.3)
			VP15TF	150(100−200)	≤DC	≤10	0.2(0.1−0.3)

VOX400 (Fine Pitch)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (m/min)	ϕ50,ϕ63			ϕ80		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)	Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)
K	Gray Cast Iron	≤200MPa	MC5020	300(250−350)	≤DC	≤10	0.4(0.3−0.5)	≤DC	≤10	0.4(0.3−0.5)
			VP15TF	250(200−300)	≤DC	≤10	0.4(0.3−0.5)	≤DC	≤10	0.4(0.3−0.5)
		≤350MPa	MC5020	220(150−300)	≤DC	≤10	0.3(0.2−0.4)	≤DC	≤10	0.3(0.2−0.4)
			VP15TF	200(150−300)	≤DC	≤10	0.3(0.2−0.4)	≤DC	≤10	0.3(0.2−0.4)
	Ductile Cast Iron	≤450MPa	MC5020	200(150−250)	≤0.8DC	≤10	0.3(0.2−0.4)	≤0.6DC	≤10	0.3(0.2−0.4)
			VP15TF	170(150−200)	≤0.8DC	≤10	0.3(0.2−0.4)	≤0.6DC	≤10	0.3(0.2−0.4)
		≤800MPa	MC5020	170(150−200)	≤0.8DC	≤10	0.2(0.1−0.3)	≤0.6DC	≤10	0.2(0.1−0.3)
			VP15TF	150(100−200)	≤0.8DC	≤10	0.2(0.1−0.3)	≤0.6DC	≤10	0.2(0.1−0.3)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (m/min)	ϕ100			ϕ125		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)	Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)
K	Gray Cast Iron	≤200MPa	MC5020	300(250−350)	≤DC	≤10	0.4(0.3−0.5)	≤DC	≤10	0.4(0.3−0.5)
			VP15TF	250(200−300)	≤DC	≤10	0.4(0.3−0.5)	≤DC	≤10	0.4(0.3−0.5)
		≤350MPa	MC5020	220(150−300)	≤DC	≤10	0.3(0.2−0.4)	≤DC	≤10	0.3(0.2−0.4)
			VP15TF	200(150−300)	≤DC	≤10	0.3(0.2−0.4)	≤DC	≤10	0.3(0.2−0.4)
	Ductile Cast Iron	≤450MPa	MC5020	200(150−250)	≤0.5DC	≤10	0.3(0.2−0.4)	≤0.4DC	≤10	0.3(0.2−0.4)
			VP15TF	170(150−200)	≤0.5DC	≤10	0.3(0.2−0.4)	≤0.4DC	≤10	0.3(0.2−0.4)
		≤800MPa	MC5020	170(150−200)	≤0.5DC	≤10	0.2(0.1−0.3)	≤0.4DC	≤10	0.2(0.1−0.3)
			VP15TF	150(100−200)	≤0.5DC	≤10	0.2(0.1−0.3)	≤0.4DC	≤10	0.2(0.1−0.3)

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (m/min)	φ160			φ200, φ250		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)	Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)
K	Gray Cast Iron	≤200MPa	MC5020	300(250−350)	≤DC	≤10	0.4(0.3−0.5)	≤DC	≤10	0.4(0.3−0.5)
			VP15TF	250(200−300)	≤DC	≤10	0.4(0.3−0.5)	≤DC	≤10	0.4(0.3−0.5)
		≤350MPa	MC5020	220(150−300)	≤DC	≤10	0.3(0.2−0.4)	≤DC	≤10	0.3(0.2−0.4)
			VP15TF	200(150−300)	≤DC	≤10	0.3(0.2−0.4)	≤DC	≤10	0.3(0.2−0.4)
	Ductile Cast Iron	≤450MPa	MC5020	200(150−250)	≤0.3DC	≤10	0.3(0.2−0.4)	≤0.2DC	≤10	0.3(0.2−0.4)
			VP15TF	170(150−200)	≤0.3DC	≤10	0.3(0.2−0.4)	≤0.2DC	≤10	0.3(0.2−0.4)
		≤800MPa	MC5020	170(150−200)	≤0.3DC	≤10	0.2(0.1−0.3)	≤0.2DC	≤10	0.2(0.1−0.3)
			VP15TF	150(100−200)	≤0.3DC	≤10	0.2(0.1−0.3)	≤0.2DC	≤10	0.2(0.1−0.3)

Note 1) DC is cutter diameter.

Note 2) When using wiper insert, please reduce the feed per tooth to half the normal rate.

■VOX400 (Extra Fine Pitch)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (m/min)	φ63			φ80		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)	Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)
K	Gray Cast Iron	≤200MPa	MC5020	300(250−350)	≤DC	≤10	0.4(0.3−0.5)	≤DC	≤10	0.4(0.3−0.5)
			VP15TF	250(200−300)	≤DC	≤10	0.4(0.3−0.5)	≤DC	≤10	0.4(0.3−0.5)
		≤350MPa	MC5020	220(150−300)	≤DC	≤10	0.3(0.2−0.4)	≤DC	≤10	0.3(0.2−0.4)
			VP15TF	200(150−300)	≤DC	≤10	0.3(0.2−0.4)	≤DC	≤10	0.3(0.2−0.4)
	Ductile Cast Iron	≤450MPa	MC5020	200(150−250)	≤0.6DC	≤10	0.3(0.2−0.4)	≤0.5DC	≤10	0.3(0.2−0.4)
			VP15TF	170(150−200)	≤0.6DC	≤10	0.3(0.2−0.4)	≤0.5DC	≤10	0.3(0.2−0.4)
		≤800MPa	MC5020	170(150−200)	≤0.6DC	≤10	0.2(0.1−0.3)	≤0.5DC	≤10	0.2(0.1−0.3)
			VP15TF	150(100−200)	≤0.6DC	≤10	0.2(0.1−0.3)	≤0.5DC	≤10	0.2(0.1−0.3)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (m/min)	φ100			φ125		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)	Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)
K	Gray Cast Iron	≤200MPa	MC5020	300(250−350)	≤DC	≤10	0.4(0.3−0.5)	≤DC	≤10	0.4(0.3−0.5)
			VP15TF	250(200−300)	≤DC	≤10	0.4(0.3−0.5)	≤DC	≤10	0.4(0.3−0.5)
		≤350MPa	MC5020	220(150−300)	≤DC	≤10	0.3(0.2−0.4)	≤DC	≤10	0.3(0.2−0.4)
			VP15TF	200(150−300)	≤DC	≤10	0.3(0.2−0.4)	≤DC	≤10	0.3(0.2−0.4)
	Ductile Cast Iron	≤450MPa	MC5020	200(150−250)	≤0.4DC	≤10	0.3(0.2−0.4)	≤0.3DC	≤10	0.3(0.2−0.4)
			VP15TF	170(150−200)	≤0.4DC	≤10	0.3(0.2−0.4)	≤0.3DC	≤10	0.3(0.2−0.4)
		≤800MPa	MC5020	170(150−200)	≤0.4DC	≤10	0.2(0.1−0.3)	≤0.3DC	≤10	0.2(0.1−0.3)
			VP15TF	150(100−200)	≤0.4DC	≤10	0.2(0.1−0.3)	≤0.3DC	≤10	0.2(0.1−0.3)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (m/min)	φ160			φ200, φ250		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)	Radial Depth of Cut ae (mm)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)
K	Gray Cast Iron	≤200MPa	MC5020	300(250−350)	≤DC	≤10	0.4(0.3−0.5)	≤DC	≤10	0.4(0.3−0.5)
			VP15TF	250(200−300)	≤DC	≤10	0.4(0.3−0.5)	≤DC	≤10	0.4(0.3−0.5)
		≤350MPa	MC5020	220(150−300)	≤DC	≤10	0.3(0.2−0.4)	≤DC	≤10	0.3(0.2−0.4)
			VP15TF	200(150−300)	≤DC	≤10	0.3(0.2−0.4)	≤DC	≤10	0.3(0.2−0.4)
	Ductile Cast Iron	≤450MPa	MC5020	200(150−250)	≤0.25DC	≤10	0.3(0.2−0.4)	≤0.15DC	≤10	0.3(0.2−0.4)
			VP15TF	170(150−200)	≤0.25DC	≤10	0.3(0.2−0.4)	≤0.15DC	≤10	0.3(0.2−0.4)
		≤800MPa	MC5020	170(150−200)	≤0.25DC	≤10	0.2(0.1−0.3)	≤0.15DC	≤10	0.2(0.1−0.3)
			VP15TF	150(100−200)	≤0.25DC	≤10	0.2(0.1−0.3)	≤0.15DC	≤10	0.2(0.1−0.3)

Note 1) DC is cutter diameter.

Note 2) When using wiper insert, please reduce the feed per tooth to half the normal rate.

SHOULDER MILLING

<GENERAL CUTTING>

90° KAPR F R

ASX400

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel

- High tolerance M-class inserts.
- Economical 4 cutting edge inserts.
- Curved cutting edge and high rigidity holder.
- Screw-on type.

Fig.1
ø50
ø63

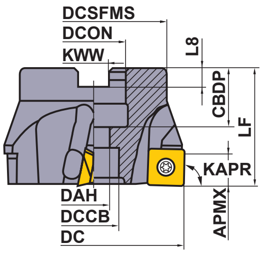


Fig.2
ø80
ø100
ø125
ø160

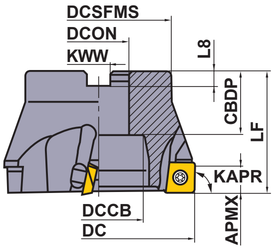
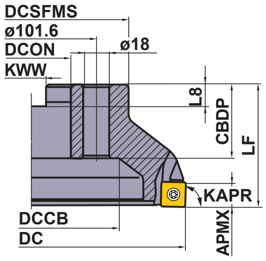


Fig.3
ø200
ø250



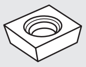
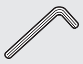
ARBOR TYPE

No coolant hole

Right hand tool holder only.

Type	Order Number	Stock	Number of Teeth	Dimensions(mm)									WT (kg)	APMX (mm)	Fig.
		R		DC	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8			
Coarse Pitch	ASX400-050A03R	●	3	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1
	ASX400-063A04R	●	4	63	40	22	20	11	17	50	10.4	6.3	0.5	10	1
	ASX400R08004C	●	4	80	50	25.4	26	—	38	60	9.5	6	1.0	10	2
	ASX400R10005D	●	5	100	50	31.75	32	—	45	70	12.7	8	1.5	10	2
	ASX400R12506E	●	6	125	63	38.1	35	—	60	80	15.9	10	2.5	10	2
	ASX400R16008F	●	8	160	63	50.8	38	—	90	100	19.1	11	4.0	10	2
	ASX400R20010K	●	10	200	63	47.625	35	—	135	160	25.4	14.22	7.0	10	3
	ASX400R25012K	●	12	250	63	47.625	35	—	180	210	25.4	14.22	12.0	10	3
Fine Pitch	ASX400-050A04R	●	4	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1
	ASX400-063A05R	●	5	63	40	22	20	11	17	50	10.4	6.3	0.5	10	1
	ASX400R08006C	●	6	80	50	25.4	26	—	38	60	9.5	6	1.0	10	2
	ASX400R10007D	●	7	100	50	31.75	32	—	45	70	12.7	8	1.5	10	2
	ASX400R12508E	●	8	125	63	38.1	35	—	60	80	15.9	10	2.5	10	2
	ASX400R16012F	●	12	160	63	50.8	38	—	90	100	19.1	11	4.0	10	2
	ASX400R20016K	●	16	200	63	47.625	35	—	135	160	25.4	14.22	7.0	10	3
	ASX400R25018K	●	18	250	63	47.625	35	—	180	210	25.4	14.22	12.0	10	3

SPARE PARTS

Tool Holder Number		 *	 *		
	Shim	Shim Screw	Clamp Screw	Wrench (Insert)	Wrench (Shim)
ASX400	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R

* Clamp Torque (N • m) : WCS503507H=5.0, TPS35=3.5

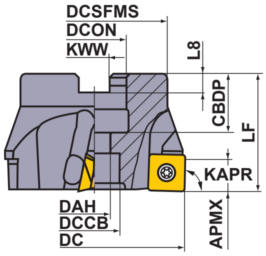
L

INDEXABLE MILLING

● : Inventory maintained in Japan.

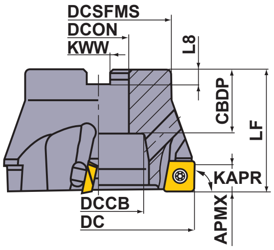
Scan here for product NEWS ▶

Fig.1



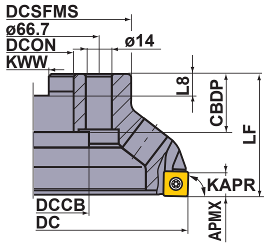
ø50
ø63

Fig.2



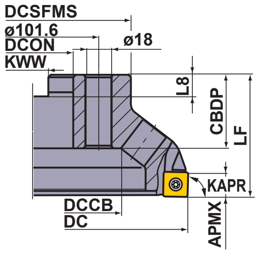
ø80
ø100
ø125

Fig.3



ø160

Fig.4



ø200
ø250

For metric arbor

The cutter bore diameter DCON is indicated in millimetre.

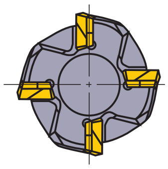
■ARBOR TYPE

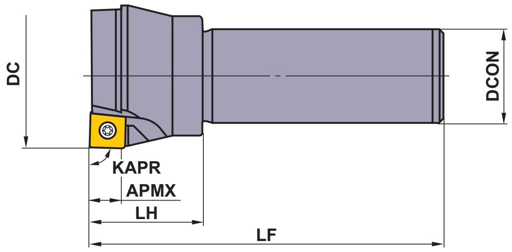
No coolant hole

Right hand tool holder only.

Type	Order Number	Stock	Number of Teeth	Dimensions(mm)									WT (kg)	APMX (mm)	Fig.
		R		DC	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8			
Coarse Pitch	**ASX400-050A03R**	●	3	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1
	ASX400-063A04R	●	4	63	40	22	20	11	17	50	10.4	6.3	0.5	10	1
	ASX400-080B04R	●	4	80	50	27	29	—	38	60	12.4	7	0.9	10	2
	ASX400-100B05R	●	5	100	50	32	32	—	45	70	14.4	8	1.4	10	2
	ASX400-125B06R	●	6	125	63	40	32	—	60	80	16.4	9	2.3	10	2
	ASX400-160C08R	●	8	160	63	40	29	—	56	100	16.4	9	3.6	10	3
	ASX400-200C10R	●	10	200	63	60	32	—	135	160	25.7	14.22	6.3	10	4
	ASX400-250C12R	●	12	250	63	60	32	—	180	210	25.7	14.22	10.8	10	4
Fine Pitch	**ASX400-050A04R**	●	4	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1
	ASX400-063A05R	●	5	63	40	22	20	11	17	50	10.4	6.3	0.5	10	1
	ASX400-080B06R	●	6	80	50	27	29	—	38	60	12.4	7	0.9	10	2
	ASX400-100B07R	●	7	100	50	32	32	—	45	70	14.4	8	1.4	10	2
	ASX400-125B08R	●	8	125	63	40	32	—	60	80	16.4	9	2.2	10	2
	ASX400-160C12R	●	12	160	63	40	29	—	56	100	16.4	9	3.5	10	3
	ASX400-200C16R	●	16	200	63	60	32	—	135	160	25.7	14.22	6.2	10	4
	ASX400-250C18R	●	18	250	63	60	32	—	180	210	25.7	14.22	10.7	10	4
Extra Fine Pitch	**ASX400-050A05R**	●	5	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1
	ASX400-063A06R	●	6	63	40	22	20	11	17	50	10.4	6.3	0.5	10	1
	ASX400-080B08R	●	8	80	50	27	29	—	38	60	12.4	7	0.9	10	2
	ASX400-100B10R	●	10	100	50	32	32	—	45	70	14.4	8	1.4	10	2
	ASX400-125B12R	●	12	125	63	40	32	—	60	80	16.4	9	2.1	10	2
	ASX400-160C15R	●	15	160	63	40	29	—	56	100	16.4	9	3.4	10	3
	ASX400-200C19R	●	19	200	63	60	32	—	135	160	25.7	14.22	6.2	10	4
	ASX400-250C22R	●	22	250	63	60	32	—	180	210	25.7	14.22	10.5	10	4

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001





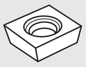
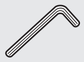
SHANK TYPE

No coolant hole

Right hand tool holder only.

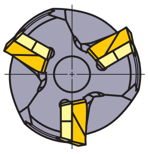
Type	Order Number	Stock	Number of Teeth	Dimensions(mm)				
		R		DC	LF	DCON	LH	APMX
Coarse Pitch	**ASX400R403S32**	●	3	40	125	32	40	10
	ASX400R503S32	●	3	50	125	32	40	10
	ASX400R634S32	●	4	63	125	32	40	10
	ASX400R804S32	●	4	80	125	32	40	10
Fine Pitch	**ASX400R504S32**	●	4	50	125	32	40	10
	ASX400R635S32	●	5	63	125	32	40	10
	ASX400R806S32	●	6	80	125	32	40	10

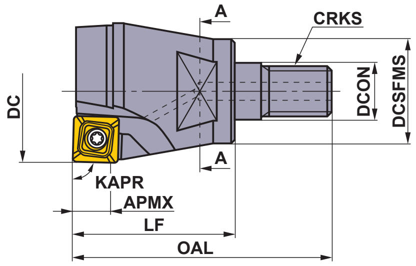
SPARE PARTS

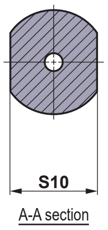
Tool Holder Number		 *	 *		
	Shim	Shim Screw	Clamp Screw	Wrench (Insert)	Wrench (Shim)
ASX400	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R

⁎ Clamp Torque (N • m) : WCS503507H=5.0, TPS35=3.5

● : Inventory maintained in Japan.







SCREW-IN TYPE

With Coolant Hole

Right hand tool holder only.

Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)								WT		*	*		
	R			DC	DCON	DCSFMS	OAL	LF	S10	CRKS	APMX	(kg)	Shim	Shim Screw	Clamp Screw	Wrench (Insert)	Wrench (Shim)
ASX400R322AM1640	●	○	2	32	17	29	63	40	24	M16	10	0.3	–	WCS503507H	TPS35	TIP15T	HKY35R
ASX400R403AM1645	●	○	3	40	17	29	68	45	24	M16	10	0.3	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R

* Clamp Torque (N • m) : WCS503507H=5.0, TPS35=3.5

Note 1) For screw-in type arbors, refer to page L341.

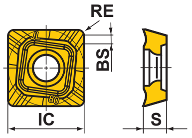
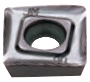
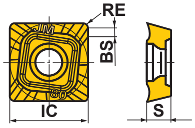
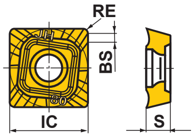
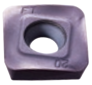
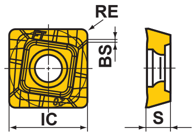
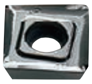
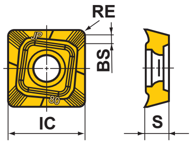
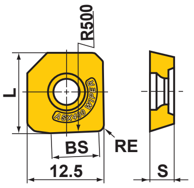
ISO13399 ➤ L003
ARBORS ➤ L341
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

INSERTS

Workpiece Material			F7030	MC5020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT	NX4545	NX2525	HTi10	HTi05T
	P	Steel	◐		◐	✤					◐	✤	◐	●		
	M	Stainless Steel	◐				◐	✤			◐	✤	◐	●		
	K	Cast Iron		◐							✤			●		◐
	N	Non-ferrous Metal													◐	◐
	S	Heat resistant Alloy, Titanium Alloy							◐	✤	◐					
	H	Hardened Steel									◐					

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting
✤ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp **T :** Chamfer

Application	Shape	Order Number	Class	Edge Preparation	Coated										Cermet		Carbide		Dimensions (mm)					Geometry
					F7030	MC5020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT	NX4545	NX2525	HTi10	HTi05T	L	IC	S	BS	RE	
Finish–Light Cutting	**JL** Breaker 	**SOET12T308PEER-JL**	E	E	●		●	●	●	●	●	●	●	●	●				–	12.7	3.97	1.4	0.8	
Light–Rough Cutting	**JM** Breaker 	**SOMT12T308PEER-JM**	M	E	●	●	●	●	●	●	●	●	●	●	●				–	12.7	3.97	1.4	0.8	 Right hand tool holder shown.
		SOMT12T308PEEL-JM	M	E									●						–	12.7	3.97	1.4	0.8	
Medium–Heavy Cutting	**JH** Breaker 	**SOMT12T308PEER-JH**	M	E	●	●	●	●	●	●	●	●	●	●					–	12.7	3.97	1.4	0.8	
Heavy Interrupted Cutting	**FT** Breaker 	**SOMT12T320PEER-FT**	M	E		●	●				●	●	●						–	12.7	3.97	0.5	2.0	
For Aluminium Alloy	**JP** Breaker 	**SOGT12T308PEFR-JP**	G	F													●		–	12.7	3.97	1.4	0.8	
Wiper		**WOEW12T308PEER8C**	E	E														●	13.2	–	3.97	8	0.8	
		WOEW12T308PETR8C	E	T												●			13.2	–	3.97	8	0.8	

INSTRUCTIONS FOR USING INSERTS

■ Instructions for use of the JP breaker

- The JP breaker has sharp cutting edges. Wear gloves when handling.
- When machining aluminium 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.
- The peripheral cutting edge of the wiper insert is located further back than general inserts. Beware of wear of the insert just behind the wiper insert.
- When using wiper set the following standard conditions. Depth of Cut (ap)≤0.5mm, Feed per Tooth (fz)≤0.2mm/t

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Finish—Light Cutting		Light—Rough Cutting		Medium—Heavy Cutting	
					Feed per Tooth (mm/t)	Breaker	Feed per Tooth (mm/t)	Breaker	Feed per Tooth (mm/t)	Breaker
P	Mild Steel	≤180HB	**F7030**	280 (210—350)	0.18 (0.08—0.28)	**JL**	0.20 (0.10—0.30)	**JM**	0.25 (0.10—0.35)	**JH**
			MP6120 VP15TF	250 (200—300)	0.18 (0.08—0.28)	**JL**	0.20 (0.10—0.30)	**JM**	0.25 (0.10—0.35)	**JH FT**
			MP6130	240 (190—290)	0.18 (0.08—0.28)	**JL**	0.20 (0.10—0.30)	**JM**	0.25 (0.10—0.35)	**JH**
			VP30RT	230 (180—280)	0.18 (0.08—0.28)	**JL**	0.20 (0.10—0.30)	**JM**	0.25 (0.10—0.35)	**JH**
			NX4545	180 (130—230)	0.15 (0.07—0.23)	**JL**	0.18 (0.10—0.28)	**JM**	—	—
	Carbon Steel Alloy Steel	180—280HB	**F7030**	250 (200—300)	0.15 (0.07—0.23)	**JL**	0.18 (0.10—0.28)	**JM**	0.20 (0.10—0.30)	**JH**
			MP6120 VP15TF	220 (170—270)	0.15 (0.07—0.23)	**JL**	0.18 (0.10—0.28)	**JM**	0.20 (0.10—0.30)	**JH FT**
			MP6130	180 (150—230)	0.15 (0.07—0.23)	**JL**	0.18 (0.10—0.28)	**JM**	0.20 (0.10—0.30)	**JH**
			VP30RT	150 (120—180)	0.15 (0.07—0.23)	**JL**	0.18 (0.10—0.28)	**JM**	0.20 (0.10—0.30)	**JH**
			NX4545	150 (120—180)	0.13 (0.06—0.20)	**JL**	0.15 (0.10—0.25)	**JM**	—	—
		280—350HB	**F7030**	180 (130—230)	0.13 (0.06—0.20)	**JL**	0.15 (0.10—0.25)	**JM**	0.18 (0.10—0.28)	**JH**
			MP6120 VP15TF	140 (100—180)	0.13 (0.06—0.20)	**JL**	0.15 (0.10—0.25)	**JM**	0.18 (0.10—0.28)	**JH FT**
			MP6130	120 (90—150)	0.13 (0.06—0.20)	**JL**	0.15 (0.10—0.25)	**JM**	0.18 (0.10—0.28)	**JH**
			VP30RT	100 (80—160)	0.13 (0.06—0.20)	**JL**	0.15 (0.10—0.25)	**JM**	0.18 (0.10—0.28)	**JH**
			NX4545	100 (80—160)	0.10 (0.05—0.15)	**JL**	0.13 (0.10—0.20)	**JM**	—	—
M	Stainless Steel	≤270HB	**MP7130 VP15TF**	220 (170—270)	0.15 (0.07—0.23)	**JL**	0.18 (0.10—0.28)	**JM**	0.20 (0.10—0.30)	**JH FT**
			MP7140 VP30RT	200 (150—250)	0.15 (0.07—0.23)	**JL**	0.18 (0.10—0.28)	**JM**	0.20 (0.10—0.30)	**JH**
			NX4545	150 (120—180)	0.15 (0.07—0.23)	**JL**	0.18 (0.10—0.28)	**JM**	—	—
K	Cast Iron Ductile Cast Iron	Tensile Strength ≤450MPa	**MC5020**	200 (150—250)	—	—	0.20 (0.10—0.30)	**JM**	0.25 (0.10—0.35)	**JH FT**
			VP15TF	180 (130—230)	0.18 (0.10—0.28)	**JL**	0.20 (0.10—0.30)	**JM**	0.25 (0.10—0.35)	**JH FT**
N	Aluminium Alloy	—	**HTi10**	650 (300—1000)	0.15 (0.10—0.20)	**JP**	0.20 (0.10—0.30)	**JP**	0.30 (0.20—0.40)	**JP**
S	Titanium Alloy	—	**MP9120 VP15TF**	50 (40—60)	0.12 (0.05—0.20)	**JL**	0.15 (0.05—0.20)	**JM**	0.18 (0.10—0.28)	**JH FT**
			MP9130	45 (30—55)	0.10 (0.05—0.20)	**JL**	0.15 (0.05—0.20)	**JM**	0.18 (0.10—0.28)	**JH FT**
	Heat Resistant Alloy (Inconel etc.)	—	**MP9120 VP15TF**	40 (20—50)	0.12 (0.05—0.20)	**JL**	0.15 (0.05—0.20)	**JM**	0.18 (0.10—0.28)	**JH FT**
			MP9130	35 (15—45)	0.10 (0.05—0.20)	**JL**	0.15 (0.05—0.20)	**JM**	0.18 (0.10—0.28)	**JH FT**
H	Hardened Steel	40—55HRC	**VP15TF**	80 (60—100)	0.08 (0.04—0.13)	**JL**	0.10 (0.05—0.15)	**JM**	0.12 (0.07—0.17)	**JH FT**

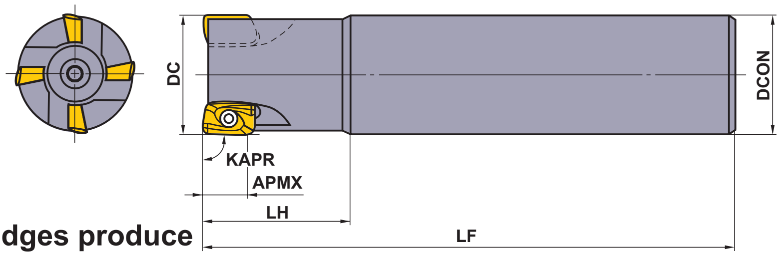
●Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
●Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

SHOULDER MILLING

90° KAPR

BAP300

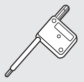
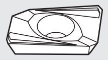
P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel



- 11° positive insert.
- Inserts with wiper edges produce optimal finished surface.
- Multi insert design for high feed machining.

SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock	Number of Teeth	Dimensions(mm)					 *		
		R		DC	LF	DCON	LH	APMX	Clamp Screw	Wrench	Insert
Standard	**BAP300R101S16**	▲	1	10	85	16	25	9	TS25	TKY08F	APG/MT1135PD○R-○○
	BAP300R121S16	▲	1	12	85	16	25	9	TS25	TKY08F	
	BAP300R141S16	▲	1	14	85	16	25	9	TS25	TKY08F	
	BAP300R162S16	▲	2	16	85	16	25	9	TS25	TKY08F	
	BAP300R182S16	▲	2	18	85	16	25	9	TS25	TKY08F	
	BAP300R203S20	▲	3	20	100	20	30	9	TS25	TKY08F	
	BAP300R223S20	▲	3	22	100	20	30	9	TS25	TKY08F	
	BAP300R254S25	▲	4	25	115	25	35	9	TS25	TKY08F	
	BAP300R284S25	▲	4	28	115	25	35	9	TS25	TKY08F	
	BAP300R304S32	▲	4	30	125	32	45	9	TS25	TKY08F	
	BAP300R325S32	▲	5	32	125	32	45	9	TS25	TKY08F	
	BAP300R406S32	▲	6	40	125	32	45	9	TS25	TKY08F	
	BAP300R507S32	▲	7	50	125	32	45	9	TS25	TKY08F	
	BAP300R638S32	▲	8	63	125	32	45	9	TS25	TKY08F	
Long	**BAP300R202LS20**	▲	2	20	150	20	60	9	TS25	TKY08F	APG/MT1135PD○R-○○
	BAP300R253LS25	▲	3	25	170	25	70	9	TS25	TKY08F	
	BAP300R323LS32	▲	3	32	190	32	90	9	TS25	TKY08F	
	BAP300R403LS32	▲	3	40	190	32	90	9	TS25	TKY08F	

* Clamp Torque (N • m) : TS25=1.0

Scan here for product NEWS ▶

● : Inventory maintained in Japan. **▲ : Inventory maintained in Japan. To be replaced by new products.**

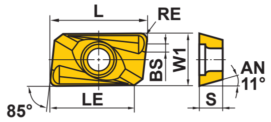
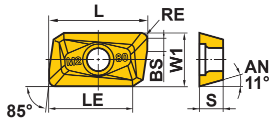
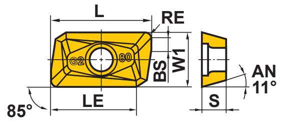
(Contains 10 pieces per case.)

INSERTS

Workpiece Material			F7030	VP15TF			NX2525	NX4545	HTi10	
Workpiece Material	P	Steel	◐	◐			●	◐		
	M	Stainless Steel	◐	◐			●	◐		
	K	Cast Iron		✣			●		◐	
	N	Non-ferrous Metal							◐	
	S	Heat resistant Alloy, Titanium Alloy		◐					◐	
	H	Hardened Steel		◐						

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Edge Preparation :
E : Round F : Sharp

Shape	Order Number	Class	Edge Preparation	Coated				Cermet		Carbide		Dimensions(mm)						Geometry
				F7030	VP15TF			NX2525	NX4545	HTi10		L	LE	W1	S	BS	RE	
	**APMT1135PDER-H1**	M	E	●	●			●	●	●		11.25	9	6.35	3.5	1.5	0.4	
	APMT1135PDER-H2	M	E	●	●			●	●	●		11.25	9	6.35	3.5	1.2	0.8	
	APMT1135PDER-H3	M	E	●								11.26	9	6.35	3.5	0.8	1.2	
	APMT1135PDER-H4	M	E	●								11.24	9	6.35	3.5	0.4	1.6	
	APMT1135PDER-H6	M	E	●								11.10	9	6.35	3.5	0.4	2.4	
	**APMT1135PDER-M0**	M	E	●								11.25	9	6.35	3.5	1.8	0.2	
	APMT1135PDER-M1	M	E	●								11.25	9	6.35	3.5	1.5	0.4	
	APMT1135PDER-M2	M	E	●	●				●			11.18	9	6.35	3.5	1.2	0.8	
	**APGT1135PDFR-G2**	G	F							●		11.3	9.7	6.35	3.5	1.2	0.8	

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

RECOMMENDED CUTTING CONDITIONS

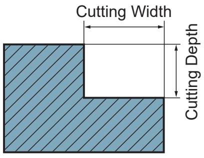
	Workpiece Material	Hardness	Grade	Breaker	Cutting Mode	Cutting Speed (m/min)	Feed per Tooth (mm/t)
P	Mild Steel	≦180HB	**NX4545**	**H**	Finish Cutting	160 (120―180)	0.1 (0.05―0.15)
			F7030	**M**	General Cutting	180 (150―200)	0.15 (0.1―0.2)
	Carbon Steel Alloy Steel	180―280HB	**NX4545**	**H**	Finish Cutting	120 (100―160)	0.08 (0.05―0.1)
			F7030	**M**	General Cutting	150 (120―200)	0.15 (0.1―0.2)
			F7030	**H**	Unstable Cutting	120 (100―160)	0.15 (0.1―0.2)
		280―350HB	**NX4545**	**H**	Finish Cutting	100 (80―120)	0.08 (0.05―0.1)
			F7030	**M**	General Cutting	140 (120―160)	0.15 (0.1―0.2)
			F7030	**H**	Unstable Cutting	100 (80―120)	0.2 (0.1―0.25)
M	Stainless Steel	≦200HB	**F7030**	**M**	General Cutting	140 (120―160)	0.15 (0.1―0.2)
			F7030	**H**	Unstable Cutting	120 (80―140)	0.2 (0.1―0.25)
K	Gray Cast Iron	Tensile Strength ≦350MPa	**VP15TF**	**M**	General Cutting	140 (120―160)	0.15 (0.1―0.2)
			HTi10	**H**	General Cutting	120 (100―140)	0.2 (0.1―0.25)
	Ductile Cast Iron (≦JIS FCD450)	Tensile Strength ≦450MPa	**VP15TF**	**M**	General Cutting	120 (100―140)	0.15 (0.1―0.2)
			HTi10	**H**	General Cutting	100 (80―120)	0.2 (0.1―0.25)
	Ductile Cast Iron (≧JIS FCD500)	Tensile Strength 500―800MPa	**VP15TF**	**M**	General Cutting	100 (80―120)	0.1 (0.05―0.15)
			HTi10	**H**	General Cutting	80 (60―100)	0.15 (0.1―0.2)
N	Aluminium Alloy	―	**HTi10**	**G**	General Cutting	500 (200―1000)	0.2 (0.1―0.3)
S	Ti Alloy	≧350HB	**HTi10**	**G**	General Cutting	40 (30―60)	0.2 (0.1―0.3)
	Heat Resistant Alloy	―	**F7030**	**M**	General Cutting	30 (20―40)	0.15 (0.1―0.2)
H	Hardened Steel	≧40HRC	**VP15TF**	**M**	General Cutting	70 (50―100)	0.1 (0.05―0.15)

●Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
●Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

CUTTING PERFORMANCE

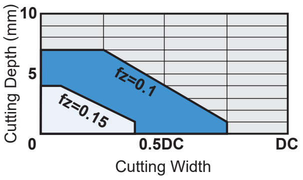
Cemented carbide/Coated carbide

Shoulder Milling

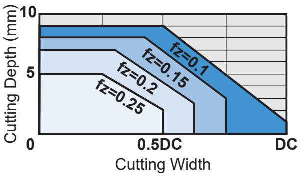


Workpiece : **JIS S50C**
Grade : **F7030**

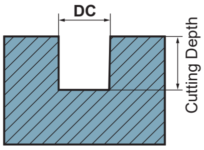
●ϕ10−ϕ14



●ϕ16−ϕ100

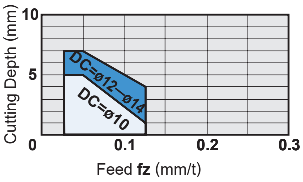


Slot Milling

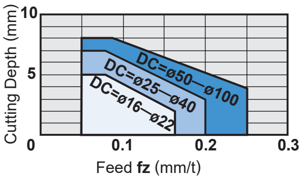


Workpiece : **JIS S50C**
Grade : **F7030**

●ϕ10−ϕ14

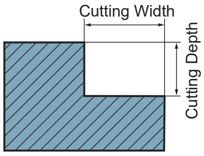


●ϕ16−ϕ100



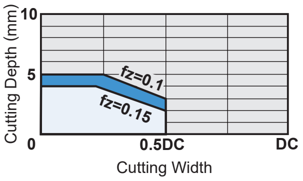
Cermet

Shoulder Milling

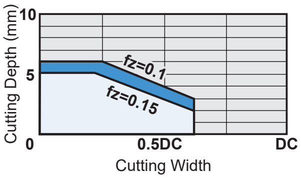


Workpiece : **JIS S50C**
Grade : **NX2525**

●ϕ10−ϕ14



●ϕ16−ϕ100



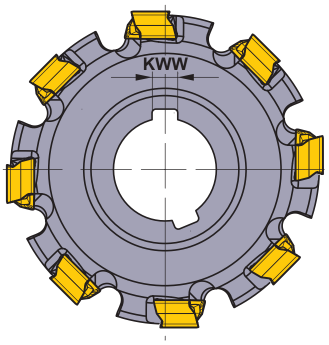
Note 1) The cutting capacity in the table is set for carbon steel (S50C). In case of alloy steel, etc., lower the cutting conditions by 20%—30%.
Note 2) In the case of deep slot milling, an air blower should be used.
Note 3) The diameter "DC" is taken from the tools peripheral cutting edge.

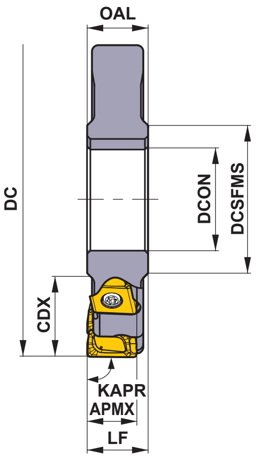
SIDE CUTTER

VAS300 NEW

Table Regarding Special Designs

P Steel | M | **K** Cast Iron | N | S | H

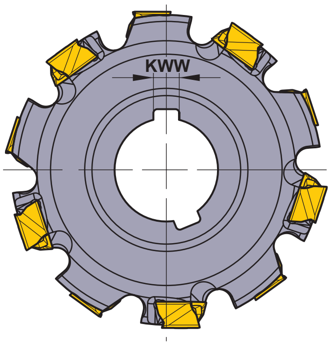


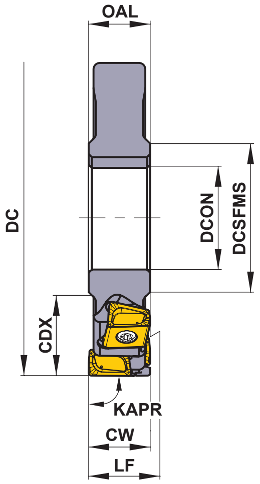


Max. Cutting Diameter **DC** : ø300mm
Max. Depth of Cut **APMX** : 8.6mm

HALF SIDE

DC (mm)	Effective No. of Teeth	Dimensions (mm)						Insert Type
		LF	**CDX**	**DCON**	**DCSFMS**	**OAL**	**KWW**	
80	8	≥12	20.0	27	40	≥12	7	LNGU09
100	10	≥12	27.0	32	46	≥12	8	LNGU09
125	12	≥12	35.0	40	55	≥12	10	LNGU09
160	14	≥12	52.5	40	55	≥12	10	LNGU09





Largest Width **CW** : 17.2mm
Max. Cutting Diameter **DC** : ø300mm

FULL SIDE

DC (mm)	Effective No. of Teeth	Total No. of Teeth	Dimensions (mm)							Insert Type
			LF	**CW**	**CDX**	**DCON**	**DCSFMS**	**OAL**	**KWW**	
80	4	8	≥12	12 – 17.2	20.0	27	40	≥12	7	LNGU09
100	5	10	≥12	12 – 17.2	27.0	32	46	≥12	8	LNGU09
125	6	12	≥12	12 – 17.2	35.0	40	55	≥12	10	LNGU09
160	7	14	≥12	12 – 17.2	52.5	40	55	≥12	10	LNGU09

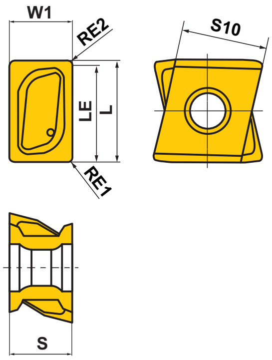
Note 1) Please contact us for details of any geometry of half sides and full sides.

Scan here for product NEWS ▶

INSERTS

Workpiece Material			VP15TF		
	P	Steel	●		
	K	Cast Iron	✣		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
Edge Preparation :
E : Round

Shape	Order Number	Hand	Class	Edge Preparation	Coated			Dimensions (mm)							Geometry
					VP15TF			**L**	**LE**	**S**	**S10**	**RE1**	**RE2**	**W1**	
Low Resistance Type **M** Breaker 	**LNGU090604PNER-M**	R	G	E	●			9.0	8.6	6.0	8.5	0.4	0.4	6.0	
	LNGU090604PNEL-M	L	G	E	●			9.0	8.6	6.0	8.5	0.4	0.4	6.0	
	LNGU090608PNER-M	R	G	E	●			9.0	8.6	6.0	8.5	0.8	0.4	6.0	
	LNGU090608PNEL-M	L	G	E	●			9.0	8.6	6.0	8.5	0.8	0.4	6.0	
	LNGU090612PNER-M	R	G	E	●			9.0	8.6	6.0	8.5	1.2	0.4	6.0	
	LNGU090612PNEL-M	L	G	E	●			9.0	8.6	6.0	8.5	1.2	0.4	6.0	
	LNGU090616PNER-M	R	G	E	●			9.0	8.6	6.0	8.5	1.6	0.4	6.0	
	LNGU090616PNEL-M	L	G	E	●			9.0	8.6	6.0	8.5	1.6	0.4	6.0	
	LNGU090620PNER-M	R	G	E	●			9.0	8.6	6.0	8.5	2.0	0.4	6.0	
	LNGU090620PNEL-M	L	G	E	●			9.0	8.6	6.0	8.5	2.0	0.4	6.0	
	LNGU090624PNER-M	R	G	E	●			9.0	8.6	6.0	8.5	2.4	0.4	6.0	
	LNGU090624PNEL-M	L	G	E	●			9.0	8.6	6.0	8.5	2.4	0.4	6.0	
	LNGU090630PNER-M	R	G	E	●			9.0	8.6	6.0	8.5	3.0	0.4	6.0	
	LNGU090630PNEL-M	L	G	E	●			9.0	8.6	6.0	8.5	3.0	0.4	6.0	
	LNGU090640PNER-M	R	G	E	●			9.0	8.6	6.0	8.5	4.0	0.4	6.0	
	LNGU090640PNEL-M	L	G	E	●			9.0	8.6	6.0	8.5	4.0	0.4	6.0	Right hand insert shown.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

ISO13399 ➤ **L003**
SPARE PARTS ➤ **L132**
CUTTING CONDITIONS ➤ **L133**
TECHNICAL DATA ➤ **Q001**

SIDE CUTTER

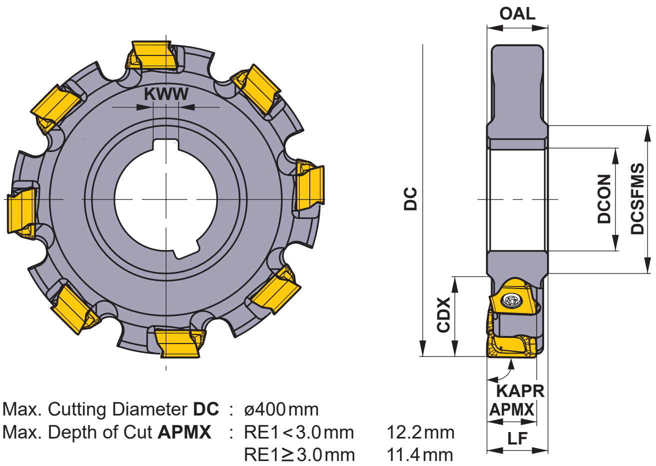
90° KAPR

VAS400

Table Regarding Special Designs

P Steel

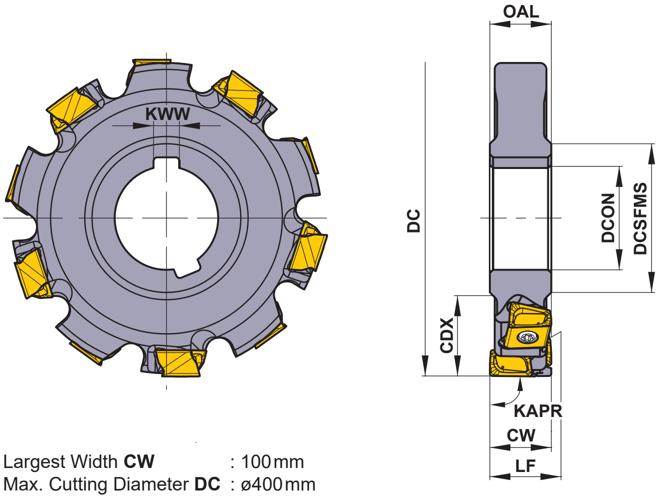
K Cast Iron



Max. Cutting Diameter **DC** : ø400mm
Max. Depth of Cut **APMX** : RE1<3.0mm 12.2mm
RE1≥3.0mm 11.4mm

HALF SIDE

DC (mm)	Effective No. of Teeth	Dimensions (mm)						Insert Type
		LF	CDX	DCON	DCSFMS	OAL	KWW	
80	8	≥17	20.0	27	40	≥17	7	LNGU13
100	10	≥17	27.0	32	46	≥17	8	LNGU13
125	12	≥17	35.0	40	55	≥17	10	LNGU13
160	14	≥17	52.5	40	55	≥17	10	LNGU13



Largest Width **CW** : 100mm
Max. Cutting Diameter **DC** : ø400mm

FULL SIDE

DC (mm)	Effective No. of Teeth	Total No. of Teeth	Dimensions (mm)							Insert Type
			LF *1	CW *2	CDX	DCON	DCSFMS	OAL	KWW	
80	4	8	≥17	18 – 24	20.0	27	40	≥17	7	LNGU13
100	5	10	≥17	18 – 24	27.0	32	46	≥17	8	LNGU13
125	6	12	≥17	18 – 24	35.0	40	55	≥17	10	LNGU13
160	7	14	≥17	18 – 24	52.5	40	55	≥17	10	LNGU13

*1 In case of adjustment piece specification. LF : ≥24

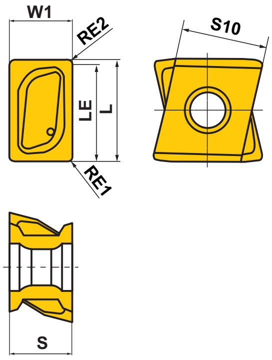
*2 CW of RE1<3.0mm is 24mm, and RE1≥3.0mm is 22.8mm. If these values are exceeded, multilevel designs can be used. Multilevel designs are available for CW of each size.

Note 1) Please contact us for details of any geometry of half sides and full sides.

INSERTS

Workpiece Material			MP6120	VP15TF	
	P	Steel	◐	●	
	K	Cast Iron		✤	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting
Edge Preparation :
E : Round

Shape	Order Number	Hand	Class	Edge Preparation	Coated MP6120	 VP15TF		Dimensions (mm) L	 LE	 S	 S10	 RE1	 RE2	 W1	Geometry
Low Resistance Type **M** Breaker 	**LNGU130804PNER-M**	R	G	E		●		13.0	12.2	8.0	11.0	0.4	0.8	8.0	
	LNGU130804PNEL-M	L	G	E		●		13.0	12.2	8.0	11.0	0.4	0.8	8.0	
	LNGU130808PNER-M	R	G	E		●		13.0	12.2	8.0	11.0	0.8	0.8	8.0	
	LNGU130808PNEL-M	L	G	E		●		13.0	12.2	8.0	11.0	0.8	0.8	8.0	
	LNGU130812PNER-M	R	G	E		●		13.0	12.2	8.0	11.0	1.2	0.8	8.0	
	LNGU130812PNEL-M	L	G	E		●		13.0	12.2	8.0	11.0	1.2	0.8	8.0	
	LNGU130816PNER-M	R	G	E		●		13.0	12.2	8.0	11.0	1.6	0.8	8.0	
	LNGU130816PNEL-M	L	G	E		●		13.0	12.2	8.0	11.0	1.6	0.8	8.0	
	LNGU130820PNER-M	R	G	E		●		13.0	12.2	8.0	11.0	2.0	0.8	8.0	
	LNGU130820PNEL-M	L	G	E		●		13.0	12.2	8.0	11.0	2.0	0.8	8.0	
	LNGU130824PNER-M	R	G	E		●		13.0	12.2	8.0	11.0	2.4	0.8	8.0	
	LNGU130824PNEL-M	L	G	E		●		13.0	12.2	8.0	11.0	2.4	0.8	8.0	
	LNGU130830PNER-M	R	G	E		●		13.0	11.4	8.0	11.0	3.0	1.6	8.0	
	LNGU130830PNEL-M	L	G	E		●		13.0	11.4	8.0	11.0	3.0	1.6	8.0	
	LNGU130840PNER-M	R	G	E		●		13.0	11.4	8.0	11.0	4.0	1.6	8.0	
	LNGU130840PNEL-M	L	G	E		●		13.0	11.4	8.0	11.0	4.0	1.6	8.0	
	LNGU130850PNER-M	R	G	E		●		13.0	11.4	8.0	11.0	5.0	1.6	8.0	
	LNGU130850PNEL-M	L	G	E		●		13.0	11.4	8.0	11.0	5.0	1.6	8.0	
Strong Cutting Edge Type **R** Breaker 	**LNGU130804PNER-R**	R	G	E	●	●		13.0	12.2	8.0	11.0	0.4	0.8	8.0	
	LNGU130804PNEL-R	L	G	E	●	●		13.0	12.2	8.0	11.0	0.4	0.8	8.0	
	LNGU130808PNER-R	R	G	E	●	●		13.0	12.2	8.0	11.0	0.8	0.8	8.0	
	LNGU130808PNEL-R	L	G	E	●	●		13.0	12.2	8.0	11.0	0.8	0.8	8.0	
	LNGU130812PNER-R	R	G	E	●	●		13.0	12.2	8.0	11.0	1.2	0.8	8.0	
	LNGU130812PNEL-R	L	G	E	●	●		13.0	12.2	8.0	11.0	1.2	0.8	8.0	
	LNGU130816PNER-R	R	G	E	●	●		13.0	12.2	8.0	11.0	1.6	0.8	8.0	
	LNGU130816PNEL-R	L	G	E	●	●		13.0	12.2	8.0	11.0	1.6	0.8	8.0	
	LNGU130820PNER-R	R	G	E	●	●		13.0	12.2	8.0	11.0	2.0	0.8	8.0	
	LNGU130820PNEL-R	L	G	E	●	●		13.0	12.2	8.0	11.0	2.0	0.8	8.0	
	LNGU130824PNER-R	R	G	E	●	●		13.0	12.2	8.0	11.0	2.4	0.8	8.0	
	LNGU130824PNEL-R	L	G	E	●	●		13.0	12.2	8.0	11.0	2.4	0.8	8.0	
	LNGU130830PNER-R	R	G	E	●	●		13.0	11.4	8.0	11.0	3.0	1.6	8.0	
	LNGU130830PNEL-R	L	G	E	●	●		13.0	11.4	8.0	11.0	3.0	1.6	8.0	
	LNGU130840PNER-R	R	G	E	●	●		13.0	11.4	8.0	11.0	4.0	1.6	8.0	
	LNGU130840PNEL-R	L	G	E	●	●		13.0	11.4	8.0	11.0	4.0	1.6	8.0	
	LNGU130850PNER-R	R	G	E	●	●		13.0	11.4	8.0	11.0	5.0	1.6	8.0	
	LNGU130850PNEL-R	L	G	E	●	●		13.0	11.4	8.0	11.0	5.0	1.6	8.0	Right hand insert shown.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

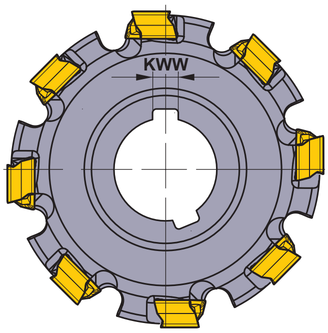
ISO13399 ➤ L003
SPARE PARTS ➤ L132
CUTTING CONDITIONS ➤ L133
TECHNICAL DATA ➤ Q001

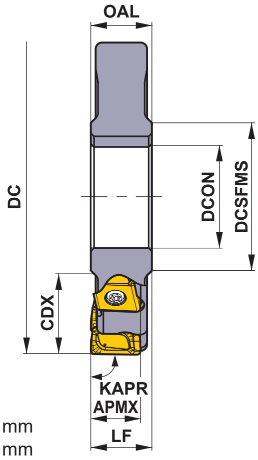
SIDE CUTTER

VAS500

Table Regarding Special Designs

P	M	K	N	S	H
Steel		Cast Iron			



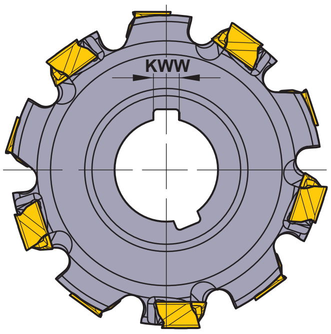


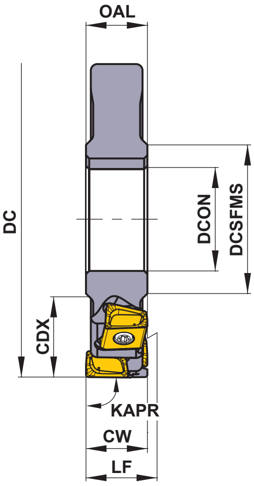
Max. Cutting Diameter **DC** : ø660mm
Max. Depth of Cut **APMX** : RE1<3.0mm 16.2mm
RE1≥3.0mm 15.4mm

HALF SIDE

DC (mm)	Effective No. of Teeth	Dimensions(mm)						Insert Type
		LF *	CDX	DCON	DCSFMS	OAL	KWW	
100	8	≥23	27.0	32	46	≥23	8	LNGU17
125	10	≥23	35.0	40	55	≥23	10	LNGU17
160	12	≥23	52.5	40	55	≥23	10	LNGU17
200	16	≥23	65.0	50	70	≥23	12	LNGU17

* In case of adjustment piece specification. **LF** : ≥29





Largest Width **CW** : 100mm
Max. Cutting Diameter **DC** : ø660mm

FULL SIDE

DC (mm)	Effective No. of Teeth	Total No. of Teeth	Dimensions(mm)							Insert Type
			LF *1	CW *2	CDX	DCON	DCSFMS	OAL	KWW	
100	4	8	≥23	23－32	27.0	32	46	≥23	8	LNGU17
125	5	10	≥23	23－32	35.0	40	55	≥23	10	LNGU17
160	6	12	≥23	23－32	52.5	40	55	≥23	10	LNGU17
200	8	16	≥23	23－32	65.0	50	70	≥23	12	LNGU17

*1 In case of adjustment piece specification. **LF** : ≥29

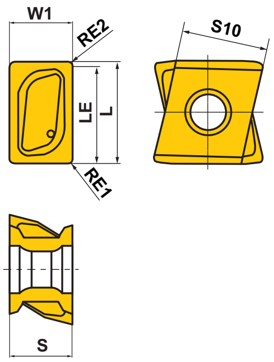
*2 CW of RE1<3.0mm is 32mm, and RE1≥3.0mm is 30.8mm. If these values are exceeded, multilevel designs can be used. Multilevel designs are available for CW of each size.

Note 1) Please contact us for details of any geometry of half sides and full sides.

INSERTS

Workpiece Material			MP6120	VP15TF
	P	Steel	◐	◐
	K	Cast Iron		◐

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting
Edge Preparation :
E : Round

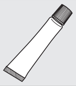
Shape	Order Number	Hand	Class	Edge Preparation	Coated		Dimensions (mm)							Geometry
					MP6120	**VP15TF**	**L**	**LE**	**S**	**S10**	**RE1**	**RE2**	**W1**	
Strong Cutting Edge Type **R** Breaker 	**LNGU171004PNER-R**	R	G	E	●	●	17.0	16.2	10.0	13.0	0.4	0.8	10.0	
	LNGU171004PNEL-R	L	G	E	●	●	17.0	16.2	10.0	13.0	0.4	0.8	10.0	
	LNGU171008PNER-R	R	G	E	●	●	17.0	16.2	10.0	13.0	0.8	0.8	10.0	
	LNGU171008PNEL-R	L	G	E	●	●	17.0	16.2	10.0	13.0	0.8	0.8	10.0	
	LNGU171012PNER-R	R	G	E	●	●	17.0	16.2	10.0	13.0	1.2	0.8	10.0	
	LNGU171012PNEL-R	L	G	E	●	●	17.0	16.2	10.0	13.0	1.2	0.8	10.0	
	LNGU171016PNER-R	R	G	E	●	●	17.0	16.2	10.0	13.0	1.6	0.8	10.0	
	LNGU171016PNEL-R	L	G	E	●	●	17.0	16.2	10.0	13.0	1.6	0.8	10.0	
	LNGU171020PNER-R	R	G	E	●	●	17.0	16.2	10.0	13.0	2.0	0.8	10.0	
	LNGU171020PNEL-R	L	G	E	●	●	17.0	16.2	10.0	13.0	2.0	0.8	10.0	
	LNGU171024PNER-R	R	G	E	●	●	17.0	16.2	10.0	13.0	2.4	0.8	10.0	
	LNGU171024PNEL-R	L	G	E	●	●	17.0	16.2	10.0	13.0	2.4	0.8	10.0	
	LNGU171030PNER-R	R	G	E	●	●	17.0	15.4	10.0	13.0	3.0	1.6	10.0	
	LNGU171030PNEL-R	L	G	E	●	●	17.0	15.4	10.0	13.0	3.0	1.6	10.0	
	LNGU171040PNER-R	R	G	E	●	●	17.0	15.4	10.0	13.0	4.0	1.6	10.0	
	LNGU171040PNEL-R	L	G	E	●	●	17.0	15.4	10.0	13.0	4.0	1.6	10.0	
	LNGU171050PNER-R	R	G	E	●	●	17.0	15.4	10.0	13.0	5.0	1.6	10.0	
	LNGU171050PNEL-R	L	G	E	●	●	17.0	15.4	10.0	13.0	5.0	1.6	10.0	
	LNGU171060PNER-R	R	G	E	●	●	17.0	15.4	10.0	13.0	6.0	1.6	10.0	
	LNGU171060PNEL-R	L	G	E	●	●	17.0	15.4	10.0	13.0	6.0	1.6	10.0	
	LNGU171070PNER-R	R	G	E	●	●	17.0	15.4	10.0	13.0	7.0	1.6	10.0	
	LNGU171070PNEL-R	L	G	E	●	●	17.0	15.4	10.0	13.0	7.0	1.6	10.0	Right hand insert shown.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

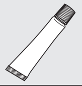
ISO13399 ➤ **L003**
SPARE PARTS ➤ **L132**
CUTTING CONDITIONS ➤ **L133**
TECHNICAL DATA ➤ **Q001**

VAS300/400/500

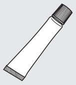
SPARE PARTS

Tool Holder Type	 *		
	Clamp Screw	Wrench	Anti-seize Lubricant
VAS300	TS304	TKY08W	MK1KS

* Clamp Torque (N • m) : TS304=1.5

Tool Holder Type	 *		
	Clamp Screw	Wrench	Anti-seize Lubricant
VAS400	TS406	TKY15T	MK1KS

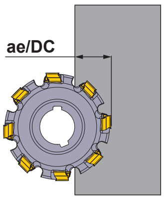
* Clamp Torque (N • m) : TS406=3.5

Tool Holder Type	 *		
	Clamp Screw	Wrench	Anti-seize Lubricant
VAS500	TS53	TKY25T	MK1KS

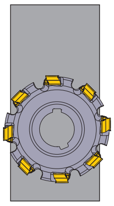
* Clamp Torque (N • m) : TS53=7.5

RECOMMENDED CUTTING CONDITIONS (DRY CUTTING)

Shoulder Milling

Workpiece Material		Properties	Insert Grade	vc (m/min)	ap (mm)	ae/DC	fz (mm/t)	Cutting Mode
P	Mild Steels	Hardness ≤180HB	MP6120 VP15TF	150 (130—180)	≤APMX	<10%	0.10 (0.08—0.15)	
				150 (130—180)	≤APMX	<30%	0.10 (0.08—0.15)	
				150 (130—180)	≤APMX	≤50%	0.10 (0.08—0.15)	
	Carbon Steels Alloy Steels	Hardness 180—280HB	MP6120 VP15TF	150 (130—180)	≤2.0	≤50%	0.12 (0.08—0.20)	
				150 (130—180)	≤4.0	<10%	0.12 (0.08—0.20)	
				150 (130—180)	≤4.0	≤50%	0.10 (0.08—0.15)	
				150 (130—180)	≤APMX	<10%	0.10 (0.08—0.15)	
				150 (130—180)	≤APMX	≤50%	0.10 (0.08—0.12)	
K	Gray Cast Irons	Tensile Strength ≤350MPa	VP15TF	150 (130—180)	≤2.0	≤50%	0.12 (0.08—0.20)	
				150 (130—180)	≤4.0	<10%	0.12 (0.08—0.20)	
				150 (130—180)	≤4.0	≤50%	0.10 (0.08—0.15)	
				150 (130—180)	≤APMX	<10%	0.10 (0.08—0.15)	
				150 (130—180)	≤APMX	≤50%	0.10 (0.08—0.12)	
	Gray Cast Irons	Tensile Strength ≤450MPa	VP15TF	130 (110—160)	≤2.0	≤50%	0.12 (0.08—0.20)	
				130 (110—160)	≤4.0	<10%	0.12 (0.08—0.20)	
				130 (110—160)	≤4.0	≤50%	0.10 (0.08—0.15)	
				130 (110—160)	≤APMX	<10%	0.10 (0.08—0.15)	
				130 (110—160)	≤APMX	≤50%	0.10 (0.08—0.12)	
	Gray Cast Irons	Tensile Strength ≤800MPa	VP15TF	130 (110—160)	≤2.0	≤50%	0.12 (0.08—0.20)	
				130 (110—160)	≤4.0	<10%	0.12 (0.08—0.20)	
				130 (110—160)	≤4.0	≤50%	0.10 (0.08—0.15)	
				130 (110—160)	≤APMX	<10%	0.10 (0.08—0.15)	
				130 (110—160)	≤APMX	≤50%	0.10 (0.08—0.12)	

Face Milling (Centre Cutting)

Workpiece Material		Properties	Insert Grade	vc (m/min)	ap (mm)	fz (mm/t)	Cutting Mode
P	Mild Steels	Hardness ≤180HB	MP6120 VP15TF	150 (130—180)	≤APMX	0.10 (0.08—0.15)	
	Carbon Steels Alloy Steels	Hardness 180—280HB	MP6120 VP15TF	150 (130—180)	≤2.0	0.12 (0.08—0.20)	
				150 (130—180)	≤4.0	0.10 (0.08—0.15)	
				150 (130—180)	≤APMX	0.10 (0.08—0.12)	
K	Gray Cast Irons	Tensile Strength ≤350MPa	VP15TF	150 (130—180)	≤2.0	0.12 (0.08—0.20)	
				150 (130—180)	≤4.0	0.10 (0.08—0.15)	
				150 (130—180)	≤APMX	0.10 (0.08—0.12)	
	Gray Cast Irons	Tensile Strength ≤450MPa	VP15TF	150 (130—180)	≤2.0	0.12 (0.08—0.20)	
				150 (130—180)	≤4.0	0.10 (0.08—0.15)	
				150 (130—180)	≤APMX	0.10 (0.08—0.12)	
	Gray Cast Irons	Tensile Strength ≤800MPa	VP15TF	130 (110—160)	≤2.0	0.12 (0.08—0.20)	
				130 (110—160)	≤4.0	0.10 (0.08—0.15)	
				130 (110—160)	≤APMX	0.10 (0.08—0.12)	

SIDE CUTTER

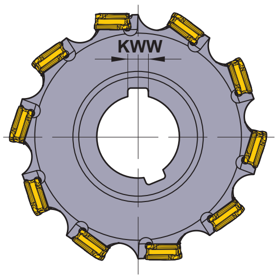
90° KAPR

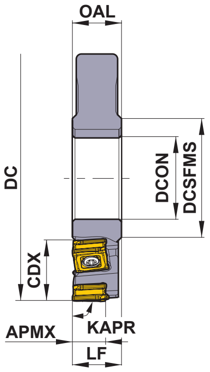
VOS400

Table Regarding Special Designs

P M **K** N S H

Cast Iron

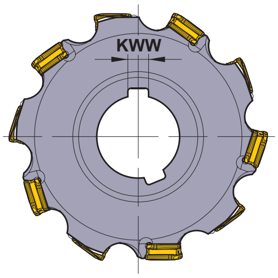


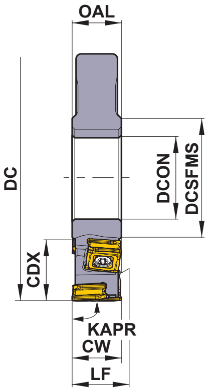


HALF SIDE

Max. Cutting Diameter **DC** : ø400 mm

DC (mm)	Effective No. of Teeth	Dimensions (mm)						APMX (mm)
		LF	CDX	DCON	DCSFMS	OAL	KWW	
80	8	≥16	20.0	27	40	≥16.8	7	10.0
100	10	≥16	27.0	32	46	≥16.8	8	10.0
125	12	≥16	35.0	40	55	≥16.8	10	10.0
160	14	≥16	52.5	40	55	≥16.8	10	10.0





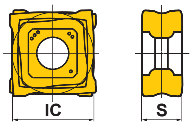
FULL SIDE

Largest Width **CW** : 100 mm
Max. Cutting Diameter **DC** : ø400 mm

DC (mm)	Effective No. of Teeth	Total No. of Teeth	Dimensions (mm)						
			LF	CW	CDX	DCON	DCSFMS	OAL	KWW
80	4	8	≥16	16 – 20	20.0	27	40	≥16	7
100	5	10	≥16	16 – 20	27.0	32	46	≥16	8
125	6	12	≥16	16 – 20	35.0	40	55	≥16	10
160	7	14	≥16	16 – 20	52.5	40	55	≥16	10

Note 1) Multilevel designs available for CW over 20mm.
Note 2) Please contact us for details of any geometry of half sides and full sides.

INSERTS

Shape	Order Number	Hand	Class	Edge Preparation	Coated		Dimensions (mm)		Geometry
					VP15TF		IC	S	
	**SONX1206PER**	R	N	E	●		12.7	6.3	 IC S Right hand insert shown.
	SONX1206PEL	L	N	E	●		12.7	6.3	

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

Scan here for product NEWS ▶

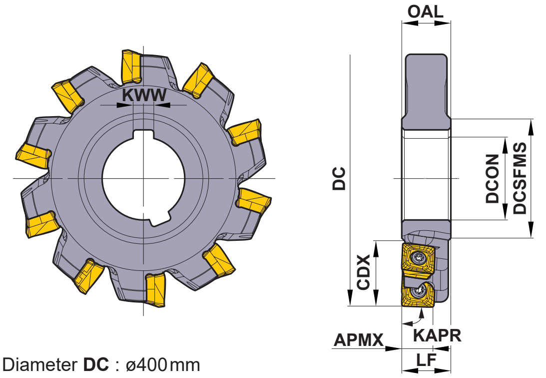
SIDE CUTTER

90° KAPR

ASX400

Table Regarding Special Designs

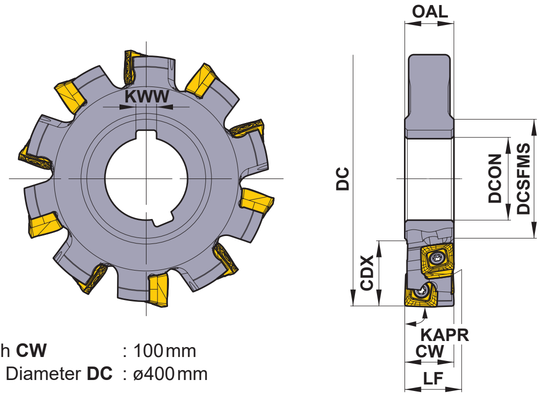
P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			



Max. Cutting Diameter **DC** : ø400mm

HALF SIDE

DC (mm)	Effective No. of Teeth	Dimensions (mm)						APMX (mm)
		LF	**CDX**	**DCON**	**DCSFMS**	**OAL**	**KWW**	
80	8	≥16	20.0	27	40	≥16.8	7	10.0
100	10	≥16	27.0	32	46	≥16.8	8	10.0
125	12	≥16	35.0	40	55	≥16.8	10	10.0
160	14	≥16	52.5	40	55	≥16.8	10	10.0



Largest Width **CW** : 100mm
Max. Cutting Diameter **DC** : ø400mm

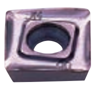
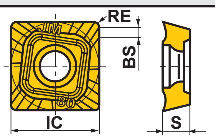
FULL SIDE

DC (mm)	Effective No. of Teeth	Total No. of Teeth	Dimensions (mm)						
			LF	**CW**	**CDX**	**DCON**	**DCSFMS**	**OAL**	**KWW**
80	4	8	≥16	16 – 20	20.0	27	40	≥16	7
100	5	10	≥16	16 – 20	27.0	32	46	≥16	8
125	6	12	≥16	16 – 20	35.0	40	55	≥16	10
160	7	14	≥16	16 – 20	52.5	40	55	≥16	10

Note 1) Multilevel designs available for CW over 20mm.

Note 2) Please contact us for details of any geometry of half sides and full sides.

INSERTS

Shape	Order Number	Hand	Class	Edge Preparation	Coated		Dimensions (mm)				Geometry
					VP15TF		**IC**	**S**	**BS**	**RE**	
	**SOMT12T308PEER-JM**	R	M	E	●		12.7	3.97	1.4	0.8	
	SOMT12T308PEEL-JM	L	M	E	●		12.7	3.97	1.4	0.8	

Right hand insert shown.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

Scan here for product NEWS ▶

ISO13399 ➤ **L003**
TECHNICAL DATA ➤ **Q001**

MULTI-FUNCTIONAL MILLING

90°
KAPR

APX3000

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel

- High accuracy, high-quality vertical wall.
- Low cutting force insert.

Fig.1

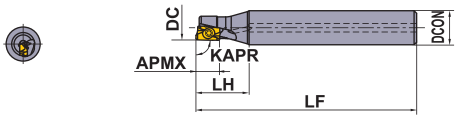


Fig.2

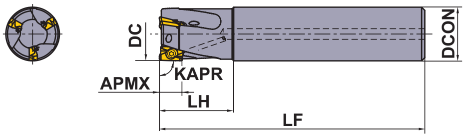
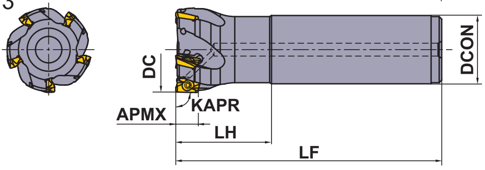


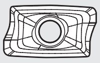
Fig.3



Right hand tool holder only.

SHANK TYPE

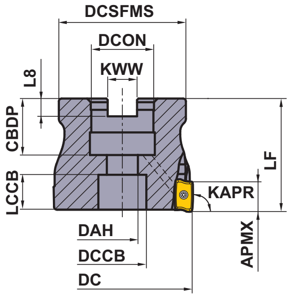
With Coolant Hole

DC (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)			WT (kg)	APMX (mm)	RMPX	RPMX (min^{-1})	Fig.	
		R		DCON	LF	LH						Insert Type
12	**APX3000R121SA16SA**	●	1	16	85	25	0.10	10	6.0°	10500	1	AO◌T12
14	**APX3000R141SA16SA**	●	1	16	85	25	0.11	10	6.0°	9000	1	AO◌T12
16	**APX3000R162SA16SA**	●	2	16	85	25	0.11	10	11.3°	20900	2	AO◌T12
18	**APX3000R182SA16SA**	●	2	16	85	25	0.11	10	8.6°	19600	3	AO◌T12
18	**APX3000R182SA16LA**	●	2	16	120	25	0.16	10	8.6°	19600	3	AO◌T12
18	**APX3000R182SA16ELA**	●	2	16	180	25	0.25	10	8.6°	19600	3	AO◌T12
20	**APX3000R202SA20SA**	●	2	20	100	30	0.21	10	6.9°	18500	2	AO◌T12
20	**APX3000R203SA20SA**	●	3	20	100	30	0.21	10	6.9°	18500	2	AO◌T12
20	**APX3000R202SA20LA**	●	2	20	150	60	0.32	10	6.9°	18500	2	AO◌T12
20	**APX3000R202SA20ELA**	●	2	20	200	70	0.42	10	6.9°	18500	2	AO◌T12
22	**APX3000R223SA20SA**	●	3	20	115	30	0.25	10	5.7°	17600	3	AO◌T12
22	**APX3000R222SA20LA**	●	2	20	150	30	0.34	10	5.7°	17600	3	AO◌T12
22	**APX3000R222SA20ELA**	●	2	20	200	30	0.45	10	5.7°	17600	3	AO◌T12
25	**APX3000R252SA25SA**	●	2	25	115	35	0.38	10	4.6°	16400	2	AO◌T12
25	**APX3000R253SA25SA**	●	3	25	115	35	0.38	10	4.6°	16400	2	AO◌T12
25	**APX3000R254SA25SA**	●	4	25	115	35	0.38	10	4.6°	16400	2	AO◌T12
25	**APX3000R252SA25LA**	●	2	25	170	70	0.51	10	4.6°	16400	2	AO◌T12
25	**APX3000R253SA25LA**	●	3	25	170	70	0.51	10	4.6°	16400	2	AO◌T12
25	**APX3000R252SA25ELA**	●	2	25	220	80	0.75	10	4.6°	16400	2	AO◌T12
25	**APX3000R253SA25ELA**	●	3	25	220	80	0.75	10	4.6°	16400	2	AO◌T12
28	**APX3000R284SA25SA**	●	4	25	115	35	0.40	10	3.8°	15500	3	AO◌T12
28	**APX3000R282SA25LA**	●	2	25	170	35	0.61	10	3.8°	15500	3	AO◌T12
28	**APX3000R283SA25LA**	●	3	25	170	35	0.61	10	3.8°	15500	3	AO◌T12
28	**APX3000R282SA25ELA**	●	2	25	220	35	0.80	10	3.8°	15500	3	AO◌T12
28	**APX3000R283SA25ELA**	●	3	25	220	35	0.79	10	3.8°	15500	3	AO◌T12
30	**APX3000R304SA32SA**	●	4	32	125	45	0.64	10	3.4°	14900	2	AO◌T12
32	**APX3000R323SA32SA**	●	3	32	125	45	0.68	10	3.1°	14400	2	AO◌T12
32	**APX3000R324SA32SA**	●	4	32	125	45	0.67	10	3.1°	14400	2	AO◌T12
32	**APX3000R325SA32SA**	●	5	32	125	45	0.68	10	3.1°	14400	2	AO◌T12
32	**APX3000R322SA32LA**	●	2	32	190	90	1.07	10	3.1°	14400	2	AO◌T12
32	**APX3000R323SA32LA**	●	3	32	190	90	1.05	10	3.1°	14400	2	AO◌T12
32	**APX3000R322SA32ELA**	●	2	32	260	100	1.47	10	3.1°	14400	2	AO◌T12
32	**APX3000R323SA32ELA**	●	3	32	260	100	1.45	10	3.1°	14400	2	AO◌T12
35	**APX3000R352SA32LA**	●	2	32	190	45	1.12	10	2.7°	13700	3	AO◌T12
35	**APX3000R353SA32LA**	●	3	32	190	45	1.11	10	2.7°	13700	3	AO◌T12
35	**APX3000R352SA32ELA**	●	2	32	260	45	1.53	10	2.7°	13700	3	AO◌T12
35	**APX3000R353SA32ELA**	●	3	32	260	45	1.52	10	2.7°	13700	3	AO◌T12
40	**APX3000R403SA32SA**	●	3	32	125	45	0.75	10	2.2°	12800	3	AO◌T12
40	**APX3000R405SA32SA**	●	5	32	125	45	0.75	10	2.2°	12800	3	AO◌T12
40	**APX3000R406SA32SA**	●	6	32	125	45	0.76	10	2.2°	12800	3	AO◌T12
50	**APX3000R507SA32SA**	●	7	32	125	45	0.90	10	1.7°	11300	3	AO◌T12
63	**APX3000R638SA32SA**	●	8	32	125	45	1.04	10	1.3°	10000	3	AO◌T12

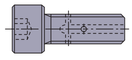
Note 1) When using inserts with corner radius RE≥2.4mm, machining of the holder is required as shown on page L139.
Note 2) The maximum spindle speeds RPMX are set to ensure tool and insert stability.
Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

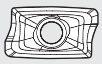


Right hand tool holder only.

DC (mm)	Set Bolt	Geometry
32, 40	HSC08030H	 With Coolant Hole
50, 63	HSC10030H	
80	HSC12035H	
100	HSC16040H	

■ARBOR TYPE

With Coolant Hole

DC (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)		WT (kg)	APMX (mm)	RMPX	RPMX (min⁻¹)	
		R		LF	DCON					Insert Type
32	**APX3000-032A05RA**	●	5	40	16	0.2	10	3.1°	14400	AO◌T12
40	**APX3000-040A06RA**	●	6	40	16	0.3	10	2.2°	12800	AO◌T12
50	**APX3000-050A07RA**	●	7	40	22	0.4	10	1.7°	11300	AO◌T12
63	**APX3000-063A08RA**	●	8	40	22	0.7	10	1.3°	10000	AO◌T12
80	**APX3000R08009CA**	●	9	50	25.4	1.3	10	1.0°	8800	AO◌T12
80	**APX3000-080A09RA**	●	9	50	27	1.3	10	1.0°	8800	AO◌T12
100	**APX3000R10011DA**	●	11	63	31.75	2.2	10	0.8°	7800	AO◌T12
100	**APX3000-100A11RA**	●	11	63	32	2.2	10	0.8°	7800	AO◌T12

Note 1) When using inserts with corner radius RE≥2.4mm, machining of the holder is required as shown on page L139.

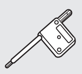
Note 2) The maximum spindle speeds RPMX are set to ensure tool and insert stability.

Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

Mounting Dimensions

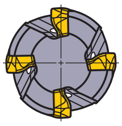
DC (mm)	Order Number	Dimensions(mm)							
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
32	**APX3000-032A05RA**	16	18	9	14	10.22	30	8.4	5.6
40	**APX3000-040A06RA**	16	18	9	14	10.35	34	8.4	5.6
50	**APX3000-050A07RA**	22	20	11	17	12.35	45	10.4	6.3
63	**APX3000-063A08RA**	22	20	11	17	12.35	55	10.4	6.3
80	**APX3000R08009CA**	25.4	26	13	20	15.35	70	9.5	6
80	**APX3000-080A09RA**	27	23	13	20	16.35	70	12.4	7
100	**APX3000R10011DA**	31.75	32	17	26	20.35	80	12.7	8
100	**APX3000-100A11RA**	32	26	17	26	26.35	80	14.4	8

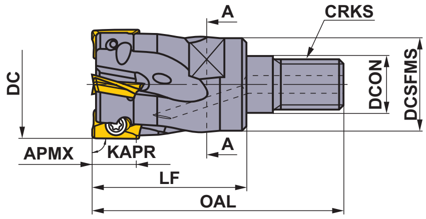
SPARE PARTS

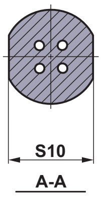
DC (mm)	Tool Holder Type	DC (mm)	Tool Holder Type	 * Clamp Screw	 Wrench	 Anti-seize Lubricant
12	**APX3000R12**	14	**APX3000R14**	TPS25	TIP07F	MK1KS
16	**APX3000R16**	18	**APX3000R18**	TPS25	TIP07F	MK1KS
20	**APX3000R20**			TPS25	TIP07F	MK1KS
22	**APX3000R22**	25	**APX3000R25**	TPS25-1	TIP07F	MK1KS
28	**APX3000R28**	30	**APX3000R30**	TPS25-1	TIP07F	MK1KS
32	**APX3000R32**	32	**APX3000-032**	TPS25-1	TIP07F	MK1KS
35	**APX3000R35**			TPS25-1	TIP07F	MK1KS
40	**APX3000R40**	40	**APX3000-040**	TPS25-1	TIP07F	MK1KS
50	**APX3000R50**	50	**APX3000-050**	TPS25-1	TIP07F	MK1KS
63	**APX3000R63**	63	**APX3000-063**	TPS25-1	TIP07F	MK1KS
80	**APX3000R080**	80	**APX3000-080**	TPS25-1	TIP07F	MK1KS
100	**APX3000R100**	100	**APX3000-100**	TPS25-1	TIP07F	MK1KS

* Clamp Torque (N • m) : TPS25 = 1.0, TPS25-1 = 1.0

SPARE PARTS ➤ **P001**
ISO13399 ➤ **L003**
TECHNICAL DATA ➤ **Q001**



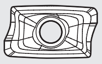




■SCREW-IN TYPE

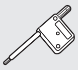
Right hand tool holder only.

With Coolant Hole

DC (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)						WT (kg)	APMX (mm)	RMPX	
		R		DCON	DCSFMS	OAL	LF	S10	CRKS				Insert Type
16	**APX3000R162M08A30**	●	2	8.5	13	48	30	10	M8	0.1	10	11.3°	AO◌T12
18	**APX3000R182M08A30**	●	2	8.5	13	48	30	10	M8	0.1	10	8.6°	AO◌T12
20	**APX3000R203M10A30**	●	3	10.5	18	49	30	14	M10	0.1	10	6.9°	AO◌T12
22	**APX3000R223M10A30**	●	3	10.5	18	49	30	14	M10	0.1	10	5.7°	AO◌T12
25	**APX3000R254M12A35**	●	4	12.5	21	57	35	19	M12	0.2	10	4.6°	AO◌T12
28	**APX3000R284M12A35**	●	4	12.5	21	57	35	19	M12	0.2	10	3.8°	AO◌T12
30	**APX3000R304M16A40**	●	4	17	29	63	40	24	M16	0.3	10	3.4°	AO◌T12
32	**APX3000R325M16A40**	●	5	17	29	63	40	24	M16	0.3	10	3.1°	AO◌T12
35	**APX3000R355M16A40**	●	5	17	29	63	40	24	M16	0.3	10	2.7°	AO◌T12
40	**APX3000R406M16A40**	●	6	17	29	63	40	24	M16	0.3	10	2.2°	AO◌T12

Note 1) When using inserts with corner radius RE≥2.4mm, machining of the holder is required as shown on page L139.
Note 2) For screw-in type arbors, refer to page L341.

SPARE PARTS

DC	Tool Holder Type	 *		
		Clamp Screw	Wrench	Anti-seize Lubricant
16	**APX3000R16**	TPS25	TIP07F	MK1KS
18	**APX3000R18**	TPS25	TIP07F	MK1KS
20	**APX3000R20**	TPS25	TIP07F	MK1KS
22	**APX3000R22**	TPS25-1	TIP07F	MK1KS
25	**APX3000R25**	TPS25-1	TIP07F	MK1KS
28	**APX3000R28**	TPS25-1	TIP07F	MK1KS
30	**APX3000R30**	TPS25-1	TIP07F	MK1KS
32	**APX3000R32**	TPS25-1	TIP07F	MK1KS
35	**APX3000R35**	TPS25-1	TIP07F	MK1KS
40	**APX3000R40**	TPS25-1	TIP07F	MK1KS

* Clamp Torque (N • m) : TPS25 = 1.0, TPS25-1 = 1.0

■CAUTION FOR USE

- ●Only use the inserts and parts provided by Mitsubishi Materials with this tool.
- ●Clamp the inserts at a specified torque of only.
- ●The maximum spindle speeds **RPMX** are shown in Table 1. Ensure that the cutter operates under the maximum spindle speed.
  The maximum spindle speeds **RPMX** for safety purposes are determined in accordance with ISO15641
  (Milling Cutters for high-speed machining–Safety requirements).

Table 1 Max. Spindle Speed RPMX

Cutting Edge Diameter **DC** (mm)	ø12	ø14	ø16	ø18	ø20	ø22	ø25	ø28	ø30
Max. Spindle Speed **RPMX**(min-1)	–	–	19500	17000	15000	14000	12000	11000	10000

Cutting Edge Diameter **DC** (mm)	ø32	ø35	ø40	ø50	ø63	ø80	ø100	ø125	ø160
Max. Spindle Speed **RPMX**(min-1)	9500	9000	7500	6000	5000	3500	3000	2500	1500

●It is recommended that flank wear does not exceed 0.3mm.

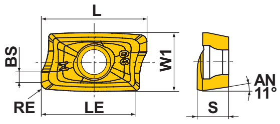
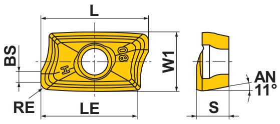
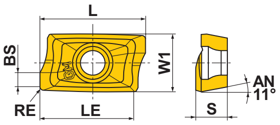
● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Edge Preparation :
E : Round F : Sharp

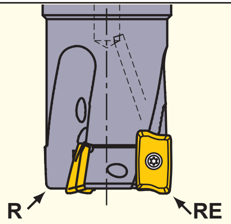
Workpiece Material			MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	VP20RT	TF15	
Workpiece Material	P	Steels		◐	✤				◐	◐		
	M	Stainless Steels				◐			◐	◐		
	K	Cast Irons	◐						✤	✤		
	N	Non-ferrous Metals					◐				◐	
	S	Heat Resistant Alloys, Titanium Alloys					◐	✤	◐			
	H	Hardened Steels							◐			

Shape	Order Number	Class	Edge Preparation	Coated								Carbide		Dimensions (mm)						Geometry
				MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	VP20RT	TF15		L	LE	W1	S	BS	* RE	
General **M** Breaker 	**AOMT123602PEER-M**	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	1.8	0.2	
	AOMT123604PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	1.6	0.4	
	AOMT123608PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	1.2	0.8	
	AOMT123610PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	1.0	1.0	
	AOMT123612PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	0.8	1.2	
	AOMT123616PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	0.4	1.6	
	AOMT123620PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	0.4	2.0	
	AOMT123624PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	0.4	2.4	
	AOMT123630PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	0.4	3.0	
	AOMT123632PEER-M	M	E		●	●	●	●	●	●	●			12	10	6.6	3.6	0.4	3.2	
Strong Cutting Edge Type **H** Breaker 	**AOMT123604PEER-H**	M	E	●	●	●	●	●	●	●	●			12	10	6.6	3.6	1.6	0.4	
	AOMT123608PEER-H	M	E	●	●	●	●	●	●	●	●			12	10	6.6	3.6	1.2	0.8	
	AOMT123616PEER-H	M	E	●	●	●	●	●	●	●	●			12	10	6.6	3.6	0.4	1.6	
For Machining of Aluminium Alloys **GM** Breaker 	**AOGT123602PEFR-GM**	G	F									●		12	10	6.6	3.6	1.8	0.2	
	AOGT123604PEFR-GM	G	F									●		12	10	6.6	3.6	1.6	0.4	
	AOGT123608PEFR-GM	G	F									●		12	10	6.6	3.6	1.2	0.8	

* Please note that the corner radius RE is different from the workpiece material of R shape depending on the axial rake angle of the body.
For more information, please contact our toll-free number or one of our sales offices.

Precautions when using larger corner R (RE) inserts with the APX3000

When using inserts with corner radius RE≥R2.4mm, please machine the holder with a radius form as shown on the table to the right.



RE (mm)	**R** (mm)
2.4	1.9
3.0	2.5
3.2	2.7

R : Holder End Radius
RE : Insert Corner Radius

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED

	Workpiece Material	Characteristics	Insert				ae (mm)			
			Grade Priority		Breaker		≤0.25DC	0.25—0.5DC	0.5—0.75DC	DC (Slot)
			1st	2nd			vc (m/min)			
P	Mild Steel	≤180HB	MP6120	VP15TF	M	H	230(180—270)	220(170—260)	180(140—210)	180(140—210)
			MP6130	VP20RT	M	H	200(150—240)	190(140—230)	150(110—180)	150(110—180)
	Carbon Steel Alloy Steel	180—350HB	MP6120	VP15TF	M	H	180(140—210)	170(130—200)	140(110—160)	140(110—160)
			MP6130	VP20RT	M	H	150(110—180)	140(100—170)	110(80—130)	110(80—130)
M	Stainless Steel	≤270HB	MP7130	VP20RT	M	H	180(140—210)	170(130—200)	140(110—160)	140(110—160)
K	Gray Cast Iron	≤350MPa	MC5020	VP15TF	H	—	250(200—300)	240(190—290)	210(160—260)	140(110—160)
	Ductile Cast Iron	≤800MPa	MC5020	VP15TF	H	—	130(100—150)	120(90—140)	100(80—120)	100(80—120)
N	Aluminium Alloy	—	TF15	MP9120	GM	M	500(200—1000)	500(200—1000)	500(200—1000)	500(200—1000)
S	Titanium Alloy	≤350HB	MP9120	VP15TF	M	H	50(40—70)	—	—	50(40—70)
			MP9130	VP20RT	M	H	40(30—60)	—	—	40(30—60)
	Heat resistant Alloy	—	MP9120	VP15TF	M	H	40(30—60)	—	—	40(30—60)
			MP9130	VP20RT	M	H	30(20—40)	—	—	30(20—40)
H	Hardened Steel	40—55HRC	VP15TF	—	H	—	90(70—100)	85(60—100)	70(50—80)	70(50—80)

DEPTH OF CUT AND FEED

	Workpiece Material	Characteristics	ae (mm)	DC					
				ø12—ø16		ø18—ø25		ø28—ø100	
				Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)
P	Mild Steel Carbon Steel Alloy Steel	≤180HB 180—350HB	≤0.25DC	≤4	0.15	≤5	0.25	≤5	0.20
				4—7	0.10	5—7	0.20	5—7	0.15
				—	—	7—8.5	0.15	7—8.5	0.10
				—	—	8.5—10	0.10	8.5—10	0.07
			0.25—0.5DC	≤2	0.15	≤3	0.25	≤3	0.20
				2—5	0.10	3—5.5	0.20	3—5.5	0.15
				—	—	5.5—8	0.15	5.5—8	0.10
				—	—	8—10	0.10	8—10	0.07
			0.5—0.75DC	≤4	0.10	≤4	0.15	≤3	0.10
				—	—	4—10	0.10	3—7	0.07
			DC (Slot)	≤3	0.10	≤4	0.10	≤3	0.10
						4—7	0.07	3—5	0.07
M	Stainless Steel	≤270HB	≤0.25DC	≤4	0.15	≤5	0.20	≤5	0.20
				4—7	0.10	5—7	0.15	5—7	0.15
				—	—	7—8.5	0.10	7—8.5	0.10
				—	—	8.5—10	0.07	8.5—10	0.07
			0.25—0.5DC	≤2	0.15	≤3	0.20	≤3	0.20
				2—5	0.10	3—5.5	0.15	3—5.5	0.15
				—	—	5.5—8	0.10	5.5—8	0.10
				—	—	8—10	0.07	8—10	0.07
			0.5—0.75DC	≤4	0.10	≤4	0.10	≤3	0.10
				—	—	4—10	0.07	3—7	0.07
			DC (Slot)	≤3	0.10	≤4	0.10	≤3	0.10
						4—7	0.07	3—5	0.07
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤0.25DC	≤4	0.15	≤5	0.25	≤5	0.20
				4—7	0.10	5—7	0.20	5—7	0.15
				—	—	7—8.5	0.15	7—8.5	0.10
				—	—	8.5—10	0.10	8.5—10	0.07
			0.25—0.5DC	≤2	0.15	≤3	0.25	≤3	0.20
				2—5	0.10	3—5.5	0.20	3—5.5	0.15
				—	—	5.5—8	0.15	5.5—8	0.10
				—	—	8—10	0.10	8—10	0.07
			0.5—0.75DC	≤4	0.10	≤4	0.15	≤3	0.10
				—	—	4—10	0.10	3—7	0.07
			DC (Slot)	≤3	0.10	≤4	0.10	≤3	0.10
						4—7	0.07	3—5	0.07
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤0.25DC	≤4	0.10	≤5	0.20	≤5	0.20
				4—7	0.07	5—7	0.15	5—7	0.15
				—	—	7—8.5	0.10	7—8.5	0.10
				—	—	8.5—10	0.07	8.5—10	0.07
			0.25—0.5DC	≤2	0.10	≤3	0.20	≤3	0.20
				2—5	0.07	3—5.5	0.15	3—5.5	0.15
				—	—	5.5—8	0.10	5.5—8	0.10
				—	—	8—10	0.07	8—10	0.07
			0.5—0.75DC	≤4	0.07	≤4	0.10	≤3	0.10
				—	—	4—10	0.07	3—7	0.07
			DC (Slot)	≤3	0.07	≤4	0.10	≤3	0.10
						4—7	0.07	3—5	0.07

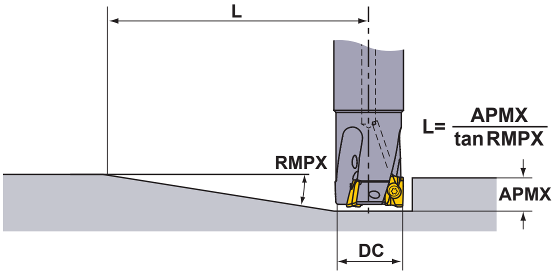
	Workpiece Material	Characteristics	ae (mm)	DC					
				ø12—ø16		ø18—ø25		ø28—ø100	
				Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t)	Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t)	Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t)
N	Aluminium Alloy	—	≤0.25DC	≤4	0.15	≤4	0.25	≤4	0.20
				4—7	0.10	4—7	0.15	4—7	0.10
			0.25—0.5DC	≤4	0.15	≤4	0.20	≤4	0.20
				4—7	0.10	4—7	0.10	4—7	0.10
			0.5—0.75DC	≤5	0.10	≤5	0.15	≤5	0.10
			DC (Slot)	≤5	0.10	≤5	0.20	≤5	0.15
S	Titanium Alloy	≤350HB	≤0.25DC	≤4	0.15	≤4	0.15	≤4	0.10
				4—7	0.10	4—7	0.10	4—7	0.07
			0.25—0.5DC	≤3	0.05	≤3	0.05	≤3	0.05
	Heat resistant Alloy	—	0.5—0.75DC	≤2	0.10	≤2	0.05	≤2	0.05
			DC (Slot)	≤1	0.05	≤1	0.05	≤1	0.05
H	Hardened Steel	40—55HRC	≤0.25DC	≤4	0.10	≤5	0.15	≤5	0.15
				4—7	0.07	5—7	0.10	5—7	0.10
				—	—	7—8.5	0.07	—	—
			0.25—0.5DC	≤2	0.10	≤3	0.15	≤3	0.15
				2—5	0.07	3—5.5	0.10	—	—
			0.5—0.75DC	≤4	0.07	≤4	0.07	≤3	0.07
			DC (Slot)	≤3	0.07	≤4	0.07	≤3	0.07

Note 1) These cutting conditions are a guide to the standard shank type and the arbor type.
Please make adjustments according to the machining conditions.
Note 2) Vibration is liable to occur in certain cases. Please reduce the depth of cut and / or reduce cutting conditions in the following cases.
- When using the long shank type and extra long shank type.
- When using long tool overhang with the standard or arbor type.
- When the application has poor clamping rigidity or when using a low rigidity machine.

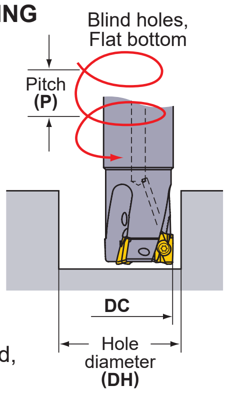
Note 3) In case of coarse and fine pitch cutters, the coarse pitch type is recommended to prevent vibration.
Note 4) For heavy interrupted and unstable cutting, the H breaker is first recommendation.

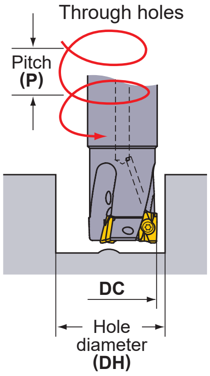
RAMPING/HELICAL CUTTING

● RAMPING



● HELICAL CUTTING





Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

Cutting Edge Diameter **DC**(mm)	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
	Maximum Ramping Angle **RMPX**	Minimum Distance⋆1 **L**(mm)	Maximum Hole Diameter⋆2 **DH max.**(mm)	Maximum Pitch **P max.**(mm)	Minimum Hole Diameter **DH min.**(mm)	Maximum Pitch **P max.**(mm)	Minimum Hole Diameter **DH min.**(mm)	Maximum Pitch **P max.**(mm)
12	6.0°	95	22	2.5	20.5	2	14	0.5
14	6.0°	95	26	2.5	24.5	2	18	1
16	11.3°	50	30	9	28	7	21	2
18	8.6°	66	34	5	32	4.5	25	2
20	6.9°	83	38	5	36	4.5	29	2
22	5.7°	100	42	5	40	4.5	33	2
25	4.6°	124	48	6	46	5	39	3
28	3.8°	151	54	4.5	52	4	45	2
30	3.4°	168	58	4.5	56	4	49	2
32	3.1°	185	62	4.5	60	4	53	2
35	2.7°	212	68	4	66	3.5	59	2
40	2.2°	260	78	4	76	3.5	69	2
50	1.7°	337	98	2	96	2	89	2
63	1.3°	441	124	2	122	2	115	2
80	1.0°	573	158	2	156	2	149	2
100	0.8°	716	198	1	196	1	189	1

Note 1) When machining highly ductile materials with ramping angles above, chips can become long.
In this case, decrease the ramping angle or feed per tooth.
⋆1 L (=10 / tan RMPX). Cutters' moving distance until depth of cut reaches 10mm at a maximum ramping angle.
⋆2 In case corner radius of 0.8mm. Find other sizes with the formula below.
{(cutting edge diameter DC)—(corner radius)—0.2)}×2

DEEP SHOULDER MILLING

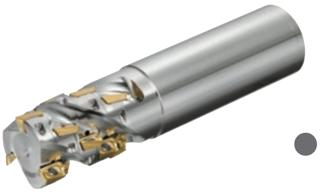
90° KAPR

R

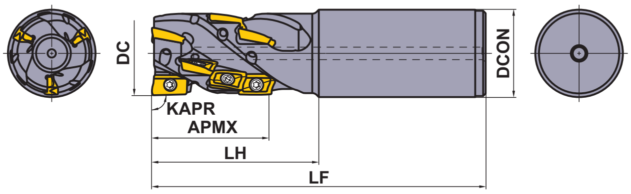
APX3000

LONG CUTTING EDGE

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	

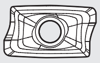


- High accuracy, high-quality vertical wall.
- Low cutting force insert.



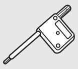
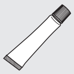
Right hand tool holder only.

SHANK TYPE

DC (mm)	Order Number	Stock	Coolant Hole	Number of Flutes	Total	Dimensions(mm)			WT (kg)	APMX (mm)	
		R				DCON	LF	LH			Insert Type
20	**APX3KR2004SN20S028A**	●	–	1	4	20	125	45	0.27	28	AO⬚T12
25	**APX3KR2506SA25S028A**	●	○	2	6	25	125	45	0.40	28	AO⬚T12
25	**APX3KR2508SA25M037A**	●	○	2	8	25	130	50	0.41	37	AO⬚T12
32	**APX3KR3208SA32S037A**	●	○	2	8	32	130	50	0.70	37	AO⬚T12
32	**APX3KR3210SA32M046A**	●	○	2	10	32	140	60	0.74	46	AO⬚T12
32	**APX3KR3212SA32S037A**	●	○	3	12	32	130	50	0.67	37	AO⬚T12
32	**APX3KR3215SA32M046A**	●	○	3	15	32	140	60	0.71	46	AO⬚T12
40	**APX3KR4015SA42S046A**	●	○	3	15	42	140	60	1.24	46	AO⬚T12
40	**APX3KR4018SA42M055A**	●	○	3	18	42	150	70	1.31	55	AO⬚T12

Note 1) When using inserts with corner radius RE≥2.4mm, machining of the holder is required as shown on page L144.
Note 2) Corner radius RE 0.8mm is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Inserts RE 0.2mm and 0.4mm can also be used.

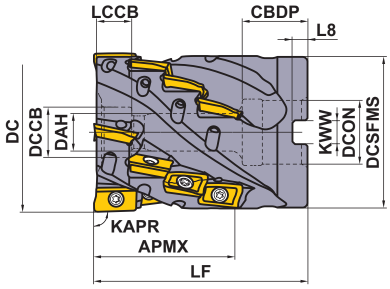
SPARE PARTS

DC (mm)	Tool Holder Type	 *		
		Clamp Screw	Wrench	Anti-seize Lubricant
20	**APX3KR20**	TPS25	TIP07F	MK1KS
25	**APX3KR25**	TPS25-1	TIP07F	MK1KS
32	**APX3KR32**	TPS25-1	TIP07F	MK1KS
40	**APX3KR40**	TPS25-1	TIP07F	MK1KS
40	**APX3K-040**	TPS25-1	TIP07F	MK1KS
50	**APX3K-050**	TPS25-1	TIP07F	MK1KS

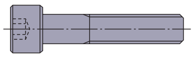
* Clamp Torque (N • m) : TPS25 = 1.0, TPS25-1 = 1.0

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

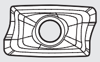


Right hand tool holder only.

DC (mm)	Set Bolt	Geometry
40	HSC08040	
50	HSC10045	

SHELL TYPE

With Coolant Hole

DC (mm)	Order Number	Stock	Number of Flutes	Total	Dimensions(mm)		WT (kg)	APMX (mm)	
		R			LF	DCON			Insert Type
40	**APX3K-040A16A037RA**	●	4	16	50	16	0.25	37	AO◌T12
50	**APX3K-050A20A046RA**	●	4	20	60	22	0.54	46	AO◌T12

Note 1) When using inserts with corner radius RE≥2.4mm, machining of the holder is required as shown on page L144.
Note 2) Corner radius RE 0.8mm is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Inserts RE 0.2mm and 0.4mm can also be used.
Note 3) Coolant can be supplied from the end face of the centering location bore in the arbor. However, it cannot be supplied from the set bolt.

Mounting Dimensions

DC (mm)	Order Number	Dimensions(mm)							
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
40	**APX3K-040A16A037RA**	16	18	9	14	9.9	38.5	8.4	5.6
50	**APX3K-050A20A046RA**	22	20	11	17	11.9	48.4	10.4	6.3

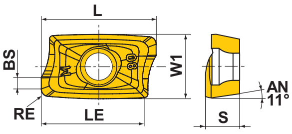
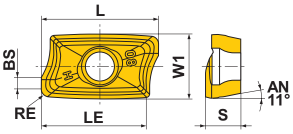
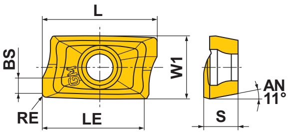
ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

INSERTS

Workpiece Material			MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	VP20RT	TF15	
Workpiece Material	P	Steels		◐	✤				◐	◐		
	M	Stainless Steels				◐			◐	◐		
	K	Cast Irons	◐						✤	✤		
	N	Non-ferrous Metals					◐				◐	
	S	Heat Resistant Alloys, Titanium Alloys					◐	✤	◐	✤		
	H	Hardened Steels							◐			

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

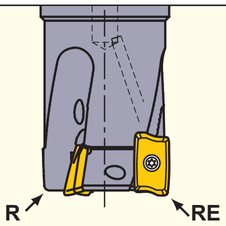
Edge Preparation :
E : Round F : Sharp

Shape	Order Number	Class	Edge Preparation	Coated							Carbide		Dimensions (mm)						Geometry
				MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	VP20RT	TF15	L	LE	W1	S	BS	RE*	
General **M** Breaker 	**AOMT123602PEER-M**	M	E		●	●	●	●	●	●	●		12	10	6.6	3.6	1.8	0.2	
	AOMT123604PEER-M	M	E		●	●	●	●	●	●	●		12	10	6.6	3.6	1.6	0.4	
	AOMT123608PEER-M	M	E		●	●	●	●	●	●	●		12	10	6.6	3.6	1.2	0.8	
	AOMT123610PEER-M	M	E		●	●	●	●	●	●	●		12	10	6.6	3.6	1.0	1.0	
	AOMT123612PEER-M	M	E		●	●	●	●	●	●	●		12	10	6.6	3.6	0.8	1.2	
	AOMT123616PEER-M	M	E		●	●	●	●	●	●	●		12	10	6.6	3.6	0.4	1.6	
	AOMT123620PEER-M	M	E		●	●	●	●	●	●	●		12	10	6.6	3.6	0.4	2.0	
	AOMT123624PEER-M	M	E		●	●	●	●	●	●	●		12	10	6.6	3.6	0.4	2.4	
	AOMT123630PEER-M	M	E		●	●	●	●	●	●	●		12	10	6.6	3.6	0.4	3.0	
	AOMT123632PEER-M	M	E		●	●	●	●	●	●	●		12	10	6.6	3.6	0.4	3.2	
Strong Cutting Edge Type **H** Breaker 	**AOMT123604PEER-H**	M	E	●	●	●	●	●	●	●	●		12	10	6.6	3.6	1.6	0.4	
	AOMT123608PEER-H	M	E	●	●	●	●	●	●	●	●		12	10	6.6	3.6	1.2	0.8	
	AOMT123616PEER-H	M	E	●	●	●	●	●	●	●	●		12	10	6.6	3.6	0.4	1.6	
For Machining of Aluminium Alloys **GM** Breaker 	**AOGT123602PEFR-GM**	G	F									●	12	10	6.6	3.6	1.8	0.2	
	AOGT123604PEFR-GM	G	F									●	12	10	6.6	3.6	1.6	0.4	
	AOGT123608PEFR-GM	G	F									●	12	10	6.6	3.6	1.2	0.8	

* Please note that the corner radius RE is different from the workpiece material of R shape depending on the axial rake angle of the body.
For more information, please contact our toll-free number or one of our sales offices.

Precautions when using larger corner R (RE) inserts with the APX3000

When using inserts with corner radius RE≥R2.4mm, please machine the holder with a radius form as shown on the table to the right.



RE (mm)	**R** (mm)
2.4	1.9
3.0	2.5
3.2	2.7

R : Holder End Radius
RE : Insert Corner Radius

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

RECOMMENDED CUTTING CONDITIONS

Cutting Speed

	Workpiece Material	Insert				ae (mm)		
		Grade Priority		Breaker		≤0.25DC	0.25—0.75DC	DC (Slot)
		1st	2nd			vc (m/min)		
P	Mild Steels	MP6120	VP15TF	M	H	180(140—220)	150(110—180)	120(100—140)
		MP6130	VP20RT	M	H	160(120—200)	130(100—160)	100(80—120)
	Carbon Steels Alloy Steels, Alloy Tool Steels	MP6120	VP15TF	M	H	150(100—200)	120(90—150)	100(80—120)
		MP6130	VP20RT	M	H	130(90—170)	90(70—110)	80(60—100)
	Pre-hardened Steels	MP6120	VP15TF	M	H	120(80—160)	100(70—130)	90(50—120)
		MP6130	VP20RT	M	H	100(70—130)	90(60—120)	70(50—100)
M	Stainless Steels	MP7130	—	M	—	150(120—180)	120(100—140)	100(80—120)
K	Gray Cast Irons	MC5020	—	H	—	200(150—250)	180(150—210)	—
		VP15TF	—	M	H	180(120—240)	150(100—200)	100(60—140)
	Ductile Cast Irons	VP15TF	—	M	H	160(120—200)	140(100—180)	80(60—100)
N	Aluminium Alloys	TF15	MP9120	GM	M	400(200—800)	400(200—800)	400(200—800)
S	Titanium Alloys	MP9130	—	M	—	40(30—60)	—	40(30—60)
		MP9120	—	M	—	50(40—70)	—	50(40—70)
	Heat Resistant Alloys	MP9120	VP15TF	M	H	40(30—60)	—	40(30—60)
		MP9130	VP20RT	M	H	30(20—40)	—	30(20—40)

Depth of Cut / Feed per Tooth

	Workpiece Material	Characteristics	ae (mm)	DC (mm)					
				ø20		ø25		ø32—ø50	
				ap (mm)	**fz** (mm/t)	**ap** (mm)	**fz** (mm/t)	**ap** (mm)	**fz** (mm/t)
P	Mild Steels	≤180HB	≤0.25DC	≤28	0.15	≤37	0.17	≤55	0.2
			0.25-0.75DC	≤28	0.12	≤37	0.15	≤55	0.17
			DC (Slot)	≤18	0.08	≤18	0.08	≤18	0.08
	Carbon Steels Alloy Steels	180—280HB	≤0.25DC	≤28	0.12	≤37	0.15	≤55	0.17
			0.25-0.75DC	≤28	0.1	≤37	0.12	≤55	0.15
			DC (Slot)	≤18	0.08	≤18	0.08	≤18	0.08
	Tool Alloy Steels	≤350HB (Annealing)	≤0.25DC	≤28	0.12	≤37	0.15	≤55	0.17
			0.25-0.75DC	≤28	0.1	≤37	0.12	≤55	0.15
			DC (Slot)	≤18	0.08	≤18	0.08	≤18	0.08
	Pre-hardened Steels	35—45HRC	≤0.25DC	≤28	0.12	≤37	0.15	≤55	0.17
			0.25-0.75DC	≤28	0.1	≤37	0.12	≤55	0.15
			DC (Slot)	≤18	0.08	≤18	0.08	≤18	0.08
M	Ferritic and Martensitic Stainless Steels	—	≤0.25DC	≤28	0.12	≤37	0.15	≤55	0.17
			0.25-0.75DC	≤28	0.1	≤37	0.12	≤55	0.15
			DC (Slot)	≤18	0.08	≤18	0.08	≤18	0.08
	Duplex Stainless Steels	≤280HB	≤0.25DC	≤28	0.12	≤37	0.15	≤55	0.17
			0.25-0.75DC	≤28	0.1	≤37	0.12	≤55	0.15
			DC (Slot)	≤18	0.08	≤18	0.08	≤18	0.08
	Precipitation-Hardening Stainless Steel	<450HB	≤0.25DC	≤28	0.12	≤37	0.15	≤55	0.17
			0.25-0.75DC	≤28	0.1	≤37	0.12	≤55	0.15
			DC (Slot)	≤18	0.08	≤18	0.08	≤18	0.08
K	Gray Cast Irons	Tensile Strength ≤350MPa	≤0.25DC	≤28	0.15	≤37	0.17	≤55	0.2
			0.25-0.75DC	≤28	0.12	≤37	0.15	≤55	0.17
			DC (Slot)	≤18	0.1	≤18	0.1	≤18	0.1
	Ductile Cast Irons	Tensile Strength ≤800MPa	≤0.25DC	≤28	0.12	≤37	0.15	≤55	0.17
			0.25-0.75DC	≤28	0.1	≤37	0.12	≤55	0.15
			DC (Slot)	≤18	0.08	≤18	0.08	≤18	0.08
N	Aluminium Alloys	—	≤0.25DC	≤28	0.15	≤37	0.17	≤55	0.2
			0.25-0.75DC	—	—	≤9	0.17	≤9	0.2
			DC (Slot)	—	—	≤9	0.17	≤9	0.2
S	Titanium Alloys	≤350HB	≤0.25DC	≤28	0.1	≤37	0.1	≤55	0.1
			0.25-0.75DC	—	—	—	—	—	—
			DC (Slot)	≤18	0.06	≤18	0.06	≤18	0.06
	Heat Resistant Alloys	—	≤0.25DC	≤28	0.08	≤37	0.08	≤55	0.08
			0.25-0.75DC	—	—	—	—	—	—
			DC (Slot)	≤18	0.05	≤18	0.05	≤18	0.05

Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece materials, where no vibration occurred. Please adjust machining conditions if the vibration is generated.

MULTI-FUNCTIONAL MILLING

90° KAPR

APX4000

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron		Heat Resistant Alloy	Hardened Steel

- High accuracy, high-quality vertical wall.
- Low cutting force insert.

Fig.1

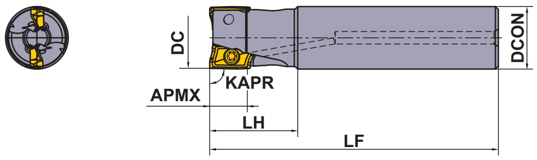
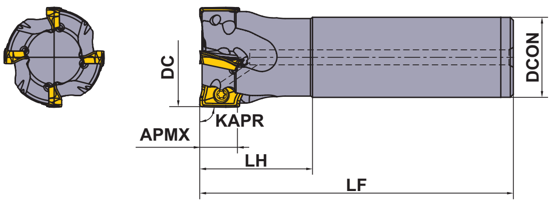


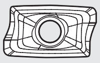
Fig.2



Right hand tool holder only.

SHANK TYPE

With Coolant Hole

DC (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)			WT (kg)	APMX (mm)	RMPX	RPMX (min^{-1})	Fig.	
		R		DCON	LF	LH						Insert Type
25	**APX4000R252SA25SA**	●	2	25	115	35	0.40	15	11.0°	18900	1	AO⬚T18
25	**APX4000R252SA25LA**	●	2	25	170	35	0.61	15	11.0°	18900	1	AO⬚T18
25	**APX4000R252SA25ELA**	●	2	25	220	80	0.76	15	11.0°	18900	1	AO⬚T18
28	**APX4000R282SA25LA**	●	2	25	170	35	0.63	15	9.0°	17700	2	AO⬚T18
28	**APX4000R282SA25ELA**	●	2	25	220	35	0.81	15	9.0°	17700	2	AO⬚T18
32	**APX4000R322SA32SA**	●	2	32	125	45	0.71	15	7.0°	16300	1	AO⬚T18
32	**APX4000R323SA32SA**	●	3	32	125	45	0.71	15	7.0°	16300	1	AO⬚T18
32	**APX4000R322SA32LA**	●	2	32	190	45	1.11	15	7.0°	16300	1	AO⬚T18
32	**APX4000R323SA32LA**	●	3	32	190	45	1.11	15	7.0°	16300	1	AO⬚T18
32	**APX4000R322SA32ELA**	●	2	32	260	100	1.49	15	7.0°	16300	1	AO⬚T18
32	**APX4000R323SA32ELA**	●	3	32	260	100	1.49	15	7.0°	16300	1	AO⬚T18
35	**APX4000R352SA32LA**	●	2	32	190	45	1.14	15	6.0°	15400	2	AO⬚T18
35	**APX4000R353SA32LA**	●	3	32	190	45	1.14	15	6.0°	15400	2	AO⬚T18
35	**APX4000R352SA32ELA**	●	2	32	260	45	1.57	15	6.0°	15400	2	AO⬚T18
35	**APX4000R353SA32ELA**	●	3	32	260	45	1.57	15	6.0°	15400	2	AO⬚T18
40	**APX4000R403SA32SA**	●	3	32	125	45	0.80	15	6.0°	14200	2	AO⬚T18
40	**APX4000R404SA32SA**	●	4	32	125	45	0.80	15	6.0°	14200	2	AO⬚T18
40	**APX4000R402SA32LA**	●	2	32	190	45	1.19	15	6.0°	14200	2	AO⬚T18
40	**APX4000R403SA32LA**	●	3	32	190	45	1.19	15	6.0°	14200	2	AO⬚T18
40	**APX4000R404SA32LA**	●	4	32	190	45	1.19	15	6.0°	14200	2	AO⬚T18
40	**APX4000R402SA32ELA**	●	2	32	260	45	1.62	15	6.0°	14200	2	AO⬚T18
40	**APX4000R403SA32ELA**	●	3	32	260	45	1.62	15	6.0°	14200	2	AO⬚T18
40	**APX4000R404SA32ELA**	●	4	32	260	45	1.62	15	6.0°	14200	2	AO⬚T18
50	**APX4000R504SA32SA**	●	4	32	125	45	0.93	15	4.0°	12400	2	AO⬚T18
50	**APX4000R505SA32SA**	●	5	32	125	45	0.93	15	4.0°	12400	2	AO⬚T18
63	**APX4000R634SA32SA**	●	4	32	125	45	1.15	15	3.0°	10800	2	AO⬚T18
63	**APX4000R636SA32SA**	●	6	32	125	45	1.15	15	3.0°	10800	2	AO⬚T18

Note 1) When using inserts with corner radius RE≥3.2mm, machining of the holder is required as shown on page L149.
Note 2) The maximum spindle speeds RPMX are set to ensure tool and insert stability.
Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

SPARE PARTS

DC (mm)	Tool Holder Type	DC (mm)	Tool Holder Type	 *		
				Clamp Screw	Wrench	Anti-seize Lubricant
25	**APX4000R25**	28	**APX4000R28**	TPS4	TIP15W	MK1KS
32	**APX4000R32**	35	**APX4000R35**	TPS4	TIP15W	MK1KS
40	**APX4000R40**	40	**APX4000-040**	TPS43	TIP15W	MK1KS
50	**APX4000R50**	50	**APX4000-050**	TPS43	TIP15W	MK1KS
63	**APX4000R63**	63	**APX4000-063**	TPS43	TIP15W	MK1KS
80	**APX4000R080**	80	**APX4000-080**	TPS43	TIP15W	MK1KS
100	**APX4000R100**	100	**APX4000-100**	TPS43	TIP15W	MK1KS
125	**APX4000R125**	125	**APX4000-125**	TPS43	TIP15W	MK1KS
160	**APX4000R160**	160	**APX4000-160**	TPS43	TIP15W	MK1KS

* Clamp Torque (N • m) : TPS4 = 4.0, TPS43 = 4.0

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

Fig.1

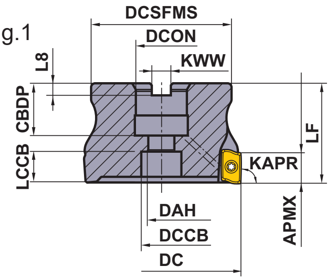
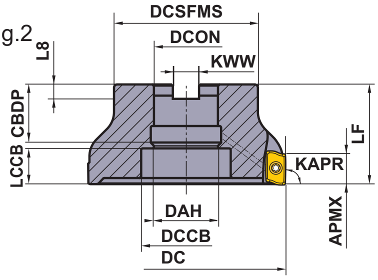
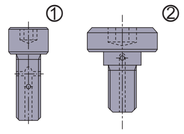


Fig.2

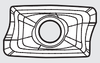


Right hand tool holder only.

DC (mm)	Set Bolt	Geometry	
40	HSC08030H	①	 With Coolant Hole
50, 63	HSC10030H		
80	HSC12035H		
100	HSC16040H		
125	MBA20040H	②	
160	MBA24045H		

ARBOR TYPE

With Coolant Hole

DC (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)		**WT** (kg)	**APMX** (mm)	**RMPX**	**RPMX** (min-1)	Fig.	
		R		LF	DCON						Insert Type
40	**APX4000-040A04RA**	●	4	40	16	0.2	15	6.0°	14200	1	AO◌T18
50	**APX4000-050A05RA**	●	5	40	22	0.3	15	4.0°	12400	1	AO◌T18
63	**APX4000-063A06RA**	●	6	40	22	0.5	15	3.0°	10800	1	AO◌T18
80	**APX4000R08007CA**	●	7	50	25.4	1.2	15	2.0°	9300	1	AO◌T18
80	**APX4000-080A07RA**	●	7	50	27	1.2	15	2.0°	9300	1	AO◌T18
100	**APX4000R10008DA**	●	8	63	31.75	2.1	15	1.5°	8100	1	AO◌T18
100	**APX4000-100A08RA**	●	8	50	32	2.1	15	1.5°	8100	1	AO◌T18
125	**APX4000R12509EA**	●	9	63	38.1	3.3	15	1.0°	7100	2	AO◌T18
125	**APX4000-125A09RA**	●	9	63	40	3.3	15	1.0°	7100	2	AO◌T18
160	**APX4000-160A10RA**	●	10	63	40	4.8	15	1.0°	6100	2	AO◌T18
160	**APX4000R16010FA**	●	10	63	50.8	4.8	15	1.0°	6100	2	AO◌T18

Note 1) When using inserts with corner radius RE≥3.2mm, machining of the holder is required as shown on page L149.

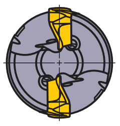
Note 2) The maximum spindle speeds RPMX are set to ensure tool and insert stability.

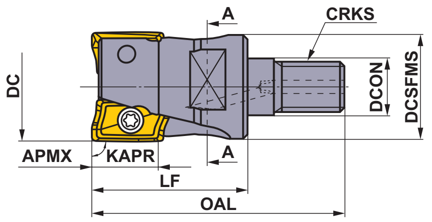
Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

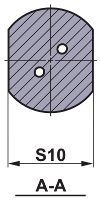
Mounting Dimensions

DC (mm)	Order Number	Dimensions(mm)							
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
40	**APX4000-040A04RA**	16	18	9	14	10.08	34	8.4	5.6
50	**APX4000-050A05RA**	22	20	11	17	12.26	45	10.4	6.3
63	**APX4000-063A06RA**	22	20	11	17	12.35	50	10.4	6.3
80	**APX4000R08007CA**	25.4	26	13	20	15.35	70	9.5	6
80	**APX4000-080A07RA**	27	23	13	20	15.35	60	12.4	7
100	**APX4000R10008DA**	31.75	32	17	26	20.35	80	12.7	8
100	**APX4000-100A08RA**	32	26	17	27	17.35	70	14.4	8
125	**APX4000R12509EA**	38.1	40	40	56	22.35	100	15.9	10
125	**APX4000-125A09RA**	40	40	42	56	22.35	90	16.4	9
160	**APX4000-160A10RA**	40	40	42	72	22.35	100	16.4	9
160	**APX4000R16010FA**	50.8	40	53	72	19.35	100	19.1	11

ISO13399 ➢L003
SPARE PARTS ➢P001
TECHNICAL DATA ➢Q001







Right hand tool holder only.

■SCREW-IN TYPE

With Coolant Hole

DC (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)						WT (kg)	APMX (mm)	RMPX	Insert Type
		R		DCON	DCSFMS	OAL	LF	S10	CRKS				
25	**APX4000R252M12A35**	●	2	12.5	23.5	57	35	19	M12	0.2	15	11.0°	AO◌T18
28	**APX4000R282M12A35**	●	2	12.5	23.5	57	35	19	M12	0.2	15	9.0°	AO◌T18
32	**APX4000R322M16A40**	●	2	17	28.5	63	40	24	M16	0.3	15	7.0°	AO◌T18
32	**APX4000R323M16A40**	●	3	17	28.5	63	40	24	M16	0.3	15	7.0°	AO◌T18
35	**APX4000R352M16A40**	●	2	17	28.5	63	40	24	M16	0.3	15	6.0°	AO◌T18
35	**APX4000R353M16A40**	●	3	17	28.5	63	40	24	M16	0.3	15	6.0°	AO◌T18
40	**APX4000R403M16A40**	●	3	17	28.5	63	40	24	M16	0.3	15	6.0°	AO◌T18
40	**APX4000R404M16A40**	●	4	17	28.5	63	40	24	M16	0.3	15	6.0°	AO◌T18

Note 1) When using inserts with corner radius RE≥3.2mm, machining of the holder is required as shown on page L149.
Note 2) For screw-in type arbors, refer to page L341.

SPARE PARTS

DC (mm)	Tool Holder Type	Clamp Screw *	Wrench	Anti-seize Lubricant
25	**APX4000R25**	TPS4	TIP15W	MK1KS
28	**APX4000R28**	TPS4	TIP15W	MK1KS
32	**APX4000R32**	TPS4	TIP15W	MK1KS
35	**APX4000R35**	TPS4	TIP15W	MK1KS
40	**APX4000R40**	TPS43	TIP15W	MK1KS

⋆ Clamp Torque (N • m) : TPS4 = 4.0, TPS43 = 4.0

■CAUTION FOR USE

- ● Only use the inserts and parts provided by Mitsubishi Materials with this tool.
- ● Clamp the inserts at a specified torque of only.
- ● The maximum spindle speeds **RPMX** are shown in Table 1. Ensure that the cutter operates under the maximum spindle speed. The maximum spindle speeds **RPMX** for safety purposes are determined in accordance with ISO15641 (Milling Cutters for high-speed machining–Safety requirements).

Table 1 Max. Spindle Speed RPMX

Cutting Edge Diameter **DC** (mm)	ø12	ø14	ø16	ø18	ø20	ø22	ø25	ø28	ø30
Max. Spindle Speed **RPMX**(min-1)	–	–	19500	17000	15000	14000	12000	11000	10000

Cutting Edge Diameter **DC** (mm)	ø32	ø35	ø40	ø50	ø63	ø80	ø100	ø125	ø160
Max. Spindle Speed **RPMX**(min-1)	9500	9000	7500	6000	5000	3500	3000	2500	1500

- ● It is recommended that flank wear does not exceed 0.3mm.

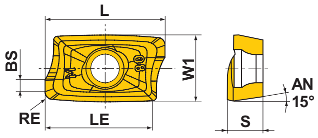
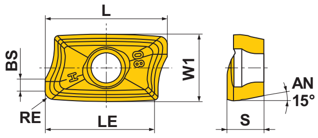
● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material			MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	VP20RT
	P	Steels		◐	✣				◐	◐
	M	Stainless Steels				◐			◐	◐
	K	Cast Irons	◐						✣	✣
	S	Heat Resistant Alloys, Titanium Alloys					◐	✣	◐	✣
	H	Hardened Steels							◐	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

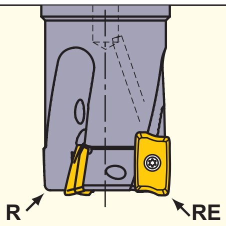
Edge Preparation :
E : Round

Shape	Order Number	Class	Edge Preparation	Coated MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	VP20RT	Dimensions (mm) L	LE	W1	S	BS	RE *	Geometry
General **M** Breaker 	**AOMT184804PEER-M**	M	E		●	●	●	●	●	●	●	18	15	9	4.8	1.8	0.4	
	AOMT184808PEER-M	M	E		●	●	●	●	●	●	●	18	15	9	4.8	1.4	0.8	
	AOMT184810PEER-M	M	E		●			●	●	●		18	15	9	4.8	1.0	1.0	
	AOMT184812PEER-M	M	E		●			●	●	●		18	15	9	4.8	0.8	1.2	
	AOMT184816PEER-M	M	E		●	●	●	●	●	●	●	18	15	9	4.8	0.4	1.6	
	AOMT184820PEER-M	M	E		●			●	●	●		18	15	9	4.8	0.4	2.0	
Strong Cutting Edge Type **H** Breaker 	**AOMT184804PEER-H**	M	E	●	●	●	●	●	●	●	●	18	15	9	4.8	1.8	0.4	
	AOMT184808PEER-H	M	E	●	●	●	●	●	●	●	●	18	15	9	4.8	1.4	0.8	
	AOMT184816PEER-H	M	E	●	●	●	●	●	●	●	●	18	15	9	4.8	0.4	1.6	
	AOMT184832PEER-H	M	E			●	●				●	18	15	9	4.8	0.4	3.2	
	AOMT184840PEER-H	M	E			●	●				●	18	15	9	4.8	0.4	4.0	
	AOMT184850PEER-H	M	E			●	●				●	18	15	9	4.8	–	5.0	
	AOMT184864PEER-H	M	E			●	●				●	18	15	9	4.8	–	6.35	

* Please note that the corner radius RE is different from the workpiece material of R shape depending on the axial rake angle of the body.
For more information, please contact our toll-free number or one of our sales offices.

Precautions when using larger corner R (RE) inserts with the APX4000

When using inserts with corner radius RE≧R3.2mm, please machine the holder with a radius form as shown on the table to the right.



RE (mm)	**R** (mm)
3.2	2.0
4.0	2.5
5.0	3.5
6.35	5.0

R : Holder End Radius
RE : Insert Corner Radius

ISO13399 ➢ L003
ARBORS ➢ L341
SPARE PARTS ➢ P001
TECHNICAL DATA ➢ Q001

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED

	Workpiece Material	Characteristics	Insert				ae (mm)			
			Grade Priority		Breaker		≤0.25DC	0.25–0.5DC	0.5–0.75DC	DC (Slot)
			1st	2nd			Cutting Speed **vc** (m/min)			
P	Mild Steel	≤180HB	MP6120	VP15TF	M	H	230(180–270)	220(170–260)	180(140–210)	180(140–210)
			MP6130	VP20RT	M	H	200(150–240)	190(140–230)	150(110–180)	150(110–180)
	Carbon Steel Alloy Steel	180–350HB	MP6120	VP15TF	M	H	180(140–210)	170(130–200)	140(110–160)	140(110–160)
			MP6130	VP20RT	M	H	150(110–180)	140(100–170)	110(80–130)	110(80–130)
M	Stainless Steel	≤270HB	MP7130	VP20RT	M	H	180(140–210)	170(130–200)	140(110–160)	140(110–160)
K	Gray Cast Iron	≤350MPa	MC5020	VP15TF	H	–	250(200–300)	240(190–290)	210(160–260)	140(110–160)
	Ductile Cast Iron	≤800MPa	MC5020	VP15TF	H	–	130(100–150)	120(90–140)	100(80–120)	100(80–120)
S	Titanium Alloy	≤350HB	MP9120	VP15TF	H	M	50(40–70)	–	–	50(40–70)
			MP9130	VP20RT	H	M	40(30–60)	–	–	40(30–60)
	Heat resistant Alloy	–	MP9120	VP15TF	H	M	40(30–60)	–	–	40(30–60)
			MP9130	VP20RT	H	M	30(20–40)	–	–	30(20–40)
H	Hardened Steel	40–55HRC	VP15TF	–	H	–	90(70–100)	85(60–100)	70(50–80)	70(50–80)

DEPTH OF CUT AND FEED PER TOOTH

	Workpiece Material	Characteristics	**ae** (mm)	Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t)		
					Cutter Diameter **DC** (mm)		
					ø25–ø40	**ø50–ø80**	**ø100–ø160**
P	Mild Steel Carbon Steel Alloy Steel	≤180HB 180–350HB	≤0.5DC	≤5	0.30	0.30	0.25
				5–7.5	0.25	0.25	0.20
				7.5–10	0.20	0.20	0.15
				10–12.5	0.15	0.15	0.10
				12.5–15	0.10	0.10	0.07
			0.5–0.75DC	≤5	0.20	0.20	0.15
				5–10	0.15	0.15	0.10
				10–15	0.10	0.10	0.07
			DC (Slot)	≤5	0.15	0.15	0.15
				5–7.5	0.10	0.10	0.10
				7.5–10	0.07	0.07	0.07
M	Stainless Steel	≤270HB	≤0.5DC	≤5	0.30	0.25	0.25
				5–7.5	0.25	0.20	0.20
				7.5–10	0.20	0.15	0.15
				10–12.5	0.15	0.10	0.10
				12.5–15	0.10	0.07	0.07
			0.5–0.75DC	≤5	0.20	0.15	0.15
				5–10	0.15	0.10	0.10
				10–15	0.10	0.07	0.07
			DC (Slot)	≤5	0.15	0.15	0.15
				5–7.5	0.10	0.10	0.10
				7.5–10	0.07	0.07	0.07
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤0.5DC	≤5	0.30	0.30	0.25
				5–7.5	0.25	0.25	0.20
				7.5–10	0.20	0.20	0.15
				10–12.5	0.15	0.15	0.10
				12.5–15	0.10	0.10	0.07
			0.5–0.75DC	≤5	0.20	0.20	0.15
				5–10	0.15	0.15	0.10
				10–15	0.10	0.10	0.07
			DC (Slot)	≤5	0.15	0.15	0.15
				5–7.5	0.10	0.10	0.10
				7.5–10	0.07	0.07	0.07
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤0.5DC	≤5	0.25	0.25	0.25
				5–7.5	0.20	0.20	0.20
				7.5–10	0.15	0.15	0.15
				10–12.5	0.10	0.10	0.10
				12.5–15	0.07	0.07	0.07
			0.5–0.75DC	≤5	0.20	0.20	0.15
				5–10	0.15	0.15	0.10
				10–15	0.10	0.10	0.07
			DC (Slot)	≤5	0.15	0.15	0.15
				5–7.5	0.10	0.10	0.10
				7.5–10	0.07	0.07	0.07

	Workpiece Material	Characteristics	**ae** (mm)	Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t)		
					Cutter Diameter **DC** (mm)		
					ø25—ø40	**ø50—ø80**	**ø100—ø160**
S	Titanium Alloy	≤350HB	≤0.25DC	≤5	0.15	0.10	0.10
				5—7.5	0.10	0.05	0.05
				7.5—10	0.05	—	—
			DC (Slot)	≤5	0.05	0.05	0.05
	Heat resistant Alloy	—	≤0.25DC	≤2	0.10	0.05	0.05
			DC (Slot)	≤1	0.05	0.05	0.05
H	Hardened Steel	40—55HRC	≤0.25DC	≤5	0.15	0.15	0.15
				5—7.5	0.10	0.10	0.10
				7.5—10	0.07	0.07	0.07
			0.25—0.5DC	≤5	0.10	0.10	0.10
				5—7.5	0.07	0.07	0.07
			0.5—0.75DC	≤5	0.07	0.07	0.07
			DC (Slot)	≤5	0.07	0.07	0.07

Note 1) These cutting conditions are a guide to the standard shank type and the arbor type.
Please make adjustments according to the machining conditions.

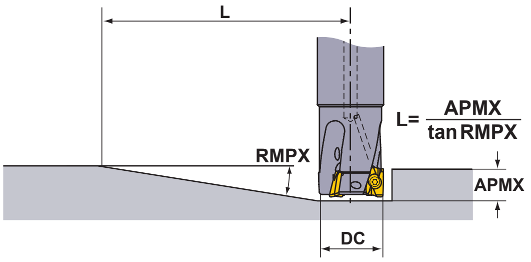
Note 2) Vibration is liable to occur in certain cases. Please reduce the depth of cut and / or reduce cutting conditions in the following cases.
- When using the long shank type and extra long shank type.
- When using long tool overhang with the standard or arbor type.
- When the application has poor clamping rigidity or when using a low rigidity machine.

Note 3) In case of coarse and fine pitch cutters, the coarse pitch type is recommended to prevent vibration.

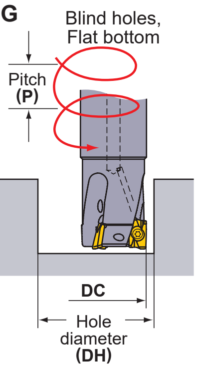
Note 4) For heavy interrupted and unstable cutting, the H breaker is first recommendation.

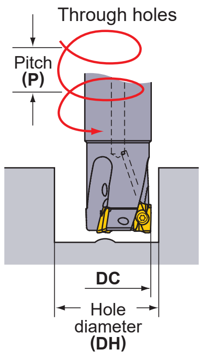
RAMPING/HELICAL CUTTING

● RAMPING



● HELICAL CUTTING





Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

Cutting Edge Diameter **DC** (mm)	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
	Maximum Ramping Angle **RMPX**	Minimum Distance *1 **L** (mm)	Maximum Hole Diameter *2 **DH max.** (mm)	Maximum Pitch **P max.** (mm)	Minimum Hole Diameter **DH min.** (mm)	Maximum Pitch **P max.** (mm)	Minimum Hole Diameter **DH min.** (mm)	Maximum Pitch **P max.** (mm)
25	11°	85	48	14	45	12	32	4
28	9°	105	54	12	51	11	38	4
32	7°	135	62	11	59	10	46	5
35	6°	158	68	10	65	9	52	5
40	6°	158	78	12	75	11	62	7
50	4°	238	98	10	95	9	82	7
63	3°	318	124	10	121	9	108	7
80	2°	477	158	8	155	8	142	6
100	1.5°	636	198	8	195	7	182	6
125	1°	954	248	6	245	6	232	5
160	1°	954	318	8	315	8	302	7

Note 1) When machining highly ductile materials with ramping angles above, chips can become long.
In this case, decrease the ramping angle or feed per tooth.

*1 L (=15 / tan RMPX). Cutters' moving distance until depth of cut reaches 15mm at a maximum ramping angle.

*2 In case corner radius of 0.8mm. Find other sizes with the formula below.
{(cutting edge diameter DC)—(corner radius)—0.2}×2

DEEP SHOULDER MILLING

90° KAPR R

APX4000

LONG CUTTING EDGE

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron		Heat Resistant Alloy	

- High accuracy, high-quality vertical wall.
- Low cutting force insert.

Fig.1

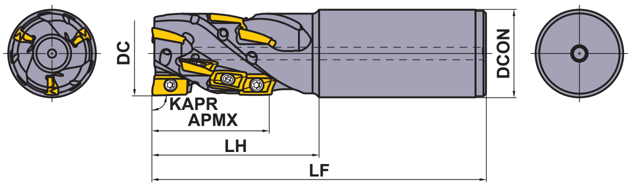
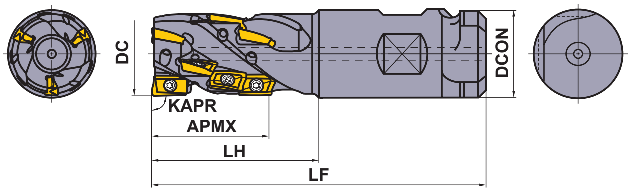


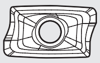
Fig.2



■SHANK TYPE

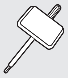
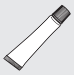
With Coolant Hole

Right hand tool holder only.

DC (mm)	Order Number	Stock	Number of Flutes	Total	Dimensions(mm)			WT (kg)	APMX (mm)	Fig.	
		R			DCON	LF	LH				Insert Type
40	**APX4KR4008SA42S056A**	●	2	8	42	160	80	1.54	56	1	AO◌T18
40	**APX4KR4012SA42S056A**	●	3	12	42	160	80	1.54	56	1	AO◌T18
50	**APX4KR5012WA508S056A**	●	3	12	50.8	160	80	1.76	56	2	AO◌T18
50	**APX4KR5018WA508M084A**	●	3	18	50.8	190	110	2.18	84	2	AO◌T18

Note 1) When using inserts with corner radius RE≥3.2mm, machining of the holder is required as shown on page L154.
Note 2) Only corner radius RE 0.4mm and 0.8mm can be used for the peripheral cutting edges except the bottom cutting edge (the end cuttting edge).

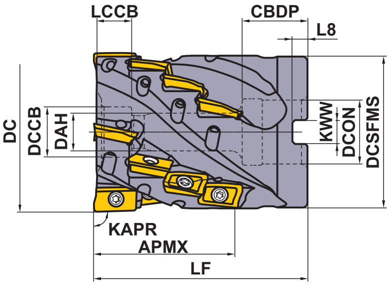
SPARE PARTS

 *		
Clamp Screw	Wrench	Anti-seize Lubricant
TPS43	TIP15W	MK1KS

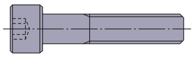
⁎ Clamp Torque (N • m) : TPS43 = 4.0

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

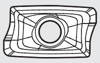


Right hand tool holder only.

DC (mm)	Set Bolt	Geometry
50	HSC10050	
63	HSC12070	

SHELL TYPE

With Coolant Hole

DC (mm)	Order Number	Stock	Number of Flutes	Total	Dimensions(mm)		WT (kg)	APMX (mm)	
		R			LF	DCON			Insert Type
50	**APX4K-050A09A042RA**	●	3	9	65	22	0.75	42	AO⬚T18
63	**APX4KR06316CA056A**	●	4	16	85	25.4	1.66	56	AO⬚T18
63	**APX4K-063A16A056RA**	●	4	16	85	27	1.63	56	AO⬚T18

Note 1) When using inserts with corner radius RE≥3.2mm, machining of the holder is required as shown on page L154.
Note 2) Only corner radius RE 0.4mm and 0.8mm can be used for the peripheral cutting edges except the bottom cutting edge (the end cuttting edge).
Note 3) Coolant can be supplied from the end face of the centering location bore in the arbor. However, it cannot be supplied from the set bolt.

Mounting Dimensions

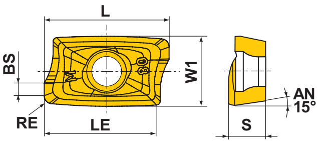
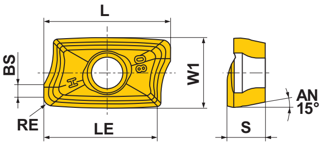
DC (mm)	Order Number	Dimensions(mm)							
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
50	**APX4K-050A09A042RA**	22	22	11	17	12.5	48	10.4	6.3
63	**APX4KR06316CA056A**	25.4	26	13	20	14	60.7	9.5	6
63	**APX4K-063A16A056RA**	27	28	13	20	14	60.7	12.4	7

INSERTS

Workpiece Material			MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	VP20RT
	P	Steels		◐	✤				◐	◐
	M	Stainless Steels				◐			◐	◐
	K	Cast Irons	◐						✤	✤
	S	Heat Resistant Alloys, Titanium Alloys					◐	✤	◐	✤
	H	Hardened Steels							◐	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

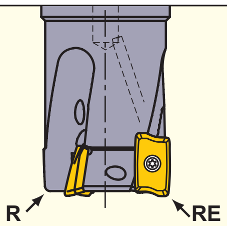
Edge Preparation :
E : Round

Shape	Order Number	Class	Edge Preparation	Coated								Dimensions (mm)						Geometry
				MC5020	**MP6120**	**MP6130**	**MP7130**	**MP9120**	**MP9130**	**VP15TF**	**VP20RT**	**L**	**LE**	**W1**	**S**	**BS**	* **RE**	
General **M** Breaker 	**AOMT184804PEER-M**	M	E		●	●	●	●	●	●	●	18	15	9	4.8	1.8	0.4	
	AOMT184808PEER-M	M	E		●	●	●	●	●	●	●	18	15	9	4.8	1.4	0.8	
	AOMT184810PEER-M	M	E		●			●	●	●		18	15	9	4.8	1.0	1.0	
	AOMT184812PEER-M	M	E		●			●	●	●		18	15	9	4.8	0.8	1.2	
	AOMT184816PEER-M	M	E		●	●	●	●	●	●	●	18	15	9	4.8	0.4	1.6	
	AOMT184820PEER-M	M	E		●			●	●	●		18	15	9	4.8	0.4	2.0	
Strong Cutting Edge Type **H** Breaker 	**AOMT184804PEER-H**	M	E	●	●	●	●	●	●	●	●	18	15	9	4.8	1.8	0.4	
	AOMT184808PEER-H	M	E	●	●	●	●	●	●	●	●	18	15	9	4.8	1.4	0.8	
	AOMT184816PEER-H	M	E	●	●	●	●	●	●	●	●	18	15	9	4.8	0.4	1.6	
	AOMT184832PEER-H	M	E			●	●				●	18	15	9	4.8	0.4	3.2	
	AOMT184840PEER-H	M	E			●	●				●	18	15	9	4.8	0.4	4.0	
	AOMT184850PEER-H	M	E			●	●				●	18	15	9	4.8	–	5.0	
	AOMT184864PEER-H	M	E			●	●				●	18	15	9	4.8	–	6.35	

* Please note that the corner radius RE is different from the workpiece material of R shape depending on the axial rake angle of the body.
For more information, please contact our toll-free number or one of our sales offices.

Precautions when using larger corner R (RE) inserts with the APX4000

When using inserts with corner radius RE≧R3.2mm, please machine the holder with a radius form as shown on the table to the right.



RE (mm)	**R** (mm)
3.2	2.0
4.0	2.5
5.0	3.5
6.35	5.0

R : Holder End Radius
RE : Insert Corner Radius

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

RECOMMENDED CUTTING CONDITIONS

■ CUTTING SPEED

	Workpiece Material	Hardness	Insert				Cutting Width **ae** (mm)		
			Grade		Breaker		≤0.15DC	0.15—0.3DC	DC (Slot)
			1st Recommendation	2nd Recommendation			Cutting Speed **vc** (m/min)		
P	Mild Steel	≤180HB	MP6120	VP15TF	M	H	200(160—250)	160(120—200)	140(120—160)
			MP6130	VP20RT	M	H	170(130—220)	130(90—170)	110(90—130)
	Carbon Steel Alloy Steel	180—350HB	MP6120	VP15TF	M	H	160(120—200)	120(100—140)	100(80—120)
			MP6130	VP20RT	M	H	130(90—170)	90(70—110)	70(50—90)
M	Stainless Steel	≤270HB	MP7130	VP15TF	M	H	160(120—200)	120(100—140)	100(80—120)
K	Gray Cast Iron	≤350MPa	MC5020	VP15TF	H	—	230(180—280)	190(140—240)	190(140—240)
	Ductile Cast Iron	≤800MPa	MC5020	VP15TF	H	—	190(140—220)	170(120—220)	170(120—220)
S	Titanium Alloy	≤350HB	MP9120	VP15TF	H	M	50(40—70)	—	50(40—70)
			MP9130	VP20RT	H	M	40(30—60)	—	40(30—60)
	Heat resistant Alloy	—	MP9120	VP15TF	H	M	40(30—60)	—	40(30—60)
			MP9130	VP20RT	H	M	30(20—40)	—	30(20—40)

■ DEPTH OF CUT AND FEED

	Workpiece Material	Characteristics	Depth of Cut **ae** (mm)	Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t)		
					Cutter Diameter **DC** (mm)		
					ø40 Length of cut 56mm ø50 Length of cut 42mm	ø50 Length of cut 56mm ø63 Length of cut 56mm	ø50 Length of cut 84mm
P	Mild Steel	≤180HB	≤0.3DC	≤20	0.25	0.25	0.20
				20—50	0.20	0.20	0.15
				50—80	—	—	0.10
			DC (Slot)	≤20	0.20	0.20	0.15
				20—50	0.15	0.15	—
	Carbon Steel Alloy Steel	180—350HB	≤0.3DC	≤20	0.25	0.25	0.20
				20—50	0.20	0.20	0.15
				50—80	—	—	0.10
			DC (Slot)	≤20	0.15	0.15	0.10
				20—50	0.10	0.10	—
M	Stainless Steel	≤270HB	≤0.3DC	≤20	0.25	0.25	0.20
				20—50	0.20	0.20	0.15
				50—80	—	—	0.10
			DC (Slot)	≤10	0.10	0.10	0.07
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤0.15DC	≤10	0.30	0.30	0.25
				10—50	0.25	0.25	0.20
				50—80	—	—	0.15
			0.15—0.3DC	≤10	0.25	0.25	0.20
				10—50	0.20	0.20	0.15
				50—80	—	—	0.10
			DC (Slot)	≤10	0.25	0.25	0.20
				10—50	0.20	0.20	0.15
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤0.15DC	≤20	0.25	0.25	0.20
				20—50	0.20	0.20	0.15
				50—80	—	—	0.10
			0.15—0.3DC	≤20	0.20	0.20	0.15
				20—50	0.15	0.15	0.10
				50—80	—	—	0.07
			DC (Slot)	≤10	0.15	0.15	0.10
				10—50	0.10	0.10	—
S	Titanium Alloy	≤350HB	≤0.15DC	≤20	0.10	0.10	—
				20—50	0.10	0.10	—
			DC (Slot)	≤50	0.08	0.08	—
	Heat resistant Alloy	—	≤0.15DC	≤10	0.07	0.07	—
			DC (Slot)	≤20	0.05	0.05	—

Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece, where no vibration occurred. Please adjust machining conditions if the vibration is generated.

MULTI-FUNCTIONAL MILLING

90° KAPR

R

VPX200

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel

Fig.1

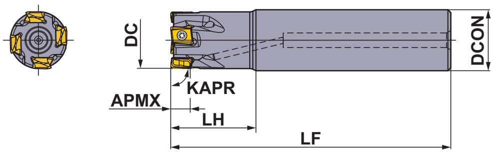
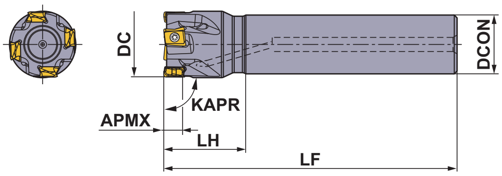


Fig.2



Right hand tool holder only.

SHANK TYPE

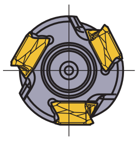
With Coolant Hole

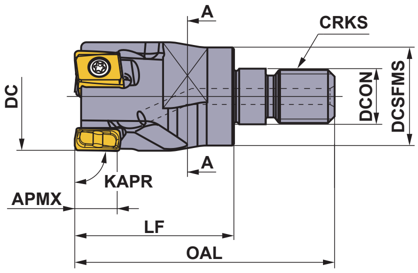
DC (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)			APMX (mm)	RMPX	Max. Spindle Speed (min^{-1})	WT (kg)	Fig.	Insert Type
		R		DCON	LF	LH						
16	**VPX200R1602SA16S**	●	2	16	85	25	8	1.85°	37900	0.11	1	LOGU09
18	**VPX200R1802SA16S**	●	2	16	85	25	8	1.56°	35300	0.12	2	LOGU09
18	**VPX200R1802SA16L**	●	2	16	120	25	8	1.56°	35300	0.17	2	LOGU09
20	**VPX200R2002SA16S**	●	2	16	100	25	8	1.35°	33200	0.14	2	LOGU09
20	**VPX200R2003SA16S**	●	3	16	100	25	8	1.35°	33200	0.14	2	LOGU09
20	**VPX200R2002SA20S**	●	2	20	100	30	8	1.35°	33200	0.21	1	LOGU09
20	**VPX200R2003SA20S**	●	3	20	100	30	8	1.35°	33200	0.21	1	LOGU09
20	**VPX200R2002SA20L**	●	2	20	150	60	8	1.35°	33200	0.32	1	LOGU09
22	**VPX200R2202SA20S**	●	2	20	115	30	8	1.16°	31400	0.26	2	LOGU09
22	**VPX200R2203SA20S**	●	3	20	115	30	8	1.16°	31400	0.25	2	LOGU09
22	**VPX200R2202SA20L**	●	2	20	150	30	8	1.16°	31400	0.34	2	LOGU09
25	**VPX200R2503SA20S**	●	3	20	115	30	8	0.97°	29000	0.26	2	LOGU09
25	**VPX200R2504SA20S**	●	4	20	115	30	8	0.97°	29000	0.26	2	LOGU09
25	**VPX200R2503SA25S**	●	3	25	115	35	8	0.97°	29000	0.39	1	LOGU09
25	**VPX200R2504SA25S**	●	4	25	115	35	8	0.97°	29000	0.39	1	LOGU09
25	**VPX200R2503SA25L**	●	3	25	170	70	8	0.97°	29000	0.57	1	LOGU09
28	**VPX200R2803SA25S**	●	3	25	115	35	8	0.84°	27200	0.41	2	LOGU09
28	**VPX200R2804SA25S**	●	4	25	115	35	8	0.84°	27200	0.41	2	LOGU09
28	**VPX200R2803SA25L**	●	3	25	170	35	8	0.84°	27200	0.61	2	LOGU09
30	**VPX200R3003SA25S**	●	3	25	125	35	8	0.77°	26000	0.46	2	LOGU09
30	**VPX200R3004SA25S**	●	4	25	125	35	8	0.77°	26000	0.46	2	LOGU09
32	**VPX200R3203SA32S**	●	3	32	125	45	8	0.71°	25100	0.70	1	LOGU09
32	**VPX200R3204SA32S**	●	4	32	125	45	8	0.71°	25100	0.70	1	LOGU09
32	**VPX200R3205SA32S**	●	5	32	125	45	8	0.71°	25100	0.70	1	LOGU09
32	**VPX200R3203SA32L**	●	3	32	190	90	8	0.71°	25100	1.06	1	LOGU09
35	**VPX200R3503SA32L**	●	3	32	190	45	8	0.63°	23800	1.14	2	LOGU09
40	**VPX200R4004SA32S**	●	4	32	125	45	8	0.54°	22000	0.81	2	LOGU09
40	**VPX200R4006SA32S**	●	6	32	125	45	8	0.54°	22000	0.80	2	LOGU09
50	**VPX200R5005SA32S**	●	5	32	125	45	8	0.42°	19200	0.91	2	LOGU09
50	**VPX200R5007SA32S**	●	7	32	125	45	8	0.42°	19200	0.91	2	LOGU09

Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

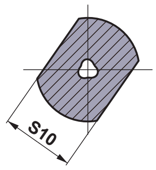
● : Inventory maintained in Japan.

Scan here for product NEWS ▶





Right hand tool holder only.



A-A Section

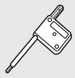
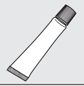
SCREW-IN TYPE

With Coolant Hole

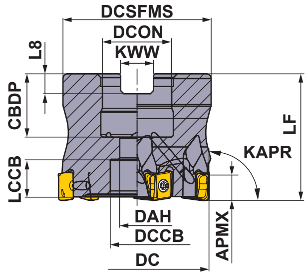
DC (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)						**WT** (kg)	**APMX** (mm)	**RMPX**	Insert Type
		R		**DCON**	**DCSFMS**	**OAL**	**LF**	**S10**	**CRKS**				
16	**VPX200R1602AM0830**	●	2	8.5	14.5	48	30	10	M08	0.03	8	1.85°	LOGU09
18	**VPX200R1802AM0830**	●	2	8.5	14.5	48	30	10	M08	0.04	8	1.56°	LOGU09
20	**VPX200R2002AM1030**	●	2	10.5	18.5	49	30	14	M10	0.06	8	1.35°	LOGU09
20	**VPX200R2003AM1030**	●	3	10.5	18.5	49	30	14	M10	0.06	8	1.35°	LOGU09
22	**VPX200R2202AM1030**	●	2	10.5	18.5	49	30	14	M10	0.06	8	1.16°	LOGU09
22	**VPX200R2203AM1030**	●	3	10.5	18.5	49	30	14	M10	0.06	8	1.16°	LOGU09
25	**VPX200R2503AM1235**	●	3	12.5	23.5	57	35	19	M12	0.11	8	0.97°	LOGU09
25	**VPX200R2504AM1235**	●	4	12.5	23.5	57	35	19	M12	0.11	8	0.97°	LOGU09
32	**VPX200R3203AM1640**	●	3	17.0	28.5	63	40	24	M16	0.21	8	0.71°	LOGU09
32	**VPX200R3204AM1640**	●	4	17.0	28.5	63	40	24	M16	0.21	8	0.71°	LOGU09
32	**VPX200R3205AM1640**	●	5	17.0	28.5	63	40	24	M16	0.21	8	0.71°	LOGU09
35	**VPX200R3503AM1640**	●	3	17.0	28.5	63	40	24	M16	0.24	8	0.63°	LOGU09
35	**VPX200R3505AM1640**	●	5	17.0	28.5	63	40	24	M16	0.23	8	0.63°	LOGU09
40	**VPX200R4004AM1640**	●	4	17.0	28.5	63	40	24	M16	0.26	8	0.54°	LOGU09
40	**VPX200R4006AM1640**	●	6	17.0	28.5	63	40	24	M16	0.26	8	0.54°	LOGU09

Note 1) For screw-in type arbors, refer to page L341.

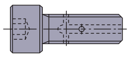
SPARE PARTS

DC (mm)	Tool Holder Type	 *		
		Clamp Screw	Wrench	Anti-seize Lubricant
16	**VPX200R16**	TPS27F1	TIP07F	MK1KS
18	**VPX200R18**	TPS27F1	TIP07F	MK1KS
20	**VPX200R20**	TPS27F1	TIP07F	MK1KS
22	**VPX200R22**	TPS27F2	TIP07F	MK1KS
25	**VPX200R25**	TPS27F2	TIP07F	MK1KS
28	**VPX200R28**	TPS27F2	TIP07F	MK1KS
30	**VPX200R30**	TPS27F2	TIP07F	MK1KS
32	**VPX200R32**	TPS27F2	TIP07F	MK1KS
35	**VPX200R35**	TPS27F2	TIP07F	MK1KS
40	**VPX200R40**	TPS27F2	TIP07F	MK1KS
50	**VPX200R50**	TPS27F2	TIP07F	MK1KS

* Clamp Torque (N • m) : TPS27F1 = 1.0,TPS27F2 = 1.0



Right hand tool holder only.

DC (mm)	Set Bolt	Geometry
φ32, φ40	HSC08025H	 With Coolant Hole
φ50, φ63	HSC10030H	

■ARBOR TYPE

With Coolant Hole

DCON = mm size

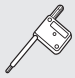
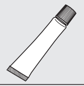
DC (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)		WT (kg)	APMX (mm)	RMPX	Max. Spindle Speed (min^{-1})	Insert Type
		R		LF	DCON					
32	**VPX200-032A03AR**	●	3	35	16	0.11	8	0.71°	25100	LOGU09
32	**VPX200-032A05AR**	●	5	35	16	0.11	8	0.71°	25100	LOGU09
40	**VPX200-040A04AR**	●	4	40	16	0.23	8	0.54°	22000	LOGU09
40	**VPX200-040A06AR**	●	6	40	16	0.22	8	0.54°	22000	LOGU09
50	**VPX200-050A05AR**	●	5	40	22	0.36	8	0.42°	19200	LOGU09
50	**VPX200-050A07AR**	●	7	40	22	0.36	8	0.42°	19200	LOGU09
63	**VPX200-063A06AR**	●	6	40	22	0.66	8	0.32°	16700	LOGU09
63	**VPX200-063A09AR**	●	9	40	22	0.66	8	0.32°	16700	LOGU09

Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

Mounting Dimensions

DC (mm)	Order Number	Dimensions(mm)							
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
32	**VPX200-032A03AR**	16	18	9	14	8	30	8.4	5.6
32	**VPX200-032A05AR**	16	18	9	14	8	30	8.4	5.6
40	**VPX200-040A04AR**	16	18	9	14	13	37	8.4	5.6
40	**VPX200-040A06AR**	16	18	9	14	13	37	8.4	5.6
50	**VPX200-050A05AR**	22	20	11	17	11	47	10.4	6.3
50	**VPX200-050A07AR**	22	20	11	17	11	47	10.4	6.3
63	**VPX200-063A06AR**	22	20	11	17	11	60	10.4	6.3
63	**VPX200-063A09AR**	22	20	11	17	11	60	10.4	6.3

SPARE PARTS

Tool Holder Type	 *		
	Clamp Screw	Wrench	Anti-seize Lubricant
VPX200	TPS27F2	TIP07F	MK1KS

* Clamp Torque (N • m) : TPS27F2 = 1.0

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

DEEP SHOULDER MILLING

90° KAPR

VPX200

NEW

LONG CUTTING EDGE

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	

Fig.1

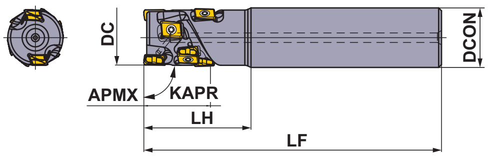
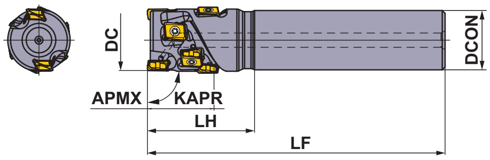


Fig.2



Right hand tool holder only.

SHANK TYPE

With Coolant Hole

DC (mm)	Order Number	Stock	Number of Flutes	Total	Dimensions(mm)			APMX (mm)	RMPX	WT (kg)	Fig.	Insert Type *
		R			DCON	LF	LH					
20	**VPX200R202SA20S01404**	●	2	4	20	100	30	14	1.35°	0.21	1	LOGU09
22	**VPX200R222SA20S01404**	●	2	4	20	115	30	14	1.16°	0.26	2	LOGU09
25	**VPX200R252SA25S02106**	●	2	6	25	115	35	21	0.97°	0.39	1	LOGU09
25	**VPX200R252SA25S02808**	●	2	8	25	125	45	28	0.97°	0.41	1	LOGU09
28	**VPX200R282SA25S02106**	●	2	6	25	115	35	21	0.84°	0.40	2	LOGU09
28	**VPX200R282SA25S02808**	●	2	8	25	125	45	28	0.84°	0.43	2	LOGU09
32	**VPX200R322SA32S02808**	●	2	8	32	125	45	28	0.71°	0.68	1	LOGU09
32	**VPX200R323SA32S02812**	●	3	12	32	125	45	28	0.71°	0.67	1	LOGU09
32	**VPX200R322SA32S03510**	●	2	10	32	130	50	35	0.71°	0.70	1	LOGU09
32	**VPX200R323SA32S03515**	●	3	15	32	130	50	35	0.71°	0.68	1	LOGU09
35	**VPX200R352SA32S02808**	●	2	8	32	125	45	28	0.63°	0.72	2	LOGU09
35	**VPX200R353SA32S02812**	●	3	12	32	125	45	28	0.63°	0.71	2	LOGU09
35	**VPX200R352SA32S03510**	●	2	10	32	130	50	35	0.63°	0.74	2	LOGU09
35	**VPX200R353SA32S03515**	●	3	15	32	130	50	35	0.63°	0.73	2	LOGU09
40	**VPX200R403SA32S03515**	●	3	15	32	130	50	35	0.54°	0.81	2	LOGU09
40	**VPX200R404SA32S03520**	●	4	20	32	130	50	35	0.54°	0.80	2	LOGU09
40	**VPX200R403SA32S04218**	●	3	18	32	140	60	42	0.54°	0.88	2	LOGU09
40	**VPX200R404SA32S04224**	●	4	24	32	140	60	42	0.54°	0.86	2	LOGU09

* Corner radius RE 0.8mm is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE 0.2mm and 0.4 mm can also be used.

SPARE PARTS

DC (mm)	Tool Holder Type	Clamp Screw *	Wrench	Anti-seize Lubricant
20	**VPX200R20**	TPS27F1	TIP07F	MK1KS
22	**VPX200R22**	TPS27F2	TIP07F	MK1KS
25	**VPX200R25**	TPS27F2	TIP07F	MK1KS
28	**VPX200R28**	TPS27F2	TIP07F	MK1KS
32	**VPX200R32**	TPS27F2	TIP07F	MK1KS
35	**VPX200R35**	TPS27F2	TIP07F	MK1KS
40	**VPX200R40**	TPS27F2	TIP07F	MK1KS

* Clamp Torque (N • m) : TPS27F1 = 1.0,TPS27F2 = 1.0

ISO13399	➢ **L003**
INSERTS	➢ **L161**
CUTTING CONDITIONS	➢ **L168—L192**
SPARE PARTS	➢ **P001**
TECHNICAL DATA	➢ **Q001**

Scan here for product NEWS ▶

Fig.1

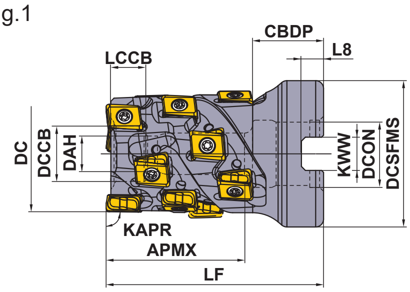
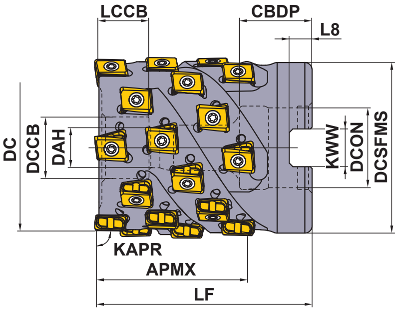
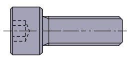


Fig.2



Right hand tool holder only.

DC (mm)	**APMX** (mm)	Set Bolt	Geometry
ϕ32	35	HSC08045	
ϕ40	42	HSC08050	
ϕ50	42	HSC10045	

SHELL TYPE

With Coolant Hole

DCON=mm size

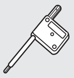
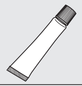
DC (mm)	Order Number	Stock	Number of Flutes	Total	Dimensions(mm)		**WT** (kg)	**APMX** (mm)	**RMPX**	Fig.	* Insert Type
		R			**LF**	**DCON**					
32	**VPX200-032A02A035R10**	●	2	10	55	16	0.22	35	0.71°	1	LOGU09
32	**VPX200-032A03A035R15**	●	3	15	55	16	0.20	35	0.71°	1	LOGU09
40	**VPX200-040A03A042R18**	●	3	18	60	16	0.34	42	0.54°	2	LOGU09
40	**VPX200-040A04A042R24**	●	4	24	60	16	0.33	42	0.54°	2	LOGU09
50	**VPX200-050A04A042R24**	●	4	24	60	22	0.55	42	0.42°	2	LOGU09
50	**VPX200-050A05A042R30**	●	5	30	60	22	0.54	42	0.42°	2	LOGU09

* Corner radius RE 0.8mm is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE 0.2mm and 0.4 mm can also be used for the peripheral cutting edges.

Mounting Dimensions

DC (mm)	Order Number	Dimensions(mm)							
		DCON	**CBDP**	**DAH**	**DCCB**	**LCCB**	**DCSFMS**	**KWW**	**L8**
32	**VPX200-032A02A035R10**	16	18	9	14	8	37	8.4	5.6
32	**VPX200-032A03A035R15**	16	18	9	14	8	37	8.4	5.6
40	**VPX200-040A03A042R18**	16	18	9	14	8	37	8.4	5.6
40	**VPX200-040A04A042R24**	16	18	9	14	8	37	8.4	5.6
50	**VPX200-050A04A042R24**	22	20	11	17	13	47	10.4	6.3
50	**VPX200-050A05A042R30**	22	20	11	17	13	47	10.4	6.3

SPARE PARTS

Tool Holder Type	 *		
	Clamp Screw	Wrench	Anti-seize Lubricant
VPX200	TPS27F2	TIP07F	MK1KS

* Clamp Torque (N • m) : TPS27F2 = 1.0

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

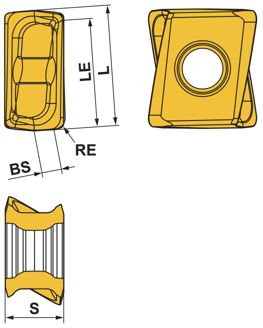
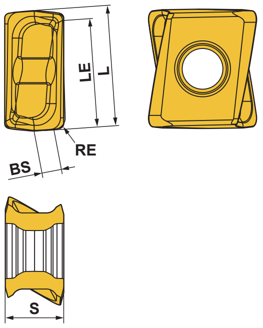
VPX200 Including long types for deep cutting

INSERTS

Workpiece Material			MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	TF15
Workpiece Material	P	Steel		◐	✤				◐	
	M	Stainless Steel				◐			◐	
	K	Cast Iron	◐						✤	
	N	Non-ferrous Metal								◐
	S	Heat resistant Alloy, Titanium Alloy					◐	✤	◐	
	H	Hardened Steel							◐	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Edge Preparation :
E : Round F : Sharp

Shape	Order Number	Class	Edge Preparation	Coated							Carbide	Dimensions(mm)					Geometry
				MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	TF15	L	RE	LE	S	BS	
Low Resistance Type **L Breaker** 	**LOGU0904020PNER-L**	G	E	●	●	●	●	●	●	●		8.7	0.2	7.6	4.3	1.7	 Right hand insert only.
	LOGU0904040PNER-L	G	E	●	●	●	●	●	●	●		8.7	0.4	7.6	4.3	1.5	
	LOGU0904080PNER-L	G	E	●	●	●	●	●	●	●		8.7	0.8	7.6	4.3	1.2	
	LOGU0904100PNER-L	G	E	●	●	●	●	●	●	●		8.7	1.0	7.6	4.3	1.0	
	LOGU0904120PNER-L	G	E	●	●	●	●	●	●	●		8.7	1.2	7.6	4.3	0.8	
	LOGU0904160PNER-L	G	E	●	●	●	●	●	●	●		8.7	1.6	7.6	4.3	0.5	
	LOGU0904020PNFR-L	G	F								●	8.7	0.2	7.6	4.3	1.7	
	LOGU0904040PNFR-L	G	F								●	8.7	0.4	7.6	4.3	1.5	
	LOGU0904080PNFR-L	G	F								●	8.7	0.8	7.6	4.3	1.2	
	LOGU0904100PNFR-L	G	F								●	8.7	1.0	7.6	4.3	1.0	
	LOGU0904120PNFR-L	G	F								●	8.7	1.2	7.6	4.3	0.8	
	LOGU0904160PNFR-L	G	F								●	8.7	1.6	7.6	4.3	0.5	
General M Breaker 	**LOGU0904020PNER-M**	G	E	●	●	●	●	●	●	●		8.7	0.2	7.6	4.3	1.7	 Right hand insert only.
	LOGU0904040PNER-M	G	E	●	●	●	●	●	●	●		8.7	0.4	7.6	4.3	1.6	
	LOGU0904080PNER-M	G	E	●	●	●	●	●	●	●		8.7	0.8	7.6	4.3	1.2	
	LOGU0904100PNER-M	G	E	●	●	●	●	●	●	●		8.7	1.0	7.6	4.3	1.0	
	LOGU0904120PNER-M	G	E	●	●	●	●	●	●	●		8.7	1.2	7.6	4.3	0.9	
	LOGU0904160PNER-M	G	E	●	●	●	●	●	●	●		8.7	1.6	7.6	4.3	0.5	
	LOGU0904020PNFR-M	G	F								●	8.7	0.2	7.6	4.3	1.7	
	LOGU0904040PNFR-M	G	F								●	8.7	0.4	7.6	4.3	1.6	
	LOGU0904080PNFR-M	G	F								●	8.7	0.8	7.6	4.3	1.2	
	LOGU0904100PNFR-M	G	F								●	8.7	1.0	7.6	4.3	1.0	
	LOGU0904120PNFR-M	G	F								●	8.7	1.2	7.6	4.3	0.9	
	LOGU0904160PNFR-M	G	F								●	8.7	1.6	7.6	4.3	0.5	

ISO13399 ➢ L003
CUTTING CONDITIONS ➢ L168—L192
SPARE PARTS ➢ P001
TECHNICAL DATA ➢ Q001

MULTI-FUNCTIONAL MILLING

90° KAPR

VPX300

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel

Fig.1

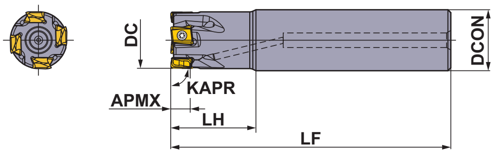
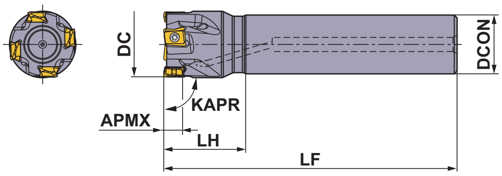


Fig.2



Right hand tool holder only.

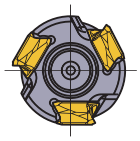
■SHANK TYPE

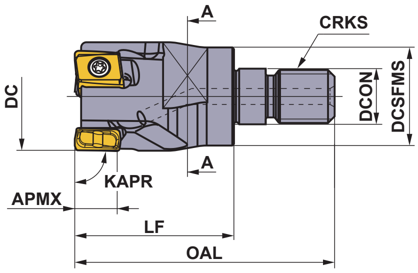
With Coolant Hole

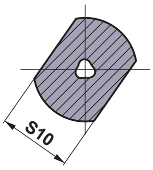
DC (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)			APMX (mm)	RMPX	Max. Spindle Speed (min^{-1})	WT (kg)	Fig.	Insert Type
		R		DCON	LF	LH						
25	**VPX300R2502SA25S**	●	2	25	115	35	11	2.13°	24100	0.38	1	LOGU12
25	**VPX300R2502SA25L**	●	2	25	170	70	11	2.13°	24100	0.56	1	LOGU12
28	**VPX300R2802SA25S**	●	2	25	115	35	11	1.77°	22500	0.40	2	LOGU12
28	**VPX300R2802SA25L**	●	2	25	170	35	11	1.77°	22500	0.60	2	LOGU12
30	**VPX300R3002SA25S**	●	2	25	125	35	11	1.61°	21500	0.45	2	LOGU12
30	**VPX300R3003SA25S**	●	3	25	125	35	11	1.61°	21500	0.44	2	LOGU12
32	**VPX300R3202SA32S**	●	2	32	125	45	11	1.47°	20600	0.69	1	LOGU12
32	**VPX300R3203SA32S**	●	3	32	125	45	11	1.47°	20600	0.68	1	LOGU12
32	**VPX300R3203SA32L**	●	3	32	190	90	11	1.47°	20600	1.04	1	LOGU12
35	**VPX300R3503SA32L**	●	3	32	190	45	11	1.28°	19500	1.10	2	LOGU12
40	**VPX300R4003SA32S**	●	3	32	125	45	11	1.06°	17900	0.76	2	LOGU12
40	**VPX300R4004SA32S**	●	4	32	125	45	11	1.06°	17900	0.76	2	LOGU12
50	**VPX300R5004SA32S**	●	4	32	125	45	11	0.79°	15500	0.89	2	LOGU12
50	**VPX300R5006SA32S**	●	6	32	125	45	11	0.79°	15500	0.88	2	LOGU12

Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

● : Inventory maintained in Japan.







A-A Section

Right hand tool holder only.

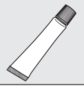
■SCREW-IN TYPE

With Coolant Hole

DC (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)						WT (kg)	APMX (mm)	RMPX	Insert Type
		R		DCON	DCSFMS	OAL	LF	S10	CRKS				
25	**VPX300R2502AM1235**	●	2	12.5	23.5	57	35	19	M12	0.10	11	2.13°	LOGU12
28	**VPX300R2802AM1235**	●	2	12.5	23.5	57	35	19	M12	0.12	11	1.77°	LOGU12
32	**VPX300R3202AM1640**	●	2	17.0	28.5	63	40	24	M16	0.20	11	1.47°	LOGU12
32	**VPX300R3203AM1640**	●	3	17.0	28.5	63	40	24	M16	0.19	11	1.47°	LOGU12
35	**VPX300R3502AM1640**	●	2	17.0	28.5	63	40	24	M16	0.22	11	1.28°	LOGU12
35	**VPX300R3503AM1640**	●	3	17.0	28.5	63	40	24	M16	0.22	11	1.28°	LOGU12
40	**VPX300R4003AM1640**	●	3	17.0	28.5	63	40	24	M16	0.26	11	1.06°	LOGU12
40	**VPX300R4004AM1640**	●	4	17.0	28.5	63	40	24	M16	0.26	11	1.06°	LOGU12

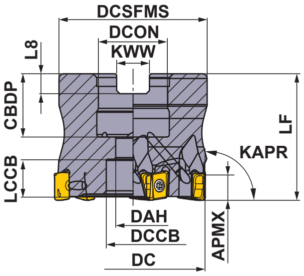
Note 1) For screw-in type arbors, refer to page L341.

SPARE PARTS

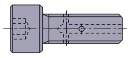
Tool Holder Type	 *		
	Clamp Screw	Wrench	Anti-seize Lubricant
VPX300	TPS40F1	TIP15W	MK1KS

⋆ Clamp Torque (N • m) : TPS40F1 = 3.0

ISO13399 ➤ L003
INSERTS ➤ L167
CUTTING CONDITIONS ➤ L168—L192
ARBORS ➤ L341
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001



Right hand tool holder only.

DC (mm)	Set Bolt	Geometry
ϕ40	HSC08025H	 With Coolant Hole
ϕ50, ϕ63	HSC10030H	
ϕ80	HSC12035H	

ARBOR TYPE

With Coolant Hole

DCON = Inch size

DC (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)		WT (kg)	APMX (mm)	RMPX	Max. Spindle Speed (min^{-1})	Insert Type
		R		LF	DCON					
80	**VPX300R08007CA**	●	7	50	25.4	1.00	11	0.45°	11500	LOGU12
80	**VPX300R08010CA**	●	10	50	25.4	1.00	11	0.45°	11500	LOGU12

DCON = mm size

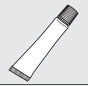
DC (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)		WT (kg)	APMX (mm)	RMPX	Max. Spindle Speed (min^{-1})	Insert Type
		R		LF	DCON					
40	**VPX300-040A03AR**	●	3	40	16	0.21	11	1.06°	17900	LOGU12
40	**VPX300-040A04AR**	●	4	40	16	0.21	11	1.06°	17900	LOGU12
50	**VPX300-050A04AR**	●	4	40	22	0.34	11	0.79°	15500	LOGU12
50	**VPX300-050A06AR**	●	6	40	22	0.33	11	0.79°	15500	LOGU12
63	**VPX300-063A06AR**	●	6	40	22	0.61	11	0.60°	13400	LOGU12
63	**VPX300-063A08AR**	●	8	40	22	0.62	11	0.60°	13400	LOGU12
80	**VPX300-080A07AR**	●	7	50	27	0.99	11	0.45°	11500	LOGU12
80	**VPX300-080A10AR**	●	10	50	27	0.99	11	0.45°	11500	LOGU12

Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

Mounting Dimensions

DC (mm)	Order Number	Dimensions(mm)							
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
40	**VPX300-040A03AR**	16	18	9	14	12.4	37	8.4	5.6
40	**VPX300-040A04AR**	16	18	9	14	12.4	37	8.4	5.6
50	**VPX300-050A04AR**	22	20	11	17	10.4	47	10.4	6.3
50	**VPX300-050A06AR**	22	20	11	17	10.4	47	10.4	6.3
63	**VPX300-063A06AR**	22	20	11	17	10.4	60	10.4	6.3
63	**VPX300-063A08AR**	22	20	11	17	10.4	60	10.4	6.3
80	**VPX300R08007CA**	25.4	26	13	20	13.4	56	9.5	6
80	**VPX300R08010CA**	25.4	26	13	20	13.4	56	9.5	6
80	**VPX300-080A07AR**	27	23	13	20	13.4	56	12.4	7
80	**VPX300-080A10AR**	27	23	13	20	13.4	56	12.4	7

SPARE PARTS

Tool Holder Type	 *		
	Clamp Screw	Wrench	Anti-seize Lubricant
VPX300	TPS40F1	TIP15W	MK1KS

* Clamp Torque (N • m) : TPS40F1 = 3.0

● : Inventory maintained in Japan.

DEEP SHOULDER MILLING

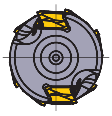
90°
KAPR

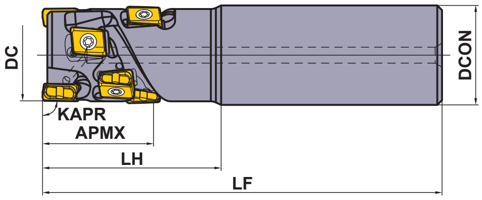
VPX300

NEW

LONG CUTTING EDGE

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	





Right hand tool holder only.

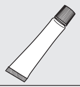
SHANK TYPE

With Coolant Hole

DC (mm)	Order Number	Stock	Number of Flutes	Total	Dimensions(mm)			**APMX** (mm)	**RMPX**	**WT** (kg)	Insert Type *
		R			**DCON**	**LF**	**LH**				
40	**VPX300R402SA32S02104**	●	2	4	32	125	45	21	1.06°	0.78	LOGU12
40	**VPX300R402SA32S03106**	●	2	6	32	130	50	31	1.06°	0.79	LOGU12
40	**VPX300R402SA32S04208**	●	2	8	32	140	60	42	1.06°	0.84	LOGU12

* Corner radius RE 0.8mm is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE 0.2mm and 0.4 mm can also be used.

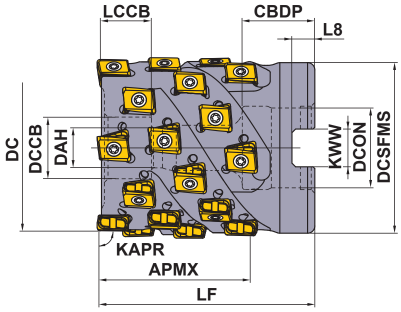
SPARE PARTS

Tool Holder Type	 * Clamp Screw	 Wrench	 Anti-seize Lubricant
VPX300	TPS40F1	TIP15W	MK1KS

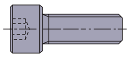
* Clamp Torque (N • m) : TPS40F1 = 3.5

Scan here for product NEWS ▶

ISO13399	➢ L003
INSERTS	➢ L167
CUTTING CONDITIONS	➢ L168 – L192
SPARE PARTS	➢ P001
TECHNICAL DATA	➢ Q001



Right hand tool holder only.

Order Number	**APMX** (mm)	Set Bolt	Geometry
VPX300-040A02A031	31	HSC08040	
VPX300-040A02A042	42	HSC08050	
VPX300-050A03A031	31	HSC10040	
VPX300-050A03A042	42	HSC10050	
VPX300-050A03A052	52	HSC10060	
VPX300-063A04A042	42	HSC12050	
VPX300-063A04A052	52	HSC12060	
VPX300-080A05A052	52	HSC12060	
VPX300-080A05A063	63	HSC12070	
VPX300R08005CA052	52	HSC16055	
VPX300R08005CA063	63	HSC16065	

SHELL TYPE

With Coolant Hole

DCON = mm size

DC (mm)	Order Number	Stock	Number of Flutes	Total	Dimensions(mm)		**WT** (kg)	**APMX** (mm)	**RMPX**	Insert Type *
		R			**LF**	**DCON**				
40	**VPX300-040A02A031R06**	●	2	6	50	16	0.26	31	1.06°	LOGU12
40	**VPX300-040A02A042R08**	●	2	8	60	16	0.31	42	1.06°	LOGU12
50	**VPX300-050A03A031R09**	●	3	9	55	22	0.47	31	0.79°	LOGU12
50	**VPX300-050A03A042R12**	●	3	12	65	22	0.55	42	0.79°	LOGU12
50	**VPX300-050A03A052R15**	●	3	15	75	22	0.63	52	0.79°	LOGU12
63	**VPX300-063A04A042R16**	●	4	16	65	27	0.92	42	0.6°	LOGU12
63	**VPX300-063A04A052R20**	●	4	20	75	27	1.06	52	0.6°	LOGU12
80	**VPX300-080A05A052R25**	●	5	25	75	27	1.94	52	0.45°	LOGU12
80	**VPX300-080A05A063R30**	●	5	30	85	27	2.20	63	0.45°	LOGU12

DCON = Inch size

DC (mm)	Order Number	Stock	Number of Flutes	Total	Dimensions(mm)		**WT** (kg)	**APMX** (mm)	**RMPX**	Insert Type *
		R			**LF**	**DCON**				
80	**VPX300R08005CA05225**	●	5	25	75	31.75	1.81	52	0.45°	LOGU12
80	**VPX300R08005CA06330**	●	5	30	85	31.75	2.06	63	0.45°	LOGU12

* Corner radius RE 0.8mm is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE 0.2mm and 0.4 mm can also be used for the peripheral cutting edges.

Mounting Dimensions

DC (mm)	Order Number	Dimensions(mm)							
		DCON	**CBDP**	**DAH**	**DCCB**	**LCCB**	**DCSFMS**	**KWW**	**L8**
40	**VPX300-040A02A031R06**	16	18	9	14	8.4	37	8.4	5.6
40	**VPX300-040A02A042R08**	16	18	9	14	8.4	37	8.4	5.6
50	**VPX300-050A03A031R09**	22	20	11	17	12.4	47	10.4	6.3
50	**VPX300-050A03A042R12**	22	20	11	17	12.4	47	10.4	6.3
50	**VPX300-050A03A052R15**	22	20	11	17	12.4	47	10.4	6.3
63	**VPX300-063A04A042R16**	27	23	13	20	12.4	76	12.4	7.0
63	**VPX300-063A04A052R20**	27	23	13	20	12.4	76	12.4	7.0
80	**VPX300-080A05A052R25**	27	23	13	20	12.4	76	12.4	7.0
80	**VPX300-080A05A063R30**	27	23	13	20	12.4	76	12.4	7.0
80	**VPX300R08005CA05225**	31.75	32	17	26	17.4	76	12.7	8.0
80	**VPX300R08005CA06330**	31.75	32	17	26	17.4	76	12.7	8.0

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

SPARE PARTS ➤L165

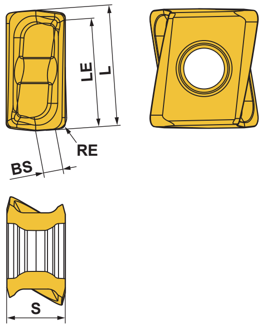
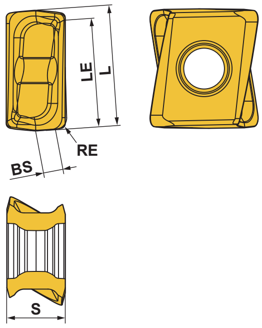
VPX300 Including long types for deep cutting

INSERTS

Workpiece Material			MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	TF15
Workpiece Material	P	Steels		◐	✤				◐	
	M	Stainless Steels				◐			◐	
	K	Cast Irons	◐						✤	
	N	Non-ferrous Metals								◐
	S	Heat Resistant Alloys, Titanium Alloys					◐	✤	◐	
	H	Hardened Steels							◐	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Edge Preparation :
E : Round **F** : Sharp

				Coated							Carbide	Dimensions(mm)					
Shape	Order Number	Class	Edge Preparation	MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	TF15	L	RE	LE	S	BS	Geometry
Low Cutting Resistance L Breaker NEW 	**LOGU1207020PNER-L**	G	E	●	●	●	●	●	●	●		12.4	0.2	11.3	7.0	3.0	
	LOGU1207040PNER-L	G	E	●	●	●	●	●	●	●		12.4	0.4	11.3	7.0	2.8	
	LOGU1207080PNER-L	G	E	●	●	●	●	●	●	●		12.4	0.8	11.3	7.0	2.6	
	LOGU1207100PNER-L	G	E	●	●	●	●	●	●	●		12.4	1.0	11.3	7.0	2.5	
	LOGU1207120PNER-L	G	E	●	●	●	●	●	●	●		12.4	1.2	11.3	7.0	2.4	
	LOGU1207160PNER-L	G	E	●	●	●	●	●	●	●		12.4	1.6	11.3	7.0	1.8	
	LOGU1207200PNER-L	G	E	●	●	●	●	●	●	●		12.4	2.0	11.3	7.0	1.4	
	LOGU1207240PNER-L	G	E	●	●	●	●	●	●	●		12.4	2.4	11.3	7.0	1.2	
	LOGU1207300PNER-L	G	E	●	●	●	●	●	●	●		12.4	3.0	11.3	7.0	0.6	
	LOGU1207320PNER-L	G	E	●	●	●	●	●	●	●		12.4	3.2	11.3	7.0	0.4	
	LOGU1207020PNFR-L	G	F								●	12.4	0.2	11.3	7.0	3.0	
	LOGU1207040PNFR-L	G	F								●	12.4	0.4	11.3	7.0	2.8	
	LOGU1207080PNFR-L	G	F								●	12.4	0.8	11.3	7.0	2.6	
	LOGU1207100PNFR-L	G	F								●	12.4	1.0	11.3	7.0	2.5	
	LOGU1207120PNFR-L	G	F								●	12.4	1.2	11.3	7.0	2.4	
	LOGU1207160PNFR-L	G	F								●	12.4	1.6	11.3	7.0	1.8	
	LOGU1207200PNFR-L	G	F								●	12.4	2.0	11.3	7.0	1.4	
	LOGU1207240PNFR-L	G	F								●	12.4	2.4	11.3	7.0	1.2	
	LOGU1207300PNFR-L	G	F								●	12.4	3.0	11.3	7.0	0.6	
	LOGU1207320PNFR-L	G	F								●	12.4	3.2	11.3	7.0	0.4	Right hand insert only.
General Use M Breaker 	**LOGU1207020PNER-M**	G	E	●	●	●	●	●	●	●		12.4	0.2	11.3	7.0	3.0	
	LOGU1207040PNER-M	G	E	●	●	●	●	●	●	●		12.4	0.4	11.3	7.0	2.8	
	LOGU1207080PNER-M	G	E	●	●	●	●	●	●	●		12.4	0.8	11.3	7.0	2.4	
	LOGU1207100PNER-M	G	E	●	●	●	●	●	●	●		12.4	1.0	11.3	7.0	2.3	
	LOGU1207120PNER-M	G	E	●	●	●	●	●	●	●		12.4	1.2	11.3	7.0	2.1	
	LOGU1207160PNER-M	G	E	●	●	●	●	●	●	●		12.4	1.6	11.3	7.0	1.7	
	LOGU1207200PNER-M	G	E	●	●	●	●	●	●	●		12.4	2.0	11.3	7.0	1.4	
	LOGU1207240PNER-M	G	E	●	●	●	●	●	●	●		12.4	2.4	11.3	7.0	1.0	
	LOGU1207300PNER-M	G	E	●	●	●	●	●	●	●		12.4	3.0	11.3	7.0	0.5	
	LOGU1207320PNER-M	G	E	●	●	●	●	●	●	●		12.4	3.2	11.3	7.0	0.3	
	LOGU1207020PNFR-M	G	F								●	12.4	0.2	11.3	7.0	3.0	
	LOGU1207040PNFR-M	G	F								●	12.4	0.4	11.3	7.0	2.8	
	LOGU1207080PNFR-M	G	F								●	12.4	0.8	11.3	7.0	2.4	
	LOGU1207100PNFR-M	G	F								●	12.4	1.0	11.3	7.0	2.3	
	LOGU1207120PNFR-M	G	F								●	12.4	1.2	11.3	7.0	2.1	
	LOGU1207160PNFR-M	G	F								●	12.4	1.6	11.3	7.0	1.7	
	LOGU1207200PNFR-M	G	F								●	12.4	2.0	11.3	7.0	1.4	
	LOGU1207240PNFR-M	G	F								●	12.4	2.4	11.3	7.0	1.0	
	LOGU1207300PNFR-M	G	F								●	12.4	3.0	11.3	7.0	0.5	
	LOGU1207320PNFR-M	G	F								●	12.4	3.2	11.3	7.0	0.3	Right hand insert only.

ISO13399 ➤ **L003**
CUTTING CONDITIONS ➤ **L168－L192**
SPARE PARTS ➤ **P001**
TECHNICAL DATA ➤ **Q001**

VPX200/300

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

RECOMMENDED CUTTING CONDITIONS

■ Breaker Selection Table by Workpiece Material Cutting State

	Workpiece Material	Characteristics	Cutting Conditions	Breaker		Grade	
				1st Recommended	2nd Recommended	1st Recommended	2nd Recommended
P	Mild Steel	Hardness ≤180HB	● ◐	L	M	MP6120	VP15TF
			✣	M	L	MP6130	—
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180-350HB ≤350HB (Annealing)	●	L	M	MP6120	VP15TF
			◐	M	L	MP6120	VP15TF
			✣	M	L	MP6130	—
	Pre-hardened Steel	Hardness 35—45HRC	● ◐	M	L	MP6120	VP15TF
			✣	M	L	MP6130	—
M	Austenitic Stainless Steel	Hardness ≤280HB	● ◐	L	M	MP7130	VP15TF
			✣	M	L	MP7130	—
		Hardness >200HB	● ◐	L	M	MP7130	VP15TF
			✣	M	L	MP7130	—
	Duplex Stainless Steel	Hardness ≤280HB	● ◐	L	M	MP7130	VP15TF
			✣	M	L	MP7130	—
	Ferritic and Martensitic Stainless Steel	—	● ◐	L	M	MP7130	VP15TF
			✣	M	L	MP7130	—
	Precipitation-Hardening Stainless Steel	Hardness <450HB	● ◐	L	M	MP7130	VP15TF
			✣	M	L	MP7130	—
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ◐	M	L	MC5020	VP15TF
			✣	M	L	VP15TF	—
	Ductile Cast Iron	Tensile Strength ≤800MPa	● ◐	M	L	MC5020	VP15TF
			✣	M	L	VP15TF	—
N	Aluminium Alloy	Content Si<5%	● ◐	L	M	TF15	—
			✣	M	L	TF15	—
S	Titanium Alloy (Ti-6Al-4V,etc.)	—	● ◐	L	M	MP9120	VP15TF
			✣	M	L	MP9130	—
	Titanium Alloy (Ti-5Al-5V-5Mo-3Cr,etc.)	—	● ◐	L	M	MP9120	VP15TF
			✣	M	L	MP9130	—
	Heat Resistant Alloy	—	● ◐	M	L	MP9120	VP15TF
			✣	M	L	MP9130	—
H	Hardened Steel	Hardness 40—55HRC	● ◐ ✣	M	—	VP15TF	—

The following table shows recommended conditions for dry cutting and wet cutting accordingly.

VPX200

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

■ Dry cutting
Cutting Speed

	Workpiece Material	Characteristics	Cutting Conditions	Grade	ae (mm)			
					≤0.25DC	0.25—0.5DC	0.5—0.75DC	DC(Slot)
					vc (m/min)			
P	Mild Steel	Hardness ≤180HB	● ◐	MP6120,VP15TF	230 (180—270)	220 (170—260)	180 (140—210)	180 (140—210)
			✤	MP6130	200 (150—240)	190 (140—230)	150 (110—180)	150 (110—180)
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—350HB ≤350HB (Annealing)	● ◐	MP6120,VP15TF	180 (140—210)	170 (130—200)	140 (110—160)	140 (110—160)
			✤	MP6130	150 (110—180)	140 (100—170)	110 (80—130)	110 (80—130)
	Pre-hardened Steel	Hardness 35—45HRC	● ◐	MP6120,VP15TF	120 (90—140)	110 (80—130)	100 (70—120)	100 (70—120)
			✤	MP6130	100 (80—120)	90 (70—110)	80 (60—100)	80 (60—100)
M	Austenitic Stainless Steel	Hardness ≤200HB	● ◐ ✤	MP7130,VP15TF	180 (140—210)	170 (130—200)	140 (110—160)	140 (110—160)
		Hardness >200HB	● ◐ ✤	MP7130,VP15TF	150 (110—180)	140 (100—160)	110 (80—130)	110 (80—130)
	Duplex Stainless Steel	Hardness ≤280HB	● ◐ ✤	MP7130,VP15TF	140 (110—170)	130 (90—150)	100 (70—120)	100 (70—120)
	Ferritic and Martensitic Stainless Steel	—	● ◐ ✤	MP7130,VP15TF	180 (140—210)	170 (130—200)	140 (110—160)	140 (110—160)
	Precipitation-Hardening Stainless Steel	Hardness <450HB	● ◐ ✤	MP7130,VP15TF	130 (100—160)	120 (80—140)	90 (60—110)	90 (60—110)
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ◐	MC5020	250 (200—300)	240 (190—290)	210 (160—260)	210 (160—260)
			● ◐ ✤	VP15TF	200 (150—250)	190 (140—240)	160 (110—210)	160 (110—210)
	Ductile Cast Iron	Tensile Strength ≤800MPa	● ◐	MC5020	180 (150—200)	170 (140—190)	150 (120—170)	150 (120—170)
			● ◐ ✤	VP15TF	130 (100—150)	120 (90—140)	100 (80—120)	100 (80—120)
N	Aluminium Alloy	Content Si<5%	● ◐ ✤	TF15	600 (400—1000)	600 (400—1000)	600 (400—1000)	600 (400—1000)
H	Hardened Steel	Hardness 40—55HRC	● ◐ ✤	VP15TF	90 (70—100)	85 (60—100)	70 (50—80)	70 (50—80)

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

VPX200

RECOMMENDED CUTTING CONDITIONS

■ Dry cutting

Depth of Cut / Feed per Tooth

Workpiece Material		Characteristics	ae (mm)	Cutting Conditions	DC (mm)					
					ø16—ø18		ø20—ø25		ø28—ø63	
					ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)
P	Mild Steel	Hardness ≦180HB	≦0.25DC	● ◐ ✣	≦6	0.10—0.15	≦8	0.10—0.20	≦8	0.10—0.25
			0.25—0.5DC	● ◐ ✣	≦5	0.08—0.12	≦8	0.10—0.15	≦8	0.10—0.20
			0.5—0.75DC	● ◐ ✣	≦4	0.08—0.12	≦6	0.08—0.12	≦6	0.10—0.15
			DC(Slot)	● ◐ ✣	≦2	0.06—0.10	≦4	0.06—0.10	≦4	0.08—0.12
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	≦0.25DC	● ◐ ✣	≦6	0.10—0.15	≦8	0.10—0.20	≦8	0.10—0.25
			0.25—0.5DC	● ◐ ✣	≦5	0.08—0.12	≦8	0.10—0.15	≦8	0.10—0.20
			0.5—0.75DC	● ◐ ✣	≦4	0.08—0.12	≦6	0.08—0.12	≦6	0.10—0.15
			DC(Slot)	● ◐ ✣	≦2	0.06—0.10	≦4	0.06—0.10	≦4	0.08—0.12
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280—350HB ≦350HB (Annealing)	≦0.25DC	● ◐ ✣	≦6	0.10—0.15	≦8	0.10—0.15	≦8	0.10—0.20
			0.25—0.5DC	● ◐ ✣	≦5	0.08—0.12	≦8	0.08—0.12	≦8	0.10—0.15
			0.5—0.75DC	● ◐ ✣	≦4	0.08—0.12	≦6	0.06—0.10	≦6	0.08—0.12
			DC(Slot)	● ◐ ✣	≦2	0.06—0.10	≦4	0.06—0.10	≦4	0.05—0.10
	Pre-hardened Steel	Hardness 35—45HRC	≦0.25DC	● ◐ ✣	≦6	0.10—0.15	≦8	0.10—0.15	≦8	0.10—0.20
			0.25—0.5DC	● ◐ ✣	≦5	0.08—0.12	≦8	0.08—0.12	≦8	0.10—0.15
			0.5—0.75DC	● ◐ ✣	≦4	0.08—0.12	≦6	0.06—0.10	≦6	0.08—0.12
			DC(Slot)	● ◐ ✣	≦2	0.06—0.10	≦4	0.06—0.10	≦4	0.06—0.10
M	Austenitic Stainless Steel	–	≦0.25DC	● ◐	≦6	0.10—0.15	≦8	0.10—0.20	≦8	0.10—0.20
				✣	≦6	0.08—0.12	≦8	0.08—0.15	≦8	0.08—0.15
			0.25—0.5DC	● ◐	≦5	0.08—0.12	≦8	0.08—0.15	≦8	0.08—0.15
				✣	≦5	0.06—0.10	≦8	0.08—0.12	≦8	0.08—0.12
			0.5—0.75DC	● ◐	≦4	0.06—0.10	≦6	0.08—0.12	≦6	0.08—0.12
				✣	≦4	0.06—0.08	≦6	0.06—0.10	≦6	0.06—0.10
			DC(Slot)	● ◐	≦2	0.06—0.10	≦4	0.06—0.10	≦4	0.06—0.10
				✣	≦2	0.06—0.08	≦4	0.06—0.08	≦4	0.06—0.08
	Duplex Stainless Steel	Hardness ≦280HB	≦0.25DC	● ◐	≦6	0.10—0.15	≦8	0.10—0.20	≦8	0.10—0.20
				✣	≦6	0.08—0.12	≦8	0.08—0.15	≦8	0.08—0.15
			0.25—0.5DC	● ◐	≦5	0.08—0.12	≦8	0.08—0.15	≦8	0.08—0.15
				✣	≦5	0.06—0.10	≦8	0.08—0.12	≦8	0.08—0.12
			0.5—0.75DC	● ◐	≦4	0.06—0.10	≦6	0.08—0.12	≦6	0.08—0.12
				✣	≦4	0.06—0.08	≦6	0.06—0.10	≦6	0.06—0.10
			DC(Slot)	● ◐	≦2	0.06—0.10	≦4	0.06—0.10	≦4	0.06—0.10
				✣	≦2	0.06—0.08	≦4	0.06—0.08	≦4	0.06—0.08
	Ferritic and Martensitic Stainless Steel	–	≦0.25DC	● ◐	≦6	0.10—0.15	≦8	0.10—0.20	≦8	0.10—0.20
				✣	≦6	0.08—0.12	≦8	0.08—0.15	≦8	0.08—0.15
			0.25—0.5DC	● ◐	≦5	0.08—0.12	≦8	0.08—0.15	≦8	0.08—0.15
				✣	≦5	0.06—0.10	≦8	0.08—0.12	≦8	0.08—0.12
			0.5—0.75DC	● ◐	≦4	0.06—0.10	≦6	0.08—0.12	≦6	0.08—0.12
				✣	≦4	0.06—0.08	≦6	0.06—0.10	≦6	0.06—0.10
			DC(Slot)	● ◐	≦2	0.06—0.10	≦4	0.06—0.10	≦4	0.06—0.10
				✣	≦2	0.06—0.08	≦4	0.06—0.08	≦4	0.06—0.08
	Precipitation-Hardening Stainless Steel	Hardness <450HB	≦0.25DC	● ◐	≦6	0.10—0.15	≦8	0.10—0.15	≦8	0.10—0.15
				✣	≦6	0.08—0.12	≦8	0.08—0.12	≦8	0.08—0.12
			0.25—0.5DC	● ◐	≦5	0.08—0.12	≦8	0.08—0.12	≦8	0.08—0.12
				✣	≦5	0.06—0.10	≦8	0.08—0.12	≦8	0.08—0.12
			0.5—0.75DC	● ◐	≦4	0.06—0.10	≦6	0.06—0.10	≦6	0.06—0.10
				✣	≦4	0.06—0.08	≦6	0.06—0.08	≦6	0.06—0.08
			DC(Slot)	● ◐	≦2	0.06—0.10	≦4	0.06—0.10	≦4	0.06—0.10
				✣	≦2	0.06—0.08	≦4	0.06—0.08	≦4	0.06—0.08

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.

Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.

Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)

Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

	Workpiece Material	Characteristics	ae (mm)	Cutting Conditions	DC (mm)					
					ø16–ø18		**ø20–ø25**		**ø28–ø63**	
					ap (mm)	**fz** (mm/t)	**ap** (mm)	**fz** (mm/t)	**ap** (mm)	**fz** (mm/t)
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤0.25DC	● ◐	≤6	0.10–0.15	≤8	0.10–0.20	≤8	0.10–0.25
				✤	≤6	0.08–0.12	≤8	0.08–0.15	≤8	0.10–0.20
			0.25–0.5DC	● ◐	≤5	0.08–0.12	≤8	0.08–0.15	≤8	0.10–0.20
				✤	≤5	0.06–0.10	≤8	0.08–0.12	≤8	0.10–0.15
			0.5–0.75DC	● ◐	≤4	0.08–0.12	≤6	0.08–0.12	≤6	0.10–0.15
				✤	≤4	0.08–0.12	≤6	0.06–0.10	≤6	0.08–0.12
			DC(Slot)	● ◐	≤2	0.06–0.10	≤4	0.06–0.10	≤4	0.08–0.15
				✤	≤2	0.06–0.08	≤4	0.06–0.08	≤4	0.08–0.10
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤0.25DC	● ◐	≤6	0.10–0.15	≤8	0.10–0.20	≤8	0.10–0.20
				✤	≤6	0.08–0.12	≤8	0.10–0.15	≤8	0.10–0.15
			0.25–0.5DC	● ◐	≤5	0.08–0.12	≤8	0.10–0.15	≤8	0.10–0.15
				✤	≤5	0.06–0.10	≤8	0.08–0.12	≤8	0.08–0.12
			0.5–0.75DC	● ◐	≤4	0.08–0.12	≤6	0.08–0.12	≤6	0.08–0.12
				✤	≤4	0.08–0.12	≤6	0.06–0.10	≤6	0.06–0.10
			DC(Slot)	● ◐	≤2	0.06–0.10	≤4	0.06–0.10	≤4	0.06–0.10
				✤	≤2	0.06–0.08	≤4	0.06–0.08	≤4	0.06–0.08
N	Aluminium Alloy	Content Si< 5%	≤0.25DC	● ◐	≤6	0.10–0.20	≤8	0.10–0.25	≤8	0.10–0.25
				✤	≤6	0.10–0.15	≤8	0.10–0.20	≤8	0.10–0.20
			0.25–0.5DC	● ◐	≤5	0.10–0.15	≤8	0.10–0.20	≤8	0.10–0.20
				✤	≤5	0.08–0.12	≤8	0.10–0.15	≤8	0.10–0.15
			0.5–0.75DC	● ◐	≤4	0.08–0.12	≤6	0.06–0.15	≤6	0.08–0.15
				✤	≤4	0.06–0.10	≤6	0.06–0.15	≤6	0.08–0.15
			DC(Slot)	● ◐	≤2	0.06–0.10	≤4	0.06–0.15	≤4	0.08–0.15
				✤	≤2	0.06–0.08	≤4	0.06–0.12	≤4	0.08–0.12
H	Hardened Steel	Hardness 40–55HRC	≤0.25DC	● ◐	≤4	0.08–0.15	≤4	0.08–0.15	≤4	0.08–0.15
				✤	≤4	0.08–0.12	≤4	0.08–0.12	≤4	0.08–0.12
			0.25–0.5DC	● ◐	≤3	0.08–0.12	≤3	0.08–0.12	≤3	0.08–0.12
				✤	≤3	0.06–0.10	≤3	0.08–0.10	≤3	0.06–0.10
			0.5–0.75DC	● ◐	≤2	0.06–0.10	≤2	0.08–0.10	≤2	0.06–0.10
				✤	≤2	0.06–0.08	≤2	0.06–0.08	≤2	0.06–0.08
			DC(Slot)	● ◐	≤1	0.06–0.10	≤1	0.06–0.10	≤1	0.06–0.10
				✤	≤1	0.06–0.08	≤1	0.06–0.08	≤1	0.06–0.08

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.

Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.

- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.

Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)

Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

VPX200

RECOMMENDED CUTTING CONDITIONS

■ Wet Cutting

Cutting Speed

Workpiece Material		Characteristics	Cutting Conditions	Grade	ae (mm)			
					≤0.25DC	0.25—0.5DC	0.5—0.75DC	DC(Slot)
					vc (m/min)			
P	Mild Steel	Hardness ≤180HB	● ◐ ✤	MP6120 MP6130 VP15TF	140 (100—190)	130 (90—180)	100 (70—120)	100 (70—120)
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—350HB ≤350HB (Annealing)	● ◐ ✤	MP6120 MP6130 VP15TF	120 (90—140)	110 (80—130)	100 (70—120)	100 (70—120)
	Pre-hardened Steel	Hardness 35—45HRC	● ◐ ✤	MP6120 MP6130 VP15TF	100 (80—120)	90 (70—110)	80 (60—100)	80 (60—100)
M	Austenitic Stainless Steel	Hardness ≤200HB	● ◐ ✤	MP7130,VP15TF	120 (100—150)	110 (90—140)	90 (70—120)	90 (70—120)
		Hardness >200HB	● ◐ ✤	MP7130,VP15TF	100 (80—130)	90 (70—110)	70 (50—100)	70 (50—100)
	Duplex Stainless Steel	Hardness ≤280HB	● ◐ ✤	MP7130,VP15TF	100 (80—130)	90 (70—120)	70 (50—100)	70 (50—100)
	Ferritic and Martensitic Stainless Steel	—	● ◐ ✤	MP7130,VP15TF	120 (100—150)	110 (90—140)	90 (70—120)	90 (70—120)
	Precipitation-Hardening Stainless Steel	Hardness <450HB	● ◐ ✤	MP7130,VP15TF	90 (70—120)	80 (60—110)	60 (40—90)	60 (40—90)
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ◐	MC5020	180 (160—220)	170 (150—210)	150 (130—190)	150 (130—190)
			● ◐ ✤	VP15TF	130 (100—150)	120 (90—140)	100 (80—120)	100 (80—120)
	Ductile Cast Iron	Tensile Strength ≤800MPa	● ◐	MC5020	160 (140—180)	150 (130—170)	130 (110—150)	130 (110—150)
			● ◐ ✤	VP15TF	110 (80—140)	100 (70—130)	80 (60—120)	80 (60—120)
N	Aluminium Alloy	Content Si<5%	● ◐ ✤	TF15	600 (400—1000)	600 (400—1000)	600 (400—1000)	600 (400—1000)
S	Titanium Alloy (Ti-6Al-4V,etc.)	—	● ◐	MP9120,VP15TF	50 (40—70)	50 (40—70)	50 (40—70)	50 (40—70)
			✤	MP9130	40 (30—60)	40 (30—60)	40 (30—60)	40 (30—60)
	Titanium Alloy (Ti-5Al-5V-5Mo-3Cr,etc.)	—	● ◐ ✤	MP9120 MP9130 VP15TF	30 (20—40)	30 (20—40)	30 (20—40)	30 (20—40)
	Heat Resistant Alloy	—	● ◐	MP9120,VP15TF	40 (30—60)	40 (30—60)	40 (30—60)	40 (30—60)
			✤	MP9130	30 (20—40)	30 (20—40)	30 (20—40)	30 (20—40)
H	Hardened Steel	Hardness 40—55HRC	● ◐ ✤	VP15TF	90 (70—100)	85 (60—100)	70 (50—80)	70 (50—80)

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.

Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.

Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)

Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Depth of Cut / Feed per Tooth

Workpiece Material		Characteristics	**ae** (mm)	Cutting Conditions	**DC** (mm)					
					ø16–ø18		**ø20–ø25**		**ø28–ø63**	
					ap (mm)	**fz** (mm/t)	**ap** (mm)	**fz** (mm/t)	**ap** (mm)	**fz** (mm/t)
P	Mild Steel	Hardness ≤180HB	≤0.25DC	● ◐ ✤	≤6	0.10–0.15	≤8	0.10–0.20	≤8	0.10–0.25
			0.25–0.5DC	● ◐ ✤	≤5	0.08–0.12	≤8	0.10–0.15	≤8	0.10–0.20
			0.5–0.75DC	● ◐ ✤	≤4	0.08–0.12	≤6	0.08–0.12	≤6	0.10–0.15
			DC(Slot)	● ◐ ✤	≤2	0.06–0.10	≤4	0.06–0.10	≤4	0.08–0.12
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180–280HB	≤0.25DC	● ◐ ✤	≤6	0.10–0.15	≤8	0.10–0.20	≤8	0.10–0.25
			0.25–0.5DC	● ◐ ✤	≤5	0.08–0.12	≤8	0.10–0.15	≤8	0.10–0.20
			0.5–0.75DC	● ◐ ✤	≤4	0.08–0.12	≤6	0.08–0.12	≤6	0.10–0.15
			DC(Slot)	● ◐ ✤	≤2	0.06–0.10	≤4	0.06–0.10	≤4	0.08–0.12
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280–350HB ≤350HB (Annealing)	≤0.25DC	● ◐ ✤	≤6	0.10–0.15	≤8	0.10–0.15	≤8	0.10–0.20
			0.25–0.5DC	● ◐ ✤	≤5	0.08–0.12	≤8	0.08–0.12	≤8	0.10–0.15
			0.5–0.75DC	● ◐ ✤	≤4	0.08–0.12	≤6	0.06–0.10	≤6	0.08–0.12
			DC(Slot)	● ◐ ✤	≤2	0.06–0.10	≤4	0.06–0.10	≤4	0.06–0.10
	Pre-hardened Steel	Hardness 35–45HRC	≤0.25DC	● ◐ ✤	≤6	0.10–0.15	≤8	0.10–0.15	≤8	0.10–0.20
			0.25–0.5DC	● ◐ ✤	≤5	0.08–0.12	≤8	0.08–0.12	≤8	0.10–0.15
			0.5–0.75DC	● ◐ ✤	≤4	0.08–0.12	≤6	0.06–0.10	≤6	0.08–0.12
			DC(Slot)	● ◐ ✤	≤2	0.06–0.10	≤4	0.06–0.10	≤4	0.06–0.10
M	Austenitic Stainless Steel	–	≤0.25DC	● ◐	≤6	0.10–0.15	≤8	0.10–0.20	≤8	0.10–0.20
				✤	≤6	0.08–0.12	≤8	0.08–0.15	≤8	0.08–0.15
			0.25–0.5DC	● ◐	≤5	0.08–0.12	≤8	0.08–0.15	≤8	0.08–0.15
				✤	≤5	0.06–0.10	≤8	0.08–0.12	≤8	0.08–0.12
			0.5–0.75DC	● ◐	≤4	0.06–0.10	≤6	0.08–0.12	≤6	0.08–0.12
				✤	≤4	0.06–0.08	≤6	0.06–0.10	≤6	0.06–0.10
			DC(Slot)	● ◐	≤2	0.06–0.10	≤4	0.06–0.10	≤4	0.06–0.10
				✤	≤2	0.06–0.08	≤4	0.06–0.08	≤4	0.06–0.08
	Duplex Stainless Steel	Hardness ≤280HB	≤0.25DC	● ◐	≤6	0.10–0.15	≤8	0.10–0.20	≤8	0.10–0.20
				✤	≤6	0.08–0.12	≤8	0.08–0.15	≤8	0.08–0.15
			0.25–0.5DC	● ◐	≤5	0.08–0.12	≤8	0.08–0.15	≤8	0.08–0.12
				✤	≤5	0.06–0.10	≤8	0.08–0.12	≤8	0.08–0.12
			0.5–0.75DC	● ◐	≤4	0.06–0.10	≤6	0.08–0.12	≤6	0.08–0.12
				✤	≤4	0.06–0.08	≤6	0.06–0.10	≤6	0.06–0.10
			DC(Slot)	● ◐	≤2	0.06–0.10	≤4	0.06–0.10	≤4	0.06–0.10
				✤	≤2	0.06–0.08	≤4	0.06–0.08	≤4	0.06–0.08
	Ferritic and Martensitic Stainless Steel	–	≤0.25DC	● ◐	≤6	0.10–0.15	≤8	0.10–0.20	≤8	0.10–0.20
				✤	≤6	0.08–0.12	≤8	0.08–0.15	≤8	0.08–0.15
			0.25–0.5DC	● ◐	≤5	0.08–0.12	≤8	0.08–0.15	≤8	0.08–0.15
				✤	≤5	0.06–0.10	≤8	0.08–0.12	≤8	0.08–0.12
			0.5–0.75DC	● ◐	≤4	0.06–0.10	≤6	0.08–0.12	≤6	0.08–0.12
				✤	≤4	0.06–0.08	≤6	0.06–0.10	≤6	0.05–0.10
			DC(Slot)	● ◐	≤2	0.06–0.10	≤4	0.06–0.10	≤4	0.05–0.10
				✤	≤2	0.06–0.08	≤4	0.06–0.08	≤4	0.05–0.08
	Precipitation-Hardening Stainless Steel	Hardness <450HB	≤0.25DC	● ◐	≤6	0.10–0.15	≤8	0.10–0.15	≤8	0.10–0.15
				✤	≤6	0.08–0.12	≤8	0.08–0.12	≤8	0.08–0.12
			0.25–0.5DC	● ◐	≤5	0.08–0.12	≤8	0.08–0.12	≤8	0.08–0.12
				✤	≤5	0.06–0.10	≤8	0.08–0.12	≤8	0.08–0.12
			0.5–0.75DC	● ◐	≤4	0.06–0.10	≤6	0.06–0.10	≤6	0.05–0.10
				✤	≤4	0.06–0.08	≤6	0.06–0.08	≤6	0.05–0.08
			DC(Slot)	● ◐	≤2	0.06–0.10	≤4	0.06–0.10	≤4	0.05–0.10
				✤	≤2	0.06–0.08	≤4	0.06–0.08	≤4	0.05–0.08

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.

Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.

Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)

Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

VPX200

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

RECOMMENDED CUTTING CONDITIONS

■ Wet Cutting

Depth of Cut / Feed per Tooth

Workpiece Material		Characteristics	ae (mm)	Cutting Conditions	DC (mm)					
					ø16—ø18		ø20—ø25		ø28—ø63	
					ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤0.25DC	● ◐	≤6	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.25
				✤	≤6	0.08—0.12	≤8	0.08—0.15	≤8	0.10—0.20
			0.25—0.5DC	● ◐	≤5	0.08—0.12	≤8	0.08—0.15	≤8	0.10—0.20
				✤	≤5	0.06—0.10	≤8	0.08—0.12	≤8	0.10—0.15
			0.5—0.75DC	● ◐	≤4	0.08—0.12	≤6	0.06—0.10	≤6	0.10—0.15
				✤	≤4	0.08—0.12	≤6	0.06—0.10	≤6	0.08—0.12
			DC(Slot)	● ◐	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.08—0.15
				✤	≤2	0.06—0.08	≤4	0.06—0.08	≤4	0.06—0.10
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤0.25DC	● ◐	≤6	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.20
				✤	≤6	0.08—0.12	≤8	0.10—0.15	≤8	0.10—0.15
			0.25—0.5DC	● ◐	≤5	0.08—0.12	≤8	0.10—0.15	≤8	0.10—0.15
				✤	≤5	0.06—0.10	≤8	0.08—0.12	≤8	0.08—0.12
			0.5—0.75DC	● ◐	≤4	0.08—0.12	≤6	0.08—0.12	≤6	0.08—0.12
				✤	≤4	0.08—0.12	≤6	0.08—0.12	≤6	0.06—0.10
			DC(Slot)	● ◐	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.06—0.10
				✤	≤2	0.06—0.08	≤4	0.06—0.08	≤4	0.06—0.08
N	Aluminium Alloy	Content Si< 5%	≤0.25DC	● ◐	≤6	0.10—0.20	≤8	0.10—0.25	≤8	0.10—0.25
				✤	≤6	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.20
			0.25—0.5DC	● ◐	≤5	0.10—0.15	≤8	0.10—0.20	≤8	0.10—0.20
				✤	≤5	0.08—0.12	≤8	0.10—0.15	≤8	0.10—0.15
			0.5—0.75DC	● ◐	≤4	0.08—0.12	≤6	0.06—0.15	≤6	0.08—0.15
				✤	≤4	0.06—0.10	≤6	0.06—0.15	≤6	0.08—0.15
			DC(Slot)	● ◐	≤2	0.06—0.10	≤4	0.06—0.15	≤4	0.08—0.15
				✤	≤2	0.06—0.08	≤4	0.06—0.12	≤4	0.08—0.12
S	Titanium Alloy (Ti-6Al-4V,etc.)	–	≤0.25DC	● ◐ ✤	≤6	0.08—0.15	≤8	0.08—0.15	≤8	0.08—0.15
			0.25—0.5DC	● ◐ ✤	≤5	0.08—0.12	≤8	0.08—0.12	≤8	0.08—0.12
			0.5—0.75DC	● ◐ ✤	≤4	0.06—0.10	≤6	0.06—0.10	≤6	0.06—0.10
			DC(Slot)	● ◐ ✤	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.06—0.10
	Titanium Alloy (Ti-5Al-5V-5Mo-3Cr,etc.)	–	≤0.25DC	● ◐ ✤	≤6	0.08—0.12	≤8	0.08—0.12	≤8	0.08—0.12
			0.25—0.5DC	● ◐ ✤	≤5	0.08—0.12	≤8	0.08—0.12	≤8	0.08—0.12
			0.5—0.75DC	● ◐ ✤	≤4	0.06—0.10	≤6	0.06—0.10	≤6	0.06—0.10
			DC(Slot)	● ◐ ✤	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.06—0.10
	Heat Resistant Alloy	–	≤0.25DC	● ◐ ✤	≤6	0.08—0.12	≤8	0.08—0.12	≤8	0.08—0.12
			0.25—0.5DC	● ◐ ✤	≤5	0.08—0.12	≤8	0.08—0.12	≤8	0.08—0.12
			0.5—0.75DC	● ◐ ✤	≤4	0.06—0.10	≤6	0.06—0.10	≤6	0.06—0.10
			DC(Slot)	● ◐ ✤	≤2	0.06—0.10	≤4	0.06—0.10	≤4	0.06—0.10
H	Hardened Steel	Hardness 40—55HRC	≤0.25DC	● ◐	≤4	0.08—0.15	≤4	0.08—0.15	≤4	0.08—0.15
				✤	≤4	0.08—0.12	≤4	0.08—0.12	≤4	0.08—0.12
			0.25—0.5DC	● ◐	≤3	0.08—0.12	≤3	0.08—0.12	≤3	0.08—0.12
				✤	≤3	0.06—0.10	≤3	0.06—0.10	≤3	0.06—0.10
			0.5—0.75DC	● ◐	≤2	0.06—0.10	≤2	0.06—0.10	≤2	0.06—0.10
				✤	≤2	0.06—0.10	≤2	0.06—0.10	≤2	0.06—0.10
			DC(Slot)	● ◐	≤1	0.06—0.10	≤1	0.06—0.10	≤1	0.06—0.10
				✤	≤1	0.06—0.10	≤1	0.06—0.10	≤1	0.06—0.10

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.

Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.

Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)

Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

VPX300

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

RECOMMENDED CUTTING CONDITIONS

■ Dry Cutting

Cutting Speed

	Workpiece Material	Properties	Cutting Conditions	Insert Grade	ae (mm) ≤0.25DC vc (m/min)	ae (mm) 0.25—0.5DC vc (m/min)	ae (mm) 0.5—0.75DC vc (m/min)	ae (mm) DC(Slot) vc (m/min)
P	Mild Steels	Hardness ≤180HB	● ◐	MP6120, VP15TF	230 (180—270)	220 (170—260)	180 (140—210)	180 (140—210)
			✤	MP6130	200 (150—240)	190 (170—260)	150 (110—180)	150 (110—180)
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 180—350HB ≤350HB (Annealing)	● ◐	MP6120, VP15TF	180 (140—210)	170 (130—200)	140 (110—160)	140 (110—180)
			✤	MP6130	150 (110—180)	140 (100—170)	110 (80—130)	110 (80—130)
	Pre-hardened Steels	Hardness 35—45HRC	● ◐	MP6120, VP15TF	120 (90—140)	110 (80—130)	100 (70—120)	100 (70—120)
			✤	MP6130	100 (80—120)	90 (70—110)	80 (60—100)	80 (60—100)
M	Austenitic Stainless Steels	Hardness ≤200HB	● ◐ ✤	MP7130, VP15TF	180 (140—210)	170 (130—200)	140 (110—160)	140 (110—160)
		Hardness >200HB	● ◐ ✤	MP7130, VP15TF	150 (110—180)	140 (100—160)	110 (80—130)	110 (80—130)
	Duplex Stainless Steels	Hardness ≤280HB	● ◐ ✤	MP7130, VP15TF	140 (110—170)	130 (90—150)	100 (70—120)	100 (70—120)
	Ferritic and Martensitic Stainless Steels	—	● ◐ ✤	MP7130, VP15TF	180 (140—210)	170 (130—200)	140 (110—160)	140 (110—160)
	Precipitation-Hardening Stainless Steel	Hardness <450HB	● ◐ ✤	MP7130, VP15TF	130 (100—160)	120 (80—140)	90 (60—110)	90 (60—110)
K	Gray Cast Irons	Tensile Strength ≤350MPa	● ◐	MC5020	250 (200—300)	240 (190—290)	210 (160—260)	210 (160—260)
			● ◐ ✤	VP15TF	200 (150—250)	190 (140—240)	160 (110—210)	160 (110—210)
	Ductile Cast Irons	Tensile Strength ≤800MPa	● ◐	MC5020	180 (150—200)	170 (140—190)	150 (120—170)	150 (120—170)
			● ◐ ✤	VP15TF	130 (100—150)	120 (90—140)	100 (80—120)	100 (80—120)
N	Aluminium Alloys	Content Si<5%	● ◐ ✤	TF15	600 (400—1000)	600 (400—1000)	600 (400—1000)	600 (400—1000)
H	Hardened Steels	Hardness 40—55HRC	● ◐ ✤	VP15TF	90 (70—100)	85 (60—100)	70 (50—80)	70 (50—80)

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.

Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.

Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)

Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

VPX300

RECOMMENDED CUTTING CONDITIONS

■ Dry Cutting

Depth of Cut / Feed per Tooth

	Workpiece Material	Characteristics	ae (mm)	Cutting Conditions	DC (mm)			
					ø25		ø28—ø80	
					ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)
P	Mild Steel	Hardness ≦180HB	≦0.25DC	● ◐ ✤	≦11	0.10—0.20	≦11	0.10—0.30
			0.25—0.5DC	● ◐ ✤	≦11	0.10—0.15	≦11	0.10—0.25
			0.5—0.75DC	● ◐ ✤	≦8	0.08—0.12	≦8	0.10—0.20
			DC(Slot)	● ◐ ✤	≦5	0.06—0.10	≦5	0.08—0.15
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	≦0.25DC	● ◐ ✤	≦11	0.10—0.20	≦11	0.10—0.30
			0.25—0.5DC	● ◐ ✤	≦11	0.10—0.15	≦11	0.10—0.25
			0.5—0.75DC	● ◐ ✤	≦8	0.08—0.12	≦8	0.10—0.20
			DC(Slot)	● ◐ ✤	≦5	0.06—0.10	≦5	0.08—0.15
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280—350HB ≦350HB (Annealing)	≦0.25DC	● ◐ ✤	≦11	0.10—0.15	≦11	0.10—0.25
			0.25—0.5DC	● ◐ ✤	≦11	0.08—0.12	≦11	0.10—0.20
			0.5—0.75DC	● ◐ ✤	≦8	0.06—0.10	≦8	0.10—0.15
			DC(Slot)	● ◐ ✤	≦5	0.06—0.10	≦5	0.08—0.12
	Pre-hardened Steel	Hardness 35—45HRC	≦0.25DC	● ◐ ✤	≦11	0.10—0.15	≦11	0.10—0.25
			0.25—0.5DC	● ◐ ✤	≦11	0.08—0.12	≦11	0.10—0.20
			0.5—0.75DC	● ◐ ✤	≦8	0.06—0.10	≦8	0.10—0.15
			DC(Slot)	● ◐ ✤	≦5	0.06—0.10	≦5	0.08—0.12
M	Austenitic Stainless Steel	—	≦0.25DC	● ◐	≦11	0.10—0.20	≦11	0.10—0.20
				✤	≦11	0.08—0.15	≦11	0.08—0.15
			0.25—0.5DC	● ◐	≦11	0.08—0.15	≦11	0.08—0.15
				✤	≦11	0.08—0.12	≦11	0.08—0.12
			0.5—0.75DC	● ◐	≦8	0.08—0.12	≦8	0.08—0.12
				✤	≦8	0.06—0.10	≦8	0.06—0.10
			DC(Slot)	● ◐	≦5	0.06—0.10	≦5	0.06—0.10
				✤	≦5	0.06—0.08	≦5	0.06—0.08
	Duplex Stainless Steel	Hardness ≦280HB	≦0.25DC	● ◐	≦11	0.10—0.20	≦11	0.10—0.20
				✤	≦11	0.08—0.15	≦11	0.08—0.15
			0.25—0.5DC	● ◐	≦11	0.08—0.15	≦11	0.08—0.15
				✤	≦11	0.08—0.12	≦11	0.08—0.12
			0.5—0.75DC	● ◐	≦8	0.08—0.12	≦8	0.08—0.12
				✤	≦8	0.06—0.10	≦8	0.06—0.10
			DC(Slot)	● ◐	≦5	0.06—0.10	≦5	0.06—0.10
				✤	≦5	0.06—0.08	≦5	0.06—0.08
	Ferritic and Martensitic Stainless Steel	—	≦0.25DC	● ◐	≦11	0.10—0.20	≦11	0.10—0.20
				✤	≦11	0.08—0.15	≦11	0.08—0.15
			0.25—0.5DC	● ◐	≦11	0.08—0.15	≦11	0.08—0.15
				✤	≦11	0.08—0.12	≦11	0.08—0.12
			0.5—0.75DC	● ◐	≦8	0.08—0.12	≦8	0.08—0.12
				✤	≦8	0.06—0.10	≦8	0.06—0.10
			DC(Slot)	● ◐	≦5	0.06—0.10	≦5	0.06—0.10
				✤	≦5	0.06—0.08	≦5	0.06—0.08
	Precipitation-Hardening Stainless Steel	Hardness <450HB	≦0.25DC	● ◐	≦11	0.10—0.15	≦11	0.10—0.15
				✤	≦11	0.08—0.12	≦11	0.08—0.12
			0.25—0.5DC	● ◐	≦11	0.08—0.12	≦11	0.08—0.12
				✤	≦11	0.08—0.12	≦11	0.06—0.10
			0.5—0.75DC	● ◐	≦8	0.06—0.10	≦8	0.06—0.10
				✤	≦8	0.06—0.08	≦8	0.06—0.08
			DC(Slot)	● ◐	≦5	0.06—0.10	≦5	0.06—0.10
				✤	≦5	0.06—0.08	≦5	0.06—0.08

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.

Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.

- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.

Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)

Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

	Workpiece Material	Characteristics	**ae** (mm)	Cutting Conditions	**DC** (mm)			
					ø25		**ø28—ø80**	
					ap (mm)	**fz** (mm/t)	**ap** (mm)	**fz** (mm/t)
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤0.25DC	● ◐	≤11	0.10—0.20	≤11	0.10—0.30
				✤	≤11	0.08—0.15	≤11	0.10—0.25
			0.25—0.5DC	● ◐	≤11	0.08—0.15	≤11	0.10—0.25
				✤	≤11	0.08—0.12	≤11	0.10—0.20
			0.5—0.75DC	● ◐	≤8	0.08—0.12	≤8	0.10—0.20
				✤	≤8	0.06—0.10	≤8	0.08—0.15
			DC(Slot)	● ◐	≤5	0.06—0.10	≤5	0.08—0.15
				✤	≤5	0.06—0.08	≤5	0.08—0.12
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤0.25DC	● ◐	≤11	0.10—0.20	≤11	0.10—0.25
				✤	≤11	0.10—0.15	≤11	0.10—0.20
			0.25—0.5DC	● ◐	≤11	0.10—0.15	≤11	0.10—0.20
				✤	≤11	0.08—0.12	≤11	0.10—0.15
			0.5—0.75DC	● ◐	≤8	0.08—0.12	≤8	0.10—0.15
				✤	≤8	0.08—0.12	≤8	0.08—0.12
			DC(Slot)	● ◐	≤5	0.06—0.10	≤5	0.08—0.12
				✤	≤5	0.06—0.08	≤5	0.06—0.10
N	Aluminium Alloy	Content Si< 5%	≤0.25DC	● ◐	≤11	0.10—0.25	≤11	0.10—0.25
				✤	≤11	0.10—0.20	≤11	0.10—0.20
			0.25—0.5DC	● ◐	≤11	0.10—0.20	≤11	0.10—0.20
				✤	≤11	0.10—0.15	≤11	0.10—0.15
			0.5—0.75DC	● ◐	≤8	0.06—0.15	≤8	0.08—0.15
				✤	≤8	0.06—0.15	≤8	0.08—0.15
			DC(Slot)	● ◐	≤5	0.06—0.15	≤5	0.08—0.15
				✤	≤5	0.06—0.15	≤5	0.08—0.12
H	Hardened Steel	Hardness 40—55HRC	≤0.25DC	● ◐	≤5	0.08—0.15	≤5	0.08—0.15
				✤	≤5	0.08—0.12	≤5	0.08—0.12
			0.25—0.5DC	● ◐	≤4	0.08—0.12	≤4	0.08—0.12
				✤	≤4	0.06—0.10	≤4	0.06—0.10
			0.5—0.75DC	● ◐	≤3	0.06—0.10	≤3	0.06—0.10
				✤	≤3	0.06—0.08	≤3	0.06—0.08
			DC(Slot)	● ◐	≤2	0.06—0.10	≤2	0.06—0.10
				✤	≤2	0.06—0.08	≤2	0.06—0.08

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.

Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.

Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)

Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

VPX300

RECOMMENDED CUTTING CONDITIONS

■ Wet Cutting

Cutting Speed

	Workpiece Material	Properties	Cutting Conditions	Insert Grade	**ae** (mm)			
					≤0.25DC	0.25—0.5DC	0.5—0.75DC	DC(Slot)
					vc (m/min)			
P	Mild Steels	Hardness ≤180HB	● ◐ ✤	MP6120 MP6130 VP15TF	140 (100—190)	130 (90—180)	100 (70—120)	100 (70—120)
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 180—350HB ≤350HB (Annealing)	● ◐ ✤	MP6120 MP6130 VP15TF	120 (90—140)	110 (80—130)	100 (70—120)	100 (70—120)
	Pre-hardened Steels	Hardness 35—45HRC	● ◐ ✤	MP6120 MP6130 VP15TF	100 (80—120)	90 (70—110)	80 (60—100)	80 (60—100)
M	Austenitic Stainless Steels	Hardness ≤200HB	● ◐ ✤	MP7130, VP15TF	120 (100—150)	110 (90—140)	90 (70—120)	90 (70—120)
		Hardness >200HB	● ◐ ✤	MP7130, VP15TF	100 (80—130)	90 (70—120)	70 (50—100)	70 (50—100)
	Duplex Stainless Steels	Hardness ≤280HB	● ◐ ✤	MP7130, VP15TF	100 (80—130)	90 (70—120)	70 (50—100)	70 (50—100)
	Ferritic and Martensitic Stainless Steels	–	● ◐ ✤	MP7130, VP15TF	120 (100—150)	110 (90—140)	90 (70—120)	90 (70—120)
	Precipitation-Hardening Stainless Steel	Hardness <450HB	● ◐ ✤	MP7130, VP15TF	90 (70—120)	80 (60—110)	60 (40—90)	60 (40—90)
K	Gray Cast Irons	Tensile Strength ≤350MPa	● ◐	MC5020	180 (160—220)	170 (150—210)	150 (130—190)	150 (130—190)
			● ◐ ✤	VP15TF	130 (100—150)	120 (90—140)	100 (80—120)	100 (80—120)
	Ductile Cast Irons	Tensile Strength ≤800MPa	● ◐	MC5020	160 (140—180)	150 (130—170)	130 (110—150)	130 (110—150)
			● ◐ ✤	VP15TF	110 (80—140)	100 (70—130)	80 (60—120)	80 (60—120)
N	Aluminium Alloys	Content Si<5%	● ◐ ✤	TF15	600 (400—1000)	600 (400—1000)	600 (400—1000)	600 (400—1000)
S	Titanium Alloys (Ti-6Al-4V,etc.)	–	● ◐	MP9120, VP15TF	50 (40—70)	50 (40—70)	50 (40—70)	50 (40—70)
			✤	MP9130	40 (30—60)	40 (30—60)	40 (30—60)	40 (30—60)
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr,etc.)	–	● ◐	MP9120, VP15TF	30 (20—40)	30 (20—40)	30 (20—40)	30 (20—40)
			✤	MP9130	30 (20—40)	30 (20—40)	30 (20—40)	30 (20—40)
	Heat Resistant Alloys	–	● ◐	MP9120, VP15TF	40 (30—60)	40 (30—60)	40 (30—60)	40 (30—60)
			✤	MP9130	30 (20—40)	30 (20—40)	30 (20—40)	30 (20—40)
H	Hardened Steels	Hardness 40—55HRC	● ◐ ✤	VP15TF	90 (70—100)	85 (60—100)	70 (50—80)	70 (50—80)

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.

Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.

Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)

Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ❉ : Unstable Cutting

■ Wet Cutting
Depth of Cut / Feed per Tooth

	Workpiece Material	Characteristics	**ae** (mm)	Cutting Conditions	**DC** (mm)			
					ø25		ø28—ø80	
					ap (mm)	**fz** (mm/t)	**ap** (mm)	**fz** (mm/t)
P	Mild Steel	Hardness ≤180HB	≤0.25DC	● ◐ ❉	≤11	0.10—0.20	≤11	0.10—0.30
			0.25—0.5DC	● ◐ ❉	≤11	0.10—0.15	≤11	0.10—0.25
			0.5—0.75DC	● ◐ ❉	≤8	0.08—0.12	≤8	0.10—0.20
			DC(Slot)	● ◐ ❉	≤5	0.06—0.10	≤5	0.08—0.15
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	≤0.25DC	● ◐ ❉	≤11	0.10—0.20	≤11	0.10—0.30
			0.25—0.5DC	● ◐ ❉	≤11	0.10—0.15	≤11	0.10—0.25
			0.5—0.75DC	● ◐ ❉	≤8	0.08—0.12	≤8	0.10—0.20
			DC(Slot)	● ◐ ❉	≤5	0.06—0.10	≤5	0.08—0.15
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280—350HB ≤350HB (Annealing)	≤0.25DC	● ◐ ❉	≤11	0.10—0.15	≤11	0.10—0.25
			0.25—0.5DC	● ◐ ❉	≤11	0.08—0.12	≤11	0.10—0.20
			0.5—0.75DC	● ◐ ❉	≤8	0.06—0.10	≤8	0.10—0.15
			DC(Slot)	● ◐ ❉	≤5	0.06—0.10	≤5	0.08—0.12
	Pre-hardened Steel	Hardness 35—45HRC	≤0.25DC	● ◐ ❉	≤11	0.10—0.15	≤11	0.10—0.25
			0.25—0.5DC	● ◐ ❉	≤11	0.08—0.12	≤11	0.10—0.20
			0.5—0.75DC	● ◐ ❉	≤8	0.06—0.10	≤8	0.10—0.15
			DC(Slot)	● ◐ ❉	≤5	0.06—0.10	≤5	0.08—0.12
M	Austenitic Stainless Steel	–	≤0.25DC	● ◐	≤11	0.10—0.20	≤11	0.10—0.20
				❉	≤11	0.08—0.15	≤11	0.08—0.15
			0.25—0.5DC	● ◐	≤11	0.08—0.12	≤11	0.08—0.15
				❉	≤11	0.06—0.10	≤11	0.08—0.12
			0.5—0.75DC	● ◐	≤8	0.06—0.10	≤8	0.08—0.12
				❉	≤8	0.06—0.10	≤8	0.06—0.10
			DC(Slot)	● ◐	≤5	0.06—0.10	≤5	0.06—0.10
				❉	≤5	0.06—0.08	≤5	0.06—0.08
	Duplex Stainless Steel	Hardness ≤280HB	≤0.25DC	● ◐	≤11	0.10—0.20	≤11	0.10—0.20
				❉	≤11	0.08—0.15	≤11	0.08—0.15
			0.25—0.5DC	● ◐	≤11	0.08—0.15	≤11	0.08—0.15
				❉	≤11	0.08—0.12	≤11	0.08—0.12
			0.5—0.75DC	● ◐	≤8	0.08—0.12	≤8	0.08—0.12
				❉	≤8	0.06—0.10	≤8	0.06—0.10
			DC(Slot)	● ◐	≤5	0.06—0.10	≤5	0.06—0.10
				❉	≤5	0.06—0.08	≤5	0.06—0.08
	Ferritic and Martensitic Stainless Steel	–	≤0.25DC	● ◐	≤11	0.10—0.20	≤11	0.10—0.20
				❉	≤11	0.08—0.15	≤11	0.08—0.15
			0.25—0.5DC	● ◐	≤11	0.08—0.15	≤11	0.08—0.15
				❉	≤11	0.08—0.12	≤11	0.08—0.12
			0.5—0.75DC	● ◐	≤8	0.08—0.12	≤8	0.08—0.12
				❉	≤8	0.06—0.10	≤8	0.06—0.10
			DC(Slot)	● ◐	≤5	0.06—0.10	≤5	0.06—0.10
				❉	≤5	0.06—0.08	≤5	0.06—0.08
	Precipitation-Hardening Stainless Steel	Hardness <450HB	≤0.25DC	● ◐	≤11	0.10—0.15	≤11	0.10—0.15
				❉	≤11	0.08—0.12	≤11	0.08—0.12
			0.25—0.5DC	● ◐	≤11	0.08—0.12	≤11	0.08—0.12
				❉	≤11	0.08—0.12	≤11	0.08—0.12
			0.5—0.75DC	● ◐	≤8	0.06—0.10	≤8	0.06—0.10
				❉	≤8	0.06—0.08	≤8	0.06—0.08
			DC(Slot)	● ◐	≤5	0.06—0.10	≤5	0.06—0.10
				❉	≤5	0.06—0.08	≤5	0.06—0.08

VPX300

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

RECOMMENDED CUTTING CONDITIONS

■ Wet Cutting

Depth of Cut / Feed per Tooth

	Workpiece Material	Characteristics	**ae** (mm)	Cutting Conditions	**DC** (mm)			
					ø25		ø28—ø80	
					ap (mm)	**fz** (mm/t)	**ap** (mm)	**fz** (mm/t)
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤0.25DC	● ◐	≤11	0.10—0.20	≤11	0.10—0.30
				✤	≤11	0.08—0.15	≤11	0.10—0.25
			0.25—0.5DC	● ◐	≤11	0.08—0.15	≤11	0.10—0.25
				✤	≤11	0.08—0.12	≤11	0.10—0.20
			0.5—0.75DC	● ◐	≤8	0.08—0.12	≤8	0.10—0.20
				✤	≤8	0.06—0.10	≤8	0.08—0.15
			DC(Slot)	● ◐	≤5	0.06—0.10	≤5	0.08—0.15
				✤	≤5	0.06—0.08	≤5	0.08—0.12
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤0.25DC	● ◐	≤11	0.10—0.20	≤11	0.10—0.25
				✤	≤11	0.10—0.15	≤11	0.10—0.20
			0.25—0.5DC	● ◐	≤11	0.10—0.15	≤11	0.10—0.20
				✤	≤11	0.08—0.12	≤11	0.10—0.15
			0.5—0.75DC	● ◐	≤8	0.08—0.12	≤8	0.10—0.15
				✤	≤8	0.06—0.10	≤8	0.08—0.12
			DC(Slot)	● ◐	≤5	0.06—0.10	≤5	0.08—0.12
				✤	≤5	0.06—0.08	≤5	0.06—0.10
N	Aluminium Alloy	Content Si<5%	≤0.25DC	● ◐	≤11	0.10—0.25	≤11	0.10—0.25
				✤	≤11	0.10—0.20	≤11	0.10—0.20
			0.25—0.5DC	● ◐	≤11	0.10—0.20	≤11	0.10—0.20
				✤	≤11	0.10—0.15	≤11	0.10—0.15
			0.5—0.75DC	● ◐	≤8	0.06—0.15	≤8	0.08—0.15
				✤	≤8	0.06—0.15	≤8	0.08—0.15
			DC(Slot)	● ◐	≤5	0.06—0.15	≤5	0.08—0.15
				✤	≤5	0.06—0.15	≤5	0.08—0.12
S	Titanium Alloy (Ti-6Al-4V,etc.)	—	≤0.25DC	● ◐ ✤	≤11	0.08—0.15	≤11	0.08—0.15
			0.25—0.5DC	● ◐ ✤	≤11	0.08—0.12	≤11	0.08—0.12
			0.5—0.75DC	● ◐ ✤	≤8	0.06—0.10	≤8	0.06—0.10
			DC(Slot)	● ◐ ✤	≤5	0.06—0.10	≤5	0.06—0.10
	Titanium Alloy (Ti-5Al-5V-5Mo-3Cr,etc.)	—	≤0.25DC	● ◐ ✤	≤11	0.08—0.12	≤11	0.08—0.12
			0.25—0.5DC	● ◐ ✤	≤11	0.08—0.12	≤11	0.08—0.12
			0.5—0.75DC	● ◐ ✤	≤8	0.06—0.10	≤8	0.06—0.10
			DC(Slot)	● ◐ ✤	≤5	0.06—0.10	≤5	0.06—0.10
	Heat Resistant Alloy	—	≤0.25DC	● ◐ ✤	≤11	0.08—0.12	≤11	0.08—0.12
			0.25—0.5DC	● ◐ ✤	≤11	0.08—0.12	≤11	0.08—0.12
			0.5—0.75DC	● ◐ ✤	≤8	0.06—0.10	≤8	0.06—0.10
			DC(Slot)	● ◐ ✤	≤5	0.06—0.10	≤5	0.06—0.10
H	Hardened Steel	Hardness 40—55HRC	≤0.25DC	● ◐	≤5	0.08—0.15	≤5	0.08—0.15
				✤	≤5	0.08—0.12	≤5	0.08—0.12
			0.25—0.5DC	● ◐	≤4	0.08—0.12	≤4	0.08—0.12
				✤	≤4	0.06—0.10	≤4	0.06—0.10
			0.5—0.75DC	● ◐	≤3	0.06—0.10	≤3	0.06—0.10
				✤	≤3	0.06—0.10	≤3	0.06—0.08
			DC(Slot)	● ◐	≤2	0.06—0.10	≤2	0.06—0.10
				✤	≤2	0.06—0.10	≤2	0.06—0.08

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.

Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.

Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)

Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

VPX200/300
DEEP SHOULDER MILLING

RECOMMENDED CUTTING CONDITIONS

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Cutting Speed

	Workpiece Material	Characteristics	Cutting Conditions	Grade	ae (mm)				Cutting Mode
					≤0.25DC	0.25–0.5DC	0.5–0.75DC	DC(Slot)	
					vc (m/min)				
P	Mild Steels	Hardness ≤180HB	● ◐	MP6120,VP15TF	140 (100–190)	130 (90–180)	100 (70–120)	100 (70–120)	Dry, Wet
			✣	MP6130	140 (100–190)	130 (90–180)	100 (70–120)	100 (70–120)	Dry, Wet
	Carbon Steels Alloy Steels	Hardness 180–350HB	● ◐	MP6120,VP15TF	120 (90–140)	110 (80–130)	100 (70–120)	100 (70–120)	Dry, Wet
			✣	MP6130	120 (90–140)	110 (80–130)	100 (70–120)	100 (70–120)	Dry, Wet
	Pre-hardened Steels	Hardness 180–350HB	● ◐	MP6120,VP15TF	100 (80–120)	90 (70–110)	80 (60–100)	80 (60–100)	Dry, Wet
			✣	MP6130	100 (80–120)	90 (70–110)	80 (60–100)	80 (60–100)	Dry, Wet
M	Austenitic Stainless Steels	Hardness ≤200HB	● ◐	MP7130,VP15TF	120 (100–150)	110 (90–140)	90 (70–120)	90 (70–120)	Dry, Wet
			✣	MP7130	120 (100–150)	110 (90–140)	90 (70–120)	90 (70–120)	Dry, Wet
		Hardness >200HB	● ◐	MP7130,VP15TF	100 (80–130)	90 (70–120)	70 (50–100)	70 (50–100)	Dry, Wet
			✣	MP7130	100 (80–130)	90 (70–120)	70 (50–100)	70 (50–100)	Dry, Wet
	Ferritic and Martensitic Stainless Steels	–	● ◐	MP7130,VP15TF	120 (100–150)	110 (90–140)	90 (70–120)	90 (70–120)	Dry, Wet
			✣	MP7130	120 (100–150)	110 (90–140)	90 (70–120)	90 (70–120)	Dry, Wet
	Duplex Stainless Steels	Hardness ≤280HB	● ◐	MP7130,VP15TF	100 (80–130)	90 (70–120)	70 (50–100)	70 (50–100)	Dry, Wet
			✣	MP7130	100 (80–130)	90 (70–120)	70 (50–100)	70 (50–100)	Dry, Wet
	Precipitation-Hardening Stainless Steel	Hardness <450HB	● ◐	MP7130,VP15TF	90 (70–120)	80 (60–110)	60 (40–90)	60 (40–90)	Dry, Wet
			✣	MP7130	90 (70–120)	80 (60–110)	60 (40–90)	60 (40–90)	Dry, Wet
K	Gray Cast Irons	Tensile Strength ≤350MPa	● ◐	MC5020	180 (160–220)	170 (150–210)	150 (130–190)	150 (130–190)	Dry, Wet
			◐ ✣	VP15TF	130 (100–150)	120 (90–140)	100 (80–120)	100 (80–120)	Dry, Wet
	Ductile Cast Irons	Tensile Strength ≤800MPa	● ◐	MC5020	160 (140–180)	150 (130–170)	130 (110–150)	130 (110–150)	Dry, Wet
			◐ ✣	VP15TF	110 (80–140)	100 (70–130)	80 (60–120)	80 (60–120)	Dry, Wet
N	Aluminium Alloys	Content Si<5%	● ◐ ✣	TF15	600 (400–1000)	600 (400–1000)	600 (400–1000)	600 (400–1000)	Dry, Wet
S	Titanium Alloys (Ti-6Al-4V etc.)	–	● ◐	MP9120	50 (40–70)	50 (40–70)	50 (40–70)	50 (40–70)	Wet
			●	VP15TF	50 (40–70)	50 (40–70)	50 (40–70)	50 (40–70)	Wet
			◐ ✣	MP9130	50 (40–70)	50 (40–70)	50 (40–70)	50 (40–70)	Wet
	Titanium Alloys (Ti-6Al-5V-5Mo-3Cr etc.)	–	● ◐	MP9120	30 (20–40)	30 (20–40)	30 (20–40)	30 (20–40)	Wet
			●	VP15TF	30 (20–40)	30 (20–40)	30 (20–40)	30 (20–40)	Wet
			◐ ✣	MP9130	30 (20–40)	30 (20–40)	30 (20–40)	30 (20–40)	Wet
	Heat Resistant Alloys	–	● ◐	MP9120	40 (30–60)	40 (30–60)	40 (30–60)	40 (30–60)	Wet
			●	VP15TF	40 (30–60)	40 (30–60)	40 (30–60)	40 (30–60)	Wet
			◐ ✣	MP9130	40 (30–60)	40 (30–60)	40 (30–60)	40 (30–60)	Wet

Note 1) If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.

Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.

Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)

Note 5) When using under higher than recommended conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

VPX200
DEEP SHOULDER MILLING

RECOMMENDED CUTTING CONDITIONS

Depth of Cut / Feed per Tooth

	Workpiece Material	Characteristics	**ae** (mm)	Cutting Conditions	**DC** (mm)			
					ø20—ø28		**ø32—ø50**	
					ap (mm)	**fz** (mm/t)	**ap** (mm)	**fz** (mm/t)
P	Mild Steels	Hardness ≤180HB	≤0.25DC	● ◐ ✤	≤14	0.13 (0.10—0.15)	≤APMX	0.15 (0.10—0.20)
			0.25—0.5DC	● ◐ ✤	≤8	0.10 (0.08—0.12)	≤28	0.13 (0.10—0.15)
			0.5—0.75DC	● ◐ ✤	≤6	0.10 (0.08—0.12)	≤14	0.10 (0.08—0.12)
			DC(Slot)	● ◐ ✤	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
	Carbon Steels Alloy Steels	Hardness 180—280HB	≤0.25DC	● ◐ ✤	≤14	0.13 (0.10—0.15)	≤APMX	0.15 (0.10—0.20)
			0.25—0.5DC	● ◐ ✤	≤8	0.10 (0.08—0.12)	≤28	0.13 (0.10—0.15)
			0.5—0.75DC	● ◐ ✤	≤6	0.10 (0.08—0.12)	≤14	0.10 (0.08—0.12)
			DC(Slot)	● ◐ ✤	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
	Carbon Steels Alloy Steels	Hardness 280—350HB	≤0.25DC	● ◐ ✤	≤14	0.13 (0.10—0.15)	≤APMX	0.13 (0.10—0.15)
			0.25—0.5DC	● ◐ ✤	≤8	0.10 (0.08—0.12)	≤28	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐ ✤	≤6	0.10 (0.08—0.12)	≤14	0.08 (0.06—0.10)
			DC(Slot)	● ◐ ✤	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
	Pre-hardened Steels	Hardness 35—45HRC	≤0.25DC	● ◐ ✤	≤14	0.13 (0.10—0.15)	≤APMX	0.13 (0.10—0.15)
			0.25—0.5DC	● ◐ ✤	≤8	0.10 (0.08—0.12)	≤28	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐ ✤	≤6	0.10 (0.08—0.12)	≤14	0.08 (0.06—0.10)
			DC(Slot)	● ◐ ✤	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
M	Austenitic Stainless Steels	–	≤0.25DC	● ◐	≤14	0.13 (0.10—0.15)	≤APMX	0.15 (0.10—0.20)
				✤	≤14	0.10 (0.08—0.12)	≤APMX	0.12 (0.08—0.15)
			0.25—0.5DC	● ◐	≤8	0.10 (0.08—0.12)	≤28	0.12 (0.08—0.15)
				✤	≤8	0.08 (0.06—0.10)	≤28	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐	≤6	0.08 (0.06—0.10)	≤14	0.10 (0.08—0.12)
				✤	≤6	0.07 (0.06—0.08)	≤14	0.08 (0.06—0.10)
			DC(Slot)	● ◐	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
				✤	≤4	0.07 (0.06—0.08)	≤4	0.07 (0.06—0.08)
	Ferritic and Martensitic Stainless Steels	Hardness ≤200HB	≤0.25DC	● ◐	≤14	0.13 (0.10—0.15)	≤APMX	0.15 (0.10—0.20)
				✤	≤14	0.10 (0.08—0.12)	≤APMX	0.12 (0.08—0.15)
			0.25—0.5DC	● ◐	≤8	0.10 (0.08—0.12)	≤28	0.12 (0.08—0.15)
				✤	≤8	0.08 (0.06—0.10)	≤28	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐	≤6	0.08 (0.06—0.10)	≤14	0.10 (0.08—0.12)
				✤	≤6	0.07 (0.06—0.08)	≤14	0.08 (0.06—0.10)
			DC(Slot)	● ◐	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
				✤	≤4	0.07 (0.06—0.08)	≤4	0.07 (0.06—0.08)
	Duplex Stainless Steels	Hardness ≤280HB	≤0.25DC	● ◐	≤14	0.13 (0.10—0.15)	≤APMX	0.15 (0.10—0.20)
				✤	≤14	0.10 (0.08—0.12)	≤APMX	0.12 (0.08—0.15)
			0.25—0.5DC	● ◐	≤8	0.10 (0.08—0.12)	≤28	0.12 (0.08—0.15)
				✤	≤8	0.08 (0.06—0.10)	≤28	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐	≤6	0.08 (0.06—0.10)	≤14	0.10 (0.08—0.12)
				✤	≤6	0.07 (0.06—0.08)	≤14	0.08 (0.06—0.10)
			DC(Slot)	● ◐	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
				✤	≤4	0.07 (0.06—0.08)	≤4	0.07 (0.06—0.08)
	Precipitation-Hardening Stainless Steel	Hardness <450HB	≤0.25DC	● ◐	≤14	0.13 (0.10—0.15)	≤APMX	0.13 (0.10—0.15)
				✤	≤14	0.10 (0.08—0.12)	≤APMX	0.10 (0.08—0.12)
			0.25—0.5DC	● ◐	≤8	0.10 (0.08—0.12)	≤28	0.10 (0.08—0.12)
				✤	≤8	0.08 (0.06—0.10)	≤28	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐	≤6	0.08 (0.06—0.10)	≤14	0.08 (0.06—0.10)
				✤	≤6	0.07 (0.06—0.08)	≤14	0.07 (0.06—0.08)
			DC(Slot)	● ◐	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
				✤	≤4	0.07 (0.06—0.08)	≤4	0.07 (0.06—0.08)

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Workpiece Material		Characteristics	**ae** (mm)	Cutting Conditions	**DC** (mm)			
					ø20—ø28		**ø32—ø50**	
					ap (mm)	**fz** (mm/t)	**ap** (mm)	**fz** (mm/t)
K	Gray Cast Irons	Tensile Strength ≤350MPa	≤0.25DC	● ◐	≤14	0.13 (0.10—0.15)	≤APMX	0.15 (0.10—0.20)
				✤	≤14	0.10 (0.08—0.12)	≤APMX	0.12 (0.08—0.15)
			0.25—0.5DC	● ◐	≤8	0.10 (0.08—0.12)	≤28	0.12 (0.08—0.15)
				✤	≤8	0.08 (0.06—0.10)	≤28	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐	≤6	0.10 (0.08—0.12)	≤14	0.10 (0.08—0.12)
				✤	≤6	0.08 (0.06—0.10)	≤14	0.08 (0.06—0.10)
			DC(Slot)	● ◐	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
				✤	≤4	0.07 (0.06—0.08)	≤4	0.07 (0.06—0.08)
	Ductile Cast Irons	–	≤0.25DC	● ◐	≤14	0.13 (0.10—0.15)	≤APMX	0.15 (0.10—0.20)
				✤	≤14	0.10 (0.08—0.12)	≤APMX	0.13 (0.10—0.15)
			0.25—0.5DC	● ◐	≤8	0.10 (0.08—0.12)	≤28	0.13 (0.10—0.15)
				✤	≤8	0.08 (0.06—0.10)	≤28	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐	≤6	0.10 (0.08—0.12)	≤14	0.10 (0.08—0.12)
				✤	≤6	0.08 (0.06—0.10)	≤14	0.08 (0.06—0.10)
			DC(Slot)	● ◐	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
				✤	≤4	0.07 (0.06—0.08)	≤4	0.07 (0.06—0.08)
N	Aluminium Alloys	Content Si<5%	≤0.25DC	● ◐	≤14	0.15 (0.10—0.20)	≤APMX	0.18 (0.10—0.25)
				✤	≤14	0.13 (0.10—0.15)	≤APMX	0.15 (0.10—0.20)
			0.25—0.5DC	● ◐	≤8	0.13 (0.10—0.15)	≤28	0.15 (0.10—0.20)
				✤	≤8	0.10 (0.08—0.12)	≤28	0.13 (0.10—0.15)
			0.5—0.75DC	● ◐	≤6	0.10 (0.08—0.12)	≤14	0.11 (0.06—0.15)
				✤	≤6	0.08 (0.06—0.10)	≤14	0.11 (0.06—0.15)
			DC(Slot)	● ◐	≤4	0.08 (0.06—0.10)	≤4	0.11 (0.06—0.15)
				✤	≤4	0.07 (0.06—0.08)	≤4	0.09 (0.06—0.12)
S	Titanium Alloys (Ti-6Al-4V etc.)	–	≤0.25DC	● ◐ ✤	≤14	0.12 (0.08—0.15)	≤APMX	0.12 (0.08—0.15)
			0.25—0.5DC	● ◐ ✤	≤8	0.10 (0.08—0.12)	≤28	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐ ✤	≤6	0.08 (0.06—0.10)	≤14	0.08 (0.06—0.10)
			DC(Slot)	● ◐ ✤	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr etc.)	–	≤0.25DC	● ◐ ✤	≤14	0.10 (0.08—0.12)	≤APMX	0.10 (0.08—0.12)
			0.25—0.5DC	● ◐ ✤	≤8	0.10 (0.08—0.12)	≤28	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐ ✤	≤6	0.08 (0.06—0.10)	≤14	0.08 (0.06—0.10)
			DC(Slot)	● ◐ ✤	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)
	Heat Resistant Alloys	–	≤0.25DC	● ◐ ✤	≤14	0.10 (0.08—0.12)	≤APMX	0.10 (0.08—0.12)
			0.25—0.5DC	● ◐ ✤	≤8	0.10 (0.08—0.12)	≤28	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐ ✤	≤6	0.08 (0.06—0.10)	≤14	0.08 (0.06—0.10)
			DC(Slot)	● ◐ ✤	≤4	0.08 (0.06—0.10)	≤4	0.08 (0.06—0.10)

Note 1) If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.

Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.

Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)

Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

VPX300
DEEP SHOULDER MILLING

RECOMMENDED CUTTING CONDITIONS

Depth of Cut / Feed per Tooth

	Workpiece Material	Characteristics	**ae** (mm)	Cutting Conditions	**DC** (mm)			
					ø40		**ø50—ø80**	
					ap (mm)	**fz** (mm/t)	**ap** (mm)	**fz** (mm/t)
P	Mild Steels	Hardness ≤180HB	≤0.25DC	● ◔ ⊕	≤APMX	0.15(0.10—0.20)	≤APMX	0.18(0.10—0.25)
			0.25—0.5DC	● ◔ ⊕	≤APMX	0.13(0.10—0.15)	≤31	0.15(0.10—0.20)
			0.5—0.75DC	● ◔ ⊕	≤21	0.10(0.08—0.12)	≤21	0.13(0.10—0.15)
			DC(Slot)	● ◔ ⊕	≤5	0.08(0.06—0.10)	≤5	0.10(0.08—0.12)
	Carbon Steels Alloy Steels	Hardness 180—280HB	≤0.25DC	● ◔ ⊕	≤APMX	0.15(0.10—0.20)	≤APMX	0.18(0.10—0.25)
			0.25—0.5DC	● ◔ ⊕	≤APMX	0.13(0.10—0.15)	≤31	0.15(0.10—0.20)
			0.5—0.75DC	● ◔ ⊕	≤21	0.10(0.08—0.12)	≤21	0.13(0.10—0.15)
			DC(Slot)	● ◔ ⊕	≤5	0.08(0.06—0.10)	≤5	0.10(0.08—0.12)
	Carbon Steels Alloy Steels	Hardness 280—350HB	≤0.25DC	● ◔ ⊕	≤APMX	0.13(0.10—0.15)	≤APMX	0.15(0.10—0.20)
			0.25—0.5DC	● ◔ ⊕	≤APMX	0.10(0.08—0.12)	≤31	0.13(0.10—0.15)
			0.5—0.75DC	● ◔ ⊕	≤21	0.08(0.06—0.10)	≤21	0.10(0.08—0.12)
			DC(Slot)	● ◔ ⊕	≤5	0.08(0.06—0.10)	≤5	0.08(0.06—0.10)
	Pre-hardened Steels	Hardness 35—45HRC	≤0.25DC	● ◔ ⊕	≤APMX	0.13(0.10—0.15)	≤APMX	0.15(0.10—0.20)
			0.25—0.5DC	● ◔ ⊕	≤APMX	0.10(0.08—0.12)	≤31	0.13(0.10—0.15)
			0.5—0.75DC	● ◔ ⊕	≤21	0.08(0.06—0.10)	≤21	0.10(0.08—0.12)
			DC(Slot)	● ◔ ⊕	≤5	0.08(0.06—0.10)	≤5	0.08(0.06—0.10)
M	Austenitic Stainless Steels	—	≤0.25DC	● ◔	≤APMX	0.15(0.10—0.20)	≤APMX	0.15(0.10—0.20)
				⊕	≤APMX	0.12(0.08—0.15)	≤APMX	0.12(0.08—0.15)
			0.25—0.5DC	● ◔	≤APMX	0.12(0.08—0.15)	≤31	0.12(0.08—0.15)
				⊕	≤APMX	0.10(0.08—0.12)	≤31	0.10(0.08—0.12)
			0.5—0.75DC	● ◔	≤21	0.10(0.08—0.12)	≤21	0.10(0.08—0.12)
				⊕	≤21	0.08(0.06—0.10)	≤21	0.08(0.06—0.10)
			DC(Slot)	● ◔	≤5	0.08(0.06—0.10)	≤5	0.08(0.06—0.10)
				⊕	≤5	0.07(0.06—0.08)	≤5	0.07(0.06—0.08)
	Ferritic and Martensitic Stainless Steels	Hardness ≤200HB	≤0.25DC	● ◔	≤APMX	0.15(0.10—0.20)	≤APMX	0.15(0.10—0.20)
				⊕	≤APMX	0.12(0.08—0.15)	≤APMX	0.12(0.08—0.15)
			0.25—0.5DC	● ◔	≤APMX	0.12(0.08—0.15)	≤31	0.12(0.08—0.15)
				⊕	≤APMX	0.10(0.08—0.12)	≤31	0.10(0.08—0.12)
			0.5—0.75DC	● ◔	≤21	0.10(0.08—0.12)	≤21	0.10(0.08—0.12)
				⊕	≤21	0.08(0.06—0.10)	≤21	0.08(0.05—0.10)
			DC(Slot)	● ◔	≤5	0.08(0.06—0.10)	≤5	0.08(0.05—0.10)
				⊕	≤5	0.07(0.06—0.08)	≤5	0.07(0.05—0.08)
	Duplex Stainless Steels	Hardness ≤280HB	≤0.25DC	● ◔	≤APMX	0.15(0.10—0.20)	≤APMX	0.15(0.10—0.20)
				⊕	≤APMX	0.12(0.08—0.15)	≤APMX	0.12(0.08—0.15)
			0.25—0.5DC	● ◔	≤APMX	0.12(0.08—0.15)	≤31	0.12(0.08—0.15)
				⊕	≤APMX	0.10(0.08—0.12)	≤31	0.10(0.08—0.12)
			0.5—0.75DC	● ◔	≤21	0.10(0.08—0.12)	≤21	0.10(0.08—0.12)
				⊕	≤21	0.08(0.06—0.10)	≤21	0.08(0.06—0.10)
			DC(Slot)	● ◔	≤5	0.08(0.06—0.10)	≤5	0.08(0.06—0.10)
				⊕	≤5	0.07(0.06—0.08)	≤5	0.07(0.06—0.08)
	Precipitation-Hardening Stainless Steel	Hardness <450HB	≤0.25DC	● ◔	≤APMX	0.13(0.10—0.15)	≤APMX	0.13(0.10—0.15)
				⊕	≤APMX	0.10(0.08—0.12)	≤APMX	0.10(0.08—0.12)
			0.25—0.5DC	● ◔	≤APMX	0.10(0.08—0.12)	≤31	0.10(0.08—0.12)
				⊕	≤APMX	0.10(0.08—0.12)	≤31	0.10(0.08—0.12)
			0.5—0.75DC	● ◔	≤21	0.08(0.06—0.10)	≤21	0.08(0.05—0.10)
				⊕	≤21	0.07(0.06—0.08)	≤21	0.07(0.05—0.08)
			DC(Slot)	● ◔	≤5	0.08(0.06—0.10)	≤5	0.08(0.05—0.10)
				⊕	≤5	0.07(0.06—0.08)	≤5	0.07(0.06—0.08)

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Workpiece Material		Characteristics	**ae** (mm)	Cutting Conditions	**DC** (mm)			
					ø40		**ø50—ø80**	
					ap (mm)	**fz** (mm/t)	**ap** (mm)	**fz** (mm/t)
K	Gray Cast Irons	Tensile Strength ≤350MPa	≤0.25DC	● ◐	≤APMX	0.15 (0.10—0.20)	≤APMX	0.18 (0.10—0.25)
				✤	≤APMX	0.12 (0.08—0.15)	≤APMX	0.15 (0.10—0.20)
			0.25—0.5DC	● ◐	≤APMX	0.12 (0.08—0.15)	≤31	0.15 (0.10—0.20)
				✤	≤APMX	0.10 (0.08—0.12)	≤31	0.13 (0.10—0.15)
			0.5—0.75DC	● ◐	≤21	0.10 (0.08—0.12)	≤21	0.13 (0.10—0.15)
				✤	≤21	0.08 (0.06—0.10)	≤21	0.10 (0.08—0.12)
			DC(Slot)	● ◐	≤5	0.08 (0.06—0.10)	≤5	0.12 (0.08—0.15)
				✤	≤5	0.07 (0.06—0.08)	≤5	0.08 (0.06—0.10)
	Ductile Cast Irons	–	≤0.25DC	● ◐	≤APMX	0.15 (0.10—0.20)	≤APMX	0.15 (0.10—0.20)
				✤	≤APMX	0.13 (0.10—0.15)	≤APMX	0.13 (0.10—0.15)
			0.25—0.5DC	● ◐	≤APMX	0.13 (0.10—0.15)	≤31	0.13 (0.10—0.15)
				✤	≤APMX	0.10 (0.08—0.12)	≤31	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐	≤21	0.10 (0.08—0.12)	≤21	0.10 (0.08—0.12)
				✤	≤21	0.08 (0.06—0.10)	≤21	0.08 (0.06—0.10)
			DC(Slot)	● ◐	≤5	0.08 (0.06—0.10)	≤5	0.08 (0.06—0.10)
				✤	≤5	0.07 (0.06—0.08)	≤5	0.07 (0.06—0.08)
N	Aluminium Alloys	Content Si＜5%	≤0.25DC	● ◐	≤APMX	0.18 (0.10—0.25)	≤APMX	0.18 (0.10—0.25)
				✤	≤APMX	0.15 (0.10—0.20)	≤APMX	0.15 (0.10—0.20)
			0.25—0.5DC	● ◐	≤APMX	0.15 (0.10—0.20)	≤31	0.15 (0.10—0.20)
				✤	≤APMX	0.13 (0.10—0.15)	≤31	0.13 (0.10—0.15)
			0.5—0.75DC	● ◐	≤21	0.11 (0.06—0.15)	≤21	0.12 (0.08—0.15)
				✤	≤21	0.11 (0.06—0.15)	≤21	0.12 (0.08—0.15)
			DC(Slot)	● ◐	≤5	0.11 (0.06—0.15)	≤5	0.12 (0.08—0.15)
				✤	≤5	0.09 (0.06—0.12)	≤5	0.10 (0.08—0.12)
S	Titanium Alloys (Ti-6Al-4V etc.)	–	≤0.25DC	● ◐ ✤	≤APMX	0.12 (0.08—0.15)	≤APMX	0.12 (0.08—0.15)
			0.25—0.5DC	● ◐ ✤	≤APMX	0.10 (0.08—0.12)	≤31	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐ ✤	≤21	0.08 (0.06—0.10)	≤21	0.08 (0.06—0.10)
			DC(Slot)	● ◐ ✤	≤5	0.08 (0.06—0.10)	≤5	0.08 (0.06—0.10)
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr etc.)	–	≤0.25DC	● ◐ ✤	≤APMX	0.10 (0.08—0.12)	≤APMX	0.10 (0.08—0.12)
			0.25—0.5DC	● ◐ ✤	≤APMX	0.10 (0.08—0.12)	≤31	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐ ✤	≤21	0.08 (0.06—0.10)	≤21	0.08 (0.06—0.10)
			DC(Slot)	● ◐ ✤	≤5	0.08 (0.06—0.10)	≤5	0.08 (0.06—0.10)
	Heat Resistant Alloys	–	≤0.25DC	● ◐ ✤	≤APMX	0.10 (0.08—0.12)	≤APMX	0.10 (0.08—0.12)
			0.25—0.5DC	● ◐ ✤	≤APMX	0.10 (0.08—0.12)	≤31	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐ ✤	≤21	0.08 (0.06—0.10)	≤21	0.08 (0.06—0.10)
			DC(Slot)	● ◐ ✤	≤5	0.08 (0.06—0.10)	≤5	0.08 (0.06—0.10)

Note 1) If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.

Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket machining

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.

Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)

Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

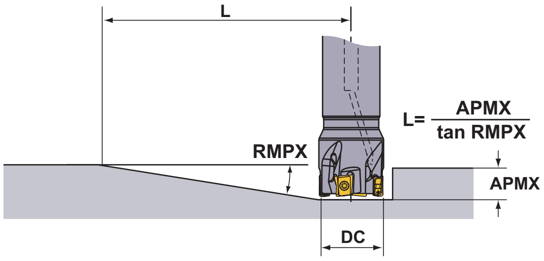
Memo

Memo

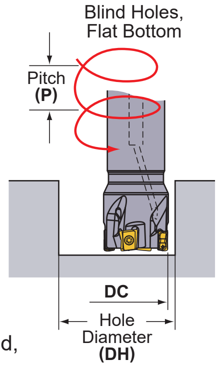
VPX200 Including long types for deep cutting

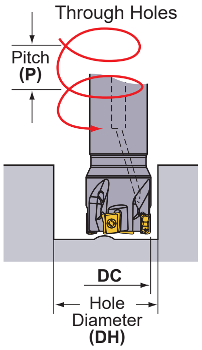
■ Ramping / Helical Milling

● Ramping



● Helical Milling





Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

DC (mm)	RE (mm)	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		RMPX	**L** (mm) *	**DH max.** (mm)	**P max.** (mm)	**DH min.** (mm)	**P max.** (mm)	**DH min.** (mm)	**P max.** (mm)
16	0.2	1.85°	248	31	1.5	27.5	1.2	24.2	0.8
	0.4	1.85°	248	30.6	1.5	27.5	1.2	24.2	0.8
	0.8	1.85°	248	29.8	1.4	27.5	1.2	24.2	0.8
	1	1.85°	248	29.4	1.4	27.5	1.2	24.2	0.8
	1.2	1.85°	248	29	1.3	27.5	1.2	24.2	0.8
	1.6	1.85°	248	28.2	1.2	27.5	1.2	24.2	0.8
18	0.2	1.56°	294	35	1.5	31.5	1.2	28.1	0.9
	0.4	1.56°	294	34.6	1.4	31.5	1.2	28.1	0.9
	0.8	1.56°	294	33.8	1.4	31.5	1.2	28.1	0.9
	1	1.56°	294	33.4	1.3	31.5	1.2	28.1	0.9
	1.2	1.56°	294	33	1.3	31.5	1.2	28.1	0.9
	1.6	1.56°	294	32.2	1.2	31.5	1.2	28.1	0.9
20	0.2	1.35°	340	39	1.4	35.5	1.1	32	0.9
	0.4	1.35°	340	38.6	1.4	35.5	1.1	32	0.9
	0.8	1.35°	340	37.8	1.3	35.5	1.1	32	0.9
	1	1.35°	340	37.4	1.3	35.5	1.1	32	0.9
	1.2	1.35°	340	37	1.3	35.5	1.1	32	0.9
	1.6	1.35°	340	36.2	1.2	35.5	1.1	32	0.9
22	0.2	1.16°	396	43	1.3	39.5	1.1	36	0.9
	0.4	1.16°	396	42.6	1.3	39.5	1.1	36	0.9
	0.8	1.16°	396	41.8	1.3	39.5	1.1	36	0.9
	1	1.16°	396	41.4	1.2	39.5	1.1	36	0.9
	1.2	1.16°	396	41	1.2	39.5	1.1	36	0.9
	1.6	1.16°	396	40.2	1.2	39.5	1.1	36	0.9
25	0.2	0.97°	473	49	1.3	45.5	1.1	42	0.9
	0.4	0.97°	473	48.6	1.3	45.5	1.1	42	0.9
	0.8	0.97°	473	47.8	1.2	45.5	1.1	42	0.9
	1	0.97°	473	47.4	1.2	45.5	1.1	42	0.9
	1.2	0.97°	473	47	1.2	45.5	1.1	42	0.9
	1.6	0.97°	473	46.2	1.1	45.5	1.1	42	0.9
28	0.2	0.84°	546	55	1.2	51.5	1.1	48	0.9
	0.4	0.84°	546	54.6	1.2	51.5	1.1	48	0.9
	0.8	0.84°	546	53.8	1.2	51.5	1.1	48	0.9
	1	0.84°	546	53.4	1.2	51.5	1.1	48	0.9
	1.2	0.84°	546	53	1.2	51.5	1.1	48	0.9
	1.6	0.84°	546	52.2	1.1	51.5	1.1	48	0.9
30	0.2	0.77°	596	59	1.2	55.5	1.1	52	0.9
	0.4	0.77°	596	58.6	1.2	55.5	1.1	52	0.9
	0.8	0.77°	596	57.8	1.2	55.5	1.1	52	0.9
	1	0.77°	596	57.4	1.2	55.5	1.1	52	0.9
	1.2	0.77°	596	57	1.1	55.5	1.1	52	0.9
	1.6	0.77°	596	56.2	1.1	55.5	1.1	52	0.9
32	0.2	0.71°	646	62.8	1.2	59.4	1.1	56	0.9
	0.4	0.71°	646	62.4	1.2	59.4	1.1	56	0.9
	0.8	0.71°	646	61.6	1.2	59.4	1.1	56	0.9
	1	0.71°	646	61.2	1.1	59.4	1.1	56	0.9
	1.2	0.71°	646	60.8	1.1	59.4	1.1	56	0.9
	1.6	0.71°	646	60	1.1	59.4	1.1	56	0.9

Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips may be elongated.
* Shows the distance until a maximum depth of cut of 8 mm is achieved at the maximum ramping angle L (= 8/tan RMPX).

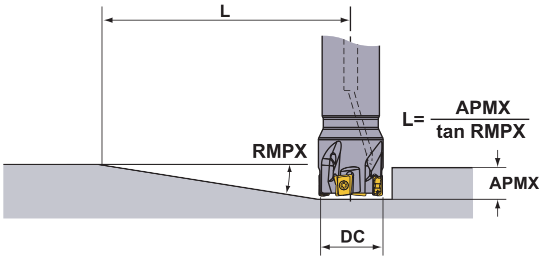
DC (mm)	RE (mm)	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		RMPX	L (mm) *	DH max. (mm)	P max. (mm)	DH min. (mm)	P max. (mm)	DH min. (mm)	P max. (mm)
35	0.2	0.63°	728	69	1.2	65.5	1.1	62	0.9
	0.4	0.63°	728	68.6	1.2	65.5	1.1	62	0.9
	0.8	0.63°	728	67.8	1.1	65.5	1.1	62	0.9
	1	0.63°	728	67.4	1.1	65.5	1.1	62	0.9
	1.2	0.63°	728	67	1.1	65.5	1.1	62	0.9
	1.6	0.63°	728	66.2	1.1	65.5	1.1	62	0.9
40	0.2	0.54°	849	78.8	1.2	75.4	1	72	0.9
	0.4	0.54°	849	78.4	1.1	75.4	1	72	0.9
	0.8	0.54°	849	77.6	1.1	75.4	1	72	0.9
	1	0.54°	849	77.2	1.1	75.4	1	72	0.9
	1.2	0.54°	849	76.8	1.1	75.4	1	72	0.9
	1.6	0.54°	849	76	1.1	75.4	1	72	0.9
50	0.2	0.42°	1092	98.8	1.1	95.4	1	92	1
	0.4	0.42°	1092	98.4	1.1	95.4	1	92	1
	0.8	0.42°	1092	97.6	1.1	95.4	1	92	1
	1	0.42°	1092	97.2	1.1	95.4	1	92	1
	1.2	0.42°	1092	96.8	1.1	95.4	1	92	1
	1.6	0.42°	1092	96	1.1	95.4	1	92	1
63	0.2	0.32°	1433	124.8	1.1	121.4	1	118	1
	0.4	0.32°	1433	124.4	1.1	121.4	1	118	1
	0.8	0.32°	1433	123.6	1.1	121.4	1	118	1
	1	0.32°	1433	123.2	1.1	121.4	1	118	1
	1.2	0.32°	1433	122.8	1.1	121.4	1	118	1
	1.6	0.32°	1433	122	1	121.4	1	118	1

Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips can become long.
* Shows the distance until a maximum depth of cut of 8 mm is achieved at the maximum ramping angle L (= 8/tan RMPX).

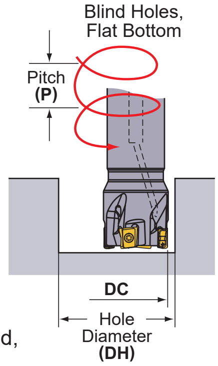
VPX300 Including long types for deep cutting

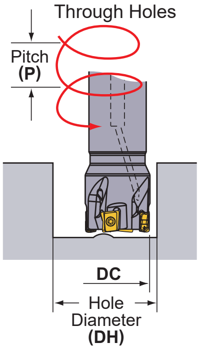
Ramping / Helical Milling

● Ramping



● Helical Milling





Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

DC (mm)	RE (mm)	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		RMPX	L (mm) *	DH max. (mm)	P max. (mm)	DH min. (mm)	P max. (mm)	DH min. (mm)	P max. (mm)
25	0.2	2.13°	296	49	2.8	42.7	2.1	36.9	1.4
	0.4	2.13°	296	48.6	2.8	42.7	2.1	36.9	1.4
	0.8	2.13°	296	47.8	2.7	42.7	2.1	36.9	1.4
	1	2.13°	296	47.4	2.6	42.7	2.1	36.9	1.4
	1.2	2.13°	296	47	2.6	42.7	2.1	36.9	1.4
	1.6	2.13°	296	46.2	2.5	42.7	2.1	36.9	1.4
	2	2.13°	296	45.4	2.4	42.7	2.1	36.9	1.4
	2.4	2.13°	296	44.6	2.3	42.7	2.1	36.9	1.4
	3	2.13°	296	43.4	2.2	42.7	2.1	36.9	1.4
	3.2	2.13°	296	43	2.1	42.7	2.1	36.9	1.4
28	0.2	1.77°	356	55	2.6	48.7	2	42.7	1.4
	0.4	1.77°	356	54.6	2.6	48.7	2	42.7	1.4
	0.8	1.77°	356	53.8	2.5	48.7	2	42.7	1.4
	1	1.77°	356	53.4	2.5	48.7	2	42.7	1.4
	1.2	1.77°	356	53	2.4	48.7	2	42.7	1.4
	1.6	1.77°	356	52.2	2.4	48.7	2	42.7	1.4
	2	1.77°	356	51.4	2.3	48.7	2	42.7	1.4
	2.4	1.77°	356	50.6	2.2	48.7	2	42.7	1.4
	3	1.77°	356	49.4	2.1	48.7	2	42.7	1.4
	3.2	1.77°	356	49	2	48.7	2	42.7	1.4
30	0.2	1.61°	392	59	2.6	52.7	2	46.6	1.5
	0.4	1.61°	392	58.6	2.5	52.7	2	46.6	1.5
	0.8	1.61°	392	57.8	2.5	52.7	2	46.6	1.5
	1	1.61°	392	57.4	2.4	52.7	2	46.6	1.5
	1.2	1.61°	392	57	2.4	52.7	2	46.6	1.5
	1.6	1.61°	392	56.2	2.3	52.7	2	46.6	1.5
	2	1.61°	392	55.4	2.2	52.7	2	46.6	1.5
	2.4	1.61°	392	54.6	2.2	52.7	2	46.6	1.5
	3	1.61°	392	53.4	2.1	52.7	2	46.6	1.5
	3.2	1.61°	392	53	2	52.7	2	46.6	1.5
32	0.2	1.47°	429	63	2.5	56.7	2	50.6	1.5
	0.4	1.47°	429	62.6	2.5	56.7	2	50.6	1.5
	0.8	1.47°	429	61.8	2.4	56.7	2	50.6	1.5
	1	1.47°	429	61.4	2.4	56.7	2	50.6	1.5
	1.2	1.47°	429	61	2.3	56.7	2	50.6	1.5
	1.6	1.47°	429	60.2	2.3	56.7	2	50.6	1.5
	2	1.47°	429	59.4	2.2	56.7	2	50.6	1.5
	2.4	1.47°	429	58.6	2.1	56.7	2	50.6	1.5
	3	1.47°	429	57.4	2.1	56.7	2	50.6	1.5
	3.2	1.47°	429	57	2	56.7	2	50.6	1.5

Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips can become long.
* Shows the distance until a maximum depth of cut of 11 mm is achieved at the maximum ramping angle L (= 11/tan RMPX).

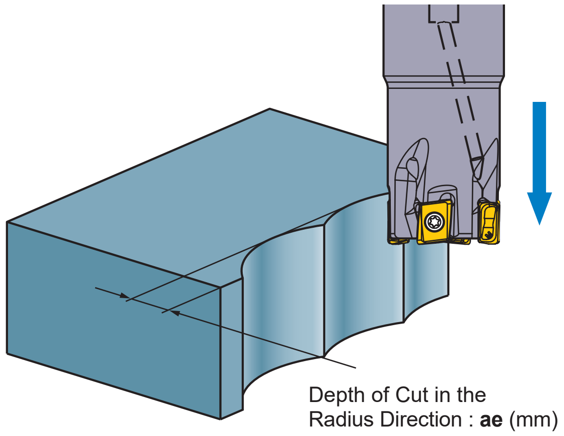
DC (mm)	RE (mm)	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		RMPX	**L** (mm) *	**DH max.** (mm)	**P max.** (mm)	**DH min.** (mm)	**P max.** (mm)	**DH min.** (mm)	**P max.** (mm)
35	0.2	1.28°	493	69	2.4	62.8	1.9	56.6	1.5
	0.4	1.28°	493	68.6	2.4	62.8	1.9	56.6	1.5
	0.8	1.28°	493	67.8	2.3	62.8	1.9	56.6	1.5
	1	1.28°	493	67.4	2.3	62.8	1.9	56.6	1.5
	1.2	1.28°	493	67	2.2	62.8	1.9	56.6	1.5
	1.6	1.28°	493	66.2	2.2	62.8	1.9	56.6	1.5
	2	1.28°	493	65.4	2.1	62.8	1.9	56.6	1.5
	2.4	1.28°	493	64.6	2.1	62.8	1.9	56.6	1.5
	3	1.28°	493	63.4	2	62.8	1.9	56.6	1.5
	3.2	1.28°	493	63	2	62.8	1.9	56.6	1.5
40	0.2	1.06°	595	78.8	2.3	72.7	1.9	66.5	1.5
	0.4	1.06°	595	78.4	2.2	72.7	1.9	66.5	1.5
	0.8	1.06°	595	77.6	2.2	72.7	1.9	66.5	1.5
	1	1.06°	595	77.2	2.2	72.7	1.9	66.5	1.5
	1.2	1.06°	595	76.8	2.1	72.7	1.9	66.5	1.5
	1.6	1.06°	595	76	2.1	72.7	1.9	66.5	1.5
	2	1.06°	595	75.2	2	72.7	1.9	66.5	1.5
	2.4	1.06°	595	74.4	2	72.7	1.9	66.5	1.5
	3	1.06°	595	73.2	1.9	72.7	1.9	66.5	1.5
	3.2	1.06°	595	72.8	1.9	72.7	1.9	66.5	1.5
50	0.2	0.79°	798	98.8	2.1	92.7	1.8	86.5	1.6
	0.4	0.79°	798	98.4	2.1	92.7	1.8	86.5	1.6
	0.8	0.79°	798	97.6	2.1	92.7	1.8	86.5	1.6
	1	0.79°	798	97.2	2	92.7	1.8	86.5	1.6
	1.2	0.79°	798	96.8	2	92.7	1.8	86.5	1.6
	1.6	0.79°	798	96	2	92.7	1.8	86.5	1.6
	2	0.79°	798	95.2	2	92.7	1.8	86.5	1.6
	2.4	0.79°	798	94.4	1.9	92.7	1.8	86.5	1.6
	3	0.79°	798	93.2	1.9	92.7	1.8	86.5	1.6
	3.2	0.79°	798	92.8	1.9	92.7	1.8	86.5	1.6
63	0.2	0.6°	1051	124.8	2	118.7	1.8	112.5	1.6
	0.4	0.6°	1051	124.4	2	118.7	1.8	112.5	1.6
	0.8	0.6°	1051	123.6	2	118.7	1.8	112.5	1.6
	1	0.6°	1051	123.2	2	118.7	1.8	112.5	1.6
	1.2	0.6°	1051	122.8	2	118.7	1.8	112.5	1.6
	1.6	0.6°	1051	122	1.9	118.7	1.8	112.5	1.6
	2	0.6°	1051	121.2	1.9	118.7	1.8	112.5	1.6
	2.4	0.6°	1051	120.4	1.9	118.7	1.8	112.5	1.6
	3	0.6°	1051	119.2	1.9	118.7	1.8	112.5	1.6
	3.2	0.6°	1051	118.8	1.8	118.7	1.8	112.5	1.6
80	0.2	0.45°	1401	158.8	1.9	152.6	1.8	146.5	1.6
	0.4	0.45°	1401	158.4	1.9	152.7	1.8	146.5	1.6
	0.8	0.45°	1401	157.6	1.9	152.7	1.8	146.5	1.6
	1	0.45°	1401	157.2	1.9	152.7	1.8	146.5	1.6
	1.2	0.45°	1401	156.8	1.9	152.7	1.8	146.5	1.6
	1.6	0.45°	1401	156	1.9	152.7	1.8	146.5	1.6
	2	0.45°	1401	155.2	1.9	152.7	1.8	146.5	1.6
	2.4	0.45°	1401	154.4	1.8	152.7	1.8	146.5	1.6
	3	0.45°	1401	153.2	1.8	152.7	1.8	146.5	1.6
	3.2	0.45°	1401	152.8	1.8	152.7	1.8	146.5	1.6

VPX200/300 Including long types for deep cutting

For Plunging and Drilling

See the tables to the right for cutting conditions. Follow the cutting conditions for slot milling regarding feed per tooth and cutting speed.

● Plunging



VPX200

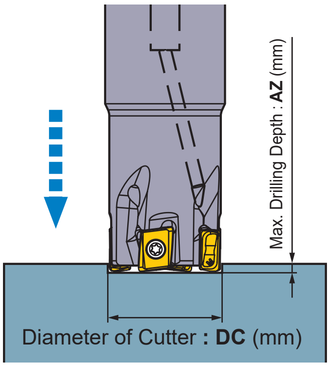
DC (mm)	**ae max.** (mm)
16	3.9
18	3.9
20	3.9
22	4.0
25	4.0
28	4.0
30	4.0
32	4.0
35	4.0
40	4.0
50	4.0
63	4.0

VPX300

DC (mm)	**ae max.** (mm)
25	6.5
28	6.6
30	6.6
32	6.6
35	6.7
40	6.7
50	6.7
63	6.7
80	6.7

Note 1) No step feed necessary.

● Drilling



VPX200

DC (mm)	**AZ max.** (mm)
16	0.3
18	0.3
20	0.3
22	0.3
25	0.3
28	0.3
30	0.3
32	0.3
35	0.3
40	0.3
50	0.3
63	0.3

VPX300

DC (mm)	**AZ max.** (mm)
25	0.55
28	0.55
30	0.55
32	0.55
35	0.55
40	0.55
50	0.55
63	0.55
80	0.55

Note 1) Exercise due caution as chips scatter easily.
Note 2) Use compressed air to eliminate chips (or coolant for when machining aluminium alloy).

Memo

MULTI-FUNCTIONAL MILLING

<ALUMINIUM ALLOY TO DIFFICULT-TO-CUT MATERIAL CUTTING>

90° KAPR

AXD4000

P	M	K	N	S	H
Steel			Non-ferrous Metal	Heat Resistant Alloy	

Fig.1

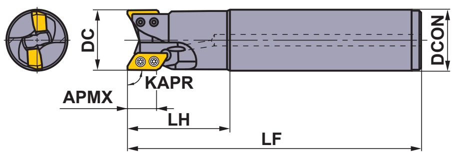
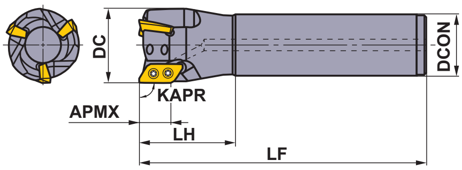


Fig.2



SHANK TYPE

With Coolant Hole

Right hand tool holder only.

Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	LF	LH	DCON	APMX (mm)	Max. Allowable Revolution (min^{-1})	Fig.	Clamp Screw *	Wrench	Anti-seize Lubricant	Insert
A Type	0.4 | 3.2	AXD4000R201SA20SA	●	1	20	110	35	20	15.5	15000	1	TS3SBS	TKY08D	MK1KS	XDGX1750◌◌
		AXD4000R252SA25SA	●	2	25	125	50	25	15.5	49000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R252SA25LA	●	2	25	170	80	25	15.5	49000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R282SA25SA	●	2	28	125	50	25	15.5	48500	2	TS3SB	TKY08D	MK1KS	
		AXD4000R282SA25ELA	●	2	28	220	50	25	15.5	48500	2	TS3SB	TKY08D	MK1KS	
		AXD4000R322SA32SA	●	2	32	150	50	32	15.5	48000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R322SA32LA	●	2	32	200	80	32	15.5	48000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R352SA32SA	●	2	35	150	50	32	15.5	45000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R352SA32ELA	●	2	35	250	50	32	15.5	45000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R403SA32SA	●	3	40	150	50	32	15.5	41000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R403SA42SA	●	3	40	170	80	42	15.5	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R403SA32ELA	●	3	40	250	50	32	15.5	41000	2	TS3SB	TKY08D	MK1KS	
B Type	4.0 | 5.0	AXD4000R201SA20SB	●	1	20	110	35	20	14.8	15000	1	TS3SBS	TKY08D	MK1KS	
		AXD4000R252SA25SB	●	2	25	125	50	25	14.8	49000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R252SA25LB	●	2	25	170	80	25	14.8	49000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R282SA25SB	●	2	28	125	50	25	14.8	48500	2	TS3SB	TKY08D	MK1KS	
		AXD4000R282SA25ELB	●	2	28	220	50	25	14.8	48500	2	TS3SB	TKY08D	MK1KS	
		AXD4000R322SA32SB	●	2	32	150	50	32	14.8	48000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R322SA32LB	●	2	32	200	80	32	14.8	48000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R352SA32SB	●	2	35	150	50	32	14.8	45000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R352SA32ELB	●	2	35	250	50	32	14.8	45000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R403SA32SB	●	3	40	150	50	32	14.8	41000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R403SA42SB	●	3	40	170	80	42	14.8	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000R403SA32ELB	●	3	40	250	50	32	14.8	41000	2	TS3SB	TKY08D	MK1KS	

Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
Before operating the tool read the operational guidance on page L213.
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 1.6 and above, as corner radius increases the LF and LH dimensions decrease.
* Clamp Torque (N • m) : TS3SBS=1.5, TS3SB=1.5
Use the clamp screw by setting the bundled screw.

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

Fig. 1

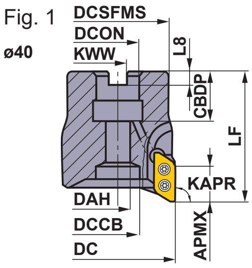


Fig. 2

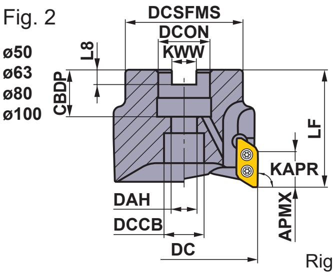
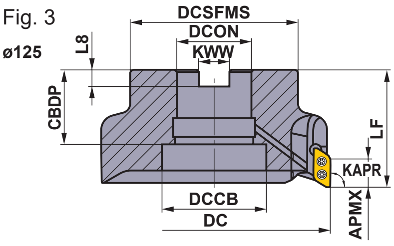
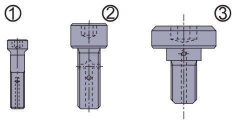


Fig. 3



Right hand tool holder only.

Cutter Diameter **DC** (mm)	Set Bolt	Geometry	
ϕ40	HFF08043H	①	 ① ② ③ With Coolant Hole
ϕ50, ϕ63	HSC10030H	②	
ϕ80	HSC12035H		
ϕ100	HSC16040H		
ϕ125	MBA20040H	③	

ARBOR TYPE

With Coolant Hole

Type	Insert Corner Radius	Order Number	Stock	Number of Teeth	Dimensions(mm)									WT	APMX (mm)	Max. Allowable Revolution (min^{-1})	Fig.	*			
	RE		R		DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	DCCB	(kg)				Clamp Screw	Wrench	Anti-seize Lubricant	Insert
A Type	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○○
		AXD4000-040A03RA	●	3	40	50	16	18	8.5	34	8.4	5.6	12	0.3	15.5	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000-050A02RA	●	2	50	50	22	20	11	45	10.4	6.3	17	0.4	15.5	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-050A04RA	●	4	50	50	22	20	11	45	10.4	6.3	17	0.4	15.5	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-063A05RA	●	5	63	50	22	20	11	50	10.4	6.3	17	0.6	15.5	30000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R08005CA	●	5	80	50	25.4	26	13	60	9.5	6	20	1	15.5	27000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R10006DA	●	6	100	63	31.75	32	17	70	12.7	8	26	2	15.5	23000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R12507EA	●	7	125	63	38.1	40	—	90	15.9	10	56	2.8	15.5	20000	3	TS3SB	TKY08D	MK1KS	
B Type	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	
		AXD4000-040A03RB	●	3	40	50	16	18	8.5	34	8.4	5.6	12	0.3	14.8	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000-050A02RB	●	2	50	50	22	20	11	45	10.4	6.3	17	0.4	14.8	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-050A04RB	●	4	50	50	22	20	11	45	10.4	6.3	17	0.4	14.8	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-063A05RB	●	5	63	50	22	20	11	50	10.4	6.3	17	0.6	14.8	30000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R08005CB	●	5	80	50	25.4	26	13	60	9.5	6	20	1	14.8	27000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R10006DB	●	6	100	63	31.75	32	17	70	12.7	8	26	2	14.8	23000	2	TS3SB	TKY08D	MK1KS	
		AXD4000R12507EB	●	7	125	63	38.1	40	—	90	15.9	10	56	2.8	14.8	20000	3	TS3SB	TKY08D	MK1KS	

For metric arbor

The cutter bore diameter DCON is indicated in millimetre.

Type	Insert Corner Radius	Order Number	Stock	Number of Teeth	Dimensions(mm)									WT	APMX (mm)	Max. Allowable Revolution (min^{-1})	Fig.	*			
	RE		R		DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	DCCB	(kg)				Clamp Screw	Wrench	Anti-seize Lubricant	Insert
A Type	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○○
		AXD4000-040A03RA	●	3	40	50	16	18	8.5	34	8.4	5.6	12	0.3	15.5	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000-050A02RA	●	2	50	50	22	20	11	45	10.4	6.3	17	0.4	15.5	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-050A04RA	●	4	50	50	22	20	11	45	10.4	6.3	17	0.4	15.5	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-063A05RA	●	5	63	50	22	20	11	50	10.4	6.3	17	0.6	15.5	30000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-080A05RA	●	5	80	50	27	23	13	60	12.4	7	20	1	15.5	27000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-100A06RA	●	6	100	63	32	26	17	78	14.4	8	26	2	15.5	23000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-125B07RA	●	7	125	63	40	40	—	90	16.4	9	56	2.8	15.5	20000	3	TS3SB	TKY08D	MK1KS	
B Type	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	
		AXD4000-040A03RB	●	3	40	50	16	18	8.5	34	8.4	5.6	12	0.3	14.8	41000	1	TS3SB	TKY08D	MK1KS	
		AXD4000-050A02RB	●	2	50	50	22	20	11	45	10.4	6.3	17	0.4	14.8	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-050A04RB	●	4	50	50	22	20	11	45	10.4	6.3	17	0.4	14.8	35000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-063A05RB	●	5	63	50	22	20	11	50	10.4	6.3	17	0.6	14.8	30000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-080A05RB	●	5	80	50	27	23	13	60	12.4	7	20	1	14.8	27000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-100A06RB	●	6	100	63	32	26	17	78	14.4	8	26	2	14.8	23000	2	TS3SB	TKY08D	MK1KS	
		AXD4000-125B07RB	●	7	125	63	40	40	—	90	16.4	9	56	2.8	14.8	20000	3	TS3SB	TKY08D	MK1KS	

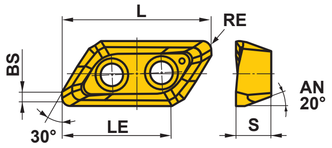
Note 1) The maximum allowable spindle speeds are set to ensure tool and insert stability.
Before operating the tool read the operational guidance on page L213.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
Note 3) Note for inserts with a corner radius of 1.6 and above, as corner radius increases the LF dimension decrease.
* Clamp Torque (N • m) : TS3SB=1.5
Use the clamp screw by setting the bundled screw.

INSERTS

Workpiece Material			LC15TF	MP6120	MP9120		TF15	
	P	Steel		◐				
	N	Aluminium Alloy	✤		✤		◐	
	S	Titanium Alloy			◐			

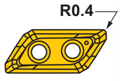
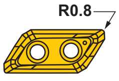
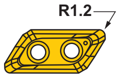
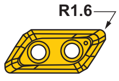
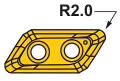
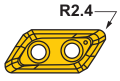
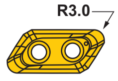
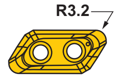
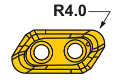
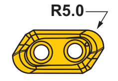
Cutting Conditions (Guide):
● :Stable Cutting ◐ :General Cutting ✤ :Unstable Cutting

Edge Preparation:
F :Sharp **E** :Round

Shape	Order Number	Class	Edge Preparation	Stock						Dimensions (mm)					Geometry
				Coated				Carbide							
				LC15TF	MP6120	MP9120		TF15		L	LE	S	BS	RE*	
GL Breaker 	**XDGX175004PDFR-GL**	G	F	●				●		23	16.9	5	1.7	0.4	
	XDGX175008PDFR-GL	G	F	●				●		23	17	5	1.3	0.8	
	XDGX175012PDFR-GL	G	F	●				●		23	17	5	0.9	1.2	
	XDGX175016PDFR-GL	G	F	●				●		22	16.4	5	1.4	1.6	
	XDGX175020PDFR-GL	G	F	●				●		22	16.4	5	1.0	2.0	
	XDGX175024PDFR-GL	G	F	●				●		22	16.4	5	0.6	2.4	
	XDGX175030PDFR-GL	G	F	●				●		21.1	16.1	5	0.8	3.0	
	XDGX175032PDFR-GL	G	F	●				●		21.1	16.1	5	0.6	3.2	
	XDGX175040PDFR-GL	G	F	●				●		20	15.6	5	0.8	4.0	
	XDGX175050PDFR-GL	G	F	●				●		19.4	15.3	5	0.4	5.0	
GM Breaker 	**XDGX175004PDER-GM**	G	E		●	●				23	17	5	1.7	0.4	
	XDGX175008PDER-GM	G	E		●	●				23	17	5	1.2	0.8	
	XDGX175012PDER-GM	G	E		●	●				23	17	5	0.9	1.2	
	XDGX175016PDER-GM	G	E		●	●				22	15.9	5	1.3	1.6	
	XDGX175020PDER-GM	G	E		●	●				22	15.9	5	0.8	2.0	
	XDGX175024PDER-GM	G	E		●	●				22	15.9	5	0.4	2.4	
	XDGX175030PDER-GM	G	E		●	●				21.1	16	5	0.6	3.0	
	XDGX175032PDER-GM	G	E		●	●				21.1	16	5	0.4	3.2	
	XDGX175040PDER-GM	G	E		●	●				20	14.8	5	0.5	4.0	
	XDGX175050PDER-GM	G	E		●	●				19.4	15	5	0.3	5.0	
GM Breaker 	**XDGX175004PDFR-GM**	G	F					●		23	17	5	1.7	0.4	
	XDGX175008PDFR-GM	G	F					●		23	17	5	1.2	0.8	
	XDGX175012PDFR-GM	G	F					●		23	17	5	0.9	1.2	
	XDGX175016PDFR-GM	G	F					●		22	15.9	5	1.3	1.6	
	XDGX175020PDFR-GM	G	F					●		22	15.9	5	0.8	2.0	
	XDGX175024PDFR-GM	G	F					●		22	15.9	5	0.4	2.4	
	XDGX175030PDFR-GM	G	F					●		21.1	16	5	0.6	3.0	
	XDGX175032PDFR-GM	G	F					●		21.1	16	5	0.4	3.2	
	XDGX175040PDFR-GM	G	F					●		20	14.8	5	0.5	4.0	
	XDGX175050PDFR-GM	G	F					●		19.4	15	5	0.3	5.0	

* Be careful because corner R(RE) has a different shape than machined workpiece R.
When a GM breaker is recommended, stress the dimensional precision of the workpiece shape.

Holder And Insert Corner Radius Combination

Holder	**A** Type Holder								**B** Type Holder	
	AXD4000–○○○○○○○○A **AXD4000R○○○○○○○○○A**								**AXD4000–○○○○○○○B** **AXD4000R○○○○○○○○○B**	
Applicable Insert Corner R (**RE**)										
	XDGX **175004PD○R-○○**	**XDGX** **175008PD○R-○○**	**XDGX** **175012PD○R-○○**	**XDGX** **175016PD○R-○○**	**XDGX** **175020PD○R-○○**	**XDGX** **175024PD○R-○○**	**XDGX** **175030PD○R-○○**	**XDGX** **175032PD○R-○○**	**XDGX** **175040PD○R-○○**	**XDGX** **175050PD○R-○○**

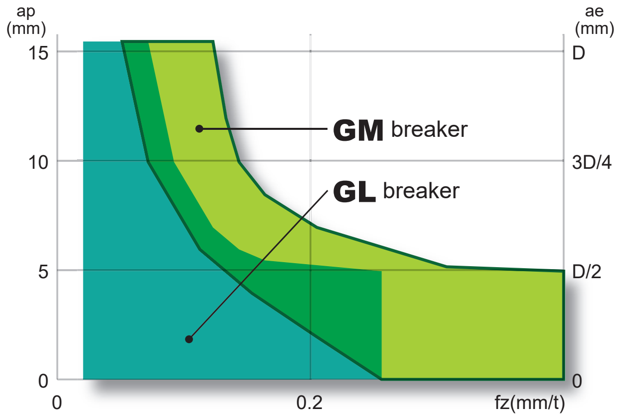
Not interchangeable with the corresponding inserts of the A type and B type holders.

● **: Inventory maintained in Japan.**
(Contains 10 pieces per case.)

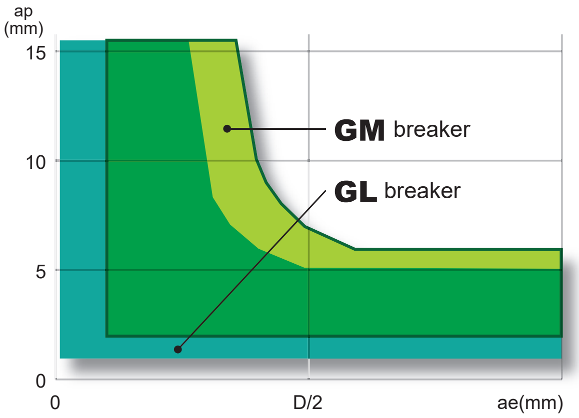
Selection of insert

It is necessary to choose the best insert according to the cutting conditions. Please select an insert from the tables below.
1st recommendation for stable cutting condition is the GL breaker with a strong cutting edge.

Selection of insert according to the feed per tooth and the required cutting depth



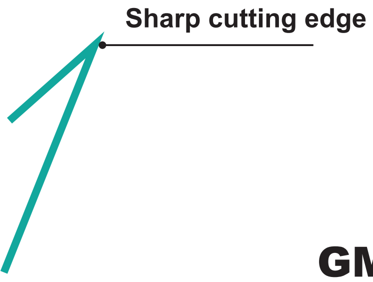
Selection of insert according to the width of cut and the required cutting depth



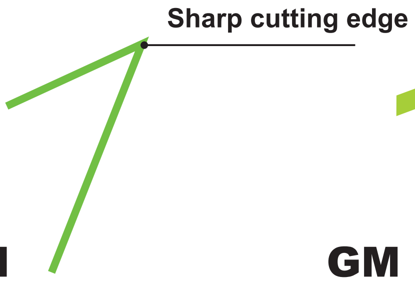
1st recommendation for machining aluminium alloys is GL breaker.
Under high-load conditions such as deep or high feed cutting, it is advisable to use the GM breaker.

Selection of insert according to cutting edge

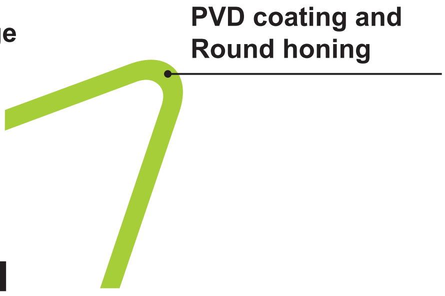
Insert type



GL
TF15/LC15TF
Low cutting resistance
(LC15TF: Excellent weld resistance)

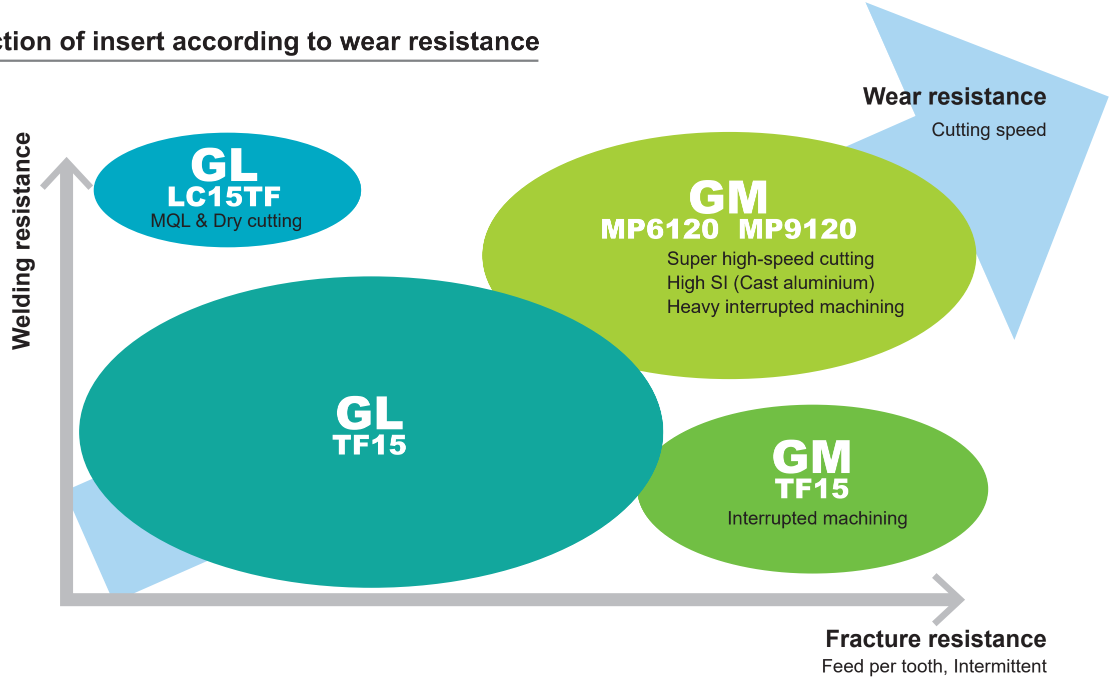


GM
TF15
Tougher cutting edge



GM
MP9120
Tougher cutting edge & wear resistance
Machining of difficult-to-cut materials & aluminium

Selection of insert according to wear resistance



RECOMMENDED CUTTING CONDITIONS

Cutting Speed

Workpiece Material			Greade	Breaker	Cutting Speed **vc** (m/min)
P	Mild Steel (ASTM A36,AISI 1010)	**≤180HB**	**MP6120**	**GM**	200 (150–220)
	Carbon Steel, Alloy Steel (AISI 1045,AISI 4140)	**180–280HB**	**MP6120**	**GM**	200 (150–220)
N	Aluminium Alloy (A6061, A7075 etc)	**Si<5%**	**TF15** **LC15TF**	**GL**	1000 (200–3000)
			TF15 **MP9120**	**GM**	1000 (200–3000)
	Aluminium Alloy (AC4B, ADC12, A390 etc)	**5%≤Si≤10%** **Si>10%**	**MP9120**	**GM**	1000 (200–3000)
S	Titanium Alloy (Ti-6Al-4V etc)	–	**MP9120**	**GM**	40 (30–60)

Depth of Cut / Feed per Tooth

Workpiece Material			Breaker	Cutting Width **ae** (mm)	Depth of Cut **ap** (mm)	Feed per Tooth (mm/t)					
						Cutting Edge Diameter **DC** (mm)					
						20	**25, 28**	**32, 35**	**40**	**50, 63, 80**	**100, 125**
P	Mild Steel (ASTM A36,AISI 1010)	**≤180HB**	**GM**	≤0.25 DC	≤ 5	≤ 0.05	≤ 0.15	≤ 0.15	≤ 0.18	≤ 0.18	≤ 0.18
					≤ 10	≤ 0.05	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.15
					≤ 14.5	≤ 0.05	≤ 0.10	≤ 0.10	≤ 0.12	≤ 0.12	–
				≤0.5 DC	≤ 5	≤ 0.05	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.18	≤ 0.18
					≤ 10	–	≤ 0.10	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15
					≤ 14.5	–	≤ 0.08	≤ 0.10	≤ 0.10	≤ 0.12	–
				≤0.75 DC	≤ 5	≤ 0.05	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.15
					≤ 10	–	≤ 0.10	≤ 0.10	≤ 0.12	≤ 0.12	≤ 0.12
				DC (Slot)	≤ 5	≤ 0.05	≤ 0.10	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15
	Carbon Steel, Alloy Steel (AISI 1045,AISI 4140)	**180–280HB**	**GM**	≤0.25 DC	≤ 5	≤ 0.05	≤ 0.15	≤ 0.15	≤ 0.18	≤ 0.18	≤ 0.18
					≤ 10	≤ 0.05	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.15
					≤ 14.5	≤ 0.05	≤ 0.10	≤ 0.10	≤ 0.12	≤ 0.12	–
				≤0.5 DC	≤ 5	≤ 0.05	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.18	≤ 0.18
					≤ 10	–	≤ 0.10	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15
					≤ 14.5	–	≤ 0.08	≤ 0.10	≤ 0.10	≤ 0.12	–
				≤0.75 DC	≤ 5	≤ 0.05	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.15
					≤ 10	–	≤ 0.10	≤ 0.10	≤ 0.12	≤ 0.12	≤ 0.12
				DC (Slot)	≤ 5	≤ 0.05	≤ 0.10	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15

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.

	Workpiece Material		Breaker	Cutting Width **ae** (mm)	Depth of Cut **ap** (mm)	Feed per Tooth (mm/t)					
						Cutting Edge Diameter **DC** (mm)					
						20	**25, 28**	**32, 35**	**40**	**50, 63, 80**	**100, 125**
N	Aluminium Alloy (A6061, A7075 etc)	**Si<5%**	**GL**	≤0.25 DC	≤ 5	≤ 0.05	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25
					≤ 10	≤ 0.05	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2
					≤ 14.5	≤ 0.05	≤ 0.15	≤ 0.15	≤ 0.15	≤ 0.15	≤ 0.15
				≤0.5 DC	≤ 5	≤ 0.05	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25
					≤ 10	—	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2
					≤ 14.5	—	≤ 0.15	≤ 0.15	≤ 0.15	≤ 0.15	≤ 0.15
				≤0.75 DC	≤ 5	≤ 0.05	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25
					≤ 10	—	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2
					≤ 14.5	—	≤ 0.15	≤ 0.15	≤ 0.15	≤ 0.15	≤ 0.15
				DC (Slot)	≤ 5	≤ 0.05	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25
	Aluminium Alloy (A6061, A7075 etc)	**Si<5%**	**GM**	≤0.25 DC	≤ 5	≤ 0.05	≤ 0.35	≤ 0.35	≤ 0.4	≤ 0.4	≤ 0.4
					≤ 10	≤ 0.05	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35	≤ 0.35
					≤ 14.5	≤ 0.05	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3	≤ 0.3
				≤0.5 DC	≤ 5	≤ 0.05	≤ 0.35	≤ 0.35	≤ 0.35	≤ 0.4	≤ 0.4
					≤ 10	—	≤ 0.3	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 14.5	—	≤ 0.2	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3
				≤0.75 DC	≤ 5	≤ 0.05	≤ 0.3	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 10	—	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3
					≤ 14.5	—	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.25	≤ 0.25
				DC (Slot)	≤ 5	≤ 0.05	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.35	≤ 0.35
	Aluminium Alloy (AC4B etc) Aluminium Alloy (ADC12, A390 etc)	**5%≤Si≤10% Si>10%**	**GM**	≤0.25 DC	≤ 5	≤ 0.05	≤ 0.35	≤ 0.35	≤ 0.4	≤ 0.4	≤ 0.4
					≤ 10	≤ 0.05	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35	≤ 0.35
					≤ 14.5	≤ 0.05	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3	≤ 0.3
				≤0.5 DC	≤ 5	≤ 0.05	≤ 0.35	≤ 0.35	≤ 0.35	≤ 0.4	≤ 0.4
					≤ 10	—	≤ 0.3	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 14.5	—	≤ 0.2	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3
				≤0.75 DC	≤ 5	≤ 0.05	≤ 0.3	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 10	—	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3
					≤ 14.5	—	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.25	≤ 0.25
				DC (Slot)	≤ 5	≤ 0.05	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.35	≤ 0.35
S	Titanium Alloy (Ti-6Al-4V etc)	—	**GM**	≤0.25 DC	≤ 5	≤ 0.05	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1
					≤ 10	≤ 0.05	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1
					≤ 14.5	≤ 0.05	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1
				≤0.5 DC	≤ 5	≤ 0.05	≤ 0.08	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1
					≤ 10	—	≤ 0.08	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1
					≤ 14.5	—	≤ 0.08	≤ 0.1	≤ 0.1	≤ 0.1	≤ 0.1
				≤0.75 DC	≤ 5	≤ 0.05	≤ 0.05	≤ 0.08	≤ 0.1	≤ 0.1	≤ 0.1
					≤ 10	—	≤ 0.05	≤ 0.08	≤ 0.1	≤ 0.1	≤ 0.1
					≤ 14.5	—	≤ 0.05	≤ 0.08	≤ 0.1	≤ 0.1	≤ 0.1
				DC (Slot)	≤ 5	≤ 0.05	≤ 0.05	≤ 0.05	≤ 0.05	≤ 0.05	≤ 0.05

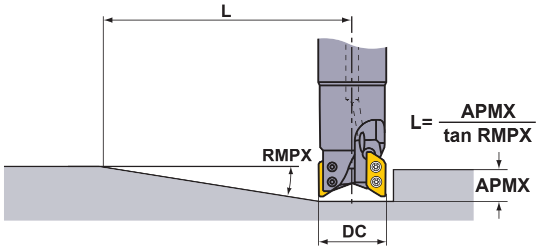
Note 1) The above cutting conditions are determined based on high workpiece and machine rigidity, where no vibration occurred. If vibrations occur make adjustments according to the machining conditions.

Note 2) Note, vibrations may occur in the following conditions.

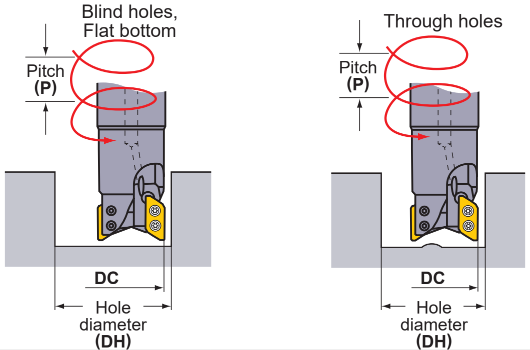
- When using long tool overhang.
- When pocket machining corner radii.
- When the workpiece has poor clamping rigidity or when the machine rigidity or workpiece rigidity is low, vibrations can occur easily, if so, reduce cutting conditions such as width and depth of cut and feed per tooth.

■RAMPING/HELICAL CUTTING

●RAMPING



●HELICAL CUTTING



RAMPING/HELICAL CUTTING (Aluminium Alloy)

Holder Type	Cutting Edge Diameter DC (mm)	Insert Corner R RE (mm)	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling	
			Maximum Ramping Angle RMPX	Minimum Distance L *1 (mm)	Maximum Hole Diameter DH max. (mm)	Maximum Pitch P max. (mm)	Minimum Hole Diameter DH min. (mm)	Maximum Pitch P max. (mm)	Minimum Hole Diameter DH min. (mm)	Maximum Pitch P max. (mm)
A type	20	0.4—1.2	20.7°	42	37.1 *2	14	36.1	14	22	2
		1.6—2.4	19.9°	43	34.7 *3	13	34.6	13	22	2
		3.0—3.2	18.9°	46	33.1 *4	12	33.3	12	22	1
	25	0.4—1.2	23.1°	37	47.1 *2	14	46	14	31.6	8
		1.6—2.4	22.0°	39	44.7 *3	13	44.4	13	31.6	8
		3.0—3.2	18.7°	46	43.1 *4	12	43	12	31.6	7
	28	0.4—1.2	19.2°	45	53.1 *2	14	52	14	36	8
		1.6—2.4	18.5°	47	50.7 *3	13	50.4	13	36	8
		3.0—3.2	16.7°	52	49.1 *4	12	48.9	12	36	7
	32	0.4—1.2	15.4°	57	61.1 *2	14	59.9	14	45.5	11
		1.6—2.4	14.7°	60	58.7 *3	13	58.3	13	45.5	11
		3.0—3.2	13.8°	64	57.1 *4	12	56.8	12	45.5	10
	35	0.4—1.2	13.4°	66	67.1 *2	14	65.8	14	50	11
		1.6—2.4	12.7°	69	64.7 *3	13	64.3	13	50	10
		3.0—3.2	11.8°	75	63.1 *4	12	62.8	12	50	9
	40	0.4—1.2	11.1°	80	76.7 *2	14	75.9	14	61.5	13
		1.6—2.4	10.4°	85	74.3 *3	13	74.2	13	61.5	12
		3.0—3.2	9.7°	91	72.7 *4	12	72.7	12	61.5	11
	50	0.4—1.2	8.2°	108	96.7 *2	14	95.6	14	81.4	14
		1.6—2.4	7.6°	117	94.3 *3	13	94	13	81.4	13
		3.0—3.2	6.9°	129	92.7 *4	12	92.4	12	81.4	11
	63	0.4—1.2	6.1°	146	122.7 *2	14	121.6	14	107.4	14
		1.6—2.4	5.6°	159	120.3 *3	13	119.9	13	107.4	13
		3.0—3.2	5.2°	171	118.7 *4	12	118.4	12	107.4	12
	80	0.4—1.2	4.6°	193	156.7 *2	14	155.6	14	141.4	14
		1.6—2.4	4.2°	212	154.3 *3	13	153.9	13	141.4	13
		3.0—3.2	3.8°	234	152.7 *4	12	152.4	12	141.4	12
	100	0.4—1.2	3.5°	254	196.7 *2	14	195.5	14	181.5	14
		1.6—2.4	3.2°	278	194.3 *3	13	193.9	13	181.5	13
		3.0—3.2	2.9°	306	192.7 *4	12	192.3	12	181.5	12
	125	0.4—1.2	2.7°	329	246.7 *2	14	245.5	14	231.5	14
		1.6—2.4	2.5°	356	244.3 *3	13	243.8	13	231.5	13
		3.0—3.2	2.3°	386	242.7 *4	12	242.3	12	231.5	12

Note 1) Ramping, helical, and drilling are not recommended for machining of steel and titanium alloys.

Holder Type	Cutting Edge Diameter **DC** (mm)	Insert Corner R **RE** (mm)	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling	
			Maximum Ramping Angle **RMPX**	Minimum Distance **L** *1 (mm)	Maximum Hole Diameter **DH max.** (mm)	Maximum Pitch **P max.** (mm)	Minimum Hole Diameter **DH min.** (mm)	Maximum Pitch **P max.** (mm)	Minimum Hole Diameter **DH min.** (mm)	Maximum Pitch **P max.** (mm)
B type	20	4	17.5°	47	31.5	10	31.8	10	22	1
		5	16.6°	71	29.5	6	31.1	7	22	1
	25	4	15.1°	55	41.5	10	41.4	10	31.7	5
		5	13.7°	61	39.5	9	40.6	9	31.7	5
	28	4	14.1°	59	47.5	10	47.2	10	36	6
		5	13°	65	45.5	9	46.4	9	36	5
	32	4	12.7°	66	55.5	10	55.1	10	45.5	9
		5	12°	70	53.5	9	54.3	9	45.5	8
	35	4	10.8°	78	61.5	10	61	10	50	8
		5	10.2°	83	59.5	9	60.2	9	50	8
	40	4	8.8°	96	71.1	10	70.9	10	61.5	10
		5	8.2°	103	69.1	9	70.1	9	61.5	9
	50	4	6.3°	135	91.1	10	90.6	10	81.3	10
		5	5.8°	146	89.1	9	89.8	9	81.3	9
	63	4	4.6°	184	117.1	10	116.6	10	107.4	10
		5	4.2°	202	115.1	9	115.7	9	107.3	9
	80	4	3.4°	250	151.1	10	150.5	10	141.4	10
		5	3.1°	274	149.1	9	149.6	9	141.4	9
	100	4	2.6°	326	191.1	10	190.5	10	181.4	10
		5	2.4°	354	189.1	9	189.6	9	181.4	9
	125	4	2°	424	241.1	10	240.5	10	231.4	10
		5	1.8°	471	239.1	9	239.6	9	229.9	9

Note 1) The recommended ramping feed is 0.05mm/t or under.

*1 Using the maximum ramping angle, the distance to reach the maximum depth of cut is as follows:
L= (maximum depth of cut APMX/tan RMPX). Maximum depth of cut A type is 15.5mm, B type is 14.8mm.

*2 Corner radius of 1.2mm. For other corner radii, use the following formula. {(cutting edge diameter DC)–(corner radius RE)–0.25}×2

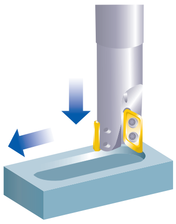
*3 Corner radius of 2.4mm. For other corner radii, use the following formula. {(cutting edge diameter DC)–(corner radius RE)–0.25}×2

*4 Corner radius of 3.2mm. For other corner radii, use the following formula. {(cutting edge diameter DC)–(corner radius RE)–0.25}×2

■ Max.Drilling Depth (Aluminium Alloy)

Type	Insert Corner R **RE** (mm)	Max.Drilling Depth (mm)					
		Cutting Edge Diameter **DC** (mm)					
		φ20	**φ25**	**φ28**	**φ32**	**φ35**	**φ40–φ125**
A type	0.4	5.3	5.2	5.2	5.2	5.3	5.3
	0.8	5.3	5.2	5.2	5.2	5.3	5.3
	1.2	5.3	5.2	5.2	5.2	5.3	5.3
	1.6	4.8	4.6	4.7	4.7	4.9	4.8
	2.0	4.8	4.6	4.7	4.7	4.9	4.8
	2.4	4.8	4.6	4.7	4.7	4.9	4.8
	3.0	4.3	3.7	4.2	4.2	4.4	4.4
	3.2	4.3	3.7	4.2	4.2	4.4	4.4
B type	4.0	3.7	2.7	3.7	3.6	3.8	3.8
	5.0	3.4	2.3	3.3	3.3	3.5	3.5

AXD4000 can be effectively used for pocket machining without the need for a prepared hole.



MULTI-FUNCTIONAL MILLING
<ALUMINIUM ALLOY MATERIAL CUTTING>

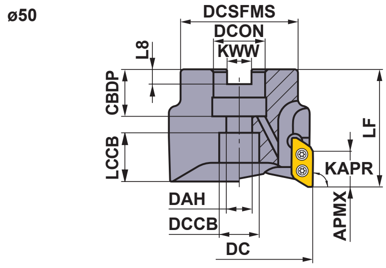
90° KAPR

AXD4000A

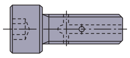
NEW

P M K **N** S H

Non-ferrous Metal



Right hand tool holder only.

Cutter Diameter **DC** (mm)	Set Bolt	Geometry
ϕ50	HSC10030H	 With Coolant Hole

■ARBOR TYPE

DCON = inch size, With Coolant Hole

DC (mm)	Type	Insert Corner Radius **RE** (mm)	Order Number	Stock	Number of Teeth	Dimensions (mm)		**WT** (kg)	**APMX** (mm)	**RPMX** (min^{-1})	Insert Type
				R		LF	DCON				
50	D	0.4–3.2	**AXD4000A-050A04RD**	●	4	50	22	0.4	15.5	34000	XDGX1750
50	E	4.0–5.0	**AXD4000A-050A04RE**	●	4	50	22	0.4	14.8	34000	XDGX1750

Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
RPMX (max. rev/min) for holders must also be considered.
Note 2) Tool should be set with balancing quality of G6.3 (ISO1940) or ISO16084, in case over 6000 min^{-1} spindle rotation.
Note 3) When using the tool at high spindle speeds, ensure that the tool and chuck are correctly balanced.
Note 4) Note for inserts with a corner radius of 1.6 and above, as corner radius increases the LF dimensions decrease.

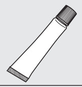
● : Inventory maintained in Japan.

Scan here for product NEWS ▶

Mounting Dimensions

DC (mm)	Order Number	Dimensions (mm)							
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
50	**AXD4000A-050A04RD**	22	20	11	17	15.4	45	10.4	6.3
50	**AXD4000A-050A04RE**	22	20	11	17	14.6	45	10.4	6.3

SPARE PARTS

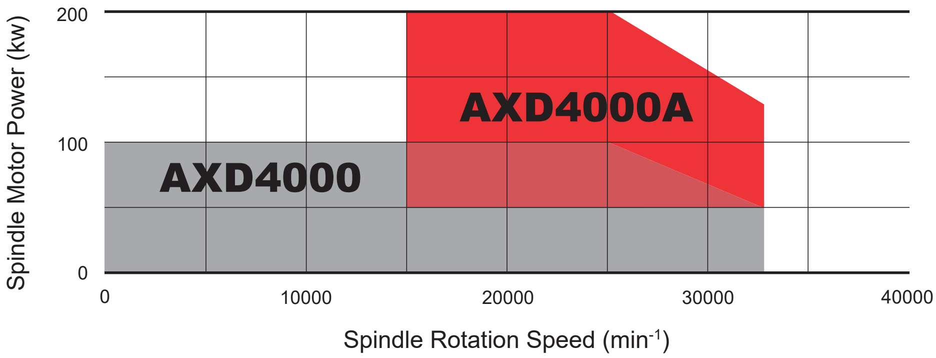
 *		
Clamp Screw	Wrench	Anti-seize Lubricant
TPS3SB	TIP10D	MK1KS

* Clamp Torque (N • m) : TPS3SB = 3.0

Note 1) Clamp screw and wrench of AXD4000A are different from AXD4000.

How to Choose AXD4000A or AXD4000

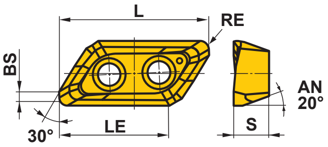
AXD4000A is specifically engineered for continuous high-speed and ultra-high-speed machining of aluminium alloys, and can be better utilized on more powerful machines with a motors of more than 80kW.



INSERTS

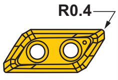
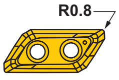
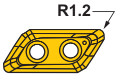
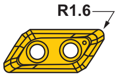
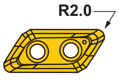
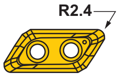
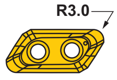
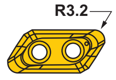
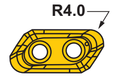
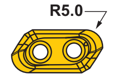
Cutting Conditions (Guide):
● :Stable Cutting ◐ :General Cutting ✤ :Unstable Cutting

Edge Preparation:
F :Sharp **E** :Round

Shape	Order Number	Class	Edge Preparation	Stock Coated LC15TF	MP9120			Carbide MT2010	TF15	Dimensions (mm) L	LE	S	BS	RE*	Geometry
Workpiece Material	**N** Aluminium Alloys			◐	✤			◐	✤						
Strong Cutting Edge **GM** Breaker 	**XDGX175004PDFR-GM**	G	F					●	●	23.0	17.0	5	1.7	0.4	
	XDGX175008PDFR-GM	G	F					●	●	23.0	17.0	5	1.2	0.8	
	XDGX175012PDFR-GM	G	F					●	●	23.0	17.0	5	0.9	1.2	
	XDGX175016PDFR-GM	G	F					●	●	22.0	15.9	5	1.3	1.6	
	XDGX175020PDFR-GM	G	F					●	●	22.0	15.9	5	0.8	2.0	
	XDGX175024PDFR-GM	G	F					●	●	22.0	15.9	5	0.4	2.4	
	XDGX175030PDFR-GM	G	F					●	●	21.1	16.0	5	0.6	3.0	
	XDGX175032PDFR-GM	G	F					●	●	21.1	16.0	5	0.4	3.2	
	XDGX175040PDFR-GM	G	F					●	●	20.0	14.8	5	0.5	4.0	
	XDGX175050PDFR-GM	G	F					●	●	19.4	15.0	5	0.3	5.0	
Strong Cutting Edge Fracture Resistance Type **GM** Breaker 	**XDGX175004PDER-GM**	G	E		●					23.0	17.0	5	1.7	0.4	
	XDGX175008PDER-GM	G	E		●					23.0	17.0	5	1.2	0.8	
	XDGX175012PDER-GM	G	E		●					23.0	17.0	5	0.9	1.2	
	XDGX175016PDER-GM	G	E		●					22.0	15.9	5	1.3	1.6	
	XDGX175020PDER-GM	G	E		●					22.0	15.9	5	0.8	2.0	
	XDGX175024PDER-GM	G	E		●					22.0	15.9	5	0.4	2.4	
	XDGX175030PDER-GM	G	E		●					21.1	16.0	5	0.6	3.0	
	XDGX175032PDER-GM	G	E		●					21.1	16.0	5	0.4	3.2	
	XDGX175040PDER-GM	G	E		●					20.0	14.8	5	0.5	4.0	
	XDGX175050PDER-GM	G	E		●					19.4	15.0	5	0.3	5.0	
Low Cutting Resistance **GL** Breaker 	**XDGX175004PDFR-GL**	G	F	●					●	23.0	16.9	5	1.7	0.4	
	XDGX175008PDFR-GL	G	F	●					●	23.0	17.0	5	1.3	0.8	
	XDGX175012PDFR-GL	G	F	●					●	23.0	17.0	5	0.9	1.2	
	XDGX175016PDFR-GL	G	F	●					●	22.0	16.4	5	1.4	1.6	
	XDGX175020PDFR-GL	G	F	●					●	22.0	16.4	5	1.0	2.0	
	XDGX175024PDFR-GL	G	F	●					●	22.0	16.4	5	0.6	2.4	
	XDGX175030PDFR-GL	G	F	●					●	21.1	16.1	5	0.8	3.0	
	XDGX175032PDFR-GL	G	F	●					●	21.1	16.1	5	0.6	3.2	
	XDGX175040PDFR-GL	G	F	●					●	20.0	15.6	5	0.8	4.0	
	XDGX175050PDFR-GL	G	F	●					●	19.4	15.3	5	0.4	5.0	

* Be careful because corner R(RE) has a different shape than machined workpiece R.
When a GM breaker is recommended, stress the dimensional precision of the workpiece shape.

Holder And Insert Corner Radius Combination

Holder	**D** Type Holder								**E** Type Holder	
	AXD4000A–050A04RD								**AXD4000A–050A04RE**	
Applicable Insert Corner R (**RE**)										
	XDGX **175004PD○R-○○**	**XDGX** **175008PD○R-○○**	**XDGX** **175012PD○R-○○**	**XDGX** **175016PD○R-○○**	**XDGX** **175020PD○R-○○**	**XDGX** **175024PD○R-○○**	**XDGX** **175030PD○R-○○**	**XDGX** **175032PD○R-○○**	**XDGX** **175040PD○R-○○**	**XDGX** **175050PD○R-○○**

Not interchangeable with the corresponding inserts of the C type and D type holders.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

Inserts to be used with the AXD4000A ,which include clamping screws, must be ordered via the kit order numbers referenced below.

Insert Kit

Package contents of insert kit (10 inserts and 20 clamp screws)

Workpiece Material	**N** Aluminium Alloys	◐	✤			◐	✤		**Cutting Conditions (Guide):** ● :Stable Cutting ◐ :General Cutting ✤ :Unstable Cutting				
Shape	Order Number	Stock							Inserts		Clamp Screw		Use
		Coated				Carbide							
		LC15TF	**MP9120**			**MT2010**	**TF15**		Order Number	Pieces	Order Number	Pieces	
Strong Cutting Edge **GM** Breaker 	**K-XDGX175004PDFR-GM**					□	□		XDGX175004PDFR-GM	10	TPS3SB	20	First Recommendation High-Speed, High Efficiency and High Load Machining
	K-XDGX175008PDFR-GM					□	□		XDGX175008PDFR-GM	10	TPS3SB	20	
	K-XDGX175012PDFR-GM					□	□		XDGX175012PDFR-GM	10	TPS3SB	20	
	K-XDGX175016PDFR-GM					□	□		XDGX175016PDFR-GM	10	TPS3SB	20	
	K-XDGX175020PDFR-GM					□	□		XDGX175020PDFR-GM	10	TPS3SB	20	
	K-XDGX175024PDFR-GM					□	□		XDGX175024PDFR-GM	10	TPS3SB	20	
	K-XDGX175030PDFR-GM					□	□		XDGX175030PDFR-GM	10	TPS3SB	20	
	K-XDGX175032PDFR-GM					□	□		XDGX175032PDFR-GM	10	TPS3SB	20	
	K-XDGX175040PDFR-GM					□	□		XDGX175040PDFR-GM	10	TPS3SB	20	
	K-XDGX175050PDFR-GM					□	□		XDGX175050PDFR-GM	10	TPS3SB	20	
Strong Cutting Edge Fracture Resistance Type **GM** Breaker 	**K-XDGX175004PDER-GM**		□						XDGX175004PDER-GM	10	TPS3SB	20	
	K-XDGX175008PDER-GM		□						XDGX175008PDER-GM	10	TPS3SB	20	
	K-XDGX175012PDER-GM		□						XDGX175012PDER-GM	10	TPS3SB	20	
	K-XDGX175016PDER-GM		□						XDGX175016PDER-GM	10	TPS3SB	20	
	K-XDGX175020PDER-GM		□						XDGX175020PDER-GM	10	TPS3SB	20	
	K-XDGX175024PDER-GM		□						XDGX175024PDER-GM	10	TPS3SB	20	
	K-XDGX175030PDER-GM		□						XDGX175030PDER-GM	10	TPS3SB	20	
	K-XDGX175032PDER-GM		□						XDGX175032PDER-GM	10	TPS3SB	20	
	K-XDGX175040PDER-GM		□						XDGX175040PDER-GM	10	TPS3SB	20	
	K-XDGX175050PDER-GM		□						XDGX175050PDER-GM	10	TPS3SB	20	
Low Cutting Resistance **GL** Breaker 	**K-XDGX175004PDFR-GL**	□					□		XDGX175004PDFR-GL	10	TPS3SB	20	General Machining
	K-XDGX175008PDFR-GL	□					□		XDGX175008PDFR-GL	10	TPS3SB	20	
	K-XDGX175012PDFR-GL	□					□		XDGX175012PDFR-GL	10	TPS3SB	20	
	K-XDGX175016PDFR-GL	□					□		XDGX175016PDFR-GL	10	TPS3SB	20	
	K-XDGX175020PDFR-GL	□					□		XDGX175020PDFR-GL	10	TPS3SB	20	
	K-XDGX175024PDFR-GL	□					□		XDGX175024PDFR-GL	10	TPS3SB	20	
	K-XDGX175030PDFR-GL	□					□		XDGX175030PDFR-GL	10	TPS3SB	20	
	K-XDGX175032PDFR-GL	□					□		XDGX175032PDFR-GL	10	TPS3SB	20	
	K-XDGX175040PDFR-GL	□					□		XDGX175040PDFR-GL	10	TPS3SB	20	
	K-XDGX175050PDFR-GL	□					□		XDGX175050PDFR-GL	10	TPS3SB	20	

For safety reasons, clamping screws must be replaced at the same time as inserts.

Note 1) Use the GM type insert when using with a high-speed, high-power spindle machine for the AXD4000A (spindle RPM of 20000 min^{-1} or more, motor power of 80 kw or more).

Note 2) The clamp screws and wrenches are different for the AXD4000 and the AXD4000A.

Note 3) For insert dimensions, refer to page L204.

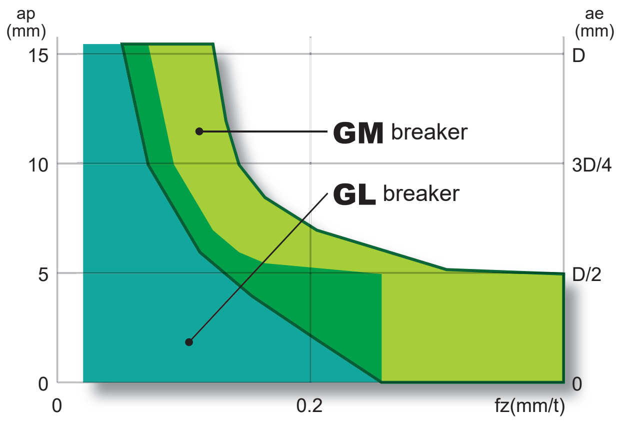
□ **: Non stock, produced to order only.**

When ordering please specify : (1) insert kit order number and (2) insert grades.

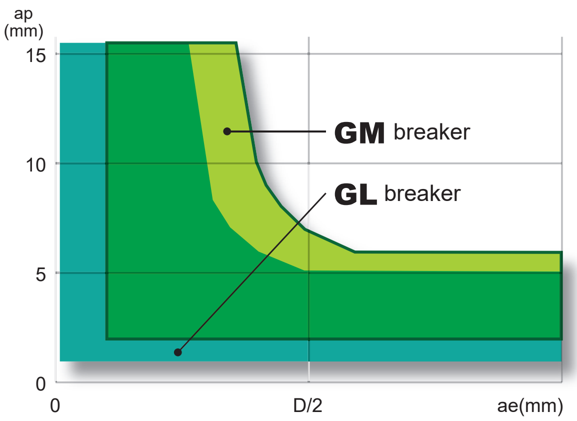
AXD4000 Selection of insert

It is necessary to choose the best insert according to the cutting conditions. Please select an insert from the tables below. The first recommendation for efficient, high load machining with a high-speed spindle is the GM breaker with a strong cutting edge.

Selection of insert according to the feed per tooth and the required cutting depth



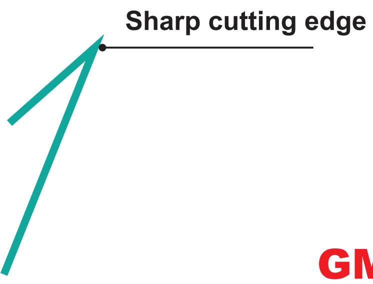
Selection of insert according to the width of cut and the required cutting depth



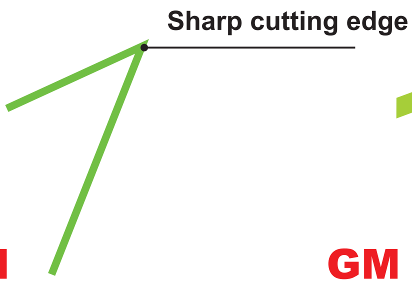
1st recommendation for machining aluminium alloys is GL breaker.
Under high-load conditions such as deep or high feed cutting, it is advisable to use the GM breaker.

Selection of insert according to cutting edge

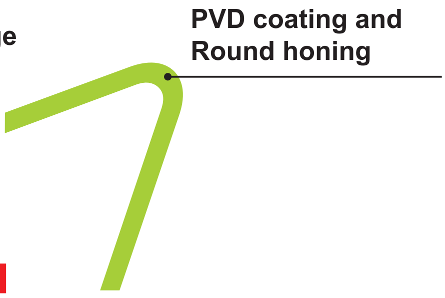
Insert type



GL
TF15/LC15TF
Low cutting resistance
(LC15TF: Excellent weld resistance)



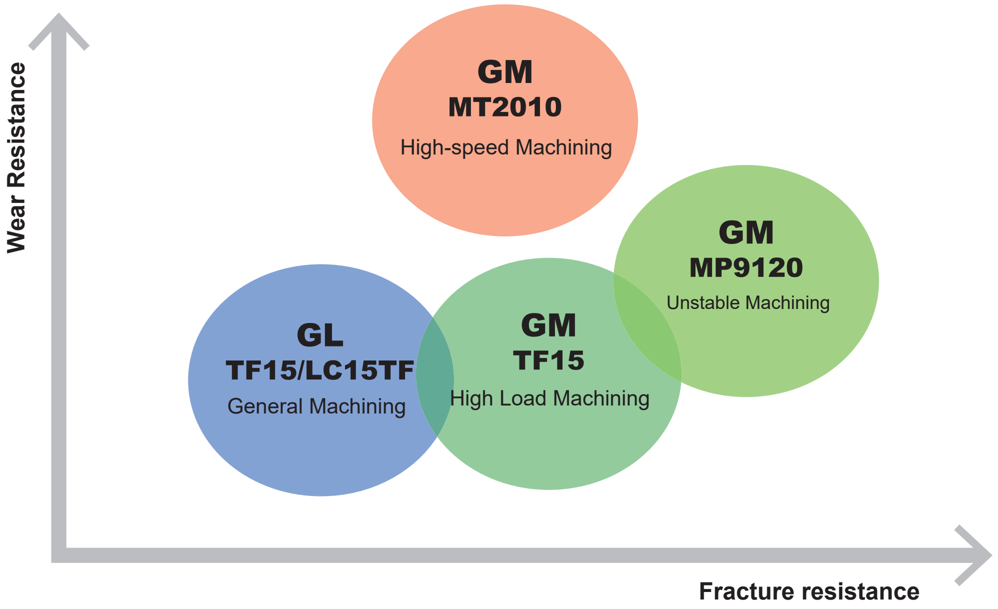
GM
MT2010/TF15
Tougher cutting edge



GM
MP9120
Strong Fracture Resistant Cutting Edge

Selection of insert according to wear resistance

For ultra-high-speed, high efficiency machining with cutting speeds of 3,000-5,000 m/min for extra super duralumin and aluminium-lithium alloys, and also includes a GM breaker and MT2010, which combine fracture resistance and wear resistance at a high levels making this the first recommendation.



RECOMMENDED CUTTING CONDITIONS

(mm)

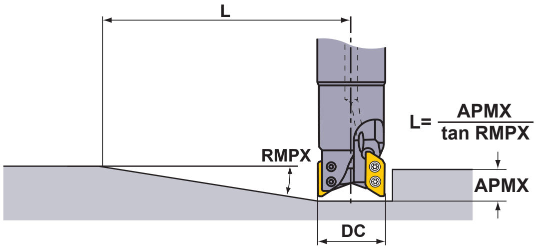
	Workpiece Material	Characteristics	Grade	Breaker	Cutting Speed **vc** (m/min)	Cutting Width **ae**	Depth of Cut **ap**	Feed per Tooth (mm/t)
N	Aluminium Alloys (A7050, A7075, A2024, A6061 etc) Aluminium-lithium Alloy	Content Si<5%	MT2010 TF15 MP9120	**GM**	4000(2000–5000)	≤0.5 DC	≤ 5	≤ 0.35
							≤ 10	≤ 0.30
							≤ 14.5	≤ 0.25
						≤0.75 DC	≤ 5	≤ 0.30
							≤ 10	≤ 0.25
							≤ 14.5	≤ 0.20
						DC (Slot)	≤ 5	≤ 0.30
			TF15 LC15TF	**GL**	4000(2000–5000)	≤0.75 DC	≤ 5	≤ 0.20
							≤ 10	≤ 0.15
							≤ 14.5	≤ 0.10
						DC (Slot)	≤ 5	≤ 0.20

Note 1) The above cutting conditions are determined based on high workpiece materials and machine rigidity, where no vibration occurred. If vibrations occur make adjustments according to the machining conditions.

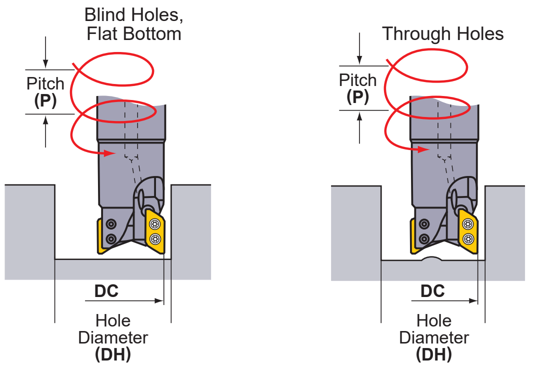
Note 2) Note, vibrations may occur in the following conditions.
- When using a long tool overhang.
- When pocket machining corner radii.
- When the workpiece materials has poor clamping rigidity or when the machine rigidity or workpiece material rigidity is low, vibrations can occur easily, if so, reduce cutting conditions such as width and depth of cut and feed per tooth.

■ Ramping / Helical Milling / Drilling

● Ramping



● Helical Milling



Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

(mm)

DC	Type	Insert Corner R **RE**	Ramping		Helical Milling (Blind Hole, Flat Bottom)			Helical Milling (Through Hole)		Drilling
			RMPX	**L** *1	**DH max.**	**DH min.**	**P max.**	**DH min.**	**P max.**	
50	D	0.4–1.2	8.2°	108	96.8 *2	95.4	14	81.2	14	5.5
		1.6–2.4	7.6°	117	94.4 *3	93.6	13	81.2	13	5.0
		3.0–3.2	6.9°	129	92.8 *4	92.0	12	81.2	12	4.5
	E	4.0	6.3°	135	91.2	90.0	10	81.2	10	3.9
		5.0	5.8°	146	89.2	88.8	9	81.2	9	3.6

*1 Using the maximum ramping angle, the distance to reach the maximum depth of cut is as follows:
L= (maximum depth of cut APMX/tan RMPX). Maximum depth of cut D type is 15.5mm, E type is 14.8mm.
*2 Corner radius of 1.2mm. For other corner radii, use the following formula. {(cutting edge diameter DC)–(corner radius RE)–0.3}×2
*3 Corner radius of 2.4mm. For other corner radii, use the following formula. {(cutting edge diameter DC)–(corner radius RE)–0.3}×2
*4 Corner radius of 3.2mm. For other corner radii, use the following formula. {(cutting edge diameter DC)–(corner radius RE)–0.3}×2
Note 1) The recommended ramping feed is 0.05mm/t or under.

MULTI-FUNCTIONAL MILLING

<ALUMINIUM ALLOY TO DIFFICULT-TO-CUT MATERIAL CUTTING>

90° KAPR

AXD7000

P	M	K	N	S	H
Steel			Non-ferrous Metal	Heat Resistant Alloy	

- Low resistance chipbreaker.
- Low resistance insert and high rigidity design for excellent performance.
- For high-speed machining.
- Multi-functional machining.

Fig.1

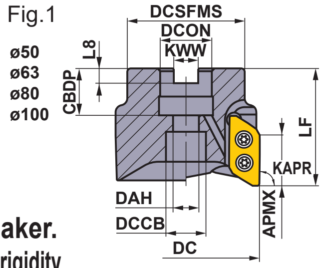
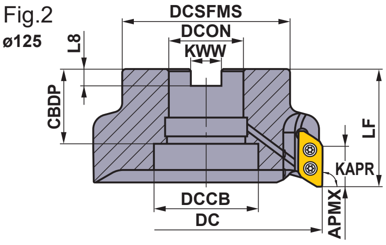
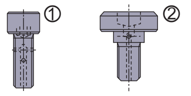


Fig.2



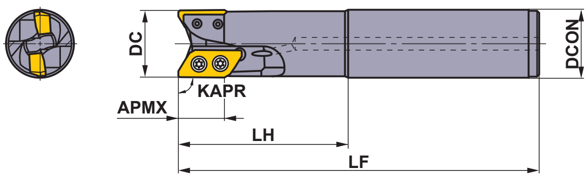
Right hand tool holder only.

Cutter Diameter DC (mm)	Set Bolt	Geometry	
ϕ50, ϕ63	HSC10030H	①	 ① ② With Coolant Hole
ϕ80	HSC12035H		
ϕ100	HSC16040H		
ϕ125	MBA20040H	②	

■ARBOR TYPE

With Coolant Hole

Type	Insert Corner Radius	Order Number	Stock	Number of Teeth	Dimensions (mm)									WT (kg)	APMX	Max. Allowable Revolution (min^{-1})	Fig.	*			
	RE		R		DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	DCCB		(mm)			Clamp Screw	Wrench	Anti-seize Lubricant	Insert
A Type	0.8 I 3.2	**AXD7000-050A03RA**	●	3	50	50	22	20	11	45	10.4	6.3	17	0.4	21	30000	1	TS4SBL	TKY15D	MK1KS	XDGX2270○○
		AXD7000-063A03RA	●	3	63	50	22	20	11	50	10.4	6.3	17	0.5	21	25000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000R08004CA	●	4	80	63	25.4	26	13	63	9.5	6	20	1.2	21	23000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000R10005DA	●	5	100	63	31.75	32	17	70	12.7	8	26	1.8	21	19000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000R12506EA	●	6	125	63	38.1	40	—	90	15.9	10	56	2.7	21	16000	2	TS4SBL	TKY15D	MK1KS	
B Type	4.0 I 5.0	**AXD7000-050A03RB**	●	3	50	50	22	20	11	45	10.4	6.3	17	0.4	20.4	30000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-063A03RB	●	3	63	50	22	20	11	50	10.4	6.3	17	0.5	20.4	25000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000R08004CB	●	4	80	63	25.4	26	13	63	9.5	6	20	1.2	20.4	23000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000R10005DB	●	5	100	63	31.75	32	17	70	12.7	8	26	1.8	20.4	19000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000R12506EB	●	6	125	63	38.1	40	—	90	15.9	10	56	2.7	20.4	16000	2	TS4SBL	TKY15D	MK1KS	



■SHANK TYPE

With Coolant Hole

Right hand tool holder only.

Type	Insert Corner Radius	Order Number	Stock	Number of Teeth	Dimensions (mm)				APMX	Max. Allowable Revolution (min^{-1})	*			
	RE		R		DC	LF	LH	DCON	(mm)		Clamp Screw	Wrench	Anti-seize Lubricant	Insert
A Type	0.8 I 3.2	**AXD7000R322SA32SA**	●	2	32	170	80	32	21	41000	TS4SB	TKY15D	MK1KS	XDGX2270○○
		AXD7000R402SA42SA	●	2	40	170	80	42	21	36000	TS4SBL	TKY15D	MK1KS	
B Type	4.0 I 5.0	**AXD7000R322SA32SB**	●	2	32	170	80	32	20.4	41000	TS4SB	TKY15D	MK1KS	
		AXD7000R402SA42SB	●	2	40	170	80	42	20.4	36000	TS4SBL	TKY15D	MK1KS	

Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
Before operating the tool read the operational guidance on page L213.

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 LF and LH dimensions decreases.

* Clamp Torque (N • m) : TS4SB=3.5, TS4SBL=3.5
Use the clamp screw by setting the bundled screw.

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

Fig.1

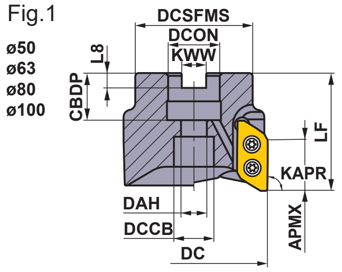
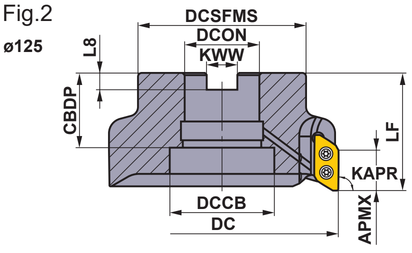


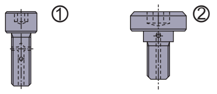
Fig.2



Right hand tool holder only.

For metric arbor

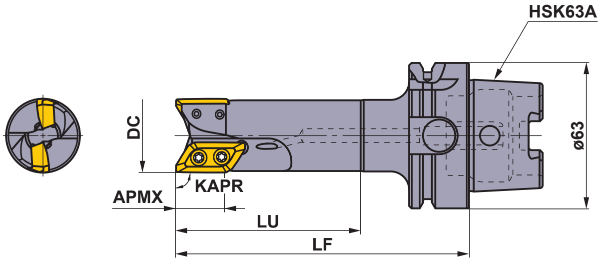
The cutter bore diameter DCON is indicated in millimetre.

Cutter Diameter **DC** (mm)	Set Bolt	Geometry	
ϕ50, ϕ63	HSC10030H	①	 ① ② With Coolant Hole
ϕ80	HSC12035H		
ϕ100	HSC16040H		
ϕ125	MBA20040H	②	

■ARBOR TYPE

With Coolant Hole

Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	DCCB	WT (kg)	APMX (mm)	Max. Allowable Revolution (min^{-1})	Fig.	Clamp Screw*	Wrench	Anti-seize Lubricant	Insert
A Type	0.8 I 3.2	**AXD7000-050A03RA**	●	3	50	50	22	20	11	45	10.4	6.3	17	0.4	21	30000	1	TS4SBL	TKY15D	MK1KS	XDGX2270◌◌
		AXD7000-063A03RA	●	3	63	50	22	20	11	50	10.4	6.3	17	0.5	21	25000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-080A04RA	●	4	80	63	27	23	13	63	12.4	7	20	1.2	21	23000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-100A05RA	●	5	100	63	32	26	17	70	14.4	8	26	1.8	21	19000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-125B06RA	●	6	125	63	40	40	—	90	16.4	9	56	2.7	21	16000	2	TS4SBL	TKY15D	MK1KS	
B Type	4.0 I 5.0	**AXD7000-050A03RB**	●	3	50	50	22	20	11	45	10.4	6.3	17	0.4	20.4	30000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-063A03RB	●	3	63	50	22	20	11	50	10.4	6.3	17	0.5	20.4	25000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-080A04RB	●	4	80	63	27	23	13	63	12.4	7	20	1.2	20.4	23000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-100A05RB	●	5	100	63	32	26	17	70	14.4	8	26	1.8	20.4	19000	1	TS4SBL	TKY15D	MK1KS	
		AXD7000-125B06RB	●	6	125	63	40	40	—	90	16.4	9	56	2.7	20.4	16000	2	TS4SBL	TKY15D	MK1KS	



■HSK63A SHANK TYPE

With Coolant Hole

Right hand tool holder only.

Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LU	LF	APMX (mm)	Max. Allowable Revolution (min^{-1})	Clamp Screw*	Wrench	Anti-seize Lubricant	Insert
A Type	0.8 I 3.2	**AXD7000R03202A-H63A**	●	2	32	127	80	21	41000	TS4SB	TKY15D	MK1KS	XDGX2270◌◌
		AXD7000R04002A-H63A	●	2	40	132	85	21	36000	TS4SBL	TKY15D	MK1KS	
		AXD7000R05003A-H63A	●	3	50	137	90	21	30000	TS4SBL	TKY15D	MK1KS	

Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
Before operating the tool read the operational guidance on page L213.

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 LF and LU dimensions decreases.

Note 4) No hole for data carrier.

Note 5) The HSK63A shank type has a built-in coolant pipe for installation.

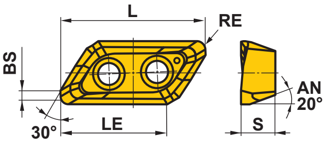
* Clamp Torque (N • m) : TS4SB=3.5, TS4SBL=3.5
Use the clamp screw by setting the bundled screw.

ISO13399 ➤ L003
CAUTION FOR USE ➤ L213
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

INSERTS

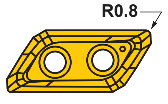
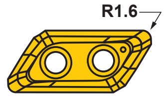
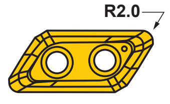
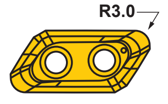
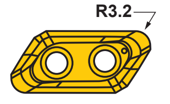
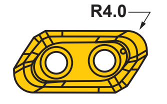
Workpiece Material			LC15TF	MP6120	MP9120		TF15	
	P	Steel		◖				
	N	Aluminium Alloy	✤		✤		◖	
	S	Titanium Alloy			●			

Cutting Conditions (Guide):
● : Stable Cutting ◖ : General Cutting ✤ : Unstable Cutting
Edge Preparation :
E : Round **F :** Sharp

Shape	Order Number	Class	Edge Preparation	Stock Coated LC15TF	MP6120	MP9120		Carbide TF15		Dimensions (mm) L	LE	S	BS	RE*	Geometry
	**XDGX227008PDFR-GL**	G	F	●				●		30	21.6	7	2.0	0.8	
	XDGX227016PDFR-GL	G	F	●				●		30	21.7	7	1.2	1.6	
	XDGX227020PDFR-GL	G	F	●				●		30	21.7	7	0.8	2	
	XDGX227030PDFR-GL	G	F	●				●		28.8	21.2	7	0.8	3	
	XDGX227032PDFR-GL	G	F	●				●		28.8	21.2	7	0.6	3.2	
	XDGX227040PDFR-GL	G	F	●				●		27.5	20.6	7	0.9	4	
	XDGX227050PDFR-GL	G	F	●				●		27	20.3	7	0.4	5	
	XDGX227008PDER-GLA	G	E		●	●				30	21.7	7	1.9	0.8	
	XDGX227016PDER-GLA	G	E		●	●				30	21.7	7	1.1	1.6	
	XDGX227020PDER-GLA	G	E		●	●				30	21.7	7	0.7	2	
	XDGX227024PDER-GLA	G	E		●	●				30	21.7	7	0.3	2.4	
	XDGX227030PDER-GLA	G	E		●	●				28.8	21.1	7	0.7	3	
	XDGX227032PDER-GLA	G	E		●	●				28.8	21.1	7	0.5	3.2	
	XDGX227040PDER-GLA	G	E		●	●				27.5	20.4	7	0.8	4	
	XDGX227050PDER-GLA	G	E		●	●				27	20.2	7	0.2	5	

* GLA breaker corner R (RE) is designed with almost same corner R as a machined corner R of workpiece.
* Please note that the GL breaker is slightly different from the workpiece R geometry after machining due to the influence of the rake angle of the cutting edge.

■HOLDER AND INSERT CORNER RADIUS COMBINATION

Holder	**A** Holder					**B** Holder	
	AXD7000–◌◌◌◌◌◌◌A AXD7000R◌◌◌◌◌◌◌◌◌A AXD7000R◌◌◌◌A-H63A					**AXD7000–◌◌◌◌◌◌◌B AXD7000R◌◌◌◌◌◌◌◌◌B**	
Insert Corner Radius (**RE**)							
	XDGX 227008PDFR-G◌	**XDGX 227016PDFR-G◌**	**XDGX 227020PDFR-G◌**	**XDGX 227030PDFR-G◌**	**XDGX 227032PDFR-G◌**	**XDGX 227040PDFR-G◌**	**XDGX 227050PDFR-G◌**

Not interchangeable with the corresponding inserts of the A type and B type holders.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

RECOMMENDED CUTTING CONDITIONS

■Cutting Speed

	Workpiece Material		Greade	Breaker	Cutting Speed **vc** (m/min)
P	Mild Steel (JIS SS400, S10C etc)	**≤180HB**	**MP6120**	**GLA**	200 (150–220)
	Carbon Steel Alloy Steel (JIS S45C, SCM440 etc)	**180−280HB**	**MP6120**	**GLA**	200 (150–220)
N	Aluminium Alloy (A6061, A7075 etc)	**Si<5%**	**LC15TF**	**GL**	1000 (200–3000)
			TF15	**GL**	1000 (200–3000)
	Aluminium Alloy (AC4B, ADC12, A390 etc)	**5%≤Si≤10%** **Si>10%**	**LC15TF**	**GL**	1000 (200–3000)
S	Titanium Alloy (Ti-6Al-4V etc)	–	**MP9120**	**GLA**	40 (30–60)

■Depth of Cut / Feed per Tooth

	Workpiece Material		Breaker	Cutting Width **ae** (mm)	Depth of Cut **ap** (mm)	Feed per Tooth (mm/t)			
						Cutting Edge Diameter **DC** (mm)			
						32	**40**	**50, 63, 80**	**100, 125**
P	Mild Steel (JIS SS400, S10C etc)	**≤180HB**	**GLA**	≤0.25 DC	≤ 5	≤ 0.18	≤ 0.2	≤ 0.2	≤ 0.2
					≤ 10	≤ 0.15	≤ 0.18	≤ 0.18	≤ 0.18
					≤ 15	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.15
					≤ 20	≤ 0.1	≤ 0.12	≤ 0.12	–
				≤0.5 DC	≤ 5	≤ 0.18	≤ 0.2	≤ 0.2	≤ 0.2
					≤ 10	≤ 0.15	≤ 0.18	≤ 0.18	≤ 0.18
					≤ 15	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.15
					≤ 20	≤ 0.1	≤ 0.12	≤ 0.12	–
				≤0.75 DC	≤ 5	≤ 0.15	≤ 0.15	≤ 0.18	≤ 0.18
					≤ 10	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15
					≤ 15	≤ 0.1	≤ 0.1	≤ 0.12	≤ 0.12
				DC (Slot)	≤ 5	≤ 0.12	≤ 0.15	≤ 0.18	≤ 0.18
					≤ 10	≤ 0.1	≤ 0.12	≤ 0.15	≤ 0.15
	Carbon Steel Alloy Steel (JIS S45C, SCM440 etc)	**180−280HB**	**GLA**	≤0.25 DC	≤ 5	≤ 0.18	≤ 0.2	≤ 0.2	≤ 0.2
					≤ 10	≤ 0.15	≤ 0.18	≤ 0.18	≤ 0.18
					≤ 15	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.15
					≤ 20	≤ 0.1	≤ 0.12	≤ 0.12	–
				≤0.5 DC	≤ 5	≤ 0.18	≤ 0.2	≤ 0.2	≤ 0.2
					≤ 10	≤ 0.15	≤ 0.18	≤ 0.18	≤ 0.18
					≤ 15	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.15
					≤ 20	≤ 0.1	≤ 0.12	≤ 0.12	–
				≤0.75 DC	≤ 5	≤ 0.15	≤ 0.15	≤ 0.18	≤ 0.18
					≤ 10	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15
					≤ 15	≤ 0.1	≤ 0.1	≤ 0.12	≤ 0.12
				DC (Slot)	≤ 5	≤ 0.12	≤ 0.15	≤ 0.18	≤ 0.18
					≤ 10	≤ 0.1	≤ 0.12	≤ 0.15	≤ 0.15

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.

RECOMMENDED CUTTING CONDITIONS

■Depth of Cut / Feed per Tooth

Workpiece Material			Breaker	Cutting Width **ae** (mm)	Depth of Cut **ap** (mm)	Feed per Tooth (mm/t)			
						Cutting Edge Diameter **DC** (mm)			
						32	**40**	**50, 63, 80**	**100, 125**
N	Aluminium Alloy (A6061, A7075 etc)	**Si<5%**	**GL**	≤0.25 DC	≤ 5	≤ 0.35	≤ 0.4	≤ 0.4	≤ 0.4
					≤ 10	≤ 0.3	≤ 0.35	≤ 0.35	≤ 0.35
					≤ 15	≤ 0.25	≤ 0.3	≤ 0.3	≤ 0.3
					≤ 20	≤ 0.2	≤ 0.25	≤ 0.25	≤ 0.25
				≤0.5 DC	≤ 5	≤ 0.35	≤ 0.35	≤ 0.4	≤ 0.4
					≤ 10	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 15	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3
					≤ 20	≤ 0.2	≤ 0.2	≤ 0.25	≤ 0.25
				≤0.75 DC	≤ 5	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 10	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3
					≤ 15	≤ 0.2	≤ 0.2	≤ 0.25	≤ 0.25
					≤ 20	≤ 0.15	≤ 0.15	≤ 0.2	≤ 0.2
				DC (Slot)	≤ 5	≤ 0.25	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 10	≤ 0.2	≤ 0.25	≤ 0.3	≤ 0.3
					≤ 15	≤ 0.15	≤ 0.2	≤ 0.25	≤ 0.25
					≤ 20	≤ 0.1	≤ 0.15	≤ 0.2	≤ 0.2
	Aluminium Alloy (AC4B etc) Aluminium Alloy (ADC12, A390 etc)	**5%≤Si≤10% Si>10%**	**GL**	≤0.25 DC	≤ 5	≤ 0.35	≤ 0.4	≤ 0.4	≤ 0.4
					≤ 10	≤ 0.3	≤ 0.35	≤ 0.35	≤ 0.35
					≤ 15	≤ 0.25	≤ 0.3	≤ 0.3	≤ 0.3
					≤ 20	≤ 0.2	≤ 0.25	≤ 0.25	≤ 0.25
				≤0.5 DC	≤ 5	≤ 0.35	≤ 0.35	≤ 0.4	≤ 0.4
					≤ 10	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 15	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3
					≤ 20	≤ 0.2	≤ 0.2	≤ 0.25	≤ 0.25
				≤0.75 DC	≤ 5	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 10	≤ 0.25	≤ 0.25	≤ 0.3	≤ 0.3
					≤ 15	≤ 0.2	≤ 0.2	≤ 0.25	≤ 0.25
					≤ 20	≤ 0.15	≤ 0.15	≤ 0.2	≤ 0.2
				DC (Slot)	≤ 5	≤ 0.25	≤ 0.3	≤ 0.35	≤ 0.35
					≤ 10	≤ 0.2	≤ 0.25	≤ 0.3	≤ 0.3
					≤ 15	≤ 0.15	≤ 0.2	≤ 0.25	≤ 0.25
					≤ 20	≤ 0.1	≤ 0.15	≤ 0.2	≤ 0.2
S	Titanium Alloy (Ti-6Al-4V etc)	–	**GLA**	≤0.25 DC	≤ 5	≤ 0.1	≤ 0.12	≤ 0.12	–
					≤ 10	≤ 0.1	≤ 0.12	≤ 0.12	–
					≤ 15	≤ 0.1	≤ 0.12	≤ 0.12	–
					≤ 20	≤ 0.1	≤ 0.12	≤ 0.12	–
				≤0.5 DC	≤ 5	≤ 0.1	≤ 0.12	≤ 0.12	–
					≤ 10	≤ 0.1	≤ 0.12	≤ 0.12	–
					≤ 15	≤ 0.1	≤ 0.12	≤ 0.12	–
					≤ 20	–	≤ 0.1	≤ 0.1	–
				≤0.75 DC	≤ 5	≤ 0.1	≤ 0.12	≤ 0.12	–
					≤ 10	≤ 0.1	≤ 0.12	≤ 0.12	–
					≤ 15	≤ 0.1	≤ 0.12	≤ 0.12	–
					≤ 20	–	≤ 0.1	≤ 0.1	–
				DC (Slot)	≤ 5	≤ 0.08	≤ 0.08	≤ 0.08	–
					≤ 10	≤ 0.05	≤ 0.08	≤ 0.08	–

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.

■CAUTION FOR USE

Procedure for attaching inserts

1) Clean the seat by air blowing or with a brush before installing the insert.
2) Tighten the clamp screw using the accessory wrench while pressing the insert against the seat.
3) Tighten the clamp screw as shown in Figure 1.
4) Coat the clamp screw with anti-seize compound and tighten it to the specified tightening torque.
The tightening torque is shown below.
AXD7000 3.5N•m(2.58ft•lb)
AXD4000 1.5N•m(1.11ft•lb)
5) The clamp screw is an important part in ensuring safety.
Purchase an official product from Mitsubishi Materials.
When using over the revolution shown in Table 2, replacing the clamp screw simultaneously with insert replacement is recommended.

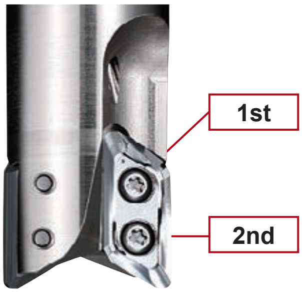
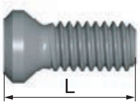


Fig.1

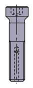
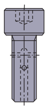
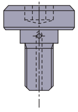
Type	**AXD4000**		**AXD7000**		
Cutting Edge Diameter **DC**(mm)	ø20	ø25−ø125	ø32	ø40−ø125	
Clamp Screw Number	TS3SBS	TS3SB	TS4SB	TS4SBL	
Overall Length **L**(mm)	6.5	8	9	10.5	

6) Check that there is no clearance at the insert seat surface.

Installation of arbor type

1) Clean carefully the inside and face of the hole and the arbor face before installing the body to the arbor.
2) Set the body at the arbor and tighten it with the accessory. Refer to the table shown below for the tightening torque.
3) The set bolt supplied with the AXD is a special coolant through compatible nozzle. Be careful not to lose it.

AXD4000

Geometry	Set Bolt	Clamp Torque (N • m)	Cutting Edge Diameter **DC**(mm)	Fig
Fig.1  Fig.2  Fig.3  With Coolant Hole	HFF08043H	11	ø40	1
	HSC10030H	40	ø50, ø63	2
	HSC12035H	80	ø80	2
	HSC16040H	150	ø100	2
	MBA20040H	320	ø120	3

AXD7000

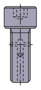
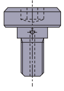
Geometry	Set Bolt	Clamp Torque (N•m)	Cutting Edge Diameter **DC**(mm)	Fig
Fig.1  Fig.2  With Coolant Hole	HSC10030H	40	ø50, ø63	1
	HSC12035H	80	ø80	1
	HSC16040H	150	ø100	1
	MBA20040H	320	ø120	2

Table 1 Max. Allowable Revolution

AXD4000

Cutting Edge Diameter **DC**(mm)	ø25	ø32	ø40	ø50	ø63	ø80	ø100	ø125
Max. Allowable Revolution (min^{-1})	49000	48000	41000	35000	30000	27000	23000	20000

AXD7000

Cutting Edge Diameter **DC**(mm)	ø32	ø40	ø50	ø63	ø80	ø100	ø125
Max. Allowable Revolution (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 betterbased 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.

Note 1) The balance quality of the holder (without inserts and clamp screws) is G6.3 or better at 10,000min^{-1}.

Table 2 Maximum spindle speed when balancing with the arbor or milling chuck has not been achieved

AXD4000

Cutting Edge Diameter **DC**(mm)	ø25	ø32	ø40	ø50	ø63	ø80	ø100	ø125
Max. Allowable Revolution (min^{-1})	12000	9500	7600	6000	4800	3800	3000	2400

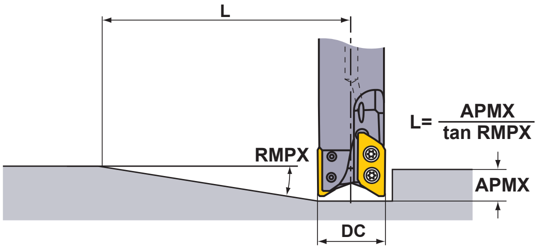
AXD7000

Cutting Edge Diameter **DC**(mm)	ø32	ø40	ø50	ø63	ø80	ø100	ø125
Max. Allowable Revolution (min^{-1})	9500	7600	6000	4800	3800	3000	2400

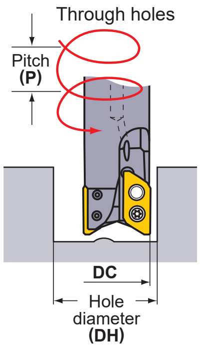
- When setting the spindle speed, take into consideration the maximum allowable spindle speed of the arbor or milling chuck.
- Use the specified set bolt when using the arbor type with through coolant.
- The inserts have sharp cutting edges and handling them with bare hands may cause injuries.
Always wear safety gloves whenhandling the indexable inserts.

RAMPING/HELICAL CUTTING

● RAMPING



● HELICAL CUTTING



RAMPING/HELICAL CUTTING (ALUMINIUM ALLOY)

Type	DC (mm)	RE (mm)	Ramping	
			RMPX	L (mm) *1
A type	32	0.8 - 2.4	19°	61
		3,3.2	18°	65
	40	0.8 - 2.4	14°	85
		3, 3.2	13°	91
	50	0.8 - 2.4	10°	120
		3, 3.2	9°	133
	63	0.8 - 2.4	8°	150
		3, 3.2	7°	172
	80	0.8 - 2.4	6°	200
		3, 3.2	5°	241
	100	0.8 - 2.4	4°	301
		3, 3.2	4°	301
	125	0.8 - 2.4	3°	401
		3, 3.2	3°	401
B type	32	4, 5	18°	63
	40	4, 5	11°	105
	50	4, 5	8°	146
	63	4, 5	6°	195
	80	4, 5	4°	292
	100	4, 5	3°	390
	125	4, 5	2°	585

Type	DC (mm)	RE (mm)	Helical Milling	
			DH min. (mm)	P max. (mm)
A type	32	0.8 - 2.4	41	8
		3, 3.2	41	7
	40	0.8 - 2.4	57	10
		3, 3.2	57	9
	50	0.8 - 2.4	77	12
		3, 3.2	77	11
	63	0.8 - 2.4	103	13
		3, 3.2	103	12
	80	0.8 - 2.4	137	14
		3, 3.2	137	12
	100	0.8 - 2.4	177	14
		3, 3.2	177	13
	125	0.8 - 2.4	227	15
		3, 3.2	227	13
B type	32	4	41	7
		5	41	6
	40	4	57	9
		5	57	8
	50	4	77	10
		5	77	9
	63	4	103	10
		5	103	10
	80	4	137	11
		5	137	10
	100	4	177	11
		5	177	10
	125	4	227	11
		5	227	11

Note 1) The recommended ramping feed is 0.05mm/t or under.
Ramping, helical, and drilling are not recommended for machining of steel and titanium alloys.

*1 L= (Max. Depth of Cut / tan RMPX) until the maximum depth of cut (APMX) is reached at the maximum ramping angle.
Maximum depth of cut A type is 21mm, B type is 20.4mm.

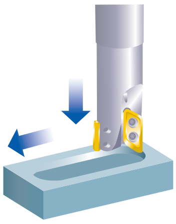
*2 The maximum diameter when machining a blind hole with a flat face using a corner radius of 0.8mm for A type and 4mm for B type.
Other than that, find with the below formula.
{(cutting edge diameter DC)−(corner radius)−0.3}×2

*3 The minimum diameter when machining a blind hole with a flat face using a corner radius of 0.8mm for A type and 4mm for B type.
Other than that, find with the below formula.
{(cutting edge diameter DC)−(corner radius)−(Width of wiper edge BS)−0.1}×2

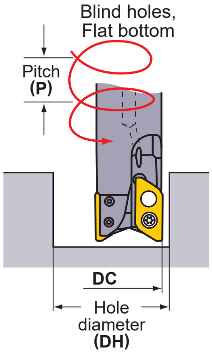
Max. Drilling Depth (Aluminium Alloy)

Type	Insert corner radius RE (mm)	Max. Drilling Depth (mm)
Type A	0.8 – 2.4	5
	3, 3.2	4.5
Type B	4	4
	5	3.5

AXD7000 can be effectively used for pocket machining without the need for a prepared hole.



● HELICAL CUTTING



RAMPING/HELICAL CUTTING (ALUMINIUM ALLOY)

Type	DC (mm)	RE (mm)	BS (mm)	Helical Cutting (Blind Hole, Flat Bottom)			
				DH max. *2 (mm)	P max. (mm)	DH min. *3 (mm)	P max. (mm)
A type	32	0.8	2	61.9	20	58.3	20
		1.6	1.2	60.3	19	58.3	19
		2	0.8	59.5	18	58.3	18
		2.4	0.4	58.7	18	58.3	18
		3	0.8	57.5	17	56.2	17
		3.2	0.6	57.1	17	56.2	17
	40	0.8	2	77.9	20	74.3	20
		1.6	1.2	76.3	19	74.3	19
		2	0.8	75.5	18	74.3	18
		2.4	0.4	74.7	18	74.3	18
		3	0.8	73.5	17	72.2	17
		3.2	0.6	73.1	17	72.2	17
	50	0.8	2	97.5	20	94.1	20
		1.6	1.2	95.9	19	94.1	19
		2	0.8	95.1	18	94.1	18
		2.4	0.4	94.3	18	94.1	18
		3	0.8	93.1	17	92.1	17
		3.2	0.6	92.7	17	92.1	17
	63	0.8	2	123.5	20	120.1	19
		1.6	1.2	121.9	19	120.1	19
		2	0.8	121.1	18	120.1	18
		2.4	0.4	120.3	18	120.1	18
		3	0.8	119.1	17	118	16
		3.2	0.6	118.7	17	118	16
	80	0.8	2	157.5	19	154.1	18
		1.6	1.2	155.9	19	154.1	18
		2	0.8	155.1	18	154.1	18
		2.4	0.4	154.3	18	154.1	18
		3	0.8	153.1	16	152	16
		3.2	0.6	152.7	16	152	16
	100	0.8	2	197.5	18	194.1	18
		1.6	1.2	195.9	18	194.1	18
		2	0.8	195.1	18	194.1	18
		2.4	0.4	194.3	18	194.1	18
		3	0.8	193.1	15	192	15
		3.2	0.6	192.7	15	192	15
	125	0.8	2	247.5	18	244.1	17
		1.6	1.2	245.9	17	244.1	17
		2	0.8	245.1	17	244.1	17
		2.4	0.4	244.3	17	244.1	17
		3	0.8	243.1	15	242	15
		3.2	0.6	242.7	15	242	15
B type	32	4	0.9	55.5	16	54	16
		5	0.4	53.5	15	53.1	15
	40	4	0.9	71.5	16	70	16
		5	0.4	69.5	15	69	14
	50	4	0.9	91.1	15	89.8	15
		5	0.4	89.1	14	88.9	14
	63	4	0.9	117.1	14	115.8	14
		5	0.4	115.1	13	114.9	13
	80	4	0.9	151.1	14	149.8	13
		5	0.4	149.1	12	148.9	12
	100	4	0.9	191.1	13	189.8	13
		5	0.4	189.1	12	188.8	12
	125	4	0.9	241.1	13	239.8	13
		5	0.4	239.1	12	238.8	12

Note 1) The recommended ramping feed is 0.05mm/t or under.

*1 L= (Max. Depth of Cut / tan RMPX) until the maximum depth of cut (APMX) is reached at the maximum ramping angle.
Maximum depth of cut A type is 21mm, B type is 20.4mm.

*2 The maximum diameter when machining a blind hole with a flat face using a corner radius of 0.8mm for A type and 4mm for B type.Other than that, find with the below formula.
{(cutting edge diameter DC)−(corner radius)−0.3}×2

*3 The minimum diameter when machining a blind hole with a flat face using a corner radius of 0.8mm for A type and 4mm for B type.Other than that, find with the below formula.
{(cutting edge diameter DC)−(corner radius)−(Width of wiper edge BS)−0.1}×2

MULTI-FUNCTIONAL MILLING

<ALUMINIUM ALLOY TO DIFFICULT-TO-CUT MATERIAL CUTTING>

90° KAPR

BXD4000

P	M	K	N	S	H
Steel	Stainless Steel		Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel

- Curved cutting edge and high rigidity holder produce high wall accuracy.
- Low resistance insert and high rigidity design for excellent performance.
- With through coolant holes to ensure smooth chip discharge.
- For high-speed machining.

Fig.1

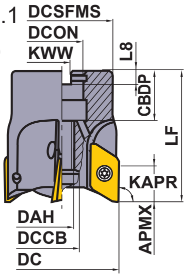


Fig.2

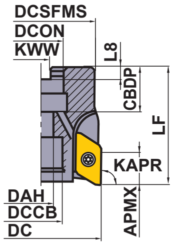
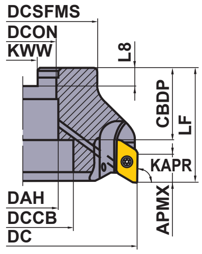
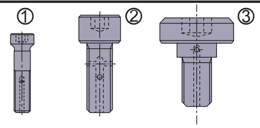


Fig.3



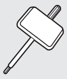
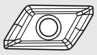
Right hand tool holder only.

- The set bolts in the table to the right are supplied with respective cutter.

Cutter Diameter DC (mm)	Set Bolt	Geometry	
ϕ40	HFF08043H	①	
ϕ50, ϕ63	HSC10030H	②	
ϕ80	HSC12035H	②	
ϕ100	HSC16040H	②	
ϕ125	MBA20040H	③	

ARBOR TYPE

With Coolant Hole

Type	Insert Radius RE	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	DCCB	WT (kg)	APMX (mm)	RMPX	Max. Allowable Revolution (min^{-1})	Fig.	 Clamp Screw *	 Wrench	 Insert
A type	0.4 | 3.2	BXD4000-040A03RA	●	3	40	50	16	18	8.5	32	8.4	5.6	12	0.3	15	9°	29000	1	TS4SL	TKY15W	XDGT1550 PD◌R-G◌◌
		BXD4000-050A04RA	●	4	50	50	22	20	11	41	10.4	6.3	17	0.4	15	6°	24000	2	TS4SL	TKY15W	
		BXD4000-063A05RA	●	5	63	50	22	20	11	50	10.4	6.3	17	0.7	15	5°	21000	2	TS4SL	TKY15W	
		BXD4000 R08005CA	●	5	80	50	25.4	26	13	60	9.5	6	20	1.1	15	3°	19000	2	TS4SL	TKY15W	XDGT1550 PD◌R-GL◌◌
		BXD4000 R10006DA	●	6	100	63	31.75	32	17	70	12.7	8	26	2.0	15	3°	16000	2	TS4SL	TKY15W	
		BXD4000 R12507EA	●	7	125	63	38.1	40	42	80	15.9	10	56	2.8	15	2°	14000	3	TS4SL	TKY15W	
B type	4.0 | 5.0	BXD4000-040A03RB	●	3	40	50	16	18	8.5	32	8.4	5.6	12	0.3	15	9°	29000	1	TS4SL	TKY15W	XDGT1550 PD◌R-G◌◌
		BXD4000-050A04RB	●	4	50	50	22	20	11	41	10.4	6.3	17	0.4	15	6°	24000	2	TS4SL	TKY15W	
		BXD4000-063A05RB	●	5	63	50	22	20	11	50	10.4	6.3	17	0.7	15	5°	21000	2	TS4SL	TKY15W	
		BXD4000 R08005CB	●	5	80	50	25.4	26	13	60	9.5	6	20	1.1	15	3°	19000	2	TS4SL	TKY15W	
		BXD4000 R10006DB	●	6	100	63	31.75	32	17	70	12.7	8	26	2.0	15	3°	16000	2	TS4SL	TKY15W	
		BXD4000 R12507EB	●	7	125	63	38.1	40	42	80	15.9	10	56	2.8	15	2°	14000	3	TS4SL	TKY15W	

Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
* Clamp Torque (N • m) : TS4SL=4.0

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

Fig.1

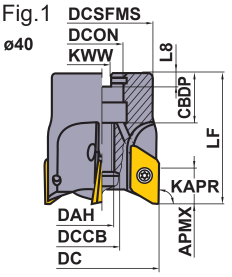


Fig.2

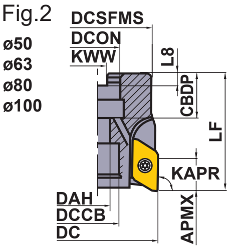
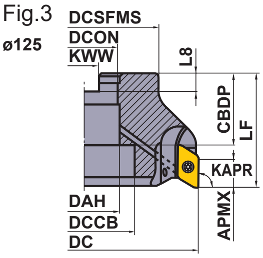
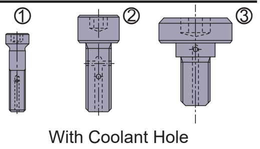


Fig.3



Right hand tool holder only.

Cutter Diameter **DC** (mm)	Set Bolt		Geometry
ϕ40	HFF08043H	①	 ① ② ③ With Coolant Hole
ϕ50, ϕ63	HSC10030H	②	
ϕ80	HSC12035H		
ϕ100	HSC16040H		
ϕ125	MBA20040H	③	

For metric arbor

The cutter bore diameter DCON is indicated in millimetre.

■ARBOR TYPE

With Coolant Hole

Type	Insert Radius RE	Order Number	Stock R	Number of Teeth	Dimensions(mm) DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	DCCB	WT (kg)	APMX (mm)	RMPX	Max. Allowable Revolution (min^{-1})	Fig.	* Clamp Screw	Wrench	Insert
A type	0.4 I 3.2	**BXD4000-040A03RA**	●	3	40	50	16	18	8.5	32	8.4	5.6	12	0.3	15	9°	29000	1	TS4SL	TKY15W	XDGT1550 PD◌R-G◌◌
		BXD4000-050A04RA	●	4	50	50	22	20	11	41	10.4	6.3	17	0.4	15	6°	24000	2	TS4SL	TKY15W	
		BXD4000-063A05RA	●	5	63	50	22	20	11	50	10.4	6.3	17	0.7	15	5°	21000	2	TS4SL	TKY15W	
		BXD4000-080A05RA	●	5	80	50	27	23	13	60	12.4	7	20	1.1	15	3°	19000	2	TS4SL	TKY15W	
		BXD4000-100A06RA	●	6	100	63	32	26	17	70	14.4	8	26	2.0	15	3°	16000	2	TS4SL	TKY15W	
		BXD4000-125B07RA	●	7	125	63	40	40	42	80	16.4	9	56	2.8	15	2°	14000	3	TS4SL	TKY15W	
B type	4.0 I 5.0	**BXD4000-040A03RB**	●	3	40	50	16	18	8.5	32	8.4	5.6	12	0.3	15	9°	29000	1	TS4SL	TKY15W	XDGT1550 PD◌R-G◌◌
		BXD4000-050A04RB	●	4	50	50	22	20	11	41	10.4	6.3	17	0.4	15	6°	24000	2	TS4SL	TKY15W	
		BXD4000-063A05RB	●	5	63	50	22	20	11	50	10.4	6.3	17	0.7	15	5°	21000	2	TS4SL	TKY15W	
		BXD4000-080A05RB	●	5	80	50	27	23	13	60	12.4	7	20	1.1	15	3°	19000	2	TS4SL	TKY15W	
		BXD4000-100A06RB	●	6	100	63	32	26	17	70	14.4	8	26	2.0	15	3°	16000	2	TS4SL	TKY15W	
		BXD4000-125B07RB	●	7	125	63	40	40	42	80	16.4	9	56	2.8	15	2°	14000	3	TS4SL	TKY15W	

Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
∗ Clamp Torque (N • m) : TS4SL=4.0

■CAUTION FOR USE

- 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.
- 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 Max. Allowable Revolution

Cutting Edge Diameter **DC**(mm)	ø20	ø25	ø28	ø32	ø35	ø40	ø50	ø63	ø80	ø100	ø125
Max. Allowable Revolution (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 betterbased 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.

Table 2 Maximum spindle speed when balancing with the arbor or milling chuck has not been achieved

Cutting Edge Diameter **DC**(mm)	ø20	ø25	ø28	ø32	ø35	ø40	ø50	ø63	ø80	ø100	ø125
Max. Allowable Revolution (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.

ISO13399 ➤ **L003**
SPARE PARTS ➤ **P001**
TECHNICAL DATA ➤ **Q001**

Fig.1 Straight Shank

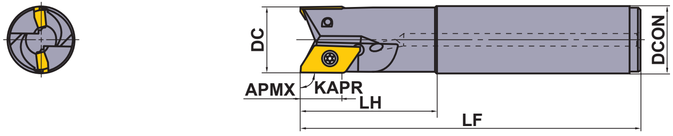
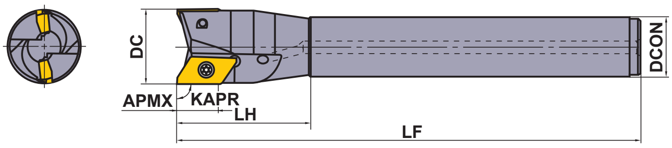


Fig.2 Offset Shank



SHANK TYPE

With Coolant Hole

Right hand tool holder only.

Type	Insert Radius RE	Shank Type	Order Number	Stock R	Number of Teeth	DC	APMX	LF	LH	DCON	RMPX	Max. Allowable Revolution (min⁻¹)	Fig.	Clamp Screw *	Wrench	Insert
Type A	0.4 I 3.2	Standard	**BXD4000R201SA20SA**	●	1	20	15	110	35	20	28°	15000	1	TS4SL	TKY15W	XDGT1550 PD○R-G○○ XDGT1550 PD○R-GL○○
			BXD4000R252SA25SA	●	2	25	15	125	50	25	20°	38000	1	TS4SL	TKY15W	
			BXD4000R282SA25SA	●	2	28	15	125	50	25	17°	35000	2	TS4SL	TKY15W	
			BXD4000R322SA32SA	●	2	32	15	150	50	32	13°	33000	1	TS4SL	TKY15W	
			BXD4000R352SA32SA	●	2	35	15	150	50	32	11°	31000	2	TS4SL	TKY15W	
			BXD4000R403SA32SA	●	3	40	15	170	80	32	9°	29000	2	TS4SL	TKY15W	
			BXD4000R403SA42SA	●	3	40	15	170	80	42	9°	29000	1	TS4SL	TKY15W	
		Long	**BXD4000R252SA25LA**	●	2	25	15	170	80	25	20°	38000	1	TS4SL	TKY15W	
			BXD4000R322SA32LA	●	2	32	15	200	80	32	13°	33000	1	TS4SL	TKY15W	
		Extra Long	**BXD4000R282SA25ELA**	●	2	28	15	220	50	25	17°	35000	2	TS4SL	TKY15W	
			BXD4000R352SA32ELA	●	2	35	15	250	50	32	11°	31000	2	TS4SL	TKY15W	
			BXD4000R403SA32ELA	●	3	40	15	250	65	32	9°	29000	2	TS4SL	TKY15W	
Type B	4.0 I 5.0	Standard	**BXD4000R201SA20SB**	●	1	20	15	110	35	20	28°	15000	1	TS4SL	TKY15W	XDGT1550 PD○R-G○○
			BXD4000R252SA25SB	●	2	25	15	125	50	25	20°	38000	1	TS4SL	TKY15W	
			BXD4000R282SA25SB	●	2	28	15	125	50	25	17°	35000	2	TS4SL	TKY15W	
			BXD4000R322SA32SB	●	2	32	15	150	50	32	13°	33000	1	TS4SL	TKY15W	
			BXD4000R352SA32SB	●	2	35	15	150	50	32	11°	31000	2	TS4SL	TKY15W	
			BXD4000R403SA32SB	●	3	40	15	170	80	32	9°	29000	2	TS4SL	TKY15W	
			BXD4000R403SA42SB	●	3	40	15	170	80	42	9°	29000	1	TS4SL	TKY15W	
		Long	**BXD4000R252SA25LB**	●	2	25	15	170	80	25	20°	38000	1	TS4SL	TKY15W	
			BXD4000R322SA32LB	●	2	32	15	200	80	32	13°	33000	1	TS4SL	TKY15W	
		Extra Long	**BXD4000R282SA25ELB**	●	2	28	15	220	50	25	17°	35000	2	TS4SL	TKY15W	
			BXD4000R352SA32ELB	●	2	35	15	250	50	32	11°	31000	2	TS4SL	TKY15W	
			BXD4000R403SA32ELB	●	3	40	15	250	65	32	9°	29000	2	TS4SL	TKY15W	

Note 1) The maximum allowed revolutions are set to ensure tool and insert stability.
Note 2) When using the tool at high revolutions, ensure that the tool and arbor are correctly balanced.
⁎ Clamp Torque (N • m) : TS4SL=4.0

HOLDER AND INSERT CORNER RADIUS COMBINATION

Holder	**A** Holder							**B** Holder	
	BXD4000R○○○○○○○○A							**BXD4000R○○○○○○○○B**	
Insert Corner Radius (**RE**)	**R 0.4** 	**R 0.8** 	**R 1.2** 	**R 1.6** 	**R 2.0** 	**R 3.0** 	**R 3.2** 	**R 4.0** 	**R 5.0** 
	XDGT.....-G04 **XDGT.....-GL04**	**XDGT.....-G08** **XDGT.....-GL08**	**XDGT.....-G12**	**XDGT.....-G16**	**XDGT.....-G20**	**XDGT.....-G30**	**XDGT.....-G32**	**XDGT.....-G40**	**XDGT.....-G50**

Note 1) Please only use the holder and insert corner radius combinations shown above.
Note 2) XDGT....-GL08 and -G12 inserts are compatible only with the BXD4000R○○○○○○○○A type holder.

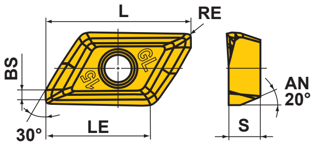
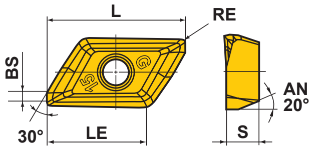
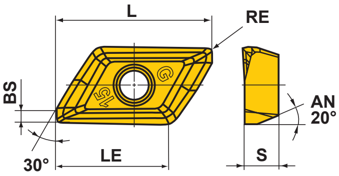
● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material	P	Steel	◐					
	M	Stainless Steel	◐					
	K	Cast Iron	✤					
	N	Non-ferrous Metal		◐			✤	
	S	Heat resistant Alloy, Titanium Alloy	◐					
	H	Hardened Steel	◐					

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Edge Preparation :
E : Round F : Sharp

Shape	Order Number	Class	Edge Preparation	Stock						Dimensions(mm)					Geometry
				Coated				Carbide							
				VP15TF	LC15TF			TF15		L	LE	S	BS	RE	
Low Resistance Type 	**XDGT1550PDFR-GL04**	G	F					●		22	15.5	5	1.5	0.4	
	XDGT1550PDFR-GL08	G	F					●		22	15.5	5	1.1	0.8	
	**XDGT1550PDFR-G04**	G	F		●			●		22	15.5	5	1.5	0.4	
	XDGT1550PDFR-G08	G	F		●			●		22	15.5	5	1.1	0.8	
	XDGT1550PDFR-G12	G	F		●			●		22	15.5	5	0.7	1.2	
	XDGT1550PDFR-G16	G	F		●			●		22	15.6	5	0.4	1.6	
	XDGT1550PDFR-G20	G	F		●			●		21.7	15.6	5	0.2	2.0	
	XDGT1550PDFR-G30	G	F		●			●		20	14.8	5	0.6	3.0	
	XDGT1550PDFR-G32	G	F		●			●		20	14.8	5	0.4	3.2	
	XDGT1550PDFR-G40	G	F		●			●		19	14.4	5	0.5	4.0	
	XDGT1550PDFR-G50	G	F		●			●		18	14	5	0.4	5.0	
	XDGT1550PDER-G04	G	E	●						22	15.5	5	1.5	0.4	
	XDGT1550PDER-G08	G	E	●						22	15.5	5	1.1	0.8	
	XDGT1550PDER-G12	G	E	●						22	15.5	5	0.7	1.2	
	XDGT1550PDER-G16	G	E	●						22	15.6	5	0.4	1.6	
	XDGT1550PDER-G20	G	E	●						21.7	15.6	5	0.2	2.0	
	XDGT1550PDER-G30	G	E	●						20	14.8	5	0.6	3.0	
	XDGT1550PDER-G32	G	E	●						20	14.8	5	0.4	3.2	
	XDGT1550PDER-G40	G	E	●						19	14.4	5	0.5	4.0	
	XDGT1550PDER-G50	G	E	●						18	14	5	0.4	5.0	

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
P	Mild Steel	≤180HB	**VP15TF**	180 (150—200)	0.15 (0.1—0.2)
	Carbon Steel Alloy Steel	≤280HB	**VP15TF**	150 (120—200)	0.15 (0.1—0.2)
		280—350HB	**VP15TF**	140 (120—160)	0.15 (0.1—0.2)
M	Stainless Steel	≤270HB	**VP15TF**	140 (120—160)	0.2 (0.1—0.3)
N	Aluminium Alloy	–	**LC15TF** **TF15**	1000 (200—3000)	0.3 (0.1—0.5)
S	Ti Alloy	–	**VP15TF**	40 (30—60)	0.1 (0.1—0.3)
	Heat Resistance Alloy (Inconel etc.)	–	**VP15TF**	30 (20—40)	0.15 (0.1—0.2)
H	Hardened Steel	40—60HRC	**VP15TF**	70 (50—100)	0.1 (0.05—0.15)

●Figures above are a guide lines for optimum general use. They may vary depending on machine rigidity, work clamping and length of tool overhang.
●When using ϕ20 shank type, set the table feed at under 0.05mm/t and maintain observation during cutting.
●Please adjust the table feed when using long- and extra-long-shank types.
●Please adjust the table feed when ramping (Recommended feed:0.05 mm/t under).

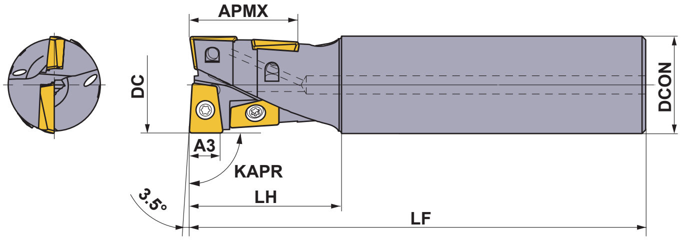
ISO13399 ➤ **L003**
SPARE PARTS ➤ **P001**
TECHNICAL DATA ➤ **Q001**

MULTI-FUNCTIONAL MILLING

90° KAPR

AQX

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel



- The centre bottom cutting edge enables drilling without previously formed hole.
- With through coolant holes.

STANDARD EDGE TYPE

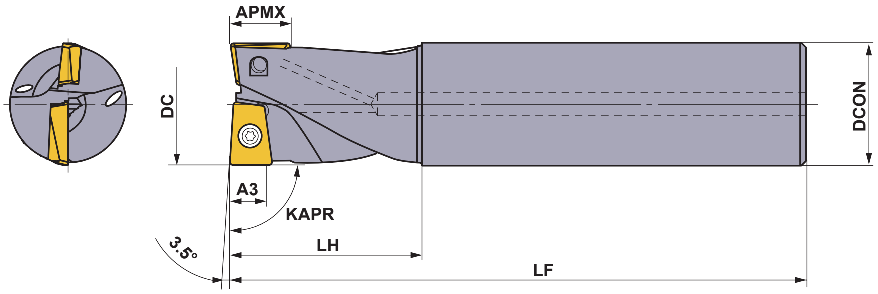
Right hand tool holder only.

Type	Order Number	Stock	Coolant Hole	Dimensions (mm)					*2 APMX (mm)	*3	F D T	
		R		DC	LF	DCON	LH	A3 *1		Clamp Screw	Wrench	Insert
Standard	**AQXR164SA16S**	●	○	16	120	16	30	4.5	17.6	TS2A	TKY06F	QOG/MT0830R-G1/M2
	AQXR164SN16S	●	–	16	120	16	30	4.5	17.6	TS2A	TKY06F	
	AQXR174SA16S	●	○	17	120	16	30	4.5	17.6	TS2A	TKY06F	
	AQXR174SN16S	●	–	17	120	16	30	4.5	17.6	TS2A	TKY06F	
	AQXR204SA20S	●	○	20	130	20	35	6	22	TS25	TKY08F	QOG/MT1035R-G1/M2
	AQXR204SN20S	●	–	20	130	20	35	6	22	TS25	TKY08F	
	AQXR214SA20S	●	○	21	130	20	35	6	22	TS25	TKY08F	
	AQXR214SN20S	●	–	21	130	20	35	6	22	TS25	TKY08F	
	AQXR254SA25S	●	○	25	140	25	40	7.5	27.5	TS33	TKY08D	QOG/MT1342R-G1/M2
	AQXR254SN25S	●	–	25	140	25	40	7.5	27.5	TS33	TKY08D	
	AQXR264SA25S	●	○	26	140	25	40	7.5	27.5	TS33	TKY08D	
	AQXR264SN25S	●	–	26	140	25	40	7.5	27.5	TS33	TKY08D	
	AQXR324SA32S	●	○	32	150	32	50	9.5	35.2	TS407	TKY15D	QOG/MT1651R-G1/M2
	AQXR324SN32S	●	–	32	150	32	50	9.5	35.2	TS407	TKY15D	
	AQXR334SA32S	●	○	33	150	32	50	9.5	35.2	TS407	TKY15D	
	AQXR334SN32S	●	–	33	150	32	50	9.5	35.2	TS407	TKY15D	
	AQXR354SA32S	●	○	35	150	32	50	11	40	TS407	TKY15D	QOG/MT1856R-G1/M2
	AQXR354SN32S	●	–	35	150	32	50	11	40	TS407	TKY15D	
	AQXR404SA32S	●	○	40	160	32	60	12	44	TS55	TKY25D	QOG/MT2062R-G1/M2
	AQXR404SN32S	●	–	40	160	32	60	12	44	TS55	TKY25D	
	AQXR504SA42S	●	○	50	170	42	70	15	55	TS6S	TKY30T	QOG/MT2576R-G1/M2
	AQXR504SN42S	●	–	50	170	42	70	15	55	TS6S	TKY30T	
Long	**AQXR164SA16L**	●	○	16	175	16	50	4.5	17.6	TS2A	TKY06F	QOG/MT0830R-G1/M2
	AQXR164SN16L	●	–	16	175	16	50	4.5	17.6	TS2A	TKY06F	
	AQXR174SA16L	●	○	17	175	16	30	4.5	17.6	TS2A	TKY06F	
	AQXR174SN16L	●	–	17	175	16	30	4.5	17.6	TS2A	TKY06F	
	AQXR204SA20L	●	○	20	185	20	60	6	22	TS25	TKY08F	QOG/MT1035R-G1/M2
	AQXR204SN20L	●	–	20	185	20	60	6	22	TS25	TKY08F	
	AQXR214SA20L	●	○	21	185	20	35	6	22	TS25	TKY08F	
	AQXR214SN20L	●	–	21	185	20	35	6	22	TS25	TKY08F	
	AQXR254SA25L	●	○	25	220	25	75	7.5	27.5	TS33	TKY08D	QOG/MT1342R-G1/M2
	AQXR254SN25L	●	–	25	220	25	75	7.5	27.5	TS33	TKY08D	
	AQXR264SA25L	●	○	26	220	25	40	7.5	27.5	TS33	TKY08D	
	AQXR264SN25L	●	–	26	220	25	40	7.5	27.5	TS33	TKY08D	
	AQXR324SA32L	●	○	32	230	32	90	9.5	35.2	TS407	TKY15D	QOG/MT1651R-G1/M2
	AQXR324SN32L	●	–	32	230	32	90	9.5	35.2	TS407	TKY15D	
	AQXR334SA32L	●	○	33	230	32	50	9.5	35.2	TS407	TKY15D	
	AQXR334SN32L	●	–	33	230	32	50	9.5	35.2	TS407	TKY15D	
	AQXR354SA32L	●	○	35	230	32	50	11	40	TS407	TKY15D	QOG/MT1856R-G1/M2
	AQXR354SN32L	●	–	35	230	32	50	11	40	TS407	TKY15D	
	AQXR404SA32L	●	○	40	240	32	60	12	44	TS55	TKY25D	QOG/MT2062R-G1/M2
	AQXR404SN32L	●	–	40	240	32	60	12	44	TS55	TKY25D	
	AQXR504SA42L	●	○	50	250	42	70	15	55	TS6S	TKY30T	QOG/MT2576R-G1/M2
	AQXR504SN42L	●	–	50	250	42	70	15	55	TS6S	TKY30T	

*1 Dimension A3 represents the depth of cut when the cutting edge consists of 2 inserts. *2 APMX : Maximum depth of cut.
*3 Clamp Torque (N • m) : TS2A=0.6, TS25=1.0, TS33=1.0, TS407=3.5, TS55=7.5, TS6S=10.0

● : Inventory maintained in Japan.

Scan here for product NEWS ▶



Number of Teeth : **2**

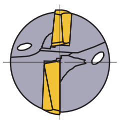
■SHORT EDGE TYPE

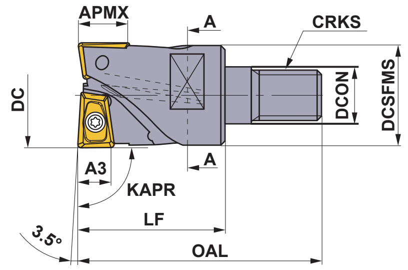
Right hand tool holder only.

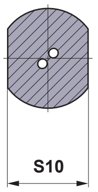
Type	Order Number	Stock	Coolant Hole	Dimensions (mm)					*2 APMX (mm)	*3	F D T	
		R		DC	LF	DCON	LH	A3 *1		Clamp Screw	Wrench	Insert
Standard	**AQXR162SA16S**	●	○	16	120	16	30	4.5	7.4	TS2A	TKY06F	QOG/MT0830R-G1/M2
	AQXR162SN16S	●	–	16	120	16	30	4.5	7.4	TS2A	TKY06F	
	AQXR172SA16S	●	○	17	120	16	30	4.5	7.4	TS2A	TKY06F	
	AQXR172SN16S	●	–	17	120	16	30	4.5	7.4	TS2A	TKY06F	
	AQXR202SA20S	●	○	20	130	20	35	6	9.2	TS25	TKY08F	QOG/MT1035R-G1/M2
	AQXR202SN20S	●	–	20	130	20	35	6	9.2	TS25	TKY08F	
	AQXR212SA20S	●	○	21	130	20	35	6	9.2	TS25	TKY08F	
	AQXR212SN20S	●	–	21	130	20	35	6	9.2	TS25	TKY08F	
	AQXR252SA25S	●	○	25	140	25	40	7.5	11.5	TS33	TKY08D	QOG/MT1342R-G1/M2
	AQXR252SN25S	●	–	25	140	25	40	7.5	11.5	TS33	TKY08D	
	AQXR262SA25S	●	○	26	140	25	40	7.5	11.5	TS33	TKY08D	
	AQXR262SN25S	●	–	26	140	25	40	7.5	11.5	TS33	TKY08D	
	AQXR322SA32S	●	○	32	150	32	50	9.5	14.5	TS407	TKY15D	QOG/MT1651R-G1/M2
	AQXR322SN32S	●	–	32	150	32	50	9.5	14.5	TS407	TKY15D	
	AQXR332SA32S	●	○	33	150	32	50	9.5	14.5	TS407	TKY15D	
	AQXR332SN32S	●	–	33	150	32	50	9.5	14.5	TS407	TKY15D	
	AQXR352SA32S	●	○	35	150	32	50	11	16	TS407	TKY15D	QOG/MT1856R-G1/M2
	AQXR352SN32S	●	–	35	150	32	50	11	16	TS407	TKY15D	
	AQXR402SA32S	●	○	40	160	32	60	12	18	TS55	TKY25D	QOG/MT2062R-G1/M2
	AQXR402SN32S	●	–	40	160	32	60	12	18	TS55	TKY25D	
	AQXR502SA42S	●	○	50	170	42	70	15	23	TS6S	TKY30T	QOG/MT2576R-G1/M2
	AQXR502SN42S	●	–	50	170	42	70	15	23	TS6S	TKY30T	
Long	**AQXR162SA16L**	●	○	16	175	16	50	4.5	7.4	TS2A	TKY06F	QOG/MT0830R-G1/M2
	AQXR162SN16L	●	–	16	175	16	50	4.5	7.4	TS2A	TKY06F	
	AQXR172SA16L	●	○	17	175	16	30	4.5	7.4	TS2A	TKY06F	
	AQXR172SN16L	●	–	17	175	16	30	4.5	7.4	TS2A	TKY06F	
	AQXR202SA20L	●	○	20	185	20	60	6	9.2	TS25	TKY08F	QOG/MT1035R-G1/M2
	AQXR202SN20L	●	–	20	185	20	60	6	9.2	TS25	TKY08F	
	AQXR212SA20L	●	○	21	185	20	35	6	9.2	TS25	TKY08F	
	AQXR212SN20L	●	–	21	185	20	35	6	9.2	TS25	TKY08F	
	AQXR252SA25L	●	○	25	220	25	75	7.5	11.5	TS33	TKY08D	QOG/MT1342R-G1/M2
	AQXR252SN25L	●	–	25	220	25	75	7.5	11.5	TS33	TKY08D	
	AQXR262SA25L	●	○	26	220	25	40	7.5	11.5	TS33	TKY08D	
	AQXR262SN25L	●	–	26	220	25	40	7.5	11.5	TS33	TKY08D	
	AQXR322SA32L	●	○	32	230	32	90	9.5	14.5	TS407	TKY15D	QOG/MT1651R-G1/M2
	AQXR322SN32L	●	–	32	230	32	90	9.5	14.5	TS407	TKY15D	
	AQXR332SA32L	●	○	33	230	32	50	9.5	14.5	TS407	TKY15D	
	AQXR332SN32L	●	–	33	230	32	50	9.5	14.5	TS407	TKY15D	
	AQXR352SA32L	●	○	35	230	32	50	11	16	TS407	TKY15D	QOG/MT1856R-G1/M2
	AQXR352SN32L	●	–	35	230	32	50	11	16	TS407	TKY15D	
	AQXR402SA32L	●	○	40	240	32	60	12	18	TS55	TKY25D	QOG/MT2062R-G1/M2
	AQXR402SN32L	●	–	40	240	32	60	12	18	TS55	TKY25D	
	AQXR502SA42L	●	○	50	250	42	70	15	23	TS6S	TKY30T	QOG/MT2576R-G1/M2
	AQXR502SN42L	●	–	50	250	42	70	15	23	TS6S	TKY30T	

*1 Dimension A3 represents the depth of cut when the cutting edge consists of 2 inserts.
*2 APMX : Maximum depth of cut.
*3 Clamp Torque (N • m) : TS2A=0.6, TS25=1.0, TS33=1.0, TS407=3.5, TS55=7.5, TS6S=10.0

ISO13399 ➤L003
SPARE PARTS ➤P001
TECHNICAL DATA ➤Q001







A-A section

Number of Teeth : **2**

Right hand tool holder only.

■SCREW-IN TYPE

Order Number	Stock	Coolant Hole	Dimensions (mm)								APMX (mm)	WT (kg)	*2	F D	
	R		DC	DCON	DCSFMS	OAL	LF	S10	CRKS	A3 *1			Clamp Screw	Wrench	Insert Type
AQXR162M08A30	●	○	16	8.5	14.7	48	30	10	M8	4.5	7.4	0.1	TS2A	TKY06F	QO◌T0830R
AQXR172M08A30	●	○	17	8.5	14.5	48	30	10	M8	4.5	7.4	0.1	TS2A	TKY06F	
AQXR202M10A30	●	○	20	10.5	18.6	49	30	14	M10	6	9.2	0.2	TS25	TKY08F	QO◌T1035R
AQXR212M10A30	●	○	21	10.5	18.5	49	30	14	M10	6	9.2	0.2	TS25	TKY08F	
AQXR252M12A35	●	○	25	12.5	23.5	57	35	19	M12	7.5	11.5	0.2	TS33	TKY08D	QO◌T1342R
AQXR262M12A35	●	○	26	12.5	23.5	57	35	19	M12	7.5	11.5	0.2	TS33	TKY08D	
AQXR322M16A40	●	○	32	17	28.5	63	40	24	M16	9.5	14.5	0.3	TS407	TKY15D	QO◌T1651R
AQXR332M16A40	●	○	33	17	28.5	63	40	24	M16	9.5	14.5	0.3	TS407	TKY15D	
AQXR352M16A40	●	○	35	17	28.5	63	40	24	M16	11	16	0.3	TS407	TKY15D	QO◌T1856R
AQXR402M16A45	●	○	40	17	28.5	68	45	24	M16	12	18	0.3	TS55	TKY25D	QO◌T2062R

*1 Dimension A3 represents the depth of cut when the cutting edge consists of 2 inserts.
*2 Clamp Torque (N • m) : TS2A=0.5, TS25=1.0, TS33=1.5, TS407=3.5, TS55=7.5
Note 1) For screw-in type arbors, refer to page L341.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

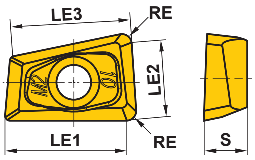
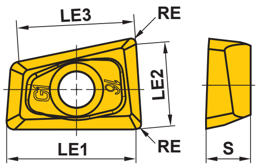
ISO13399 ➤ L003
ARBORS ➤ L341
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

INSERTS

Workpiece Material			MP6120	MP6130	MP7130	MP7140	MP9120	VP15TF	VP30RT	HTi10		
Workpiece Material	P	Steel	●	◐				◐	✣			
	M	Stainless Steel			◐	✣		◐	✣			
	K	Cast Iron						✣	✣	◐		
	N	Non-ferrous Metal								◐		
	S	Heat resistant Alloy, Titanium Alloy					◐	◐	✣			
	H	Hardened Materials						◐				

Cutting Conditions (Guide)**:**
●:Stable Cutting ◐:General Cutting ✣:Unstable Cutting

Edge Preparation:
E:Round **F**:Sharp

Shape	Order Number	DC	Class	Edge Preparation	Coated							Carbide			Dimensions (mm)					Geometry
					MP6120	MP6130	MP7130	MP7140	MP9120	VP15TF	VP30RT	HTi10			LE1	LE2	LE3	S	RE	
	**QOMT0830R-M2**	ϕ16,17	M	E	●	●	●	●	●	●	●				7.3	4.4	7.3	3	0.8	
	QOMT1035R-M2	ϕ20,21	M	E	●	●	●	●	●	●	●				9.5	5.9	9.3	3.5	0.8	
	QOMT1342R-M2	ϕ25,26	M	E	●	●	●	●	●	●	●				12	7.6	11.6	4.2	0.8	
	QOMT1651R-M2	ϕ32,33	M	E	●	●	●	●	●	●	●				15.4	9.9	14.6	5.1	0.8	
	QOMT1856R-M2	ϕ35	M	E	●	●	●	●	●	●	●				16.9	10.9	16	5.6	0.8	
	QOMT2062R-M2	ϕ40	M	E	●	●	●	●	●	●	●				19.4	12.6	18.1	6.2	0.8	
	QOMT2576R-M2	ϕ50	M	E	●	●	●	●	●	●	●				24.8	16.1	23.1	7.6	0.8	
	**QOGT0830R-G1**	ϕ16,17	G	E*	●				●	●		●			7.7	4.9	7.3	3	0.4	
	QOGT1035R-G1	ϕ20,21	G	E*	●				●	●		●			9.9	6.4	9.3	3.5	0.4	
	QOGT1342R-G1	ϕ25,26	G	E*	●				●	●		●			12.4	8.1	11.6	4.2	0.4	
	QOGT1651R-G1	ϕ32,33	G	E*	●				●	●		●			15.8	10.4	14.6	5.1	0.4	
	QOGT1856R-G1	ϕ35	G	E*	●				●	●		●			17.3	11.4	16	5.6	0.4	
	QOGT2062R-G1	ϕ40	G	E*	●				●	●		●			19.8	13.1	18.1	6.2	0.4	
	QOGT2576R-G1	ϕ50	G	E*	●				●	●		●			25.2	16.6	23.1	7.6	0.4	

* HTi10 insert honing is "F" type.

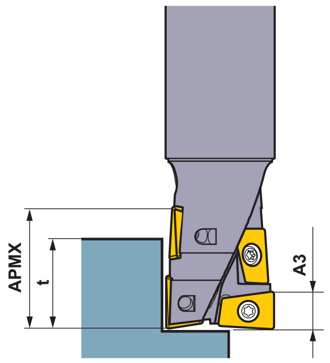
RECOMMENDED CUTTING CONDITIONS

■ CUTTING SPEED

	Workpiece Material	No.	Hardness	Breaker	Cutting Speed for Different Grades **vc** (m/min)		
P					**MP6120**	**VP15TF**	**MP6130**
	Mild Steel (ASTM A36, AISI 1010 etc.)	1	≤180HB	**M2/G1**	200 (170—240)	180 (150—220)	160 (130—200)
	Carbon Steel, Alloy Steel (AISI 1045, AISI 4140 etc.)	2	180—350HB	**M2**	180 (140—220)	160 (120—200)	140 (100—180)
M					**MP7130**	**MP7140**	**VP30RT(VP15TF)**
	Austenitic Stainless Steel (AISI 304, AISI 316 etc.)	1	≤200HB	**M2/G1**	170 (120—200)	160 (100—180)	150 (120—180)
	Austenitic Stainless Steel (AISI 304LN, AISI 316LN etc.)	2	>200HB	**M2**			
	Ferritic and Martensitic Stainless Steel (AISI 410, AISI 430 etc.)	3	≤200HB	**M2**			
	Ferritic and Martensitic Stainless Steel (AISI 431, AISI 420 etc.)	4	>200HB	**M2**			
K					**VP15TF**		
	Gray Cast Iron (AISI No45B etc.)	1	≤350MPa	**M2**	180 (150—220)	—	—
	Ductile Cast Iron (FCD450 etc.)	2	≤450MPa	**M2**	180 (150—220)	—	—
N					**HTi10**		
	Aluminium Alloy (A6061, A7075 etc.)	1	Si<5%	**G1**	500 (200—800)	—	—
	Aluminium Alloy (AC4B etc.)	2	5%≤Si≤10%	**G1**	100 (50—300)	—	—
	Aluminium Alloy (ADC12, A390 etc.)	3	Si>5%	**G1**	100 (50—300)	—	—
S					**MP9120**		
	Titanium Alloy* (Ti-6Al-4V etc.)	1	—	**M2**	50 (30—70)	—	—
H					**VP15TF**		
	Hardened Steel (AISI H13, AISI L6 etc.)	1	40—55HRC	**M2**	80 (50—120)	—	—

* Wet cutting is recommended for Titanium alloy.

RECOMMENDED CUTTING CONDITIONS

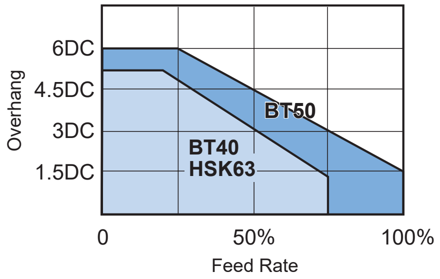


- A3 is the depth of cut for the full dual insert portion at the end of the cutting edge.
- Beyond the range of A3 where overlapping occurs, there is an area where the cutting edge becomes a single insert, not forming full dual insert configuration. As such, please pay special attention to the relationship 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 insert at the border of cut, is recommended to prevent damage to the cutting edge.

(mm)

Tool diameter	Recommended depth of cut **t** (mm)
ϕ16,17	12 – 14
ϕ20,21	14 – 17
ϕ25,26	17 – 22
ϕ32,33	22 – 28
ϕ35	25 – 32
ϕ40	28 – 35
ϕ50	35 – 45

* Figures for A3 and APMX are shown in the standard holder tables on the previous pages.



- 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 chart above as a guideline.

CUTTING CONDITIONS FOR SHOULDER MILLING

Workpiece Material		No.	Hardness	ϕ16, 17			ϕ20, 21			ϕ25, 26		
				ap (mm)	ae (mm)	fr (mm/rev)	ap (mm)	ae (mm)	fr (mm/rev)	ap (mm)	ae (mm)	fr (mm/rev)
P	Mild Steel	1	≤180HB	≤4.5	≤8	0.25	≤6	≤10	0.3	≤7.5	≤12.5	0.35
				4.5−12	≤5	0.16	6−14	≤7	0.25	7.5−17	≤8	0.28
				12−17	≤3	0.1	14−22	≤4	0.18	17−27	≤5	0.2
	Carbon Steel Alloy Steel	2	180−350HB	≤4.5	≤8	0.2	≤6	≤10	0.25	≤7.5	≤12.5	0.3
				4.5−12	≤4	0.14	6−14	≤6	0.2	7.5−17	≤7	0.25
				12−17	≤2	0.08	14−22	≤3	0.16	17−27	≤4	0.18
M	Stainless Steel	1,2,3,4	—	≤4.5	≤8	0.2	≤6	≤10	0.25	≤7.5	≤12.5	0.3
				4.5−12	≤4	0.14	6−14	≤6	0.2	7.5−17	≤7	0.25
				12−17	≤2	0.08	14−22	≤3	0.16	17−27	≤4	0.18
K	Cast Iron	1,2	—	≤4.5	≤8	0.25	≤6	≤10	0.3	≤7.5	≤12.5	0.35
				4.5−12	≤5	0.16	6−14	≤7	0.25	7.5−17	≤8	0.28
				12−17	≤3	0.1	14−22	≤4	0.18	17−27	≤5	0.2
N	Aluminium Alloy	1,2,3	—	≤4.5	≤11	0.3	≤6	≤14	0.35	≤7.5	≤12.5	0.4
				4.5−12	≤8	0.21	6−14	≤10	0.3	7.5−17	≤7	0.33
				12−17	≤5	0.15	14−22	≤6	0.23	17−27	≤4	0.25
S	Titanium Alloy	1	—	≤4.5	≤8	0.14	≤6	≤10	0.18	≤7.5	≤17.5	0.21
				4.5−12	≤4	0.1	6−14	≤6	0.14	7.5−17	≤12.5	0.18
				12−17	≤2	0.06	14−22	≤3	0.11	17−27	≤7.5	0.13
H	Hardened Steel	1	40−55HRC	≤4.5	≤5	0.16	≤6	≤6	0.2	≤7.5	≤7	0.22
				4.5−12	≤3	0.1	6−14	≤4	0.16	7.5−17	≤4	0.18
				12−17	≤1	0.06	14−22	≤2	0.12	17−27	≤2	0.14

Workpiece Material		No.	Hardness	ϕ32, 33			ϕ35			ϕ40			ϕ50		
				ap (mm)	ae (mm)	fr (mm/rev)	ap (mm)	ae (mm)	fr (mm/rev)	ap (mm)	ae (mm)	fr (mm/rev)	ap (mm)	ae (mm)	fr (mm/rev)
P	Mild Steel	1	≤180HB	≤9.5	≤16	0.4	≤11	≤17.5	0.45	≤12	≤20	0.5	≤15	≤25	0.6
				9.5−22	≤11	0.32	11−25	≤12	0.35	12−28	≤13	0.4	15−35	≤16	0.5
				22−35	≤6	0.25	25−40	≤6.5	0.28	28−44	≤7	0.3	35−55	≤10	0.35
	Carbon Steel Alloy Steel	2	180−350HB	≤9.5	≤16	0.35	≤11	≤17.5	0.37	≤12	≤20	0.4	≤15	≤25	0.5
				9.5−22	≤10	0.28	11−25	≤11	0.3	12−28	≤12	0.32	15−35	≤14	0.4
				22−35	≤5	0.2	25−40	≤5.5	0.22	28−44	≤6	0.25	35−55	≤8	0.3
M	Stainless Steel	1,2,3,4	—	≤9.5	≤16	0.35	≤11	≤17.5	0.37	≤12	≤20	0.4	≤15	≤25	0.5
				9.5−22	≤10	0.28	11−25	≤12	0.3	12−28	≤12	0.32	15−35	≤14	0.4
				22−35	≤5	0.2	25−40	≤6.5	0.22	28−44	≤6	0.25	35−55	≤8	0.3
K	Cast Iron	1,2	—	≤9.5	≤16	0.4	≤11	≤17.5	0.45	≤12	≤20	0.5	≤15	≤25	0.6
				9.5−22	≤11	0.32	11−25	≤12	0.35	12−28	≤13	0.4	15−35	≤16	0.5
				22−35	≤6	0.25	25−40	≤6.5	0.28	28−44	≤7	0.3	35−55	≤10	0.35
N	Aluminium Alloy	1,2,3	—	≤9.5	≤16	0.45	≤11	≤17.5	0.5	≤12	≤20	0.55	≤15	≤25	0.65
				9.5−22	≤10	0.37	11−25	≤12	0.4	12−28	≤12	0.45	15−35	≤14	0.55
				22−35	≤5	0.3	25−40	≤6.5	0.32	28−44	≤6	0.35	35−55	≤8	0.4
S	Titanium Alloy	1	—	≤9.5	≤23	0.25	≤11	≤24.5	0.26	≤12	≤28	0.28	≤15	≤35	0.35
				9.5−22	≤16	0.2	11−25	≤17.5	0.21	12−28	≤20	0.22	15−35	≤25	0.28
				22−35	≤10	0.14	25−40	≤10.5	0.15	28−44	≤12	0.18	35−55	≤15	0.21
H	Hardened Steel	1	40−55HRC	≤9.5	≤8	0.25	≤11	≤9	0.28	≤12	≤10	0.3	≤15	≤14	0.35
				9.5−22	≤5	0.2	11−25	≤5.5	0.22	12−28	≤6	0.24	15−35	≤8	0.3
				22−35	≤2	0.16	25−40	≤2	0.17	28−44	≤2	0.18	35−55	≤4	0.22

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), ensure that the feed rate is 80% or lower than the rate listed above.
Note 3) For the details of No., Please refer to the cutting speed on page L223.

SLOT MILLING

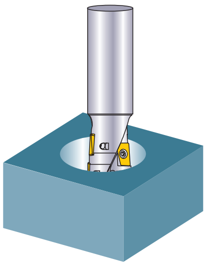
Workpiece Material		No.	Hardness	ϕ16, 17		ϕ20, 21		ϕ25, 26	
				ap (mm)	fr (mm/rev)	ap (mm)	fr (mm/rev)	ap (mm)	fr (mm/rev)
P	Mild Steel	1	≤180HB	≤4.5	0.16	≤6	0.18	≤7.5	0.2
				4.5–12	0.1	6–14	0.14	7.5–17	0.16
				12–17	0.07	14–22	0.1	17–27	0.12
	Carbon Steel Alloy Steel	2	180–350HB	≤4.5	0.14	≤6	0.16	≤7.5	0.18
				4.5–12	0.09	6–14	0.12	7.5–17	0.14
				12–17	0.05	14–22	0.1	17–27	0.1
M	Stainless Steel	1,2,3,4	–	≤4.5	0.14	≤6	0.16	≤7.5	0.18
				4.5–12	0.09	6–14	0.12	7.5–17	0.14
				12–17	0.05	14–22	0.1	17–27	0.1
K	Gray Cast Iron	1	≤350MPa	≤4.5	0.16	≤6	0.18	≤7.5	0.2
				4.5–12	0.1	6–14	0.14	7.5–17	0.16
				12–17	0.07	14–22	0.1	17–27	0.12
N	Aluminium Alloy	1,2,3	–	≤4.5	0.18	≤6	0.2	≤7.5	0.22
				4.5–12	0.12	6–14	0.16	7.5–17	0.18
				12–17	0.09	14–22	0.12	17–27	0.14
S	Titanium Alloy	1	–	≤4.5	0.1	≤6	0.12	≤7.5	0.15
				4.5–12	0.05	6–14	0.08	7.5–17	0.1
				12–17	0.03	14–22	0.05	17–27	0.08
H	Hardened Steel	1	40–55HRC	≤4.5	0.1	≤6	0.12	≤7.5	0.14
				4.5–12	0.07	6–14	0.1	7.5–17	0.12
				–	–	–	–	–	–

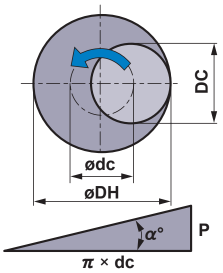
Workpiece Material		No.	Hardness	ϕ32, 33		ϕ35		ϕ40		ϕ50	
				ap (mm)	fr (mm/rev)	ap (mm)	fr (mm/rev)	ap (mm)	fr (mm/rev)	ap (mm)	fr (mm/rev)
P	Mild Steel	1	≤180HB	≤9.5	0.25	≤11	0.27	≤12	0.3	≤15	0.35
				9.5–22	0.2	11–25	0.22	12–28	0.25	15–35	0.3
				22–35	0.14	25–40	0.16	28–44	0.18	35–55	0.22
	Carbon Steel Alloy Steel	2	180–350HB	≤9.5	0.2	≤11	0.22	≤12	0.25	≤15	0.3
				9.5–22	0.16	11–25	0.18	12–28	0.2	15–35	0.25
				22–35	0.12	25–40	0.13	28–44	0.14	35–55	0.16
M	Stainless Steel	1,2,3,4	–	≤9.5	0.2	≤11	0.22	≤12	0.25	≤15	0.3
				9.5–22	0.16	11–25	0.18	12–28	0.2	15–35	0.25
				22–35	0.12	25–40	0.13	28–44	0.14	35–55	0.16
K	Gray Cast Iron	1	≤350MPa	≤9.5	0.25	≤11	0.27	≤12	0.3	≤15	0.35
				9.5–22	0.2	11–25	0.22	12–28	0.25	15–35	0.3
				22–35	0.14	25–40	0.16	28–44	0.18	35–55	0.22
N	Aluminium Alloy	1,2,3	–	≤9.5	0.27	≤11	0.3	≤12	0.32	≤15	0.37
				9.5–22	0.22	11–25	0.25	12–28	0.27	15–35	0.32
				22–35	0.16	25–40	0.18	28–44	0.2	35–55	0.25
S	Titanium Alloy	1	–	≤9.5	0.18	≤11	0.2	≤12	0.23	≤15	0.25
				9.5–22	0.12	11–25	0.15	12–28	0.2	15–35	0.23
				22–35	0.1	25–40	0.12	28–44	0.15	35–55	0.18
H	Hardened Steel	1	40–55HRC	≤9.5	0.16	≤11	0.17	≤12	0.18	≤15	0.22
				9.5–22	0.12	11–25	0.13	12–28	0.14	15–35	0.16
				–	–	–	–	–	–	–	–

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), ensure that the feed rate is 80% or lower than the rate listed above.
Note 3) For the details of No., Please refer to the cutting speed on page L223.

RECOMMENDED CUTTING CONDITIONS

■ FOR HELICAL CUTTING





- ●How to derive a locus of the centre of the tool.

$$\varnothing dc = \varnothing DH - DC$$

Locus of the centre of the tool / Desired hole diameter / Cutting edge diameter

- ●Depth of cut for each pass.

$$P = \pi \times dc \times \tan\alpha°$$

(Note) $\alpha° \leq 3°$

- ●Min. machined hole diameter for helical cutting : 1.2DC
  Max. machined hole diameter for helical cutting : 1.8DC
- ●For efficient chip discharge, always apply air blow.
- ●When using the G1 breaker, VP15TF, use 80% of the feed rate listed in the table below.

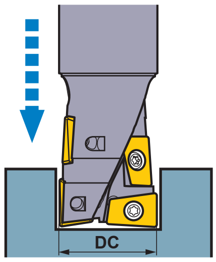
	Workpiece Material	No.	Hardness	ϕ16, 17				ϕ20, 21				ϕ25, 26			
				DH (mm)	APMX (mm)	fr (mm/rev)	P (mm/pass)	DH (mm)	APMX (mm)	fr (mm/rev)	P (mm/pass)	DH (mm)	APMX (mm)	fr (mm/rev)	P (mm/pass)
P	Mild Steel	1	≤180HB	20	8	0.16	0.44	24	10	0.18	0.44	30	12.5	0.2	0.55
				25	12	0.14	0.99	30	15	0.16	1.1	38	19	0.18	1.43
				29	16	0.12	1.43	36	20	0.14	1.76	45	25	0.16	2.2
	Carbon Steel Alloy Steel	2	180−350HB	20	8	0.14	0.33	24	10	0.16	0.33	30	12.5	0.18	0.41
				25	12	0.12	0.74	30	15	0.14	0.82	38	19	0.16	1.07
				29	16	0.1	1.07	36	20	0.12	1.32	45	25	0.14	1.65
M	Stainless Steel	1,2,3,4	−	20	3	0.14	0.22	24	4	0.16	0.22	30	5	0.18	0.27
				25	5	0.12	0.49	30	7	0.14	0.55	38	9	0.16	0.71
				29	8	0.1	0.71	36	10	0.12	0.88	45	12.5	0.14	1.1
K	Gray Cast Iron	1	≤350MPa	20	10	0.16	0.55	24	14	0.18	0.55	30	18	0.2	0.69
				25	13	0.14	1.23	30	17	0.16	1.37	38	21	0.18	1.78
				29	16	0.12	1.78	36	20	0.14	2.19	45	25	0.16	2.74
N	Aluminium Alloy	1,2,3	−	20	10	0.18	0.44	24	14	0.2	0.44	30	18	0.22	0.55
				25	13	0.16	0.99	30	17	0.18	1.1	38	21	0.2	1.43
				29	16	0.14	1.43	36	20	0.16	1.76	45	25	0.18	2.2
S	Titanium Alloy	1	−	20	3	0.1	0.22	24	4	0.11	0.22	30	5	0.13	0.27
				25	5	0.08	0.49	30	7	0.1	0.55	38	9	0.11	0.71
				29	8	0.07	0.71	36	10	0.08	0.88	45	12.5	0.1	1.1
H	Hardened Steel	1	40−55HRC	20	3	0.1	0.22	24	4	0.12	0.22	30	5	0.14	0.27
				25	5	0.08	0.49	30	7	0.1	0.55	38	9	0.12	0.71
				29	8	0.06	0.71	36	10	0.08	0.88	45	12.5	0.1	1.1

	Workpiece Material	No.	Hardness	ϕ32, 33				ϕ35				ϕ40				ϕ50			
				DH (mm)	APMX (mm)	fr (mm/rev)	P (mm/pass)	DH (mm)	APMX (mm)	fr (mm/rev)	P (mm/pass)	DH (mm)	APMX (mm)	fr (mm/rev)	P (mm/pass)	DH (mm)	APMX (mm)	fr (mm/rev)	P (mm/pass)
P	Mild Steel	1	≤180HB	38	16	0.25	0.66	42	18	0.28	0.77	48	20	0.3	0.88	60	25	0.35	1.1
				48	24	0.22	1.76	53	27	0.24	1.97	60	30	0.26	2.19	75	38	0.3	2.74
				58	32	0.2	2.85	63	35	0.21	3.07	72	40	0.22	3.51	90	50	0.26	4.39
	Carbon Steel Alloy Steel	2	180−350HB	38	16	0.2	0.49	42	18	0.22	0.58	48	20	0.25	0.66	60	25	0.28	0.82
				48	24	0.18	1.32	53	27	0.2	1.48	60	30	0.22	1.65	75	38	0.26	2.06
				58	32	0.16	2.14	63	35	0.18	2.3	72	40	0.2	2.63	90	50	0.24	3.29
M	Stainless Steel	1,2,3,4	−	38	6	0.2	0.33	42	7	0.22	0.38	48	8	0.25	0.44	60	10	0.28	0.55
				48	11	0.18	0.88	53	13	0.2	0.99	60	14	0.22	1.1	75	18	0.26	1.37
				58	16	0.16	1.43	63	18	0.18	1.53	72	20	0.2	1.75	90	25	0.27	2.19
K	Gray Cast Iron	1	≤350MPa	38	22	0.25	0.82	42	25	0.28	0.95	48	28	0.3	1.1	60	35	0.35	1.37
				48	27	0.22	2.19	53	30	0.24	2.47	60	34	0.26	2.74	75	43	0.3	3.43
				58	32	0.2	3.57	63	35	0.21	3.84	72	40	0.22	4.39	90	50	0.26	5.49
N	Aluminium Alloy	1,2,3	−	38	22	0.27	0.66	42	25	0.3	0.77	48	28	0.32	0.88	60	35	0.37	1.1
				48	27	0.24	1.76	53	30	0.26	1.97	60	34	0.28	2.19	75	43	0.32	2.74
				58	32	0.22	2.85	63	35	0.21	3.07	72	40	0.24	3.51	90	50	0.27	4.39
S	Titanium Alloy	1	−	38	6	0.14	0.33	42	7	0.15	0.38	48	8	0.18	0.44	60	10	0.2	0.55
				48	11	0.13	0.88	53	13	0.14	0.99	60	14	0.15	1.1	75	18	0.18	1.37
				58	16	0.11	1.43	63	18	0.13	1.53	72	20	0.14	1.75	90	25	0.17	2.19
H	Hardened Steel	1	40−55HRC	38	6	0.16	0.33	42	7	0.17	0.38	48	8	0.18	0.44	60	10	0.2	0.55
				48	11	0.14	0.88	53	13	0.15	0.99	60	14	0.16	1.1	75	18	0.18	1.37
				58	16	0.12	1.43	63	18	0.13	1.53	72	20	0.14	1.75	90	25	0.16	2.19

Note 1) Helical grooving is strongly recommended for machining tempered steel.
Note 2) When using the G1 breaker (VP15TF), ensure that the feed rate is 80% or lower than the rate listed above.
Note 3) For the details of No., Please refer to the cutting speed on page L223.

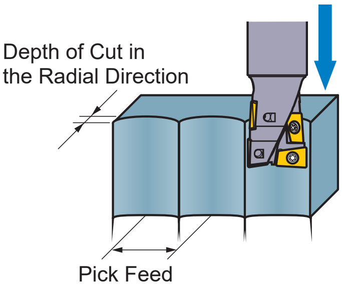
FOR DRILLING AND PLUNGING

Drilling



- The recommended drilling depth is less than 0.5DC.
- Use step feed when drilling (0.25—0.5mm) to ensure that the chips are effectively broken.
- Use internal or external cooling to ensure that the chip disposal is sufficiently achieved.
- The chips generated can dispel in any direction, so ensure that adequate safety precautions are taken.

Plunging



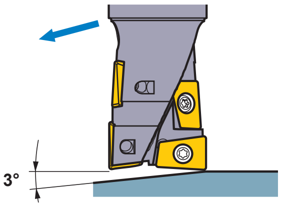
- The feed for plunging is the same as the feed for drilling.
- No step feed necessary.
- Please refer to the following table for the depth of cut at plunging operations.

Depth of Cut in the Radial Direction	≤ 0.4DC
Pick Feed	≤ 0.5DC

	Workpiece Material	No.	Hardness	φ16, 17		φ20, 21		φ25, 26		φ32, 33, 35		φ40		φ50	
				fr (mm/rev)	Step (mm)	fr (mm/rev)	Step (mm)	fr (mm/rev)	Step (mm)	fr (mm/rev)	Step (mm)	fr (mm/rev)	Step (mm)	fr (mm/rev)	Step (mm)
P	Mild Steel	1	≤180HB	0.035	0.2	0.045	0.3	0.05	0.3	0.055	0.3	0.06	0.3	0.065	0.3
	Carbon Steel Alloy Steel	2	180—350HB	0.03	0.2	0.04	0.3	0.045	0.3	0.05	0.3	0.055	0.3	0.06	0.3
M	Stainless Steel	1,2,3,4	—	0.03	0.15	0.04	0.25	0.045	0.25	0.05	0.25	0.055	0.25	0.06	0.25
K	Gray Cast Iron	1	≤350MPa	0.04	0.4	0.05	0.5	0.06	0.5	0.065	0.5	0.07	0.5	0.075	0.5
N	Aluminium Alloy	1,2,3	—	0.04	0.2	0.05	0.3	0.06	0.3	0.065	0.3	0.07	0.3	0.075	0.3
H	Hardened Steel	1	40—55HRC	0.02	0.15	0.03	0.25	0.035	0.25	0.04	0.25	0.045	0.25	0.05	0.25

Note 1) Helical grooving is strongly recommended for machining tempered steel.
Note 2) When using the G1 breaker (VP15TF), ensure that the feed rate is 80% or lower than the rate listed above.
Note 3) For the details of No., Please refer to the cutting speed on page L223.

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.
- During ramping, it is recommended to reduce the feed rate to about 60% of the recommended cutting conditions.

MULTI-FUNCTIONAL MILLING

AJX

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron		Heat Resistant Alloy	Hardened Steel

Fig.1

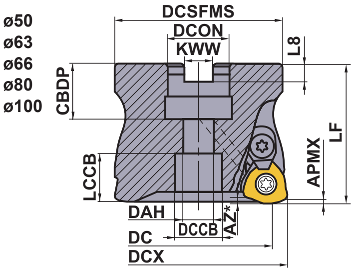
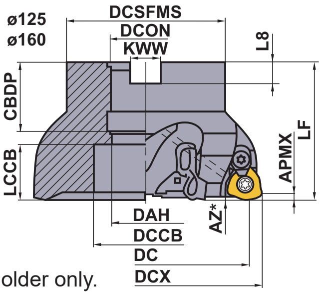
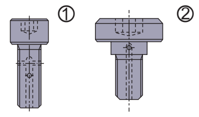


Fig.2



Right hand tool holder only.

DCX (mm)		Set Bolt	Geometry	
DCON inch size	DCON mm size			
ϕ50, ϕ63	ϕ50, ϕ63(DCON=22)	HSC10030H	①	 ① ② With Coolant Hole
	ϕ63(DCON=27), ϕ80	HSC12035H		
ϕ80, ϕ100	ϕ100	HSC16040H		
ϕ125	ϕ125, ϕ160	MBA20040H	②	
ϕ160		MBA24045H		

ARBOR TYPE

With Coolant Hole

DCX = mm size, DCON = inch size

DCX (mm)	Order Number	Stock	Number of Teeth	Dimensions (mm)			WT (kg)	APMX (mm)	RMPX	Fig.	Insert Type
		R		DC	LF	DCON					
50	**AJX12R05003B**	●	3	38.3	50	22.225	0.4	1.2	2°	1	JDM◌1204
50	**AJX12R05004B**	●	4	38.3	50	22.225	0.4	1.2	2°	1	JDM◌1204
50	**AJX09R05005B**	●	5	40.0	50	22.225	0.5	1.2	1.1°	1	JDM◌09T3
63	**AJX14R06303B**	●	3	51.1	50	22.225	0.7	1.2	2.8°	1	JDM◌1405
63	**AJX14R06304B**	●	4	51.1	50	22.225	0.7	1.2	2.8°	1	JDM◌1405
63	**AJX12R06305B**	●	5	51.3	50	22.225	0.9	1.2	1.5°	1	JDM◌1204
80	**AJX14R08004D**	●	4	68.1	63	31.75	1.3	1.2	1.8°	1	JDM◌1405
80	**AJX14R08005D**	●	5	68.1	63	31.75	1.3	1.2	1.8°	1	JDM◌1405
80	**AJX12R08006D**	●	6	68.3	63	31.75	1.7	1.2	1.1°	1	JDM◌1204
100	**AJX14R10005D**	●	5	88.1	63	31.75	2.4	1.2	1.2°	1	JDM◌1405
100	**AJX14R10006D**	●	6	88.1	63	31.75	2.4	1.2	1.2°	1	JDM◌1405
100	**AJX12R10007D**	●	7	88.3	63	31.75	2.9	1.2	0.8°	1	JDM◌1204
125	**AJX14R12505E**	●	5	113.2	63	38.1	3.3	1.2	0.8°	2	JDM◌1405
125	**AJX14R12507E**	●	7	113.2	63	38.1	3.3	1.2	0.8°	2	JDM◌1405
160	**AJX14R16006F**	●	6	148.2	63	50.8	5.0	1.2	0.5°	2	JDM◌1405
160	**AJX14R16008F**	●	8	148.2	63	50.8	5.0	1.2	0.5°	2	JDM◌1405

DCX = mm size, DCON = mm size

DCX (mm)	Order Number	Stock	Number of Teeth	Dimensions (mm)			WT (kg)	APMX (mm)	RMPX	Fig.	Insert Type
		R		DC	LF	DCON					
50	**AJX12-050A03R**	●	3	38.3	50	22	0.4	1.2	2°	1	JDM◌1204
50	**AJX12-050A04R**	●	4	38.3	50	22	0.4	1.2	2°	1	JDM◌1204
50	**AJX09-050A05R**	●	5	40.0	50	22	0.5	1.2	1.1°	1	JDM◌09T3
63	**AJX14-063A03R**	●	3	51.1	50	22	0.7	1.2	2.8°	1	JDM◌1405
63	**AJX14-063A04R**	●	4	51.1	50	22	0.7	1.2	2.8°	1	JDM◌1405
63	**AJX12-063A05R**	●	5	51.3	50	22	0.9	1.2	1.5°	1	JDM◌1204
NEW 63	**AJX14-063X03R**	●	3	51.1	50	27	0.6	1.2	2.8°	1	JDM◌1405
NEW 63	**AJX14-063X04R**	●	4	51.1	50	27	0.6	1.2	2.8°	1	JDM◌1405
NEW 63	**AJX12-063X05R**	●	5	51.3	50	27	0.6	1.2	1.5°	1	JDM◌1204
NEW 66	**AJX14-066X03R**	●	3	54.1	50	27	0.6	1.2	2.6°	1	JDM◌1405
NEW 66	**AJX14-066X04R**	●	4	54.1	50	27	0.6	1.2	2.6°	1	JDM◌1405
NEW 66	**AJX12-066X05R**	●	5	54.3	50	27	0.7	1.2	1.4°	1	JDM◌1204
80	**AJX14-080A04R**	●	4	68.1	50	27	1.2	1.2	1.8°	1	JDM◌1405
80	**AJX14-080A05R**	●	5	68.1	50	27	1.2	1.2	1.8°	1	JDM◌1405
80	**AJX12-080A06R**	●	6	68.3	50	27	1.2	1.2	1.1°	1	JDM◌1204
100	**AJX14-100A05R**	●	5	88.1	63	32	2.4	1.2	1.2°	1	JDM◌1405
100	**AJX14-100A06R**	●	6	88.1	63	32	2.4	1.2	1.2°	1	JDM◌1405
100	**AJX12-100A07R**	●	7	88.3	63	32	2.6	1.2	0.8°	1	JDM◌1204

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

DCX (mm)	Order Number	Stock	Number of Teeth	Dimensions (mm)			**WT** (kg)	**APMX** (mm)	**RMPX**	Fig.	Insert Type
		R		**DC**	**LF**	**DCON**					
125	**AJX14-125B05R**	●	5	113.2	63	40	3.3	1.2	0.8°	2	JDM◌1405
125	**AJX14-125B07R**	●	7	113.2	63	40	3.3	1.2	0.8°	2	JDM◌1405
160	**AJX14-160B06R**	●	6	148.2	63	40	5.0	1.2	0.5°	2	JDM◌1405
160	**AJX14-160B08R**	●	8	148.2	63	40	5.0	1.2	0.5°	2	JDM◌1405

⁎ Refer to page L237, for the max. drilling depth (**AZ**).

Note 1) The maximum depth of cut (**APMX**) value listed is for when using a JL breaker. Please refer to page L237 for the APMX for other breakers.

Fig.3

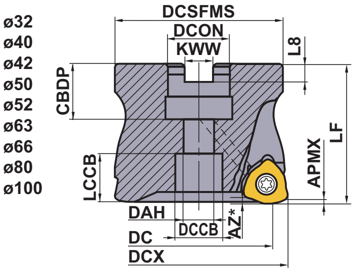
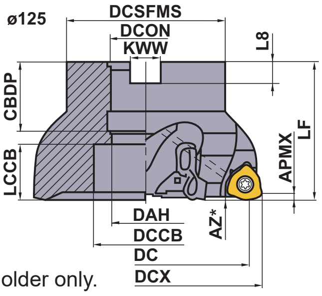
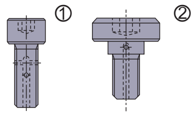


Fig.4



Right hand tool holder only.

DCX (mm)	Set Bolt	Geometry	
ϕ32, ϕ40, ϕ42	HSC08025H	①	 ① ② With Coolant Hole
ϕ50, ϕ52, ϕ63 ϕ66 (DCON=22)	HSC10030H		
ϕ63 ϕ66 (DCON=27), ϕ80	HSC12035H		
ϕ100	HSC16040H		
ϕ125	MBA20040H	②	

■Arbor Type Super Extra Fine Pitch

With Coolant Hole

DCX = mm size, DCON = mm size

	DCX (mm)	Order Number	Stock	Number of Teeth	Dimensions (mm)			**WT** (kg)	**APMX** (mm)	**RMPX**	Fig.	Insert Type
			R		**DC**	**LF**	**DCON**					
NEW	32	**AJX06-032A05R**	●	5	24.9	40	16	0.1	0.6	0.5°	3	JOM◌06T2
NEW	32	**AJX06-032A06R**	●	6	24.9	40	16	0.1	0.6	0.5°	3	JOM◌06T2
NEW	40	**AJX08-040A06R**	●	6	31.4	40	16	0.2	0.9	1°	3	JOM◌0803
NEW	42	**AJX08-042A06R**	●	6	33.4	40	16	0.2	0.9	0.9°	3	JOM◌0803
NEW	50	**AJX09-050A06R**	●	6	39.3	50	22	0.4	1.2	1.1°	3	JDM◌09T3
NEW	50	**AJX08-050A07R**	●	7	41.4	50	22	0.4	0.9	0.7°	3	JOM◌0803
NEW	52	**AJX09-052A06R**	●	6	41.9	50	22	0.4	1.2	1°	3	JDM◌09T3
NEW	52	**AJX08-052A07R**	●	7	43.4	50	22	0.5	0.9	0.7°	3	JOM◌0803
NEW	63	**AJX12-063A06R**	●	6	51.3	50	22	0.7	1.2	1.5°	3	JDM◌1204
NEW	63	**AJX09-063A07R**	●	7	52.9	50	22	0.7	1.2	0.8°	3	JDM◌09T3
NEW	63	**AJX12-063X06R**	●	6	51.3	50	27	0.6	1.2	1.5°	3	JDM◌1204
NEW	63	**AJX09-063X07R**	●	7	52.9	50	27	0.7	1.2	0.8°	3	JDM◌09T3
NEW	66	**AJX12-066A06R**	●	6	54.3	50	22	0.7	1.2	1.4°	3	JDM◌1204
NEW	66	**AJX09-066A07R**	●	7	55.9	50	22	0.8	1.2	0.8°	3	JDM◌09T3
NEW	66	**AJX12-066X06R**	●	6	54.3	50	27	0.7	1.2	1.4°	3	JDM◌1204
NEW	66	**AJX09-066X07R**	●	7	55.9	50	27	0.8	1.2	0.8°	3	JDM◌09T3
NEW	80	**AJX12-080A08R**	●	8	68.3	50	27	1.1	1.2	1.1°	3	JDM◌1204
NEW	100	**AJX12-100A09R**	●	9	88.3	63	32	2.5	1.2	0.8°	3	JDM◌1204
NEW	125	**AJX14-125B09R**	●	9	113.2	63	40	3.0	1.2	0.8°	4	JDM◌1405

⁎ Refer to page L237, for the max. drilling depth (**AZ**).

Note 1) The maximum depth of cut (**APMX**) value listed is for when using a JL breaker. Please refer to page L237 for the APMX for other breakers.

ISO13399 ➤ **L003**
SPARE PARTS ➤ **P001**
TECHNICAL DATA ➤ **Q001**

Mounting Dimensions

Fig.1

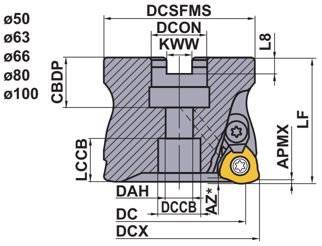


Fig.2

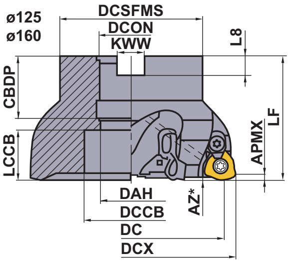


Fig.3

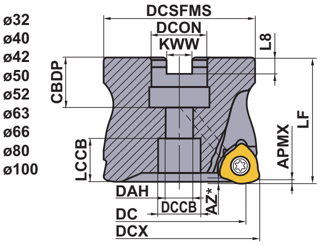
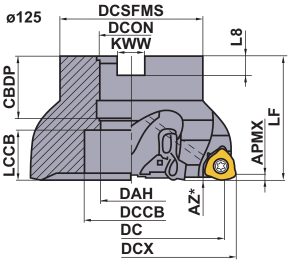


Fig.4



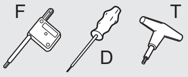
DCX = mm size, DCON = inch size

DCX (mm)	Order Number	Dimensions (mm)								Fig.
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
50	**AJX12R050**	22.225	19	11	17	18.3	47	8.4	5	1
50	**AJX09R050**	22.225	19	11	17	18.3	47	8.4	5	1
63	**AJX14R063**	22.225	19	11	17	18.2	60	8.4	5	1
63	**AJX12R063**	22.225	19	11	17	18.3	60	8.4	5	1
80	**AJX14R080**	31.75	32	17	26	20.2	76	12.7	8	1
80	**AJX12R080**	31.75	32	17	26	20.3	76	12.7	8	1
100	**AJX14R100**	31.75	32	17	26	20.2	96	12.7	8	1
100	**AJX12R100**	31.75	32	17	26	20.3	96	12.7	8	1
125	**AJX14R125**	38.1	40	40	56	22.1	100	15.9	10	2
160	**AJX14R160**	50.8	43	53	72	19.1	100	19.1	11	2

DCX = mm size, DCON = mm size

DCX (mm)	Order Number	Dimensions (mm)								Fig.
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
32	**AJX06-032A**	16	18	9	14	14.45	30	8.4	5.6	3
40	**AJX08-040A**	16	18	9	14	14.3	37	8.4	5.6	3
42	**AJX08-042A**	16	18	9	14	14.3	37	8.4	5.6	3
50	**AJX12-050A**	22	20	11	17	17.28	47	10.4	6.3	1
50	**AJX09-050A**	22	20	11	17	17.31	47	10.4	6.3	1, 3
50	**AJX08-050A**	22	20	11	17	17.36	47	10.4	6.3	3
52	**AJX09-052A**	22	20	11	17	17.31	47	10.4	6.3	3
52	**AJX08-052A**	22	20	11	17	17.36	47	10.4	6.3	3
63	**AJX14-063A**	22	20	11	17	17.16	60	10.4	6.3	1
63	**AJX12-063A**	22	20	11	17	17.28	60	10.4	6.3	1, 3
63	**AJX09-063A**	22	20	11	17	17.31	60	10.4	6.3	3
63	**AJX14-063X**	27	23	13	20	16.16	60	12.4	7.0	1
63	**AJX12-063X**	27	23	13	20	16.28	60	12.4	7.0	3
63	**AJX09-063X**	27	23	13	20	16.31	60	12.4	7.0	3
66	**AJX12-066A**	22	20	11	17	17.28	60	10.4	6.3	3
66	**AJX09-066A**	22	20	11	17	17.31	60	10.4	6.3	3
66	**AJX14-066X**	27	23	13	20	16.16	60	12.4	7.0	1
66	**AJX12-066X**	27	23	13	20	16.28	60	12.4	7.0	1, 3
66	**AJX09-066X**	27	23	13	20	16.31	60	12.4	7.0	3
80	**AJX14-080A**	27	23	13	19	16.16	76	12.4	7.0	1
80	**AJX12-080A**	27	23	13	19	16.28	76	12.4	7.0	1, 3
100	**AJX14-100A**	32	26	17	26	26.16	96	14.4	8.0	1
100	**AJX12-100A**	32	26	17	26	26.28	96	14.4	8.0	1, 3
125	**AJX14-125B**	40	40	42	56	22.14	100	16.4	9.0	2, 4
160	**AJX14-160B**	40	40	42	56	22.14	100	16.4	9.0	2

SPARE PARTS

Tool Holder Type	 *		 *		 F D T
	Clamp Screw	Clamp Bridge	Clamp Bridge Screw	Spring	Wrench
AJX06 Super Extra Fine Pitch	TS25	–	–	–	TKY08F
AJX08 Super Extra Fine Pitch	TS33	–	–	–	TKY08D
AJX09	TS351	AMS3	AJS3010T10	ASS2	TKY10D
AJX09 Super Extra Fine Pitch	TS351	–	–	–	TKY10D
AJX12	TS43	AMS4	AJS4012T15	ASS2	TKY15T
AJX12 Super Extra Fine Pitch	TS43	–	–	–	TKY15T
AJX14	TS54	AMS5	AJS5014T25	ASS3	TKY25T
AJX14 Super Extra Fine Pitch	TS54	–	–	–	TKY25T

* Clamp Torque (N • m) : TS25=1.0, TS33=1.5, TS351=2.5, TS43=3.5, TS54=7.5, AJS3010T10=2.5, AJS4012T15=3.5, AJS5014T25=7.5

●: Inventory maintained in Japan.

Fig.1

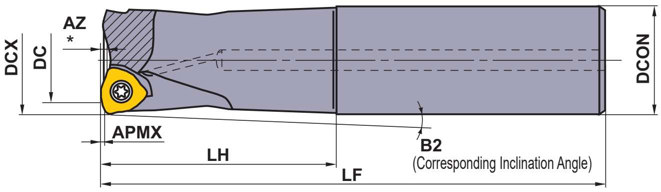


Fig.2

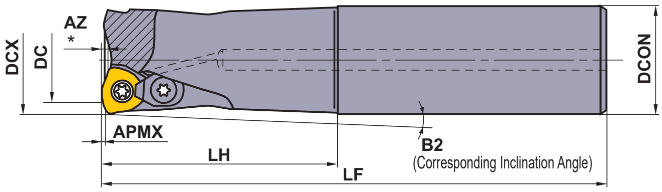
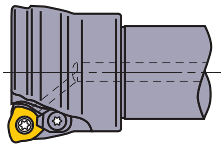


Fig.3



Right hand tool holder only.

SHANK TYPE

With Coolant Hole

DCX (mm)	Order Number	Stock	Number of Teeth	Dimensions (mm)					APMX (mm)	RMPX	Fig.	Insert Type
		R		LF	DC	LH	DCON	B2				
16	**AJX06R162SA16SS**	●	2	70	8.9	20	16	3.5°	0.6	3°	1	JOM◌06T2
16	**AJX06R162SA16S**	●	2	110	8.9	30	16	2.25°	0.6	3°	1	JOM◌06T2
16	**AJX06R162SA16L**	●	2	150	8.9	70	16	0.93°	0.6	3°	1	JOM◌06T2
16	**AJX06R162SA16EL**	●	2	200	8.9	100	16	0.64°	0.6	3°	1	JOM◌06T2
17	**AJX06R172SA16SS**	●	2	70	9.9	20	16	–	0.6	2.5°	1	JOM◌06T2
17	**AJX06R172SA16S**	●	2	110	9.9	20	16	–	0.6	2.5°	1	JOM◌06T2
17	**AJX06R172SA16L**	●	2	150	9.9	20	16	–	0.6	2.5°	1	JOM◌06T2
17	**AJX06R172SA16EL**	●	2	200	9.9	20	16	–	0.6	2.5°	1	JOM◌06T2
20	**AJX08R202SA20S**	●	2	130	11.4	50	20	1.34°	0.9	3.5°	1	JOM◌0803
20	**AJX06R203SA20S**	●	3	130	12.9	50	20	1.31°	0.6	1.5°	1	JOM◌06T2
20	**AJX08R202SA20L**	●	2	180	11.4	100	20	0.65°	0.9	3.5°	1	JOM◌0803
20	**AJX06R203SA20L**	●	3	180	12.9	100	20	0.64°	0.6	1.5°	1	JOM◌06T2
20	**AJX08R202SA20EL**	●	2	250	11.4	130	20	0.5°	0.9	3.5°	1	JOM◌0803
22	**AJX08R222SA20S**	●	2	130	13.4	30	20	–	0.9	3°	1	JOM◌0803
22	**AJX06R223SA20S**	●	3	130	14.9	30	20	–	0.6	1°	1	JOM◌06T2
22	**AJX08R222SA20L**	●	2	180	13.4	30	20	–	0.9	3°	1	JOM◌0803
22	**AJX06R223SA20L**	●	3	180	14.9	30	20	–	0.6	1°	1	JOM◌06T2
22	**AJX08R222SA20EL**	●	2	250	13.4	30	20	–	0.9	3°	1	JOM◌0803
25	**AJX09R252SA25S**	●	2	140	14.9	60	25	1.1°	1.2	4°	2	JDM◌09T3
25	**AJX08R253SA25S**	●	3	140	16.4	60	25	1.1°	0.9	2°	1	JOM◌0803
NEW 25	**AJX06R254SA25S**	●	4	140	17.9	60	25	1.11°	0.6	0.8°	1	JOM◌06T2
25	**AJX09R252SA25L**	●	2	200	14.9	120	25	0.54°	1.2	4°	2	JDM◌09T3
25	**AJX08R253SA25L**	●	3	200	16.4	120	25	0.54°	0.9	2°	1	JOM◌0803
NEW 25	**AJX06R254SA25L**	●	4	200	17.9	120	25	0.54°	0.6	0.8°	1	JOM◌06T2
25	**AJX09R252SA25EL**	●	2	300	14.9	180	25	0.36°	1.2	4°	2	JDM◌09T3
28	**AJX09R282SA25S**	●	2	140	17.9	40	25	–	1.2	3°	2	JDM◌09T3
28	**AJX08R283SA25S**	●	3	140	19.4	40	25	–	0.9	1.7°	1	JOM◌0803
NEW 28	**AJX06R284SA25S**	●	4	140	20.9	40	25	–	0.6	0.7°	1	JOM◌06T2
28	**AJX09R282SA25L**	●	2	200	17.9	40	25	–	1.2	3°	2	JDM◌09T3
28	**AJX08R283SA25L**	●	3	200	19.4	40	25	–	0.9	1.7°	1	JOM◌0803
NEW 28	**AJX06R284SA25L**	●	4	200	20.9	40	25	–	0.6	0.7°	1	JOM◌06T2
28	**AJX09R282SA25EL**	●	2	300	17.9	40	25	–	1.2	3°	2	JDM◌09T3
30	**AJX12R302SA32S**	●	2	150	18.3	70	32	1.82°	1.2	4.5°	2	JDM◌1204
30	**AJX09R303SA32S**	●	3	150	20	70	32	1.79°	1.2	2.7°	2	JDM◌09T3
30	**AJX12R302SA32L**	●	2	200	18.3	120	32	1.04°	1.2	4.5°	2	JDM◌1204
30	**AJX09R303SA32L**	●	3	200	20	120	32	1.03°	1.2	2.7°	2	JDM◌09T3
30	**AJX12R302SA32EL**	●	2	300	18.3	180	32	0.69°	1.2	4.5°	2	JDM◌1204

∗ Refer to page L237, for the max. drilling depth (**AZ**).

Note 1) The maximum depth of cut (**APMX**) value listed is for when using a JL breaker. Please refer to page L237 for the APMX for other breakers.

ISO13399 ➤ **L003**
SPARE PARTS ➤ **P001**
TECHNICAL DATA ➤ **Q001**

DCX (mm)	Order Number	Stock	Number of Teeth	Dimensions (mm)					APMX (mm)	RMPX	Fig.	Insert Type
		R		LF	DC	LH	DCON	B2				
32	**AJX12R322SA32S**	●	2	150	20.3	70	32	0.96°	1.2	4°	2	JDM◌1204
32	**AJX09R323SA32S**	●	3	150	21.9	70	32	0.94°	1.2	2.5°	2	JDM◌09T3
NEW 32	**AJX08R324SA32S**	●	4	150	23.4	70	32	0.95°	0.9	1.4°	1	JOM◌0803
NEW 32	**AJX06R325SA32S**	●	5	150	24.9	70	32	0.94°	0.6	0.5°	1	JOM◌06T2
NEW 32	**AJX06R326SA32S**	●	6	150	24.9	70	32	0.94°	0.6	0.5°	1	JOM◌06T2
32	**AJX12R322SA32L**	●	2	200	20.3	120	32	0.55°	1.2	4°	2	JDM◌1204
32	**AJX09R323SA32L**	●	3	200	21.9	120	32	0.54°	1.2	2.5°	2	JDM◌09T3
NEW 32	**AJX08R324SA32L**	●	4	200	23.4	120	32	0.55°	0.9	1.4°	1	JOM◌0803
NEW 32	**AJX06R325SA32L**	●	5	200	24.9	120	32	0.54°	0.6	0.5°	1	JOM◌06T2
32	**AJX12R322SA32EL**	●	2	300	20.3	180	32	0.36°	1.2	4°	2	JDM◌1204
35	**AJX12R352SA32S**	●	2	150	23.3	50	32	—	1.2	3.5°	2	JDM◌1204
35	**AJX09R353SA32S**	●	3	150	24.9	50	32	—	1.2	2°	2	JDM◌09T3
35	**AJX12R352SA32L**	●	2	200	23.3	50	32	—	1.2	3.5°	2	JDM◌1204
35	**AJX09R353SA32L**	●	3	200	24.9	50	32	—	1.2	2°	2	JDM◌09T3
35	**AJX12R352SA32EL**	●	2	300	23.3	50	32	—	1.2	3.5°	2	JDM◌1204
40	**AJX12R403SA32S**	●	3	150	28.3	50	32	—	1.2	3°	2	JDM◌1204
40	**AJX09R404SA32S**	●	4	150	29.9	50	32	—	1.2	1.5°	2	JDM◌09T3
NEW 40	**AJX08R406SA32S**	●	6	150	31.4	50	32	—	0.9	1°	1	JOM◌0803
40	**AJX12R403SA32L**	●	3	250	28.3	50	32	—	1.2	3°	2	JDM◌1204
40	**AJX09R404SA32L**	●	4	250	29.9	50	32	—	1.2	1.5°	2	JDM◌09T3
NEW 40	**AJX08R406SA32L**	●	6	250	31.4	50	32	—	0.9	1°	1	JOM◌0803
40	**AJX12R402SA32EL**	●	2	350	28.3	50	32	—	1.2	3°	2	JDM◌1204
40	**AJX12R403SA42S**	●	3	150	28.3	70	42	1.79°	1.2	3°	2	JDM◌1204
40	**AJX09R404SA42S**	●	4	150	29.9	70	42	1.8°	1.2	1.5°	2	JDM◌09T3
40	**AJX12R403SA42L**	●	3	250	28.3	70	42	1.79°	1.2	3°	2	JDM◌1204
40	**AJX09R404SA42L**	●	4	250	29.9	70	42	1.8°	1.2	1.5°	2	JDM◌09T3
40	**AJX12R402SA42EL**	●	2	350	28.3	70	42	1.79°	1.2	3°	2	JDM◌1204
50	**AJX14R503SA42S**	●	3	150	38.2	50	42	—	1.2	4.2°	2	JDM◌1405
50	**AJX14R503SA42L**	●	3	250	38.1	50	42	—	1.2	4.2°	2	JDM◌1405
63	**AJX14R634SA42S**	●	4	150	51.1	50	42	—	1.2	2.8°	3	JDM◌1405
63	**AJX14R634SA42L**	●	4	250	51.1	50	42	—	1.2	2.8°	3	JDM◌1405

* Refer to page L237, for the max. drilling depth (**AZ**).

Note 1) The maximum depth of cut (**APMX**) value listed is for when using a JL breaker. Please refer to page L237 for the APMX for other breakers.

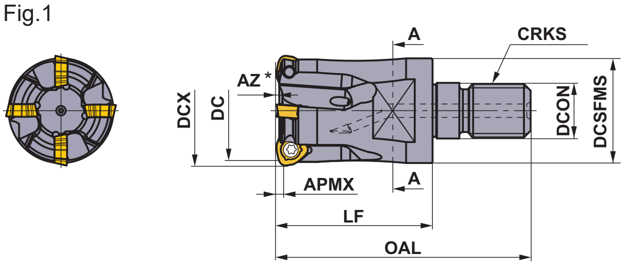
SPARE PARTS

Tool Holder Type	*		*		F D
	Clamp Screw	Clamp Bridge	Clamp Bridge Screw	Spring	Wrench
AJX06R	TS25	—	—	—	TKY08F
AJX08R	TS33	—	—	—	TKY08D
AJX09R	TS351	AMS3	AJS3010T10	ASS2	TKY10D
AJX12R30	TS407	AMS4	AJS4012T15	ASS2	TKY15D
AJX12R32	TS43	AMS4	AJS4012T15	ASS2	TKY15D
AJX12R35	TS43	AMS4	AJS4012T15	ASS2	TKY15D
AJX12R40	TS43	AMS4	AJS4012T15	ASS2	TKY15D
AJX14R	TS54	AMS5	AJS5014T25	ASS3	TKY25D

* Clamp Torque (N • m) : TS25=1.0, TS33=1.5, TS351=2.5, TS407=3.5, TS43=3.5, TS54=7.5, AJS3010T10=2.5, AJS4012T15=3.5, AJS5014T25=7.5

● : Inventory maintained in Japan.

Fig.1



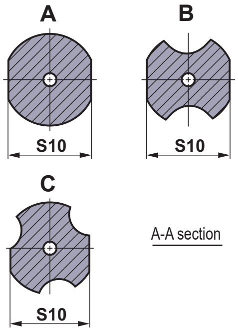
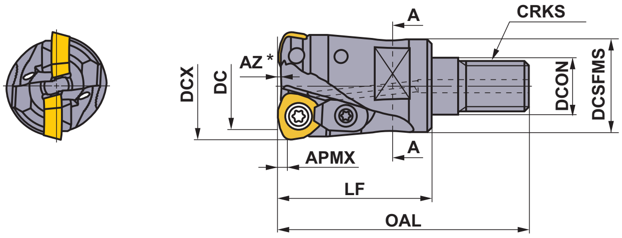


Fig.2



Right hand tool holder only.

■SCREW-IN TYPE

With Coolant Hole

DCX (mm)	Order Number	Stock	Number of Teeth	Dimensions (mm)				WT (kg)	APMX (mm)	RMPX	Fig.	Insert Type
		R		DC	LF	OAL	DCON					
16	**AJX06R162AM0830**	●	2	8.9	30	48	8.5	0.1	0.6	3°	1	JOM◌06T2
17	**AJX06R172AM0830**	●	2	9.9	30	48	8.5	0.1	0.6	2.5°	1	JOM◌06T2
20	**AJX08R202AM1030**	●	2	11.4	30	49	10.5	0.1	0.9	3.5°	1	JOM◌0803
20	**AJX06R203AM1030**	●	3	12.9	30	49	10.5	0.1	0.6	1.5°	1	JOM◌06T2
22	**AJX08R222AM1030**	●	2	13.4	30	49	10.5	0.1	0.9	3°	1	JOM◌0803
22	**AJX06R223AM1030**	●	3	14.9	30	49	10.5	0.1	0.6	1°	1	JOM◌06T2
25	**AJX09R252AM1235**	●	2	14.9	35	57	12.5	0.2	1.2	4°	2	JDM◌09T3
25	**AJX08R253AM1235**	●	3	16.4	35	57	12.5	0.1	0.9	2°	1	JOM◌0803
NEW 25	**AJX06R254AM1235**	●	4	17.9	35	57	12.5	0.1	0.6	0.8°	1	JOM◌06T2
28	**AJX09R282AM1235**	●	2	17.9	35	57	12.5	0.2	1.2	3°	2	JDM◌09T3
28	**AJX08R283AM1235**	●	3	19.4	35	57	12.5	0.1	0.9	1.7°	1	JOM◌0803
NEW 28	**AJX06R284AM1235**	●	4	20.9	35	57	12.5	0.1	0.6	0.7°	1	JOM◌06T2
30	**AJX12R302AM1645**	●	2	18.3	45	68	17.0	0.3	1.2	4.5°	2	JDM◌1204
30	**AJX09R303AM1645**	●	3	20	45	68	17.0	0.2	1.2	2.7°	2	JDM◌09T3
32	**AJX12R322AM1645**	●	2	20.3	45	68	17.0	0.3	1.2	4°	2	JDM◌1204
32	**AJX09R323AM1645**	●	3	21.9	45	68	17.0	0.2	1.2	2.5°	2	JDM◌09T3
NEW 32	**AJX08R324AM1645**	●	4	23.4	45	68	17.0	0.2	0.9	1.4°	1	JOM◌0803
35	**AJX12R352AM1645**	●	2	23.3	45	68	17.0	0.3	1.2	3.5°	2	JDM◌1204
35	**AJX09R353AM1645**	●	3	24.9	45	68	17.0	0.2	1.2	2°	2	JDM◌09T3
NEW 35	**AJX08R354AM1645**	●	4	26.4	45	68	17.0	0.2	0.9	1.2°	1	JOM◌0803
40	**AJX12R403AM1645**	●	3	28.3	45	68	17.0	0.3	1.2	3°	2	JDM◌1204
40	**AJX09R404AM1645**	●	4	29.9	45	68	17.0	0.2	1.2	1.5°	2	JDM◌09T3
NEW 40	**AJX08R406AM1645**	●	6	31.4	45	68	17.0	0.3	0.9	1°	1	JOM◌0803

* Refer to page L237, for the max. drilling depth (**AZ**).
Note 1) The maximum depth of cut (**APMX**) value listed is for when using a JL breaker. Please refer to page L237 for the APMX for other breakers.
Note 2) For screw-in type arbors, refer to page L341.

SPARE PARTS

Tool Holder Type	Clamp Screw *	Clamp Bridge	Clamp Bridge Screw *	Spring	Wrench
AJX06R	TS25	—	—	—	TKY08F
AJX08R	TS33	—	—	—	TKY08D
AJX09R	TS351	AMS3	AJS3010T10	ASS2	TKY10D
AJX12R30	TS407	AMS4	AJS4012T15	ASS2	TKY15D
AJX12R32	TS43	AMS4	AJS4012T15	ASS2	TKY15D
AJX12R35	TS43	AMS4	AJS4012T15	ASS2	TKY15D
AJX12R40	TS43	AMS4	AJS4012T15	ASS2	TKY15D

* Clamp Torque (N • m) : TS25=1.0, TS33=1.5, TS351=2.5, TS407=3.5, TS43=3.5, AJS3010T10=2.5, AJS4012T15=3.5, AJS5014T25=7.5

Mounting Dimensions

DCX (mm)	Order Number	Dimensions (mm)				Connection Type	Shank Arbor Type
		DCON	DCSFMS	S10	CRKS		
16	**AJX06R162AM0830**	8.5	13	10	M8	A	SC16M08
17	**AJX06R172AM0830**	8.5	13	10	M8	A	SC16M08
20	**AJX08R202AM1030**	10.5	18	14	M10	B	SC20M10
20	**AJX06R203AM1030**	10.5	18	14	M10	C	SC20M10
22	**AJX08R222AM1030**	10.5	18	14	M10	B	SC20M10
22	**AJX06R223AM1030**	10.5	18	14	M10	C	SC20M10
25	**AJX09R252AM1235**	12.5	21	19	M12	B	SC25M12
25	**AJX08R253AM1235**	12.5	21	19	M12	A	SC25M12
NEW 25	**AJX06R254AM1235**	12.5	23.5	19	M12	A	SC25M12
28	**AJX09R282AM1235**	12.5	21	19	M12	B	SC25M12
28	**AJX08R283AM1235**	12.5	21	19	M12	A	SC25M12
NEW 28	**AJX06R284AM1235**	12.5	23.5	19	M12	A	SC25M12
30	**AJX12R302AM1645**	17.0	29	24	M16	B	SC32M16
30	**AJX09R303AM1645**	17.0	29	24	M16	A	SC32M16
32	**AJX12R322AM1645**	17.0	29	24	M16	B	SC32M16
32	**AJX09R323AM1645**	17.0	29	24	M16	A	SC32M16
NEW 32	**AJX08R324AM1645**	17.0	29	24	M16	A	SC32M16
35	**AJX12R352AM1645**	17.0	29	24	M16	B	SC32M16
35	**AJX09R353AM1645**	17.0	29	24	M16	A	SC32M16
NEW 35	**AJX08R354AM1645**	17.0	29	24	M16	A	SC32M16
40	**AJX12R403AM1645**	17.0	29	24	M16	B	SC32M16
40	**AJX09R404AM1645**	17.0	29	24	M16	A	SC32M16
NEW 40	**AJX08R406AM1645**	17.0	29	24	M16	A	SC32M16

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.

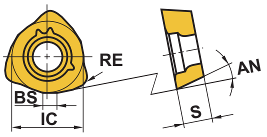
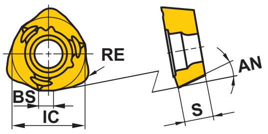
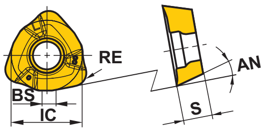
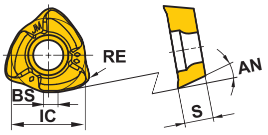
Screw Size	Recommended Torque (N • m)	Wrench Size (mm)
M8	23	10
M10	46	14
M12	80	19
M16	90	24

- ●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.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

Workpiece Material			FH7020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	MP9140	VP15TF	VP30RT
	P	Steel	●	◐	✣						◐	✣
	M	Stainless Steel				◐	✣				◐	✣
	K	Cast Iron	●								✣	
	S	Heat resistant Alloy, Titanium Alloy						◐	✣	✣	◐	
	H	Hardened Materials									◐	

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

Shape	Order Number	Class	Coated										Dimensions (inch)					Geometry
			FH7020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	MP9140	VP15TF	VP30RT	AN	IC	S	BS	RE	
Partial Profile **FT** Breaker 	**JOMW06T215ZZSR-FT**	M	●	●	●	●	●	●	●		●	●	13°	6.35	2.78	1.2	1.5	
	JOMW080320ZZSR-FT	M	●	●	●	●	●	●	●		●	●	13°	8	3.18	1.4	2	
	JDMW09T320ZDSR-FT	M	●	●	●	●	●	●	●		●	●	15°	9.525	3.97	1.8	2	
	JDMW120420ZDSR-FT	M	●	●	●	●	●	●	●		●	●	15°	12	4.76	2.5	2	
	JDMW140520ZDSR-FT	M	●	●	●	●	●	●	●		●	●	15°	14	5.56	2.8	2	
Strong Cutting Edge Type **ST** Breaker 	**JDMT120420ZDSR-ST**	M	●	●	●	●	●				●	●	15°	12	4.76	2.5	2	
	JDMT140520ZDSR-ST	M	●	●	●	●	●				●	●	15°	14	5.56	2.8	2	
Focus on cutting edge sharpness (For Difficult-to-cut Materials) **JL** Breaker 	**JOMT06T216ZZER-JL**	M				●	●	●	●	●			13°	6.35	2.78	1.2	1.6	
	JOMT080322ZZER-JL	M				●	●	●	●	●			13°	8	3.18	1.4	2.2	
	JDMT09T323ZDER-JL	M				●	●	●	●	●			15°	9.525	3.97	1.8	2.3	
	JDMT120423ZDER-JL	M				●	●	●	●	●			15°	12	4.76	2.5	2.3	
	JDMT140523ZDER-JL	M				●	●	●	●	●			15°	14	5.56	2.8	2.3	
Focus on cutting edge sharpness (For General Cutting) **JM** Breaker 	**JOMT06T215ZZSR-JM**	M	●	●	●	●	●	●	●		●	●	13°	6.35	2.78	1.2	1.5	
	JOMT080320ZZSR-JM	M	●	●	●	●	●	●	●		●	●	13°	8	3.18	1.4	2	
	JDMT09T320ZDSR-JM	M	●	●	●	●	●	●	●		●	●	15°	9.525	3.97	1.8	2	
	JDMT120420ZDSR-JM	M	●	●	●	●	●	●	●		●	●	15°	12	4.76	2.5	2	
	JDMT140520ZDSR-JM	M	●	●	●	●	●	●	●		●	●	15°	14	5.56	2.8	2	

Note 1) Setting height for ST chipbreaker is slightly different from that for other chipbreakers.
If you use ST chipbreaker, check the setting height.

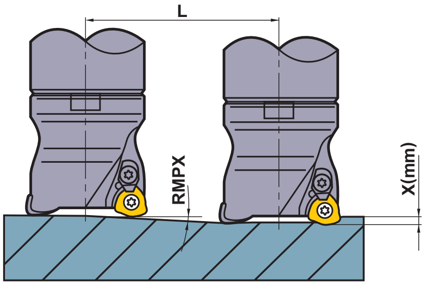
RECOMMENDED CUTTING CONDITIONS

■CUTTING SPEED

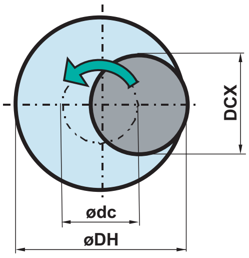
	Workpiece Material	Characteristics	Cutting Speed (m/min) for Different Grades			
P			**FH7020**	**MP6120**	**MP6130**	**VP30RT**
	Mild Steels	Hardness ≤180HB	170 (120—220)	150 (100—200)	130 (80—180)	110 (60—160)
	Carbon Steels Alloy Steels	Hardness 180—280HB	150 (100—200)	130 (80—180)	110 (60—160)	90 (40—140)
	Carbon Steels Alloy Steels	Hardness 280—350HB	130 (80—180)	100 (50—150)	80 (30—130)	60 (20—110)
	Alloy Tool Steels	Hardness ≤350HB (Annealing)	130 (80—180)	100 (50—150)	80 (30—120)	60 (20—90)
	Pre-hardened Steels	Hardness 35—45HRC	—	100 (70—130)	80 (50—110)	80 (30—90)
M			**MP7130**	**MP7140**	—	—
	Stainless Steels	Hardness ≤270HB	140 (100—180)	120 (80—160)		
K			**FH7020**	**VP15TF**	—	—
	Gray Cast Irons	Tensile Strength ≤350MPa	150 (100—200)	—		
	Ductile Cast Irons	Tensile Strength ≤800MPa	—	120 (80—160)	—	—
S			**MP9120**	**MP9130**	**MP9140**	—
	Heat Resistant Alloys	Hardness ≤350HB	30 (20—40)	25 (20—35)	20 (15—30)	
	Titanium Alloys	—	50 (40—60)	45 (30—55)	40 (30—50)	
H			**VP15TF**	—	—	—
	Hardened Steels	Hardness 40—55HRC	70 (50—90)			

MAXIMUM CAPACITIES BY MODE

■RAMPING



■HELICAL DRILLING



- How to derive a locus of the centre of the tool.

ødc = øDH - DCX

Locus of the centre of the tool / Desired hole diameter / Cutting Diameter Maximum

- For the depth of cut per pass, refer to the cutting conditions above for helical drilling.
- Set the machine spindle revolution so that the tool is rotating and cutting in a down cut direction.

- When ramping and helical cutting, please apply a lower feed.
- When drilling, please set the feed in the axial direction at 0.2mm/rev or less.
- The long chips generated can disperse, ensure that adequate safety precautions are taken.

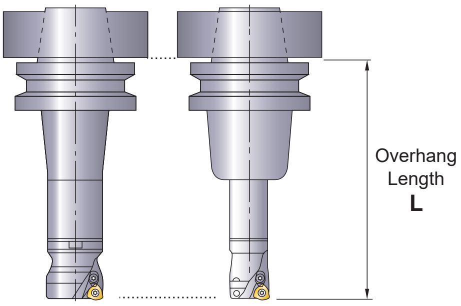
	Tool Holder Type	DCX (mm)	DC (mm)	APMX (mm)		RMPX	Ramping				Helical Drilling		AZ (mm)
				FT/JM/ST Breaker	JL Breaker		L Required distance for X mm depth				DH (mm)		
							X=1	X=1.2	X=1.5	X=2	Min	Max	
Shank type/Screw-in type	**AJX06**	16	8.9	1.0	0.6	3°	19.1	—	—	—	23	29	0.3
	AJX06	17	9.9	1.0	0.6	2.5°	22.9	—	—	—	25	31	0.3
	AJX06	20	12.9	1.0	0.6	1.5°	38.2	—	—	—	31	37	0.3
	AJX06	22	14.9	1.0	0.6	1°	57.3	—	—	—	35	41	0.3
	AJX08	20	11.4	1.5	0.9	3.5°	16.3	19.6	24.5	—	27	36	0.5
	AJX08	22	13.4	1.5	0.9	3°	19.1	22.9	28.6	—	31	40	0.5
	AJX08	25	16.4	1.5	0.9	2°	28.6	34.4	43.0	—	37	46	0.5
	AJX08	28	19.4	1.5	0.9	1.7°	33.7	40.4	50.5	—	43	52	0.5
	AJX09	25	14.9	2.0	1.2	4°	14.3	17.2	21.5	28.6	33	46	1.0
	AJX09	28	17.9	2.0	1.2	3°	19.1	22.9	28.6	38.1	39	52	1.0
	AJX09	30	20.0	2.0	1.2	2.7°	21.2	25.4	31.8	42.4	43	56	1.0
	AJX09	32	21.9	2.0	1.2	2.5°	22.9	27.5	34.4	45.8	47	60	1.0
	AJX09	35	24.9	2.0	1.2	2°	28.6	34.4	43.0	57.3	53	66	1.0
	AJX09	40	29.9	2.0	1.2	1.5°	38.2	45.8	57.3	76.4	63	76	1.0
	AJX12	30	18.3	2.0	1.2	4.5°	12.7	15.2	19.0	25.4	39	56	1.5
	AJX12	32	20.3	2.0	1.2	4°	14.3	17.2	21.4	28.6	41	60	1.5
	AJX12	35	23.3	2.0	1.2	3.5°	16.3	19.6	24.5	32.7	47	66	1.5
	AJX12	40	28.3	2.0	1.2	3°	19.1	22.9	28.6	38.2	57	76	1.5
	AJX14	50	38.2	2.0	1.2	4.2°	13.6	16.3	20.4	27.2	72	96	2.0
	AJX14	63	51.1	2.0	1.2	2.8°	20.4	24.5	30.7	40.9	98	122	2.0
Arbor type	**AJX06**	32	24.9	1.0	0.6	0.5°	114.6	137.5	171.9	229.2	51	61	0.3
	AJX08	40	31.4	1.5	0.9	1°	57.3	68.7	85.9	114.6	65	76	0.5
	AJX08	42	33.4	1.5	0.9	0.9°	63.7	76.4	95.5	127.3	69	80	0.5
	AJX08	50	41.4	1.5	0.9	0.7°	81.8	98.2	122.8	163.7	85	96	0.5
	AJX08	52	43.4	1.5	0.9	0.7°	81.8	98.2	122.8	163.7	89	100	0.5
	AJX09	50	40.0	2.0	1.2	1.1°	52.1	62.5	78.1	104.2	83	96	1.0
	AJX09	52	41.9	2.0	1.2	1°	57.3	68.7	85.9	114.6	85	100	1.0
	AJX09	63	52.9	2.0	1.2	0.8°	71.6	85.9	107.4	143.2	107	122	1.0
	AJX09	66	55.9	2.0	1.2	0.8°	71.6	85.9	107.4	143.2	113	128	1.0
	AJX12	50	38.3	2.0	1.2	2°	28.6	34.4	43.0	57.3	77	96	1.5
	AJX12	63	51.3	2.0	1.2	1.5°	38.2	45.8	57.3	76.4	103	122	1.5
	AJX12	66	54.3	2.0	1.2	1.4°	40.9	49.1	61.4	81.8	109	128	1.5
	AJX12	80	68.3	2.0	1.2	1.1°	52.1	62.5	78.1	104.2	137	156	1.5
	AJX12	100	88.3	2.0	1.2	0.8°	71.6	85.9	107.4	143.2	177	196	1.5
	AJX14	63	51.1	2.0	1.2	2.8°	20.4	24.5	30.7	40.9	98	122	2.0
	AJX14	66	54.1	2.0	1.2	2.6°	22.0	26.4	33.0	44.0	108	128	2.0
	AJX14	80	68.1	2.0	1.2	1.8°	31.8	38.2	47.7	63.6	132	156	2.0
	AJX14	100	88.1	2.0	1.2	1.2°	47.7	57.3	71.6	95.5	172	196	2.0
	AJX14	125	113.2	2.0	1.2	0.8°	71.6	85.9	107.4	143.2	222	246	2.0
	AJX14	160	148.2	2.0	1.2	0.5°	114.6	137.5	171.9	229.2	292	316	2.0

RECOMMENDED CUTTING CONDITIONS

■DEPTH OF CUT / FEED

	Workpiece Material	Characteristics	Shank Type / Screw-in Type								
			DCX=ø16, ø17			DCX=ø20, ø22			DCX=ø25, ø28		
			L (mm)	**ap** (mm)	**fz** (mm/t)	**L** (mm)	**ap** (mm)	**fz** (mm/t)	**L** (mm)	**ap** (mm)	**fz** (mm/t)
P	Mild Steel	Hardness ≤180HB	140	0.8	0.8	160	1.0	1.0	170	1.0	1.2
			180	0.6	0.6	210	0.8	0.8	230	0.8	1.0
			210	0.4	0.4	240	0.6	0.6	290	0.6	0.8
	Carbon Steel Alloy Steel	Hardness 180—280HB	140	0.8	0.8	160	1.0	1.0	170	1.0	1.2
			180	0.6	0.6	210	0.8	0.8	230	0.8	1.0
			210	0.4	0.4	240	0.6	0.6	290	0.6	0.8
	Carbon Steel Alloy Steel	Hardness 280—350HB	140	0.7	0.8	160	0.8	1.0	170	0.8	1.2
			180	0.5	0.6	210	0.6	0.8	230	0.6	1.0
			210	0.3	0.4	240	0.4	0.6	290	0.4	0.8
	Alloy Tool Steel	Hardness ≤350HB	140	0.7	0.8	160	0.8	1.0	170	0.8	1.2
			180	0.5	0.6	210	0.6	0.8	230	0.6	1.0
			210	0.3	0.4	240	0.4	0.6	290	0.4	0.8
	Pre-hardened Steel	Hardness 35—45HRC	140	0.7	0.7	160	0.8	0.8	170	0.8	1.0
			180	0.5	0.5	210	0.6	0.6	230	0.6	0.8
			210	0.3	0.3	240	0.4	0.4	290	0.4	0.6
M	Stainless Steel	Hardness ≤270HB	140	0.8	0.7	160	1.0	0.8	170	1.0	1.0
			180	0.6	0.5	210	0.8	0.6	230	0.8	0.8
			210	0.4	0.3	240	0.6	0.4	290	0.6	0.6
K	Gray Cast Iron	Tensile Strength ≤350MPa	140	0.8	1.0	160	1.0	1.2	170	1.0	1.4
			180	0.6	0.8	210	0.8	1.0	230	0.8	1.2
			210	0.4	0.6	240	0.6	0.8	290	0.6	1.0
	Ductile Cast Iron	Tensile Strength ≤800MPa	140	0.7	0.8	160	0.8	1.0	170	0.8	1.2
			180	0.5	0.6	210	0.6	0.8	230	0.6	1.0
			210	0.3	0.4	240	0.4	0.6	290	0.4	0.8
S	Heat Resistant Alloy	Hardness ≤350HB	140	0.6	0.6	160	0.8	0.6	170	1.0	0.6
			180	0.4	0.4	210	0.6	0.4	230	0.8	0.4
	Titanium Alloy	—	210	0.3	0.3	240	0.4	0.3	290	0.6	0.3
H	Hardened Steel	Hardness 40—55HRC	140	0.5	0.5	160	0.5	0.6	170	0.5	0.8
			180	0.4	0.3	210	0.4	0.4	230	0.4	0.6
			210	0.3	0.2	240	0.3	0.2	290	0.3	0.4

① Overhang Length **L**



② Main Spindle Revolution
n(min^{-1})=(Recommended Cutting Speed x 1000)÷
(DCX x 3.14)

③ Table Feed Rate
vf(mm/min)=n x Feed per Tooth x Number of Teeth

④ Recommended width of cut (ae) is more than 60% of the cutting edge diameter (DCX).

⑤ The above cutting conditions are guides to cutting on a #50 BT machine. In case of #40 BT and #63 HSK machines, a cutting edge diameter of under 35mm is recommended. In this case, reduce the depth of cut and table feed rate.

⑥ Use of ST chipbreaker with tougher cutting edges is recommended for machining parts that require interrupted cutting. First recommended insert grade for non-standard 06/08/09 ST chipbreakers is VP30RT irrespective of the workpiece material.

⑦ Cutter body with coarse pitch is recommended for the unstable cutting caused by the long tool overhang.

⑧ Use the "sharp" JM chipbreaker to lower cutting forces or when long tool overhangs are used.

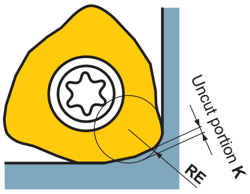
⑨ Heavy chips are generated when machining with the AJX. To avoid chip jamming-related problems, use air blower while machining to discharging chips effectively.

⑩ The maximum depth of cut of JL breaker is different in the insert size. 06 size is up to 0.6mm, 08 size is up to 0.9mm, and 09,12,14 size is up to 1.2mm.

Shank Type / Screw-in Type												Arbor Type					
DCX=ø30, ø32, ø35			**DCX=ø40** (**ø32** Shank)			**DCX=ø40** (**ø42** Shank)			**DCX=ø50, ø63**			**DCX=ø50, ø63, ø66**			**DCX≥ø80**		
L (mm)	**ap** (mm)	**fz** (mm/t)	**L** (mm)	**ap** (mm)	**fz** (mm/t)	**L** (mm)	**ap** (mm)	**fz** (mm/t)	**L** (mm)	**ap** (mm)	**fz** (mm/t)	**L** (mm)	**ap** (mm)	**fz** (mm/t)	**L** (mm)	**ap** (mm)	**fz** (mm/t)
180	1.2	1.4	180	1.2	1.4	180	1.2	1.5	180	1.4	1.5	150	1.5	1.5	170	1.5	1.5
230	1.0	1.2	240	1.0	1.2	240	1.0	1.3	240	1.2	1.3	250	1.3	1.3	300	1.3	1.3
290	0.8	1.0	300	0.8	1.0	300	0.8	1.1	—	—	—	350	1.1	1.1	450	1.0	1.0
180	1.2	1.4	180	1.2	1.4	180	1.2	1.5	180	1.4	1.5	150	1.5	1.5	170	1.5	1.5
230	1.0	1.2	240	1.0	1.2	240	1.0	1.3	240	1.2	1.3	250	1.3	1.3	300	1.3	1.3
290	0.8	1.0	300	0.8	1.0	300	0.8	1.1	—	—	—	350	1.1	1.1	450	1.0	1.0
180	1.0	1.4	180	1.0	1.4	180	1.0	1.5	180	1.2	1.5	150	1.3	1.5	170	1.3	1.5
230	0.8	1.2	240	0.8	1.2	240	0.8	1.3	240	1.0	1.3	250	1.1	1.3	300	1.1	1.3
290	0.6	1.0	300	0.6	1.0	300	0.6	1.1	—	—	—	350	0.9	1.1	450	0.8	1.0
180	1.0	1.4	180	1.0	1.4	180	1.0	1.5	180	1.2	1.5	150	1.3	1.5	170	1.3	1.5
230	0.8	1.2	240	0.8	1.2	240	0.8	1.3	240	1.0	1.3	250	1.1	1.3	300	1.1	1.3
290	0.6	1.0	300	0.6	1.0	300	0.6	1.1	—	—	—	350	0.9	1.1	450	0.8	1.0
180	1.0	1.2	180	1.0	1.2	180	1.0	1.3	180	1.2	1.3	150	1.3	1.3	170	1.3	1.3
230	0.8	1.0	240	0.8	1.0	240	0.8	1.1	240	1.0	1.1	250	1.1	1.1	300	1.1	1.1
290	0.6	0.8	300	0.6	0.8	300	0.6	0.9	—	—	—	350	0.9	0.9	450	0.8	0.8
180	1.2	1.2	180	1.2	1.2	180	1.2	1.3	180	*1.4	1.3	150	*1.5	1.3	170	*1.5	1.3
230	1.0	1.0	240	1.0	1.0	240	1.0	1.1	240	1.2	1.1	250	*1.3	1.1	300	*1.3	1.1
290	0.8	0.8	300	0.8	0.8	300	0.8	0.9	—	—	—	350	1.1	0.9	450	1.0	0.8
180	1.2	1.6	180	1.2	1.6	180	1.2	1.7	180	1.4	1.7	150	1.5	1.7	170	1.5	1.7
230	1.0	1.4	240	1.0	1.4	240	1.0	1.5	240	1.2	1.5	250	1.3	1.5	300	1.3	1.5
290	0.8	1.2	300	0.8	1.2	300	0.8	1.3	—	—	—	350	1.1	1.3	450	1.0	1.2
180	1.0	1.4	180	1.0	1.4	180	1.0	1.5	180	1.2	1.5	150	1.3	1.5	170	1.3	1.5
230	0.8	1.2	240	0.8	1.2	240	0.8	1.3	240	1.0	1.3	250	1.1	1.3	300	1.1	1.3
290	0.6	1.0	300	0.6	1.0	300	0.6	1.1	—	—	—	350	0.9	1.1	450	0.8	1.0
180	1.2	0.6	180	1.2	0.6	180	1.2	0.6	180	1.2	0.6	150	1.2	0.6	170	1.2	0.6
230	1.0	0.4	240	1.0	0.4	240	1.0	0.4	240	1.0	0.4	250	1.0	0.4	300	1.0	0.4
290	0.8	0.3	300	0.8	0.3	300	0.8	0.3	—	—	—	350	0.8	0.3	450	0.8	0.3
180	0.6	1.0	180	0.6	1.0	180	0.6	1.1	180	0.8	1.1	150	0.9	1.1	170	0.9	1.1
230	0.5	0.8	240	0.5	0.8	240	0.5	0.9	240	0.6	0.9	250	0.7	0.9	300	0.7	0.9
290	0.4	0.6	300	0.4	0.6	300	0.4	0.7	—	—	—	—	—	—	—	—	—

* Depth of cut of JL breaker is up to 1.2 mm.

NOTE FOR PROGRAMMING



When using the AJX, please programme as an R3 radius cutter. The approximate radius RE and uncut amount K at that time are as shown on the table to the right.

Insert Size	Breaker	Approx. **RE** (mm)	Uncut Portion **K** (mm)
06	**FT / JM**	2.0	0.33
	JL	2.5	0.32
08	**FT / JM**	2.5	0.46
	JL	2.0	0.40
09	**FT / JM**	3.0	0.47
	JL	3.0	0.46
12	**FT / JM / ST**	3.0	0.63
	JL	3.0	0.53
14	**FT / JM / ST**	3.0	0.64
	JL	3.0	0.55

Note 1) The uncut portion may change slightly depending on cutting conditions.

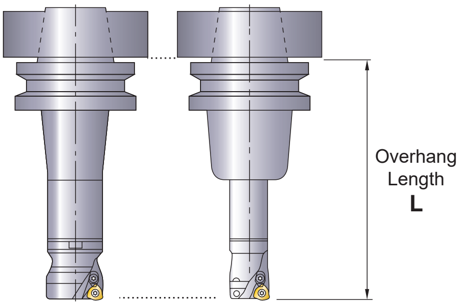
Shank / Screw-in Type Extra Fine Pitch and Arbor Type Super Extra Fine Pitch

RECOMMENDED CUTTING CONDITIONS

■DEPTH OF CUT / FEED

	Workpiece Material	Characteristics	Shank Type / Screw-in Type								
			DCX=ø25, ø28			DCX=ø30, ø32, ø35			DCX=ø40 (ø32 Shank)		
			L (mm)	ap (mm)	fz (mm/t)	L (mm)	ap (mm)	fz (mm/t)	L (mm)	ap (mm)	fz (mm/t)
P	Mild Steels	Hardness ≤180HB	170	0.5	1.2	180	0.7	1.4	180	0.8	1.4
			230	0.4	1.0	230	0.5	1.2	240	0.6	1.2
			290	0.3	0.8	290	0.3	1.0	300	0.4	1.0
	Carbon Steels Alloy Steels	Hardness 180—280HB	170	0.5	1.2	180	0.7	1.4	180	0.8	1.4
			230	0.4	1.0	230	0.5	1.2	240	0.6	1.2
			290	0.3	0.8	290	0.3	1.0	300	0.4	1.0
	Carbon Steels Alloy Steels	Hardness 280—350HB	170	0.4	1.2	180	0.5	1.4	180	0.6	1.4
			230	0.3	1.0	230	0.4	1.2	240	0.5	1.2
			290	0.2	0.8	290	0.3	1.0	300	0.4	1.0
	Alloy Tool Steels	Hardness ≤350HB	170	0.4	1.2	180	0.5	1.4	180	0.6	1.4
			230	0.3	1.0	230	0.4	1.2	240	0.5	1.2
			290	0.2	0.8	290	0.3	1.0	300	0.4	1.0
	Pre-hardened Steels	Hardness 35—45HRC	170	0.4	1.0	180	0.5	1.2	180	0.6	1.2
			230	0.3	0.8	230	0.4	1.0	240	0.5	1.0
			290	0.2	0.6	290	0.3	0.8	300	0.4	0.8
M	Stainless Steels	Hardness ≤270HB	170	0.5	1.0	180	0.7	1.2	180	0.8	1.2
			230	0.4	0.8	230	0.5	1.0	240	0.6	1.0
			290	0.3	0.6	290	0.3	0.8	300	0.4	0.8
K	Gray Cast Irons	Tensile Strength ≤350MPa	170	0.5	1.4	180	0.7	1.6	180	0.8	1.6
			230	0.4	1.2	230	0.5	1.4	240	0.6	1.4
			290	0.3	1.0	290	0.3	1.2	300	0.4	1.2
	Ductile Cast Irons	Tensile Strength ≤800MPa	170	0.4	1.2	180	0.5	1.4	180	0.6	1.4
			230	0.3	1.0	230	0.4	1.2	240	0.5	1.2
			290	0.2	0.8	290	0.3	1.0	300	0.4	1.0
S	Heat Resistant Alloys	Hardness ≤350HB	170	0.5	0.6	180	0.7	0.6	180	0.8	0.6
			230	0.4	0.4	230	0.5	0.4	240	0.6	0.4
	Titanium Alloys	—	290	0.3	0.3	290	0.3	0.3	300	0.4	0.3
H	Hardened Steels	Hardness 40—55HRC	170	0.3	0.8	180	0.4	1.0	180	0.5	1.0
			230	0.2	0.6	230	0.3	0.8	240	0.4	0.8
			290	0.1	0.4	290	0.2	0.6	300	0.3	0.6

① Overhang Length **L**



② Main Spindle Revolution
n(min^{-1})=(Recommended Cutting Speed x 1000)÷
(DCX x 3.14)

③ Table Feed Rate
vf(mm/min)=n x Feed per Tooth x Number of Teeth

④ Recommended width of cut (ae) is more than 60% of the cutting edge diameter (DCX).

⑤ The above cutting conditions are guides to cutting on a #50 BT machine. In case of #40 BT and #63 HSK machines, a cutting edge diameter of under 35mm is recommended. In this case, reduce the depth of cut and table feed rate.

⑥ Use of ST chipbreaker with tougher cutting edges is recommended for machining parts that require interrupted cutting. First recommended insert grade for non-standard 06/08/09 ST chipbreakers is VP30RT irrespective of the workpiece material.

⑦ Cutter body with coarse pitch is recommended for the unstable cutting caused by the long tool overhang.

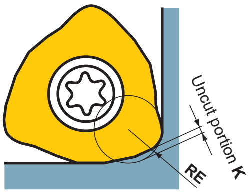
⑧ Use the "sharp" JM chipbreaker to lower cutting forces or when long tool overhangs are used.

⑨ Heavy chips are generated when machining with the AJX. To avoid chip jamming-related problems, use air blower while machining to discharging chips effectively.

⑩ The maximum depth of cut of JL breaker is different in the insert size.
06 size is up to 0.6mm, 08 size is up to 0.9mm, and 09,12,14 size is up to 1.2mm.

			Arbor Type								
DCX=ø40 (**ø42** Shank)			**DCX=ø32, ø40, ø42**			**DCX=ø50, ø63, ø66**			**DCX≥ø80**		
L (mm)	**ap** (mm)	**fz** (mm/t)	**L** (mm)	**ap** (mm)	**fz** (mm/t)	**L** (mm)	**ap** (mm)	**fz** (mm/t)	**L** (mm)	**ap** (mm)	**fz** (mm/t)
180	0.8	1.5	180	0.8	1.4	150	0.8	1.5	170	1.1	1.5
240	0.6	1.3	230	0.6	1.2	250	0.6	1.3	300	0.9	1.3
300	0.4	1.1	290	0.4	1.0	350	0.3	1.1	450	0.7	1.0
180	0.8	1.5	180	0.8	1.4	150	0.8	1.5	170	1.1	1.5
240	0.6	1.3	230	0.6	1.2	250	0.6	1.3	300	0.9	1.3
300	0.4	1.1	290	0.4	1.0	350	0.3	1.1	450	0.7	1.0
180	0.6	1.5	180	0.6	1.4	150	0.6	1.5	170	0.9	1.5
240	0.5	1.3	230	0.5	1.2	250	0.5	1.3	300	0.7	1.3
300	0.4	1.1	290	0.4	1.0	350	0.3	1.1	450	0.5	1.0
180	0.6	1.5	180	0.6	1.4	150	0.6	1.5	170	0.9	1.5
240	0.5	1.3	230	0.5	1.2	250	0.5	1.3	300	0.7	1.3
300	0.4	1.1	290	0.4	1.0	350	0.3	1.1	450	0.5	1.0
180	0.6	1.3	180	0.6	1.2	150	0.6	1.3	170	0.9	1.3
240	0.5	1.1	230	0.5	1.0	250	0.5	1.1	300	0.7	1.1
300	0.4	0.9	290	0.4	0.8	350	0.3	0.9	450	0.5	0.8
180	0.8	1.3	180	0.8	1.2	150	0.8	1.3	170	1.1	1.3
240	0.6	1.1	230	0.6	1.0	250	0.6	1.1	300	0.9	1.1
300	0.4	0.9	290	0.4	0.8	350	0.3	0.9	450	0.7	0.8
180	0.8	1.7	180	0.8	1.6	150	0.8	1.7	170	1.1	1.7
240	0.6	1.5	230	0.6	1.4	250	0.6	1.5	300	0.9	1.5
300	0.4	1.3	290	0.4	1.2	350	0.3	1.3	450	0.7	1.2
180	0.6	1.5	180	0.6	1.4	150	0.6	1.5	170	0.9	1.5
240	0.5	1.3	230	0.5	1.2	250	0.5	1.3	300	0.7	1.3
300	0.4	1.1	290	0.4	1.0	350	0.3	1.1	450	0.5	1.0
180	0.8	0.6	180	0.5	0.6	150	0.5	0.6	170	0.8	0.6
240	0.6	0.4	230	0.4	0.4	250	0.4	0.4	300	0.6	0.4
300	0.4	0.3	290	0.3	0.3	350	0.3	0.3	450	0.4	0.3
180	0.5	1.1	180	0.4	1.0	150	0.4	1.1	170	0.7	1.1
240	0.4	0.9	230	0.3	0.8	250	0.3	0.9	300	0.5	0.9
300	0.3	0.7	—	—	—	—	—	—	—	—	—

NOTE FOR PROGRAMMING



When using the AJX, please programme as an R3 radius cutter. The approximate radius RE and uncut amount K at that time are as shown on the table to the right.

Insert Size	Breaker	Approx. **RE** (mm)	Uncut Portion **K** (mm)
06	**FT / JM**	2.0	0.33
	JL	2.5	0.32
08	**FT / JM**	2.5	0.46
	JL	2.0	0.40
09	**FT / JM**	3.0	0.47
	JL	3.0	0.46
12	**FT / JM / ST**	3.0	0.63
	JL	3.0	0.53
14	**FT / JM / ST**	3.0	0.64
	JL	3.0	0.55

Note 1) The uncut portion may change slightly depending on cutting conditions.

MULTI-FUNCTIONAL MILLING

WJX09 NEW

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron		Heat Resistant Alloy	Hardened Steel

Fig.1
ø40

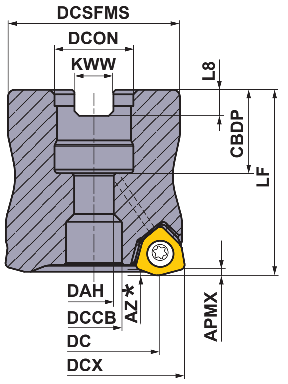
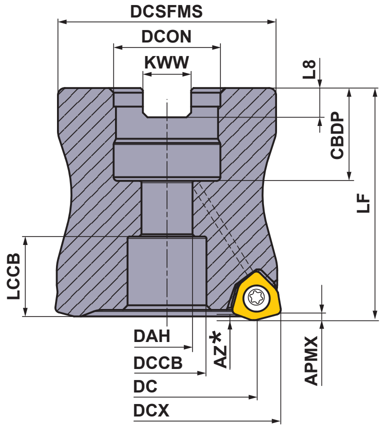
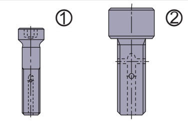


Fig.2
ø50
ø52
ø63
ø66



Right hand tool holder only.

DCON		Set Bolt	Geometry	
inch size	mm size			
	ϕ16	HFF08033H	①	 ① ② With Coolant Hole
ϕ22.225	ϕ22	HSC10030H	②	
	ϕ27	HSC12035H		

■ARBOR TYPE

With Coolant Hole

DCON = Inch size

DCX (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)			WT (kg)	APMX (mm)	RPMX (min^{-1})	Fig.	Insert Type
		R		DC	LF	DCON					
50	**WJX09R05004BA**	●	4	38.8	50	22.225	0.4	1.2	20000	2	JOMU0905
50	**WJX09R05006BA**	●	6	38.8	50	22.225	0.4	1.2	20000	2	JOMU0905
63	**WJX09R06305BA**	●	5	51.8	50	22.225	0.8	1.2	17300	2	JOMU0905
63	**WJX09R06307BA**	●	7	51.8	50	22.225	0.8	1.2	17300	2	JOMU0905

DCON = mm size

DCX (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)			WT (kg)	APMX (mm)	RPMX (min^{-1})	Fig.	Insert Type
		R		DC	LF	DCON					
40	**WJX09-040A04AR**	●	4	28.8	40	16	0.2	1.2	23200	1	JOMU0905
40	**WJX09-040A05AR**	●	5	28.8	40	16	0.2	1.2	23200	1	JOMU0905
50	**WJX09-050A04AR**	●	4	38.8	50	22	0.4	1.2	20000	2	JOMU0905
50	**WJX09-050A06AR**	●	6	38.8	50	22	0.4	1.2	20000	2	JOMU0905
52	**WJX09-052A06AR**	●	6	40.8	50	22	0.5	1.2	19500	2	JOMU0905
63	**WJX09-063A05AR**	●	5	51.8	50	22	0.8	1.2	17300	2	JOMU0905
63	**WJX09-063A07AR**	●	7	51.8	50	22	0.8	1.2	17300	2	JOMU0905
63	**WJX09-063X07AR**	●	7	51.8	50	27	0.7	1.2	17300	2	JOMU0905
66	**WJX09-066X07AR**	●	7	54.8	50	27	0.8	1.2	16800	2	JOMU0905

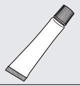
∗ Refer to page L249, for the maximum drilling depth (**AZ**).
Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

● : Inventory maintained in Japan.

Mounting Dimensions

DCX (mm)	Order Number	Dimensions(mm)								Fig.
		DCON	**CBDP**	**DAH**	**DCCB**	**LCCB**	**DCSFMS**	**KWW**	**L8**	
40	**WJX09-040A04AR**	16	18	8.5	12	—	37	8.4	5.6	1
40	**WJX09-040A05AR**	16	18	8.5	12	—	37	8.4	5.6	1
50	**WJX09-050A04AR**	22	20	11	17	17.2	47	10.4	6.3	2
50	**WJX09-050A06AR**	22	20	11	17	17.2	47	10.4	6.3	2
50	**WJX09R05004BA**	22.225	19	11	17	18.2	47	8.4	5	2
50	**WJX09R05006BA**	22.225	19	11	17	18.2	47	8.4	5	2
52	**WJX09-052A06AR**	22	20	11	17	17.2	47	10.4	6.3	2
63	**WJX09-063A05AR**	22	20	11	17	17.2	60	10.4	6.3	2
63	**WJX09-063A07AR**	22	20	11	17	17.2	60	10.4	6.3	2
63	**WJX09R06305BA**	22.225	19	11	17	18.2	60	8.4	5	2
63	**WJX09R06307BA**	22.225	19	11	17	18.2	60	8.4	5	2
63	**WJX09-063X07AR**	27	23	13	20	16.2	60	12.4	7	2
66	**WJX09-066X07AR**	27	23	13	20	16.2	60	12.4	7	2

SPARE PARTS

Tool Holder Type	 *		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WJX09	TPS3R	TIP10D	MK1KS

* Clamp Torque (N • m) : TPS3R = 2.0

ISO13399 ➤ L003
HOW TO USE ➤ L257
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

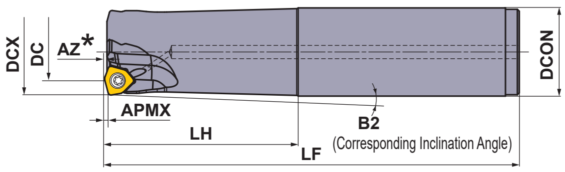


Fig.1

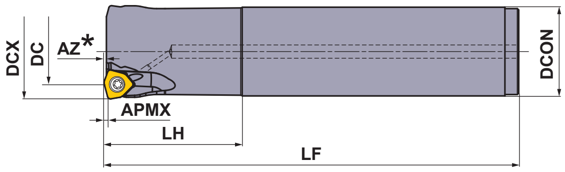


Fig.2

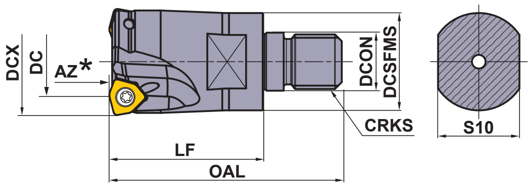
SHANK TYPE

With Coolant Hole

Right hand tool holder only.

DCX (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)					APMX (mm)	RPMX (min^{-1})	Fig.	Insert Type
		R		DC	LF	LH	DCON	B2				
25	**WJX09R2502SA25S**	●	2	14	140	60	25	1.09°	1.2	33500	1	JOMU0905
25	**WJX09R2503SA25S**	●	3	14	140	60	25	1.09°	1.2	33500	1	JOMU0905
25	**WJX09R2502SA25L**	●	2	14	200	120	25	0.54°	1.2	33500	1	JOMU0905
25	**WJX09R2503SA25L**	●	3	14	200	120	25	0.54°	1.2	33500	1	JOMU0905
25	**WJX09R2502SA25EL**	●	2	14	300	180	25	0.35°	1.2	33500	1	JOMU0905
28	**WJX09R2802SA25S**	●	2	16.9	140	40	25	—	1.2	30300	2	JOMU0905
28	**WJX09R2803SA25S**	●	3	16.9	140	40	25	—	1.2	30300	2	JOMU0905
28	**WJX09R2802SA25L**	●	2	16.9	200	40	25	—	1.2	30300	2	JOMU0905
28	**WJX09R2803SA25L**	●	3	16.9	200	40	25	—	1.2	30300	2	JOMU0905
28	**WJX09R2802SA25EL**	●	2	16.9	300	40	25	—	1.2	30300	2	JOMU0905
32	**WJX09R3202SA32S**	●	2	20.9	150	70	32	0.93°	1.2	27300	1	JOMU0905
32	**WJX09R3203SA32S**	●	3	20.9	150	70	32	0.93°	1.2	27300	1	JOMU0905
32	**WJX09R3202SA32L**	●	2	20.9	200	120	32	0.54°	1.2	27300	1	JOMU0905
32	**WJX09R3203SA32L**	●	3	20.9	200	120	32	0.54°	1.2	27300	1	JOMU0905
32	**WJX09R3202SA32EL**	●	2	20.9	300	180	32	0.35°	1.2	27300	1	JOMU0905
35	**WJX09R3503SA32S**	●	3	23.8	150	50	32	—	1.2	25500	2	JOMU0905
35	**WJX09R3504SA32S**	●	4	23.8	150	50	32	—	1.2	25500	2	JOMU0905
35	**WJX09R3503SA32L**	●	3	23.8	200	50	32	—	1.2	25500	2	JOMU0905
35	**WJX09R3504SA32L**	●	4	23.8	200	50	32	—	1.2	25500	2	JOMU0905
35	**WJX09R3502SA32EL**	●	2	23.8	300	50	32	—	1.2	25500	2	JOMU0905
40	**WJX09R4003SA32S**	●	3	28.8	150	50	32	—	1.2	23200	2	JOMU0905
40	**WJX09R4004SA32S**	●	4	28.8	150	50	32	—	1.2	23200	2	JOMU0905
40	**WJX09R4003SA32L**	●	3	28.8	250	50	32	—	1.2	23200	2	JOMU0905
40	**WJX09R4004SA32L**	●	4	28.8	250	50	32	—	1.2	23200	2	JOMU0905
40	**WJX09R4003SA32EL**	●	3	28.8	300	50	32	—	1.2	23200	2	JOMU0905

* Refer to page L249, for the maximum drilling depth (**AZ**).



SCREW-IN TYPE

With Coolant Hole

Right hand tool holder only.

DCX (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)							WT (kg)	APMX (mm)	RPMX (min^{-1})	Insert Type
		R		DC	LF	OAL	DCON	DCSFMS	S10	CRKS				
25	**WJX09R2502AM1235**	●	2	14	35	57	12.5	23.5	19	M12	0.1	1.2	33500	JOMU0905
25	**WJX09R2503AM1235**	●	3	14	35	57	12.5	23.5	19	M12	0.1	1.2	33500	JOMU0905
28	**WJX09R2802AM1235**	●	2	16.9	35	57	12.5	23.5	19	M12	0.1	1.2	30300	JOMU0905
28	**WJX09R2803AM1235**	●	3	16.9	35	57	12.5	23.5	19	M12	0.1	1.2	30300	JOMU0905
32	**WJX09R3202AM1645**	●	2	20.9	45	68	17.0	28.5	24	M16	0.2	1.2	27300	JOMU0905
32	**WJX09R3203AM1645**	●	3	20.9	45	68	17.0	28.5	24	M16	0.2	1.2	27300	JOMU0905
35	**WJX09R3502AM1645**	●	2	23.8	45	68	17.0	28.5	24	M16	0.3	1.2	25500	JOMU0905
35	**WJX09R3503AM1645**	●	3	23.8	45	68	17.0	28.5	24	M16	0.2	1.2	25500	JOMU0905
35	**WJX09R3504AM1645**	●	4	23.8	35	68	17.0	28.5	24	M16	0.2	1.2	25500	JOMU0905
40	**WJX09R4003AM1645**	●	3	28.8	45	68	17.0	28.5	24	M16	0.3	1.2	23200	JOMU0905
40	**WJX09R4004AM1645**	●	4	28.8	45	68	17.0	28.5	24	M16	0.3	1.2	23200	JOMU0905
40	**WJX09R4005AM1645**	●	5	28.8	45	68	17.0	28.5	24	M16	0.3	1.2	23200	JOMU0905

* Refer to page L249, for the maximum drilling depth (**AZ**).
Note 1) For screw-in type arbors, refer to page L341.

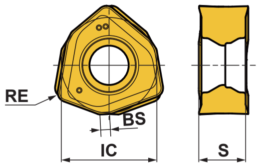
● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material		MC7020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT
P	Steels	◐	◐	✤					◐	✤
M	Stainless Steels	◐			◐	✤			◐	✤
K	Cast Irons								✤	
S	Heat Resistant Alloys, Titanium Alloys						◐	✤	◐	
H	Hardened Steels								◐	

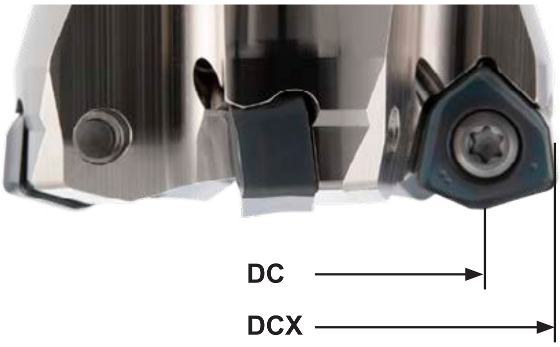
Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Edge Preparation : **E :** Round

Shape	Order Number	Class	Edge Preparation	Coated									Dimensions(mm)				Geometry
				MC7020	**MP6120**	**MP6130**	**MP7130**	**MP7140**	**MP9120**	**MP9130**	**VP15TF**	**VP30RT**	**IC**	**S**	**BS**	**RE**	
	**JOMU090512ZZER-L**	M	E	●	●	●	●	●	●	●	●	●	9.525	4.73	0.88	1.2	
	JOMU090512ZZER-M	M	E	●	●	●	●	●	●	●	●	●	9.525	4.75	0.88	1.2	
	JOMU090512ZZER-R	M	E	●	●	●					●	●	9.525	4.83	0.88	1.2	Right hand insert only.

■Cutter Diameter and Flat Surface Milling

The maximum cutting diameter (DCX) shown in the WJX items table is not the same as the possible dimensions for plane cutting.
The possible dimensions for plane cutting are given as the cutting axle DC value. Please note that this is smaller than the DCX value.



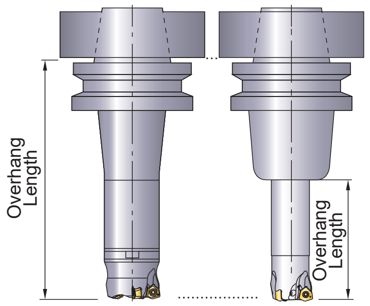
ISO13399 ➤L003
HOW TO USE ➤L257
ARBORS ➤L341
SPARE PARTS ➤P001
TECHNICAL DATA ➤Q001

RECOMMENDED CUTTING CONDITIONS

Correction Value According to Overhang Length

Please use by multiplying the recommended cutting conditions by the correction factor for the overhang length.

Type	DCX (mm)	Overhang Length (mm)	Correction Value		
			vc (m/min)	**ap** (mm)	**fz** (mm/t)
Shank Type Screw-in Type	25–40	< 2.5 × DCON	100%	100%	100%
		3.0 × DCON	90%	100%	90%
		4.0 × DCON	85%	90%	85%
		5.0 × DCON	80%	85%	80%
		7.5 × DCON	70%	75%	75%
Arbor Type	40–66	< 2.5 × DCX	100%	100%	100%
		3.0 × DCX	85%	100%	90%
		4.0 × DCX	80%	80%	80%
		5.0 × DCX	75%	75%	60%
		6.0 × DCX	70%	70%	40%



Cutting Speed (Dry Cutting)

Workpiece Material	Characteristics	Cutting Speed (Priority Basis) vc (m/min)				
P		MP6130	MP6120	VP15TF	MC7020	VP30RT
Mild Steels	≤180HB	160 (110–200)	170 (120–220)	170 (120–220)	230 (180–280)	140 (100–180)
Carbon Steels Alloy Steels	180–280HB	140 (90–200)	160 (100–220)	160 (100–220)	220 (170–270)	120 (80–170)
Carbon Steels Alloy Steels	280–350HB	140 (90–200)	160 (100–220)	160 (100–220)	220 (170–270)	120 (80–170)
Alloy Tool Steels	≤350HB (Annealing)	140 (90–200)	160 (100–220)	160 (100–220)	220 (170–270)	120 (80–170)
Pre-hardened Steels	35–45HRC	100 (60–140)	120 (80–160)	120 (80–160)	–	90 (50–130)
M		MP7130	MP7140	MC7020	VP30RT	
Austenitic Stainless Steels	≤200HB	160 (130–200)	150 (120–180)	220 (170–270)	150 (120–180)	
Austenitic Stainless Steels	>200HB	140 (100–200)	130 (80–180)	190 (140–240)	130 (80–180)	
Ferritic and Martensitic Stainless Steels	≤200HB	150 (100–200)	130 (80–180)	220 (170–270)	130 (80–180)	
Duplex Stainless Steels	≤280HB	130 (80–180)	110 (60–160)	180 (130–230)	110 (60–160)	
Precipitation-Hardening Stainless Steel	<450HB	110 (60–160)	90 (50–130)	170 (120–220)	90 (50–130)	
K		VP15TF				
Gray Cast Irons	≤350MPa	180 (140–220)				
Ductile Cast Irons	≤450MPa	160 (120–210)				
Ductile Cast Irons	≤800MPa	130 (90–170)				
S		MP9130	MP9120	VP15TF		
Titanium Alloys	–	40 (30–60)	50 (30–65)	50 (30–65)		
Heat Resistant Alloys	–	30 (20–40)	40 (20–50)	40 (20–50)		
H		VP15TF				
Hardened Steels	40–55HRC	70 (40–100)				

Note 1) To discharge chips effectively, use an air blower when machining. When the air blower is less effective at discharging chips, we recommend wet cutting.
Note 2) Tools may have a shorter life with wet cutting than dry cutting. For the cutting speed, multiply the values in the table above by 75% before use.
Note 3) When large vibration occurs, reduce the cutting conditions.
Note 4) For interrupted cutting, multiply the cutting speed listed in the table above by 80% and the feed rate per tooth by 80%.

Depth of Cut / Feed per Tooth

	Workpiece Material	Characteristics	Depth of Cut **ap** (mm)	Breaker	Cutting Dia. Max. DCX=25,28(Z=2)	Cutting Dia. Max. DCX=25,28(Z=3)	Cutting Dia. Max. DCX=32–	Cutting Mode
					Feed **fz**(mm/t)	Feed **fz**(mm/t)	Feed **fz**(mm/t)	
P	Mild Steels	Hardness ≦180HB	≦0.5	M,R	1.3(0.4–2.0)	1.3(0.4–2.0)	1.5(0.5–2.0)	Dry
				L	1.2(0.4–1.6)	1.2(0.4–1.6)	1.2(0.4–1.6)	
			≦1.0	M,R	1.0(0.3–1.3)	0.8(0.3–1.0)	1.2(0.4–1.5)	
				L	0.8(0.3–1.2)	0.8(0.3–1.0)	0.8(0.3–1.2)	
			≦1.5	M,R	0.6(0.3–1.0)	–	0.8(0.4–1.2)	
	Carbon Steels Alloy Steels	Hardness 180–280HB	≦0.5	M,R	1.3(0.4–1.7)	1.3(0.4–1.7)	1.5(0.4–2.0)	Dry
				L	1.2(0.3–1.5)	1.2(0.3–1.5)	1.2(0.3–1.5)	
			≦1.0	M,R	0.8(0.3–1.0)	0.7(0.3–0.9)	1.0(0.3–1.3)	
				L	0.7(0.2–1.0)	0.7(0.2–0.9)	0.7(0.2–1.0)	
			≦1.5	M,R	0.5(0.3–0.7)	–	0.7(0.3–1.0)	
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 280–350HB ≦350HB (Annealing)	≦0.5	M,R	1.3(0.4–1.7)	1.3(0.4–1.7)	1.5(0.4–2.0)	Dry
				L	1.2(0.3–1.5)	1.2(0.3–1.5)	1.2(0.3–1.5)	
			≦1.0	M,R	0.8(0.3–1.0)	0.7(0.3–0.9)	1.0(0.3–1.3)	
				L	0.7(0.2–1.0)	0.7(0.2–0.9)	0.7(0.2–1.0)	
			≦1.5	M,R	0.5(0.3–0.7)	–	0.7(0.3–1.0)	
	Pre-hardened Steels	Hardness 35–45HRC	≦0.5	M,R	1.0(0.3–1.3)	1.0(0.3–1.3)	1.2(0.3–1.5)	Dry
				L	0.8(0.3–1.2)	0.8(0.3–1.2)	0.8(0.3–1.2)	
			≦1.0	M,R	0.6(0.2–0.8)	0.6(0.2–0.8)	0.8(0.2–1.0)	
				L	0.5(0.2–0.8)	0.5(0.2–0.8)	0.5(0.2–0.8)	
M	Austenitic Stainless Steels	–	≦0.5	L	0.8(0.3–1.0)	0.8(0.3–1.0)	0.8(0.3–1.0)	Dry
				M	1.0(0.4–1.2)	1.0(0.4–1.2)	1.0(0.4–1.2)	
			≦1.0	L	0.6(0.2–0.8)	0.6(0.2–0.8)	0.6(0.2–0.8)	
				M	0.8(0.3–1.0)	0.8(0.3–1.0)	0.8(0.3–1.0)	
	Ferritic and Martensitic Stainless Steels	Hardness ≦200HB	≦0.5	L	0.8(0.3–1.0)	0.8(0.3–1.0)	0.8(0.3–1.0)	Dry
				M	1.0(0.4–1.2)	1.0(0.4–1.2)	1.0(0.4–1.2)	
			≦1.0	L	0.6(0.2–0.8)	0.6(0.2–0.8)	0.6(0.2–0.8)	
				M	0.8(0.3–1.0)	0.8(0.3–1.0)	0.8(0.3–1.0)	
	Duplex Stainless Steels	Hardness ≦280HB	≦0.5	L	0.6(0.3–0.8)	0.6(0.3–0.8)	0.6(0.3–0.8)	Dry
				M	0.7(0.3–1.0)	0.7(0.3–1.0)	0.7(0.3–1.0)	
			≦1.0	L	0.5(0.2–0.7)	0.5(0.2–0.7)	0.5(0.2–0.7)	
				M	0.6(0.3–0.7)	0.6(0.3–0.7)	0.6(0.3–0.7)	
	Precipitation-Hardening Stainless Steel	Hardness <450HB	≦0.5	L	0.6(0.3–0.8)	0.6(0.3–0.8)	0.6(0.3–0.8)	Dry
				M	0.7(0.3–1.0)	0.7(0.3–1.0)	0.7(0.3–1.0)	
			≦1.0	L	0.5(0.2–0.7)	0.5(0.2–0.7)	0.5(0.2–0.7)	
				M	0.6(0.3–0.7)	0.6(0.3–0.7)	0.6(0.3–0.7)	
K	Gray Cast Irons	Tensile Strength ≦350MPa	≦0.5	M,R	1.3(0.4–2.0)	1.3(0.4–2.0)	1.5(0.5–2.0)	Dry
				L	1.2(0.4–1.6)	1.2(0.4–1.6)	1.2(0.4–1.6)	
			≦1.0	M,R	1.0(0.3–1.3)	0.8(0.3–1.0)	1.2(0.4–1.5)	
				L	1.0(0.3–1.3)	0.8(0.3–1.0)	1.0(0.3–1.3)	
			≦1.5	M,R	0.6(0.3–1.0)	–	0.8(0.4–1.2)	
	Ductile Cast Irons	Tensile Strength ≦450MPa	≦0.5	M,R	1.3(0.4–1.7)	1.3(0.4–1.7)	1.5(0.4–2.0)	Dry
				L	1.0(0.3–1.3)	1.0(0.3–1.3)	1.0(0.3–1.3)	
			≦1.0	M,R	0.8(0.3–1.0)	0.7(0.3–0.9)	1.0(0.3–1.3)	
				L	0.8(0.2–1.0)	0.7(0.2–0.9)	0.8(0.2–1.2)	
			≦1.5	M,R	0.5(0.3–0.7)	–	0.7(0.3–1.0)	
	Ductile Cast Irons	Tensile Strength ≦800MPa	≦0.5	M,R	1.0(0.2–1.5)	1.0(0.2–1.5)	1.3(0.3–1.7)	Dry
				L	0.8(0.3–1.2)	0.8(0.3–1.2)	0.8(0.3–1.2)	
			≦1.0	M,R	0.8(0.2–1.0)	0.6(0.2–0.8)	1.0(0.3–1.2)	
				L	0.5(0.2–0.8)	0.5(0.2–0.8)	0.5(0.2–0.8)	
S	Titanium Alloys	–	≦0.5	L	0.3(0.2–0.6)	0.3(0.2–0.6)	0.3(0.2–0.6)	Wet
			≦1.0	L	0.3(0.2–0.4)	0.3(0.2–0.4)	0.3(0.2–0.4)	
	Heat Resistant Alloys	–	≦0.5	L,M,R	0.8(0.3–1.2)	0.8(0.3–1.2)	0.8(0.3–1.2)	Wet
			≦1.0	L,M,R	0.7(0.3–1.0)	0.7(0.3–1.0)	0.7(0.3–1.0)	
H	Hardened Steels	Hardness 40–55HRC	≦0.5	R,M	0.6(0.3–1.0)	0.6(0.3–1.0)	0.6(0.3–1.0)	Dry
			≦1.0	R,M	0.5(0.3–0.8)	0.4(0.3–0.6)	0.5(0.3–0.8)	

Note 1) To discharge chips effectively, use an air blower when machining. When the air blower is less effective at discharging chips, we recommend wet cutting.
Note 2) When large vibration occurs, reduce the cutting conditions.
Note 3) For interrupted cutting, multiply the cutting speed listed in the table on page L246 by 80% and the feed rate per tooth listed in the table above by 80%.
Note 4) If ap is set at 2mm or more, avoid machining on the walls or ramping.

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

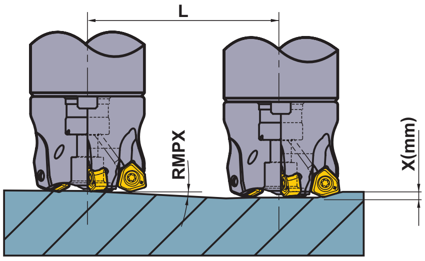
Selecting the Proper Breaker

	Workpiece Material	Characteristics	L Breaker		M Breaker		R Breaker	
			Cutting Conditions	Depth of Cut **ap** (mm)	Cutting Conditions	Depth of Cut **ap** (mm)	Cutting Conditions	Depth of Cut **ap** (mm)
P	Mild Steels	Hardness ≦180HB	● ◐	≦1.0	● ◐	≦1.5	◐ ✤	≦1.5
	Carbon Steels Alloy Steels	Hardness 180—350HB	● ◐	≦1.0	● ◐	≦1.5	◐ ✤	≦1.5
M	Precipitation-Hardening Stainless Steel	Hardness <450HB	● ◐	≦1.0	● ◐	≦1.0	—	—
K	Ductile Cast Irons	Tensile Strength ≦450MPa	● ◐	≦1.0	● ◐	≦1.5	—	≦1.5
		Tensile Strength ≦800MPa	● ◐	≦1.0	● ◐	≦1.0	—	≦1.0

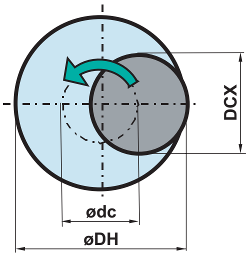
Note 1) To discharge chips effectively, use an air blower when machining. When the air blower is less effective at discharging chips, we recommend wet cutting.
Note 2) Tools may have a shorter life with wet cutting than dry cutting. For the cutting speed, multiply the values in the table above by 75% before use.
Note 3) When large vibration occurs, reduce the cutting conditions.
Note 4) For interrupted cutting, multiply the cutting speed listed in the table on page L246 by 80% and the feed rate per tooth listed in the table above by 80%.

Maximum Capacities by Mode

■Ramping



■Helical Milling



● How to derive a locus of the centre of the tool.

ødc = øDH - DCX

ødc	øDH	DCX
Locus of the Centre of the Tool	Desired Hole Diameter	Cutting Diameter Maximum

Tool Holder Type	DCX (mm)	DC (mm)	APMX (mm)	Ramping		Helical Milling (Blind Hole, Flat Bottom)		Helical Milling (Through Hole)		AZ (mm)
				RMPX	L (mm) Required Distance for X mm Depth	**DH** (mm)		**DH** (mm)	Maximum Pitch **P max.** (mm)	
					x = 1 (mm)	Min.	Max.	Min.		
WJX09R25	25	14.0	1.2	4.7°	12.2	38	47	34	1.2	0.8
WJX09R28	28	16.9	1.2	5.6°	10.2	44	53	38	1.2	1.2
WJX09R32	32	20.9	1.2	4.2°	13.7	52	61	46	1.2	1.2
WJX09R35	35	23.8	1.2	3.6°	15.9	58	67	52	1.2	1.2
WJX09R40	40	28.8	1.2	2.9°	19.8	68	77	61	1.2	1.2
WJX09-040	40	28.8	1.2	2.9°	19.8	68	77	61	1.2	1.2
WJX09-050	50	38.8	1.2	2.0°	28.7	88	97	81	1.2	1.2
WJX09R050	50	38.8	1.2	2.0°	28.7	88	97	81	1.2	1.2
WJX09-052	52	40.8	1.2	1.9°	30.2	92	101	85	1.2	1.2
WJX09-063	63	51.8	1.2	1.4°	41.0	114	123	107	1.2	1.2
WJX09R063	63	51.8	1.2	1.4°	41.0	114	123	107	1.2	1.2
WJX09-066	66	54.8	1.2	1.4°	41.0	120	129	113	1.2	1.2

Note 1) When ramping and helical milling, it is recommended to reduce the feed per tooth.
Note 2) When ramping, helical milling and drilling, long continuous chips may be scattered so please be careful.

<Helical Milling>
To obtain a flat bottom surface when helical milling, it requires to remove “the uncut part” in the centre of the workpiece material at a final pass.
When helical milling, make sure that the depth of cut per helical pass doesn’t exceed the maximum depth of cut (APMX).
<Drilling>
When drilling, set the axial feed per revolution at 0.2 mm/rev or less.

MULTI-FUNCTIONAL MILLING

WJX14

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron		Heat Resistant Alloy	Hardened Steel

Fig.1

ø50
ø52

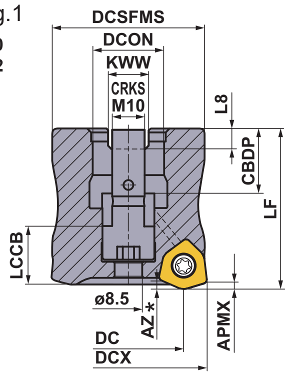
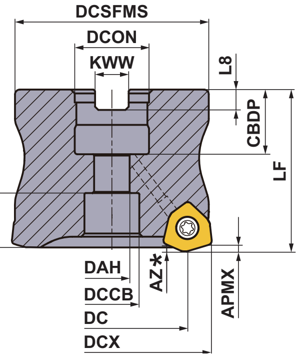


Fig.2

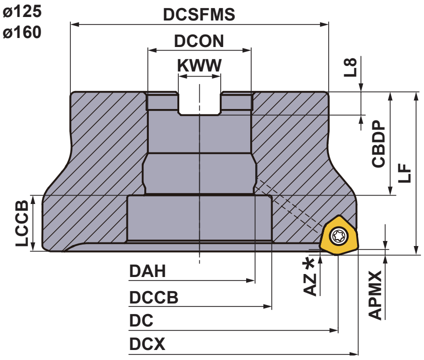
ø63
ø66
ø80
ø100

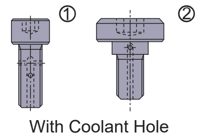


Right hand tool holder only.

Fig.3

ø125
ø160



DCON		Set Bolt	Geometry	
inch size	mm size			
ϕ22.225	ϕ22	HSC10030H	①	 ① ② With Coolant Hole
ϕ31.75	ϕ27	HSC12035H		
ϕ38.1	ϕ32	HSC16040H		
ϕ50.8	ϕ40	MBA20040H	②	
		MBA24045H		

Note 1) The milling cutter with a cutting diameter of maximum DCX = 50mm and 52mm has a built in set bolt.
Please use a 7mm Allen wrench to tighten/loosen the set bolt.

ARBOR TYPE

With Coolant Hole

DCON = Inch size

DCX (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)			WT (kg)	APMX (mm)	RPMX (min^{-1})	Fig.	Insert Type
		R		DC	LF	DCON					
50	**WJX14R05003BA**	●	3	34.5	50	22.225	0.4	2	5000	1	JOMU1407
50	**WJX14R05004BA**	●	4	34.5	50	22.225	0.4	2	5000	1	JOMU1407
63	**WJX14R06304BA**	●	4	47.5	50	22.225	0.7	2	18200	2	JOMU1407
63	**WJX14R06305BA**	●	5	47.5	50	22.225	0.7	2	18200	2	JOMU1407
80	**WJX14R08005DA**	●	5	64.4	63	31.75	1.4	2	15600	2	JOMU1407
80	**WJX14R08006DA**	●	6	64.4	63	31.75	1.4	2	15600	2	JOMU1407
100	**WJX14R10006DA**	●	6	84.4	63	31.75	2.5	2	13500	2	JOMU1407
100	**WJX14R10007DA**	●	7	84.4	63	31.75	2.5	2	13500	2	JOMU1407
125	**WJX14R12507EA**	●	7	109.4	63	38.1	3.2	2	11600	3	JOMU1407
125	**WJX14R12509EA**	●	9	109.4	63	38.1	3.1	2	11600	3	JOMU1407
160	**WJX14R16009FA**	●	9	144.4	63	50.8	4.5	2	9900	3	JOMU1407

DCON = mm size

DCX (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)			WT (kg)	APMX (mm)	RPMX (min^{-1})	Fig.	Insert Type
		R		DC	LF	DCON					
50	**WJX14-050A03AR**	●	3	34.5	50	22	0.4	2	5000	1	JOMU1407
50	**WJX14-050A04AR**	●	4	34.5	50	22	0.4	2	5000	1	JOMU1407
52	**WJX14-052A04AR**	●	4	36.5	50	22	0.4	2	5000	1	JOMU1407
63	**WJX14-063A04AR**	●	4	47.5	50	22	0.7	2	18200	2	JOMU1407
63	**WJX14-063A05AR**	●	5	47.5	50	22	0.7	2	18200	2	JOMU1407
63	**WJX14-063X05AR**	●	5	47.5	50	27	0.6	2	18200	2	JOMU1407
66	**WJX14-066X05AR**	●	5	50.4	50	27	0.7	2	17700	2	JOMU1407
80	**WJX14-080A05AR**	●	5	64.4	50	27	1.2	2	15600	2	JOMU1407
80	**WJX14-080A06AR**	●	6	64.4	50	27	1.2	2	15600	2	JOMU1407
100	**WJX14-100A06AR**	●	6	84.4	63	32	2.5	2	13500	2	JOMU1407
100	**WJX14-100A07AR**	●	7	84.4	63	32	2.5	2	13500	2	JOMU1407
125	**WJX14-125B07AR**	●	7	109.4	63	40	3.2	2	11600	3	JOMU1407
125	**WJX14-125B09AR**	●	9	109.4	63	40	3.1	2	11600	3	JOMU1407
160	**WJX14-160B09AR**	●	9	144.4	63	40	4.9	2	9900	3	JOMU1407

* Refer to page L256, for the maximum drilling depth (**AZ**).
Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

● **: Inventory maintained in Japan.**

Scan here for product NEWS ▶

Mounting Dimensions

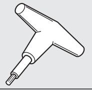
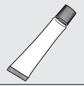
DCX (mm)	Order Number	Dimensions(mm)								Fig.
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
50	**WJX14-050A03AR**	22	20	–	–	18.3	47	10.4	6.3	1
50	**WJX14-050A04AR**	22	20	–	–	18.3	47	10.4	6.3	1
50	**WJX14R05003BA**	22.225	20	–	–	18.3	47	8.4	5	1
50	**WJX14R05004BA**	22.225	20	–	–	18.3	47	8.4	5	1
52	**WJX14-052A04AR**	22	20	–	–	18.3	47	10.4	6.3	1
63	**WJX14-063A04AR**	22	20	11	17	16.7	60	10.4	6.3	2
63	**WJX14-063A05AR**	22	20	11	17	16.7	60	10.4	6.3	2
63	**WJX14R06304BA**	22.225	19	11	17	17.7	60	8.4	5	2
63	**WJX14R06305BA**	22.225	19	11	17	17.7	60	8.4	5	2
63	**WJX14-063X05AR**	27	23	13	20	15.7	60	12.4	7	2
66	**WJX14-066X05AR**	27	23	13	20	15.7	60	12.4	7	2
80	**WJX14-080A05AR**	27	23	13	20	15.7	76	12.4	7	2
80	**WJX14-080A06AR**	27	23	13	20	15.7	76	12.4	7	2
80	**WJX14R08005DA**	31.75	32	17	26	19.7	76	12.7	8	2
80	**WJX14R08006DA**	31.75	32	17	26	19.7	76	12.7	8	2
100	**WJX14R10006DA**	31.75	32	17	26	19.7	96	12.7	8	2
100	**WJX14R10007DA**	31.75	32	17	26	19.7	96	12.7	8	2
100	**WJX14-100A06AR**	32	26	17	26	25.7	96	14.4	8	2
100	**WJX14-100A07AR**	32	26	17	26	25.7	96	14.4	8	2
125	**WJX14R12507EA**	38.1	40	40	56	21.7	100	15.9	10	3
125	**WJX14R12509EA**	38.1	40	40	56	21.7	100	15.9	10	3
125	**WJX14-125B07AR**	40	40	42	56	21.7	100	16.4	9	3
125	**WJX14-125B09AR**	40	40	42	56	21.7	100	16.4	9	3
160	**WJX14-160B09AR**	40	40	42	56	21.7	100	16.4	9	3
160	**WJX14R16009FA**	50.8	43	53	72	18.7	100	19.1	11	3

* Refer to page L256, for the maximum drilling depth (**AZ**).

Note 1) The milling cutter with a cutting diameter of DC = 50 mm and 52 mm has a built-in set bolt cannot be replaced.
Therefore, absolutely do not disassemble the milling cutter.

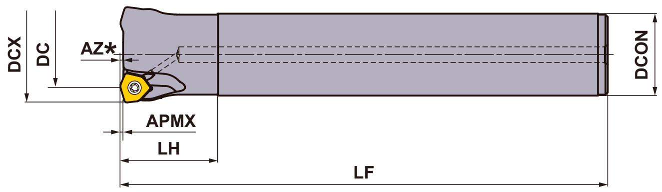
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

SPARE PARTS

Tool Holder Type	 *		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WJX14	TS5R	TKY20T	MK1KS

* Clamp Torque (N • m) : TS5R = 5.0

ISO13399 ➢ L003
HOW TO USE ➢ L257
SPARE PARTS ➢ P001
TECHNICAL DATA ➢ Q001



Right hand tool holder only.

■SHANK TYPE

With Coolant Hole

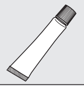
DCX (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)				APMX	RPMX	Insert Type
		R		DC	LF	LH	DCON	(mm)	(min^{-1})	
50	**WJX14R5003SA42S**	●	3	34.5	150	50	42	2	21200	JOMU1407
50	**WJX14R5003SA42L**	●	3	34.5	250	50	42	2	21200	JOMU1407

* Refer to page L256, for the maximum drilling depth (**AZ**).

Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.

Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

SPARE PARTS

Tool Holder Type	 * Clamp Screw	 Wrench (Insert)	 Anti-seize Lubricant
WJX14	TS5R	TKY20D	MK1KS

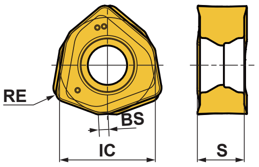
* Clamp Torque (N • m) : TS5R = 5.0

INSERTS

Workpiece Material				MC7020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT
	P	Steels		◐	◐	✣					◐	✣
	M	Stainless Steels		◐			◐	✣			◐	✣
	K	Cast Irons									✣	
	S	Heat Resistant Alloys, Titanium Alloys							◐	✣	◐	
	H	Hardened Steels									◐	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Edge Preparation :
E : Round

Shape	Order Number	Class	Edge Preparation	Coated										Dimensions(mm)				Geometry
					MC7020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT	IC	S	BS	RE	
	NEW **JOMU140715ZZER-L**	M	E		●	●	●	●	●	●	●	●	●	14	6.58	1.3	1.5	 RE BS IC S Right hand insert only.
	JOMU140715ZZER-M	M	E		●	●	●	●	●	●	●	●	●	14	6.63	1.3	1.5	
	NEW **JOMU140715ZZER-R**	M	E		●	●	●					●	●	14	6.75	1.3	1.5	

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

ISO13399 ➢ **L003**
HOW TO USE ➢ **L257**
SPARE PARTS ➢ **P001**
TECHNICAL DATA ➢ **Q001**

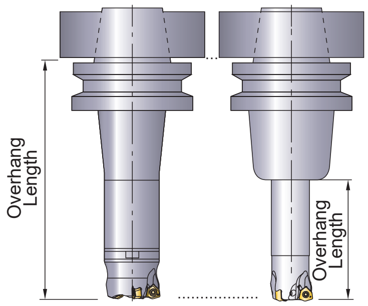
RECOMMENDED CUTTING CONDITIONS

Correction Value According to Overhang Length

Please use by multiplying the recommended cutting conditions by the correction factor for the overhang length.

Type	**DCX** (mm)	Overhang Length (mm)	Correction Value		
			vc (m/min)	**ap** (mm)	**fz** (mm/t)
Shank Type	50	< 2.5×DCON	100%	100%	100%
		3.0×DCON	90%	100%	90%
		4.0×DCON	80%	80%	90%
Arbor Type	50—80	< 2.5×DCX	100%	100%	100%
		3.0×DCX	85%	100%	90%
		4.0×DCX	80%	80%	80%
		5.0×DCX	75%	75%	60%
		6.0×DCX	70%	70%	40%
	≥100	200	100%	100%	100%
		300	85%	100%	90%
		400	80%	80%	80%

DCON=Connection Dia.



Cutting Speed (Dry Cutting)

Workpiece Material	Characteristics	Cutting Speed (Priority Basis) **vc** (m/min)				
P		MP6130	MP6120	MC7020	VP15TF	VP30RT
Mild Steels	≤180HB	140 (90—180)	150 (100—200)	220 (170—270)	150 (100—200)	120 (80—160)
Carbon Steels Alloy Steels	180—280HB	120 (70—180)	140 (80—200)	200 (150—250)	140 (80—200)	100 (60—150)
Carbon Steels Alloy Steels	280—350HB	120 (70—180)	140 (80—200)	200 (150—250)	140 (80—200)	100 (60—150)
Alloy Tool Steels	≤350HB (Annealing)	120 (70—180)	140 (80—200)	200 (150—250)	140 (80—200)	100 (60—150)
Pre-hardened Steels	35—45HRC	90 (50—130)	110 (70—150)	—	110 (70—150)	80 (40—120)
M		MP7130	MP7140	MC7020	VP30RT	
Austenitic Stainless Steels	≤200HB	160 (130—200)	150 (120—180)	220 (170—270)	150 (120—180)	
Austenitic Stainless Steels	>200HB	140 (100—200)	130 (80—180)	190 (140—240)	130 (80—180)	
Ferritic and Martensitic Stainless Steels	≤200HB	150 (100—200)	130 (80—180)	220 (170—270)	130 (80—180)	
Duplex Stainless Steels	≤280HB	130 (80—180)	110 (60—160)	180 (130—230)	110 (60—160)	
Precipitation-Hardening Stainless Steel	<450HB	110 (60—160)	90 (50—130)	170 (120—220)	90 (50—130)	
K		VP15TF				
Gray Cast Irons	≤350MPa	160 (120—200)				
Ductile Cast Irons	≤450MPa	150 (100—200)				
Ductile Cast Irons	≤800MPa	120 (80—160)				
S		MP9130	MP9120	VP15TF		
Titanium Alloys	—	40 (30—60)	50 (30—65)	50 (30—65)		
Heat Resistant Alloys	—	30 (20—40)	40 (20—50)	40 (20—50)		
H		VP15TF				
Hardened Steels	40—55HRC	70 (40—100)				

Note 1) To discharge chips effectively, use an air blower when machining. When the air blower is less effective at discharging chips, we recommend wet cutting.
Note 2) Tools may have a shorter life with wet cutting than dry cutting. For the cutting speed, multiply the values in the table above by 75% before use.
Note 3) When large vibration occurs, reduce the cutting conditions.
Note 4) For interrupted cutting, multiply the cutting speed listed in the table above by 80% and the feed rate per tooth by 80%.

Depth of Cut / Feed per Tooth

	Workpiece Material	Characteristics	Depth of Cut **ap** (mm)	Breaker	Cutting Dia. Max. DCX=50, 52	Cutting Dia. Max. DCX≥63	Cutting Mode
					Feed **fz**(mm/t)	Feed **fz**(mm/t)	
P	Mild Steels	Hardness ≤180HB	≤1.0	M,R	1.5(0.6–2.5)	1.7(0.6–2.8)	Dry
				L	1.2(0.4–2.0)	1.2(0.4–2.0)	
			≤1.5	M,R	1.3(0.6–2.0)	1.5(0.6–2.5)	
				L	1.0(0.4–1.8)	1.0(0.4–1.8)	
			≤2.0	M,R	1.2(0.6–2.0)	1.3(0.6–2.5)	
				L	0.8(0.4–1.7)	0.8(0.4–1.7)	
			≤2.5	M,R	0.8(0.3–1.5)	1.0(0.3–1.6)	
			≤3.0	M,R	0.4(0.2–1.0)	0.5(0.2–1.2)	
	Carbon Steels Alloy Steels	Hardness 180–280HB	≤1.0	M,R	1.5(0.5–2.0)	1.7(0.5–2.5)	Dry
				L	1.0(0.3–1.7)	1.0(0.3–1.7)	
			≤1.5	M,R	1.2(0.5–1.7)	1.3(0.5–2.5)	
				L	0.8(0.3–1.5)	0.8(0.3–1.5)	
			≤2.0	M,R	1.0(0.5–1.5)	1.2(0.5–2.0)	
				L	0.7(0.3–1.2)	0.7(0.3–1.2)	
			≤2.5	M,R	0.7(0.3–1.2)	0.9(0.3–1.5)	
			≤3.0	M,R	0.3(0.2–0.8)	0.4(0.2–1.0)	
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 280–350HB ≤350HB (Annealing)	≤1.0	M,R	1.5(0.5–2.0)	1.7(0.5–2.5)	Dry
				L	1.0(0.3–1.7)	1.0(0.3–1.7)	
			≤1.5	M,R	1.2(0.5–1.7)	1.3(0.5–2.2)	
				L	0.8(0.3–1.5)	0.8(0.3–1.5)	
			≤2.0	M,R	1.0(0.5–1.5)	1.2(0.5–2.0)	
				L	0.7(0.3–1.2)	0.7(0.3–1.2)	
			≤2.5	M,R	0.7(0.3–1.2)	0.9(0.3–1.5)	
			≤3.0	M,R	0.3(0.2–0.8)	0.4(0.2–1.0)	
	Pre-hardened Steels	Hardness 35–45HRC	≤1.0	M,R	1.3(0.4–1.7)	1.5(0.4–2.0)	Dry
				L	0.7(0.3–1.2)	0.7(0.3–1.2)	
			≤1.5	M,R	1.0(0.4–1.5)	1.2(0.4–1.5)	
				L	0.6(0.3–1.0)	0.6(0.3–1.0)	
			≤2.0	M,R	0.8(0.4–1.2)	1.0(0.4–1.3)	
				L	0.5(0.3–0.8)	0.5(0.3–0.8)	
M	Austenitic Stainless Steels	–	≤1.0	L	0.8(0.3–1.2)	0.8(0.3–1.2)	Dry
				M	1.0(0.5–1.2)	1.0(0.5–1.2)	
			≤1.5	L	0.8(0.3–1.0)	0.8(0.3–1.0)	
				M	1.0(0.5–1.0)	1.0(0.5–1.0)	
	Ferritic and Martensitic Stainless Steels	Hardness ≤200HB	≤1.0	L	0.8(0.3–1.2)	0.8(0.3–1.2)	Dry
				M	1.0(0.5–1.2)	1.0(0.5–1.2)	
			≤1.5	L	0.8(0.3–1.0)	0.8(0.3–1.0)	
				M	1.0(0.5–1.0)	1.0(0.5–1.0)	
	Duplex Stainless Steels	Hardness ≤280HB	≤1.0	L	0.6(0.3–1.0)	0.6(0.3–1.0)	Dry
				M	0.8(0.4–1.0)	0.8(0.4–1.0)	
			≤1.5	L	0.6(0.3–0.8)	0.6(0.3–0.8)	
				M	0.8(0.4–0.8)	0.8(0.4–0.8)	
	Precipitation-Hardening Stainless Steel	Hardness <450HB	≤1	L	0.6(0.3–1.0)	0.6(0.3–1.0)	Dry
				M	0.8(0.4–1.0)	0.8(0.4–1.0)	
			≤1.5	L	0.6(0.3–0.8)	0.6(0.3–0.8)	
				M	0.8(0.4–0.8)	0.8(0.4–0.8)	
K	Gray Cast Irons	Tensile Strength ≤350MPa	≤1	M,R	1.7(0.6–2.5)	1.8(0.6–2.8)	Dry
				L	1.3(0.4–2.0)	1.3(0.4–2.0)	
			≤1.5	M,R	1.5(0.6–2.0)	1.7(0.6–2.5)	
				L	1.2(0.4–1.8)	1.2(0.4–1.8)	
			≤2	M,R	1.3(0.6–2.0)	1.5(0.6–2.5)	
				L	1.0(0.4–1.5)	1.0(0.4–1.5)	
			≤2.5	M,R	0.8(0.3–1.5)	1.0(0.3–1.6)	
			≤3	M,R	0.4(0.2–1.0)	0.5(0.2–1.2)	
	Ductile Cast Irons	Tensile Strength ≤450MPa	≤1	M,R	1.5(0.5–2.0)	1.7(0.5–2.5)	Dry
				L	1.2(0.3–2.0)	1.2(0.3–2.0)	
			≤1.5	M,R	1.3(0.5–1.8)	1.5(0.5–2.0)	
				L	1.0(0.3–1.7)	1.0(0.3–1.7)	
			≤2	M,R	1.2(0.5–1.8)	1.3(0.5–2.0)	
				L	0.8(0.3–1.5)	0.8(0.3–1.5)	
			≤2.5	M,R	0.7(0.3–1.2)	0.9(0.3–1.5)	
			≤3	M,R	0.3(0.2–0.8)	0.4(0.2–1.0)	
	Ductile Cast Irons	Tensile Strength ≤800MPa	≤1	M,R	1.3(0.4–1.8)	1.5(0.4–2.0)	Dry
				L	1.0(0.3–1.7)	1.0(0.3–1.7)	
			≤1.5	M,R	1.2(0.4–1.5)	1.3(0.4–1.8)	
				L	0.8(0.3–1.5)	0.8(0.3–1.5)	
			≤2	M,R	1.0(0.4–1.5)	1.2(0.4–1.8)	
				L	0.7(0.3–1.2)	0.7(0.3–1.2)	
S	Titanium Alloys	–	≤1	L	0.3(0.2–0.6)	0.3(0.2–0.6)	Wet
			≤1.5	L	0.3(0.2–0.5)	0.3(0.2–0.5)	
			≤2	L	0.3(0.2–0.4)	0.3(0.2–0.4)	
	Heat Resistant Alloys	–	≤1	L,M,R	1.0(0.3–1.3)	1.0(0.3–1.3)	Wet
			≤1.5	L,M,R	0.8(0.3–1.2)	0.8(0.3–1.2)	
			≤2	L,M,R	0.7(0.3–1.2)	0.7(0.3–1.2)	
H	Hardened Steels	Hardness 40–55HRC	≤1	R,M	0.8(0.3–1.2)	0.8(0.3–1.2)	Dry
			≤1.5	R,M	0.6(0.3–1.0)	0.6(0.3–1.0)	
			≤2	R,M	0.5(0.3–0.8)	0.5(0.3–0.8)	

Note 1) To discharge chips effectively, use an air blower when machining. When the air blower is less effective at discharging chips, we recommend wet cutting.

Note 2) When large vibration occurs, reduce the cutting conditions.

Note 3) For interrupted cutting, multiply the cutting speed listed in the table on page L253 by 80% and the feed rate per tooth listed in the table above by 80%.

Note 4) If ap is set at 2mm or more, avoid machining on the walls or ramping.

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

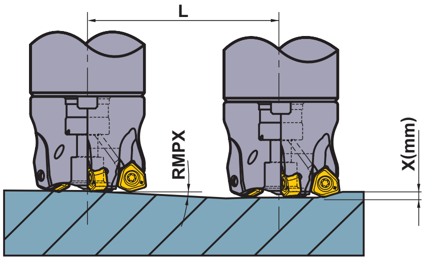
Selecting the Proper Breaker

	Workpiece Material	Characteristics	L Breaker		M Breaker		R Breaker	
			Cutting Conditions	Depth of Cut **ap** (mm)	Cutting Conditions	Depth of Cut **ap** (mm)	Cutting Conditions	Depth of Cut **ap** (mm)
P	Mild Steels	Hardness ≤180HB	● ◐	≤2.0	● ◐	≤3.0	◐ ✤	≤3.0
	Carbon Steels Alloy Steels	Hardness 180—350HB	● ◐	≤2.0	● ◐	≤3.0	◐ ✤	≤3.0
M	Precipitation-Hardening Stainless Steel	Hardness <450HB	● ◐	≤1.5	● ◐	≤1.5	—	—
K	Ductile Cast Irons	Tensile Strength ≤450MPa	● ◐	≤2.0	● ◐	≤3.0	—	—
		Tensile Strength ≤800MPa	● ◐	≤2.0	● ◐	≤2.0	—	—

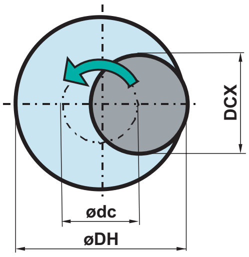
Note 1) To discharge chips effectively, use an air blower when machining. When the air blower is less effective at discharging chips, we recommend wet cutting.
Note 2) Tools may have a shorter life with wet cutting than dry cutting. For the cutting speed, multiply the values in the table above by 75% before use.
Note 3) When large vibration occurs, reduce the cutting conditions.
Note 4) For interrupted cutting, multiply the cutting speed listed in the table on page L253 by 80% and the feed rate per tooth listed in the table above by 80%.
Note 5) If ap is set at 2mm or more, avoid machining on the walls or ramping.

Maximum Capacities by Mode

■Ramping



■Helical Milling



● How to derive a locus of the centre of the tool.

ødc = øDH - DCX

ødc	øDH	DCX
Locus of the Centre of the Tool	Desired Hole Diameter	Cutting Diameter Maximum

Tool Holder Type	DCX (mm)	DC (mm)	APMX (mm)	Ramping			Helical Milling (Blind Hole, Flat Bottom)		Helical Milling (Through Hole)	AZ (mm)
				RMPX	L (mm) Required Distance for X mm Depth		DH (mm)		DH (mm)	
					x= 1 (mm)	x=2 (mm)	Min.	Max.	Min.	
WJX14R50	50	34.5	2	4.4°	13.0	26.0	82	97	73	2.1
WJX14-050	50	34.5	2	4.4°	13.0	26.0	82	97	73	2.1
WJX14R050	50	34.5	2	4.4°	13.0	26.0	82	97	73	2.1
WJX14-052	52	36.5	2	4.1°	14.0	28.0	86	101	77	2.1
WJX14-063	63	47.5	2	3.0°	19.1	38.2	108	123	99	2.1
WJX14R063	63	47.5	2	3.0°	19.1	38.2	108	123	99	2.1
WJX14-066	66	50.4	2	2.8°	20.5	40.9	114	129	105	2.1
WJX14-080	80	64.4	2	2.1°	27.3	54.6	142	157	133	2.1
WJX14R080	80	64.4	2	2.1°	27.3	54.6	142	157	133	2.1
WJX14-100	100	84.4	2	1.5°	38.2	76.4	182	197	173	2.1
WJX14R100	100	84.4	2	1.5°	38.2	76.4	182	197	173	2.1
WJX14-125	125	109.4	2	1.2°	47.8	95.5	232	247	223	2.1
WJX14R125	125	109.4	2	1.2°	47.8	95.5	232	247	223	2.1
WJX14-160	160	144.4	2	0.8°	71.7	143.3	302	317	293	2.1
WJX14R160	160	144.4	2	0.8°	71.7	143.3	302	317	293	2.1

Note 1) When ramping and helical milling, it is recommended to reduce the feed per tooth.
Note 2) When ramping, helical milling and drilling, long continuous chips may be scattered so please be careful.

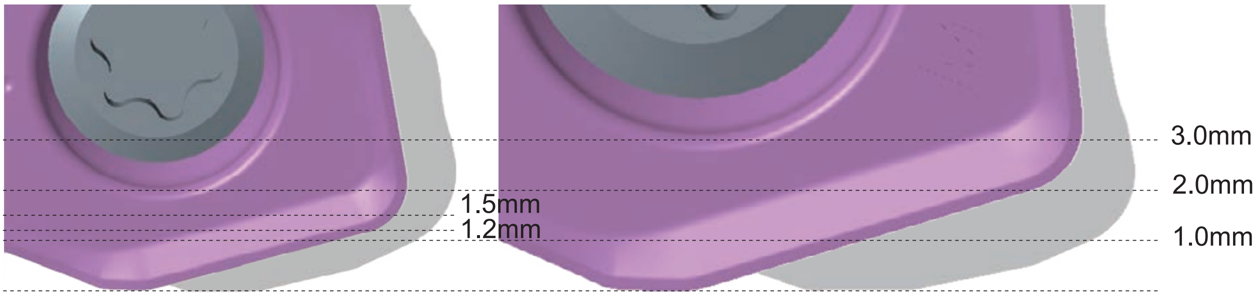
<Helical Milling>
To obtain a flat bottom surface when helical milling, it requires to remove “the uncut part” in the centre of the workpiece material at a final pass.
When helical milling, make sure that the depth of cut per helical pass doesn’t exceed the maximum depth of cut (APMX).
<Drilling>
When drilling, set the axial feed per revolution at 0.2 mm/rev or less.

OPERATIONAL GUIDANCE

■Depth of Cut

Refer to the following table for the maximum depth of cut of the WJX.
The straight cutting edge extending to the maximum depth of cut (APMX) allows for stable machining even at high depths of cut.
For face milling, lowering the feed rate will allow to exceed the APMX, up to depths of cut shown in the following table (when using the corner R).
For details on the feed rate, refer to the recommended cutting conditions on L247 and L254.

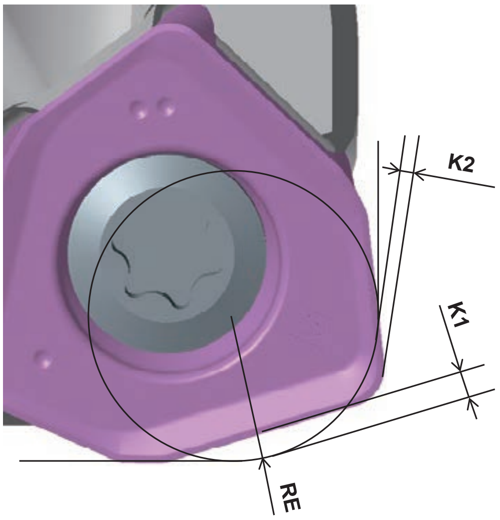
	WJX09	WJX14
High feed and multi-function machining (APMX)	ap=1.2 mm	ap=2.0 mm
Low feed and Face machining	ap=1.5 mm	ap=3.0 mm



WJX09 Conventional Size 09 **WJX14** Conventional Size 14

■Remaining Stock

For CAM, use CAD data (from online catalogues), or define as a radius milling cutter with reference to the following table.
The approximate radius RE, remaining stock K1, and over cutting amount K2 are as shown in the following table.



WJX09

RE (mm)	Remaining Stock K1 (mm)	Cutting Amount K2 (mm)
R2.0 (Recommendation)	0.93	0.00
R2.3	0.86	0.00
R3.0	0.70	0.13

WJX14

RE (mm)	Remaining Stock K1 (mm)	Cutting Amount K2 (mm)
R3.0 (Recommendation)	1.41	0.00
R3.2	1.37	0.00
R4.0	1.17	0.10
R5.0	0.92	0.39

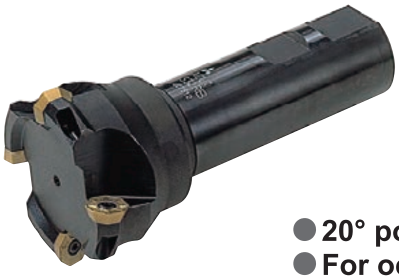
Depth of Cut ap (mm)	Remaining Stock H (mm)	
	WJX09	WJX14
0.5	0.02	−
1.0	0.07	0.05
1.5	−	0.08
2.0	−	0.12

MULTI-FUNCTIONAL MILLING

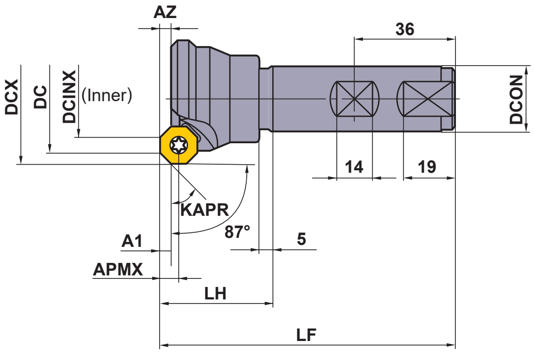
42° KAPR

OCTACUT

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			Hardened Steel



- 20° positive insert.
- For octagonal and round type inserts.
- Multi-functional machining.



SHANK TYPE

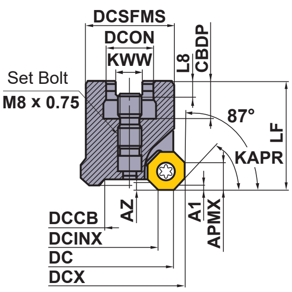
Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (mm)									*	F T	① ②
	R		DCX	DC	DCINX	LF	DCON	LH	A1	APMX	AZ	Clamp Screw	Wrench	Insert
OCTACUT322S32RB	●	2	32	23.6	13.1	125	32	45	2.5	7	3	CS350990T	TKY10F	①OEMX12T3◌◌◌◌ ②REMX12T3◌◌◌◌
OCTACUT403S32RB	●	3	40	31.7	21.2	125	32	45	2.5	7	3	CS350990T	TKY10F	
OCTACUT504S32RB	●	4	50	41.9	31.4	125	32	45	2.5	7	3	CS350990T	TKY10F	
OCTACUT634S32RB	●	4	63	54.9	44.5	125	32	45	2.5	7	3	CS350990T	TKY10F	
OCTACUT503S32R	●	3	50	38.3	24.5	125	32	45	3	9	4	CS501290T	TKY25T	①OEMX1705◌◌◌◌ ②REMX1705◌◌◌◌
OCTACUT634S32R	●	4	63	51.4	37.6	125	32	45	3	9	4	CS501290T	TKY25T	

* Clamp Torque (N • m) : CS350990T=2.5, CS501290T=7.5

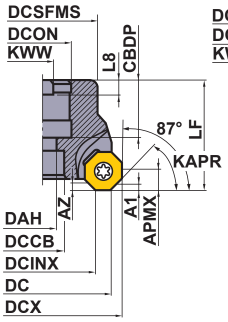
● : Inventory maintained in Japan.

Fig.1



Small Insert Type
ø40
Standard Insert Type
ø50

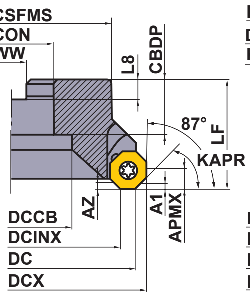
Fig.2



Small
Insert Type
ø50
ø63
ø80

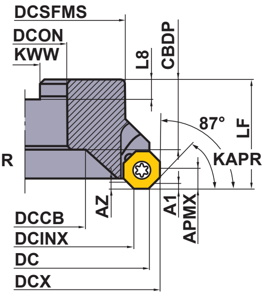
Standard
Insert Type
ø63
ø80
ø100

Fig.3



Standard Insert Type
ø125

Fig.4



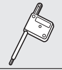
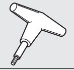
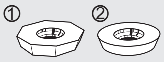
Standard Insert Type
ø160

■ARBOR TYPE

Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (mm)											WT (kg)	Max. Depth of Cut (mm)			Fig.
	R		DCX	DC	DCINX	LF	DCON	CBDP	DAH	DCCB	KWW	DCSFMS	L8		A1	APMX	AZ	
OCTACUT0403ARB	●	3	40	31.7	21.2	40	16	18	—	19.47	8.4	33	5.6	0.4	2.5	7	3	1
OCTACUT0504ARB	●	4	50	41.9	31.4	50	22	20	11	16	10.4	42.5	6.3	0.5	2.5	7	3	2
OCTACUT0634ARB	●	4	63	54.9	44.5	50	22	20	11	16	10.4	44	6.3	0.7	2.5	7	3	2
OCTACUT0805CRB	●	5	80	71.9	61.5	50	25.4	26	13	20	9.5	53	6	1.2	2.5	7	3	2
OCTACUT0503AR	●	3	50	38.3	24.5	50	22	20	—	22.15	10.4	41	6.3	0.5	3	9	4	1
OCTACUT0634AR	●	4	63	51.4	37.6	50	22	20	11	16	10.4	44	6.3	0.7	3	9	4	2
OCTACUT0805CR	●	5	80	68.4	54.7	50	25.4	26	13	20	9.5	53	6	1.2	3	9	4	2
OCTACUT1006DR	●	6	100	88.5	74.7	63	31.75	32	17	45	12.7	70	8	1.6	3	9	4	2
OCTACUT1257ER	●	7	125	113.5	99.8	63	38.1	35	—	56	15.9	80	10	1.8	3	9	4	3
OCTACUT1608FR	●	8	160	148.5	134.8	63	50.8	38	—	88.7	19.1	120	11	3.6	3	9	4	4

SPARE PARTS

Tool Holder Number	 *					① ② 
	Clamp Screw	Wrench	Wrench	Set Bolt	Set Bolt	Insert
OCTACUT0403ARB	CS350990T	TKY10F	—	HDS08030	—	①OEMX12T3○○○○ ②REMX12T3○○○○
OCTACUT0504ARB				—	BOES101	
OCTACUT0634ARB					—	
OCTACUT0805CRB						
OCTACUT0503AR	CS501290T	—	TKY25T	HDS10031	—	①OEMX1705○○○○ ②REMX1705○○○○
OCTACUT0634AR				—	BOES101	
OCTACUT0805CR					—	
OCTACUT1006DR					HSC16035	
OCTACUT1257ER					—	
OCTACUT1608FR						

⁎ Clamp Torque (N • m) : CS350990T=2.5, CS501290T=7.5

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

Fig.1

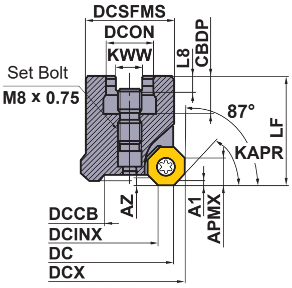


Fig.2

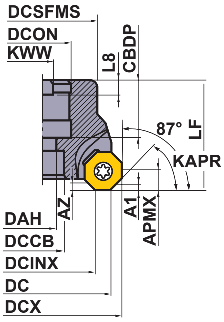


Fig.3

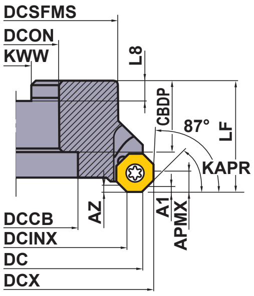


Fig.4

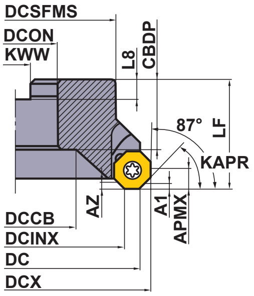
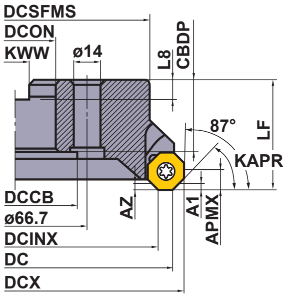


Fig.5



For metric arbor

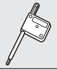
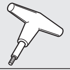
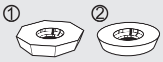
The cutter bore diameter DCON is indicated in millimetre.

■ARBOR TYPE

Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (mm)											WT (kg)	Max. Depth of Cut (mm)			Fig.
	R		DCX	DC	DCINX	LF	DCON	CBDP	DAH	DCCB	KWW	DCSFMS	L8		A1	APMX	AZ	
OCTACUT0403ARB	●	3	40	31.7	21.2	40	16	18	–	19.47	8.4	33	5.6	0.4	2.5	7	3	1
OCTACUT0504ARB	●	4	50	41.9	31.4	50	22	20	11	16	10.4	42.5	6.3	0.5	2.5	7	3	2
OCTACUT0634ARB	●	4	63	54.9	44.5	50	22	20	11	16	10.4	44	6.3	0.7	2.5	7	3	2
OCTACUT0805ARB	●	5	80	71.9	61.5	50	27	23	13	20	12.4	53	7	1.2	2.5	7	3	2
OCTACUT0503AR	●	3	50	38.3	24.5	50	22	20	–	22.15	10.4	41	6.3	0.5	3	9	4	1
OCTACUT0634AR	●	4	63	51.4	37.6	50	22	20	11	16	10.4	44	6.3	0.7	3	9	4	2
OCTACUT0805AR	●	5	80	68.4	54.7	50	27	23	13	20	12.4	53	7	1.2	3	9	4	2
OCTACUT1006AR	●	6	100	88.5	74.7	50	32	32	–	45	14.4	70	8	1.6	3	9	4	3
OCTACUT1257BR	●	7	125	113.5	99.8	50	40	32	–	56	16.4	80	9	1.8	3	9	4	4
OCTACUT1608CR	●	8	160	148.5	134.8	50	40	29	–	88.7	16.4	120	9	3.6	3	9	4	5

SPARE PARTS

Tool Holder Number	 *					① ② 
	Clamp Screw	Wrench	Wrench	Set Bolt	Set Bolt	Insert
OCTACUT0403ARB	CS350990T	TKY10F	–	HDS08030	–	①OEMX12T3○○○○ ②REMX12T3○○○○
OCTACUT0504ARB				–	BOES101	
OCTACUT0634ARB					–	
OCTACUT0805ARB						
OCTACUT0503AR	CS501290T	–	TKY25T	HDS10031	–	①OEMX1705○○○○ ②REMX1705○○○○
OCTACUT0634AR				–	BOES101	
OCTACUT0805AR					–	
OCTACUT1608CR						

* Clamp Torque (N • m) : CS350990T=2.5, CS501290T=7.5

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.

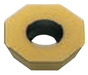
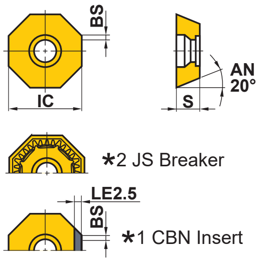
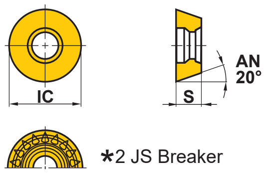
(Contains 10 pieces per case.) (Contains one CBN insert per case.)

INSERTS

Workpiece Material			F7030	VP15TF		NX4545			MB730		
	P	Steel	◐	◐		◐					
	M	Stainless Steel	◐	◐		◐					
	K	Cast Iron		✤					◐		
	H	Hardened Steel		◐					◐		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

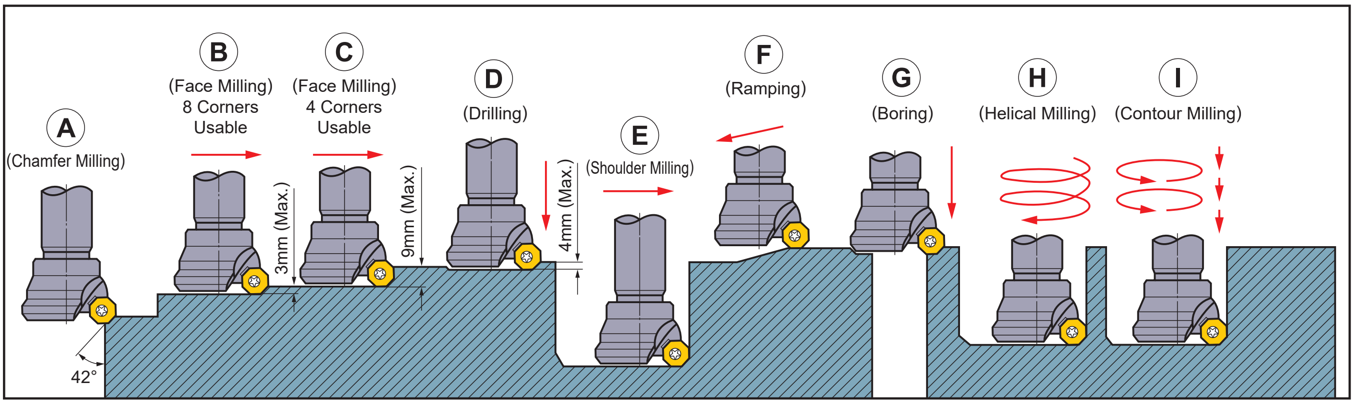
Edge Preparation :
E : Round **S :** Chamfer + Round **T :** Chamfer

Shape		Order Number	Class	Edge Preparation	Coated			Cermet			CBN *1			Dimensions (mm)			Geometry
					F7030	**VP15TF**		**NX4545**			**MB730**			**IC**	**S**	**BS**	
  *2 JS Breaker		**OEMX12T3ETR1**	M	T				●			▲			12.7	3.97	1.0	 *2 JS Breaker *1 CBN Insert
		OEMX12T3ESR1	M	S	●									12.7	3.97	1.0	
	*2	**OEMX12T3EER1-JS**	M	E	●									12.7	3.97	1.0	
		OEMX1705ETR1	M	T		●		●						17.0	5.0	1.4	
		OEMX1705ESR1	M	S	●									17.0	5.0	1.4	
	*2	**OEMX1705EER1-JS**	M	E	●									17.0	5.0	1.4	
	*2	**OEMX1705ETR1-JS**	M	T		●								17.0	5.0	1.4	
  *2 JS Breaker	*2	**REMX12T3EN-JS**	M	E	●									12.95	4.17	—	 *2 JS Breaker
		REMX1705SN	M	S	●									17.25	5.2	—	
	*2	**REMX1705EN-JS**	M	E	●									17.25	5.2	—	

*2 Insert with breaker.

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

RECOMMENDED CUTTING CONDITIONS



This list of recommended cutting conditions is for cutters with diameter≤ϕ80. For cutters with diameter greater thanϕ80 increase cutting speed by around 10%.
Above sizes are for OEMX1705◌◌◌◌.

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Cutting Mode	Feed per Tooth (mm/t)
P	Mild Steel	≤180HB	F7030	240 (180–300)	A	0.2 (0.15–0.25)
					B	0.2 (0.15–0.25)
			VP15TF	180 (100–250)	C,E,F	0.2 (0.15–0.25)
					D,G,H,I	0.075 (0.05–0.1)
	Carbon Steel Alloy Steel	180–280HB	F7030	200 (140–240)	A	0.2 (0.15–0.25)
					B	0.2 (0.15–0.25)
			VP15TF	180 (100–250)	C,E,F	0.2 (0.15–0.25)
					D,G,H,I	0.075 (0.05–0.1)
		280–380HB	F7030	150 (100–170)	A	0.2 (0.15–0.25)
					B	0.2 (0.15–0.25)
			VP15TF	120 (80–160)	C,E,F	0.2 (0.15–0.25)
					D,G,H,I	0.075 (0.05–0.1)
	Pre-Hardened Steel	35–45HRC	F7030	130 (90–160)	A	0.15 (0.1–0.2)
					B	0.15 (0.1–0.2)
			VP15TF	120 (80–160)	C,E,F	0.1 (0.05–0.15)
					D,G,H,I	0.05 (0.025–0.075)
	High Alloy Steel	≤300HB	F7030	150 (100–170)	A	0.15 (0.1–0.2)
					B	0.15 (0.1–0.2)
			VP15TF	120 (80–160)	C,E,F	0.1 (0.05–0.15)
					D,G,H,I	0.05 (0.025–0.075)
M	Stainless Steel	≤270HB	F7030	200 (140–240)	A	0.15 (0.1–0.2)
					B	0.15 (0.1–0.2)
			VP15TF	150 (100–200)	C,E,F	0.1 (0.05–0.15)
					D,G,H,I	0.075 (0.05–0.1)

●Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
●Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution
Note 1) This list of recommended cutting conditions is for flank wear of 0.3mm in 30 min. cutting time.
Note 2) More than 50mm shank length should be clamped in the milling chuck.
Note 3) Use step cutting when driling (0.5 mm steps are recommended).
Note 4) If chatter occurs, adjust the cutting speed.
Note 5) When using round inserts, make sure that the flat portion of the flank surface is secure against the insert seat wall.

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Cutting Mode	Feed per Tooth (mm/t)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP15TF**	160 (100—220)	A	0.3 (0.25—0.35)
					B	0.25 (0.2—0.3)
					C,E,F	0.15 (0.1—0.2)
					D,G,H,I	0.075 (0.05—0.1)
			MB730	1500 (1000—3000)	B (D.O.C 0.1—0.5mm)	0.15 (0.1—0.2)
	Ductile Cast Iron	Tensile Strength 360—500MPa	**VP15TF**	160 (100—220)	A	0.25 (0.2—0.3)
					B	0.2 (0.15—0.25)
					C,E,F	0.1 (0.05—0.15)
					D,G,H,I	0.05 (0.025—0.075)
	Ductile Cast Iron	Tensile Strength 500—800MPa	**VP15TF**	140 (90—190)	A	0.25 (0.2—0.3)
					B	0.2 (0.15—0.25)
					C,E,F	0.1 (0.05—0.15)
					D,G,H,I	0.05 (0.025—0.075)
H	Hardened Steel	45—60HRC	**VP15TF**	80 (50—100)	A	0.15 (0.1—0.2)
					B	0.15 (0.1—0.2)
					C,E,F	0.1 (0.05—0.12)
					D,G,H,I	0.05 (0.025—0.06)
			MB730	150 (100—200)	B (D.O.C 0.1—0.3mm)	0.15 (0.1—0.2)

●Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)

●Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

Note 1) This list of recommended cutting conditions is for flank wear of 0.3mm in 30 min. cutting time.

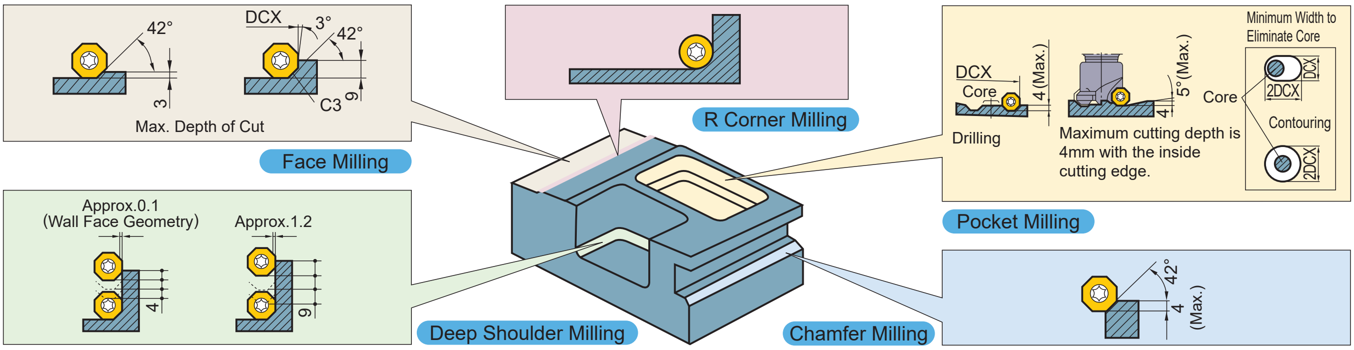
Note 2) More than 50mm shank length should be clamped in the milling chuck.

Note 3) Use step cutting when driling (0.5 mm steps are recommended).

Note 4) If chatter occurs, adjust the cutting speed.

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

ARP

P	**M**	K	N	**S**	H
	Stainless Steel			Heat Resistant Alloy	

- Run-out does not occur easily when changing sections.
- Solid clamping system.
- Standardized stock of extra fine pitch.

Fig.1

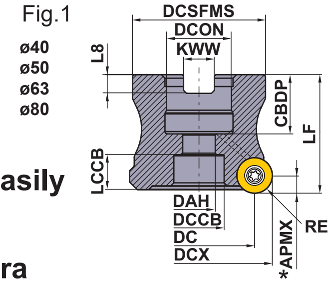
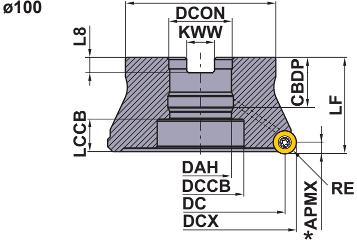
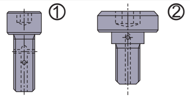


Fig.2



Right hand tool holder only.

DCX		Set Bolt	Geometry	
DCON inch size	DCON mm size			
–	ϕ40	HSC08025H	①	
–	ϕ50, ϕ63	HSC10030H		
ϕ80	ϕ80	HSC12035H		
ϕ100	ϕ100	MBA16033H	②	With Coolant Hole

■ARBOR TYPE

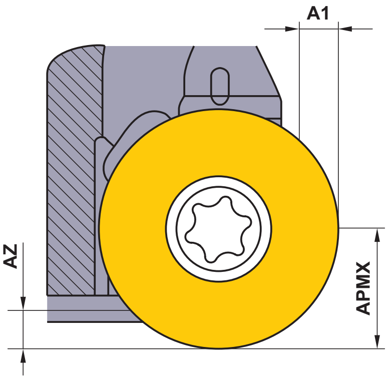
DCON = inch size, With Coolant Hole

DCX (mm)	Order Number	Stock	RE (mm)	Number of Teeth	Dimensions (mm)			WT	Max. Depth of Cut (mm)		RMPX	Fig.	Insert Type
		R			DC	LF	DCON	(kg)	A1	AZ			
80	**ARP6PR08008CA**	●	6	8	68	50	25.4	0.9	2.5	2.5	2.3°	1	RP◌T1248
80	**ARP6PR08009CA**	●	6	9	68	50	25.4	0.9	2.5	2.5	2.3°	1	RP◌T1248
100	**ARP6PR10009DA**	●	6	9	88	50	31.75	1.4	2.5	2.5	1.7°	2	RP◌T1248
100	**ARP6PR10011DA**	●	6	11	88	50	31.75	1.4	2.5	2.5	1.7°	2	RP◌T1248

DCON = mm size, With Coolant Hole

DCX (mm)	Order Number	Stock	RE (mm)	Number of Teeth	Dimensions (mm)			WT	Max. Depth of Cut (mm)		RMPX	Fig.	Insert Type
		R			DC	LF	DCON	(kg)	A1	AZ			
40	**ARP5P-040A05AR**	●	5	5	29.9	40	16	0.2	2.0	1.3	2.8°	1	RP◌T1040
40	**ARP6P-040A04AR**	●	6	4	28	40	16	0.2	2.0	1.1	2.7°	1	RP◌T1248
50	**ARP5P-050A06AR**	●	5	6	39.9	40	22	0.3	2.0	1.8	2.9°	1	RP◌T1040
50	**ARP5P-050A07AR**	●	5	7	39.9	40	22	0.3	2.0	1.8	2.9°	1	RP◌T1040
50	**ARP6P-050A05AR**	●	6	5	38	40	22	0.3	2.0	1.7	2.9°	1	RP◌T1248
50	**ARP6P-050A06AR**	●	6	6	38	40	22	0.3	2.0	1.7	2.9°	1	RP◌T1248
63	**ARP5P-063A07AR**	●	5	7	52.9	40	22	0.5	2.5	2.5	3.0°	1	RP◌T1040
63	**ARP5P-063A08AR**	●	5	8	52.9	40	22	0.5	2.5	2.5	3.0°	1	RP◌T1040
63	**ARP6P-063A06AR**	●	6	6	51	40	22	0.4	2.5	2.5	3.1°	1	RP◌T1248
63	**ARP6P-063A07AR**	●	6	7	51	40	22	0.4	2.5	2.5	3.1°	1	RP◌T1248
80	**ARP6P-080A08AR**	●	6	8	68	50	27	0.9	2.5	2.5	2.3°	1	RP◌T1248
80	**ARP6P-080A09AR**	●	6	9	68	50	27	0.9	2.5	2.5	2.3°	1	RP◌T1248
100	**ARP6P-100B09AR**	●	6	9	88	50	32	1.5	2.5	2.5	1.7°	2	RP◌T1248
100	**ARP6P-100B11AR**	●	6	11	88	50	32	1.5	2.5	2.5	1.7°	2	RP◌T1248

* For the maximum width of cut (APMX), Please refer to page L267.



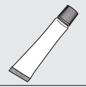
● : Inventory maintained in Japan.

Scan here for product NEWS ▶

Mounting Dimensions

DCX (mm)	Order Number	Dimensions (mm)								Fig.
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
40	**ARP5P-040A05AR**	16	18	9	14	14.0	34	8.4	5.6	1
40	**ARP6P-040A04AR**	16	18	9	13.4	13.9	34	8.4	5.6	1
50	**ARP5P-050A06AR**	22	20	11	17	12.0	45	10.4	6.3	1
50	**ARP5P-050A07AR**	22	20	11	17	12.0	45	10.4	6.3	1
50	**ARP6P-050A05AR**	22	20	11	17	11.9	45	10.4	6.3	1
50	**ARP6P-050A06AR**	22	20	11	17	11.9	45	10.4	6.3	1
63	**ARP5P-063A07AR**	22	20	11	17	12.0	50	10.4	6.3	1
63	**ARP5P-063A08AR**	22	20	11	17	12.0	50	10.4	6.3	1
63	**ARP6P-063A06AR**	22	20	11	17	11.9	50	10.4	6.3	1
63	**ARR6P-063A07AR**	22	20	11	17	11.9	50	10.4	6.3	1
80	**ARP6PR08008CA**	25.4	26	20	13	14.9	56	9.5	6.0	1
80	**ARP6PR08009CA**	25.4	26	20	13	14.9	56	9.5	6.0	1
80	**ARP6P-080A08AR**	27	23	13	20	14.9	56	12.4	7.0	1
80	**ARP6P-080A09AR**	27	23	13	20	14.9	56	12.4	7.0	1
100	**ARP6PR10009DA**	31.75	32	31.75	45	11.9	70	12.7	8.0	2
100	**ARP6PR10011DA**	31.75	32	31.75	45	11.9	70	12.7	8.0	2
100	**ARP6P-100B09AR**	32	26	45	32	16.9	78	14.4	8.0	2
100	**ARP6P-100B11AR**	32	26	45	32	16.9	78	14.4	8.0	2

SPARE PARTS

Tool Holder Type	 * Clamp Screw	 Wrench (Insert)	 Anti-seize Lubricant
ARP5	TPS351B	TIP10D	MK1KS
ARP6	TPS4	TIP15D	MK1KS

* Clamp Torque (N • m) : TPS351B=2.5,TPS4=3.5

	≤1Mpa (≤20 l/min)	←Standard→	**≥5Mpa (≥30 l/min)**	**≥7Mpa (≥50 l/min)**	To Plug a Coolant Hole
Nozzle Dia.	ø0.6mm	ø0.8mm	ø1.2mm	ø1.6mm	–
Order Number	**HSD04004H06**	**HSD04004H08**	**HSD04004H12**	**HSD04004H16**	**HSS04004**

Note 1) Coolant nozzles are available with varying diameters for adjusting coolant pressure. Select nozzles as required by the specification.
Note 2) Use HSS04004 (JIS B 1177 flat point M4x4, clamp torque 1.5 Nm) to plug the coolant hole.

ISO13399 ➤ **L003**
SPARE PARTS ➤ **P001**
TECHNICAL DATA ➤ **Q001**

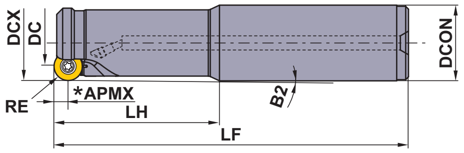


Fig.1

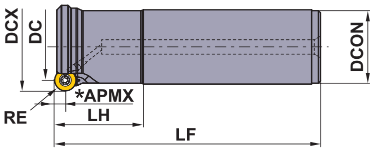


Fig.2

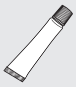
SHANK TYPE

With Coolant Hole

DCX (mm)	Order Number	Stock	RE (mm)	Number of Teeth	Dimensions (mm)					WT	Max. Depth of Cut (mm)		RMPX	Fig.	Insert Type
		R			DC	LF	LH	DCON	B2	(kg)	A1	AZ			
25	**ARP5PR2503SA25M**	●	5	3	15	140	60	25	1.10°	0.4	1.0	0.40	1.8°	1	RP◌T1040
25	**ARP5PR2502SA25L**	●	5	2	15	180	80	25	0.80°	0.6	1.0	0.40	1.8°	1	RP◌T1040
32	**ARP5PR3204SA32M**	●	5	4	22	150	70	32	0.92°	0.8	1.0	0.65	1.9°	1	RP◌T1040
32	**ARP6PR3203SA32M**	●	6	3	20	150	70	32	0.51°	0.8	1.0	0.60	2.0°	1	RP◌T1248
32	**ARP5PR3203SA32L**	●	5	3	22	200	120	32	0.94°	1.0	1.0	0.65	1.9°	1	RP◌T1040
32	**ARP6PR3202SA32L**	●	6	2	20	200	120	32	0.52°	1.0	1.0	0.60	2.0°	1	RP◌T1248
40	**ARP6PR4004SA32M**	●	6	4	28	150	50	32	−	0.9	2.5	1.15	2.7°	2	RP◌T1248
40	**ARP6PR4003SA32L**	●	6	3	28	250	50	32	−	1.5	2.5	1.15	2.7°	2	RP◌T1248
50	**ARP6PR5005SA42M**	●	6	5	38	150	50	42	−	1.5	2.5	1.70	2.9°	2	RP◌T1248
50	**ARP6PR5004SA42L**	●	6	4	38	250	50	42	−	2.5	2.5	1.70	2.9°	2	RP◌T1248

∗ For the maximum width of cut (APMX), Please refer to page L267.

SPARE PARTS

Tool Holder Type	 *		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
ARP5	TPS351B	TIP10D	MK1KS
ARP6	TPS4	TIP15D	MK1KS

∗ Clamp Torque (N • m) : TPS351B=2.5,TPS4=3.5

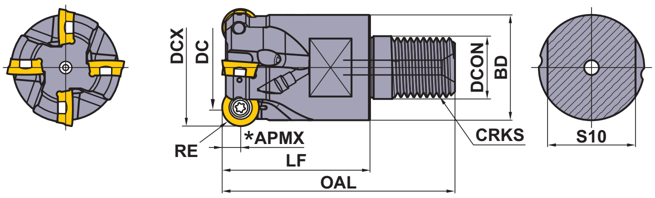
	≤1Mpa (≤20 l/min)	←Standard→	**≥5Mpa (≥30 l/min)**	**≥7Mpa (≥50 l/min)**	To Plug a Coolant Hole
Nozzle Dia.	ø0.6mm	ø0.8mm	ø1.2mm	ø1.6mm	−
Order Number	**HSD04004H06**∗	**HSD04004H08**∗	**HSD04004H12**∗	**HSD04004H16**∗	**HSS04004**

∗ Clamp Torque (N • m) : HSD0400H◌◌=1.5

Note 1) Coolant nozzles are available with varying diameters for adjusting coolant pressure. Select nozzles as required by the specification.

Note 2) Use HSS04004 (JIS B 1177 flat point M4x4, clamp torque 1.5 Nm) to plug the coolant hole.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)



SCREW-IN TYPE

With Coolant Hole

DCX (mm)	Order Number	Stock	RE (mm)	Number of Teeth	Dimensions (mm)							WT	Max. Depth of Cut (mm)		RMPX	Insert Type
		R			DC	DCON	DCSFMS	OAL	LF	S10	CRKS	(kg)	A1	AZ		
25	**ARP5PR2502AM1235**	●	5	2	15	12.5	23.5	57	35	19	M12	0.1	–	0.40	1.8°	RP◌T1040
25	**ARP5PR2503AM1235**	●	5	3	15	12.5	23.5	57	35	19	M12	0.1	–	0.40	1.8°	RP◌T1040
32	**ARP5PR3203AM1640**	●	5	3	22	17.0	28.5	63	40	24	M16	0.2	1.0	0.65	1.9°	RP◌T1040
32	**ARP5PR3204AM1640**	●	5	4	22	17.0	28.5	63	40	24	M16	0.2	1.0	0.65	1.9°	RP◌T1040
32	**ARP6PR3202AM1640**	●	6	2	20	17.0	28.5	63	40	24	M16	0.2	1.0	0.60	2.0°	RP◌T1248
32	**ARP6PR3203AM1640**	●	6	3	20	17.0	28.5	63	40	24	M16	0.2	1.0	0.60	2.0°	RP◌T1248
40	**ARP6PR4003AM1640**	●	6	3	28	17.0	28.5	63	40	24	M16	0.2	2.5	1.15	2.7°	RP◌T1248
40	**ARP6PR4004AM1640**	●	6	4	28	17.0	28.5	63	40	24	M16	0.2	2.5	1.15	2.7°	RP◌T1248

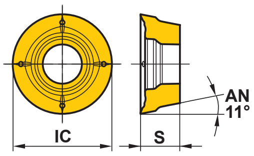
∗ For the maximum width of cut (APMX), Please refer to page L267.

Note 1) For screw-in type arbors, refer to page L341.

INSERTS

Workpiece Material			MC7020	MP7130	MP9130	MP9140
	M	Stainless Steel	◐	◐		
	S	Heat resistant Alloy, Titanium Alloy			✤	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting
Edge Preparation :
E : Round

Shape	Cutter Type	Order Number	Type	Class	Edge Preparation	Coated				Dimensions (mm)				Geometry
						MC7020	MP7130	MP9130	NEW MP9140	IC	S	APMX 4 Seats	APMX 8 Seats	
	ARP5	**RPHT1040M0E4-L**	Low Resistance, High Precision	H	E	●	●	●		10	3.97	5.0	–	
		RPMT1040M0E4-L	Low Resistance	M	E	●	●	●		10	3.97	5.0	–	
		NEW **RPMT1040M0E8-L1**	Low Resistance, 8 Seats	M	E	●	●	●	●	10	3.97	5.0	1.4	
		NEW **RPMT1040M0E4-L2**	Low Resistance, High Rigidity	M	E				●	10	3.97	5.0	–	
		RPHT1040M0E4-M	General, High Precision	H	E	●	●	●		10	3.97	5.0	–	
		RPMT1040M0E4-M	General Purpose	M	E	●	●	●		10	3.97	5.0	–	
		NEW **RPMT1040M0E8-M1**	General, 8 Seats	M	E	●	●	●	●	10	3.97	5.0	1.4	
		NEW **RPMT1040M0E4-M2**	General, High Rigidity	M	E				●	10	3.97	5.0	–	
		RPHT1040M0E4-R	Reinforced Edge, High Precision	H	E	●	●	●		10	3.97	5.0	–	
		RPMT1040M0E4-R	Reinforced Edge	M	E	●	●	●		10	3.97	5.0	–	
		NEW **RPMT1040M0E8-R1**	Reinforced Edge, 8 Seats	M	E	●	●	●		10	3.97	5.0	1.4	
	ARP6	**RPHT1248M0E4-L**	Low Resistance, High Precision	H	E	●	●	●		12	4.76	6.0	–	
		RPMT1248M0E4-L	Low Resistance	M	E	●	●	●		12	4.76	6.0	–	
		NEW **RPMT1248M0E8-L1**	Low Resistance, 8 Seats	M	E	●	●	●	●	12	4.76	6.0	1.7	
		NEW **RPMT1248M0E4-L2**	Low Resistance, High Rigidity	M	E				●	12	4.76	6.0	–	
		RPHT1248M0E4-M	General, High Precision	H	E	●	●	●		12	4.76	6.0	–	
		RPMT1248M0E4-M	General Purpose	M	E	●	●	●		12	4.76	6.0	–	
		NEW **RPMT1248M0E8-M1**	General, 8 Seats	M	E	●	●	●	●	12	4.76	6.0	1.7	
		NEW **RPMT1248M0E4-M2**	General, High Rigidity	M	E				●	12	4.76	6.0	–	
		RPHT1248M0E4-R	Reinforced Edge	H	E	●	●	●		12	4.76	6.0	–	
		RPMT1248M0E4-R	Reinforced Edge	M	E	●	●	●		12	4.76	6.0	–	
		NEW **RPMT1248M0E8-R1**	Reinforced Edge, 8 Seats	M	E	●	●	●		12	4.76	6.0	1.7	

Note 1) 8 indexing face type inserts can also be used at the same depth of cut as the 4 face type insert.

RECOMMENDED CUTTING CONDITIONS

Dry cutting

	Workpiece Material	Hardness	Grade	**vc** (m/min)	**fz** (mm/t)
M	Austenitic Stainless Steel	≤200HB	**MC7020**	220 (170–270)	0.2 (0.1–0.35)
			MP7130	200 (150–250)	0.2 (0.1–0.35)
	Austenitic Stainless Steel	>200HB	**MC7020**	190 (140–240)	0.2 (0.1–0.35)
			MP7130	170 (120–220)	0.2 (0.1–0.35)
	Two-phase Stainless Steel	≤280HB	**MC7020**	180 (130–230)	0.2 (0.1–0.35)
			MP7130	160 (110–210)	0.2 (0.1–0.35)
	Ferritic and Martensitic Stainless Steel	≤200HB	**MC7020**	240 (190–290)	0.2 (0.1–0.35)
			MP7130	200 (150–250)	0.2 (0.1–0.35)
	Ferritic and Martensitic Stainless Steel	>200HB	**MC7020**	240 (190–290)	0.2 (0.1–0.35)
			MP7130	200 (150–250)	0.2 (0.1–0.35)
	Hardened Stainless Steel	<450HB	**MC7020**	170 (120–220)	0.2 (0.1–0.35)
			MP7130	150 (100–200)	0.2 (0.1–0.35)

Wet cutting

	Workpiece Material	Hardness	Grade	**vc** (m/min)	**fz** (mm/t)
M	Austenitic Stainless Steel	≤200HB	**MC7020**	150 (100–200)	0.2 (0.1–0.35)
			MP7130	130 (80–180)	0.2 (0.1–0.35)
	Austenitic Stainless Steel	>200HB	**MC7020**	120 (70–170)	0.2 (0.1–0.35)
			MP7130	100 (80–150)	0.2 (0.1–0.35)
	Two-phase Stainless Steel	≤280HB	**MC7020**	120 (70–170)	0.2 (0.1–0.35)
			MP7130	100 (80–150)	0.2 (0.1–0.35)
	Ferritic and Martensitic Stainless Steel	≤200HB	**MC7020**	170 (120–220)	0.2 (0.1–0.35)
			MP7130	130 (80–180)	0.2 (0.1–0.35)
	Ferritic and Martensitic Stainless Steel	>200HB	**MC7020**	170 (120–220)	0.2 (0.1–0.35)
			MP7130	130 (80–180)	0.2 (0.1–0.35)
	Hardened Stainless Steel	<450HB	**MC7020**	110 (60–160)	0.2 (0.1–0.35)
			MP7130	90 (50–140)	0.2 (0.1–0.35)
S	Titanium Alloy	–	**MP9130**	45 (30–55)	0.1 (0.05–0.15)
			MP9140	40 (30–50)	0.1 (0.05–0.15)
	Heat Resistant Alloy	–	**MP9130**	35 (15–45)	0.1 (0.05–0.15)
			MP9140	30 (15–40)	0.1 (0.05–0.15)

Note 1) Actual cutting conditions are estimated to avoid chatter vibration with high rigidity of a machine or workpiece.
Make appropriate adjustments when chatter and/or insert chipping occurs during cutting.
Use with lowered conditions when there is a big overhang and/or when pocket-cutting.

Note 2) The setting level for feeding 1 blade is ap = 2.5mm with ARP5 axial cutting. With ARP6, use ap = 3mm.
Use while matching the ap fluctuation and correction value F of the respective table.
Ex. Feed for the recommended 1 blade when ARP5,SUS304, MP7130,ap=1: 0.2 mm/t×1.5 (correction value F)=0.3 mm/t

Note 3) For grooving, use feed at the recommended 70% level. For ramping, drilling, and plunging, use 50% level.

Note 4) Internal coolant is recommended in titanium alloy and heat resistant alloy cutting.
It is more effective when a separately sold, coolant nozzle is used.

Correction level F feed amount for 1 blade, based on axial cutting ap fluctuation

Holder	ap=0.5mm	ap=1mm	ap=1.5mm	ap=2mm	ap=2.5mm	ap=3mm	ap=3.5mm	ap=4mm	ap=5mm	ap=6mm
ARP5	2.3	1.5	1.2	1.1	1.0	0.9	0.8	0.8	0.8	–
ARP6	2.5	1.7	1.3	1.1	1.0	1.0	0.9	0.9	0.8	0.8

Note 1) Tool body durability may weaken, when the amount of axial cutting exceeds ARP5=5mm and ARP6=6mm.

Depth of Cut and Width of Cut

Install Type	DCX (mm)	RE (mm)	Order Number	No.of Teeth	Depth of Cut * ap (mm)	Width of Cut ae (mm)
Arbor	40	5	**ARP5P-040A05AR**	5	≤2.5	≤1.0DCX
		6	**ARP6P-040A04AR**	4	≤3.5	≤1.0DCX
	50	5	**ARP5P-050A06AR**	6	≤2.5	≤1.0DCX
			ARP5P-050A07AR	7	≤1.5	≤1.0DCX
		6	**ARP6P-050A05AR**	5	≤3.5	≤1.0DCX
			ARP6P-050A06AR	6	≤2.5	≤1.0DCX
	63	5	**ARP5P-063A07AR**	7	≤2.5	≤0.75DCX
			ARP5P-063A08AR	8	≤1.5	≤0.75DCX
		6	**ARP6P-063A06AR**	6	≤3.5	≤0.75DCX
			ARP6P-063A07AR	7	≤2.5	≤0.75DCX
	80	6	**ARP6PR08008CA**	8	≤3.5	≤0.6DCX
			ARP6PR08009CA	9	≤2.5	≤0.6DCX
	100	6	**ARP6PR10009DA**	9	≤3.5	≤0.5DCX
			ARP6PR10011DA	11	≤2.5	≤0.5DCX
Screw-in	25	5	**ARP5PR2502AM1235**	2	≤2.5	≤1.0DCX
			ARP5PR2503AM1235	3	≤1.5	≤1.0DCX
	32	5	**ARP5PR3203AM1640**	3	≤2.5	≤1.0DCX
			ARP5PR3204AM1640	4	≤2.5	≤1.0DCX
		6	**ARP6PR3202AM1640**	2	≤3.5	≤1.0DCX
			ARP6PR3203AM1640	3	≤3.5	≤1.0DCX
	40	6	**ARP6PR4003AM1640**	3	≤3.5	≤1.0DCX
			ARP6PR4004AM1640	4	≤3.5	≤1.0DCX

Install Type	DCX (mm)	RE (mm)	Tool Holder Type	Depth of Cut * ap (mm)	Width of Cut ae (mm)
Shank	25	5	**ARP5PR25**	≤1.5	≤1.0DCX
	32	5	**ARP5PR32**	≤2.5	≤1.0DCX
		6	**ARP6PR32**	≤3.5	≤1.0DCX
	40	6	**ARP6PR40**	≤3.5	≤1.0DCX
	50	6	**ARP6PR50**	≤3.5	≤1.0DCX

* When using the 8 seat type, the specifications for depth of cut should be Max. 1.4 mm for ARP5 and 1.7 mm for ARP6.

MAXIMUM CAPACITIES BY MODE

Install Type	DCX (mm)	RE (mm)	Tool Holder Type	Ramping	Helical Drilling		Drilling Depth	Plunging
				RMPX	**DH max.** (mm)	**DH min.** (mm)	Maximum **AZ** (mm)	**AE1** (mm)
Arbor	40	5	**ARP5P-040A**	2.8°	70	78	1.30	2.0
		6	**ARP6P-040A**	2.7°	68	78	1.15	2.0
	50	5	**ARP5P-050A**	2.9°	90	98	1.85	2.0
		6	**ARP6P-050A**	2.9°	88	98	1.70	2.0
	63	5	**ARP5P-063A**	3.0°	116	124	2.50	2.5
		6	**ARP6P-063A**	3.1°	114	124	2.50	2.5
	80	6	**ARP6PR080**	2.3°	148	158	2.50	2.5
	100	6	**ARP6PR100**	1.7°	188	198	2.50	2.5
Shank	25	5	**ARP5PR25**	1.8°	40	48	0.40	1.0
	32	5	**ARP5PR32**	1.9°	54	62	0.65	1.0
		6	**ARP6PR32**	2.0°	52	62	0.60	1.0
	40	6	**ARP6PR40**	2.7°	68	78	1.15	2.5
	50	6	**ARP6PR50**	2.9°	88	98	1.70	2.5
Screw-in	25	5	**ARP5PR25**	1.8°	40	48	0.40	-
	32	5	**ARP5PR32**	1.9°	54	62	0.65	1.0
		6	**ARP6PR32**	2.0°	52	62	0.60	1.0
	40	6	**ARP6PR40**	2.7°	68	78	1.15	2.5

Note 1) When drilling, be careful of long scattered cutting chips

Note 2) When cutting helical holes, do not exceed the largest APMX cutting depth per one rotation.

Note 3) Calculate using the following formula for centre tool tracks and ϕdc when cutting helical holes : Centre tool tracks ϕdc=desired hole diameter ϕDH tool diameter ϕDCX

Note 4) For preventing trouble with cutting chip biting, especially when grooving, ramping, helical cutting, and drilling, thoroughly eliminate cutting chips with an air blower or the like.

Note 5) Small diameter cutters with a large number of teeth create smaller chips.
Pay attention to the depth of cut and feed rate as chip clogging may occur.

Note 6) When machining with a large diameter cutter with a large ae, the chips produced become long increasing the risk of chip clogging.
Please adjust the depth of cut ap and feed before use.

MULTI-FUNCTIONAL MILLING

ARX

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			Hardened Steel

- 15° positive, high tolerance M-class insert.
- Effective for various machining applications.

Fig.1

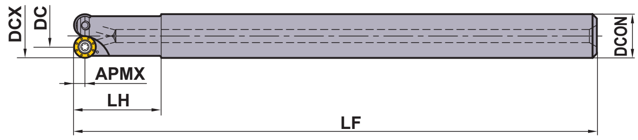


Fig.2 (Centre Cutting Edge Type)

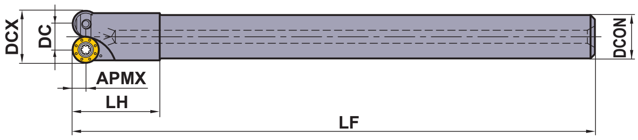
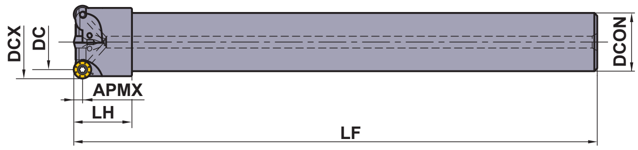


Fig.3 (Non-centre Cutting Edge Type (Multi-tooth))



STEEL SHANK TYPE

With Coolant Hole

Right hand tool holder only.

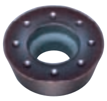
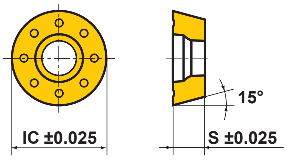
Type	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)					APMX (mm)	Fig.	*1		
		R			DCX	DCON	DC	LF	LH			Clamp Screw	Wrench	Insert
Centre Cutting	**ARX25R102SA10S**	●	○	2	10	10	5	120	20	2.5	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R122SA10S	●	○	2	12	10	6	120	20	3.0	2	TPS22S	TIP07FS	RDMW0620M0E
	ARX35R142SA12S	●	○	2	14	12	7	140	20	3.5	2	TPS22	TIP07FS	RDMW0724M0E
Non-centre Cutting (Multi-tooth)	**ARX25R122SA10S**	●	○	2	12	10	7	120	20	2.5	3	TPS20	TIP06F	RDMW0517M0E
	ARX25R163SA16S	●	○	3	16	16	11	180	20	2.5	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R163SA16S	●	○	3	16	16	10	180	20	3.0	1	TPS22	TIP07FS	RDMW0620M0E
	ARX25R173SA16S	●	○	3	17	16	12	180	20	2.5	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R173SA16S	●	○	3	17	16	11	180	20	3.0	1	TPS22	TIP07FS	RDMW0620M0E
	ARX25R204SA20S	●	○	4	20	20	15	180	20	2.5	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R203SA20S	●	○	3	20	20	14	180	20	3.0	1	TPS22	TIP07FS	RDMW0620M0E
	ARX25R224SA20S	●	○	4	22	20	17	180	20	2.5	3	TPS20	TIP06F	RDMW0517M0E
	ARX30R224SA20S	●	○	4	22	20	16	180	20	3.0	3	TPS22	TIP07FS	RDMW0620M0E
	ARX25R255SA20S	●	○	5	25	20	20	180	20	2.5	3	TPS20	TIP06F	RDMW0517M0E
	ARX30R254SA20S	●	○	4	25	20	19	180	20	3.0	3	TPS22	TIP07FS	RDMW0620M0E

*1 Clamp Torque (N • m) : TPS20=0.5, TPS22S=0.5, TPS22=0.5

INSERTS

Workpiece Material			MP8010	VP15TF
	P	Steel		◐
	M	Stainless Steel		◐
	K	Cast Iron	●	✤
	H	Hardened Steel	●	◐

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Shape	Order Number	Coated		Dimensions (mm)		Geometry
		MP8010	VP15TF	IC	S	
	**RDMW0517M0E**	●	●	5.0	1.70	
	RDMW0620M0E	●	●	6.0	1.99	
	RDMW0724M0E	●	●	7.0	2.38	

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

Scan here for product NEWS ▶

Fig.1

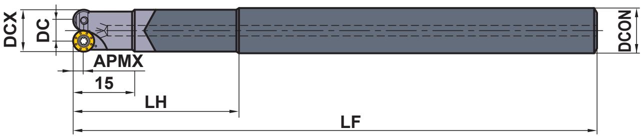


Fig.2

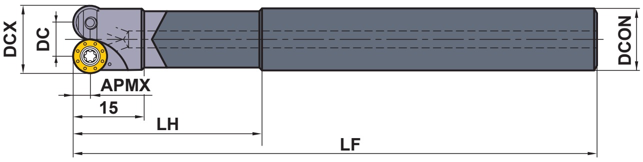
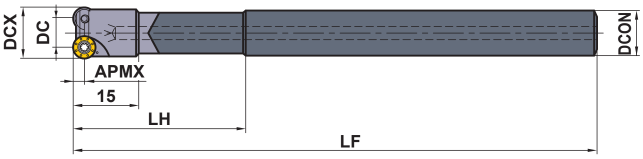


Fig.3



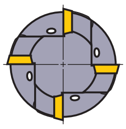
CARBIDE SHANK TYPE

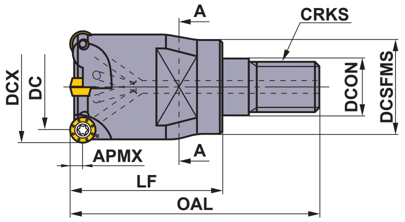
With Coolant Hole

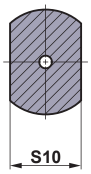
Right hand tool holder only.

Type	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)					APMX (mm)	Fig.	*		
		R			DCX	DCON	DC	LF	LH			Clamp Screw	Wrench	Insert
Centre Cutting	**ARX25R102SA10LW**	●	○	2	10	10	5	150	40	2.5	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R122SA10LW	●	○	2	12	10	6	150	40	3.0	2	TPS22S	TIP07FS	RDMW0620M0E
	ARX35R142SA12LW	●	○	2	14	12	7	170	40	3.5	2	TPS22	TIP07FS	RDMW0724M0E
Non-centre Cutting (Multi-tooth)	**ARX25R122SA10LW**	●	○	2	12	10	7	150	40	2.5	3	TPS20	TIP06F	RDMW0517M0E

* Clamp Torque (N • m) : TPS20=0.5, TPS22S=0.5, TPS22=0.5







A-A section

SCREW-IN TYPE

With Coolant Hole

Right hand tool holder only.

Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)								WT (kg)	APMX (mm)	*		
	R			DCX	DCON	DC	DCSFMS	OAL	LF	S10	CRKS			Clamp Screw	Wrench	Insert
ARX25R163M08A30	●	○	3	16	8.5	11	14.7	48	30	10	M8	0.1	2.5	TPS20	TIP06F	RDMW0517M0E
ARX25R173M08A30	●	○	3	17	8.5	12	14.5	48	30	10	M8	0.1	2.5	TPS20	TIP06F	RDMW0517M0E
ARX25R204M10A30	●	○	4	20	10.5	15	18.6	49	30	14	M10	0.2	2.5	TPS20	TIP06F	RDMW0517M0E
ARX25R224M10A30	●	○	4	22	10.5	17	18.5	49	30	14	M10	0.2	2.5	TPS20	TIP06F	RDMW0517M0E
ARX25R255M12A35	●	○	5	25	12.5	20	23.6	57	35	19	M12	0.2	2.5	TPS20	TIP06F	RDMW0517M0E
ARX30R163M08A30	●	○	3	16	8.5	11	14.6	48	30	10	M8	0.1	3.0	TPS22	TIP07FS	RDMW0620M0E
ARX30R173M08A30	●	○	3	17	8.5	12	14.5	48	30	10	M8	0.1	3.0	TPS22	TIP07FS	RDMW0620M0E
ARX30R203M10A30	●	○	3	20	10.5	15	18.5	49	30	14	M10	0.2	3.0	TPS22	TIP07FS	RDMW0620M0E
ARX30R224M10A30	●	○	4	22	10.5	17	18.5	49	30	14	M10	0.2	3.0	TPS22	TIP07FS	RDMW0620M0E
ARX30R254M12A35	●	○	4	25	12.5	20	23.4	57	35	19	M12	0.2	3.0	TPS22	TIP07FS	RDMW0620M0E

* Clamp Torque (N • m) : TPS20=0.5, TPS22=0.5

Note 1) For screw-in type arbors, refer to page L341.

ISO13399 ➤ L003
ARBORS ➤ L341
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

RECOMMENDED CUTTING CONDITIONS

Note 1) The cutting conditions below are a guide only.Please make adjustments according to the machining conditions.
Note 2) Please note the follows when machining the hardened steel by using MP8010.

- Please shorten the overhang length as much as possible.
- Use with carbide shank recommended.
- Please note the setting of the depth of cut especially to prevent the fracture.
- The first recommended grade when machining hardened steel of less than 50HRC is VP15TF.

SHOULDER MILLING • POCKET MILLING • RAMPING • COPYING

	Workpiece Material	Hardness	Grade	Cutting Speed **vc** (m/min)	**ARX25R◌◌◌SA◌◌S** **ARX25R◌◌◌M◌◌A◌◌**		**ARX30R◌◌◌SA◌◌S** **ARX30R◌◌◌M◌◌A◌◌**		**ARX35R◌◌◌SA◌◌S**	
					Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t)	Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t)	Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t)
P	Mild Steel	≤180HB	**VP15TF**	180 (150—220)	≤1.0	≤0.5	≤1.2	≤0.5	≤1.5	≤0.5
	Carbon Steel • Alloy Steel	180—350HB	**VP15TF**	160 (120—200)	≤0.7	≤0.3	≤0.9	≤0.3	≤1.2	≤0.3
M	Stainless Steel	≤270HB	**VP15TF**	150 (120—180)	≤0.7	≤0.3	≤0.9	≤0.3	≤1.2	≤0.3
K	Gray Cast Iron	Tensile Strength≤350MPa	**VP15TF**	180 (150—220)	≤1.0	≤0.5	≤1.2	≤0.5	≤1.5	≤0.5
	Ductile Cast Iron	Tensile Strength≤800MPa	**VP15TF**	120 (80—160)	≤1.0	≤0.5	≤1.2	≤0.5	≤1.5	≤0.5
H	Hardened Steel	<50HRC	**VP15TF**	80 (50—120)	≤0.5	≤0.2	≤0.7	≤0.2	≤1.0	≤0.2
		≥50HRC	**MP8010**	80 (50—120)	≤0.3	≤0.2	≤0.4	≤0.2	≤0.5	≤0.2

Note 1) For ramping process, refer to cutting criteria by type.

SLOT MILLING

	Workpiece Material	Hardness	Grade	Cutting Speed **vc** (m/min)	**ARX25R◌◌◌SA◌◌S** **ARX25R◌◌◌M◌◌A◌◌**		**ARX30R◌◌◌SA◌◌S** **ARX30R◌◌◌M◌◌A◌◌**		**ARX35R◌◌◌SA◌◌S**	
					Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t)	Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t)	Depth of Cut **ap** (mm)	Feed per Tooth **fz** (mm/t)
P	Mild Steel	≤180HB	**VP15TF**	180 (150—220)	≤1.0	≤0.4	≤1.2	≤0.4	≤1.5	≤0.4
	Carbon Steel • Alloy Steel	180—350HB	**VP15TF**	160 (120—200)	≤0.7	≤0.2	≤0.9	≤0.2	≤1.2	≤0.2
M	Stainless Steel	≤270HB	**VP15TF**	150 (120—180)	≤0.7	≤0.2	≤0.9	≤0.2	≤1.2	≤0.2
K	Gray Cast Iron	Tensile Strength≤350MPa	**VP15TF**	180 (150—220)	≤1.0	≤0.4	≤1.2	≤0.4	≤1.5	≤0.4
	Ductile Cast Iron	Tensile Strength≤800MPa	**VP15TF**	120 (80—160)	≤1.0	≤0.4	≤1.2	≤0.4	≤1.5	≤0.4
H	Hardened Steel	<50HRC	**VP15TF**	80 (50—120)	≤0.5	≤0.1	≤0.7	≤0.1	≤1.0	≤0.1
		≥50HRC	**MP8010**	80 (50—120)	≤0.3	≤0.1	≤0.4	≤0.1	≤0.5	≤0.1

PLUNGING

	Workpiece Material	Hardness	Grade	Cutting Speed **vc** (m/min)	**ARX25R◌◌◌SA◌◌S** **ARX25R◌◌◌M◌◌A◌◌**		**ARX30R◌◌◌SA◌◌S** **ARX30R◌◌◌M◌◌A◌◌**		**ARX35R◌◌◌SA◌◌S**	
					Cutting Width **ae** (mm)	Feed per Tooth **fz** (mm/t)	Cutting Width **ae** (mm)	Feed per Tooth **fz** (mm/t)	Cutting Width **ae** (mm)	Feed per Tooth **fz** (mm/t)
P	Mild Steel	≤180HB	**VP15TF**	180 (150—220)	≤2.5	≤0.3	≤3.0	≤0.3	≤3.5	≤0.3
	Carbon Steel • Alloy Steel	180—350HB	**VP15TF**	160 (120—200)	≤2.5	≤0.2	≤3.0	≤0.2	≤3.5	≤0.2
M	Stainless Steel	≤270HB	**VP15TF**	150 (120—180)	≤2.5	≤0.2	≤3.0	≤0.2	≤3.5	≤0.2
K	Gray Cast Iron	Tensile Strength≤350MPa	**VP15TF**	180 (150—220)	≤2.5	≤0.3	≤3.0	≤0.3	≤3.5	≤0.3
	Ductile Cast Iron	Tensile Strength≤800MPa	**VP15TF**	120 (80—160)	≤2.5	≤0.3	≤3.0	≤0.3	≤3.5	≤0.3
H	Hardened Steel	<50HRC	**VP15TF**	80 (50—120)	≤2.5	≤0.1	≤3.0	≤0.1	≤3.5	≤0.1
		≥50HRC	**MP8010**	80 (50—120)	≤2.5	≤0.1	≤3.0	≤0.1	≤3.5	≤0.1

HELICAL DRILLING

	Workpiece Material	Hardness	Grade	Cutting Speed **vc** (m/min)	**ARX25R◌◌◌SA◌◌S** **ARX25R◌◌◌M◌◌A◌◌**		**ARX30R◌◌◌SA◌◌S** **ARX30R◌◌◌M◌◌A◌◌**		**ARX35R◌◌◌SA◌◌S**	
					DOC/pass **ap** (mm/pass)	Feed per Tooth **fz** (mm/t)	DOC/pass **ap** (mm/pass)	Feed per Tooth **fz** (mm/t)	DOC/pass **ap** (mm/pass)	Feed per Tooth **fz** (mm/t)
P	Mild Steel	≤180HB	**VP15TF**	180 (150—220)	≤1.0	≤0.3	≤1.0	≤0.3	≤1.0	≤0.3
	Carbon Steel • Alloy Steel	180—350HB	**VP15TF**	160 (120—200)	≤0.7	≤0.2	≤0.9	≤0.2	≤1.0	≤0.2
M	Stainless Steel	≤270HB	**VP15TF**	150 (120—180)	≤0.7	≤0.2	≤0.9	≤0.2	≤1.0	≤0.2
K	Gray Cast Iron	Tensile Strength≤350MPa	**VP15TF**	180 (150—220)	≤1.0	≤0.3	≤1.0	≤0.3	≤1.0	≤0.3
	Ductile Cast Iron	Tensile Strength≤800MPa	**VP15TF**	120 (80—160)	≤1.0	≤0.3	≤1.0	≤0.3	≤1.0	≤0.3
H	Hardened Steel	<50HRC	**VP15TF**	80 (50—120)	≤0.5	≤0.1	≤0.7	≤0.1	≤1.0	≤0.1
		≥50HRC	**MP8010**	80 (50—120)	≤0.3	≤0.1	≤0.4	≤0.1	≤0.5	≤0.1

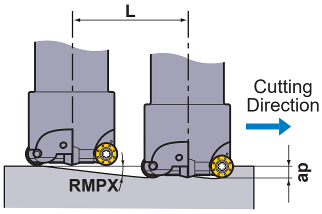
Note 1) For helical drilling, refer to the maximum capacities on page L273.

CUTTING MODE MAXIMUM CAPACITIES

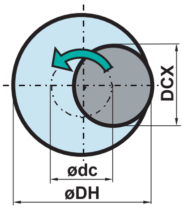
■RAMPING

Finding a cutters' distance moved **"L"** when depth of cut reaches **"ap"** at a ramping angle of **"RMPX"**.

L=ap/tan RMPX (mm)



■HELICAL DRILLING



- ●How to derive a locus of the centre of the tool.

ødc = øDH - DCX

Locus of the centre of the tool | Desired hole diameter | Cutting edge diameter

- ●For the depth of cut per cycle, refer to the cutting conditions for helical drilling.
- ●Set the machine spindle revolution so that the tool is rotating and cutting in a down cut direction.

Type	Order Number	Tool Diameter **DCX** (mm)	Number of Teeth	Ramping			Helical Drilling	
				RMPX *1	**APMX** (mm) *2	Distance L at Depth of Cut of **ap** L (mm)	Min. Hole Diameter **DH min.** (mm)	Max. Hole Diameter **DH max.** (mm)
Centre Cutting	**ARX25R102SA10S**	10	2	90°	2.5	0	15	19
	ARX25R102SA10LW	10	2	90°	2.5	0	15	19
	ARX30R122SA10S	12	2	90°	3.0	0	18	23
	ARX30R122SA10LW	12	2	90°	3.0	0	18	23
	ARX35R142SA12S	14	2	90°	3.5	0	21	27
	ARX35R142SA12LW	14	2	90°	3.5	0	21	27
Non-centre Cutting (Multi-tooth)	**ARX25R122SA10S**	12	2	27.17°	2.5	4.87	19	23
	ARX25R122SA10LW	12	2	27.17°	2.5	4.87	19	23
	ARX25R163M08A30	16	3	13.70°	2.5	10.76	27	31
	ARX25R163SA16S	16	3	13.70°	2.5	10.26	27	31
	ARX30R163M08A30	16	3	21.25	3.0	7.71	26	31
	ARX30R163SA16S	16	3	21.25°	3.0	7.71	26	31
	ARX25R173M08A30	17	3	12.22°	2.5	11.54	29	33
	ARX25R173SA16S	17	3	12.22°	2.5	11.54	29	33
	ARX30R173M08A30	17	3	18.42°	3.0	9.01	28	33
	ARX30R173SA16S	17	3	18.42°	3.0	9.01	28	33
	ARX30R203M10A30	20	3	13.21°	3.0	12.78	34	39
	ARX30R203SA20S	20	3	13.21°	3.0	12.78	34	39
	ARX25R204M10A30	20	4	9.23°	2.5	15.38	35	39
	ARX25R204SA20S	20	4	9.23°	2.5	15.38	35	39
	ARX25R224M10A30	22	4	7.94°	2.5	17.92	39	43
	ARX25R224SA20S	22	4	7.94°	2.5	17.92	39	43
	ARX30R224M10A30	22	4	11.13°	3.0	15.25	38	43
	ARX30R224SA20S	22	4	11.13°	3.0	15.25	38	43
	ARX30R254M12A35	25	4	9.01°	3.0	18.92	44	49
	ARX30R254SA20S	25	4	9.01°	3.0	18.92	44	49
	ARX25R255M12A35	25	5	6.57°	2.5	21.71	45	49
	ARX25R255SA20S	25	5	6.57°	2.5	21.71	45	49

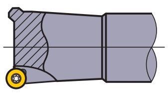
*1 RMPX : Max.Ramping Angle

*2 APMX : Max. Depth of Cut

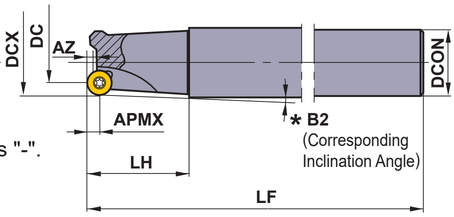
MULTI-FUNCTIONAL MILLING

BRP

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron		Heat Resistant Alloy	Hardened Steel



When the value of B2 is "-".



*Please allow for an inclination angle of B2+1°

- **11°positive insert.**
- **Round shape insert with a strong cutting edge.**
- **Wide range of tools available.**
- **Suitable for mould machining.**

SHANK TYPE

Right hand tool holder only.

Cutting Edge R (APMX)	Type	Order Number	Stock	Number of Teeth	Dimensions (mm)								*		① ②
			R		DCX	DC	LF	DCON	LH	AZ	B2	APMX	Clamp Screw	Wrench	Insert
4	R	**BRP4NR121S12**	●	1	12	3.8	85	12	25	0.2	3.0°	4	CS250560T	TKY08F	①RPMW08T2M0◌ ②RPMT08T2M0E-JS
		BRP4NR161S16	●	1	16	7.8	85	16	25	1.0	3.0°	4	CS250560T	TKY08F	
		BRP4NR202S20	●	2	20	11.8	100	20	30	2.0	2.42°	4	CS250560T	TKY08F	
		BRP4NR253S25	●	3	25	16.8	115	25	35	2.0	2.03°	4	CS250560T	TKY08F	
	L	**BRP4NR121LS12**	●	1	12	3.8	150	12	70	0.2	0.95°	4	CS250560T	TKY08F	
		BRP4NR161LS16	●	1	16	7.8	150	16	70	1.0	0.95°	4	CS250560T	TKY08F	
		BRP4NR202LS20	●	2	20	11.8	180	20	100	2.0	0.65°	4	CS250560T	TKY08F	
		BRP4NR253LS25	●	3	25	16.8	180	25	100	2.0	0.65°	4	CS250560T	TKY08F	
	EL	**BRP4NR202ELS20**	●	2	20	11.8	250	20	130	2.0	0.5°	4	CS250560T	TKY08F	
		BRP4NR253ELS25	●	3	25	16.8	250	25	130	2.0	0.5°	4	CS250560T	TKY08F	
5	R	**BRP5NR161S16**	●	1	16	5.8	85	16	25	0.3	3.15°	5	CS350760T	TKY15F	①RPMW10T3M0◌ ②RPMT10T3M0E-JS
		BRP5NR201S20	●	1	20	9.8	100	20	30	1.2	2.52°	5	CS350760T	TKY15F	
		BRP5NR252S25	●	2	25	14.8	115	25	35	2.5	2.1°	5	CS350860T	TKY15F	
		BRP5NR323S32	●	3	32	21.8	125	32	45	2.5	1.57°	5	CS350860T	TKY15F	
	L	**BRP5NR161LS16**	●	1	16	5.8	150	16	70	0.3	0.97°	5	CS350760T	TKY15F	
		BRP5NR201LS20	●	1	20	9.8	180	20	100	1.2	0.67°	5	CS350760T	TKY15F	
		BRP5NR252LS25	●	2	25	14.8	180	25	100	2.5	0.67°	5	CS350860T	TKY15F	
		BRP5NR323LS32	●	3	32	21.8	200	32	120	2.5	0.55°	5	CS350860T	TKY15F	
	EL	**BRP5NR252ELS25**	●	2	25	14.8	250	25	130	2.5	0.5°	5	CS350860T	TKY15F	
		BRP5NR323ELS32	●	3	32	21.8	300	32	180	2.5	0.34°	5	CS350860T	TKY15F	

Note 1) **R :** Regular type **L :** Long type **EL :** Extra long type
* Clamp Torque (N • m) : CS250560T=1.0, CS350760T=3.5, CS350860T=3.5

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

Cutting Edge R (APMX)	Type	Order Number	Stock	Number of Teeth	Dimensions (mm)								*		① ②
			R		DCX	DC	LF	DCON	LH	AZ	B2	APMX	Clamp Screw	Wrench	Insert
6	R	**BRP6PR322S32**	●	2	32	19.8	125	32	45	4	1.62°	6	TS43	TKY15D	①RPMW1204M0◌ ②RPMT1204M0E-JS
		BRP6PR403S32	●	3	40	27.9	125	32	45	4	—	6	TS43	TKY15D	
		BRP6PR504S32	●	4	50	37.8	150	32	50	4	—	6	TS43	TKY15D	
		BRP6PR504S42	●	4	50	37.8	150	42	50	4	—	6	TS43	TKY15D	
	L	**BRP6PR322LS32**	●	2	32	19.8	200	32	120	4	0.55°	6	TS43	TKY15D	
		BRP6PR403LS32	●	3	40	27.9	200	32	120	4	—	6	TS43	TKY15D	
		BRP6PR504LS32	●	4	50	37.8	250	32	150	4	—	6	TS43	TKY15D	
		BRP6PR504LS42	●	4	50	37.8	250	42	150	4	—	6	TS43	TKY15D	
	EL	**BRP6PR322ELS32**	●	2	32	19.8	300	32	50	4	1.43°	6	TS43	TKY15D	
		BRP6PR403ELS32	●	3	40	27.9	300	32	50	4	—	6	TS43	TKY15D	
		BRP6PR403ELS42	●	3	40	27.9	300	42	50	4	2.73°	6	TS43	TKY15D	
		BRP6PR504ELS42	●	4	50	37.8	300	42	50	4	—	6	TS43	TKY15D	
8	R	**BRP8PR402S32**	●	2	40	23.8	125	32	45	5.5	—	8	TS54	TKY25D	①RPMW1606M0◌ ②RPMT1606M0E-JS
		BRP8PR503S32	●	3	50	33.8	150	32	50	5.5	—	8	TS54	TKY25D	
		BRP8PR503S42	●	3	50	33.8	150	42	50	5.5	—	8	TS54	TKY25D	
		BRP8PR634S32	●	4	63	46.8	150	32	50	5.5	—	8	TS54	TKY25D	
		BRP8PR634S42	●	4	63	46.8	150	42	50	5.5	—	8	TS54	TKY25D	
	L	**BRP8PR402LS32**	●	2	40	23.8	200	32	120	5.5	—	8	TS54	TKY25D	
		BRP8PR503LS32	●	3	50	33.8	250	32	150	5.5	—	8	TS54	TKY25D	
		BRP8PR503LS42	●	3	50	33.8	250	42	150	5.5	—	8	TS54	TKY25D	
		BRP8PR634LS32	●	4	63	46.8	250	32	150	5.5	—	8	TS54	TKY25D	
		BRP8PR634LS42	●	4	63	46.8	250	42	150	5.5	—	8	TS54	TKY25D	
	EL	**BRP8PR402ELS32**	●	2	40	23.8	300	32	50	5.5	—	8	TS54	TKY25D	
		BRP8PR402ELS42	●	2	40	23.8	300	42	50	5.5	2.87°	8	TS54	TKY25D	
		BRP8PR503ELS42	●	3	50	33.8	300	42	50	5.5	—	8	TS54	TKY25D	
		BRP8PR634ELS42	●	4	63	46.8	300	42	50	5.5	—	8	TS54	TKY25D	

Note 1) **R :** Regular type **L :** Long type **EL :** Extra long type

* Clamp Torque (N • m) : TS43=3.5, TS54=7.5

Fig.1

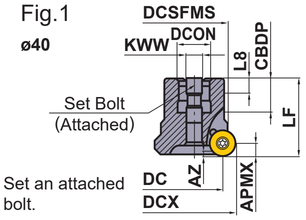


Fig.2

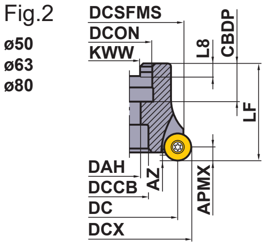
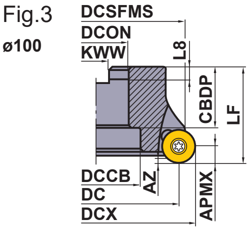


Fig.3

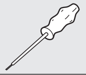
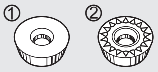


Right hand tool holder only.

■ARBOR TYPE

Cutting Edge R (APMX)	Order Number	Stock	Number of Teeth	Dimensions (mm)										WT (kg)	Max. Depth of Cut (mm)		Fig.
		R		DCX	DC	DCSFMS	LF	DCON	CBDP	DAH	DCCB	KWW	L8		APMX	AZ	
6	**BRP6P-040A03R**	●	3	40	27.9	33.3	40	16	18	—	—	8.4	5.6	0.4	6	4	1
	BRP6P-050A04R	●	4	50	37.8	43.1	50	22	20	11	17	10.4	6.3	0.5	6	4	2
	BRP6PR05004B	●	4	50	37.8	43.1	63	22.225	29	11	17	8.4	5	0.5	6	4	2
	BRP6P-063A05R	●	5	63	50.8	56.1	50	22	20	11	17	10.4	6.3	0.7	6	4	2
	BRP6PR06305B	●	5	63	50.8	56.1	63	22.225	29	11	17	8.4	5	0.7	6	4	2
	BRP6PR08006C	●	6	80	67.8	72.8	50	25.4	26	13	20	9.5	6	1.2	6	4	2
8	**BRP8P-063A04R**	●	4	63	46.8	54.5	50	22	20	11	17	10.4	6.3	0.7	8	5.5	2
	BRP8PR06304B	●	4	63	46.8	54.5	63	22.225	29	11	17	8.4	5	0.7	8	5.5	2
	BRP8PR08005C	●	5	80	63.8	70.9	50	25.4	26	13	20	9.5	6	1.2	8	5.5	2
	BRP8PR10006D	●	6	100	83.8	90.6	50	31.75	32	—	45	12.7	8	1.6	8	5.5	3

SPARE PARTS

Tool Holder Number	 *			① ② 
	Clamp Screw	Wrench	Set Bolt	Insert
BRP6P-040A03R	TS43	TKY15D	HDS08030	①RPMW1204M0◌ ②RPMT1204M0E-JS
BRP6P-050A04R ı **BRP6P-R08006C**	TS43	TKY15D	—	
BRP8P	TS54	TKY25D	—	①RPMW1606M0◌ ②RPMT1606M0E-JS

* Clamp Torque (N • m) : TS43=3.5, TS54=7.5

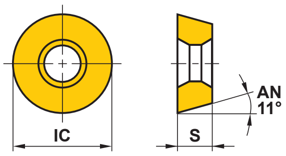
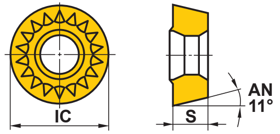
● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material			F7030	VP15TF			NX4545		UTi20T	
	P	Steel	◐	◐			◐		◐	
	M	Stainless Steel	◐	◐			◐		◐	
	K	Cast Iron		✤					✤	
	S	Heat resistant Alloy, Titanium Alloy		◐						
	H	Hardened Steel		◐					◐	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Edge Preparation :
E : Round **T :** Chamfer

Shape	Order Number	Class	Edge Preparation	Coated				Cermet		Carbide		Dimensions (mm)		Geometry
				F7030	VP15TF			NX4545		UTi20T		IC	S	
	**RPMW08T2M0T**	M	T		●							8	2.78	
	RPMW10T3M0E	M	E	●				●				10	3.97	
	RPMW10T3M0T	M	T		●							10	3.97	
	RPMW1204M0E	M	E	●				●		●		12	4.76	
	RPMW1204M0T	M	T		●							12	4.76	
	RPMW1606M0E	M	E	●						●		16	6.35	
	RPMW1606M0T	M	T		●							16	6.35	
	**RPMT08T2M0E-JS**	M	E	●	●							8	2.78	
	RPMT10T3M0E-JS	M	E	●	●							10	3.97	
	RPMT1204M0E-JS	M	E	●	●					●		12	4.76	
	RPMT1606M0E-JS	M	E	●	●							16	6.35	

RECOMMENDED CUTTING CONDITIONS

■ CUTTING SPEED (m/min)

	Workpiece Material	Hardness	Coated		Carbide
			F7030	VP15TF	UTi20T
P	Mild Steel	≤180HB	**250 (200—300)**	250 (200—300)	150 (100—200)
	Carbon Steel Alloy Steel	180—280HB	**180 (130—220)**	180 (130—220)	140 (100—170)
		280—380HB	**160 (110—190)**	160 (110—190)	100 (70—120)
	Pre-Hardened Steel	35—45HRC	**120 (80—140)**	120 (80—140)	90 (60—100)
	High Alloy Steel	300HB	**130 (90—160)**	130 (90—160)	100 (70—120)
M	Stainless Steel	≤260HB	**180 (130—220)**	180 (130—220)	140 (100—170)
K	Gray Cast Iron	Tensile Strength ≤350MPa	—	**170 (130—220)**	140 (100—170)
	Ductile Cast Iron	Tensile Strength 360—500MPa	—	**140 (100—180)**	120 (80—140)
		Tensile Strength 500—800MPa	—	**110 (80—140)**	90 (70—110)
H	Hardened Steel	45—60HRC	—	**60 (50—100)**	60 (40—70)

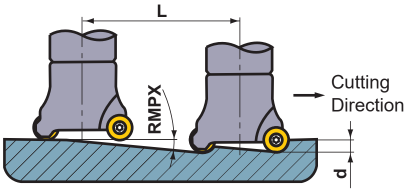
Note 1) Cutting speeds shown in bold type are for the recommended first choice grades.

■ FEED PER TOOTH (mm/t)

Type	Depth of Cut (mm)							
	1	2	3	4	5	6	7	8
BRP4	0.40	0.30	0.20	0.10	—	—	—	—
BRP5	0.40	0.35	0.30	0.20	0.10	—	—	—
BRP6	0.50	0.40	0.30	0.25	0.23	0.20	—	—
BRP8	0.60	0.50	0.45	0.40	0.33	0.30	0.25	0.20

RAMPING

■ RAMPING ANGLE AND MACHINING LENGTH



Formula to find cutting length "L" at maximum ramping angle.

$$L = \frac{d}{\tan RMPX} \text{ (mm)}$$

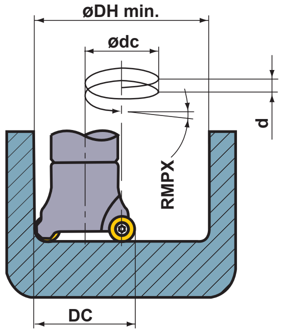
Type	Cutting Edge Diameter (ϕ)	Max. Ramping Angle **RMPX**	tan RMPX	Cutting Length L at Max. Ramping Angle **L**(mm)*				
				d=2mm	d=4mm	d=5mm	d=6mm (max.)	d=8mm (max.)
BRP4	12	5.02°	0.088	22	45	—	—	—
	16	12.2°	0.216	9	18	—	—	—
	20	14.52°	0.259	7	15	—	—	—
	25	8.8°	0.155	12	25	—	—	—
BRP5	16	4.52°	0.079	25	50	63	—	—
	20	11.4°	0.202	9	19	24	—	—
	25	14.4°	0.257	7	15	19	—	—
	32	8.37°	0.147	13	27	33	—	—
BRP6	32	15.91°	0.285	7	14	17	21	—
	40	10.29°	0.181	11	22	27	33	—
	50	7.12°	0.125	16	32	40	48	—
	63	5.08°	0.089	22	44	56	67	—
	80	3.69°	0.064	31	62	77	93	—
BRP8	40	18.86°	0.342	5	11	14	17	23
	50	11.91°	0.211	9	18	23	28	37
	63	8.01°	0.141	14	28	35	42	56
	80	5.60°	0.098	20	40	50	61	81
	100	4.13°	0.072	27	55	69	83	110

* "L" value is approximate rounded value.

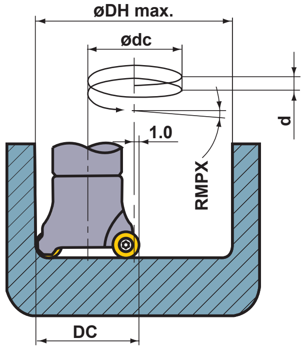
HELICAL DRILLING

■ RELATIONSHIP BETWEEN HOLE DIAMETER AND DEPTH OF CUT

Minimum Hole Diameter



Maximum Hole Diameter

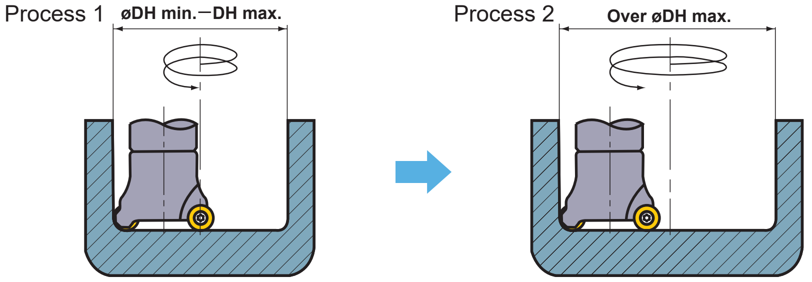


Type	Cutting Edge Diameter DC (mm)	*1 øDH min.	*2 ødc	Ramping Angle RMPX					*1 øDH max.	*2 ødc	Ramping Angle RMPX				
				d=2mm	d=4mm	d=5mm	d=6mm	d=8mm			d=2mm	d=4mm	d=5mm	d=6mm	d=8mm
BRP4	**12**	16	4	d=1mm,RMPX=4.55°					22	10	3.64°	–	–	–	–
	16	24	8	4.55°	9.10°	–	–	–	30	14	2.60°	5.20°	–	–	–
	20	32	12	3.04°	6.08°	–	–	–	38	18	2.03°	4.05°	–	–	–
	25	42	17	2.15°	4.29°	–	–	–	48	23	1.59°	3.17°	–	–	–
BRP5	**16**	22	6	d=1mm,RMPX=3.04°					30	14	2.60°	5.20°	6.50°	–	–
	20	30	10	3.64°	7.26°	9.10°	–	–	38	18	2.03°	4.05°	5.08°	–	–
	25	40	15	2.43°	4.85°	6.08°	–	–	48	23	1.59°	3.17°	3.98°	–	–
	32	54	22	1.66°	3.31°	4.15°	–	–	62	30	1.22°	2.43°	3.04°	–	–
BRP6	**32**	52	20	1.82°	3.64°	4.55°	5.45°	–	62	30	1.22°	2.43°	3.04°	3.64°	–
	40	68	28	1.30°	2.60°	3.25°	3.90°	–	78	38	0.96°	1.92°	2.40°	2.88°	–
	50	88	38	0.96°	1.92°	2.40°	2.88°	–	98	48	0.78°	1.52°	1.90°	2.28°	–
	63	114	51	0.72°	1.43°	1.79°	2.14°	–	124	61	0.60°	1.20°	1.49°	1.79°	–
	80	148	68	0.54°	1.07°	1.34°	1.61°	–	158	78	0.47°	0.94°	1.17°	1.40°	–
BRP8	**40**	64	24	1.52°	3.04°	3.79°	4.55°	6.06°	78	38	0.96°	1.92°	2.40°	2.88°	3.38°
	50	84	34	1.07°	2.14°	2.68°	3.22°	4.28°	98	48	0.76°	1.52°	1.90°	2.28°	3.04°
	63	110	47	0.78°	1.55°	1.94°	2.33°	3.10°	124	61	0.60°	1.20°	1.49°	1.79°	2.39°
	80	144	64	0.57°	1.14°	1.42°	1.71°	2.28°	158	78	0.47°	0.94°	1.17°	1.40°	1.87°
	100	184	84	0.43°	0.87°	1.09°	1.30°	1.74°	198	98	0.37°	0.74°	0.93°	1.12°	1.49°

*1 DH=Hole Diameter : ϕ(mm) *2 dc=Tool Pass : ϕ(mm)

BRP4 DH min. (Minimum Hole Diameter)=(DC - 4)×2, DH max. (Maximum Hole Diameter)=(DC - 1)×2, d max. (Maximum Depth of Cut)=4(mm)
BRP5 DH min. (Minimum Hole Diameter)=(DC - 5)×2, DH max. (Maximum Hole Diameter)=(DC - 1)×2, d max. (Maximum Depth of Cut)=5(mm)
BRP6 DH min. (Minimum Hole Diameter)=(DC - 6)×2, DH max. (Maximum Hole Diameter)=(DC - 1)×2, d max. (Maximum Depth of Cut)=6(mm)
BRP8 DH min. (Minimum Hole Diameter)=(DC - 8)×2, DH max. (Maximum Hole Diameter)=(DC - 1)×2, d max. (Maximum Depth of Cut)=8(mm)
dc=(Tool Pass)**=DH-D**

◀Note▶ When machining a hole larger than DH max., first machine a pilot hole smaller than DH max. before enlarging to the required size as shown above.



DEEP SHOULDER MILLING

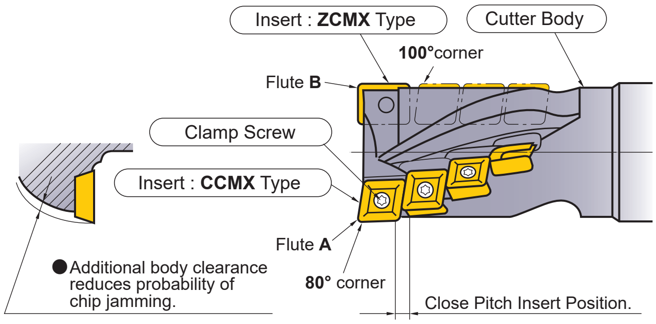
90° KAPR

DCCC

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			

● **Different helical flute angles prevents chattering.**

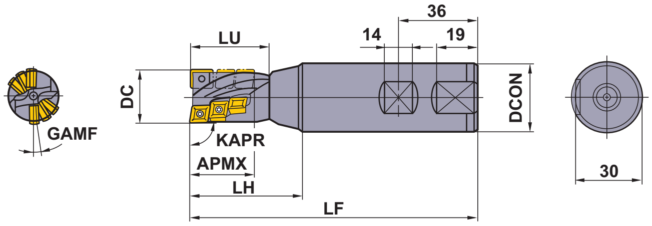
DESIGN FEATURES OF DCCC TYPE END MILL



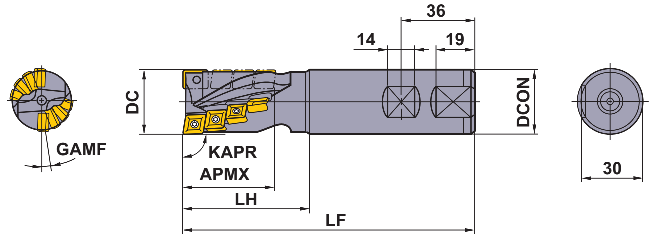
●Additional body clearance reduces probability of chip jamming.

●All 4 cutting edges of CCMX insert are utilized, 80° corners in flute "A" and 100° corners on flute "B".

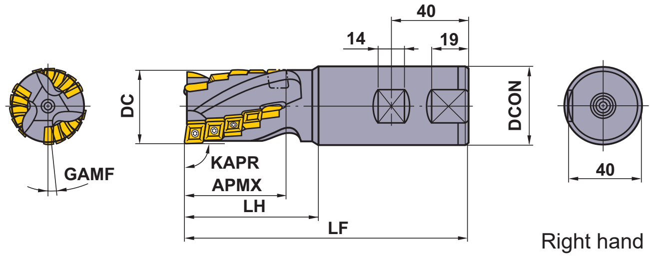
● **ϕ25 2 flute**



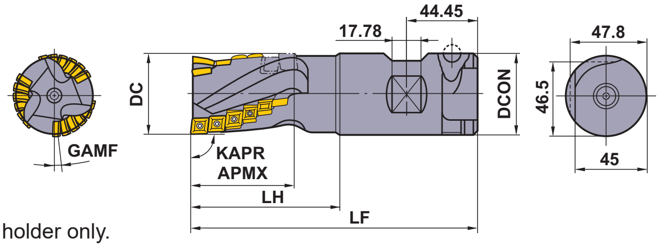
● **ϕ32 2 flute**



● **ϕ40 3 flute**



● **ϕ50 (Combination Shank) 3 flute**



Right hand tool holder only.

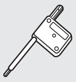
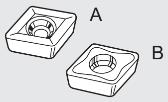
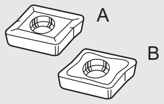
SHANK TYPE

DC (mm)	Order Number	Stock	Dimensions (mm)					GAMF	WT	No. of Teeth		Peripheral and Bottom		Bottom insert only	
			LF	DCON	LH	LU	APMX			Bottom	Total	Type	Number of Teeth	Type	Number of Teeth
25	**DCCCR2506S32**	●	130	32	50	36	27	8°	0.6	2	6	CCMX08	5	ZCMX08	1
25	**DCCCR2510S32**	●	150	32	70	56	44	8°	0.7	2	10	CCMX08	9	ZCMX08	1
32	**DCCCR3208S32**	●	140	32	60	–	43	8°36′	0.8	2	8	CCMX09	7	ZCMX09	1
32	**DCCCR3212S32**	●	160	32	80	–	63	8°36′	0.8	2	12	CCMX09	11	ZCMX09	1
40	**DCCCR4015S42**	●	150	42	70	–	53	5°31′	1.3	3	15	CCMX09	14	ZCMX09	1
40	**DCCCR4024S42**	●	180	42	100	–	83	5°31′	1.4	3	24	CCMX09	23	ZCMX09	1
50	**DCCCR5018S508**	●	175	50.8	90	–	63	5°51′	2.3	3	18	CCMX09	17	ZCMX09	1
50	**DCCCR5027S508**	●	205	50.8	120	–	93	5°51′	2.6	3	27	CCMX09	26	ZCMX09	1

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

Scan here for product NEWS ▶

SPARE PARTS

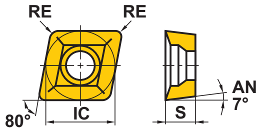
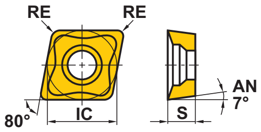
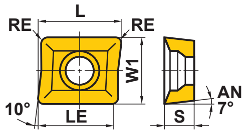
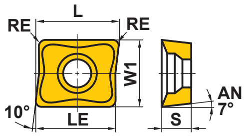
Tool Holder Number	 *				
	Clamp Screw	Wrench	Wrench	Insert	
				Peripheral and Bottom Insert	Bottom Insert (One Pocket Only)
DCCCR25	CS300890T	TKY08F	TKY08DS	CCMX083508EN-A	ZCMX083508ER-A
DCCCR32	CS350990T	TKY10F	TKY10DS	CCMX09T308EN-A or B	ZCMX09T308ER-A or B
DCCCR40					
DCCCR50					

* Clamp Torque (N • m) : CS300890T=1.0, CS350990T=2.5

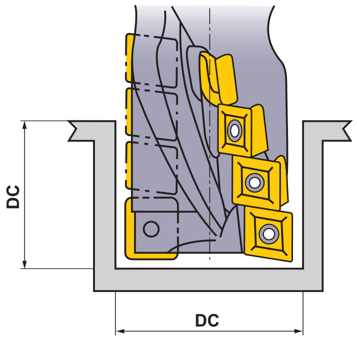
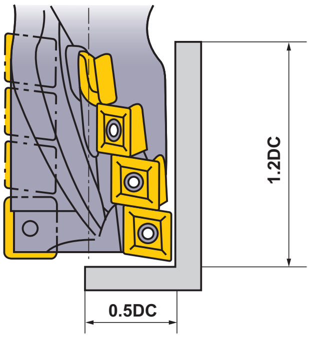
INSERTS

Workpiece Material			F7030	VP15TF	UP20M	UTi20T
	P	Steel	◐	◐	◐	◐
	M	Stainless Steel	◐	◐	◐	◐
	K	Cast Iron		✤		✤

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting
Edge Preparation : E : Round

Shape	Order Number	Class	Edge Preparation	Coated			Carbide	Dimensions (mm)						Geometry
				F7030	**VP15TF**	**UP20M**	**UTi20T**	**L**	**LE**	**W1**	**IC**	**S**	**RE**	
	**CCMX083508EN-A**	M	E	●		●	●	—	—	—	7.94	3.5	0.8	
	CCMX09T308EN-A	M	E	●	●	●	●	—	—	—	9.525	3.97	0.8	
Strong Cutting Edge Type 	**CCMX09T308EN-B**	M	E	●			●	—	—	—	9.525	3.97	0.8	
	**ZCMX083508ER-A**	M	E	●			●	11.0	8.5	7.94	—	3.5	0.8	
	ZCMX09T308ER-A	M	E	●	●	●	●	12.7	11.0	9.525	—	3.97	0.8	
Strong Cutting Edge Type 	**ZCMX09T308ER-B**	M	E	●		●	●	12.7	11.0	9.525	—	3.97	0.8	

RECOMMENDED CUTTING CONDITIONS

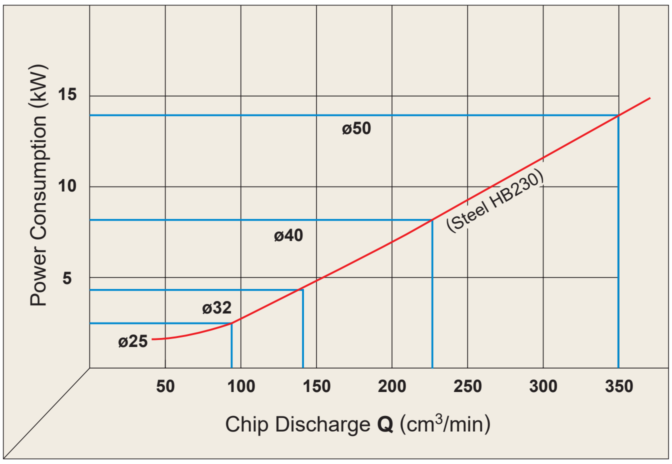
	A : Slot Milling (APMX Short Type)	B : Shoulder Milling (APMX Short Type)
Cutting Mode		

	Workpiece Material	Hardness	Grade	Cutting Mode	Cutting Speed (m/min)	Table Feed (mm/min)			
						ϕ25	ϕ32	ϕ40	ϕ50
P	Mild Steel	≤180HB	**F7030**	A	200 (160—240)	120 (100—140)	120 (100—140)	120 (100—140)	120 (100—140)
			F7030	B	200 (160—240)	200 (180—220)	200 (180—220)	230 (200—250)	230 (200—250)
	Carbon Steel Alloy Steel	180—280HB	**F7030**	A	160 (130—180)	120 (100—140)	120 (100—140)	140 (120—150)	140 (120—150)
			F7030	B	160 (130—180)	150 (120—180)	150 (120—180)	180 (150—200)	180 (150—200)
		280—350HB	**F7030**	A	160 (130—180)	100 (80—120)	100 (80—120)	130 (100—150)	130 (100—150)
			F7030	B	160 (130—180)	120 (100—140)	120 (100—140)	150 (120—180)	150 (120—180)
M	Stainless Steel	≤200HB	**F7030**	A	80 (60—100)	70 (50—90)	70 (50—90)	70 (50—90)	70 (50—90)
			F7030	B	130 (100—160)	100 (80—120)	100 (80—120)	120 (100—140)	120 (100—140)
K	Cast Iron	Tensile Strength ≤450MPa	**UTI20T**	A	120 (100—140)	200 (180—220)	200 (180—220)	230 (200—250)	230 (200—250)
			UTI20T	B	120 (100—140)	230 (200—250)	230 (200—250)	260 (240—280)	260 (240—280)

- Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
- Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

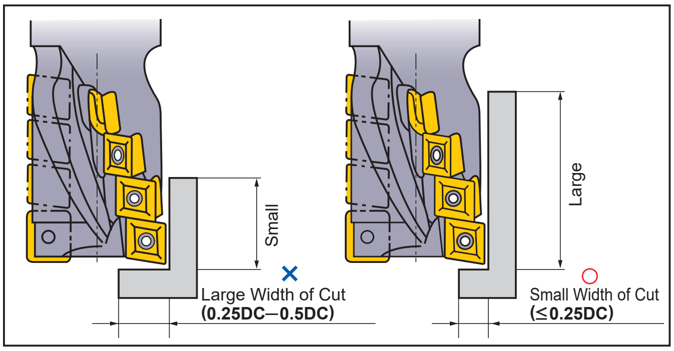
■POWER CONSUMPTION

- Please use the chart below for reference, please select the conditions that suits the machines power.
- Chip Discharge Q (cm^3/min)=Table Feed x Depth of Cut x Cutting Width÷1000



■FOR USE OF APMX LONG 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 APMX Short type as much as possible.)



DEEP SHOULDER MILLING

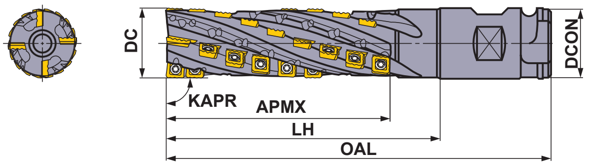
90° KAPR

SPX

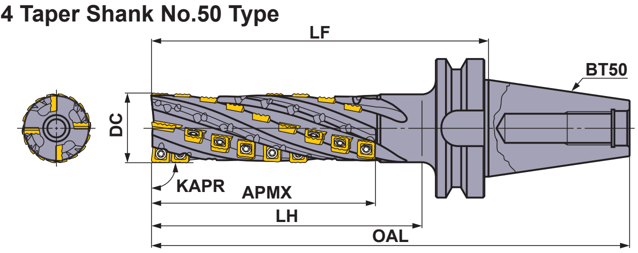
P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron		Heat Resistant Alloy	

- Low cutting resistance due to the use of wavy inserts.
- Suitable for heavy cutting due to holder rigidity.

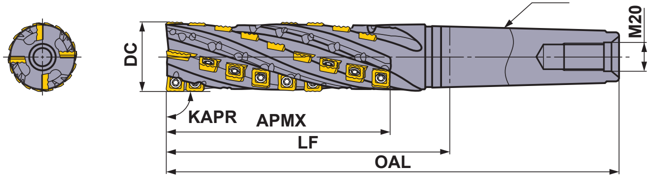
● **Straight Shank Type (Combination Shank)**



● **7/24 Taper Shank No.50 Type**



● **MT5 shank type**



SHANK TYPE

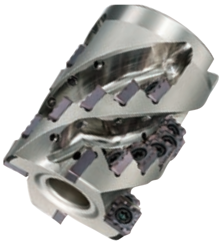
Right hand tool holder only.

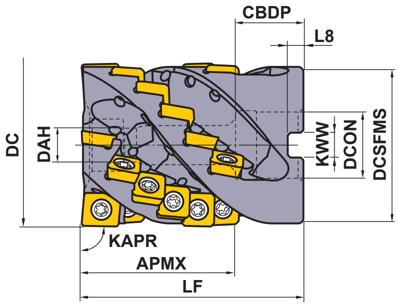
Type		Order Number	Stock	Number of Flutes	Number of Teeth	Dimensions (mm)						Number of Insert		
												Bottom On-edge **A**	Bottom On-edge **B**	Peripheral
			R			DC	OAL	DCON	LH	LF	APMX	JPMX 190412-○○	MPMX 120412-○○	SPMX 120408-○○
Straight Shank (Combination Shank)	Short Edge Type	SPX4R05016WNES	●	2	16	50	180	50.8	100	—	72	2	2	12
	Coarse Pitch	SPX4R05024WNS	●	2	24	50	220	50.8	140	—	110	2	2	20
		SPX4R05034WNM	●	2	34	50	270	50.8	190	—	157	2	2	30
7/24 Taper Shank (No. 50)	Short Edge Type	SPX4R05016BT50NES	●	2	16	50	249.8	—	100	148	72	2	2	12
	Coarse Pitch	SPX4R05024BT50NS	●	2	24	50	289.8	—	140	188	110	2	2	20
		SPX4R05034BT50NM	●	2	34	50	339.8	—	190	238	157	2	2	30
		SPX4R06324BT50NS	●	2	24	63	289.8	—	140	188	110	2	2	20
		SPX4R06334BT50NM	●	2	34	63	339.8	—	190	238	157	2	2	30
		SPX4R06344BT50NL	●	2	44	63	389.8	—	240	288	205	2	2	40
		SPX4R06356BT50NX	●	2	56	63	439.8	—	290	338	261	2	2	52
MT5 shank type		SPX4R05024MT5NS	●	2	24	50	279.5	—	—	150	110	2	2	20
		SPX4R05034MT5NM	●	2	34	50	329.5	—	—	200	157	2	2	30

● : Inventory maintained in Japan.

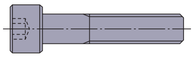
Scan here for product NEWS ▶

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001





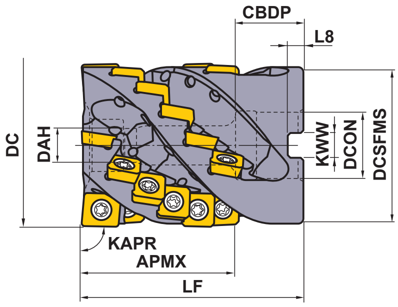
Right hand tool holder only.

Cutter Diameter **DC** (mm)	Set Bolt	Geometry
ϕ63	HSC12070	
ϕ80	HSC16065	

■SHELL TYPE

Order Number	Stock	Number of Flutes	Number of Teeth	Dimensions (mm)									Number of Insert		
	R			DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	APMX	Bottom On-edge **A**	Bottom On-edge **B**	Peripheral
													JPMX 140412-○○	**MPMX 120412-○○**	**SPMX 120408-○○**
SPX4R06324CA058A	●	4	24	63	85	25.4	26	13	60	9.5	6	58	2	2	20
SPX4R08024DA058A	●	4	24	80	85	31.75	38	17	76.8	12.7	8	58	2	2	20

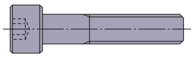
Note 1) In case of internal coolant supply, please use a face mill arbor with through coolant channels. Regular centre-thru or side-thru arbors can't be used.



Right hand tool holder only.

For metric arbor

The cutter bore diameter DCON is indicated in millimetre.

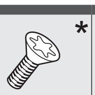
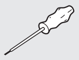
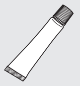
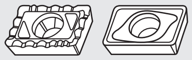
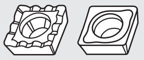
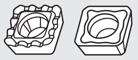
Cutter Diameter **DC** (mm)	Set Bolt	Geometry
ϕ63	HSC12070	
ϕ80	HSC16065	

■SHELL TYPE

Order Number	Stock	Number of Flutes	Number of Teeth	Dimensions (mm)									Number of Insert		
	R			DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	APMX	Bottom On-edge **A**	Bottom On-edge **B**	Peripheral
													JPMX 140412-○○	**MPMX 120412-○○**	**SPMX 120408-○○**
SPX4-063A24A058RA	●	4	24	63	85	27	28	13	60	12.4	7	58	2	2	20
SPX4-080A24A058RA	●	4	24	80	85	32	40	17	76.8	14.4	8	58	2	2	20

Note 1) In case of internal coolant supply, please use a face mill arbor with through coolant channels. Regular centre-thru or side-thru arbors can't be used.

SPARE PARTS

Tool Holder Number	 *					
	Clamp Screw	Wrench	Anti-seize Lubricant	Insert		
				Bottom On-edge **A**	Bottom On-edge **B**	Peripheral
SPX	TS55	TKY25D	MK1KS	JPMX140412-WH	MPMX120412-WH	SPMX120408-WH
				JPMX140412-JM	MPMX120412-JM	SPMX120408-JM

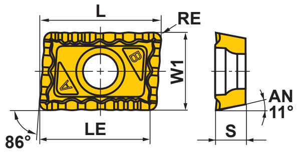
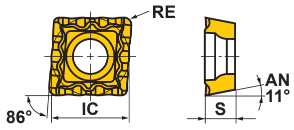
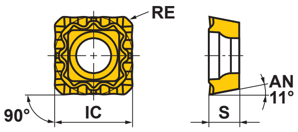
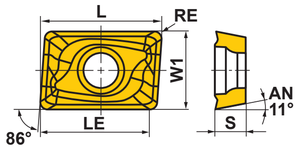
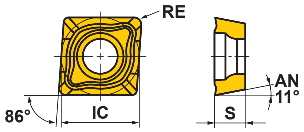
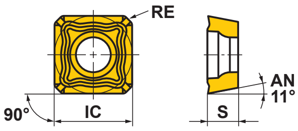
⁎ Clamp Torque (N • m) : TS55=7.5

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material			VP15TF	VP20RT		
	P	Steel	◐	◐		
	M	Stainless Steel	◐	◐		
	K	Cast Iron	✤	✤		
	S	Heat resistant Alloy, Titanium Alloy	◐	✤		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Type		Shape	Order Number	Class	Coated				Dimensions (mm)						Geometry
					VP15TF	VP20RT			L	LE	W1	IC	S	RE	
Wavy cutting edge type (**WH** Breaker)	Bottom On-edge **A**		**JPMX190412-WH**	M	●	●			19.81	17.6	12.7	—	4.76	1.2	
			⁎ JPMX140412-WH	M	●	●			15.04	12.9	12.7	—	4.76	1.2	
	Bottom On-edge **B**		**MPMX120412-WH**	M	●	●			—	—	—	12.7	4.76	1.2	
	Peripheral		**SPMX120408-WH**	M	●	●			—	—	—	12.7	4.76	0.8	
Straight cutting edge type (**JM** Breaker)	Bottom On-edge **A**		**JPMX190412-JM**	M	●	●			19.81	17.6	12.7	—	4.83	1.2	
			⁎ JPMX140412-JM	M	●	●			15.04	12.9	12.7	—	4.79	1.2	
	Bottom On-edge **B**		**MPMX120412-JM**	M	●	●			—	—	—	12.7	4.79	1.2	
	Peripheral		**SPMX120408-JM**	M	●	●			—	—	—	12.7	4.80	0.8	

⁎ Only for use with a shell type holder.

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

RECOMMENDED CUTTING CONDITIONS (SHANK TYPE)

■CUTTING CONDITIONS FOR SHOULDER MILLING

	Workpiece Material	Hardness	Grade Breaker		Cutting Speed **vc** (m/min)	Cutting Width : **ae** (mm) Feed per Tooth : **fz** (mm/t)						
						φ50 (the last letter of order number for cutter body)			φ63 (the last letter of order number for cutter body)			
						S (APMX≤110)	**M** (APMX=157)	**L** (APMX=205)	**S** (APMX=110)	**M** (APMX=157)	**L** (APMX=205)	**X** (APMX=261)
P	Mild Steel	≤180HB	**VP15TF**	**WH**	120 (100—140)	≤10.0 0.15—0.25	≤5.0 0.15—0.25	≤2.5 0.10—0.20	≤12.5 0.15—0.25	≤10.0 0.15—0.25	≤5.0 0.15—0.25	≤2.5 0.10—0.20
				JM	120 (100—140)	≤7.5 0.10—0.20	≤5.0 0.10—0.20	≤2.5 0.05—0.15	≤10.0 0.10—0.20	≤7.5 0.10—0.20	≤5.0 0.10—0.20	≤2.5 0.05—0.15
	Carbon Steel Alloy Steel	180—350HB		**WH**	80 (70—120)	≤10.0 0.15—0.25	≤5.0 0.15—0.25	≤2.5 0.10—0.20	≤12.5 0.15—0.25	≤10.0 0.15—0.25	≤5.0 0.15—0.25	≤2.5 0.10—0.20
				JM	80 (70—120)	≤7.5 0.10—0.20	≤5.0 0.10—0.20	≤2.5 0.05—0.15	≤10.0 0.10—0.20	≤7.5 0.10—0.20	≤5.0 0.10—0.20	≤2.5 0.05—0.15
	Alloy Tool Steel	≤300HB		**WH**	80 (60—100)	≤10.0 0.10—0.20	≤5.0 0.10—0.20	≤2.5 0.05—0.15	≤12.5 0.10—0.20	≤10.0 0.10—0.20	≤5.0 0.10—0.20	≤2.5 0.05—0.15
				JM	80 (60—100)	≤7.5 0.10—0.15	≤5.0 0.10—0.15	≤2.5 0.05—0.10	≤10.0 0.10—0.15	≤7.5 0.10—0.15	≤5.0 0.10—0.15	≤2.5 0.05—0.10
M	Stainless Steel	≤200HB	**VP20RT**	**WH**	80 (60—100)	≤7.5 0.08—0.15	≤5.0 0.08—0.15	≤2.5 0.05—0.10	≤10.0 0.08—0.15	≤7.5 0.08—0.15	≤5.0 0.08—0.15	≤2.5 0.05—0.10
				JM	80 (60—100)	≤5.0 0.08—0.15	≤3.5 0.08—0.15	≤2.0 0.05—0.10	≤7.5 0.08—0.15	≤5.0 0.08—0.15	≤3.5 0.08—0.15	≤2.0 0.05—0.10
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP15TF**	**WH**	100 (80—120)	≤10.0 0.15—0.40	≤5.0 0.15—0.35	≤2.5 0.10—0.30	≤12.5 0.15—0.40	≤10.0 0.15—0.40	≤5.0 0.15—0.35	≤2.5 0.10—0.30
				JM	100 (80—120)	≤7.5 0.10—0.25	≤5.0 0.10—0.25	≤2.5 0.05—0.20	≤10.0 0.10—0.25	≤7.5 0.10—0.25	≤5.0 0.10—0.25	≤2.5 0.05—0.20
	Ductile Cast Iron	Tensile Strength ≤800MPa		**WH**	80 (60—100)	≤10.0 0.15—0.35	≤5.0 0.15—0.30	≤2.5 0.10—0.25	≤12.5 0.15—0.35	≤10.0 0.15—0.35	≤5.0 0.15—0.30	≤2.5 0.10—0.25
				JM	80 (60—100)	≤7.5 0.10—0.20	≤5.0 0.10—0.20	≤2.5 0.05—0.15	≤10.0 0.10—0.20	≤7.5 0.10—0.20	≤5.0 0.10—0.20	≤2.5 0.05—0.15
S	Ti Alloy	≤350HB	**VP20RT**	**WH**	40 (35—50)	≤5.0 0.05—0.10	≤3.5 0.05—0.10	≤2.0 0.05—0.10	≤7.5 0.05—0.10	≤5.0 0.05—0.10	≤3.5 0.05—0.10	≤2.0 0.05—0.10
				JM	40 (35—50)	≤3.5 0.05—0.10	≤2.5 0.05—0.10	≤1.5 0.05—0.10	≤5.0 0.05—0.10	≤3.5 0.05—0.10	≤2.5 0.05—0.10	≤1.5 0.05—0.10

Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece, where no vibration occurred. Please adjust machining conditions if the vibration is generated.

Note 2) If the contact angle between the tool and the workpiece exceeds 90°, such as when machining corners, reduce the cutting speed and table feed by about 10 to 20%, reduce the cutting width by about 50%, and if possible, add R to the centre trajectory of the tool for machining.

■SLOT MILLING

	Workpiece Material	Hardness	Grade Breaker		Cutting Speed **vc** (m/min)	Depth of Cut : **ap** : (mm) Feed per Tooth : **fz** (mm/t)						
						φ50 (the last letter of order number for cutter body)			φ63 (the last letter of order number for cutter body)			
						S (APMX≤110)	**M** (APMX=157)	**L** (APMX=205)	**S** (APMX=110)	**M** (APMX=157)	**L** (APMX=205)	**X** (APMX=261)
P	Mild Steel	≤180HB	**VP15TF**	**WH**	60 (50—120)	≤10.0 0.10—0.25	≤5.0 0.10—0.20	≤2.5 0.10—0.15	≤12.5 0.10—0.25	≤10.0 0.10—0.25	≤5.0 0.10—0.20	≤2.5 0.10—0.15
				JM	60 (50—120)	≤7.5 0.10—0.15	≤5.0 0.10—0.15	≤2.5 0.10—0.15	≤10.0 0.10—0.15	≤7.5 0.10—0.15	≤5.0 0.10—0.15	≤2.5 0.10—0.15
	Carbon Steel Alloy Steel	180—350HB		**WH**	60 (50—100)	≤10.0 0.10—0.25	≤5.0 0.10—0.20	≤2.5 0.10—0.15	≤12.5 0.10—0.25	≤10.0 0.10—0.25	≤5.0 0.10—0.20	≤2.5 0.10—0.15
				JM	60 (50—100)	≤7.5 0.10—0.15	≤5.0 0.10—0.15	≤2.5 0.10—0.15	≤10.0 0.10—0.15	≤7.5 0.10—0.15	≤5.0 0.10—0.15	≤2.5 0.10—0.15
	Alloy Tool Steel	≤300HB		**WH**	50 (40—80)	≤10.0 0.10—0.25	≤5.0 0.10—0.20	≤2.5 0.10—0.15	≤12.5 0.10—0.25	≤10.0 0.10—0.25	≤5.0 0.10—0.20	≤2.5 0.10—0.15
				JM	50 (40—80)	≤7.5 0.10—0.15	≤5.0 0.10—0.15	≤2.5 0.10—0.15	≤10.0 0.10—0.15	≤7.5 0.10—0.15	≤5.0 0.10—0.15	≤2.5 0.10—0.15
M	Stainless Steel	≤200HB	**VP20RT**	**WH**	40 (35—80)	≤10.0 0.08—0.15	≤5.0 0.08—0.15	≤2.5 0.05—0.10	≤12.5 0.08—0.15	≤10.0 0.08—0.15	≤5.0 0.08—0.15	≤2.5 0.05—0.10
				JM	40 (35—80)	≤7.5 0.08—0.15	≤5.0 0.08—0.15	≤2.5 0.05—0.10	≤10.0 0.08—0.15	≤7.5 0.08—0.15	≤5.0 0.08—0.15	≤2.5 0.05—0.10
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP15TF**	**WH**	50 (40—80)	≤10.0 0.15—0.25	≤5.0 0.10—0.25	≤2.5 0.10—0.20	≤12.5 0.15—0.25	≤10.0 0.15—0.25	≤5.0 0.10—0.25	≤2.5 0.10—0.20
				JM	50 (40—80)	≤7.5 0.10—0.20	≤5.0 0.10—0.20	≤2.5 0.10—0.20	≤10.0 0.10—0.20	≤7.5 0.10—0.20	≤5.0 0.10—0.20	≤2.5 0.10—0.20
	Ductile Cast Iron	Tensile Strength ≤800MPa		**WH**	40 (35—80)	≤10.0 0.15—0.25	≤5.0 0.10—0.25	≤2.5 0.10—0.20	≤12.5 0.15—0.25	≤10.0 0.15—0.25	≤5.0 0.10—0.25	≤2.5 0.10—0.20
				JM	40 (35—80)	≤7.5 0.10—0.20	≤5.0 0.10—0.20	≤2.5 0.10—0.20	≤10.0 0.10—0.20	≤7.5 0.10—0.20	≤5.0 0.10—0.20	≤2.5 0.10—0.20
S	Ti Alloy	≤350HB	**VP20RT**	**WH**	35 (30—50)	≤5.0 0.05—0.10	≤3.5 0.05—0.10	≤2.0 0.05—0.10	≤7.5 0.05—0.10	≤5.0 0.05—0.10	≤3.5 0.05—0.10	≤2.0 0.05—0.10
				JM	35 (30—50)	≤5.0 0.05—0.10	≤3.5 0.05—0.10	≤2.0 0.05—0.10	≤7.5 0.05—0.10	≤5.0 0.05—0.10	≤3.5 0.05—0.10	≤2.0 0.05—0.10

Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece, where no vibration occurred. Please adjust machining conditions if the vibration is generated.

Note 2) For slotting, please use high rigidity tools such as SPX4R05016WNES/BT50NES.

RECOMMENDED CUTTING CONDITIONS (SHELL TYPE)

SHOULDER MILLING

Workpiece Material		Hardness	Grade Breaker	Cutting Speed **vc** (m/min)	Depth of Cut **ap** (mm)	Cutting Width **ae** (mm)	Feed per Tooth **fz** (mm/t)
P	Mild Steel	≤180HB	**VP15TF** **JM**	120 (100−140)	−0.5DC	−10	0.15−0.30
				120 (100−140)	0.5DC−	−10	0.15−0.25
	Carbon Steel Alloy Steel	180−350HB	**VP15TF** **JM**	120 (80−130)	−0.5DC	−10	0.15−0.30
				100 (80−120)	0.5DC−	−10	0.15−0.25
	Alloy Tool Steel	≤300HB	**VP15TF** **JM**	100 (60−110)	−0.5DC	−10	0.10−0.20
				80 (60−100)	0.5DC−	−10	0.10−0.15
M	Stainless Steel	≤200HB	**VP20RT** **JM**	140 (100−150)	−0.5DC	−10	0.10−0.25
				120 (100−140)	0.5DC−	−10	0.10−0.20
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP15TF** **WH**	120 (80−130)	−0.5DC	−10	0.25−0.40
				100 (80−120)	0.5DC−	−10	0.25−0.40
			VP15TF **JM**	120 (80−130)	−0.5DC	−10	0.15−0.30
				100 (80−120)	0.5DC−	−10	0.15−0.25
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF** **WH**	100 (60−110)	−0.5DC	−10	0.20−0.35
				80 (60−110)	0.5DC−	−10	0.20−0.35
			VP15TF **JM**	100 (60−120)	−0.5DC	−10	0.15−0.30
				80 (60−120)	0.5DC−	−10	0.15−0.30
S	Ti Alloy	≤350HB	**VP20RT** **JM**	45 (35−50)	−0.5DC	−10	0.08−0.10
				40 (35−50)	0.5DC−	−10	0.08−0.10

Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece, where no vibration occurred. Please adjust machining conditions if the vibration is generated.

SLOT MILLING

Workpiece Material		Hardness	Grade Breaker	Cutting Speed **vc** (m/min)	Depth of Cut **ap** (mm)	Cutting Width **ae** (mm)	Feed per Tooth **fz** (mm/t)
P	Mild Steel	≤180HB	**VP15TF** **JM**	120 (100−140)	−10	DC	0.15−0.25
	Carbon Steel Alloy Steel	180−350HB	**VP15TF** **JM**	100 (80−120)	−0.25DC	DC	0.15−0.25
	Alloy Tool Steel	≤300HB	**VP15TF** **JM**	80 (60−100)	−10	DC	0.10−0.20
M	Stainless Steel	≤200HB	**VP20RT** **JM**	100 (80−140)	−10	DC	0.10−0.15
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP15TF** **WH**	80 (60−100)	−0.25DC	DC	0.10−0.25
				60 (50−100)	−0.6DC	DC	0.10−0.20
			VP15TF **JM**	80 (60−100)	−0.25DC	DC	0.10−0.20
				60 (50−100)	−0.6DC	DC	0.10−0.15
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF** **WH**	80 (60−100)	−0.25DC	DC	0.10−0.25
				60 (50−100)	−0.5DC	DC	0.10−0.20
			VP15TF **JM**	80 (60−100)	−0.25DC	DC	0.10−0.20
				60 (50−100)	−0.5DC	DC	0.10−0.15
S	Ti Alloy	≤350HB	**VP20RT** **JM**	40 (35−50)	−0.25DC	DC	0.06−0.10

Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece, where no vibration occurred. Please adjust machining conditions if the vibration is generated.

DEEP SHOULDER MILLING

<CUTTING FOR TITANIUM ALLOY>

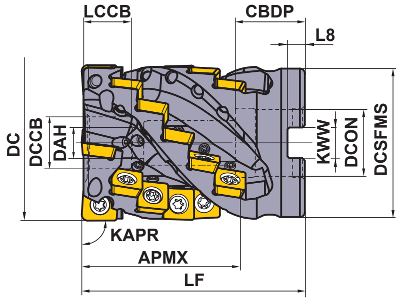
90° KAPR

ASPX

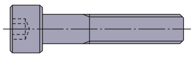
NEW

P M K N **S** H

Heat Resistant Alloy



Right hand tool holder only.

Cutter Diameter DC (mm)	Set Bolt	Geometry
ϕ50	HSC10070	
ϕ63	HSC12070	
ϕ80	HSC16080	

SHELL TYPE

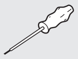
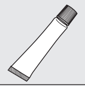
With Coolant Hole : Shell type should be combined with a through coolant arbor.

DC (mm)	Order Number	Stock	Number of Flutes	Total	Dimensions (mm)		WT (kg)	APMX (mm)
		R			LF	DCON		
50	**ASPX4-050A03A054RA15**	●	3	15	85	22	0.6	54
63	**ASPX4-063A04A064RA24**	●	4	24	90	27	1.0	64
80	**ASPX4-080A05A075RA35**	●	5	35	100	32	2.0	75

Mounting Dimensions

DC (mm)	Order Number	Dimensions (mm)							
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
50	**ASPX4-050A03A054RA15**	22	21	10.5	17	14	47	10.4	6.3
63	**ASPX4-063A04A064RA24**	27	28	12.5	21	19	60	12.4	7
80	**ASPX4-080A05A075RA35**	32	28	16.5	27	20	76	14.4	8

SPARE PARTS

Tool Holder Type	 *						Number of Insert	
	Clamp Screw	Seal Washer	Wrench	Coolant Nozzle	Number	Anti-seize Lubricant	JPGX	SPGX
ASPX4-050A	TS55	W10-S1	TKY25D	HSD04004H08	18	MK1KS	3	12
ASPX4-063A	TS55	W12-S1	TKY25D	HSD04004H08	28	MK1KS	4	20
ASPX4-080A	TS55	W16-S1	TKY25D	HSD04004H08	40	MK1KS	5	30

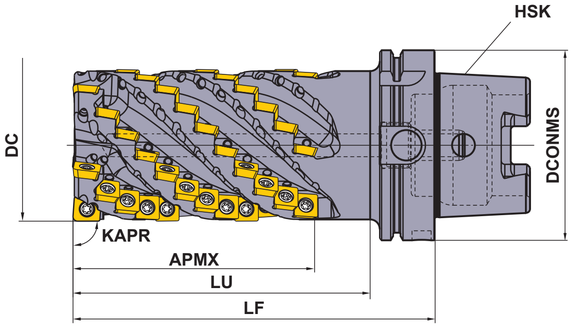
* Clamp Torque (N • m) : TS55 = 5.0

	≦1Mpa (≦20 l/min)	←Standard→	≧5Mpa (≧30 l/min)	≧7Mpa (≧50 l/min)	To Plug a Coolant Hole
Nozzle Dia.	ø0.6mm	ø0.8mm	ø1.2mm	ø1.6mm	–
Order Number	**HSD04004H06**	**HSD04004H08**	**HSD04004H12**	**HSD04004H16**	**HSS04004**

Note 1) Coolant nozzles are available with varying diameters for adjusting coolant pressure. Select nozzles as required by the specification.
Note 2) Use HSS04004 (JIS B 1177 flat point M4x4, clamp torque 1.5 Nm) to plug the coolant hole.

● : Inventory maintained in Japan.

Scan here for product NEWS ▶



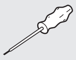
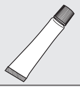
The standard type is right-handed (R) only.
The HSK shank type has a built-in movable coolant pipe for installation.

■HSK Shank Type

With Coolant Hole

DC (mm)	Order Number	Stock	Number of Flutes	Total	Dimensions (mm)			**HSK**	**APMX** (mm)
		R			**LF**	**LU**	**DCONMS**		
80	**ASPX4R0805H100A127SA**	●	5	60	190	156	100	HSK-A100	127
80	**ASPX4R0805H125A127SA**	●	5	60	190	156	125	HSK-A125	127

SPARE PARTS

Tool Holder Type	 *					Number of Insert	
	Clamp Screw	Wrench	Coolant Nozzle	Number	Anti-seize Lubricant	JPGX	SPGX
ASPX4R0805H100A	TS55	TKY25D	HSD04004H08	65	MK1KS	5	55
ASPX4R0805H125A	TS55	TKY25D	HSD04004H08	65	MK1KS	5	55

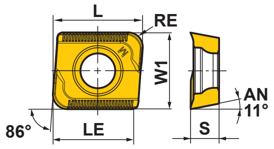
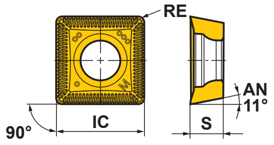
⁎ Clamp Torque (N • m) : TS55 = 5.0

ISO13399 ➢ L003
SPARE PARTS ➢ P001
TECHNICAL DATA ➢ Q001

INSERTS

Workpiece Material			Coated
	S	Heat resistant Alloy	◐

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting
Edge Preparation :
E : Round

Shape		Order Number	Class	Edge Preparation	Coated MP9140	L	LE	W1	IC	S	RE	Geometry
Bottom	 2 Corner	**JPGX1404080PPER-JM**	G	E	●	15.12	13.4	12.7	—	4.8	0.8	
		JPGX1404120PPER-JM	G	E	●	15.06	13.3	12.7	—	4.8	1.2	
		JPGX1404160PPER-JM	G	E	●	15.00	13.3	12.7	—	4.8	1.6	
		JPGX1404240PPER-JM	G	E	●	14.88	13.2	12.7	—	4.8	2.4	
		JPGX1404320PPER-JM	G	E	●	14.72	13.1	12.7	—	4.8	3.2	
		JPGX1404400PPER-JM	G	E	●	14.64	13.0	12.7	—	4.8	4.0	
		JPGX1404500PPER-JM	G	E	●	14.49	13.0	12.7	—	4.8	5.0	
		JPGX1404635PPER-JM	G	E	●	14.29	12.9	12.7	—	4.8	6.35	
Peripheral	 4 Corner	**SPGX1204100PPER-JM**	G	E	●	—	—	—	12.7	4.8	1.0	

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Cutting Width **ae** (mm)	Cutting Speed **vc** (m/min)	Feed per Tooth **fz** (mm/t)
S	Ti Alloys Ti-6Al-4V,Ti-6Al-4V-ELI Ti-10V-2Fe-3Al Ti-5Al-5V-5Mo-3Cr etc.	ae≤0.5DC	60(50—80)	0.12(0.10—0.14)
		0.5DC<ae<0.8DC	50(40—60)	0.10(0.08—0.12)
		ae≥0.8DC	40(50—60)	0.08(0.06—0.10)

Note 1) The cutting performance depends on machine and clamping rigidity, as well as the supply and pressure of the coolant. Adjust as necessary.

Note 2) Use a machine and spindle size suitable for heavy machining of titanium alloys. (7/24 taper #50 or #60, or high rigidity HSK-A100 or A125, with an output of 15kW or higher and torque of 500 Nm or higher for a rotation speed of 500min^{-1} or less).
Caution, at high load cutting conditions the output power of the machine spindle may be exceeded.

Note 3) If chatter and vibration or machine overloading occur, it is recommended to reduce the depth of cut ap.

Note 4) The coolant system combines internal and external lubrication. It is recommended to supply coolant in ample quantities.

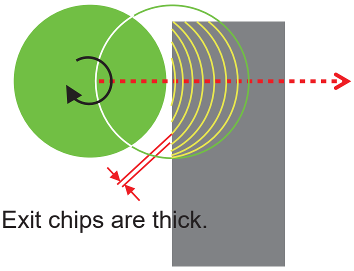
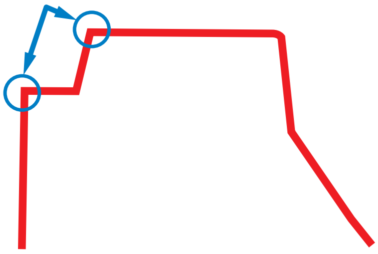
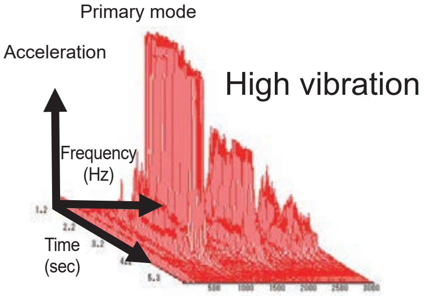
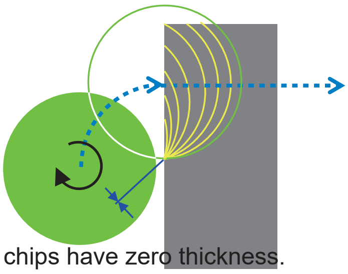
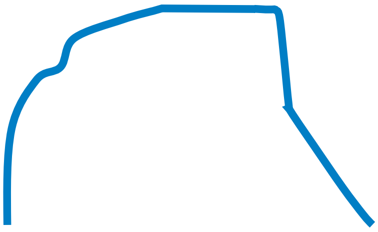
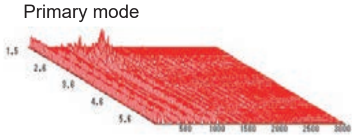
Note 5) A gradual roll feed into the workpiece and use of down cutting (climb milling) is recommended. (refer to page L291)

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

How to Use

■Positive Effects of a Roll Into Cutting Approach

The roll into cutting approach can control sharp increases in cutting loads and prevent sudden chipping of inserts which is likely to occur at the start of machining.

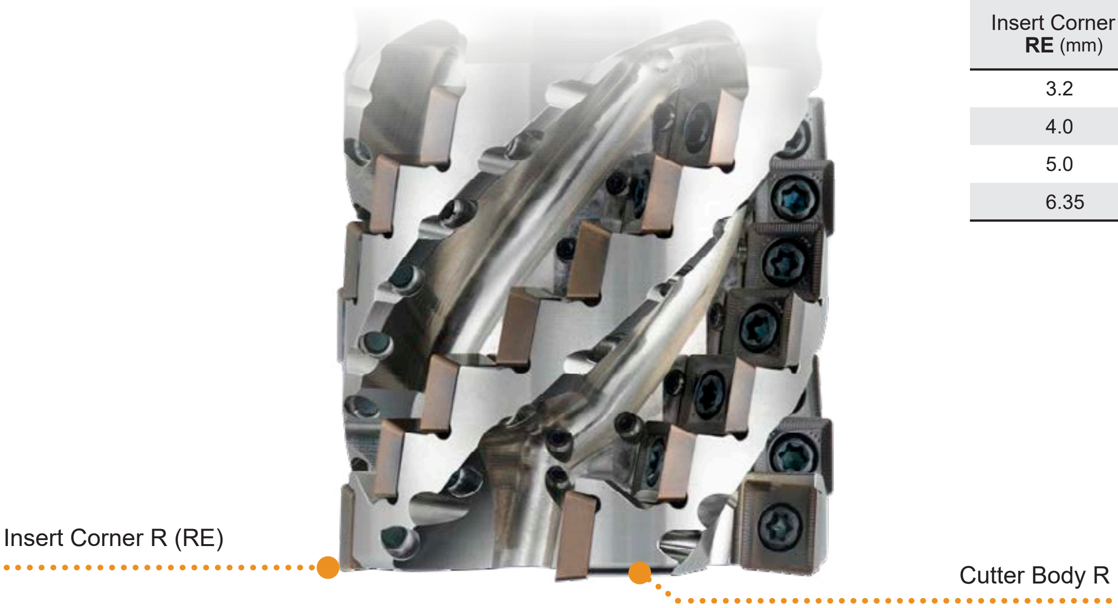
Approach Method	Cutting Load Simulation	Image of Cutting Vibration Frequency
Direct Approach  Exit chips are thick.	Cutting load increases suddenly. High risk of chipping. 	
Roll Into Cutting Approach  Exit chips have zero thickness.	Cutting load increases smoothly. 	Almost no vibration 

Down cutting (climb milling) is recommended.

■Use of Inserts with Large Corner Radii

When using inserts with corner radius RE≥R3.2mm, please machine the cutter body with a radius form as shown in the table below.

Insert Corner R **RE** (mm)	Cutter Body Radius **R** (mm)
3.2	3.0
4.0	4.0
5.0	5.0
6.35	6.2

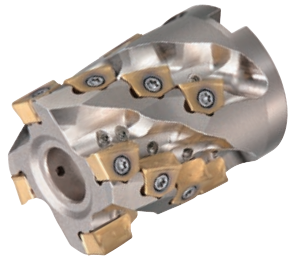


DEEP SHOULDER MILLING
<CUTTING FOR TITANIUM ALLOY>

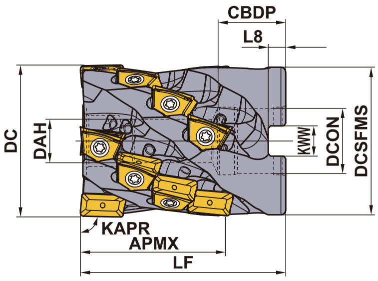
VFX5

P M K N **S** H

Heat Resistant Alloy



- **Vertical inserts with high strength cutting edge.**
- **Screw-on type clamping.**
- **High efficiency milling of titanium alloys.**



Right hand tool holder only.

SHELL TYPE

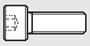
With Coolant Hole

Order Number	Stock	Number of Flutes	Number of Teeth	Dimensions (mm)								APMX (mm)	WT(kg)
	R			DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8		
VFX5-040A03A026R	▲	3	6	40	50	16	21	8.5	38.2	8.4	5.6	26	0.3
VFX5-040A03A038R	▲	3	9	40	60	16	21	8.5	38.2	8.4	5.6	38	0.4
VFX5-050X03A026R	▲	3	6	50	50	27	23	12.5	48.2	12.4	7.0	26	0.4
VFX5-050X03A038R	▲	3	9	50	60	27	23	12.5	48.2	12.4	7.0	38	0.5
VFX5-050A04A026R	▲	4	8	50	50	22	21	10.5	48.2	10.4	6.3	26	0.5
VFX5-050A04A038R	▲	4	12	50	60	22	21	10.5	48.2	10.4	6.3	38	0.6
VFX5-050X04A038R	▲	4	12	50	60	27	23	12.5	48.2	12.4	7.0	38	0.5
VFX5-050A04A050R	▲	4	16	50	70	22	21	10.5	48.2	10.4	6.3	50	0.7
VFX5-063A05A026R	▲	5	10	63	60	27	28	12.5	61	12.4	7.0	26	1.0
VFX5-063A05A063R	▲	5	25	63	85	27	28	12.5	61	12.4	7.0	63	1.4
VFX5-080A06A075R	▲	6	36	80	100	32	28	16.5	77.3	14.4	8.0	75	2.8

Scan here for product NEWS ▶

▲ : Inventory maintained in Japan. To be replaced by new products.

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-◌◌**
VFX5-040A03A026R	TS352	6	W8-S1	TKY10D	HSD04004H08	9	MK1KS	HSC08040	3	3
VFX5-040A03A038R	TS352	9	W8-S1	TKY10D	HSD04004H08	12	MK1KS	HSC08050	3	6
VFX5-050X03A026R	TS352	6	W12-S1	TKY10D	HSD04004H08	9	MK1KS	HSC12035	3	3
VFX5-050X03A038R	TS352	9	W12-S1	TKY10D	HSD04004H08	12	MK1KS	HSC12045	3	6
VFX5-050A04A026R	TS352	8	W10-S1	TKY10D	HSD04004H08	12	MK1KS	HSC10035	4	4
VFX5-050A04A038R	TS352	12	W10-S1	TKY10D	HSD04004H08	16	MK1KS	HSC10045	4	8
VFX5-050X04A038R	TS352	12	W12-S1	TKY10D	HSD04004H08	16	MK1KS	HSC12045	4	8
VFX5-050A04A050R	TS352	16	W10-S1	TKY10D	HSD04004H08	20	MK1KS	HSC10055	4	12
VFX5-063A05A026R	TS352	10	W12-S1	TKY10D	HSD04004H08	15	MK1KS	HSC12045	5	5
VFX5-063A05A063R	TS352	25	W12-S1	TKY10D	HSD04004H08	30	MK1KS	HSC12070	5	20
VFX5-080A06A075R	TS352	36	W16-S1	TKY10D	HSD04004H08	42	MK1KS	HSC16080	6	30

*1 Only corner radius R0.8 can be used for the peripheral cutting edges except the end cutting edge.

*2 Clamp Torque (N • m) : TS352=2.5

*3 Coolant nozzles are available with varying diameters for adjusting coolant pressure. Select nozzles as required by the specification.

	≤1Mpa (≤20 l/min)	←Standard→	**≥5Mpa (≥30 l/min)**	**≥7Mpa (≥50 l/min)**
Nozzle Dia.	ø0.6mm	ø0.8mm	ø1.2mm	ø1.6mm
Order Number	**HSD04004H06**	**HSD04004H08**	**HSD04004H12**	**HSD04004H16**

* Clamp Torque (N • m) : HSD0400H◌◌=1.5

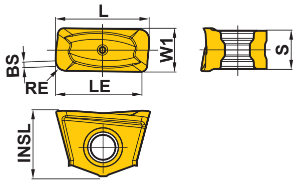
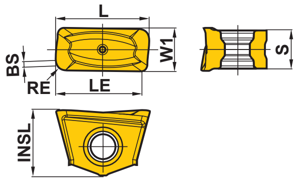
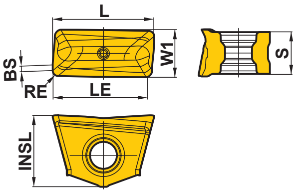
Note 1) The part number for a blank screw without a through nozzle is HSS04004.

Note 2) Note for insert with a corner radius of 3.2 and above, as corner radius increases the LF dimension increases.
Corner radius 3.2: LF+0.7mm Corner radius 4.0: LF+1.5mm

ISO13399 ➤L003
SPARE PARTS ➤P001
TECHNICAL DATA ➤Q001

INSERTS

Workpiece Material	S	Heat resistant Alloy, Titanium Alloy	✤				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Shape	Order Number	Stock				Dimensions (mm)							Geometry
		Coated											
		MP9130				L	LE	W1	INSL	S	BS	RE	
General Purpose 	**XNMU160708R-MS**	▲				16.0	13.4	7.0	11.1	6.5	1.0	0.8	
	XNMU160712R-MS	▲				16.0	13.8	7.0	11.1	6.5	1.0	1.2	
	XNMU160716R-MS	▲				16.0	13.8	7.0	11.1	6.5	1.0	1.6	
	XNMU160724R-MS	▲				16.0	13.8	7.0	11.1	6.5	1.0	2.4	
	*1 **XNMU160732R-MS**	▲				17.3	14.4	7.0	11.1	6.5	—	3.2	
	*1 **XNMU160740R-MS**	▲				18.9	15.2	7.0	11.1	6.5	—	4.0	
Cutting Edge Enhancement Type 	**XNMU160708R-HS**	▲				16.0	13.4	7.0	11.1	6.5	1.0	0.8	
Chip Processing Type 	**XNMU160708R-LS**	▲				16.0	13.4	7.0	11.1	6.5	1.0	0.8	

*1 Note for insert with a corner radius of 3.2 and above, as corner radius increases the LF dimension increases.
Corner radius 3.2: LF+0.7mm Corner radius 4.0: LF+1.5mm

▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains 10 pieces per case.)

RECOMMENDED CUTTING CONDITIONS

■VFX5

Workpiece Material		Cutting Edge Diameter (mm)	Number of Flutes	Recommended Insert	Cutting Speed **vc** (m/min)	Revolution **n** (min^{-1})	Depth of Cut **apmax** (mm)	Cutting Width **ae** (mm)	Feed per Tooth **fz** (mm/t)	Table Feed **vf** (mm/min)	Chip Removal Rate **Q** (cm^3/min)	Estimated Cutting Power (kW)	Expected Torque (Nm)	Tool Life Ratio (%)
S	Titanium Alloy (Ti-6Al-4V)	**ϕ40**	3	LS	40	318	38	40	0.10	95	145	6.5	194	40
			3	MS	50	398	38	24	0.10	119	109	4.5	109	60
			3	MS	60	477	38	16	0.10	143	87	3.5	69	80
			3	HS	60	477	38	8	0.12	172	52	2.3	45	100
		ϕ50	3	LS	40	255	38	50	0.10	76	145	6.5	242	40
			4	MS	50	318	50	30	0.10	127	191	7.9	237	60
			4	MS	60	382	50	20	0.10	153	153	6.0	151	80
			4	HS	60	382	50	10	0.12	183	92	3.9	98	100
		ϕ63	5	LS	40	202	60	63	0.10	101	382	16.8	793	40
			5	MS	50	253	60	38	0.10	126	286	11.8	447	60
			5	MS	60	303	60	25	0.10	152	229	9.0	285	80
			5	HS	60	303	60	13	0.12	182	138	5.9	185	100
		ϕ80	6	LS	40	159	75	80	0.10	95	573	25.0	1500	40
			6	MS	50	199	75	48	0.10	119	430	17.6	846	60
			6	MS	60	239	75	32	0.10	143	344	13.5	539	80
			6	HS	60	239	75	16	0.12	172	206	8.7	350	100
	Titanium Alloy (Ti-5Al-5V-5Mo-3Cr)	**ϕ40**	3	LS	25	199	38	40	0.08	48	73	3.4	161	30
			3	MS	25	199	38	24	0.08	48	44	1.9	92	50
			3	MS	30	239	38	16	0.10	72	44	1.8	74	70
			3	HS	30	239	38	8	0.10	72	22	1.0	41	90
		ϕ50	4	LS	25	159	50	50	0.08	51	127	5.8	350	30
			4	MS	25	159	50	30	0.08	51	76	3.4	201	50
			4	MS	30	191	50	20	0.10	76	76	3.2	160	70
			4	HS	30	191	50	10	0.10	76	38	1.8	89	90
		ϕ63	5	LS	25	126	60	63	0.08	51	191	8.7	658	30
			5	MS	25	126	60	38	0.08	51	115	5.0	378	50
			5	MS	30	152	60	25	0.10	76	115	4.8	301	70
			5	HS	30	152	60	13	0.10	76	57	2.6	167	90
		ϕ80	6	LS	25	99	75	80	0.08	48	286	13.0	1246	30
			6	MS	25	99	75	48	0.08	48	172	7.5	716	50
			6	MS	30	119	75	32	0.10	72	172	7.1	570	70
			6	HS	30	119	75	16	0.10	72	86	3.9	316	90

Note 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.

Note 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.

Note 3) The tool life ratio shows the standard when ae = tool diameter × 20% is assumed to be 100 when shoulder cutting.

Note 4) The maximum depth of cut (apmax) varies according to the machine rigidity and power.

DEEP SHOULDER MILLING

<CUTTING FOR TITANIUM ALLOY>

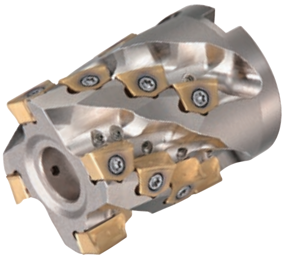
90° KAPR

R

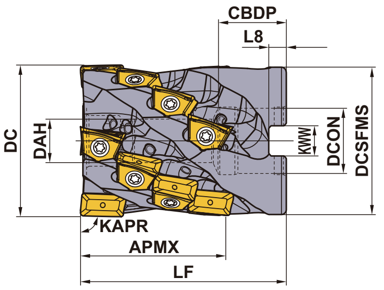
VFX6

P M K N **S** H

Heat Resistant Alloy



- Vertical inserts with high strength cutting edge.
- Screw-on type clamping.
- High efficiency milling of titanium alloys.



Right hand tool holder only.

SHELL TYPE

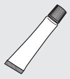
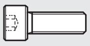
With Coolant Hole

Order Number	Stock	Number of Flutes	Number of Teeth	Dimensions (mm)								APMX (mm)	WT(kg)
	R			DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8		
VFX6-063A04A031R	▲	4	8	63	60	27	28	12.5	61	12.4	7	31	0.9
VFX6-063A04A060R	▲	4	16	63	85	27	28	12.5	61	12.4	7	60	1.3
VFX6-080A05A031R	▲	5	10	80	60	32	28	16.5	77.3	14.4	8	31	1.5
VFX6-080A05A075R	▲	5	25	80	100	32	28	16.5	77.3	14.4	8	75	2.6
VFX6-100A06A031R	▲	6	12	100	65	40	30	20.5	96.6	16.4	9	31	2.7
VFX6-100A06A090R	▲	6	36	100	115	40	30	20.5	96.6	16.4	9	90	4.8

Scan here for product NEWS ▶

▲ : Inventory maintained in Japan. To be replaced by new products.

SPARE PARTS

Order Number	 *2				 *3				Number of Insert	
									End Cutting Edge	Peripheral Cutting Edge *1
	Clamp Screw	Number	Seal Washer	Wrench	Coolant Nozzle	Number	Anti-seize Lubricant	Set Bolt	**XNMU1909 ◌◌R-◌◌**	**XNMU1909 12R-◌◌**
VFX6-063A04A031R	TS450	8	W12-S1	TKY20T	HSD04004H08	12	MK1KS	HSC12045	4	4
VFX6-063A04A060R	TS450	16	W12-S1	TKY20T	HSD04004H08	20	MK1KS	HSC12070	4	12
VFX6-080A05A031R	TS450	10	W16-S1	TKY20T	HSD04004H08	15	MK1KS	HSC16040	5	5
VFX6-080A05A075R	TS450	25	W16-S1	TKY20T	HSD04004H08	30	MK1KS	HSC16080	5	20
VFX6-100A06A031R	TS450	12	W20-S1	TKY20T	HSD04004H08	18	MK1KS	HSC20040	6	6
VFX6-100A06A090R	TS450	36	W20-S1	TKY20T	HSD04004H08	42	MK1KS	HSC20090	6	30

*1 Only corner radius R1.2 can be used for the peripheral cutting edges except the end cutting edge.

*2 Clamp Torque (N • m) : TS450=5.0

*3 Coolant nozzles are available with varying diameters for adjusting coolant pressure. Select nozzles as required by the specification.

	≤1Mpa (≤20 l/min)	←Standard→	**≥5Mpa (≥30 l/min)**	**≥7Mpa (≥50 l/min)**
Nozzle Dia.	ø0.6mm	ø0.8mm	ø1.2mm	ø1.6mm
Order Number	**HSD04004H06**	**HSD04004H08**	**HSD04004H12**	**HSD04004H16**

* Clamp Torque (N • m) : HSD0400H◌◌=1.5

Note 1) The part number for a blank screw without a through nozzle is HSS04004.

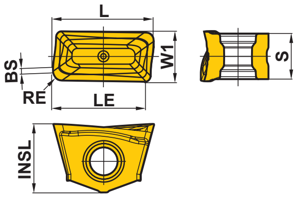
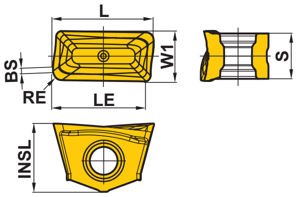
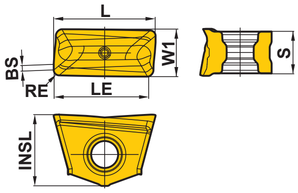
Note 2) Note for insert with a corner radius of 3.2 and above, as corner radius increases the LF dimension increases.
Corner radius 3.2: LF+0.7mm Corner radius 4.0: LF+1.5mm Corner radius 5.0: LF+1.5mm

ISO13399 ➤L003
SPARE PARTS ➤P001
TECHNICAL DATA ➤Q001

INSERTS

Workpiece Material	S	Heat resistant Alloy, Titanium Alloy	✤		

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Shape	Order Number	Stock			Dimensions (mm)							Geometry
		Coated										
		MP9130			L	LE	W1	INSL	S	BS	RE	
General Purpose 	**XNMU190912R-MS**	▲			19.1	16.5	9.5	12.7	8.5	1.0	1.2	
	XNMU190916R-MS	▲			19.1	16.5	9.5	12.7	8.5	1.0	1.6	
	XNMU190924R-MS	▲			19.1	16.6	9.5	12.7	8.5	1.0	2.4	
	*1 **XNMU190932R-MS**	▲			20.2	17.1	9.5	12.7	8.5	—	3.2	
	*1 **XNMU190940R-MS**	▲			21.8	17.8	9.5	12.7	8.5	—	4.0	
	*1 **XNMU190950R-MS**	▲			21.8	17.8	9.5	12.7	8.5	—	5.0	
Cutting Edge Enhancement Type 	**XNMU190912R-HS**	▲			19.1	16.5	9.5	12.7	8.5	1.0	1.2	
Chip Processing Type 	**XNMU190912R-LS**	▲			19.1	16.5	9.5	12.7	8.5	1.0	1.2	

*1 Note for insert with a corner radius of 3.2 and above, as corner radius increases the LF dimension increases.
Corner radius 3.2: LF+0.7mm Corner radius 4.0: LF+1.5mm Corner radius 5.0: LF+1.5mm

▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains 10 pieces per case.)

RECOMMENDED CUTTING CONDITIONS

■VFX6

Workpiece Material		Cutting Edge Diameter (mm)	Number of Flutes	Recommended Insert	Cutting Speed **vc** (m/min)	Revolution **n** (min^{-1})	Depth of Cut **apmax** (mm)	Cutting Width **ae** (mm)	Feed per Tooth **fz** (mm/t)	Table Feed **vf** (mm/min)	Chip Removal Rate **Q** (cm^3/min)	Estimated Cutting Power (kW)	Expected Torque (Nm)	Tool Life Ratio (%)
S	Titanium Alloy (Ti-6Al-4V)	**ϕ63**	4	LS	40	202	60	63	0.10	81	306	13.4	634	40
			4	MS	50	253	60	38	0.10	101	229	9.5	357	60
			4	MS	60	303	60	25	0.10	121	183	7.2	228	80
			4	HS	60	303	60	13	0.12	146	110	4.7	148	100
		ϕ80	5	LS	40	159	75	80	0.10	80	477	20.8	1250	40
			5	MS	50	199	75	48	0.10	99	358	14.7	705	60
			5	MS	60	239	75	32	0.10	119	286	11.2	449	80
			5	HS	60	239	75	16	0.12	143	172	7.3	291	100
		ϕ100	6	LS	40	127	90	100	0.10	76	688	29.6	2218	40
			6	MS	50	159	90	60	0.10	95	516	20.9	1252	60
			6	MS	60	191	90	40	0.10	115	413	16.0	798	80
			6	HS	60	191	90	20	0.12	138	248	10.3	517	100
	Titanium Alloy (Ti-5Al-5V-5Mo-3Cr)	**ϕ63**	4	LS	25	126	60	63	0.08	40	153	7.0	527	30
			4	MS	25	126	60	38	0.08	40	92	4.0	303	50
			4	MS	30	152	60	25	0.10	61	92	3.8	241	70
			4	HS	30	152	60	13	0.10	61	46	2.1	133	80
		ϕ80	5	LS	25	99	75	80	0.08	40	239	10.8	1038	30
			5	MS	25	99	75	48	0.08	40	143	6.2	597	50
			5	MS	30	119	75	32	0.10	60	143	5.9	475	70
			5	HS	30	119	75	16	0.10	60	72	3.3	263	80
		ϕ100	6	LS	25	80	90	100	0.08	38	344	15.3	1841	30
			6	MS	25	80	90	60	0.08	38	206	8.8	1059	50
			6	MS	30	95	90	40	0.10	57	206	8.4	844	70
			6	HS	30	95	90	20	0.10	57	103	4.7	466	80

Note 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.

Note 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.

Note 3) The tool life ratio shows the standard when ae = tool diameter × 20% is assumed to be 100 when shoulder cutting.

Note 4) The maximum depth of cut (apmax) varies according to the machine rigidity and power.

BALL NOSE END MILL

SRF/SRB

P	M	K	N	S	H
Steel		Cast Iron	Non-ferrous Metal		Hardened Steel

- 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.

Fig.1

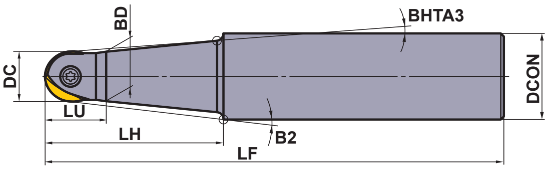


Fig.2

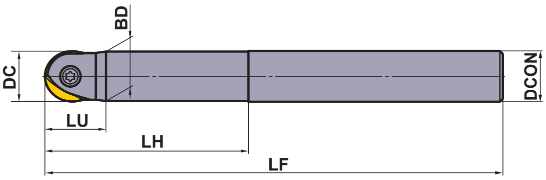
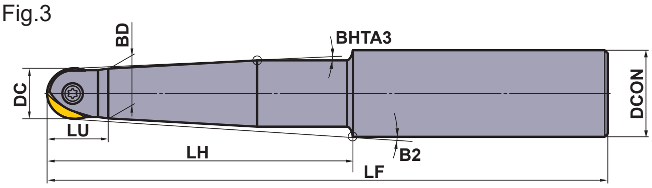


Fig.3



Right hand tool holder only.

STEEL SHANK TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)									Fig.	*1	D T	
		R		RE*2	DC	DCON	LF	BD	LH	LU	B2	BHTA3		Clamp Screw	Wrench	Insert
Standard	**SRFH10S12M**	●	1	5	10	12	110	9.5	40	13	1.63°	1.5°	1	RS3008T	TKY08D	SRFT10 SRBT10
	SRFH12S16M	●	1	6	12	16	120	11.5	50	15	2.6°	1.5°	1	RS3510T	TKY10D	SRFT12 SRBT12
	SRFH16S20M	●	1	8	16	20	130	15.5	50	20	2.73	1.5°	1	RS4015T	TKY15T	SRFT16 SRBT16
	SRFH20S25M	●	1	10	20	25	150	19.5	70	24	2.38°	1.5°	1	RS5020T	TKY20T	SRFT20 SRBT20
	SRFH25S32M	●	1	12.5	25	32	180	24.5	80	30	2.97°	1.5°	1	RS6025T	TKY25T	SRFT25 SRBT25
	SRFH30S32M	●	1	15	30	32	200	29.5	100	35	—	—	2	RS8030T	TKY30T	SRFT30 SRBT30
	SRFH32S32M	●	1	16	32	32	200	31.5	100	35	—	—	2	RS8030T	TKY30T	SRFT32 SRBT32
Semi-long	**SRFH10S12L**	●	1	5	10	12	150	9.5	60	13	1.5°	1.5°	1	RS3008T	TKY08D	SRFT10 SRBT10
	SRFH12S16L	●	1	6	12	16	160	11.5	70	15	1.78°	1.5°	1	RS3510T	TKY10D	SRFT12 SRBT12
	SRFH16S20L	●	1	8	16	20	160	15.5	70	20	1.85°	1.5°	1	RS4015T	TKY15T	SRFT16 SRBT16
	SRFH20S25L	●	1	10	20	25	180	19.5	80	24	2.05°	1.5°	1	RS5020T	TKY20T	SRFT20 SRBT20
	SRFH20S20L80	●	1	10	20	20	180	19.5	80	24	—	—	2	RS5020T	TKY20T	SRFT20 SRBT20
	SRFH25S32L	●	1	12.5	25	32	200	24.5	100	30	2.28°	1.5°	1	RS6025T	TKY25T	SRFT25 SRBT25
	SRFH25S25L100	●	1	12.5	25	25	200	24.5	100	30	—	—	2	RS6025T	TKY25T	SRFT25 SRBT25
	SRFH30S32L	●	1	15	30	32	230	29.5	130	35	—	—	2	RS8030T	TKY30T	SRFT30 SRBT30
Long	**SRFH20S25E**	●	1	10	20	25	220	19.5	120	24	1.5°	1.5°	3	RS5020T	TKY20T	SRFT20 SRBT20
	SRFH20S20E120	●	1	10	20	20	220	19.5	120	24	—	—	2	RS5020T	TKY20T	SRFT20 SRBT20
	SRFH25S32E	●	1	12.5	25	32	250	24.5	150	30	1.5°	1.5°	3	RS6025T	TKY25T	SRFT25 SRBT25
	SRFH25S25E150	●	1	12.5	25	25	250	24.5	150	30	—	—	2	RS6025T	TKY25T	SRFT25 SRBT25
	SRFH30S32E	●	1	15	30	32	300	29.5	200	35	—	—	2	RS8030T	TKY30T	SRFT30 SRBT30

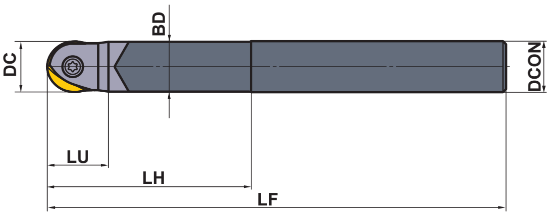
*1 Clamp Torque (N • m) : RS3008T=1.5, RS3510T=2.5, RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0

*2 RE is shown for insert corner R.

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

Fig.1



Right hand tool holder only.

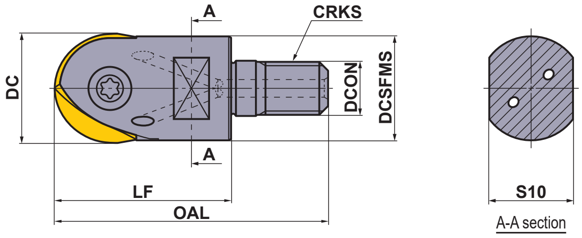
CARBIDE SHANK TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)							Fig.	*1	D T	
		R		RE*2	DC	DCON	LF	BD	LH	LU		Clamp Screw	Wrench	Insert
Standard	**SRFH10S10MW**	●	1	5	10	10	110	9.5	40	13	1	RS3008T	TKY08D	SRFT10 SRBT10
	SRFH12S12MW	●	1	6	12	12	120	11.5	50	15	1	RS3510T	TKY10D	SRFT12 SRBT12
	SRFH16S16MW	●	1	8	16	16	130	15.5	50	20	1	RS4015T	TKY15T	SRFT16 SRBT16
	SRFH20S20MW	●	1	10	20	20	180	19.5	80	24	1	RS5020T	TKY20T	SRFT20 SRBT20
	SRFH25S25MW	●	1	12.5	25	25	200	24.5	100	30	1	RS6025T	TKY25T	SRFT25 SRBT25
	SRFH30S32MW	●	1	15	30	32	230	29.5	130	35	1	RS8030T	TKY30T	SRFT30 SRBT30
				16	32	32	231	29.5	131	36				SRFT32 SRBT32
Long	**SRFH10S10LW**	●	1	5	10	10	150	9.5	60	13	1	RS3008T	TKY08D	SRFT10 SRBT10
	SRFH12S12LW	●	1	6	12	12	160	11.5	70	15	1	RS3510T	TKY10D	SRFT12 SRBT12
	SRFH16S16LW	●	1	8	16	16	160	15.5	70	20	1	RS4015T	TKY15T	SRFT16 SRBT16
	SRFH16S16EW	●	1	8	16	16	200	15.5	110	20	1	RS4015T	TKY15T	SRFT16 SRBT16
	SRFH20S20LW	●	1	10	20	20	250	19.5	150	24	1	RS5020T	TKY20T	SRFT20 SRBT20
	SRFH25S25LW	●	1	12.5	25	25	300	24.5	200	30	1	RS6025T	TKY25T	SRFT25 SRBT25
	SRFH30S32LW	●	1	15	30	32	350	29.5	250	35	1	RS8030T	TKY30T	SRFT30 SRBT30
				16	32	32	351	29.5	251	36				SRFT32 SRBT32

Note 1) SRFH30S32MW and SRFH30S32LW tool bodies can use both inserts SRFT30 and SRFT32.
However the overall length sizes, LF and LH, differ respectively.

*1 Clamp Torque (N • m) : RS3008T=1.5, RS3510T=2.5, RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0

*2 RE is shown for insert corner R.



SCREW-IN TYPE

Right hand tool holder only.

Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)								WT (kg)	*1		
	R			RE *2	DC	DCON	DCSFMS	OAL	LF	S10	CRKS		Clamp Screw	Wrench	Insert
SRFH16AM0830	●	○	1	8	16	8.5	14.9	48	30	10	8	0.1	RS4015T	TKY15T	SRFT16 SRBT16
SRFH20AM1035	●	○	1	10	20	10.5	18.4	54	35	14	10	0.1	RS5020T	TKY20T	SRFT20 SRBT20
SRFH25AM1240	●	○	1	12.5	25	12.5	23.5	62	40	19	12	0.1	RS6025T	TKY25T	SRFT25 SRBT25
SRFH30AM1645	●	○	1	15	30	17	28.1	68	45	24	16	0.2	RS8030T	TKY30T	SRFT30 SRBT30
				16	32	17	28.1	69	46	24	16	0.2			SRFT32 SRBT32

Note 1) SRFH30AM1645 tool body can use both inserts SRFT30 and SRFT32. However, the overall length sizes, OAL and LF, differ respectively.

Note 2) For screw-in type arbors, refer to page L341.

*1 Clamp Torque (N • m) : RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0

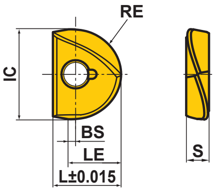
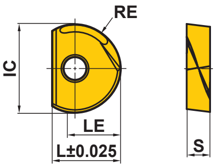
*2 RE is shown for insert corner R.

ISO13399 ➤ L003
ARBORS ➤ L341
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

INSERTS

Workpiece Material			EP6120	VP15TF	MP8010	
	P	Steel	◐	◐		
	M	Stainless Steel		◐		
	K	Cast Iron		✤	●	
	N	Non-ferrous Metal	◐			
	H	Hardened Steel	◐	◐	●	

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

Shape	Order Number	Coated				Dimensions (mm)							Geometry
		EP6120	VP15TF	MP8010		IC	RE		L	LE	BS	S	
							Corner R	Tolerance					
	**SRFT10**	●	●	●		10	5	±0.006	8.5	5.5	0.5	2.6	
	SRFT12	●	●	●		12	6	±0.006	10	6.5	0.5	3	
	SRFT16	●	●	●		16	8	±0.006	12	9	1	4	
	SRFT20	●	●	●		20	10	±0.006	15	11	1	5	
	SRFT25	●	●	●		25	12.5	±0.006	18.5	13.5	1	6	
	SRFT30	●	●	●		30	15	±0.006	22.5	16	1	7	
	SRFT32	●	●	●		32	16	±0.006	23.5	17	1	7	
	**SRBT10**		●			10	5	±0.02	8.5	5	—	2.6	
	SRBT12		●			12	6	±0.02	10	6	—	3	
	SRBT16		●			16	8	±0.025	12	8	—	4	
	SRBT20		●			20	10	±0.025	15	10	—	5	
	SRBT25		●			25	12.5	±0.035	18.5	12.5	—	6	
	SRBT30		●			30	15	±0.035	22.5	15	—	7	
	SRBT32		●			32	16	±0.035	23.5	16	—	7	

FITTING INSERTS ON HOLDERS

1. Clean the insert seat

Clean the insert seat in the holder body by blowing air or using a brush.

2. Fit the insert

Place the concave mark of the insert into the clamp-screw-fastening part of the holder(only SRF type inserts). Fasten the clamp screw while firmly pressing the insert against the insert seat wall. It is recommended to use the special lubricant for preventing screw seizing, MK1KS, and to fasten with recommended torque.

● : Inventory maintained in Japan.
(Contains 2 inserts per case.)

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed vc (m/min)	Feed per Tooth fz (mm/t)	Depth of Cut ap (mm)
P	Mild Steel (ASTM A36, AISI 1010)	≤180HB	**EP6120**	200 (80—300)	0.2 (0.1—0.3)	≤0.05DC
	Carbon Steel, Alloy Steel (AISI 1045, AISI 4140)	180—280HB	**EP6120**	200 (80—300)	0.2 (0.1—0.3)	≤0.05DC
			VP15TF	200 (80—300)	0.2 (0.1—0.3)	≤0.05DC
	Carbon Steel, Alloy Steel (AISI 4340)	280—350HB	**EP6120**	200 (80—300)	0.2 (0.1—0.3)	≤0.05DC
	Pre-Hardened Steel (AISI P21, AISI P20 etc)	35—45HRC	**EP6120**	150 (80—200)	0.2 (0.1—0.3)	≤0.05DC
			VP15TF	150 (80—200)	0.2 (0.1—0.3)	≤0.05DC
	Alloy Tool Steel	≤350HB	**EP6120**	150 (80—200)	0.2 (0.1—0.3)	≤0.05DC
			VP15TF	150 (80—200)	0.2 (0.1—0.3)	≤0.05DC
K	Gray Cast Iron (FC300)	Tensile Strength ≤350MPa	**MP8010**	250 (80—450)	0.2 (0.1—0.3)	≤0.05DC
	Ductile Cast Iron (FCD450)	Tensile Strength ≤450MPa	**MP8010**	200 (80—300)	0.2 (0.1—0.3)	≤0.05DC
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MP8010**	200 (80—300)	0.2 (0.1—0.3)	≤0.05DC
N	Copper, Copper alloys	—	**EP6120**	200 (80—300)	0.2 (0.1—0.3)	≤0.05DC
H	Hardened Steel	45—55HRC	**MP8010**	100 (60—120)	0.2 (0.1—0.3)	≤0.05DC
	Hardened Steel	55—65HRC	**MP8010**	80 (60—120)	0.2 (0.1—0.3)	≤0.01DC

Note 1) The above values are average condition values at actual cutting speeds. The values change slightly according to the state of a machine to be used and method of workholding. Adjust the values depending on an actual machine condition, referring to the above values.

Note 2) For end mills with a carbide shank, you will be able to set about 20% higher cutting conditions.

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.
- Please note the setting of the depth of cut especially to prevent the fracture.

CUTTING SPEED FORMULAE

1. Employingθ° ➡ Calculate cutting speed at point P.
(Cutting speed at the cutting depth border for oblique machining)

Formula : Cutting Speed = $\frac{\pi \cdot \mathrm{DC} \cdot \sin\theta \cdot \mathrm{n}}{1000}$ (m/min)

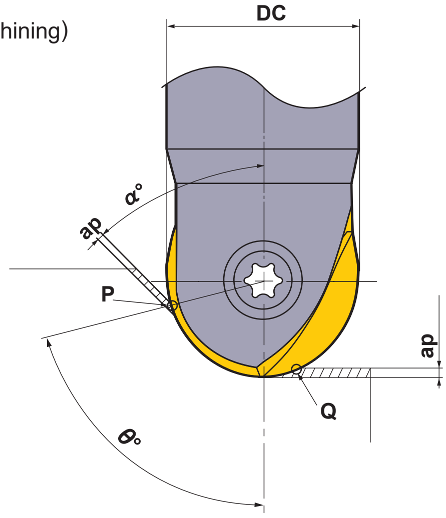
$$\theta° = \cos^{-1}\left(\frac{\mathrm{DC}-2\mathrm{ap}}{\mathrm{DC}}\right)+90-\alpha$$

n : Spindle Speed (min^{-1})

2. Employing ap ➡ Calculate cutting speed at point Q.
(Cutting speed at the cutting depth border)

Formula : Cutting Speed = $\frac{2\pi \mathrm{n}\sqrt{\mathrm{ap}\,(\mathrm{DC}-\mathrm{ap})}}{1000}$ (m/min)

n : Spindle Speed (min^{-1})
DC : Cutting Edge Diameter (mm)
ap : Depth of Cut (mm)



RADIUS END MILL

R KAPR F

SUF

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			Hardened Steel

- Highly accurate corner radius tolerance allows for high precision finishing.
- Seamless gash.

Fig.1

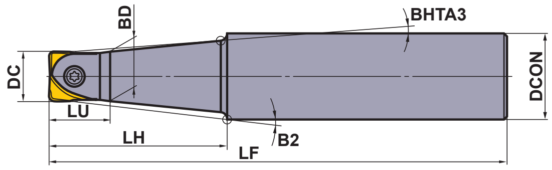


Fig.2

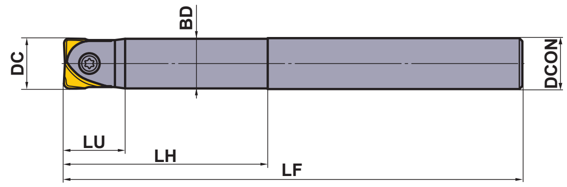
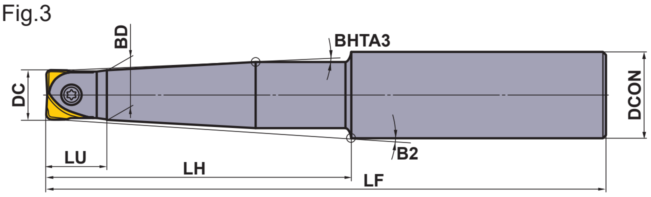
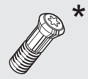
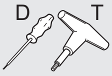
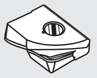


Fig.3



STEEL SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)								Fig.	 *	D  T	
		R		DC	DCON	LF	BD	LH	LU	B2	BHTA3		Clamp Screw	Wrench	Insert
Standard	SRFH10S12M	●	1	10	12	110	9.5	40	13	1.63°	—	1	RS3008T	TKY08D	SUFT10R○○
	SRFH12S16M	●	1	12	16	120	11.5	50	15	2.60°	—	1	RS3510T	TKY10D	SUFT12R○○
	SRFH16S20M	●	1	16	20	130	15.5	50	20	2.73°	—	1	RS4015T	TKY15T	SUFT16R○○
	SRFH20S25M	●	1	20	25	150	19.5	70	24	2.38°	1.5°	1	RS5020T	TKY20T	SUFT20R○○
	SRFH25S32M	●	1	25	32	180	24.5	80	30	2.97°	1.5°	1	RS6025T	TKY25T	SUFT25R○○
	SRFH30S32M	●	1	30	32	200	29.5	100	35	—	—	2	RS8030T	TKY30T	SUFT30R○○
	SRFH32S32M	●	1	32	32	200	31.5	100	35	—	—	2	RS8030T	TKY30T	SUFT32R○○
Semi-long	SRFH10S12L	●	1	10	12	150	9.5	60	13	1.5°	—	1	RS3008T	TKY08D	SUFT10R○○
	SRFH12S16L	●	1	12	16	160	11.5	70	15	1.78°	—	1	RS3510T	TKY10D	SUFT12R○○
	SRFH16S20L	●	1	16	20	160	15.5	70	20	1.85°	—	1	RS4015T	TKY15T	SUFT16R○○
	SRFH20S25L	●	1	20	25	180	19.5	80	24	2.05°	1.5°	1	RS5020T	TKY20T	SUFT20R○○
	SRFH20S20L80	●	1	20	20	180	19.5	80	24	—	—	2	RS5020T	TKY20T	SUFT20R○○
	SRFH25S32L	●	1	25	32	200	24.5	100	30	2.28°	1.5°	1	RS6025T	TKY25T	SUFT25R○○
	SRFH25S25L100	●	1	25	25	200	24.5	100	30	—	—	2	RS6025T	TKY25T	SUFT25R○○
	SRFH30S32L	●	1	30	32	230	29.5	130	35	—	—	2	RS8030T	TKY30T	SUFT30R○○
Long	SRFH20S25E	●	1	20	25	220	19.5	120	24	1.5°	1.5°	3	RS5020T	TKY20T	SUFT20R○○
	SRFH20S20E120	●	1	20	20	220	19.5	120	24	—	—	2	RS5020T	TKY20T	SUFT20R○○
	SRFH25S32E	●	1	25	32	250	24.5	150	30	1.5°	1.5°	3	RS6025T	TKY25T	SUFT25R○○
	SRFH25S25E150	●	1	25	25	250	24.5	150	30	—	—	2	RS6025T	TKY25T	SUFT25R○○
	SRFH30S32E	●	1	30	32	300	29.5	200	35	—	—	2	RS8030T	TKY30T	SUFT30R○○

* Clamp Torque (N • m) : RS3008T=1.5, RS3510T=2.5, RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

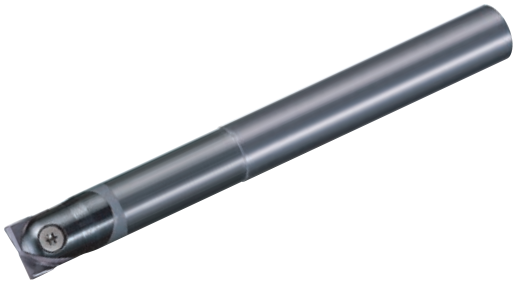
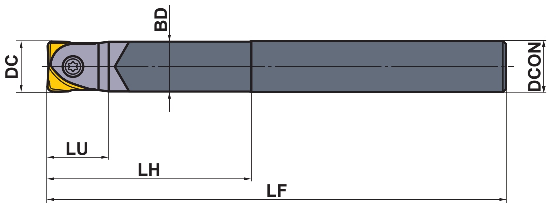


Fig.1



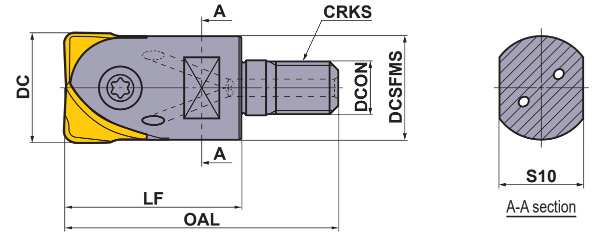
CARBIDE SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)						Fig.	*	D T	
		R		DC	DCON	LF	BD	LH	LU		Clamp Screw	Wrench	Insert
Standard	**SRFH10S10MW**	●	1	10	10	110	9.5	40	13	1	RS3008T	TKY08D	SUFT10R◌◌
	SRFH12S12MW	●	1	12	12	120	11.5	50	15	1	RS3510T	TKY10D	SUFT12R◌◌
	SRFH16S16MW	●	1	16	16	130	15.5	50	20	1	RS4015T	TKY15T	SUFT16R◌◌
	SRFH20S20MW	●	1	20	20	180	19.5	80	24	1	RS5020T	TKY20T	SUFT20R◌◌
	SRFH25S25MW	●	1	25	25	200	24.5	100	30	1	RS6025T	TKY25T	SUFT25R◌◌
	SRFH30S32MW	●	1	30	32	230	29.5	130	35	1	RS8030T	TKY30T	SUFT30R◌◌
				32	32	231	29.5	131	36				SUFT32R◌◌
Long	**SRFH10S10LW**	●	1	10	10	150	9.5	60	13	1	RS3008T	TKY08D	SUFT10R◌◌
	SRFH12S12LW	●	1	12	12	160	11.5	70	15	1	RS3510T	TKY10D	SUFT12R◌◌
	SRFH16S16LW	●	1	16	16	160	15.5	70	20	1	RS4015T	TKY15T	SUFT16R◌◌
	SRFH20S20LW	●	1	20	20	250	19.5	150	24	1	RS5020T	TKY20T	SUFT20R◌◌
	SRFH25S25LW	●	1	25	25	300	24.5	200	30	1	RS6025T	TKY25T	SUFT25R◌◌
	SRFH30S32LW	●	1	30	32	350	29.5	250	35	1	RS8030T	TKY30T	SUFT30R◌◌
				32	32	351	29.5	251	36				SUFT32R◌◌

Note 1) SRFH30S32MW and SRFH30S32LW tool body can use both inserts SUFT30R◌◌ and SUFT32R◌◌.
However the overall length sizes, LF and LH, differ respectively.

* Clamp Torque (N • m) : RS3008T=1.5, RS3510T=2.5, RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0



SCREW-IN TYPE

Right hand tool holder only.

Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)							WT (kg)	*		
	R			DC	DCON	DCSFMS	OAL	LF	S10	CRKS		Clamp Screw	Wrench	Insert
SRFH16AM0830	●	○	1	16	8.5	14.9	48	30	10	8	0.1	RS4015T	TKY15T	SUFT16R◌◌
SRFH20AM1035	●	○	1	20	10.5	18.4	54	35	14	10	0.1	RS5020T	TKY20T	SUFT20R◌◌
SRFH25AM1240	●	○	1	25	12.5	23.5	62	40	19	12	0.1	RS6025T	TKY25T	SUFT25R◌◌
SRFH30AM1645	●	○	1	30	17	28.1	68	45	24	16	0.2	RS8030T	TKY30T	SUFT30R◌◌
				32	17	28.1	69	46	24	16				SUFT32R◌◌

Note 1) SRFH30AM1645 tool body can use both inserts SUFT30R◌◌ and SUFT32R◌◌.
However the overall length sizes, OAL and LF, differ respectively.

Note 2) For screw-in type arbors, refer to page L341.

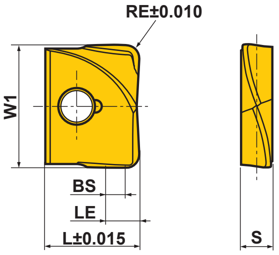
* Clamp Torque (N • m) : RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0

ISO13399 ➤ **L003**
ARBORS ➤ **L341**
SPARE PARTS ➤ **P001**
TECHNICAL DATA ➤ **Q001**

INSERTS

Workpiece Material	P	Steel		◐	
	M	Stainless Steel		◐	
	K	Cast Iron	●	✻	
	H	Hardened Steel	●	◐	

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

Shape	Order Number	Coated			Dimensions (mm)						Geometry
		MP8010	VP15TF		W1	RE	BS	LE	L	S	
	SUFT10R05	●	●		10	0.5	1	1.5	8.5	2.6	
	SUFT10R10	●	●		10	1	1	2	8.5	2.6	
	SUFT10R20	●	●		10	2	1	3	8.5	2.6	
	SUFT12R05	●	●		12	0.5	1.2	1.7	10	3	
	SUFT12R10	●	●		12	1	1.2	2.2	10	3	
	SUFT12R20	●	●		12	2	1.2	3.2	10	3	
	SUFT12R30	●	●		12	3	1.2	4.2	10	3	
	SUFT16R05	●	●		16	0.5	1.6	2.1	12	4	
	SUFT16R10	●	●		16	1	1.6	2.6	12	4	
	SUFT16R15	●	●		16	1.5	1.6	3.1	12	4	
	SUFT16R20	●	●		16	2	1.6	3.6	12	4	
	SUFT16R30	●	●		16	3	1.6	4.6	12	4	
	SUFT20R05	●	●		20	0.5	2	2.5	15	5	
	SUFT20R10	●	●		20	1	2	3	15	5	
	SUFT20R15	●	●		20	1.5	2	3.5	15	5	
	SUFT20R20	●	●		20	2	2	4	15	5	
	SUFT20R30	●	●		20	3	2	5	15	5	
	SUFT25R05	●	●		25	0.5	2.5	3	18.5	6	
	SUFT25R10	●	●		25	1	2.5	3.5	18.5	6	
	SUFT25R20	●	●		25	2	2.5	4.5	18.5	6	
	SUFT25R30	●	●		25	3	2.5	5.5	18.5	6	
	SUFT30R05	●	●		30	0.5	3	3.5	22.5	7	
	SUFT30R10	●	●		30	1	3	4	22.5	7	
	SUFT30R20	●	●		30	2	3	5	22.5	7	
	SUFT30R30	●	●		30	3	3	6	22.5	7	
	SUFT32R05	●	●		32	0.5	3.2	3.7	23.5	7	
	SUFT32R10	●	●		32	1	3.2	4.2	23.5	7	
	SUFT32R20	●	●		32	2	3.2	5.2	23.5	7	

FITTING INSERTS ON HOLDERS

1. Clean the insert seat

Clean the insert seat in the holder body by blowing air or using a brush.

2. Fit the insert

Place the concave mark of the insert into the clamp-screw-fastening part of the holder(only SRF type inserts). Fasten the clamp screw while firmly pressing the insert against the insert seat wall. You are recommended to use the special lubricant for preventing screw seizing, MK1KS, and to fasten with recommended torque.

● : Inventory maintained in Japan.

(Contains 2 inserts per case.)

RECOMMENDED CUTTING CONDITIONS

■SHOULDER MILLING(When small width of cut.*)

Workpiece Material		Hardness	Grade	Cutting Speed **vc** (m/min)	Depth of Cut **ap** (mm)	Cutting Width **ae** (mm)	Feed per Tooth **fz** (mm/t)
P	Carbon Steel Alloy Steel	180−280HB	**VP15TF**	200 (80−300)	≤0.05DC	≤0.05DC	0.2 (≤0.4)
	Pre-Hardened Steel	≤45HRC	**VP15TF**	150 (80−200)	≤0.05DC	≤0.05DC	0.15 (≤0.3)
	Alloy Tool Steel	180−380HB	**VP15TF**	150 (80−200)	≤0.05DC	≤0.05DC	0.15 (≤0.3)
M	Stainless Steel	≤270HB	**VP15TF**	150 (100−200)	≤0.05DC	≤0.05DC	0.2 (≤0.4)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MP8010**	250 (180−450)	≤0.05DC	≤0.1DC	0.3 (≤0.4)
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MP8010**	200 (80−300)	≤0.05DC	≤0.1DC	0.3 (≤0.4)
H	Hardened Steel	45−55HRC	**MP8010**	100 (80−120)	≤0.05DC	≤0.02DC	0.1 (≤0.2)
	Hardened Steel	55−65HRC	**MP8010**	80 (60−100)	≤0.05DC	≤0.02DC	0.1 (≤0.2)

* When the pick feed direction is along the axis of the tool such as finish machining at the wall part.

■SLOTTING•SHOULDER MILLING(When large width of cut.*)

Workpiece Material		Hardness	Grade	Cutting Speed **vc** (m/min)	Depth of Cut **ap** (mm)	Cutting Width **ae** (mm)	Feed per Tooth **fz** (mm/t)
P	Carbon Steel Alloy Steel	180−280HB	**VP15TF**	200 (80−300)	≤0.02DC	≤DC	0.2 (≤0.4)
	Pre-Hardened Steel	≤45HRC	**VP15TF**	150 (80−200)	≤0.02DC	≤DC	0.15 (≤0.3)
	Alloy Tool Steel	180−380HB	**VP15TF**	150 (80−200)	≤0.02DC	≤DC	0.15 (≤0.3)
M	Stainless Steel	≤270HB	**VP15TF**	150 (100−200)	≤0.02DC	≤DC	0.2 (≤0.4)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MP8010**	250 (180−450)	≤0.03DC	≤DC	0.3 (≤0.4)
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MP8010**	200 (80−300)	≤0.03DC	≤DC	0.3 (≤0.4)
H	Hardened Steel	45−55HRC	**MP8010**	100 (80−120)	≤0.01DC	≤DC	0.1 (≤0.2)
	Hardened Steel	55−65HRC	**MP8010**	70 (60−80)	≤0.01DC	≤DC	0.1 (≤0.2)

* When the pick feed direction is along the axis of the tool such as finish machining at the wall part.

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})=1000×Cutting speed vc ÷Diameter of cutting tool DC÷3.14

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.
- Please note the setting of the depth of cut especially to prevent the fracture.

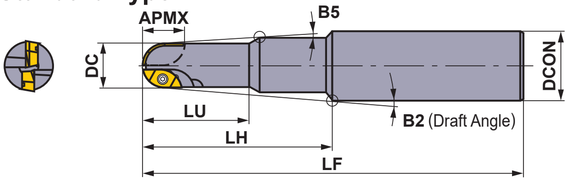
BALL NOSE END MILL

SRM2

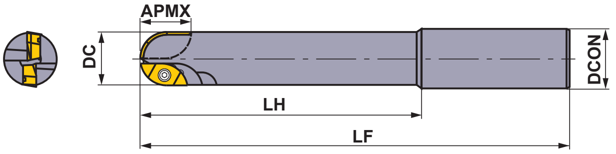
P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			Hardened Steel

- Suitable for roughing to semi-finishing of small and medium moulds.
- High rigidity body design.
- Low resistance chipbreaker.
- Through coolant hole type.

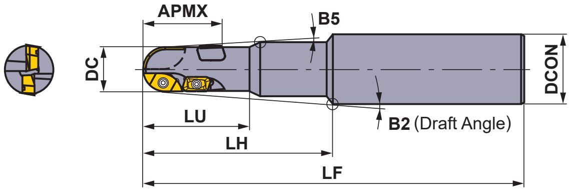
Standard Type



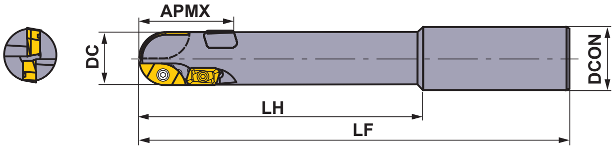
Long Neck Type



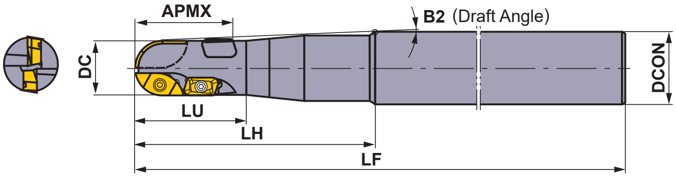
Long Cutting Edge Type



Long Neck Cutting Edge Type



Extra Long Cutting Edge Type



Right hand tool holder only.

Type	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)									*1	*1	D T F				
		R			*2 RE	DC	DCON	LF	LH	LU	APMX	B2	B5	Inner, Outer	Peripheral	Inner, Outer	Peripheral	Inner	Outer	Peripheral
														Clamp Screw		Wrench		Insert		
Standard	SRM2160SNM	●	–	2	8	16	20	130	50	25	12	2.8°	1.5°	TS25H	–	TKY08D	–	SRG16C SRM16C-M	SRG16E SRM16E-M	–
	SRM2160SAM	●	○	2	8	16	20	130	50	25	12	2.8°	1.5°	TS25H	–	TKY08D	–	SRG16C SRM16C-M	SRG16E SRM16E-M	–
	SRM2200SNM	●	–	2	10	20	25	150	70	35	14	2.45°	1.5°	TS32	–	TKY08D	–	SRG20C SRM20C-M	SRG20E SRM20E-M	–
	SRM2200SAM	●	○	2	10	20	25	150	70	35	14	2.45°	1.5°	TS32	–	TKY08D	–	SRG20C SRM20C-M	SRG20E SRM20E-M	–
	SRM2250SNM	●	–	2	12.5	25	32	180	80	40	19	3.22°	1.5°	TS43	–	TKY15T	–	SRG25C SRM25C-M	SRG25E SRM25E-M	–
	SRM2250SAM	●	○	2	12.5	25	32	180	80	40	19	3.22°	1.5°	TS43	–	TKY15T	–	SRG25C SRM25C-M	SRG25E SRM25E-M	–
	SRM2300SNM	●	–	2	15	30	32	200	100	50	24	0.73°	0.5°	TS55	–	TKY25T	–	SRG30C SRM30C-M	SRG30E SRM30E-M	–
	SRM2300SAM	●	○	2	15	30	32	200	100	50	24	0.73°	0.5°	TS55	–	TKY25T	–	SRG30C SRM30C-M	SRG30E SRM30E-M	–

*1 Clamp Torque (N • m) : TS25H=1.7, TS25=1.0, TS32=2.0, TS43=3.5, TS55=7.5

*2 RE is shown for insert corner R.

● : Inventory maintained in Japan.

Scan here for product NEWS ▶

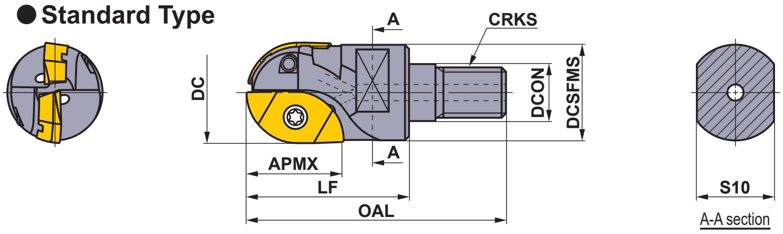
Type	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)									*1	*1	D	T F			
		R			RE *2	DC	DCON	LF	LH	LU	APMX	B2	B5	Inner, Outer	Peripheral	Inner, Outer	Peripheral	Inner	Outer	Peripheral
														Clamp Screw		Wrench		Insert		
Long Cutting Edge	**SRM2200SNL**	●	–	4	10	20	25	150	70	35	30	2.45°	1.5°	TS32	TS25	TKY08D	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-◌2
	SRM2200SAL	●	○	4	10	20	25	150	70	35	30	2.45°	1.5°	TS32	TS25	TKY08D	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-◌2
	SRM2250SNL	●	–	4	12.5	25	32	180	80	40	37	3.22°	1.5°	TS43	TS25	TKY15T	TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-◌2
	SRM2250SAL	●	○	4	12.5	25	32	180	80	40	37	3.22°	1.5°	TS43	TS25	TKY15T	TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-◌2
	SRM2300SNL	●	–	4	15	30	32	200	100	50	44	0.73°	0.5°	TS55	TS43	TKY25T	TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-◌2
	SRM2300SAL	●	○	4	15	30	32	200	100	50	44	0.73°	0.5°	TS55	TS43	TKY25T	TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-◌2
Long Neck	**SRM2160SNF**	●	–	2	8	16	16	150	70	—	12	—	—	TS25H	—	TKY08D	—	SRG16C SRM16C-M	SRG16E SRM16E-M	—
	SRM2160SAF	●	○	2	8	16	16	150	70	—	12	—	—	TS25H	—	TKY08D	—	SRG16C SRM16C-M	SRG16E SRM16E-M	—
	SRM2200SNF	●	–	2	10	20	20	180	100	—	14	—	—	TS32	—	TKY08D	—	SRG20C SRM20C-M	SRG20E SRM20E-M	—
	SRM2200SAF	●	○	2	10	20	20	180	100	—	14	—	—	TS32	—	TKY08D	—	SRG20C SRM20C-M	SRG20E SRM20E-M	—
	SRM2250SNF	●	–	2	12.5	25	25	200	120	—	19	—	—	TS43	—	TKY15T	—	SRG25C SRM25C-M	SRG25E SRM25E-M	—
	SRM2250SAF	●	○	2	12.5	25	25	200	120	—	19	—	—	TS43	—	TKY15T	—	SRG25C SRM25C-M	SRG25E SRM25E-M	—
	SRM2300SNF	●	–	2	15	30	32	230	150	—	24	—	—	TS55	—	TKY25T	—	SRG30C SRM30C-M	SRG30E SRM30E-M	—
	SRM2300SAF	●	○	2	15	30	32	230	150	—	24	—	—	TS55	—	TKY25T	—	SRG30C SRM30C-M	SRG30E SRM30E-M	—
Long Neck Cutting Edge	**SRM2200SNLF**	●	–	4	10	20	20	180	100	—	30	—	—	TS32	TS25	TKY08D	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-◌2
	SRM2200SALF	●	○	4	10	20	20	180	100	—	30	—	—	TS32	TS25	TKY08D	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-◌2
	SRM2250SNLF	●	–	4	12.5	25	25	200	120	—	37	—	—	TS43	TS25	TKY15T	TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-◌2
	SRM2250SALF	●	○	4	12.5	25	25	200	120	—	37	—	—	TS43	TS25	TKY15T	TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-◌2
	SRM2300SNLF	●	–	4	15	30	32	230	150	—	44	—	—	TS55	TS43	TKY25T	TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-◌2
	SRM2300SALF	●	○	4	15	30	32	230	150	—	44	—	—	TS55	TS43	TKY25T	TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-◌2
Extra Long Cutting Edge	**SRM2200SNLL**	●	–	4	10	20	25	250	120	35	30	1.5°	—	TS32	TS25	TKY08D	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-◌2
	SRM2200SALL	●	○	4	10	20	25	250	120	35	30	1.5°	—	TS32	TS25	TKY08D	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-◌2
	SRM2250SNLL	●	–	4	12.5	25	32	300	170	37	37	1.5°	—	TS43	TS25	TKY15T	TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-◌2
	SRM2250SALL	●	○	4	12.5	25	32	300	170	37	37	1.5°	—	TS43	TS25	TKY15T	TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-◌2
	SRM2300SNLL	●	–	4	15	30	32	350	100	50	44	1.5°	—	TS55	TS43	TKY25T	TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-◌2
	SRM2300SALL	●	○	4	15	30	32	350	100	50	44	1.5°	—	TS55	TS43	TKY25T	TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-◌2

*1 Clamp Torque (N • m) : TS25H=1.7, TS25=1.0, TS32=2.0, TS43=3.5, TS55=7.5

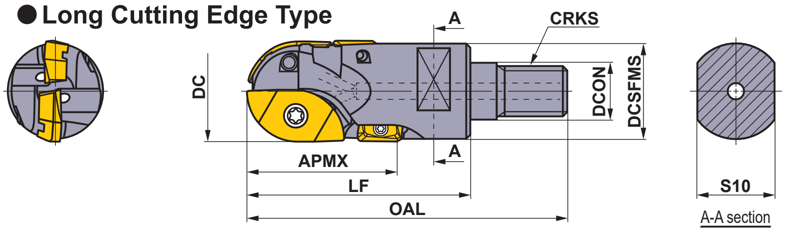
*2 RE is shown for insert corner R.

ISO13399 ➤ **L003**
SPARE PARTS ➤ **P001**
TECHNICAL DATA ➤ **Q001**

● Standard Type



● Long Cutting Edge Type



■SCREW-IN TYPE

Right hand tool holder only.

Type	Order Number	Stock	Coolant Hole	Dimensions (mm)									WT (kg)	*1	*1	D T F			
		R		*2 RE	DC	DCON	DCSFMS	OAL	LF	S10	CRKS	APMX		Clamp Screw Inner, Outer	Clamp Screw Peripheral	Wrench	Insert Inner	Insert Outer	Insert Peripheral
Standard	**SRM2160AM08S30**	●	○	8	16	8.5	14.6	48	30	10	M8	12	0.1	TS25H	–	TKY08D	SRG16C SRM16C-M	SRG16E SRM16E-M	–
	SRM2200AM10S35	●	○	10	20	10.5	18.6	54	35	14	M10	14	0.1	TS32	–	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	–
	SRM2250AM12S40	●	○	12.5	25	12.5	23.5	62	40	19	M12	19	0.2	TS43	–	TKY15T	SRG25C SRM25C-M	SRG25E SRM25E-M	–
	SRM2300AM16S45	●	○	15	30	17	28.3	68	45	24	M16	24	0.2	TS55	–	TKY25T	SRG30C SRM30C-M	SRG30E SRM30E-M	–
	SRM2320AM16S45	●	○	16	32	17	30.0	68	45	24	M16	24	0.2	TS55	–	TKY25T	SRG32C SRM32C-M	SRG32E SRM32E-M	–
Long Cutting Edge	**SRM2200AM10L45**	●	○	10	20	10.5	18.6	64	45	14	M10	30	0.2	TS32	TS25	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-◌2
	SRM2250AM12L55	●	○	12.5	25	12.5	23.5	77	55	19	M12	37	0.3	TS43	TS25	TKY15T TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-◌2
	SRM2300AM16L60	●	○	15	30	17	28.3	83	60	24	M16	44	0.3	TS55	TS43	TKY25T TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-◌2
	SRM2320AM16L60	●	○	16	32	17	29.0	83	60	24	M16	44	0.3	TS55	TS43	TKY25T TKY15F	SRG32C SRM32C-M	SRG32E SRM32E-M	APMT1604 PDER-◌2

Note 1) For screw-in type arbors, refer to page L341.

*1 Clamp Torque (N • m) : TS25H=1.7, TS25=1.0, TS32=2.0, TS43=3.5, TS55=7.5

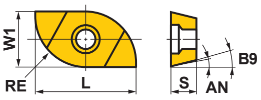
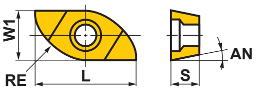
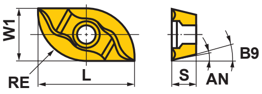
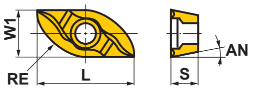
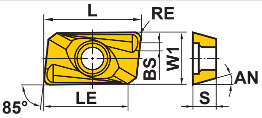
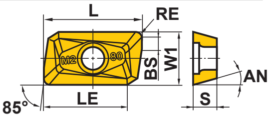
*2 RE is shown for insert corner R.

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material			F7030	MP6120	MP9120	VP15TF
	P	Steel	◐	◐		◐
	M	Stainless Steel	◐			◐
	K	Cast Iron				✤
	S	Heat resistant Alloy, Titanium Alloy			◐	◐
	H	Hardened Steel				◐

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

Type	Shape	Order Number	Class	Coated				Dimensions (mm)								Geometry
				F7030	MP6120	MP9120	VP15TF	RE	L	LE	W1	S	BS	AN	B9	
Inner	Strong Cutting Edge Type 	SRG16C	G		●	●	●	8	16	—	8.2	3.5	—	11°	—	
		SRG20C	G		●	●	●	10	19	—	10.2	4.6	—	10°	18°	
		SRG25C	G		●	●	●	12.5	24	—	12.8	5.5	—	10°	18°	
		SRG30C	G		●	●	●	15	28	—	15.3	7	—	10°	18°	
		SRG32C	G		●	●	●	16	28	—	16.3	7	—	10°	18°	
Outer	Strong Cutting Edge Type 	SRG16E	G		●	●	●	8	13.5	—	6.7	3.5	—	11°	—	
		SRG20E	G		●	●	●	10	15.5	—	8.5	4.6	—	9°	—	
		SRG25E	G		●	●	●	12.5	20.5	—	10.2	5.5	—	9°	—	
		SRG30E	G		●	●	●	15	25.2	—	12.2	7	—	9°	—	
		SRG32E	G		●	●	●	16	26.1	—	13.1	7	—	9°	—	
Inner	Low Resistance Type 	SRM16C-M	M		●	●	●	8	16	—	8.2	3.5	—	11°	—	
		SRM20C-M	M		●	●	●	10	19	—	10.2	4.6	—	10°	18°	
		SRM25C-M	M		●	●	●	12.5	24	—	12.8	5.5	—	10°	18°	
		SRM30C-M	M		●	●	●	15	28	—	15.3	7	—	10°	18°	
		SRM32C-M	M		●	●	●	16	28	—	16.3	7	—	10°	18°	
Outer	Low Resistance Type 	SRM16E-M	M		●	●	●	8	13.5	—	6.7	3.5	—	11°	—	
		SRM20E-M	M		●	●	●	10	15.5	—	8.5	4.6	—	9°	—	
		SRM25E-M	M		●	●	●	12.5	20.5	—	10.2	5.5	—	9°	—	
		SRM30E-M	M		●	●	●	15	25.2	—	12.2	7	—	9°	—	
		SRM32E-M	M		●	●	●	16	26.1	—	13.1	7	—	9°	—	
Peripheral ∗1	Strong Cutting Edge Type 	APMT1135PDER-H2	M	●			●	0.8	11.25	9	6.35	3.5	1.2	11°	—	
		APMT1604PDER-H2	M	●			●	0.8	17.11	14	9.525	4.76	1.4	11°	—	
	Low Resistance Type 	APMT1135PDER-M2	M	●			●	0.8	11.18	9	6.35	3.5	1.2	11°	—	
		APMT1604PDER-M2	M	●			●	0.8	17.10	14	9.525	4.76	1.4	11°	—	

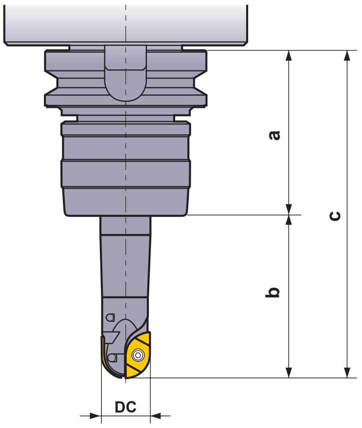
(Low-resistance inner or outer inserts are precision M class type.)

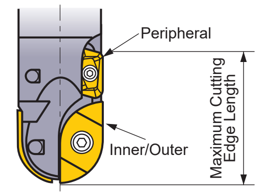
∗1 Selection guide for peripheral cutting edges : The first recommendation is the super sharp M breaker (APMT....PDER-M2).
When cutting edge strength is particularly important, use the H breaker (APMT....PDER-H2).

RECOMMENDED CUTTING CONDITIONS

SRM2

Ø16—Ø32





(Long Cutting Edge)

Tool Overhang

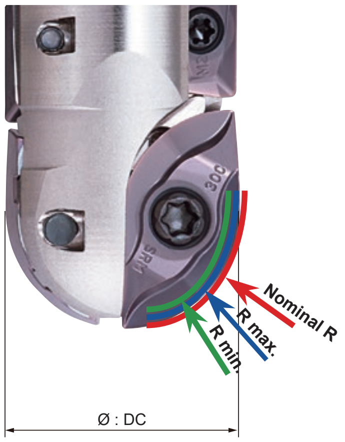
The recommended cutting conditions are chosen based on deflection, vibration and surface finish when using a BT50 arbor under the conditions below -**"a"**, a length from a gauge line to the arbor end face and **"b"**, neck length (tool overhang from the arbor).

Cutting Edge Diameter:DC	Type	a	b	c
16	Standard	105	50	155
	Long Neck		70	175
	Extra Long		—	—
20	Standard		70	175
	Long Neck		100	205
	Extra Long		150	255
25	Standard		80	185
	Long Neck		120	225
	Extra Long		200	305
30	Standard		100	205
	Long Neck		150	255
	Extra Long		250	355

Recommended Depth of Cut for Long Cutting Edge Type

The maximum cutting edge length of the long cutting edge type with a peripheral insert is 1.4-1.5DC. The peripheral insert's main purpose is to remove the small un-machined portions of the pre-machined surface above the main cutting edge. Please refer to recommended cutting conditions for recommended depth of cut **ap**.

■ Radius tolerance and other dimensions with an insert mounted in the body



Radial tolerance

Cutting Edge Diameter DC	Nominal R	Tolerance	R min.	R max.
16	8	G	7.925	7.975
		M	7.910	7.970
20	10	G	9.925	9.975
		M	9.910	9.970
25	12.5	G	12.425	12.475
		M	12.410	12.470
30	15	G	14.925	14.975
		M	14.910	14.970

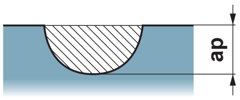
Dimensions with an insert mounted in the body

Cutting Edge Diameter DC	Tolerance	DC min.	DC max.
16	G	15.650	15.950
	M	15.620	15.940
20	G	19.650	19.950
	M	19.620	19.940
25	G	24.650	24.950
	M	24.620	24.940
30	G	29.650	29.950
	M	29.620	29.940

M : Precision M class

SLOT MILLING

Cutting Mode



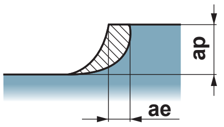
N : Revolution (min^{-1})
F : Table Feed (mm/min)

	Workpiece Material	Hardness	Cutting Speed (m/min)	Insert Grade, Type	Holder Type	φ16			φ20			φ25			φ30		
						N	F	ap	N	F	ap	N	F	ap	N	F	ap
P	Carbon Steel Alloy Steel	180−280HB	160 (120−200)	**MP6120** **VP15TF** Low Resistance Type	Standard	3183	382	6	2546	306	8	2037	489	12.5	1698	407	15
					Long Neck	3183	382	4	2546	306	4	2037	489	6	1698	407	7.5
					Extra Long	−	−	−	2546	306	2	2037	489	4	1698	407	3
		280−350HB	140 (120−160)	**MP6120** **VP15TF** Low Resistance Type	Standard	2785	334	6	2228	267	8	1783	428	12.5	1485	357	15
					Long Neck	2785	334	4	2228	267	4	1783	428	6	1485	357	7.5
					Extra Long	−	−	−	2228	267	2	1783	428	4	1485	357	3
	Pre-Hardened Steel	35−45HRC	120 (100−160)	**MP6120** **VP15TF** Low Resistance Type	Standard	2387	286	6	1910	229	8	1528	367	12.5	1273	306	15
					Long Neck	2387	286	4	1910	229	4	1528	367	6	1273	306	7.5
					Extra Long	−	−	−	1910	229	2	1528	367	4	1273	306	3
	Alloy Tool Steel	≦350HB	140 (120−160)	**MP6120** **VP15TF** Low Resistance Type	Standard	2785	334	6	2228	267	8	1783	535	10	1485	594	12
					Long Neck	2785	334	4	2228	267	4	1783	535	5	1485	594	4.5
					Extra Long	−	−	−	2228	267	2	1783	535	2.5	1485	594	1.5
M	Stainless Steel	≦270HB	200 (100−250)	**VP15TF** Low Resistance Type	Standard	3979	477	4	3183	382	5	2546	764	6	2122	849	7.5
					Long Neck	3979	477	3	3183	382	3	2546	611	4	2122	637	4.5
					Extra Long	−	−	−	3183	382	1.5	2546	509	1.5	2122	509	1.5
K	Gray Cast Iron	≦350MPa	200 (150−300)	**VP15TF** Low Resistance Type	Standard	3979	796	6	3183	637	8	2546	1019	12.5	2122	849	15
					Long Neck	3979	796	4	3183	637	4	2546	1019	7.5	2122	849	4.5
					Extra Long	−	−	−	3183	637	2	2546	1019	4	2122	849	3
	Ductile Cast Iron	≦500MPa	180 (150−240)	**VP15TF** Low Resistance Type	Standard	3581	716	6	2865	573	8	2292	917	12.5	1910	764	15
					Long Neck	3581	716	4	2865	573	4	2292	917	7.5	1910	764	4.5
					Extra Long	−	−	−	2865	573	2	2292	917	4	1910	764	1.5
	Ductile Cast Iron	≦800MPa	160 (150−250)	**VP15TF** Low Resistance Type	Standard	3183	637	6	2546	509	8	2037	815	12.5	1698	679	15
					Long Neck	3183	637	4	2546	509	4	2037	815	7.5	1698	679	4.5
					Extra Long	−	−	−	2546	509	2	2037	815	4	1698	679	1.5
H	Hardened Steel	45−50HRC	100 (60−120)	**VP15TF** Strong Cutting Edge Type	Standard	1989	239	4	1591	191	4	1273	255	6	1061	212	7.5
					Long Neck	1989	239	2	1591	191	2	1273	255	4	1061	212	3
					Extra Long	−	−	−	1591	191	1	1273	255	2.5	1061	212	1.5
	Hardened Steel	50−60HRC	60 (40−100)	**VP15TF** Strong Cutting Edge Type	Standard	1194	143	4	955	115	4	764	153	6	637	127	7.5
					Long Neck	1194	143	2	955	115	2	764	153	4	637	127	3
					Extra Long	−	−	−	955	115	1	764	153	2.5	637	127	1.5
S	Titanium Alloy	≦350HB	50 (30-60)	**MP9120**	Standard	995	100	4	796	80	4	637	64	6	531	53	7.5
					Long Neck	995	100	2	796	80	2	637	64	4	531	53	3
					Extra Long	−	−	−	796	80	1	637	64	2.5	531	53	1.5
	Heat Resistant Alloy	−	40 (30-60)	**MP9120**	Standard	796	80	4	637	64	4	510	51	6	425	43	7.5
					Long Neck	796	80	2	637	64	2	510	51	4	425	43	3
					Extra Long	−	−	−	637	64	1	510	51	2.5	425	43	1.5

RECOMMENDED CUTTING CONDITIONS

■SHOULDER MILLING (Cutting Depth : Small)

Cutting Mode

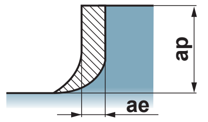


N : Revolution (min^{-1})
F : Table Feed (mm/min)

	Workpiece Material	Hardness	Cutting Speed (m/min)	Insert Grade, Type	Holder Type	ϕ16				ϕ20				ϕ25				ϕ30			
						N	F	ap	ae	N	F	ap	ae	N	F	ap	ae	N	F	ap	ae
P	Carbon Steel Alloy Steel	180–280HB	200 (160–250)	MP6120 VP15TF Low Resistance Type	Standard	3979	796	4	6	3183	955	5	8	2546	1273	6	10	2122	1273	7.5	10
					Long Neck	3979	637	4	4	3183	637	5	6	2546	1273	6	7.5	2122	1273	7.5	7.5
					Extra Long	–	–	–	–	3183	382	5	4	2546	1019	6	5	2122	637	7.5	3
		280–350HB	160 (120–200)	MP6120 VP15TF Low Resistance Type	Standard	3183	509	4	6	2546	509	5	8	2037	815	6	10	1698	849	7.5	10
					Long Neck	3183	382	4	4	2546	407	5	6	2037	611	6	7.5	1698	509	7.5	7.5
					Extra Long	–	–	–	–	2546	306	5	4	2037	489	6	5	1698	407	7.5	3
	Pre-Hardened Steel	35–45HRC	160 (120–200)	MP6120 VP15TF Low Resistance Type	Standard	3183	509	4	6	2546	509	5	8	2037	815	6	10	1698	849	7.5	10
					Long Neck	3183	382	4	4	2546	407	5	6	2037	611	6	7.5	1698	679	7.5	7.5
					Extra Long	–	–	–	–	2546	306	5	4	2037	489	6	5	1698	509	7.5	3
	Alloy Tool Steel	≦350HB	160 (120–200)	MP6120 VP15TF Low Resistance Type	Standard	3183	509	4	6	2546	509	5	8	2037	815	6	10	1698	849	7.5	10
					Long Neck	3183	382	4	4	2546	407	5	6	2037	611	6	7.5	1698	509	7.5	7.5
					Extra Long	–	–	–	–	2546	306	5	4	2037	489	6	2.5	1698	407	7.5	1.5
M	Stainless Steel	≦270HB	200 (100–250)	VP15TF Low Resistance Type	Standard	3979	477	4	6	3183	509	5	8	2546	764	6	10	2122	849	7.5	10
					Long Neck	3979	477	4	4	3183	382	5	6	2546	611	6	7.5	2122	849	7.5	7.5
					Extra Long	–	–	–	–	3183	382	5	4	2546	509	6	5	2122	424	7.5	1.5
K	Gray Cast Iron	≦350MPa	200 (150–300)	VP15TF Low Resistance Type	Standard	3979	1592	4	8	3183	1592	5	10	2546	1528	6	10	2122	1485	7.5	10
					Long Neck	3979	1194	4	6	3183	1273	5	8	2546	1528	6	10	2122	1485	7.5	6
					Extra Long	–	–	–	–	3183	955	5	6	2546	1273	6	7.5	2122	1061	7.5	3
	Ductile Cast Iron	≦500MPa	200 (150–280)	VP15TF Low Resistance Type	Standard	3979	1592	4	8	3183	1592	5	10	2546	1528	6	10	2122	1273	7.5	10
					Long Neck	3979	1194	4	6	3183	1273	5	8	2546	1528	6	10	2122	1273	7.5	6
					Extra Long	–	–	–	–	3183	955	5	6	2546	1273	6	7.5	2122	1061	7.5	3
	Ductile Cast Iron	≦800MPa	180 (150–250)	VP15TF Low Resistance Type	Standard	3581	1432	4	8	2865	1433	5	10	2292	1375	6	10	1910	1146	7.5	10
					Long Neck	3581	1074	4	6	2865	1146	5	8	2292	1375	6	10	1910	1146	7.5	6
					Extra Long	–	–	–	–	2865	860	5	6	2292	1146	6	7.5	1910	955	7.5	3
H	Hardened Steel	45–50HRC	100 (60–120)	VP15TF Strong Cutting Edge Type	Standard	1989	239	4	4	1591	191	5	5	1273	255	6	7.5	1061	212	7.5	3
					Long Neck	1989	239	4	2	1591	191	5	3	1273	255	6	4	1061	212	7.5	1.5
					Extra Long	–	–	–	–	1591	191	5	2	1273	204	6	1.5	1061	170	7.5	1
	Hardened Steel	50–60HRC	60 (40–100)	VP15TF Strong Cutting Edge Type	Standard	1194	143	4	4	955	115	5	5	764	153	6	7.5	637	127	7.5	3
					Long Neck	1194	143	4	2	955	115	5	3	764	153	6	4	637	127	7.5	1.5
					Extra Long	–	–	–	–	955	115	5	2	764	122	6	1.5	637	102	7.5	1
S	Titanium Alloy	≦350HB	50 (30-60)	MP9120	Standard	995	299	4	4	796	239	4	5	637	191	6	7.5	531	159	7.5	3
					Long Neck	995	299	2	2	796	239	2	3	637	191	4	4	531	159	3	1.5
					Extra Long	–	–	–	–	796	239	1	2	637	191	2.5	1.5	531	159	1.5	1
	Heat Resistant Alloy	–	40 (30-60)	MP9120	Standard	796	239	4	4	637	191	4	5	510	153	6	7.5	425	128	7.5	3
					Long Neck	796	239	2	2	637	191	2	3	510	153	4	4	425	128	3	1.5
					Extra Long	–	–	–	–	637	191	1	2	510	153	2.5	1.5	425	128	1.5	1

SHOULDER MILLING (Cutting Depth : Large)

Cutting Mode



N : Revolution (min^{-1})

F : Table Feed (mm/min)

Note 1) Machining Stainless Steels

When up-cut milling stainless steels at large depths and widths of cut, the machined surface is liable to have burrs and welding due to chip jamming. For stainless steels, down-cutting (climb milling) is recommended.

	Workpiece Material	Hardness	Cutting Speed (m/min)	Insert Grade, Type	Holder Type	φ16				φ20				φ25				φ30			
						N	F	ap	ae	N	F	ap	ae	N	F	ap	ae	N	F	ap	ae
P	Carbon Steel Alloy Steel	180–280HB	200 (160–250)	**MP6120** **VP15TF** Low Resistance Type	Standard	3979	637	8	4	3183	764	10	4	2546	1273	12.5	5	2122	1273	15	4.5
					Long Neck	3979	477	8	3	3183	509	10	3	2546	1019	12.5	4	2122	849	15	3
					Extra Long	—	—	—	—	3183	382	10	2	2546	764	12.5	2.5	2122	849	15	1.5
		280–350HB	160 (120–200)	**MP6120** **VP15TF** Low Resistance Type	Standard	3183	382	8	4	2546	509	10	4	2037	815	12.5	5	1698	849	15	4.5
					Long Neck	3183	382	8	3	2546	306	10	3	2037	611	12.5	4	1698	509	15	3
					Extra Long	—	—	—	—	2546	306	10	2	2037	489	12.5	2.5	1698	407	15	1.5
	Pre-Hardened Steel	35–45HRC	160 (120–200)	**MP6120** **VP15TF** Low Resistance Type	Standard	3183	382	8	4	2546	509	10	4	2037	815	12.5	5	1698	849	15	4.5
					Long Neck	3183	382	8	3	2546	306	10	3	2037	611	12.5	4	1698	509	15	3
					Extra Long	—	—	—	—	2546	306	10	2	2037	489	12.5	2.5	1698	407	15	1.5
	Alloy Tool Steel	≤350HB	160 (120–200)	**MP6120** **VP15TF** Low Resistance Type	Standard	3183	382	8	4	2546	509	10	4	2037	815	12.5	5	1698	849	15	4.5
					Long Neck	3183	382	8	3	2546	306	10	3	2037	611	12.5	2.5	1698	509	15	3
					Extra Long	—	—	—	—	2546	306	10	2	2037	489	12.5	1.5	1698	407	15	1.5
M	Stainless Steel	≤270HB	200 (100–250)	**VP15TF** Low Resistance Type	Standard	3979	477	8	4	3183	509	10	4	2546	764	12.5	10	2122	849	15	10
					Long Neck	3979	477	8	3	3183	382	10	3	2546	611	12.5	4	2122	509	15	4.5
					Extra Long	—	—	—	—	3183	382	10	2	2546	489	12.5	1.5	2122	340	15	1.5
K	Gray Cast Iron	≤350MPa	200 (150–300)	**VP15TF** Low Resistance Type	Standard	3979	1194	8	8	3183	1273	10	8	2546	1273	12.5	10	2122	1485	15	10
					Long Neck	3979	955	8	5	3183	955	10	4	2546	1273	12.5	7.5	2122	1061	15	4.5
					Extra Long	—	—	—	—	3183	764	10	2	2546	1019	12.5	1.5	2122	849	15	3
	Ductile Cast Iron	≤500MPa	200 (150–280)	**VP15TF** Low Resistance Type	Standard	3979	1194	8	8	3183	1273	10	8	2546	1273	12.5	10	2122	1273	15	10
					Long Neck	3979	955	8	5	3183	955	10	4	2546	1273	12.5	7.5	2122	849	15	4.5
					Extra Long	—	—	—	—	3183	764	10	2	2546	1019	12.5	5	2122	849	15	1.5
	Ductile Cast Iron	≤800MPa	180 (150–250)	**VP15TF** Low Resistance Type	Standard	3581	1074	8	8	2865	1146	10	8	2292	1146	12.5	10	1910	1146	15	10
					Long Neck	3581	859	8	5	2865	860	10	4	2292	1146	12.5	7.5	1910	764	15	4.5
					Extra Long	—	—	—	—	2865	688	10	2	2292	917	12.5	5	1910	764	15	1.5
H	Hardened Steel	45–50HRC	100 (60–120)	**VP15TF** Strong Cutting Edge Type	Standard	1989	239	8	2	1591	191	10	3	1273	255	12.5	4	1061	212	15	3
					Long Neck	1989	239	8	1	1591	191	10	2	1273	204	12.5	1.5	1061	106	15	1.5
					Extra Long	—	—	—	—	1591	191	10	1	—	—	—	—	—	—	—	—
	Hardened Steel	50–60HRC	60 (40–100)	**VP15TF** Strong Cutting Edge Type	Standard	1194	143	8	2	955	115	10	3	764	153	12.5	4	637	127	15	3
					Long Neck	1194	143	8	1	955	115	10	2	764	122	12.5	1.5	637	64	15	1.5
					Extra Long	—	—	—	—	955	115	10	1	—	—	—	—	—	—	—	—
S	Titanium Alloy	≤350HB	50 (30-60)	**MP9120**	Standard	995	199	4	2	796	159	4	3	637	127	6	4	531	106	7.5	3
					Long Neck	995	199	2	1	796	159	2	2	637	127	4	1.5	531	106	3	1.5
					Extra Long	—	—	—	—	796	159	1	1	637	127	2.5	—	531	106	1.5	—
	Heat Resistant Alloy	—	40 (30-60)	**MP9120**	Standard	796	159	4	2	637	127	4	3	510	102	6	4	425	85	7.5	3
					Long Neck	796	159	2	1	637	127	2	2	510	102	4	1.5	425	85	3	1.5
					Extra Long	—	—	—	—	637	127	1	1	510	102	2.5	—	425	85	1.5	—

BALL NOSE END MILL

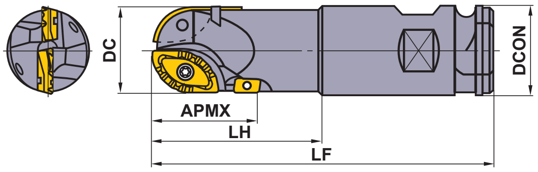
R KAPR

SRM2 ø40 ø50

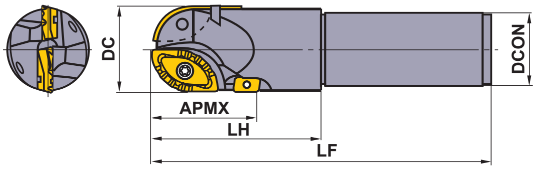
P Steel | M | **K** Cast Iron | N | S | H

- Best for roughing of moulds.
- Low resistance chipbreaker.
- Highly rigid body.

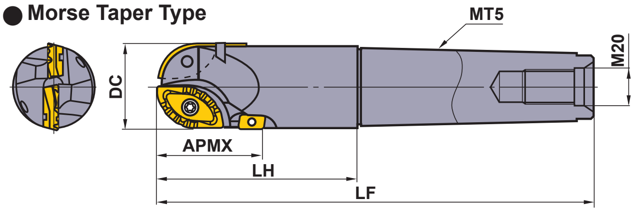
● **Combination Type**



● **Straight Type**



● **Morse Taper Type**



Right hand tool holder only.

Type		Order Number	Stock	Number of Flutes	Dimensions (mm)						*1	*1					
			R		RE *2	DC	DCON	LF	LH	APMX	Inner, Outer	Peripheral	Inner, Outer	Peripheral	Inner	Outer	Peripheral
											Clamp Screw		Wrench		Insert		
Combination	Standard	**SRM2400WNLS**	●	2	20	40	50.8	200	120	54	TS6S	TS43	TKY30T	TKY15F	SRG40C	SRG40E	APMT1604 PDER-◌2
		SRM2500WNLS	●	2	25	50	50.8	200	120	63	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-◌2
	Long	**SRM2400WNLM**	●	2	20	40	50.8	250	170	54	TS6S	TS43	TKY30T	TKY15F	SRG40C	SRG40E	APMT1604 PDER-◌2
		SRM2500WNLM	●	2	25	50	50.8	250	170	63	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-◌2
	Extra Long	**SRM2500WNLL**	●	2	25	50	50.8	300	220	63	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-◌2
		SRM2500WNLX	●	2	25	50	50.8	350	270	63	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-◌2
Straight	Standard	**SRM2400SNLS**	●	2	20	40	42	200	100	54	TS6S	TS43	TKY30T	TKY15F	SRG40C	SRG40E	APMT1604 PDER-◌2
		SRM2500SNLS	●	2	25	50	42	200	100	63	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-◌2
	Long	**SRM2400SNLM**	●	2	20	40	42	250	150	54	TS6S	TS43	TKY30T	TKY15F	SRG40C	SRG40E	APMT1604 PDER-◌2
		SRM2500SNLM	●	2	25	50	42	250	100	63	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-◌2
Morse Taper	Standard	**SRM2500MNLS**	●	2	25	50	—	256	120	63	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-◌2
	Long	**SRM2500MNLM**	●	2	25	50	—	286	150	63	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-◌2

*1 Clamp Torque (N • m) : TS43=6.0, TS6=10.0, TS6S=10.0

*2 RE is shown for insert corner R.

Scan here for product NEWS ▶

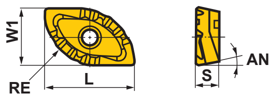
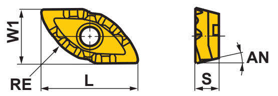
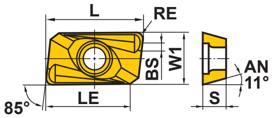
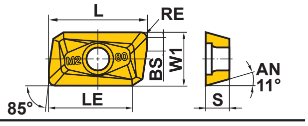
● **: Inventory maintained in Japan.**

(Contains 10 pieces per case.)(The inserts marked *2 contain 2 inserts per case.)

INSERTS

Workpiece Material			F7030	VP15TF	VP20RT	VP30RT
	P	Steel	◐	◐	◐	✤
	K	Cast Iron		✤	✤	✤

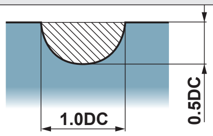
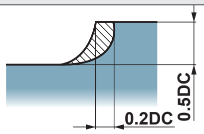
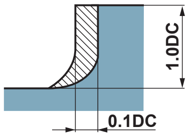
Cutting Conditions :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Type	Shape	Order Number	Class	Coated F7030	Coated VP15TF	Coated VP20RT	Coated VP30RT	Dimensions (mm) RE	L	LE	W1	S	BS	AN	Geometry
Inner		*2 **SRG40C**	G		●	●	●	20	36	—	20.5	8.0	—	11°	
		*2 **SRG50C**	G		●	●	●	25	40	—	26	8.5	—	11°	
Outer		*2 **SRG40E**	G		●	●	●	20	32	—	16.6	8.0	—	11°	
		*2 **SRG50E**	G		●	●	●	25	35.8	—	20	8.5	—	11°	
*1 Peripheral	Strong Cutting Edge Type 	**APMT1604PDER-H2**	M	●	●			0.8	11.71	14	9.525	4.76	1.4	11°	
	Low Resistance Type 	**APMT1604PDER-M2**	M	●	●			0.8	17.10	14	9.525	4.76	1.4	11°	

(Low-resistance inner or outer inserts are precision M class type.)

*1 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).

RECOMMENDED CUTTING CONDITIONS

Cutting Mode	A : Slot Milling	B : Shoulder Milling (Standard Type)	C : Shoulder Milling (Long Cutting Edge Type)
			

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)	Cutting Mode
P	Alloy Tool Steel	≤250HB	VP20RT VP30RT	160 (120—200)	0.12 (0.08—0.2)	A
					0.2 (0.1—0.4)	B
					0.15 (0.1—0.3)	C
	Alloy Tool Steel	≤250HB	VP20RT VP30RT	200 (160—250)	0.2 (0.1—0.3)	A
					0.3 (0.1—0.4)	B
					0.2 (0.1—0.4)	C
	Cast Tool Steel	≤235HB	VP20RT	200 (160—250)	0.2 (0.1—0.3)	A
					0.3 (0.1—0.4)	B
					0.2 (0.1—0.4)	C
	Cast Tool Steel	≤230HB	VP15TF VP20RT	200 (160—300)	0.2 (0.1—0.3)	A
					0.3 (0.1—0.45)	B
					0.2 (0.1—0.4)	C
K	Ductile Cast Iron	Tensile Strength ≤540MPa	VP15TF VP20RT	200 (160—300)	0.25 (0.1—0.4)	A
					0.35 (0.1—0.45)	B
					0.25 (0.1—0.45)	C
	Gray Cast Iron	Tensile Strength ≤350MPa	VP15TF VP20RT	200 (160—300)	0.25 (0.1—0.4)	A
					0.35 (0.1—0.45)	B
					0.25 (0.1—0.4)	C

CHAMFER MILLING

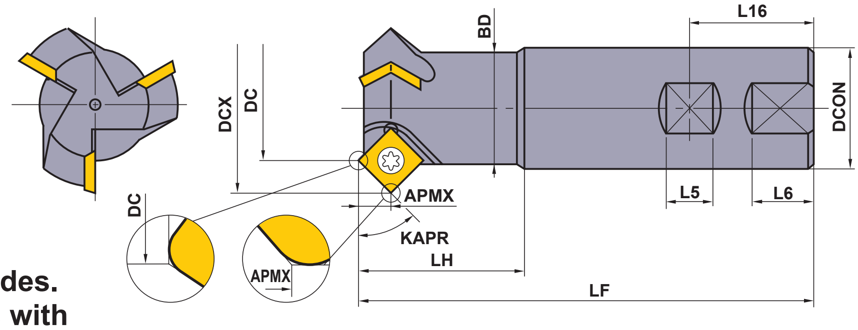
60° KAPR 45° KAPR 30° KAPR R

CESP,CFSP,CGSP

P M **K** N S H

Steel Cast Iron

- Covers 5 cutting modes.
- Excellent sharpness with 11° positive inserts.
- 30°, 45° and 60°chamfer series.



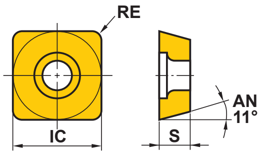
Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (mm)											*	R F	
	R		KAPR	DC	DCX	LF	DCON	BD	LH	L16	L5	L6	APMX	Clamp Screw	Wrench	Insert
CESPR081S20	●	1	60°	8	19.6	110	20	19.5	40	25	11	—	10.2	TS52	TKY25R	SPMW1203○○
CESPR161S20	●	1	60°	16	27.8	110	20	19.5	40	25	11	—	10.2	TS5	TKY25R	SPMW1203○○
CESPR323S32	●	3	60°	32	43.8	125	32	31.5	45	36	14	19	10.2	TS5	TKY25R	SPMW1203○○
CFSPR041S16S	●	1	45°	4	15.7	85	16	14.4	25	24	10	—	5.9	TS4	TKY15F	SPMW0903○○
CFSPR041S16L	●	1	45°	4	15.7	110	16	14.4	50	24	10	—	5.9	TS4	TKY15F	SPMW0903○○
CFSPR081S20	●	1	45°	8	24.6	110	20	19.5	40	25	11	—	8.3	TS5	TKY25R	SPMW1203○○
CFSPR161S20	●	1	45°	16	32.6	110	20	19.5	40	25	11	—	8.3	TS5	TKY25R	SPMW1203○○
CFSPR323S32	●	3	45°	32	48.6	125	32	31.5	45	36	14	19	8.3	TS5	TKY25R	SPMW1203○○
CGSPR081S20	●	1	30°	8	28.4	110	20	19.5	40	25	11	—	5.9	TS5	TKY25R	SPMW1203○○
CGSPR161S20	●	1	30°	16	36.4	110	20	19.5	40	25	11	—	5.9	TS5	TKY25R	SPMW1203○○
CGSPR323S32	●	3	30°	32	52.4	125	32	31.5	45	36	14	19	5.9	TS5	TKY25R	SPMW1203○○

* Clamp Torque (N • m) : TS4=3.5, TS5=7.5, TS52=7.5

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material	**P** Steel			◐	◐			●	◐	◐		**Cutting Conditions :**			
	K Cast Iron			✣				●		✣	◐	● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting			
Shape	Order Number	Class	Edge Preparation	Coated				Cermet		Carbide		Dimensions (mm)			Geometry
				VP15TF	**UP20M**			**NX2525**	**NX4545**	**UTi20T**	**HTi10**	**IC**	**S**	**RE**	
	**SPMW090304**	M	E*	●	●			●	●	●	●	9.525	3.18	0.4	
	SPMW090308	M	E*	●	●			●	●	●	●	9.525	3.18	0.8	
	SPMW120304	M	E*	●	●			●	●	●	●	12.7	3.18	0.4	
	SPMW120308	M	E*	●	●			●	●	●	●	12.7	3.18	0.8	

* NX2525 and NX4545 insert honing is "T" type.

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)	
					Chamfer Milling	Face Milling
P	Carbon Steel Alloy Steel	180—280HB	**UTi20T**	80 (60—100)	0.4	0.15
			UP20M	130 (100—160)	0.4	0.2
			NX4545	130 (100—160)	0.4	0.2
		280—350HB	**UTi20T**	80 (60—100)	0.3	0.15
K	Cast Iron	Tensile Strength ≤450MPa	**UTi20T**	100 (85—120)	0.5	0.25
			HTi10	100 (85—120)	0.5	0.25

●Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)

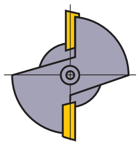
●Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

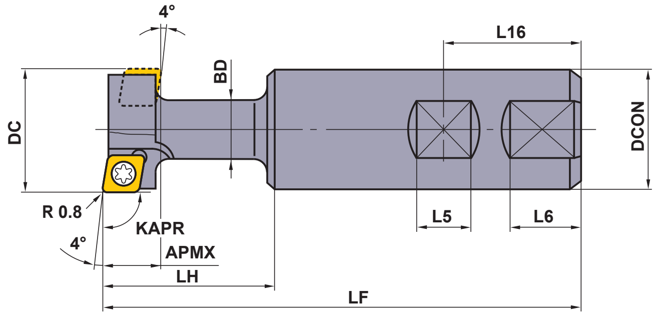
T-SLOT MILLING

90° KAPR

TSMP

P	M	K	N	S	H
Steel		Cast Iron			





- T-groove order number 14, 18 and 22 are available.
- 86° rhombic shape 11° positive insert.
- Shoulder milling and inversed spot facing are also possible.

Right hand tool holder only.

Order Number	T Slot Nomenclature	Stock	Number of Teeth	Dimensions (mm)									*	D R	
		R		DC	LF	DCON	BD	LH	L16	L5	L6	APMX	Clamp Screw	Wrench	Insert
TSMPR252S25	14	●	2	25	112	25	12.5	33.2	32	12	17	11	TS3	TKY08D	MPMW070308
TSMPR322S32	18	●	2	32	120	32	16	41.2	36	14	19	14	TS4	TKY15R	MPMW090308
TSMPR402S32	22	●	2	40	130	32	20	51.2	36	14	19	18	TS5	TKY25R	MPMW120408

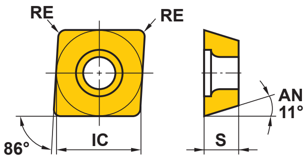
* Clamp Torque (N • m) : TS3=1.0, TS4=3.5, TS5=7.5

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material			
P	Steel	◖	
K	Cast Iron	✤	

Cutting Conditions :
● : Stable Cutting ◖ : General Cutting ✤ : Unstable Cutting

Shape	Order Number	Class	Carbide UTi20T	Dimensions (mm) IC	 S	 RE	Geometry
	**MPMW070308**	M	●	7.94	3.18	0.8	
	MPMW090308	M	●	9.525	3.18	0.8	
	MPMW120408	M	●	12.7	4.76	0.8	

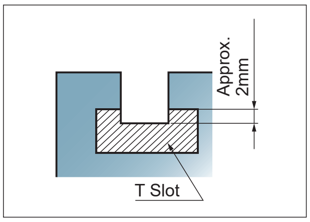
RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardness	Grade	Cutting Speed (m/min)	Feed (mm/rev)
P	Carbon Steel Alloy Steel	180−280HB	**UTi20T**	130 (100−160)	0.15 (0.1−0.2)
		280−350HB	**UTi20T**	80 (60−100)	0.1 (0.05−0.15)
K	Cast Iron	Tensile Strength ≤450MPa	**UTi20T**	100 (80−120)	0.15 (0.1−0.2)

● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)

■ CAUTION FOR USE

- ● When T slot machining steel, the workpiece must be machined as shown in the drawing to ensure smooth chip evacuation.
- ● Slots to be machined must be free from chips for smooth machining.

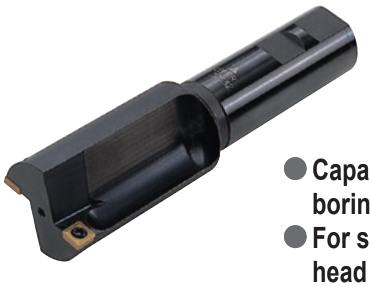


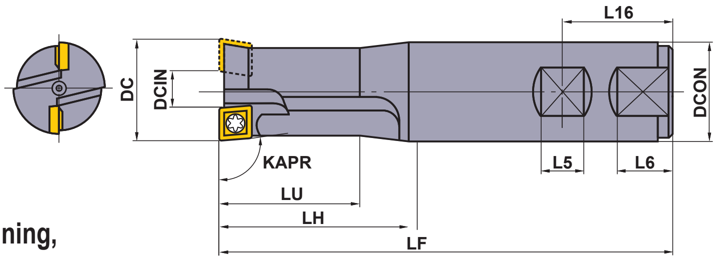
SPOT MILLING

94° KAPR R

CBJP,CBMP

P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron			





- Capable of spot facing machining, boring and interpolation.
- For seat machining of hexagon socket head bolt (M8-M30).
- 86°rhombic shape 11°positive insert.

Right hand tool holder only.

Order Number	For Bolt Size	Stock	Number of Teeth	Dimensions (mm)									*	D R	
		R		DC	DCIN	LF	DCON	LH	LU	L16	L5	L6	Clamp Screw	Wrench	Insert
CBJPR141S25	M8	●	1	14	3.1	108	25	28	21	32	12	17	TS3	TKY08D	JPMT060204-E
CBJPR172S25	M10	●	2	17.5	5.3	115	25	35	26	32	12	17	TS3	TKY08D	JPMT060204-E
CBJPR202S25	M12	●	2	20	7.8	120	25	40	30	32	12	17	TS3	TKY08D	JPMT060204-E
CBJPR232S25	M14	●	2	23	10.8	126	25	46	34.5	32	12	17	TS3	TKY08D	JPMT060204-E
CBMPR262S32	M16	●	2	26	8.5	132	32	52	39	36	14	19	TS4	TKY15R	MPMT090308
CBMPR292S32	M18	●	2	29	11.5	138	32	58	43.5	36	14	19	TS4	TKY15R	MPMT090308
CBMPR322S32	M20	●	2	32	14.5	144	32	64	59	36	14	19	TS4	TKY15R	MPMT090308
CBMPR352S32	M22	●	2	35	17.5	150	32	70	70	36	14	19	TS4	TKY15R	MPMT090308
CBMPR392S32	M24	●	2	39	21.5	158	32	78	78	36	14	19	TS4	TKY15R	MPMT090308
CBMPR432S32	M27	●	2	43	25.5	166	32	86	86	36	14	19	TS4	TKY15R	MPMT090308
CBMPR482S32	M30	●	2	48	30.5	176	32	96	96	36	14	19	TS4	TKY15R	MPMT090308

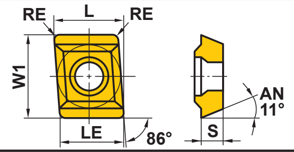
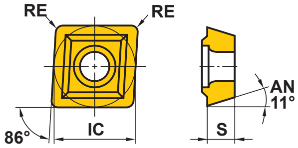
* Clamp Torque (N • m) : TS3=1.0, TS4=3.5

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material							
P	Steel	◐	◐			●	
M	Stainless Steel	◐	◐			●	
K	Cast Iron	✤				✤	

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

Cutter Type	Shape	Order Number	Class	Coated				Carbide		Dimensions (mm)						Geometry
				VP15TF	**UP20M**			**UTi20T**		**L**	**LE**	**W1**	**IC**	**S**	**RE**	
CBJP		**JPMT060204-E**	M	●	●			●		7.0	6.0	7.94	—	2.38	0.4	
CBMP		**MPMT090308**	M	●	●			●		—	—	—	9.525	3.18	0.8	

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardness	Grade	CBJP		CBMP	
				Cutting Speed (m/min)	Feed (mm/rev)	Cutting Speed (m/min)	Feed (mm/rev)
P	Mild Steel	≤180HB	**VP15TF**	180 (100—200)	0.16 (0.12—0.2)	180 (100—200)	0.225 (0.15—0.3)
	Carbon Steel Alloy Steel	180—280HB	**VP15TF**	180 (100—200)	0.2 (0.15—0.25)	180 (100—200)	0.275 (0.2—0.35)
		280—350HB	**VP15TF**	120 (80—160)	0.16 (0.12—0.2)	120 (80—160)	0.225 (0.15—0.3)
M	Stainless Steel	≤200HB	**VP15TF**	150 (100—200)	0.16 (0.12—0.2)	150 (100—200)	0.225 (0.15—0.3)
K	Cast Iron	Tensile Strength ≤450MPa	**VP15TF**	160 (100—220)	0.3 (0.2—0.4)	160 (100—220)	0.35 (0.2—0.5)

●Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC) ●Spindle feed (mm/min) = Feed rate x Tool spindle speed

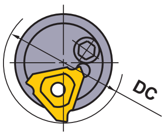
Note 1) CBJPR141S25 use feed per revolution 50 % of this table, because only 1 insert on the body.

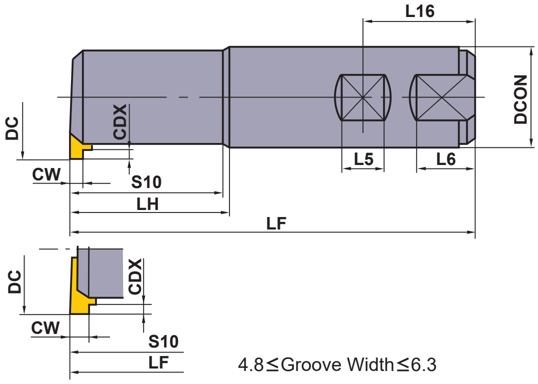
SLOT MILLING

KSMG

P	M	K	N	S	H
Steel		Cast Iron			

- Side face grooving tool for machining centres.
- The minimum cutting diameter is ϕ25mm for internal grooving.
- For groove widths of 1.25mm−6.0mm.





Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (mm)							Geometry of Groove		DC (mm)	Insert Number
	R		LF	DCON	LH	S10	L16	L5	L6	CW	CDX		
KSMGR25S25	●	1	115	25	40	36.5	32	12	17	1.25	1.2	25	MGTL33○○○
										1.45	1.5		
										1.5≤CW≤4.0	3.0		
KSMGR40S32	●	1	130	32	50	49	36	14	19	1.25	1.2	40	MGTL43○○○
										1.45	1.5		
										1.5≤CW≤2.3	3.0		
										2.5≤CW≤4.7	4.5		
			131.6	32	51.6	50.6	36	14	19	5.0≤CW≤6.0	4.5	40	MGTL44○○○
KSMGR40S32L	●	1	180	32	100	99	36	14	19	1.25	1.2	40	MGTL43○○
										1.45	1.5		
										1.5≤CW≤2.3	3.0		
										2.5≤CW≤4.7	4.5		
			181.6	32	101.6	100.6	36	14	19	5.0≤CW≤6.0	4.5	40	MGTL44○○○

SPARE PARTS

Tool Holder Number	 Clamp Lever	 Spring	 Lever Pin	*  Clamp Screw	 F R Wrench
KSMGR25S25	LLCL13S	HLS2	—	LLCS105	HKY20F
KSMGR40S32	LLCL24	—	LLP14	LLCS108	HKY30R
KSMGR40S32L	LLCL24	—	LLP14	LLCS108	HKY30R

* Clamp Torque (N • m) : LLCS105=1.5, LLCS108=3.3

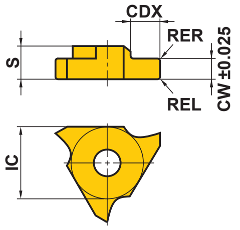
● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material			VP20MF	NX2525	UTi20T
	P	Steel	◐	●	◐
	K	Cast Iron		●	✤

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

Order Number	Grooving Width	Stock			Dimensions (mm)				Geometry
		Coated	Cermet	Carbide					
		VP20MF	NX2525	UTi20T	IC	S	RER/L	CDX	
	CW	L	L	L					
MGTL33125	1.25	●		●	9.525	4.76	0.2	1.2	**MGTL...**
MGTL33145	1.45	●		●	9.525	4.76	0.2	1.5	
MGTL33150	1.5	●	●	●	9.525	4.76	0.2	3	
MGTL33175	1.75	●	●	●	9.525	4.76	0.2	3	
MGTL33200	2	●	●	●	9.525	4.76	0.2	3	
MGTL33230	2.3	●		●	9.525	4.76	0.2	3	
MGTL33250	2.5	●	●	●	9.525	4.76	0.3	3	
MGTL33270	2.7	●		●	9.525	4.76	0.3	3	
MGTL33280	2.8	●		●	9.525	4.76	0.3	3	
MGTL33300	3	●	●	●	9.525	4.76	0.3	3	
MGTL33320	3.2	●			9.525	4.76	0.3	3	
MGTL33330	3.3	●		●	9.525	4.76	0.3	3	
MGTL33350	3.5	●		●	9.525	4.76	0.3	3	
MGTL33400	4	●	●	●	9.525	4.76	0.3	3	
MGTL43125	1.25	●	●	●	12.7	4.76	0.2	1.2	
MGTL43145	1.45	●	●	●	12.7	4.76	0.2	1.5	
MGTL43150	1.5	●	●	●	12.7	4.76	0.2	3	
MGTL43175	1.75	●	●	●	12.7	4.76	0.2	3	
MGTL43200	2	●	●	●	12.7	4.76	0.2	3	
MGTL43230	2.3	●	●	●	12.7	4.76	0.2	3	
MGTL43250	2.5	●	●	●	12.7	4.76	0.3	4.5	
MGTL43260	2.6	●		●	12.7	4.76	0.3	4.5	
MGTL43270	2.7	●		●	12.7	4.76	0.3	4.5	
MGTL43280	2.8	●	●	●	12.7	4.76	0.3	4.5	
MGTL43300	3	●	●	●	12.7	4.76	0.3	4.5	
MGTL43320	3.2			●	12.7	4.76	0.3	4.5	
MGTL43330	3.3	●	●	●	12.7	4.76	0.3	4.5	
MGTL43350	3.5	●	●	●	12.7	4.76	0.3	4.5	
MGTL43400	4	●		●	12.7	4.76	0.3	4.5	
MGTL43420	4.2	●		●	12.7	4.76	0.4	4.5	
MGTL43430	4.3	●		●	12.7	4.76	0.4	4.5	
MGTL43450	4.5	●	●	●	12.7	4.76	0.4	4.5	
MGTL43470	4.7	●	●	●	12.7	4.76	0.4	4.5	
MGTL44500	5	●		●	12.7	6.35	0.4	4.5	
MGTL44600	6			●	12.7	6.35	0.4	4.5	



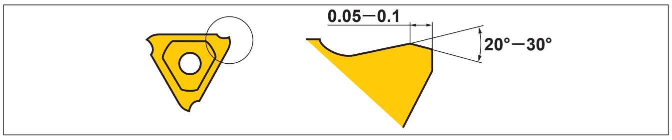
RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
P	Mild Steel	≤180HB	**NX2525** **UTi20T**	130 (120−150)	0.225 (0.1−0.35)
			VP20MF	160 (120−200)	0.225 (0.1−0.35)
	Carbon Steel Alloy Steel	180−280HB	**NX2525** **UTi20T**	110 (100−120)	0.2 (0.1−0.30)
			VP20MF	120 (100−140)	0.2 (0.1−0.30)
		280−350HB	**UTi20T**	110 (100−120)	0.175 (0.1−0.25)
K	Cast Iron	Tensile Strength ≤450MPa	**UTi20T**	100 (80−125)	0.225 (0.1−0.35)

- ● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
- ● Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

■HONING OF CUTTING EDGE

Supplementary honing when steel cutting gives longer tool life.
Use a diamond file for best results.



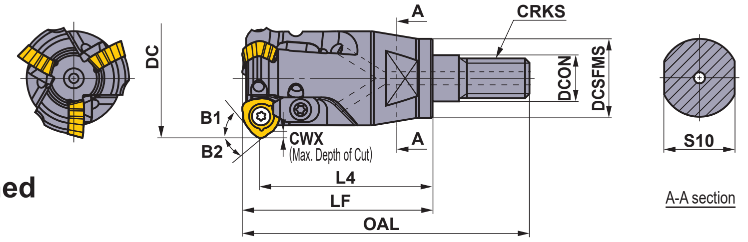
ISO13399 ➤ **L003**
SPARE PARTS ➤ **P001**
TECHNICAL DATA ➤ **Q001**

VERTICAL FEED MILLING

PMC

P	M	K	N	S	H
Steel		Cast Iron			

- **For under-cutting trimed part of press mould.**
- **2 directional cutting with large overhang.**

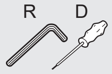
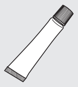


Right hand tool holder only.

Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)											WT (kg)		Shank Arbor
	R			DC	DCON	DCSFMS	OAL	LF	L4	S10	CRKS	CWX	B1	B2		Insert	
PMC08R252AM1035	●	○	2	25	10.5	18	58.7	39.7	35	14	M10	1.5	40.5°	35°	0.1	JOM◌080320 ZZSR-◌◌	SC20M10S ◌◌◌◌W
PMC09R323AM1245	●	○	3	32	12.5	21	72.5	50.5	45	19	M12	3	40.5°	35°	0.2	JDM◌09T320 ZDSR-◌◌	SC25M12S ◌◌◌◌W
PMC12R403AM1645	●	○	3	40	17	29	74.4	51.4	45	24	M16	3.5	42°	35°	0.3	JDM◌120420 ZDSR-◌◌	SC32M16S ◌◌◌◌W

Note1) For screw-in type arbors, refer to pages L341.

SPARE PARTS

Order Number	 * Clamp Screw	 Clamp Bridge	 * Clamp Bridge Screw	 Spring	R D  Wrench	 Anti-seize Lubricant
PMC08R252AM1035	TS33	AMS3	AJS3010T10	ASS2	TKY08D TKY10R	MK1KS
PMC09R323AM1245	TS351	AMS3	AJS3010T10	ASS2	TKY10D	MK1KS
PMC12R403AM1645	TS43	AMS4	AJS4012T15	ASS2	TKY15D	MK1KS

* Clamp Torque (N • m) : TS33=1.5, TS351=2.5, TS43=3.5, AJS3010T10=2.5, AJS4012T15=3.5

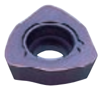
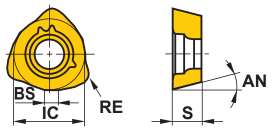
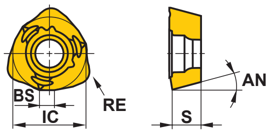
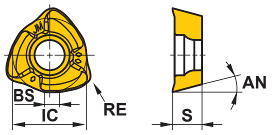
● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

Scan here for product NEWS ▶

INSERTS

Workpiece Material			FH7020	VP15TF	VP30RT
	P	Steel	◐	◐	✣
	K	Cast Iron		✣	✣

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

Shape	Order Number	Class	Coated			Dimensions (mm)					PMC holder	Geometry
			FH7020	VP15TF	VP30RT	AN	IC	S	BS	RE		
Partial Profile **FT** Breaker 	**JOMW080320ZZSR-FT**	M	●	●	●	13°	8	3.18	1.4	2	PMC08R252AM1035	
	JDMW09T320ZDSR-FT	M	●	●	●	15°	9.525	3.97	1.8	2	PMC09R323AM1245	
	JDMW120420ZDSR-FT	M	●	●	●	15°	12	4.76	2.5	2	PMC12R403AM1645	
Strong Cutting Edge Type **ST** Breaker 	**JDMT120420ZDSR-ST**	M	●	●	●	15°	12	4.76	2.5	2	PMC12R403AM1645	
JM Breaker 	**JOMT080320ZZSR-JM**	M	●	●	●	13°	8	3.18	1.4	2	PMC08R252AM1035	
	JDMT09T320ZDSR-JM	M	●	●	●	15°	9.525	3.97	1.8	2	PMC09R323AM1245	
	JDMT120420ZDSR-JM	M	●	●	●	15°	12	4.76	2.5	2	PMC12R403AM1645	

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Breaker	Diameter (mm)	Number of Teeth	Cutting Speed (m/min)	Feed per Tooth (mm/t)	Width of Cut (mm)	Pick Feed (mm)
P	Carbon Steel Alloy Steel	≤180HB	**VP15TF**	**FT**	ø40	3	250 (200—300)	—0.6	—1.5	—6
					ø32	3	200 (150—220)	—0.55	—1.2	—5
					ø25	2	200 (150—220)	—0.55	—1.0	—5
	Alloy Tool Steel Hardening Tool Steel for Cold Work Dies	≤300HB	**VP15TF**	**FT**	ø40	3	250 (200—300)	—0.55	—1.5	—5
					ø32	3	180 (150—200)	—0.5	—1.2	—3
					ø25	2	180 (150—200)	—0.5	—1.0	—3
	Alloy Tool Steel	≤300HB	**VP15TF**	**FT**	ø40	3	200 (100—300)	—0.55	—1.5	—5
					ø32	3	150 (80—200)	—0.5	—1.2	—3
					ø25	2	150 (80—200)	—0.5	—1.0	—3
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP15TF**	**FT**	ø40	3	250 (200—300)	—0.6	—1.5	—6
					ø32	3	200 (150—220)	—0.55	—1.2	—5
					ø25	2	200 (150—220)	—0.55	—1.0	—5
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF**	**FT**	ø40	3	250 (200—300)	—0.6	—1.5	—6
					ø32	3	200 (150—220)	—0.55	—1.2	—5
					ø25	2	200 (150—220)	—0.55	—1.0	—5

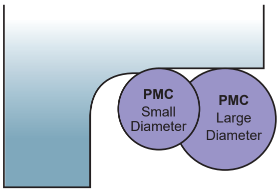
- Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
- Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

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.

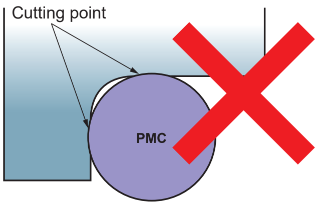
NOTES ON MACHINING METHODS

● How to choose an appropriate diameter tool.

Machine plain surfaces with a larger tool and corner radii with smaller diameter cutters.



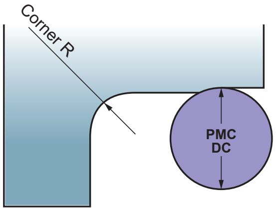
Top View of Machining



Top View of Machining

● Relation of the cutter diameter and corner R size of workpiece

A guide for the smallest possible workpiece radius that can be machined is from 0.6—0.7 x diameter of the tool.



Top View of Machining

Tool diameter **DC**(mm)	Corner R (mm)
ϕ25	R≥17.5
ϕ32	R≥22
ϕ40	R≥24

*Adjust cutting conditions according to the set up.
*Smaller workpiece corner radii (only >0.5 x cutter &) may be possible by reducing the width of cut, speed and pick feed.

ARBORS ➤**L341** **SPARE PARTS** ➤**P001** **TECHNICAL DATA** ➤**Q001**

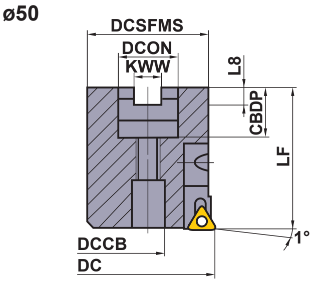
VERTICAL FEED MILLING

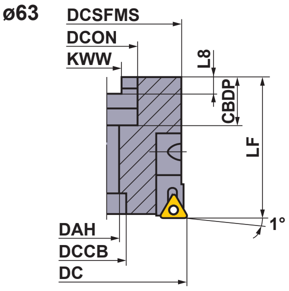
PMF

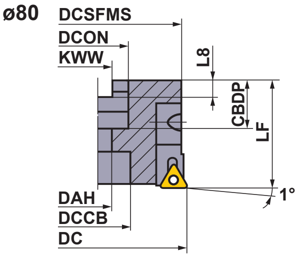
P M **K** N S H

Steel Cast Iron

- 2 directional cutting with large overhang.
- Excellent straightness.
- Excellent wall accuracy.







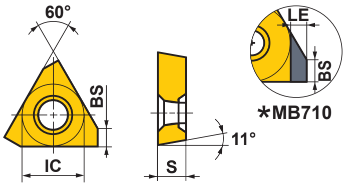
Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (mm)																
	R		DC	LF	DCON	CBDP	DAH	DCCB	KWW	L8	DCSFMS	Cartridge	Clamp Screw *	Radial Screw	Set Bolt (Cartridge) *	Wrench	Wrench	Set Bolt	Insert
PMF05004A22R	●	4	50	63	22	20	—	12	10.4	6.3	48	PMFA13R	TS254	TSS04005	HBH06012	TKY08F	HKY40R HKY50R	①HDS10031	TPEW 1303 ZP◌R2
PMF06306A22R	●	6	63	63	22	20	11	18	10.4	6.3	60	PMFA13R	TS254	TSS04005	HBH06012	TKY08F	HKY40R	②HSC10050	
PMF08008A27R	●	8	80	50	27	23	13.5	30	12.4	7	75	PMFA13R	TS254	TSS04005	HBH06012	TKY08F	HKY40R	②HSC12035	

* Clamp Torque (N • m) : TS254=1.0, HBH06012=8.5

INSERTS

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

Workpiece Material														
P Steel			◐	◐										
K Cast Iron			✤	◐			◐							
			Coated				CBN		Dimensions (mm)				
Shape	Order Number	Class	**VP15TF**	**AP10H**			**MB710**		**IC**	**LE**	**S**	**BS**	Geometry
  *	**TPEW1303ZPER2**	E	●	●					7.94	—	3.18	2	
	* **TPEW1303ZPTR2**	E					▲		7.94	1.5	3.18	2	

● : Inventory maintained in Japan.

(Contains 10 pieces per case.) (Contains one CBN insert per case.)

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
P	Carbon Steel Alloy Steel	180—280HB	**VP15TF**	250 (150—350)	0.1 (0.05—0.15)
		280—380HB	**VP15TF**	200 (100—300)	
K	Gray Cast Iron	Tensile Strength ≤350MPa	**AP10H**	350 (200—500)	0.1 (0.05—0.15)
			MB710	1500 (1000—2000)	

Workpiece Material		Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
K	Ductile Cast Iron	Tensile Strength 360—500MPa	**AP10H**	250 (150—350)	0.1 (0.05—0.15)
			MB710	1000 (800—1200)	
	Ductile Cast Iron	Tensile Strength 500—800MPa	**AP10H**	200 (100—300)	0.1 (0.05—0.15)
			MB710	1000 (800—1200)	

●Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)

●Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

Note 1) Recommended radial depth of cut is 0.1mm.

Note 2) 2 directional vertical cutting is recommended for efficiency.

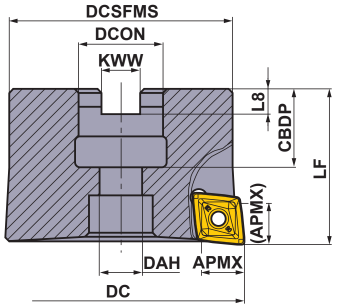
Note 3) For crossfeed cutting, the feed per tooth should be reduced to less than 0.05(mm/t).

VERTICAL FEED MILLING

PMR

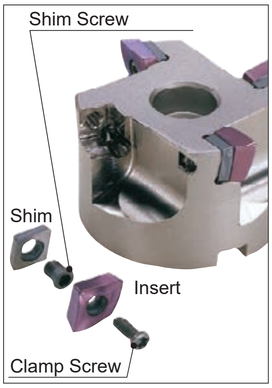
P Steel | M | **K** Cast Iron | N | S | H

- 1 directional cutting with large overhang.
- Horizontal feed cutting and oblique cutting are also possible.
- Unique shape of curved edge gives high rigidity and low resistance.

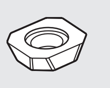
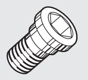


Right hand tool holder only.

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)									Insert
		R		DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	APMX	
Metric	**PMR405003A22R**	●	3	50	40	22	20	11	45	10.4	6.3	11	CPMT1205ZPEN-M2/3
	PMR406304A22R	●	4	63	40	22	20	11	57	10.4	6.3	11	CPMT1205ZPEN-M2/3
	PMR408005A27R	●	5	80	50	27	23	13	73	12.4	7	11	CPMT1205ZPEN-M2/3
Inch	**PMR405003BR**	●	3	50	40	22.225	19	11	45	8.4	5	11	CPMT1205ZPEN-M2/3
	PMR406304BR	●	4	63	40	22.225	19	11	57	8.4	5	11	CPMT1205ZPEN-M2/3
	PMR408005DR	●	5	80	63	31.75	32	17	73	12.7	8	11	CPMT1205ZPEN-M2/3



SPARE PARTS

Tool Holder Number		* 	* 			
	Shim	Shim Screw	Clamp Screw	Wrench (Insert)	Wrench (Shim)	Set Bolt
PMR405003A22R	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
PMR406304A22R	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
PMR408005A27R	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC12035
PMR405003BR	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
PMR406304BR	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
PMR408005DR	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC16040

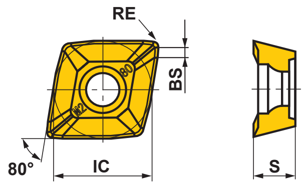
* Clamp Torque (N • m) : TPS35=3.5, WCS503507H=5.0

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

INSERTS

Workpiece Material			VP15TF			
	P	Steel	◐			
	K	Cast Iron	✤			

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

Shape	Order Number	Class	Coated				Dimensions (mm)				Geometry
			VP15TF				IC	S	BS	RE	
	**CPMT1205ZPEN-M2**	M	●				12.7	5.56	1.4	0.8	
	CPMT1205ZPEN-M3	M	●				12.7	5.56	1.4	1.2	

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)	pf (mm)
P	Carbon Steel Alloy Steel	180−280HB	**VP15TF**	180 (150−200)	0.2 (0.1−0.3)	≤0.5DC
		280−380HB				
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP15TF**	180 (150−200)	0.2 (0.1−0.3)	≤0.5DC
	Ductile Cast Iron	Tensile Strength 360−500MPa	**VP15TF**	150 (120−170)	0.2 (0.1−0.3)	≤0.5DC
		Tensile Strength 500−800MPa	**VP15TF**	120 (100−150)	0.2 (0.1−0.3)	≤0.5DC

●Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
●Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution
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 about 20−40%.
Note 3) If chatter or abnormal noises occur, adjust the depth of cut and cutting speed.

ISO13399 ➤ L003
SPARE PARTS ➤ P001

BORING CUTTER

35° KAPR

BMR

Support for special designs

P M **K** N S H

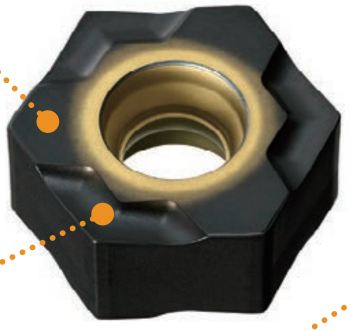
Cast Iron

Body with Peripheral Cutting Edge Run-out Regulator

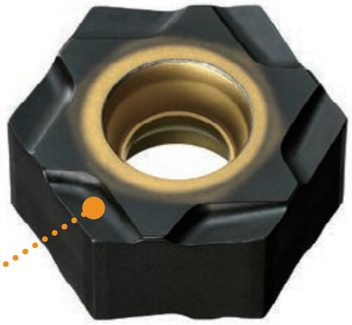
With peripheral cutting edge regulating function for possible use of economical M-class inserts.

* Cutter bodies are only available through special orders.

Double-sided 6-corner type (No hand)



Double-sided 12-corner type (Right hand only)



High Clamping Rigidity

High feed machining possible with improved fracture resistance.

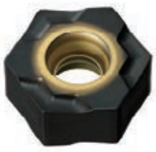
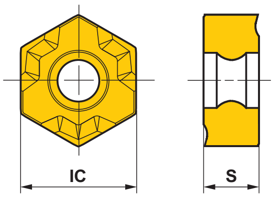
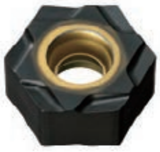
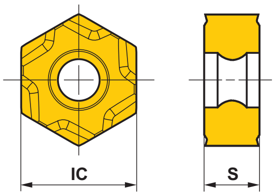
Double Positive Breaker

Reduced cutting resistance. Supports open deck work. Effective finished surface due to wiper edge.

12-Corner Type with Right Hand

Economical 12-corner type that preserves comparable insert rigidity of the 6-corner type by securing the seating surface directly below where the cutting force is absorbed.

INSERTS

Workpiece Material	K Cast Iron	◐				Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting				
Shape	Order Number	Coated MC5015				Hand	Cutting edge	Dimensions (mm) IC	S	Geometry
	**HNMX1206EN06-R**	▲				–	6	12.7	6.0	
	**HNMX1206ER12-R**	▲				R	12	12.7	6.0	

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Tensile Strength	Grade	Cutting Speed **vc** (m/min)	Feed per Tooth **fz** (mm/t)	Cutting depth **ae** (mm)
K	Gray Cast Iron	≤350MPa	**MC5015**	200 (150—250)	0.2 (0.1—0.25)	≤3.0

∗ With feed per cutter, settings are set small for finished surface roughness and large for ideal product life.

▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains 10 pieces per case.)

QUICK CHANGE TYPE

<HIGH FEED CUTTING FOR CAST IRON>

90° KAPR F

FP490

Table Regarding Special Designs

P M **K** N S H

Cast Iron

- 11°positive insert.
- Suitable for cast iron finishing.
- Multi insert design.
- For high feed cutting.
- Easy tool exchange.

Fig.1
Q type
(Small
Diameter)
ø80
ø100
ø125
ø160

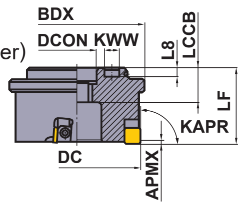


Fig.2
Q type
(Large
Diameter)
ø200
ø250
ø315
ø355
ø400
ø500

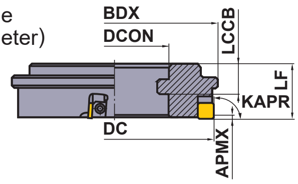
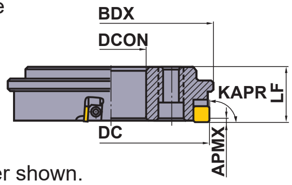


Fig.3
T type
ø250
ø315
ø355
ø400



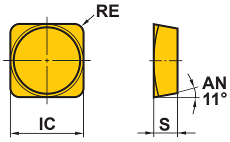
Right hand tool holder shown.

Type	Order Number	Number of Teeth	Dimensions (mm)							WT (kg)	APMX (mm)	Installation Detail Dimensions	Fig.
			DC	BDX	LF	DCON	LCCB	KWW	L8				
Quick Change Q Type	**FP490R/L0308Q**	8	80	85	50	25.4	26	10.8	7	1.5	0.5	Q Typeϕ80−ϕ160	1
	FP490R/L0410Q	10	100	105	63	31.75	29	12.8	7	2.8	0.5		1
	FP490R/L0514Q	14	125	130	63	38.1	29	15.8	7	4.2	0.5		1
	FP490R/L0618Q	18	160	165	63	50.8	29	18.8	7	6.7	0.5		1
	FP490R/L0822Q	22	200	205	45	125	25	—	—	5.5	0.5	Q Typeϕ200−ϕ500	2
	FP490R/L1028Q	28	250	255	45	175	25	—	—	8.0	0.5		2
	FP490R/L1236Q	36	315	320	45	240	25	—	—	10.7	0.5		2
	FP490R/L1440Q	40	355	360	45	280	25	—	—	12.2	0.5		2
	FP490R/L1646Q	46	400	405	45	325	25	—	—	13.8	0.5		2
	FP490R/L2056Q	56	500	505	45	425	25	—	—	17.8	0.5		2
Quick Change T Type	**FP490R/L1028T**	28	250	260	45	110	—	—	—	9.8	0.5	T Typeϕ250−ϕ400	3
	FP490R/L1236T	36	315	325	45	175	—	—	—	12.1	0.5		3
	FP490R/L1440T	40	355	365	45	215	—	—	—	14.1	0.5		3
	FP490R/L1646T	46	400	410	45	260	—	—	—	15.4	0.5		3

Note 1) These are produced to order only.

INSERTS

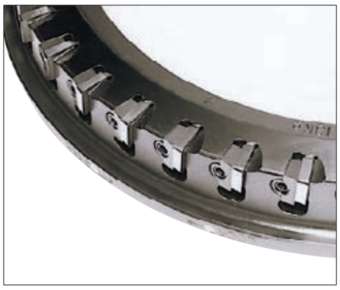
Workpiece Material	K	Cast Iron	◐	●	**Cutting Conditions :** ● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Shape	Order Number	Class	Carbide		Dimensions (mm)			Geometry
			HTi10	**HTi05T**	**IC**	**S**	**RE**	
	**SPEN424A**	E	●	●	12.7	3.18	1.6	

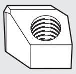
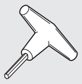
RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Tensile Strength	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
K	Gray Cast Iron	≤350MPa	**HTi05T**	125 (100—150)	0.2 (0.1—0.3)

- ● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
- ● Table Feed (mm/min)
  =Feed per Tooth x Number of Teeth x Cutter Revolution



SPARE PARTS

Tool Holder Number		 *			
	Wedge	Clamp Screw	Wrench	Wrench (Sold Separately)	Hexagonal Head (Sold Separately)
FP490R/L0308Q ı **FP490R/L1646T**	CWS42SPR/L	LS14	HKY40T	120QSPK×80 (KANONN-SEIKI CO.)	6.35□×4 (KYOKUTO MFG CO.)

* Clamp Torque (N • m) : LS14=7.8

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

QUICK CHANGE TYPE

<HIGH FEED CUTTING FOR CAST IRON>

90° KAPR

F

FP590

Table Regarding Special Designs

P M **K** N S H

Cast Iron

- 11°positive insert.
- Suitable for cast iron finishing.
- Multi insert design.
- For high feed cutting.
- Easy tool exchange.

Fig.1
Q type
(Small
Diameter)
ø125
ø160

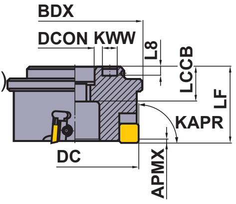


Fig.2
Q type
(Large
Diameter)
ø200
ø250
ø315
ø355
ø400
ø500

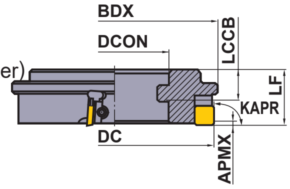
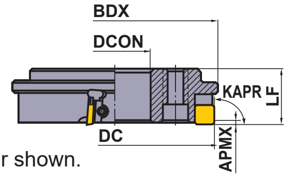


Fig.3
T type
ø250
ø315
ø355
ø400



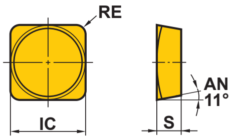
Right hand tool holder shown.

Type	Order Number	Number of Teeth	Dimensions(mm)							WT (kg)	APMX (mm)	Installation Detail Dimensions	Fig.
			DC	BDX	LF	DCON	LCCB	KWW	L8				
Quick Change Q Type	FP590R/L0514Q	14	125	135	63	38.1	29	15.8	7	4.2	0.5	Q Typeϕ125−ϕ160	1
	FP590R/L0618Q	18	160	170	63	50.8	29	18.8	7	6.7	0.5		1
	FP590R/L0822Q	22	200	210	45	125	25	—	—	5.5	0.5	Q Typeϕ200−ϕ500	2
	FP590R/L1028Q	28	250	260	45	175	25	—	—	8.0	0.5		2
	FP590R/L1236Q	36	315	325	45	240	25	—	—	10.7	0.5		2
	FP590R/L1440Q	40	355	365	45	280	25	—	—	12.2	0.5		2
	FP590R/L1646Q	46	400	410	45	325	25	—	—	13.8	0.5		2
	FP590R/L2056Q	56	500	510	45	425	25	—	—	17.8	0.5		2
Quick Change T Type	FP590R/L1028T	28	250	260	45	110	—	—	—	9.8	0.5	T Typeϕ250−ϕ400	3
	FP590R/L1236T	36	315	325	45	175	—	—	—	12.1	0.5		3
	FP590R/L1440T	40	355	365	45	215	—	—	—	14.1	0.5		3
	FP590R/L1646T	46	400	410	45	260	—	—	—	15.4	0.5		3

Note 1) These are produced to order only.

INSERTS

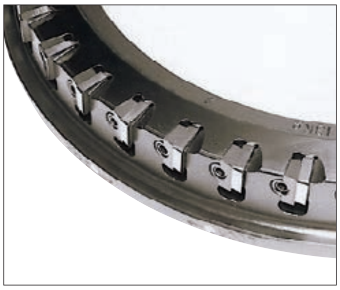
Workpiece Material	K	Cast Iron	◐	Cutting Conditions : ● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Shape	Order Number	Class	Carbide		Dimensions (mm)		Geometry
			HTi05T	IC	S	RE	
	**SPEN535A**	E	●	15.875	4.76	2.0	

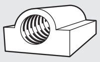
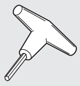
RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Tensile Strength	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
K	Gray Cast Iron	≤350MPa	**HTi05T**	125 (100—150)	0.2 (0.1—0.3)

- ● Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
- ● Table Feed (mm/min)
  =Feed per Tooth x Number of Teeth x Cutter Revolution



SPARE PARTS

Tool Holder Number		 *			
	Wedge	Clamp Screw	Wrench	Wrench (Sold Separately)	Hexagonal Head (Sold Separately)
FP590R/L0514Q ı **FP590R/L1646T**	CWS5	LS14	HKY40T	120QSPK×80 (KANONN-SEIKI CO.)	6.35□×4 (KYOKUTO MFG CO.)

* Clamp Torque (N • m) : LS14=7.8

● : Inventory maintained in Japan.
(Contains 10 pieces per case.)

ISO13399 ➤ L003
SPARE PARTS ➤ P001
TECHNICAL DATA ➤ Q001

QUICK CHANGE TYPE

<FINISHING FOR ALUMINIUM ALLOY>

86° KAPR

PF

FE404

Table Regarding Special Designs

P M K **N** S H

Non-ferrous Metal

- 21°positive insert.
- High rake and relief angle.
- Multi insert design.
- Suitable for light alloy machining.
- Easy tool exchange.

Fig.1
Q type
(Small
Diameter)
ø100
ø125
ø160

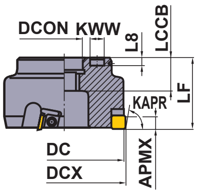


Fig.2
Q type
(Large
Diameter)
ø200
ø250
ø315
ø355
ø400
ø500

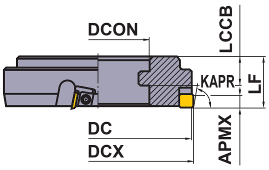
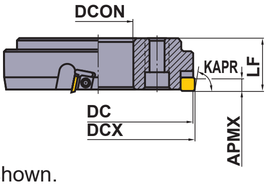


Fig.3
T type
ø250
ø315
ø355
ø400

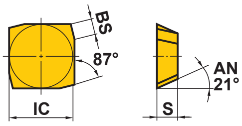


Right hand tool holder shown.

Type	Order Number	Number of Teeth	Dimensions(mm)							WT (kg)	APMX (mm)	Installation Detail Dimensions	Fig.
			DC	DCX	LF	DCON	LCCB	KWW	L8				
Quick Change Q Type	**FE404R/L0408Q**	8	100	102	63	31.75	29	12.8	7	3.2	9	Q Typeϕ100—ϕ160	1
	FE404R/L0510Q	10	125	127	63	38.1	29	15.8	7	4.7	9		1
	FE404R/L0612Q	12	160	162	63	50.8	29	18.8	7	7.6	9		1
	FE404R/L0816Q	16	200	202	45	125	25	—	—	6.1	9	Q Typeϕ200—ϕ500	2
	FE404R/L1020Q	20	250	252	45	175	25	—	—	7.8	9		2
	FE404R/L1224Q	24	315	317	45	240	25	—	—	10.2	9		2
	FE404R/L1428Q	28	355	357	45	280	25	—	—	11.8	9		2
	FE404R/L1632Q	32	400	402	45	325	25	—	—	13.3	9		2
	FE404R/L2040Q	40	500	502	45	425	25	—	—	16.2	9		2
Quick Change T Type	**FE404R/L1020T**	20	250	251	45	110	—	—	—	9.9	9	T Typeϕ250—ϕ400	3
	FE404R/L1224T	24	315	316	45	175	—	—	—	12.2	9		3
	FE404R/L1428T	28	335	356	45	215	—	—	—	13.7	9		3
	FE404R/L1632T	32	400	401	45	260	—	—	—	16.2	9		3

Note 1) These are produced to order only.

INSERTS

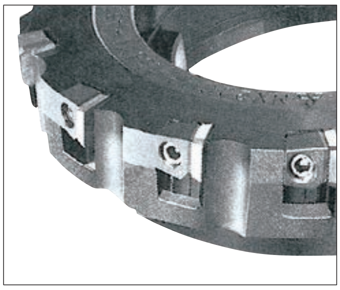
Workpiece Material	N	Non-ferrous Metal	◐		Cutting Conditions : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting			
Shape	Order Number		Class	Carbide HTi10	Dimensions (mm) IC	S	BS	Geometry
	SEA42C10GR		A	▲	12.70	3.18	2.4	
	SEA42C10GL		A	▲	12.70	3.18	2.4	

Note 1) Use R at a right hand body and L at a left hand body.

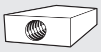
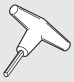
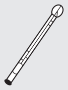
RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Silicon (%)	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t)
N	Aluminium Alloy	≤10	**HTi10**	700 (400—1000)	0.15 (0.05—0.25)
		≥10	**HTi10**	400 (200—600)	0.15 (0.05—0.25)

- ●Revolution (min^{-1})=(1000 x Cutting Speed)÷(3.14 x DC)
- ●Table Feed (mm/min)
  =Feed per Tooth x Number of Teeth x Cutter Revolution



SPARE PARTS

Tool Holder Number		 *			
	Wedge	Clamp Screw	Wrench	Wrench (Sold Separately)	Hexagonal Head (Sold Separately)
FE404R/L0408Q **ı** **FE404R/L1632T**	CWS42SER/L	LS10	HKY40T	120QSPK×80 (KANONN-SEIKI CO.)	6.35□×4 (KYOKUTO MFG CO.)

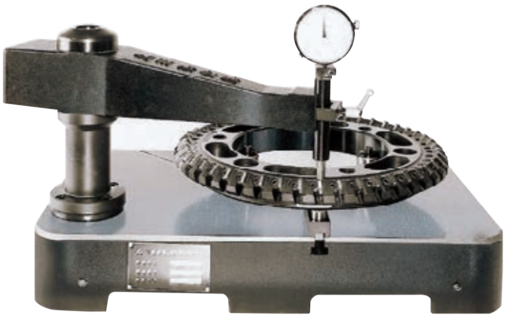
∗ Clamp Torque (N • m) : LS10=8.2

▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains 10 pieces per case.)

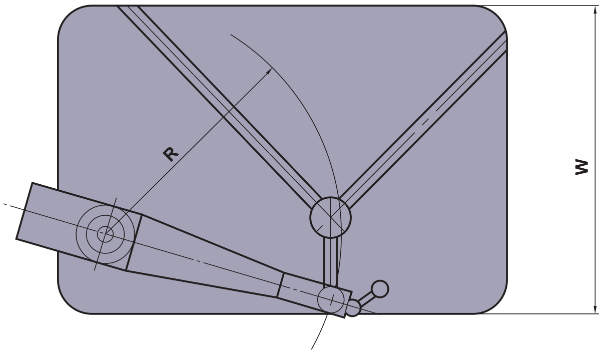
SETTING FIXTURE

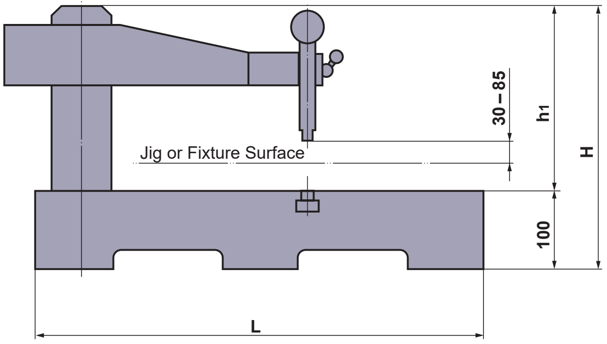
FEATURES OF SETTING FIXTURE

- **Compact design.**
- **Easy set up operation.**
- **Insert is adjusted from the cutting edge point therefore run-out accuracy is high.**



SETTING FIXTURE STANDARD

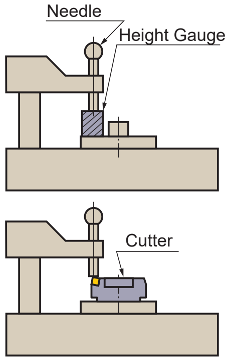




Order Number	R	L	W	H	h_1	Cutter Diameter
SEF500	315	600	400	347	247	—ϕ500
SEF700	400	800	500	360	260	ϕ315—ϕ700

Note 1) Please specify the order number when ordering.
Note 2) Please contact us regarding special spare parts order.

Method of Insert Setting for One Piece Type.



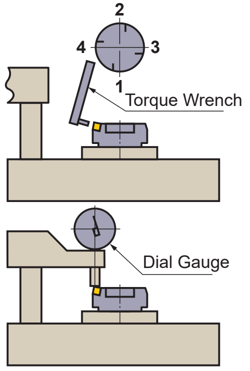
①Set the needle using a height gauge which is the same height as the cutter.

②Move the needle to the insert.

③Slide the insert to the point where it touches the needle. Tighten all the inserts lightly. (Use torque wrench.) (1—2N • m)

*Screwing the inserts too tightly results in lower accuracy.

↗



↘

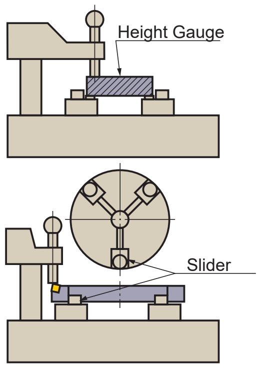
④After temporary tightening, use a torque wrench to tighten firmly. (Use torque wrench.) (8 N • m)

⑤Screw the inserts tightly according to the picture shown on the left.

⑥Check run-out of all the inserts with a dial gauge.

*For general milling, ≤10μm is the standard. For finishing,set the insert run-out at≤5μm.

Method of Insert Setting for Two Piece Type.



①Set the height gauge at the same height as the cutter on the liners of slider, then set the needle.

②Put the cutter on the liners of the slider and move the rollers of the slider to the installation holes.

③Make sure that the three rollers are free, then fix the sliders.

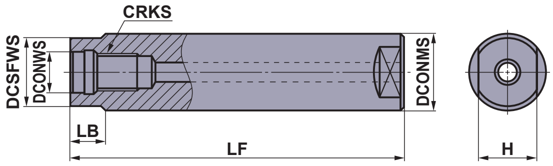
*Process of tightening the inserts is the same as the one piece type.

●Note

1. After machining, dust off chips on the cutter with air before loosening the wedge.
2. When loosening clamp screws, avoid using a damaged wrench.
3. Alien substances attached to inserts lowers run-out accuracy and damages the cutter body. Therefore, they need to be cleaned throughly.
4. After all the inserts are taken out, clean the cutter body with oil or strong air blower.
5. Use a torque wrench or special wrench for tightening the clamp screws.

ARBORS

STRAIGHT SHANK ARBOR



Through coolant compatible

Type	Order Number	Stock	Dimensions (mm)						
			DCONWS	DCONMS	DCSFWS	LF	LB	H	CRKS
STEEL SHANK TYPE	**SC16M08S100S**	●	8.5	16	14.5	100	10	10	M8
	SC16M08S200L	●	8.5	16	14.5	200	10	10	M8
	SC20M10S120S	●	10.5	20	18.5	120	10	14	M10
	SC20M10S220L	●	10.5	20	18.5	220	10	14	M10
	SC25M12S125S	●	12.5	25	23.5	125	10	19	M12
	SC25M12S245L	●	12.5	25	23.5	245	10	19	M12
	SC32M16S140S	●	17.0	32	28.5	140	15	24	M16
	SC32M16S280L	●	17.0	32	28.5	280	15	24	M16
CARBIDE SHANK TYPE	**SC16M08S100SW**	●	8.5	16	14.5	100	10	10	M8
	SC16M08S200LW	●	8.5	16	14.5	200	10	10	M8
	SC20M10S120SW	●	10.5	20	18.5	120	10	14	M10
	SC20M10S220LW	●	10.5	20	18.5	220	10	14	M10
	SC25M12S125SW	●	12.5	25	23.5	125	10	19	M12
	SC25M12S245LW	●	12.5	25	23.5	245	10	19	M12
	SC32M16S140SW	●	17.0	32	28.5	140	15	24	M16
	SC32M16S280LW	●	17.0	32	28.5	280	15	24	M16

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.

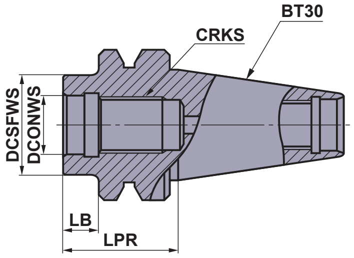
②Tighten the head at the recommended torque and ensure that there is no gap between the head and arbor.

Screw Size	Recommended Torque (N • m)	Wrench Size (mm)
M8	23	10
M10	46	14
M12	80	19
M16	90	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.

● : **Inventory maintained in Japan.**

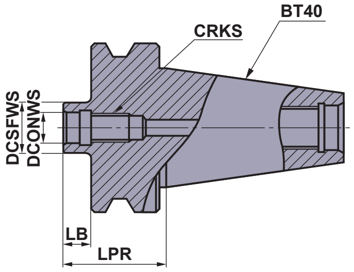
BT30 SHANK ARBOR



Through coolant compatible

Order Number	Stock	Dimensions (mm)				
		DCONWS	DCSFWS	LPR	LB	CRKS
SC16M08S10-BT30	●	8.5	14.5	32	10	M8
SC20M10S10-BT30	●	10.5	18.5	32	10	M10
SC25M12S10-BT30	●	12.5	23.5	32	10	M12
SC32M16S10-BT30	●	17.0	28.5	32	10	M16

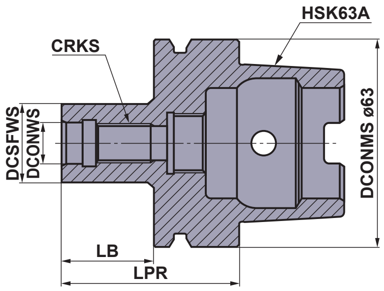
BT40 SHANK ARBOR



Through coolant compatible

Order Number	Stock	Dimensions (mm)				
		DCONWS	DCSFWS	LPR	LB	CRKS
SC16M08S10-BT40	●	8.5	14.5	37	10	M8
SC20M10S10-BT40	●	10.5	18.5	37	10	M10
SC25M12S10-BT40	●	12.5	23.5	37	10	M12
SC32M16S10-BT40	●	17.0	28.5	37	10	M16

HSK63A SHANK ARBOR



Through coolant compatible

Order Number	Stock	Dimensions (mm)				
		DCONWS	DCSFWS	LPR	LB	CRKS
SC16M08S22-HSK63A	●	8.5	14.5	48	22	M8
SC20M10S24-HSK63A	●	10.5	18.5	50	24	M10
SC25M12S27-HSK63A	●	12.5	23.5	53	27	M12
SC32M16S28-HSK63A	●	17.0	28.5	54	28	M16

Note 1) The HSK63A shank type has a built-in coolant pipe for installation.

● : Inventory maintained in Japan.

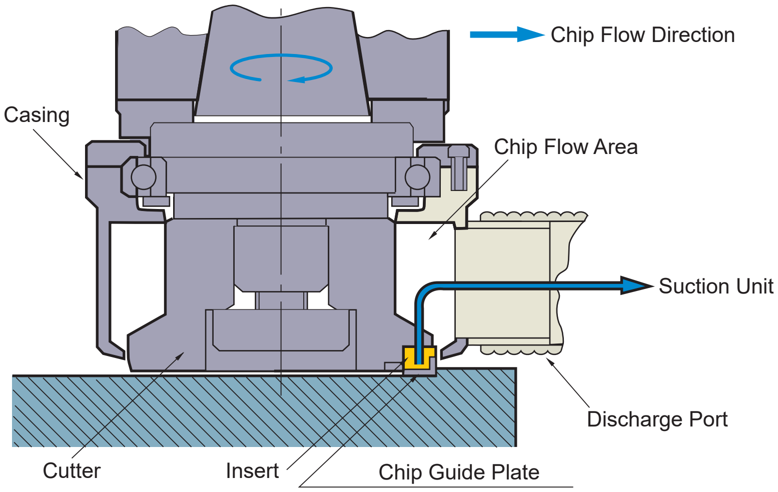
TECHNICAL DATA ➤ Q001

Qing SYSTEM

STRUCTURE CHIP COLLECTION METHOD

STRUCTURE

- Automatic continuous intake of chips while machining.
- Eliminates chip handing problems.



1 Cutting is performed by a face mill.

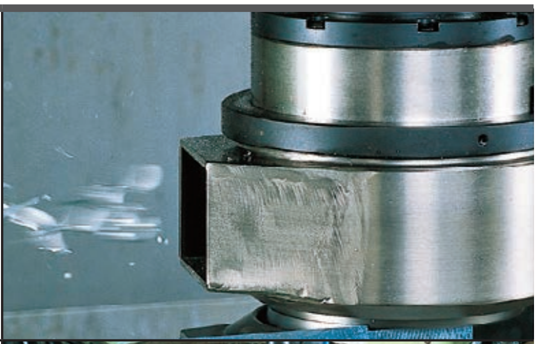
2 Chips are directed into the casing by way of the chip guide plate.

3 Chips are expelled via the discharge port.

CHIP COLLECTION METHOD

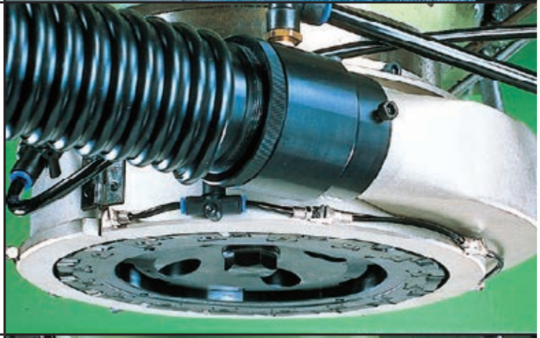
Self Expulsion Type QMC

①Chips are discharged towards the chip conveyor because of the centrifugal force created by the cutter.
②Installation with an ATC(auto tool changer) on machining centres is possible.
③Since there is no need for air or a dust collector, this method provides the lowest initial investment and running costs.
④Chips cannot be transported (carried) directly over long distances.
⑤High-speed bearing required to suit high-speed machining.



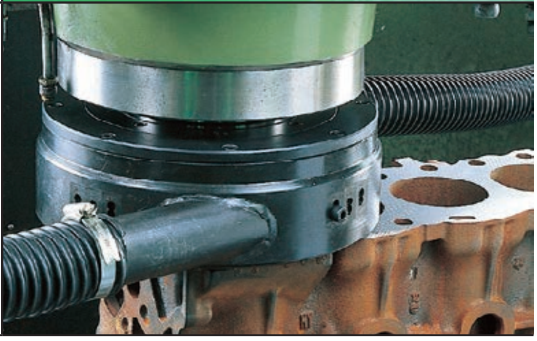
Double Air Type QWA

①Chip recovery using compressed air (factory air).
②Since air is also injected into the casing interior, wet cutting is also possible.
③Achieves the same suction capabilities as a dust collector, thereby enabling low equipment costs.
④Wet cutting is not recommended.



Vacuum Machine Type QSV

①Chip collection by use of a suction machine.
②Chip collection efficiency is high.
③Special equipment is required, such as a mist collector for wet cutting.

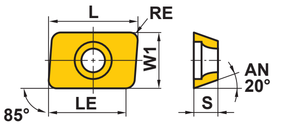
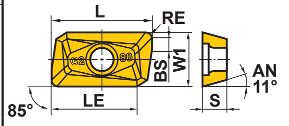
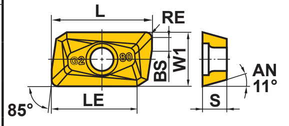
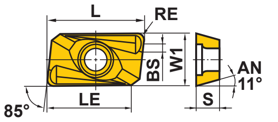
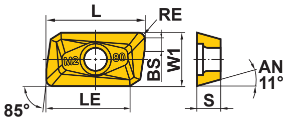
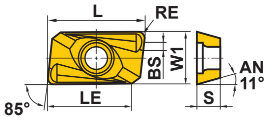
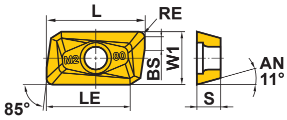
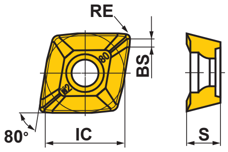


ROTATING INSERTS

Workpiece Material	P	Steel	◐	◐	◐	●	◐	◐	
	M	Stainless Steel	◐	◐	◐	●	◐	◐	
	K	Cast Iron		✣		●		✣	◐
	N	Non-ferrous Metal							◐
	S	Heat resistant Alloy, Titanium Alloy		◐					
	H	Hardened Steel		◐					

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Edge Preparation :
E : Round F : Sharp

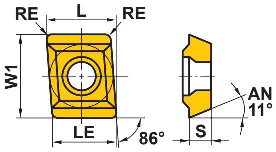
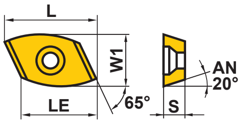
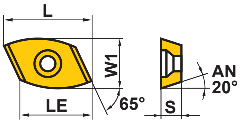
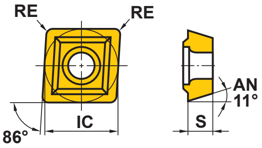
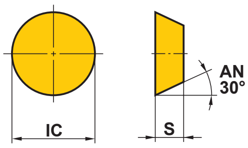
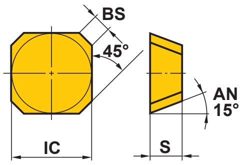
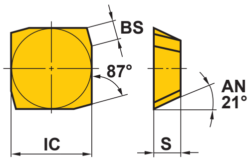
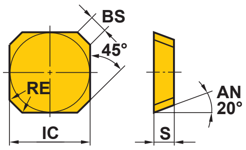
Shape	Order Number	Class	Edge Preparation	Coated			Cermet		Carbide		Dimensions (mm)							Geometry
				F7030	VP15TF	UP20M	NX2525	NX4545	UTi20T	HTi10	IC	L	LE	W1	S	BS	RE	
BAE 	**AEMW150304ER**	M	E			●	●		●		—	16.696	15.2	9.525	3.18	—	0.4	
	AEMW150308ER	M	E			●	●		●		—	16.623	14.8	9.525	3.18	—	0.8	
	AEMW19T304ER	M	E			●	●		●		—	20.161	18.4	12.7	3.97	—	0.4	
	AEMW19T308ER	M	E			●	●		●		—	20.088	18.0	12.7	3.97	—	0.8	
BAP300 **BAP300** Long cutting edge 	**APGT1135PDFR-G2**	G	F							●	—	11.3	9.7	6.35	3.5	1.2	0.8	
BAP400 	**APGT1604PDFR-G2**	G	F							●	—	17.02	14	9.525	4.76	1.4	0.8	
BAP300 **BAP300** Long cutting edge **SRM2** 	**APMT1135PDER-H1**	M	E	●	●		●	●		●	—	11.25	9	6.35	3.5	1.5	0.4	
	APMT1135PDER-H2	M	E	●	●		●	●		●	—	11.25	9	6.35	3.5	1.2	0.8	
	APMT1135PDER-H3	M	E	●							—	11.26	9	6.35	3.5	0.8	1.2	
	APMT1135PDER-H4	M	E	●							—	11.24	9	6.35	3.5	0.4	1.6	
	APMT1135PDER-H6	M	E	●							—	11.10	9	6.35	3.5	0.4	2.4	
BAP300 **BAP300** Long cutting edge **SRM2** 	**APMT1135PDER-M0**	M	E	●							—	11.25	9	6.35	3.5	1.8	0.2	
	APMT1135PDER-M1	M	E	●							—	11.25	9	6.35	3.5	1.5	0.4	
	APMT1135PDER-M2	M	E	●	●			●			—	11.18	9	6.35	3.5	1.2	0.8	
BAP400 **SRM2** **SRM2φ40** **φ50** 	**APMT1604PDER-H1**	M	E	●							—	17.02	14	9.525	4.76	1.7	0.4	
	APMT1604PDER-H2	M	E	●	●		●	●		●	—	17.11	14	9.525	4.76	1.4	0.8	
	APMT1604PDER-H4	M	E	●							—	17.06	14	9.525	4.76	0.4	1.6	
	APMT1604PDER-H6	M	E	●							—	16.93	14	9.525	4.76	0.4	2.4	
	APMT1604PDER-H8	M	E	●							—	16.79	14	9.525	4.76	0.4	3.2	
BAP400 **SRM2** **SRM2φ40** **φ50** 	**APMT1604PDER-M2**	M	E	●	●			●			—	17.10	14	9.525	4.76	1.4	0.8	
PMR 	**CPMT1205ZPEN-M2**	M	E		●						12.7	—	—	—	5.56	1.4	0.8	
	CPMT1205ZPEN-M3	M	E		●						12.7	—	—	—	5.56	1.4	1.2	
	CPMT1906ZPEN-M2	M	E		●						19.05	—	—	—	6.35	1.4	0.8	
	CPMT1906ZPEN-M3	M	E		●						19.05	—	—	—	6.35	1.4	1.2	

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains 10 pieces per case.)

Workpiece Material	P	Steel	◐		◐	◐	●	◐	◐	
	M	Stainless Steel	◐		◐	◐	●	◐	◐	
	K	Cast Iron		◐	✣		●		✣	◐
	N	Non-ferrous Metal								◐
	S	Heat resistant Alloy, Titanium Alloy			◐					
	H	Hardened Steel			◐					

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Edge Preparation :
E : Round **F** : Sharp **S** : Chamfer + Round **T** : Chamfer

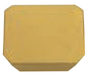
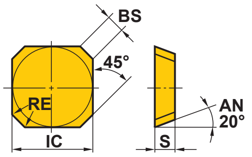
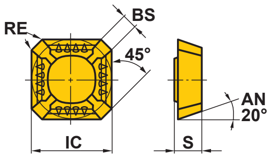
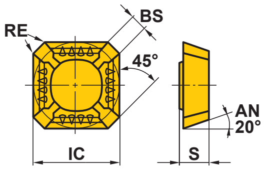
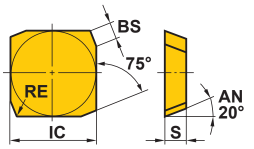
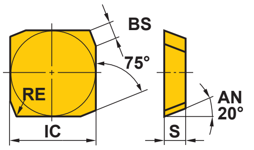
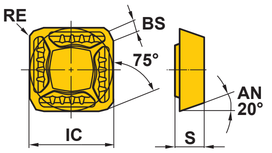
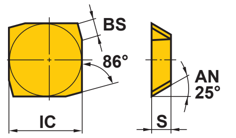
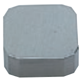
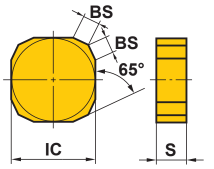
Shape	Order Number	Class	Edge Preparation	Coated				Cermet		Carbide		Dimensions (mm)							Geometry
				F7030	MC5020	VP15TF	UP20M	NX2525	NX4545	UTi20T	HTi10	IC	L	LE	W1	S	BS	RE	
CBJP TAB 	**JPMT060204-E**	M	E			●	●			●		—	7.0	6.0	7.94	2.38	—	0.4	
MG245 MG345 MG445 	**MGEEW1035AFTR**	E	T				●	●		●	●	—	14.3	9.3	9	3.5	—	—	 This figure is for outer insert (E).
	MGEEW1242AFTR	E	T				●	●		●	●	—	17.0	11.2	10.5	4.2	—	—	
	MGEEW1650AFTR	E	T				●	●		●	●	—	21.8	14.9	13	5	—	—	
MG200 MG300 MG400 	**MGEEW1035PFTR**	E	T				●	●		●	●	—	14.3	9.3	9	3.5	—	—	
	MGEEW1242PFTR	E	T				●	●		●	●	—	17.0	11.2	10.5	4.2	—	—	
	MGEEW1650PFTR	E	T				●			●	●	—	21.8	14.9	13	5	—	—	
CBMP ECMP TAB 	**MPMT070308**	M	E				●			●		7.94	—	—	—	3.18	—	0.8	
	MPMT090308	M	E			●	●			●		9.525	—	—	—	3.18	—	0.8	
	MPMT120408	M	E				●			●		12.7	—	—	—	4.76	—	0.8	
SG20 	**RGEN2004M0EN**	E	E			●						20	—	—	—	4.76	—	—	
	RGEN2004M0SN	E	S	●			●			●	●	20	—	—	—	4.76	—	—	
FMSD 	**SDEN1203AEN**	E	T						▲			12.7	—	—	—	3.18	1.2	—	
FE404 E404 	**SEA42C10GR**	A	F								▲	12.7	—	—	—	3.18	2.4	—	
	SEA42C10GL	A	F								▲	12.7	—	—	—	3.18	2.4	—	
SE445 LSE445 	**SECN1203AFTN1**	C	T						●			12.7	—	—	—	3.18	1.4	1.0	
	SEEN1203AFFN1	E	F								●	12.7	—	—	—	3.18	1.4	1.0	
	SEEN1203AFEN1	E	E			●						12.7	—	—	—	3.18	1.4	1.0	
	SEEN1203AFTN1	E	T					●	●			12.7	—	—	—	3.18	1.4	1.0	
	SEEN1203AFSN1	E	S	●	●							12.7	—	—	—	3.18	1.4	1.0	

ROTATING INSERTS

			F7030	MC5020	VP15TF	NX2525	NX4545	UTi20T	HTi10
Workpiece Material	P	Steel	◐		◐	◐	◐	◐	
	M	Stainless Steel	◐		◐	◐	◐	◐	
	K	Cast Iron		◐	✤	◐		✤	◐
	N	Non-ferrous Metal							◐
	S	Heat resistant Alloy, Titanium Alloy			◐				
	H	Hardened Steel			◐				

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp **S :** Chamfer + Round **T :** Chamfer

Shape	Order Number	Class	Edge Preparation	Coated			Cermet		Carbide		Dimensions (mm)				Geometry
				F7030	MC5020	VP15TF	NX2525	NX4545	UTi20T	HTi10	IC	S	BS	RE	
SE545 	**SEEN1504AFEN1**	E	E			●					15.875	4.76	1.4	1.0	
	SEEN1504AFTN1	E	T				●	●			15.875	4.76	1.4	1.0	
	SEEN1504AFSN1	E	S	●	●						15.875	4.76	1.4	1.0	
SE445 **LSE445** 	**SEER1203AFEN-JS**	E	E	●	●	●					12.7	3.18	1.4	1.0	
SE545 	**SEER1504AFEN-JS**	E	E	●	●						15.875	4.76	1.4	1.0	
SE415 **QSE415** 	**SEEN1203EFFR1**	E	F							●	12.7	3.18	1.4	1.0	 Right hand insert shown.
	SEEN1203EFER1	E	E			●					12.7	3.18	1.4	1.0	
	SEEN1203EFTR1	E	T				●	●			12.7	3.18	1.4	1.0	
	SEEN1203EFSR1	E	S	●	●						12.7	3.18	1.4	1.0	
SE515 	**SECN1504EFTR1**	C	T					●			15.875	4.76	1.4	1.0	 Right hand insert shown.
	SEEN1504EFER1	E	E			●					15.875	4.76	1.4	1.0	
	SEEN1504EFTR1	E	T					●			15.875	4.76	1.4	1.0	
	SEEN1504EFSR1	E	S	●							15.875	4.76	1.4	1.0	
SE415 **QSE415** 	**SEER1203EFER-JS**	E	E	●	●						12.7	3.18	1.4	1.0	
BF407 **QBF407** 	**SFAN1203ZFFR2**	A	F							●	12.7	3.175	2.4	—	
	SFAN1203ZFFL2	A	F							●	12.7	3.175	2.4	—	
	SFCN1203ZFFR2	C	F							●	12.7	3.175	2.4	—	
	SFCN1203ZFFL2	C	F							□	12.7	3.175	2.4	—	
BN425 **DN** 	**SNC43B2G**	C	F							●	12.7	4.8	2	—	
	SNC43B2S	C	T *1					●	●		12.7	4.8	2	—	

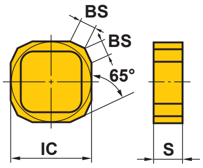
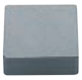
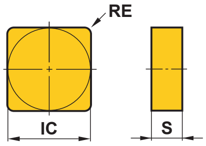
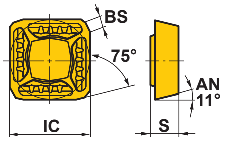
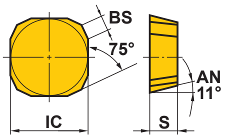
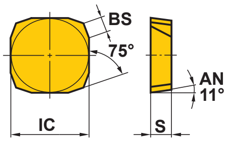
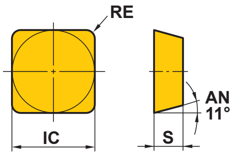
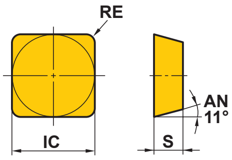
*1 Grade UTi20T is "E".

● : Inventory maintained in Japan. □ : Non stock, produced to order only.
▲ : Inventory maintained in Japan. To be replaced by new products.
(Contains 10 pieces per case.)

Workpiece Material			F7030	MC5020	VP15TF	UP20M	NX2525	NX4545	UTi20T	HTi10
	P	Steel	◐		◐	◐	●	◐	◐	
	M	Stainless Steel	◐		◐	◐	●	◐	◐	
	K	Cast Iron		◐	✤		●		✤	◐
	N	Non-ferrous Metal								◐
	S	Heat resistant Alloy, Titanium Alloy			◐					
	H	Hardened Steel			◐					

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Edge Preparation :
E : Round **F** : Sharp **T** : Chamfer

Shape	Order Number	Class	Edge Preparation	Coated				Cermet		Carbide		Dimensions (mm)				Geometry
				F7030	MC5020	VP15TF	UP20M	NX2525	NX4545	UTi20T	HTi10	IC	S	BS	RE	
BN425 DN 	**SNMF43B2G**	M	E		●							12.7	4.8	2	–	
	**SNMN120408**	M	E		●							12.7	4.76	–	0.8	
	SNMN120412	M	E		●							12.7	4.76	–	1.2	
FBP415 	**SPER1203EEER-JS**	E	E		●							12.7	3.18	1.4	–	
Corner Angle 15° 	**SPEN1203EDR**	E	T	▲				▲	▲			12.7	3.18	1.4	–	 Right hand insert shown.
FBP415 	**SPEN1203EEER1**	E	E		●						●	12.7	3.175	1.4	–	 Right hand insert shown.
	SPEN1203EEEL1	E	E		●						●	12.7	3.175	1.4	–	
	SPNN1203EEER1	N	E		●						●	12.7	3.18	1.3	–	
	SPNN1203EEEL1	N	E								●	12.7	3.18	1.3	–	
S400 	**SPMN120304**	M	E*1			●				●	●	12.7	3.18	–	0.4	
	SPMN120304T	M	T					●				12.7	3.18	–	0.4	
	SPMN120308	M	E*1	●		●	●			●	●	12.7	3.18	–	0.8	
	SPMN120312	M	E*1	●		●				●	●	12.7	3.18	–	1.2	
	SPMN120408	M	E*1		●					●	●	12.7	4.76	–	0.8	
	SPMN120412	M	E		●					●		12.7	4.76	–	1.2	
	SPGN120304	G	E*1					●		●	●	12.7	3.18	–	0.4	
	SPGN120308	G	E*1				●	●		●	●	12.7	3.18	–	0.8	
	SPGN120312	G	F								●	12.7	3.18	–	1.2	
S500 	**SPMN150408**	M	E							●		15.875	4.76	–	0.8	
	SPMN150412	M	E							●		15.875	4.76	–	1.2	
	SPGN150404	G	E							●		15.875	4.76	–	0.4	
	SPGN150408	G	F								●	15.875	4.76	–	0.8	

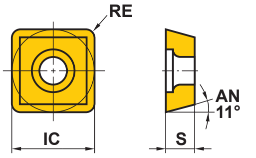
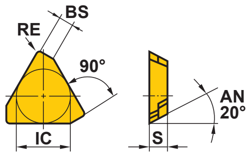
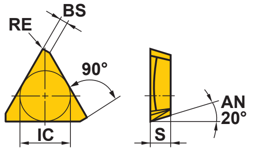
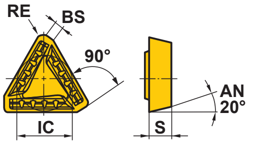
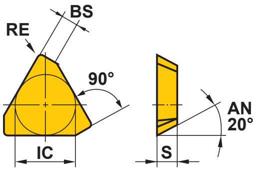
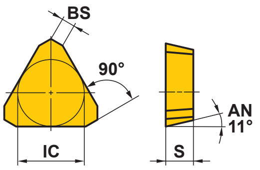
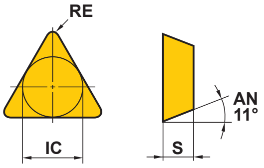
*1 Grade HTi10 is "F".

ROTATING INSERTS

			F7030	MC5020	VP15TF	UP20M	NX2525	NX4545	UTi20T	HTi10
Workpiece Material	P	Steel	◐		◐	◐	●	◐	◐	
	M	Stainless Steel	◐		◐	◐	●	◐	◐	
	K	Cast Iron		◐	✣		●		✣	◐
	N	Non-ferrous Metal								◐
	S	Heat resistant Alloy, Titanium Alloy			◐					
	H	Hardened Steel			◐					

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Edge Preparation :
E : Round **F** : Sharp **S** : Chamfer + Round **T** : Chamfer

Shape	Order Number	Class	Edge Preparation	Coated				Cermet		Carbide		Dimensions (mm)				Geometry
				F7030	MC5020	VP15TF	UP20M	NX2525	NX4545	UTi20T	HTi10	IC	S	BS	RE	
TBE1 	**SPMT120408-A**	M	E				▲			▲		12.7	4.76	—	0.8	
NSE300 SE300 	**TEEN1603PEFR1**	E	F								●	9.525	3.175	1.4	0.4	
	TEEN1603PEER1	E	E			●					●	9.525	3.175	1.4	0.4	
	TEEN1603PETR1	E	T				●	●	●	●		9.525	3.175	1.4	0.4	
	TEEN1603PESR1	E	S	●	●							9.525	3.175	1.4	0.4	
NSE300 SE300 	**TECN1603PEFR1W**	C	F								●	9.525	3.175	1.4	0.4	Wall face finishing. 
	TECN1603PEER1W	C	E								●	9.525	3.175	1.4	0.4	
	TECN1603PETR1W	C	T					●	●	●		9.525	3.175	1.4	0.4	
NSE300 NSE400 	**TEER1603PEER-JS**	E	E	●						●		9.525	3.175	1.4	0.4	
	TEER2204PEER-JS	E	E	●						●		12.7	4.76	1.4	1.0	
NSE400 SE400 	**TECN2204PEFR1**	C	F								●	12.7	4.76	1.4	1.0	
	TECN2204PEER1	C	E								●	12.7	4.76	1.4	1.0	
	TECN2204PETR1	C	T					●	●	●		12.7	4.76	1.4	1.0	
	TEEN2204PEFR1	E	F								●	12.7	4.76	1.4	1.0	
	TEEN2204PEER1	E	E			●					●	12.7	4.76	1.4	1.0	
	TEEN2204PETR1	E	T				●	●	●	●		12.7	4.76	1.4	1.0	
	TEEN2204PESR1	E	S	●	●							12.7	4.76	1.4	1.0	Right hand insert shown.
Corner Angle 0° 	**TPEN1603PPR**	E	T	▲				▲				9.525	3.18	1.2	—	
	TPEN2204PDR	E	E	▲								12.7	4.76	1.4	—	
11°Positive 	**TPMN160304**	M	E*1	●		●	●	●		●	●	9.525	3.18	—	0.4	
	TPMN160308	M	E*2	●		●	●	●		●	●	9.525	3.18	—	0.8	
	TPMN160312	M	E*1				●				●	9.525	3.18	—	1.2	
	TPMN220404	M	E							●		12.7	4.76	—	0.4	
	TPMN220408	M	E*1	●		●	●			●	●	12.7	4.76	—	0.8	
	TPMN220412	M	E*1	●		●				●	●	12.7	4.76	—	1.2	

*1 Grade HTi10 is "F".
*2 Grade HTi10 is "F", Grade NX2525 is "T".

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.

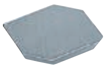
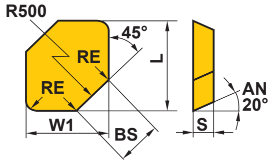
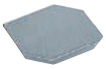
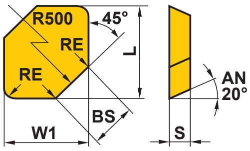
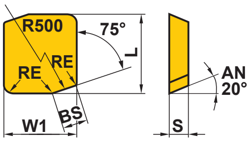
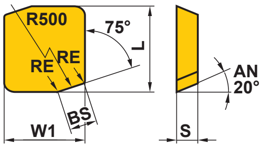
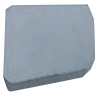
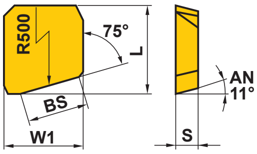
(Contains 10 pieces per case.)

WIPER INSERTS

Workpiece Material			NX2525	HTi05T
	P	Steel	◐	
	M	Stainless Steel	◐	
	K	Cast Iron	◐	◐
	N	Non-ferrous Metal		◐

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Edge Preparation :
E : Round **T** : Chamfer

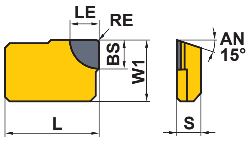
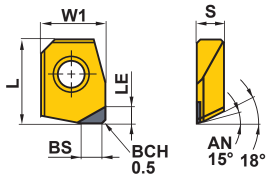
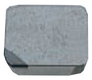
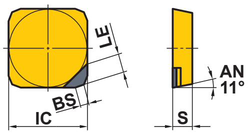
Shape	Order Number	Class	Edge Preparation	Cermet	Carbide	Dimensions (mm)					Geometry
				NX2525	HTi05T	L	W1	S	BS	RE	
SE445 **LSE445** 	**WEC42AFTR5C**	C	T	●		15.33	12.7	3.18	5	1.0	
SE545 	**WEC53AFER5C**	C	E		●	18.505	15.875	4.76	5	1.0	
	WEC53AFTR5C	C	T	●		18.505	15.875	4.76	5	1.0	
SE415 	**WEC42EFER5C**	C	E		●	13.728	12.7	3.18	5	1.0	
	WEC42EFTR5C	C	T	●		13.728	12.7	3.18	5	1.0	
SE515 	**WEC53EFTR5C**	C	T	●		16.903	15.875	4.76	5	1.0	
FBP415 **QBP415** 	**WPC42EEER10C**	C	E		●	15.163	12.7	3.175	10	–	 Right hand insert shown.
	WPC42EEEL10C	C	E		●	15.163	12.7	3.175	10	–	

CBN & PCD INSERTS

			MB710	MB730	MD220
Workpiece Material	K	Cast Iron	◐	◐	
	N	Non-ferrous Metal			◐

Cutting Conditions (Guide) :

● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Shape	Order Number	Class	CBN		PCD	Dimensions (mm)							Geometry
			MB710	MB730	MD220	L	W1	IC	S	BS	LE	RE	
AF5000 	**LDCN190412R**	C		▲		19.05	12.7	—	4.76	4.3	6.0	1.2	
V10000 	**NP-GDCW1240PDFR2**	C			●	12	9.5	—	4	2	2	—	
FBP415 	**SPEN1203EETR1**	E	▲			—	—	12.7	3.175	1.4	3	—	

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.

(Contains one piece per case.)

Memo