

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 WORK MATERIAL
provides a graph depicting the scope of the available work material for machining.

PRODUCT FEATURES
CORNER ANGLE ICON

**TYPE/
NAME OF
PRODUCT**

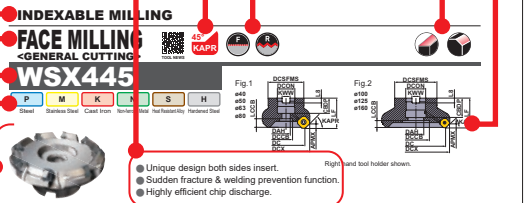
APPLICATION ICON
represents available machining applications, such as finishing and roughing.

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

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

APPLICATION

PRODUCT SECTION



Arbor Type Right Hand Tool Holder
KAPR: 45°
GAMP: 11°

DC (mm)	Order Number	Stock	Color Note	Type	DCX	LF	DCON	WT (kg)	APMX (mm)	Fig.
40	WSX445-040A03AR	●	○	3 Coarse Pitch	52.8	40	18	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	WSX445-063A03AR	●	○	3 Coarse Pitch	75.9	40	22	0.6	5	1
63	WSX445-063A04AR	●	○	4 Fine Pitch	75.9	40	22	0.6	5	1
63	WSX445-063A05AR	●	○	5 Extra Fine Pitch	75.9	40	22	0.6	5	1
80	WSX445R080A04CA	●	○	4 Coarse Pitch	92.9	50	25.4	1.3	5	1
80	WSX445R080B06CA	●	○	6 Fine Pitch	92.9	50	25.4	1.2	5	1
80	WSX445R080B08CA	●	○	8 Extra Fine Pitch	92.9	50	25.4	1.1	5	1
100	WSX445R100A05DA	●	○	5 Coarse Pitch	112.9	50	31.75	1.8	5	2
100	WSX445R100B07DA	●	○	7 Fine Pitch	112.9	50	31.75	1.7	5	2
100	WSX445R100B10DA	●	○	10 Extra Fine Pitch	112.9	50	31.75	1.6	5	2
125	WSX445R125B06EA	●	○	6 Coarse Pitch	137.9	63	38.1	3.2	5	2
125	WSX445R125B08EA	●	○	8 Fine Pitch	137.9	63	38.1	3.1	5	2
125	WSX445R125B12EA	●	○	12 Extra Fine Pitch	137.9	63	38.1	3.0	5	2
160	WSX445R160B07FA	●	○	7 Coarse Pitch	172.9	63	50.8	4.9	5	2
160	WSX445R160B10FA	●	○	10 Fine Pitch	172.9	63	50.8	4.8	5	2
160	WSX445R160B16FA	●	○	16 Extra Fine Pitch	172.9	63	50.8	4.6	5	2
200	WSX445R200B08KN	●	○	8 Coarse Pitch	212.9	63	47.625	8.7	5	3
200	WSX445R200B12KN	●	○	12 Fine Pitch	212.9	63	47.625	8.6	5	3
200	WSX445R200B20KN	●	○	20 Extra Fine Pitch	212.9	63	47.625	8.4	5	3
250	WSX445R250B10KN	●	○	10 Coarse Pitch	262.9	63	47.625	13.1	5	3
250	WSX445R250B14KN	●	○	14 Fine Pitch	262.9	63	47.625	13.2	5	3
315	WSX445R315B16PN	●	○	16 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) Please use a set bolt of the FMA(metric) type on the cutter body from 40 to 63 in diameter(DC).
Note3) Please use a set bolt of the FMA(type) on the cutter body from 80 to 315 in diameter(DC).

SPARE PARTS

Arbor Type	Clamp Screw	Wrench (Insert)
WSX445	TPS4R	TIP15W

* Clamp Torque (N·m) : TPS4R=3.5

● : Inventory maintained in Japan.

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

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

PHOTO OF PRODUCT

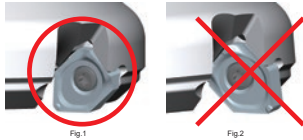
INSERTS WITH BREAKER

Work Material	Order Number	Stock	Color Note	Type	DCX	LF	DCON	WT (kg)	APMX (mm)	Fig.
P Steel	WSX445-040A03AR	●	○	3 Coarse Pitch	52.8	40	18	0.3	5	1
M Stainless Steel	WSX445-040A04AR	●	○	4 Fine Pitch	52.8	40	16	0.3	5	1
K Cast Iron	WSX445-050A03AR	●	○	3 Coarse Pitch	62.9	40	22	0.5	5	1
N Non-ferrous Metal	WSX445-050A04AR	●	○	4 Fine Pitch	62.9	40	22	0.4	5	1
S Heat-resistant Alloy, Titanium Alloy	WSX445-063A03AR	●	○	3 Coarse Pitch	75.9	40	22	0.6	5	1
H Hardened Steel	WSX445-063A04AR	●	○	4 Fine Pitch	75.9	40	22	0.6	5	1

WIPER INSERTS

Work Material	Order Number	Stock	Color Note	Type	DCX	LF	DCON	WT (kg)	APMX (mm)	Fig.
P Steel	WSX445-040A03AR	●	○	3 Coarse Pitch	52.8	40	18	0.3	5	1
M Stainless Steel	WSX445-040A04AR	●	○	4 Fine Pitch	52.8	40	16	0.3	5	1
K Cast Iron	WSX445-050A03AR	●	○	3 Coarse Pitch	62.9	40	22	0.5	5	1
N Non-ferrous Metal	WSX445-050A04AR	●	○	4 Fine Pitch	62.9	40	22	0.4	5	1
S Heat-resistant Alloy, Titanium Alloy	WSX445-063A03AR	●	○	3 Coarse Pitch	75.9	40	22	0.6	5	1
H Hardened Steel	WSX445-063A04AR	●	○	4 Fine Pitch	75.9	40	22	0.6	5	1

Instructions for use of wiper inserts



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 0.05mm/rev.

SPARE PARTS > Q001
TECHNICAL DATA > R001

●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

STANDARD OF MILLING

FACE MILLING

WSX445	M018
ASX445	M030
AHX440S	M038
AHX475S	M043
AHX640S	M046
AHX640W	M054
AOX445	M060
SE515	M062
SG20	M064

FACE MILLING (HIGH FEED)

FMAX	M066
V10000	M070
NF10000	M072
FF3000	M074

SHOULDER MILLING

VOX400	M076
ASX400	M080
BAP300	M086

SIDE CUTTER

VAS400	M090
VAS500	M092
VOS400	M094
ASX400	M095

MULTI FUNCTIONAL MILLING

APX3000	M096
APX4000	M102
NEW VPX200	M110
NEW VPX300	M122
AXD4000	M134
AXD7000	M142
BXD4000	M150
AQX	M154
AJX	M162
NEW WJX	M172
OCTACUT	M180
ARP	M186
ARX	M192
BRP	M196

*Arranged by Alphabetical order

M038	AHX440S
M043	AHX475S
M046	AHX640S
M054	AHX640W
M162	AJX
M060	AOX445
M096	APX3000
M202	APX3000 LONG CUTTING EDGE TYPE
M102	APX4000
M206	APX4000 LONG CUTTING EDGE TYPE
M154	AQX
M186	ARP
M192	ARX
M080	ASX400
M095	ASX400
M030	ASX445
M134	AXD4000
M142	AXD7000
M086	BAP300
M210	BAP300 LONG CUTTING EDGE TYPE
M260	BMR

M196	BRP
M150	BXD4000
M250	CBJP,CBMP
M246	CESP,CFSP,CGSP
M212	DCCC
M266	FE404
M074	FF3000
M066	FMAX
M262	FP490
M264	FP590
M252	KSMG
M072	NF10000
M180	OCTACUT
M254	PMC
M256	PMF
M258	PMR
M271	Qing
M269	SC-M
M062	SE515
M268	SEF
M064	SG20

SYMBOL DESCRIPTIONS	M002
LIST OF CUTTING EDGE DIAMETER TOLERANCES	M004
MAXIMUM ALLOWABLE REVOLUTION FOR CUTTER	M005
CLASSIFICATION	M006
CLASSIFICATION OF SIDE CUTTER	M009
CLASSIFICATION OF BORE BORING TOOLS	M009
CLASSIFICATION OF END MILLS	M010
CLASSIFICATION OF SCREW-IN TOOLS	M014
HOW TO SELECT AN END MILL	M016

DEEP SHOULDER MILLING

NEW APX3000 LONG CUTTING EDGE TYPE	M202
APX4000 LONG CUTTING EDGE TYPE	M206
BAP300 LONG CUTTING EDGE TYPE	M210
DCCC	M212
SPX	M215
VFX5	M220
VFX6	M224

BALL NOSE END MILLING

SRF/SRB	M228
SUF	M232
SRM2	M236
SRM2 ϕ 40, ϕ 50	M244

CHAMFER MILLING

CESP,CFSP,CGSP	M246
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T-SLOT MILLING

TSMP	M248
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SPOT MILLING

CBJP,CBMP	M250
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SLOT MILLING

KSMG	M252
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VERTICAL FEED MILLING

PMC	M254
PMF	M256
PMR	M258

BORING CUTTER

BMR	M260
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QUICK CHANGE TYPE

FP490	M262
FP590	M264
FE404	M266
SETTING FIXTURE	M268

ARBOR STANDARDS

FOR SCREW-IN TOOLS	M269
Qing SYSTEM	M271



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°

75°
KAPR 75°

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

M

INDEXABLE MILLING

Accuracy



Finish Cutting



Medium Cutting



Rough Cutting

Work Material Range

1st Recommendation



2nd Recommendation



LIST OF CUTTING EDGE DIAMETER TOLERANCES

Cutter Type	Cutting Edge Diameter Tolerance (mm)	Cutter Type	Cutting Edge Diameter Tolerance (mm)
AJX	-0.1 -0.4	BXD4000 Arbor Type	-0.1 -0.4
APX3000 Arbor Type	-0.1 -0.4	BXD4000 Shank Type	-0.1 -0.2
APX3000 Shank Type	-0.1 -0.2	CBJP	0 -0.3
APX3000 Long Cutting Edge Type	-0.1 -0.3	CBMP	0 -0.3
APX4000 Arbor Type	-0.1 -0.4	OCTACUT	0 -0.3
APX4000 Shank Type	-0.1 -0.2	PMC	±0.05
APX4000 Long Cutting Edge Type	-0.1 -0.3	PMF	0 -0.3
AQX	-0.1 -0.3	PMR	0 -0.3
ARP Arbor Type	-0.1 -0.3	SPX	-0.1 -0.3
ARP Shank Type	-0.1 -0.2	SRF	0 -0.027
ARX	-0.05 -0.15	SRM	-0.05 -0.15
ASX400	0 -0.3	SUF	0 -0.02
AXD4000 Arbor Type	-0.1 -0.4	TSMP	-0.1 -0.3
AXD4000 Shank Type	-0.1 -0.2	VFX5, VFX6 Shell Type	-0.1 -0.3
AXD7000 Arbor Type	-0.1 -0.4	VOX400	-0.1 -0.4
AXD7000 Shank Type	-0.1 -0.2	VPX Arbor Type	-0.1 -0.3
BAP300	0 -0.3	VPX Shank Type	-0.1 -0.2
BRP	-0.1 -0.3	WJX	-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		SE515	
	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	—	—
63	15000	3.5	16000	3.5	12000	8	16000	3.5	—	—
80	14000	3.5	14000	3.5	11000	8	14000	3.5	—	—
100	12000	3.5	13000	3.5	9300	8	13000	3.5	9300	8
125	11000	3.5	12000	3.5	8300	8	12000	3.5	8100	8
160	9500	3.5	10000	3.5	7200	8	10000	3.5	7000	8
200	8500	3.5	9000	3.5	6400	8	9000	3.5	—	—
250	7500	—	8000	3.5	—	—	8000	3.5	—	—
315	6500	—	6500	3.5	—	—	—	—	—	—

Diameter (mm)	FMAX		V10000		NF10000		SG20		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)
40	30000	—	—	—	—	—	—	—	—	—
50	30000	3.5	—	—	—	—	—	—	—	—
63	27000	3.5	25000	3.5	—	—	—	—	—	—
80	24500	3.5	22300	3.5	16000	8.5	8200	8.5	8900	6
100	22000	3.5	20000	3.5	14000	8.5	7000	8.5	7800	6
125	19600	3.5	17800	3.5	12000	8.5	6100	8.5	6600	6
160	—	—	—	—	—	—	5300	8.5	5300	6
200	—	—	—	—	—	—	—	—	4100	6
250	—	—	—	—	—	—	—	—	2900	6
315	—	—	—	—	—	—	—	—	1700	6

Diameter (mm)	AXD4000		AXD7000		BXD4000		VPX200		VPX300	
	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
28	48500	1.5	—	—	—	—	27200	1.0	22500	3.0
30	—	—	—	—	—	—	26000	1.0	21500	3.0
32	48000	1.5	41000	3.5	33000	4	25100	1.0	20600	3.0
35	45000	1.5	—	—	31000	4	23800	1.0	19500	3.0
40	41000	1.5	36000	3.5	29000	4	22000	1.0	17900	3.0
50	35000	1.5	30000	3.5	24000	4	19200	1.0	15500	3.0
63	30000	1.5	25000	3.5	21000	4	16700	1.0	13400	3.0
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	—	—	—	—
160	—	—	—	—	—	—	—	—	—	—

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

M

INDEXABLE MILLING

CLASSIFICATION

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Work Material	Page
For General Cutting WSX445  45° KAPR	5	● Unique design both sides insert. ● Sudden fracture & welding prevention function. ● Highly efficient chip discharge.  TOOL NEWS	Ø40 — Ø315	P M K N S H	M018
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.  TOOL NEWS	Ø50 — Ø315	P M K N S H	M030
For General Cutting AHX440S  50° KAPR	3	● Heptagonal double sided insert. ● Economical 14 cutting edge inserts. ● Multi insert design for high feed machining.  TOOL NEWS	Ø40 — Ø160	P M K H	M036 M038
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.  TOOL NEWS	Ø50 — Ø160	P K H	M036 M043
For General Cutting AHX640S  50° KAPR	6	● Heptagonal double sided insert. ● Economical 14 cutting edge inserts. ● Multi insert design for high feed machining.  TOOL NEWS	Ø63 — Ø200	P M K S H	M036 M046
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.  TOOL NEWS	Ø80 — Ø315	K	M054
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.  TOOL NEWS	Ø63 — Ø160	K	M060
For Heavy Cutting SE515  75° KAPR	11.5	● 20° positive insert. ● High rake angle. ● High rigidity due to carbide shim.	Ø100 — Ø160	P M K	M062
For Difficult-to-cut Materials SG20  R KAPR	8	● 30° positive insert. ● High rake angle. ● Round shape insert with a strong cutting edge. ● Suitable for difficult-to-cut materials.	Ø80 — Ø160	P M K H	M064
For High-efficiency Finishing of Aluminium Alloys FMAX  90° KAPR	3	● Feed Maximum (FMAX) milling cutter for ultra efficient and accurate finishing. ● With through coolant holes.  TOOL NEWS	Ø40 — Ø160	N	M066

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Work Material	Page
High Feed Finishing for Aluminium Alloy V10000  	1.5	● Insert with PCD. ● Light weight, strong aluminium alloy cutter body. ● Anti-Fly insert mechanism enables high speed milling. ● Adjustable cutting edge run-out function. 	Ø63 — Ø125		M070
High Speed Finishing for Aluminium Alloy and Cast Iron NF10000  	PCD 4.0 CBN 1.0	● Suitable for light alloy and cast iron finishing. ● Adjustable cutting edge run-out function. 	Ø80 — Ø125	 	M072
High Feed Finishing FF3000  	0.3	● 11° positive insert. ● 1000—3000mm/min high feed machining. ● For finishing of steel machining. ● Adjustable cutting edge run-out function.	Ø125 — Ø250	   	M074
High Feed Cutting for Cast Iron FP490  	0.5	● 11° positive insert. ● Suitable for cast iron finishing. ● Multi-insert design. ● For high feed cutting. ● Easy tool exchange.	Ø80 — Ø500		M262
High Feed Cutting for Cast Iron FP590  	0.5	● 11° positive insert. ● Suitable for cast iron finishing. ● Multi-insert design. ● For high feed cutting. ● Easy tool exchange.	Ø125 — Ø500		M264
High Feed Cutting for Aluminium FE404  	9	● 21° positive insert. ● High rake and relief angle. ● Multi-insert design. ● Suitable for light alloy machining. ● Easy tool exchange.	Ø100 — Ø500		M266
Multi Functional Milling NEW WJX 	2	● Negative inserts. ● Stable clamp with dovetail structure. ● Suitable for high feed machining. ● Special insert design with 6 cutting edges. ● With through coolant holes. 	Ø50 — Ø160	    	M172
Multi Functional Milling AJX 	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. 	Ø50 — Ø160	    	M162
Multi Functional Milling of Difficult-to-cut Materials ARP  	5 6	● Run-out does not occur easily when changing sections. ● Solid clamping system. ● Standardized stock of extra fine pitch. ● With through coolant holes. 	Ø40 — Ø100	 	M186
Multi Functional Milling BRP  	6 8	● 11° positive insert. ● Round shape insert with a strong cutting edge. ● Wide range of tools available. ● Suitable for mould machining. 	Ø40 — Ø100	    	M198

CLASSIFICATION

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Work Material	Page
Multi Functional Milling OCTACUT  42° KAPR	7 9	● 20° positive insert. ● For octagonal and round type inserts. ● Multi functional machining.	Ø40 — Ø160	P M K H	M181
For Cast Iron VOX400  90° KAPR	10	● Vertical inserts with high strength cutting edge. ● Economical 8 cutting edge inserts. ● Screw-on type. 	Ø50 — Ø250	K	M076
For General Cutting ASX400  90° KAPR	10	● High accuracy, high quality vertical wall. ● Low cutting force insert. ● With through air & coolant holes. 	Ø50 — Ø250	P M K N S H	M080
For Multi Functional Cutting APX3000  90° KAPR	10	● Low cutting force insert. ● High accuracy, high quality vertical wall. ● With through air & coolant holes. 	Ø32 — Ø100	P M K N S H	M097
For Multi Functional Cutting APX4000  90° KAPR	15	● Low cutting force insert. ● High accuracy, high quality vertical wall. ● With through air & coolant holes. 	Ø40 — Ø160	P M K S H	M103
Multi Functional Milling for High Efficiency Machining NEW 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. 	Ø32 — Ø63	P M K N S H	M112
Multi Functional Milling for High Efficiency Machining NEW 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. 	Ø40 — Ø80	P M K N S H	M124
Aluminium Alloy to Difficult-to-cut Material Cutting AXD4000  90° KAPR	14.8 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. 	Ø40 — Ø125	P N S	M135
Aluminium Alloy to Difficult-to-cut Material Cutting AXD7000  90° KAPR	20.4 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. 	Ø50 — Ø125	P N S	M142
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. 	Ø40 — Ø125	P M N S H	M150

CLASSIFICATION OF SIDE CUTTER

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Work Material	Page
VAS400 Side Cutter  	11.4 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. 	Ø80 — Ø160	P K	M090
VAS500 Side Cutter  	15.4 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. 	Ø100 — Ø200	P K	M092
VOS400 Side Cutter  	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. 	Ø80 — Ø160	K	M094
ASX400 Side Cutter  	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. 	Ø80 — Ø160	P M K	M095

CLASSIFICATION OF BORE BORING TOOLS

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Work Material	Page
BMR  	—	● 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.	—	K	M260

M

INDEXABLE MILLING

CLASSIFICATION

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Work Material	Page
WSX445  	5	● Unique design both sides insert. ● Sudden fracture & welding prevention function. ● Highly efficient chip discharge. ● With through coolant holes. 	Ø40 — Ø80	 	M022
ASX445  	6	● Precision inexpensive moulded type 20° positive insert. ● Screw-on type. ● A wide range of chip breakers. ● High rigidity due to carbide shim. 	Ø50 — Ø80	 	M032
AOX445  	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. 	Ø50 — Ø63		M060
AJX 	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. 	Ø16 — Ø63	 	M164
ASX400  	10	● High tolerance M-class inserts. ● Economical 4 cutting edge inserts. ● Curved cutting edge and high rigidity holder. ● Screw-on type. 	Ø40 — Ø80	 	M082
VPX200  	8	● Special insert design with 4 cutting edges. ● High precision, high quality insert cutting edge with finishing blade. ● With through coolant holes. 	Ø16 — Ø50	 	M110
VPX300  	11	● Special insert design with 4 cutting edges. ● High precision, high quality insert cutting edge with finishing blade. ● With through coolant holes. 	Ø25 — Ø50	 	M122
APX3000  	10	● High accuracy, high quality vertical wall. ● Low cutting force insert. ● With through coolant holes. 	Ø12 — Ø63	 	M096
APX3000 Long Cutting Edge  	28 55	● High accuracy, high quality vertical wall. ● Low cutting force insert. 	Ø20 — Ø40	 	M202
APX3000 Shell Type  	37 46	● High accuracy, high quality vertical wall. ● Low cutting force insert. ● With through coolant holes. 	Ø40 Ø50	 	M203

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Work Material	Page
BAP300  	9	● 11° positive insert. ● Inserts with wiper edges produce optimal finished surface. ● Multi insert design for high feed machining. 	Ø10 — Ø63		M086
BAP300 Long Cutting Edge  	25 51	● 11° positive insert. ● Inserts with wiper edges produce optimal finished surface. ● Multi insert design for high feed machining. 	Ø20 — Ø40		M210
APX4000  	15	● High accuracy, high quality vertical wall. ● Low cutting force insert. ● With through air & coolant holes. 	Ø25 — Ø63		M102
APX4000 Long Cutting Edge  	56 84	● High accuracy, high quality vertical wall. ● Low cutting force insert. ● With through air & coolant holes. 	Ø40 Ø50		M206
APX4000 Shell Type  	42 56	● High accuracy, high quality vertical wall. ● Low cutting force insert. ● With through coolant holes. 	Ø50 Ø63		M207
AXD4000  	14.8 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. 	Ø20 — Ø40		M134
AXD7000  	20.4 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. 	Ø32 — Ø50		M142
BXD4000  	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. 	Ø20 — Ø40		M152
AQX  	7.4 55	● The center bottom cutting edge enables drilling without previously formed hole. ● With through coolant holes. 	Ø16 — Ø50		M154
ARP  	5 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		M188

CLASSIFICATION

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Work Material	Page
ARX  	2.5 3.5	● 15° positive, high tolerance M-class insert. ● Effective for various machining applications. ● With through coolant holes. 	Ø10 — Ø25		M192
WJX  	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		M175
OCTACUT  	7 9	● 20° positive insert. ● For octagonal and round type inserts. ● Multi-functional machining.	Ø32 — Ø63		M180
BRP  	4 5	● 11° positive insert. ● Round shape insert with a strong cutting edge. ● Wide range of tools available. ● Suitable for mould machining. 	Ø12 — Ø63		M196
DCCC  	27 93	● Different helical flute angles prevents chattering. 	Ø25 — Ø50		M212
SPX  	72 261	● Low cutting resistance due to the use of wavy inserts. ● Suitable for heavy cutting due to holder rigidity. 	Ø50 — Ø63		M215
SPX Shell Type  	58	● Low cutting resistance due to the use of wavy inserts. ● Suitable for heavy cutting due to holder rigidity. 	Ø63 Ø80		M216
VFX5  	26 75	● High performance titanium alloy milling. ● High rigidity design. ● Highly reliable clamping mechanism. ● With through coolant holes. 	Ø40 — Ø80		M220
VFX6  	31 90	● High performance titanium alloy milling. ● High rigidity design. ● Highly reliable clamping mechanism. ● With through coolant holes. 	Ø63 — Ø100		M224
SRF/SRB  	5.5 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. 	Ø10 — Ø32		M228

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Work Material	Page
SUF  	1.5 5.2	● Highly accurate corner radius tolerance allows for high precision finishing. ● Seamless gash. 	Ø10 — Ø32		M232
SRM2  	12 44	● Suitable for roughing to semi-finishing of small and medium moulds. ● High rigidity body design. ● Low resistance chipbreaker. ● Through coolant hole type. 	Ø16 — Ø30		M236
SRM2 Ø40/Ø50  	54 63	● Best for roughing of moulds. ● Low resistance chipbreaker. ● Highly rigid body. 	Ø40 Ø50		M244
CESP·CFSP·CGSP  	5.9 10.2	● Covers 5 cutting modes. ● Excellent sharpness with 11° positive inserts. ● 30°, 45° and 60° chamfer series.	Ø8 — Ø32		M246
TSMP  	11 18	● T-groove order number 14, 18 and 22 are available. ● 86° rhombic shape 11° positive insert. ● Shoulder milling and inverted spot facing are also possible.	Ø25 — Ø40		M248
CBJP·CBMP  	—	● 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		M250
KSMG 	1.2 4.5	● Side face grooving tool for machining centers. ● The minimum cutting diameter is Ø25mm for internal grooving. ● For groove widths of 1.25mm — 6.0mm.	Ø25 Ø40		M252
PMF  	0.1	● 2 directional cutting with large overhang. ● Excellent straightness. ● Excellent wall accuracy.	Ø50 — Ø80		M256
PMR  	11	● 2 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		M258

CLASSIFICATION OF SCREW-IN TOOLS

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Work Material	Page
ASX400  	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. 	Ø32 — Ø40		M083
APX3000  	10	● High accuracy, high quality vertical wall. ● Low cutting force insert. ● With through air & coolant holes. 	Ø16 — Ø40		M098
APX4000  	15	● High accuracy, high quality vertical wall. ● Low cutting force insert. ● With through air & coolant holes. 	Ø25 — Ø40		M104
AQX  	7.4 18	● The center bottom cutting edge enables drilling without previously formed hole. ● With through coolant holes. 	Ø16 — Ø40		M156
VPX200  	8	● Special insert design with 4 cutting edges. ● High precision, high quality insert cutting edge with finishing blade. ● With through coolant holes. 	Ø16 — Ø40		M111
VPX300  	11	● Special insert design with 4 cutting edges. ● High precision, high quality insert cutting edge with finishing blade. ● With through coolant holes. 	Ø25 — Ø40		M123
AJX 	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. 	Ø16 — Ø40		M166
ARP  	5 6	● Run-out does not occur easily when changing sections. ● Solid clamping system. ● With through coolant holes. 	Ø25 — Ø40		M189
ARX  	3	● 15° positive, high tolerance M-class insert. ● Effective for various machining applications. ● With through air & coolant holes. 	Ø16 — Ø25		M193

CLASSIFICATION OF SCREW-IN TOOLS

Product Name · Shape	APMX (mm)	Features	Cutter Dia. (mm)	Work Material	Page
SRF/SRB  	9 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. 	Ø16 — Ø32		M229
SUF  	2.1 5.2	● Highly accurate corner radius tolerance allows for high precision finishing. ● Seamless gash. ● With through coolant holes. 	Ø16 — Ø32		M233
SRM2  	12 44	● Suitable for roughing to semi-finishing of small and medium moulds. ● High rigidity body design. ● Low resistance chipbreaker. ● With through coolant holes. 	Ø16 — Ø32		M238
PMC 	1.5 3.5	● For under-cutting trimmed part of press mould. ● 2 directional cutting with large overhang. ● With through coolant holes. 	Ø25 — Ø40		M254

CLASSIFICATION

	Multi Functional Type									General Type			
Product Name	VPX200 VPX300 NEW	APX3000 APX4000	AXD4000 AXD7000	BXD4000	AJX WJX NEW	AQX	ARX	ARP BRP	OCTACUT	ASX400	ASX445 WSX445	AOX445	
Cutting Mode	➡ M110 ➡ M122	➡ M096 ➡ M102	➡ M134 ➡ M142	➡ M152	➡ M164 ➡ M175	➡ M154	➡ M192	➡ M188 ➡ M196	➡ M180	➡ M082	➡ M032 ➡ M022	➡ M060	
Face Milling													
Shoulder Milling													
Slot Milling													
Pocket Milling													
Copy Milling													
Helical Drilling													
Spot Milling													
Chamfer Milling													
Radius Milling													

M

INDEXABLE MILLING

INDEXABLE MILLING

INDEXABLE MILLING

FACE MILLING <GENERAL CUTTING>



WSX445

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



Fig.1

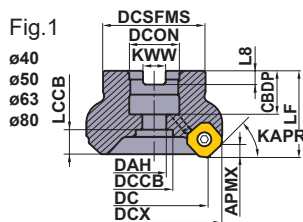
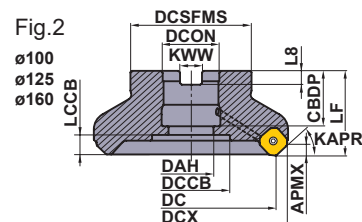


Fig.2



Right hand tool holder shown.

- Unique design both sides insert.
- Sudden fracture & welding prevention function.
- Highly efficient chip discharge.

Arbor Type Right Hand Tool Holder

KAPR : 45°

GAMP : +17° GAMF : -6°—+1°

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
NEW 250	WSX445R25010KN	●	—	10	Coarse Pitch	262.9	63	47.625	13.1	5	3
NEW 250	WSX445R25014KN	●	—	14	Fine Pitch	262.9	63	47.625	13.2	5	3
NEW 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) Please use a set bolt of the FMC(metric) type on the cutter body from 40 to 63 in diameter(DC).

Note3) Please use a set bolt of the FMA type on the cutter body from 80 to 315 in diameter(DC).

SPARE PARTS

Arbor Type	* 	
WSX445	TPS4R	TIP15W

* Clamp Torque (N・m) : TPS4R=3.5

● : Inventory maintained in Japan.

Fig.3
ø200
ø250

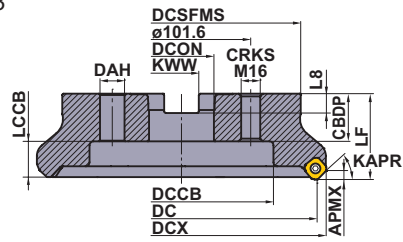
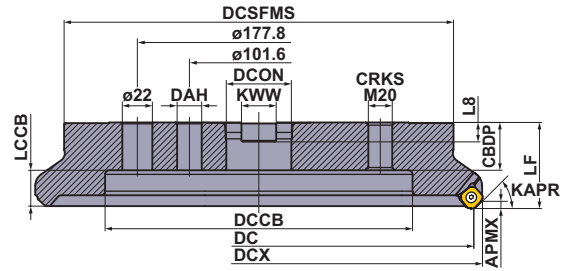


Fig.4
ø315



Right hand tool holder shown.

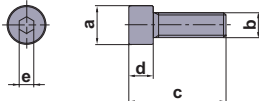
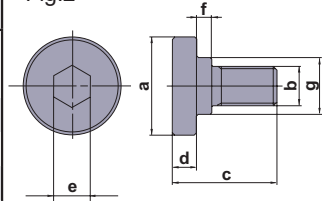
Arbor Type Left Hand Tool Holder

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
NEW 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) Please use a set bolt of the FMA type on the cutter body from 80 to 250 in diameter(DC).

SET BOLT (SOLD SEPARATELY)

Arbor Type	Set Bolt		Fig.	Reference Dimensions (mm)								Geometry
	With Coolant Hole	Without Coolant Hole		a	b	c	d	e	f	g		
	Order Number	Order Number										
WSX445-040A	HSC08025H	HSC08040	1	13	M8×1.25	33	8	5	—	—	Fig.1 	
WSX445-050A	HSC10030H	HSC10035	1	16	M10×1.5	40	10	6	—	—		
WSX445-063A	HSC10030H	HSC10035	1	16	M10×1.5	40	10	6	—	—		
WSX445-080A	HSC12035H	HSC12035 HSC12045	1	18	M12×1.75	47 57	12	10	—	—	Fig.2 	
WSX445-100B	MBA16033H	—	2	40	M16×2	43	10	14	6	23		
WSX445-125B	MBA20040H	—	2	50	M20×2.5	54	14	17	6	27		
WSX445-160C	No coolant hole	—	2	50	M20×2.5	54	14	17	6	27		
WSX445-200C	No coolant hole	—	1	24	M16×2	43	16	14	—	—		
WSX445-250C	No coolant hole	—	1	24	M16×2	43	16	14	—	—		
WSX445-315C	No coolant hole	—	1	24	M16×2	43	16	14	—	—		
WSX445-080CA	HSC12035H	HSC12035 HSC12045	1	18	M12×1.75	47 57	12	10	—	—		
WSX445-100DA	MBA16033H	—	2	40	M16×2	43	10	14	6	23		
WSX445-125EA	MBA20040H	—	2	50	M20×2.5	54	14	17	6	27		
WSX445-160FA	MBA24045H	—	2	65	M24×3	59	14	17	10	37		
WSX445-200KN	No coolant hole	—	1	24	M16×2	43	16	14	—	—		
WSX445-250KN	No coolant hole	—	1	24	M16×2	43	16	14	—	—		
WSX445-315PN	No coolant hole	—	1	30	M20×2.5	43	20	17	—	—		

Note 1) Internal coolant is necessary with the set bolt.

MOUNTING DIMENSION	> M024
SPARE PARTS	> Q001
TECHNICAL DATA	> R001

M

INDEXABLE MILLING

M019

INDEXABLE MILLING

Metric Standard

The cutter bore diameter DCON is indicated in millimetres.



Fig.1

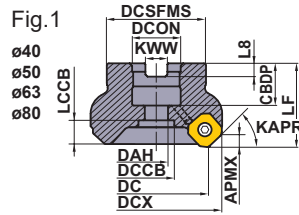
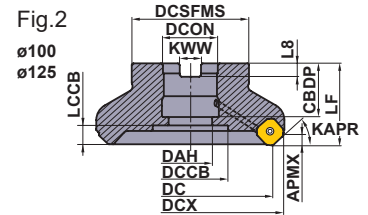


Fig.2



Right hand insert shown.

Arbor Type Right Hand Tool Holder

KAPR : 45°

GAMP: +17° GAMF: -6°—+1°

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) Please use a set bolt of the FMC(metric) type on the cutter body from 40 to 100 in diameter(DC).

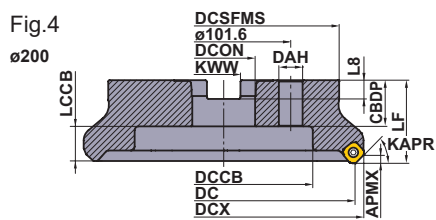
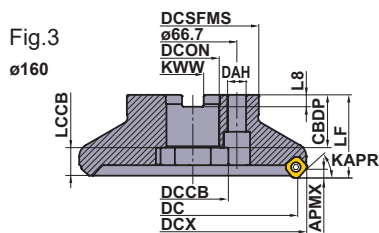
Note3) Please use a set bolt of the FMB type on the cutter body from 125 to 200 in diameter(DC).

SPARE PARTS

Arbor Type		
	Clamp Screw	Wrench (Insert)
WSX445	TPS4R	TIP15W

* Clamp Torque (N • m) : TPS4R=3.5

● : Inventory maintained in Japan.



Right hand insert 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) Please use a set bolt of the FMC(metric) type on the cutter body from 80 to 100 in diameter(DC).

Note3) Please use a set bolt of the FMB type on the cutter body from 125 to 160 in diameter(DC).

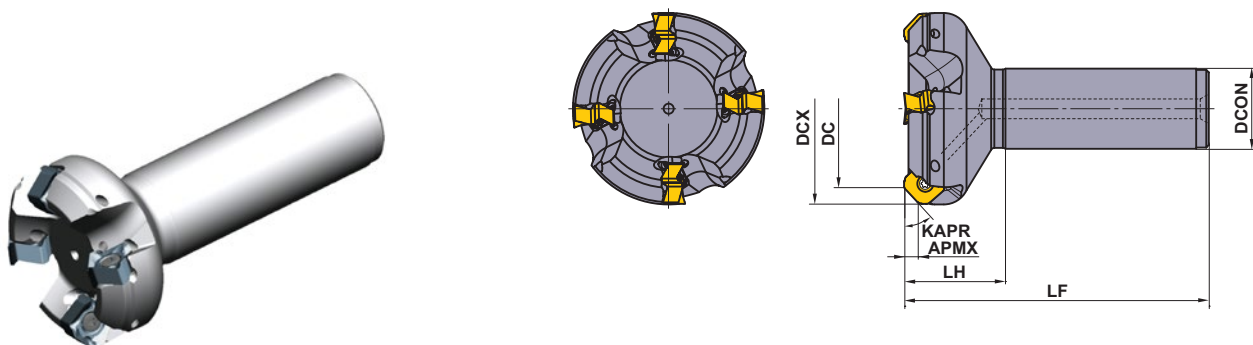
SET BOLT (SOLD SEPARATELY)

Arbor Type	Set Bolt		Fig.	Reference Dimensions (mm)							Geometry
	With Coolant Hole	Without Coolant Hole		a	b	c	d	e	f	g	
	Order Number	Order Number									
WSX445-040A○○AR	HSC08025H	HSC08040	1	13	M8×1.25	33	8	5	—	—	Fig.1
WSX445-050A○○AR	HSC10030H	HSC10035	1	16	M10×1.5	40	10	6	—	—	
WSX445-063A○○AR	HSC10030H	HSC10035	1	16	M10×1.5	40	10	6	—	—	
WSX445-080A○○A○	HSC12035H	HSC12035 (HSC12045)	1	18	M12×1.75	47 57	12	10	—	—	Fig.2
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○	No coolant hole	—	2	50	M20×2.5	54	14	17	6	27	
WSX445-200C○○NR	No coolant hole	—	1	24	M16×2	43	16	14	—	—	

Note 1) Internal coolant is necessary with the set bolt.

MOUNTING DIMENSION	> M024
SPARE PARTS	> Q001
TECHNICAL DATA	> R001

INDEXABLE MILLING



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

M

INDEXABLE MILLING

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

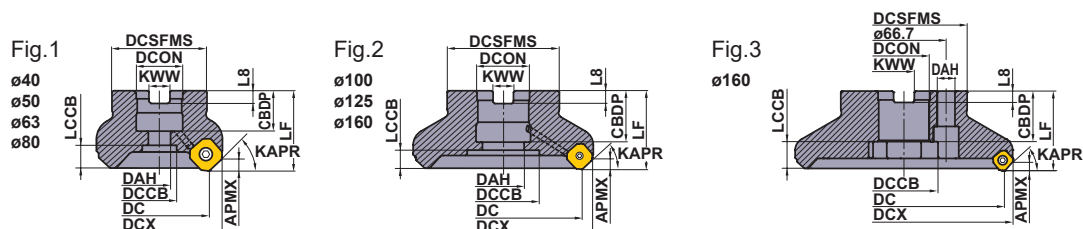
Work Material	P	Steel		Cutting Conditions :																	
	M	Stainless Steel		● : Stable Cutting ● : General Cutting ☼ : Unstable Cutting																	
K	Cast Iron	Honing : E : Round F : Sharp																			
N	Non-ferrous Metal																				
S	Heat-resistant Alloy, Titanium Alloy																				
H	Hardened Steel																				
Shape	Order Number	Class	Hand	Honing	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
	NEW SNGU140812ANFL-L	G	L	F											●		14	8.4	1.5		1.2
	NEW 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

[illegible]

Fig.2

Set more than 2 wiper inserts, equally spaced, when the feed per revolution is larger than 8mm/rev.

Arbor Mounting Dimensions



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

M

INDEXABLE MILLING

Fig.4

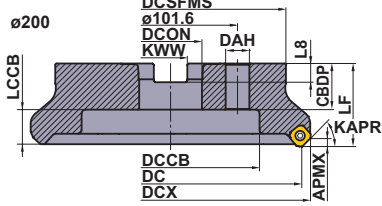


Fig.5

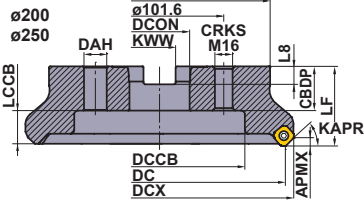
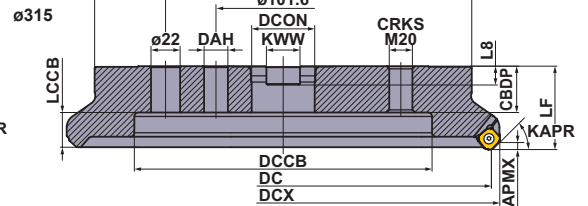


Fig.6



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

Work 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	≤ 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	≤ 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	≤ 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. (Life is lower than dry cutting.)

A feed per revolution by processing 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

Work 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	≤ 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	≤ 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	≤ 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. (Life is lower than dry cutting.)

A feed per revolution by processing 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	—	—	—	—

INDEXABLE MILLING

FACE MILLING <GENERAL CUTTING>

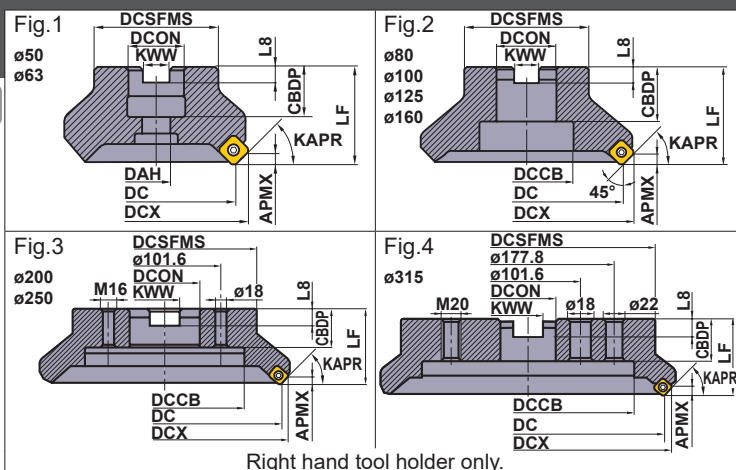


ASX445

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.



ARBOR TYPE

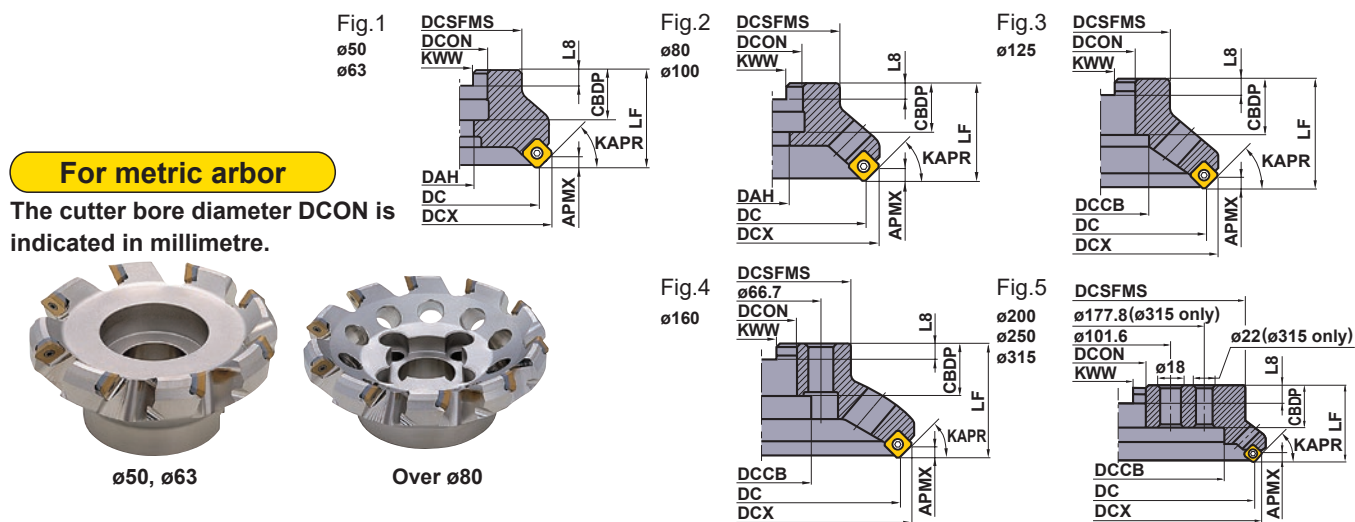
KAPR : 45°

GAMP : +20°—+23° GAMF : -10°—-13°

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	—	45	10.4	6.3	0.5	6	1
	ASX445-063A04R	●	4	63	75.9	40	22	20	11	—	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	—	45	10.4	6.3	0.4	6	1
	ASX445-063A05R	●	5	63	75.9	40	22	20	11	—	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	—	45	10.4	6.3	0.4	6	1
	ASX445-063A06R	●	6	63	75.9	40	22	20	11	—	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

* WT : Tool Weight

● : Inventory maintained in Japan.



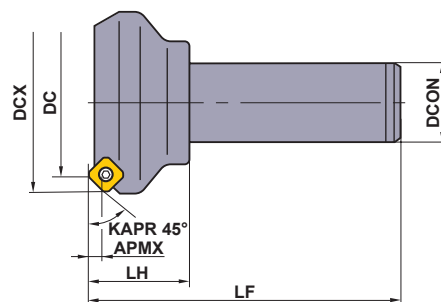
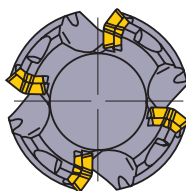
ARBOR TYPE KAPR : 45°
GAMP : +20°—+23° GAMF : -13°—-10°

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	—	45	10.4	6.3	0.5	6	1
	ASX445-063A04R	●	4	63	75.9	40	22	20	11	—	50	10.4	6.3	0.7	6	1
	ASX445-080A04R	●	4	80	93.2	50	27	23	13	—	56	12.4	7	1.0	6	2
	ASX445-100A05R	●	5	100	113.2	50	32	26	17	—	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	—	45	10.4	6.3	0.4	6	1
	ASX445-063A05R	●	5	63	75.9	40	22	20	11	—	50	10.4	6.3	0.6	6	1
	ASX445-080A06R	●	6	80	93.2	50	27	23	13	—	56	12.4	7	0.9	6	2
	ASX445-100A07R	●	7	100	113.2	50	32	26	17	—	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	—	45	10.4	6.3	0.4	6	1
	ASX445-063A06R	●	6	63	75.9	40	22	20	11	—	50	10.4	6.3	0.6	6	1
	ASX445-080A08R	●	8	80	93.2	50	27	23	13	—	56	12.4	7	0.9	6	2
	ASX445-100A10R	●	10	100	113.2	50	32	26	17	—	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

* WT : Tool Weight

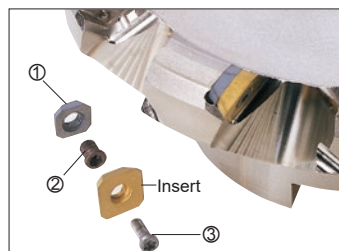
INDEXABLE MILLING



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 ASX400 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.	

M

INDEXABLE MILLING

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

M032

INSERTS

Work Material		P	Steel															Cutting Conditions (Guide) :				
		M	Stainless Steel															● : Stable Cutting ● : General Cutting ☆ : Unstable Cutting				
		K	Cast Iron																			
		N	Non-ferrous Metal																			
		S	Heat-resistant Alloy, Titanium Alloy																			
		H	Hardened Steel																			
Application	Shape	Order Number	Class	Honing	Coated										Cermet	Carbide	Dimensions(mm)				Geometry	
					F7030	MC5020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT	NX4545	HT110	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.

M

INDEXABLE MILLING

WIPER INSERTS

Work Material	P	Steel								Cutting Conditions (Guide) :											
	M	Stainless Steel																			
Work Material	K	Cast Iron								Honing :											
	N	Non-ferrous Metal																			
	S	Heat-resistant Alloy, Titanium Alloy																			
	H	Hardened Steel																			
Shape	Order Number	Class	Honing	Coated	Cermet	Coated Cermet	Carbide	CBN	PCD	Dimensions(mm)						Geometry					
				MC5020	VP15TF	NX2525	VP25N	HT105T	MB710	MD220	L	LE	W1	S	BS	RE					
	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 $a_p=0.2-0.5(\text{mm})$. (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

Work 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 (a_p) is $0.2\text{mm}-0.5\text{mm}$ and feed per tooth (f_z) is up to 0.2mm/t.

● : Inventory maintained in Japan.

(CBN and PCD wiper inserts are available in 1 piece in one case)

RECOMMENDED CUTTING CONDITIONS

	Work 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
		Tensile Strength ≥450MPa	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
			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 M045 for details.)

Note 2) APMX : Maximum depths of cut (AHX440S : the maximum depths of cut will vary depending on the breaker)

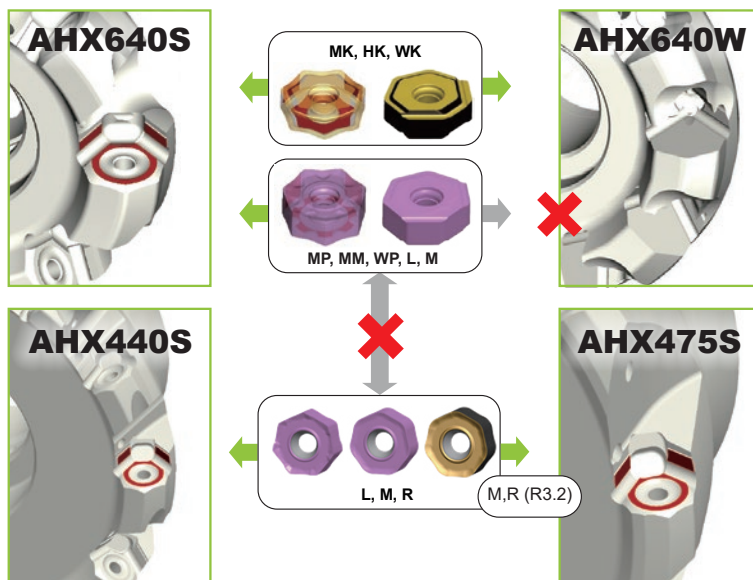
Note 3) The depths of cut and feed rate are identical to the recommended conditions for carbon steel and alloy steel.

M

Compatibility with Inserts for AHX Series

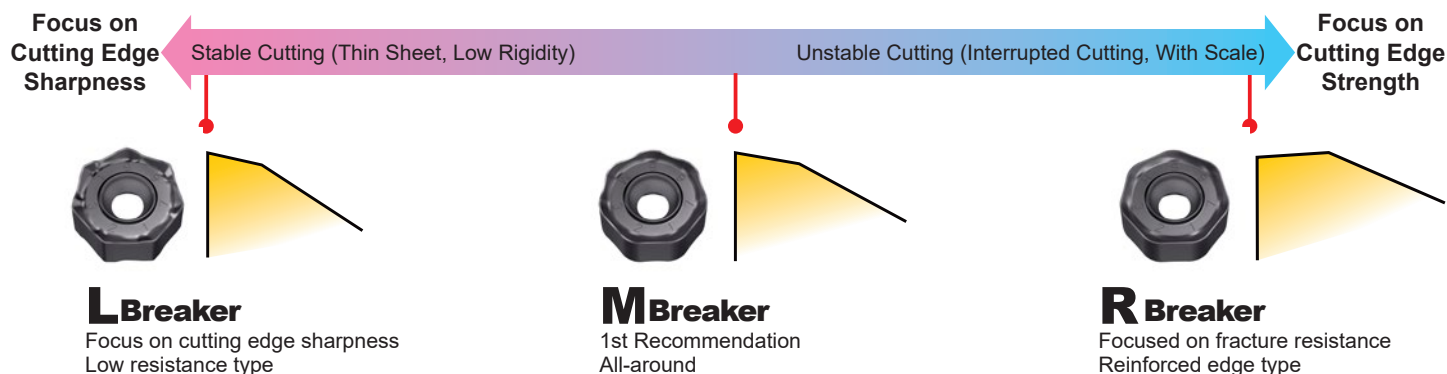
The RE = 3.2 mm insert for use with AHX440S can be mounted on AHX475S.

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



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

INDEXABLE MILLING

Wiper Insert of AHX640S

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



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



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



INDEXABLE MILLING

FACE MILLING <GENERAL CUTTING>



AHX440S

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



Fig. 1

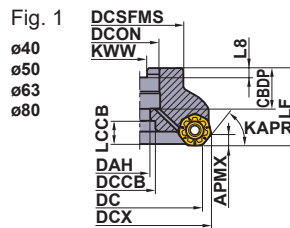


Fig. 2

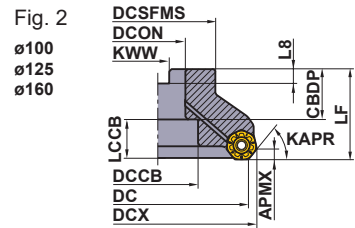
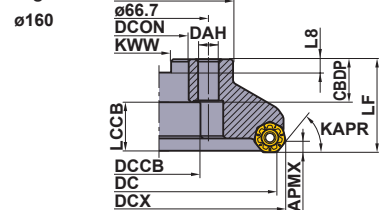


Fig. 3



KAPR : 50°
GAMP : -6° GAMF : -7°
DCON = Inch size

Right hand tool holder only.

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.

M

INDEXABLE MILLING

SPARE PARTS

Tool Holder Number	* 	
AHX440S	TS35R	TKY15T

* Clamp Torque (N · m) : TS35R=3.5

● : Inventory maintained in Japan.

Metric Standard

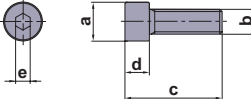
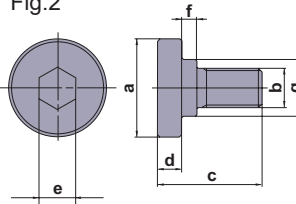
KAPR : 50°
GAMP : -6° GAMF : -7°
DCON = mm size

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		a	b	c	d	e	f	g	
	Order Number	Order Number									
AHX440S-040A○○AR	HSC08025H	HSC08040	1	13	M8×1.25	33	8	5	—	—	Fig.1 
AHX440S-050A○○AR	HSC10030H	HSC10035	1	16	M10×1.5	40	10	6	—	—	
AHX440S-063A○○AR	HSC10030H	HSC10035	1	16	M10×1.5	40	10	6	—	—	
AHX440S-080A○○AR	HSC12035H	HSC12035 (HSC12045)	1	18	M12×1.75	47 57	12	10	—	—	Fig.2 
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	
AHX440S-160C○○NR	No coolant hole	—	2	50	M20×2.5	54	14	17	6	27	
AHX440SR080○○CA	HSC12035H	HSC12035 HSC12045	1	18	M12×1.75	47 57	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) Internal coolant is necessary with the set bolt.

MOUNTING DIMENSION > M052
SPARE PARTS > Q001
TECHNICAL DATA > R001

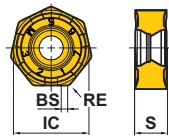
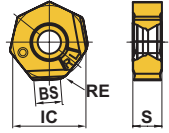
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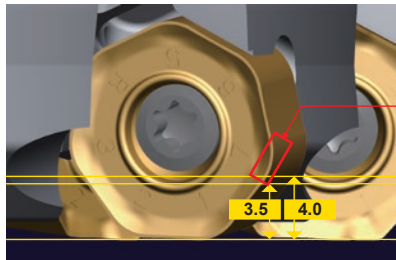
INDEXABLE MILLING

INDEXABLE MILLING

INSERTS

Work Material		P	Steel										Cutting Conditions (Guide) :				
		● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting															
		Honing :															
		E : Round															
Application	Shape	Order Number	Class	Honing	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	5.77	3		
General Cutting		NNMU130508ZEN-M	M	E	●	●	●	●	●	●	13.4	0.8	1	5.57	✱ 4		
		NNMU130532ZEN-M	M	E	●	●	●	●	●	●	13.4	3.2	—	5.57	✱ 4		
Unstable Cutting		NNMU130532ZEN-R	M	E	●	●	●	●	●	●	13.4	3.2	—	5.47	✱ 4		
Finish Cutting	 Wiper	WNEU1305ZEN4C-M	E	E	●				●	●	13.4	2.7	4	5.1	0.5		

* 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

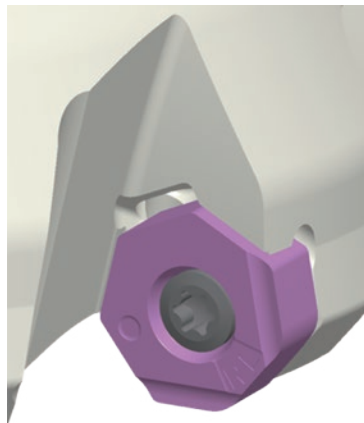


Fig.1



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. (10 inserts in one case)

RECOMMENDED CUTTING CONDITIONS

■ Dry Cutting

	Work 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
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 Martensitic 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

	Work 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 Martensitic 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

M

INDEXABLE MILLING

RECOMMENDED CUTTING CONDITIONS

■ Cutting Conditions with Wiper Insert

	Work 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 Martensitic 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 above table 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 lowered as 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, we recommended to reduce the cutting speed and the feed rate by 70-80%.

Note 5) Recommended wet cutting for good surface finishing of stainless steel. (Tool life is short compared to wet cutting.)

FACE MILLING

<HIGH FEED CUTTING>



15°
KAPR



AHX475S

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

Steel Cast Iron Hardened Steel



Fig.1

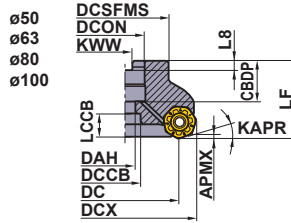
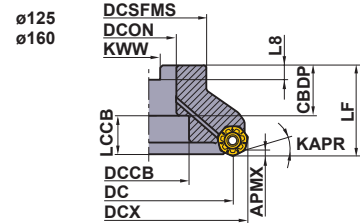


Fig.2



Right hand tool holder only.

KAPR : 15°
GAMP : -6° GAMF : -10°
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

KAPR : 15°
GAMP : -6° GAMF : -10°
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.

MOUNTING DIMENSION > M052
SPARE PARTS > Q001
TECHNICAL DATA > R001

M043

M

INDEXABLE MILLING

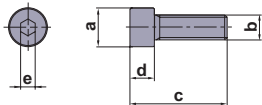
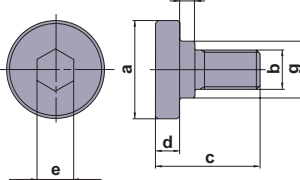
INDEXABLE MILLING

SPARE PARTS

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

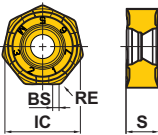
* Clamp Torque (N・m) : TS35R=3.5

SET BOLT (SOLD SEPARATELY)

Tool Holder Number	Set Bolt		Fig.	Reference Dimensions (mm)							Geometry
	With Coolant Hole	Without Coolant Hole		a	b	c	d	e	f	g	
	Order Number	Order Number									
AHX475S-050A [○] [○] AR	HSC10030H	HSC10035	1	16	M10×1.5	40	10	6	—	—	Fig.1 
AHX475S-063A [○] [○] AR	HSC10030H	HSC10035	1	16	M10×1.5	40	10	6	—	—	
AHX475S-080A [○] [○] AR	HSC12035H	HSC12035 (HSC12045)	1	18	M12×1.75	47 57	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	
AHX475S-160C [○] [○] AR	MBA20040H	—	2	50	M20×2.5	54	14	17	6	27	
AHX475SR080 [○] [○] DA	HSC16040H	—	1	24	M16×2	56	16	14	—	—	Fig.2 
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) Internal coolant is necessary with the set bolt.

INSERTS

Work Material		P	Steel						Cutting Conditions (Guide) :								
		K	Cast Iron						● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting								
		H	Hardened Steel						Honing : E : Round								
Application	Shape	Order Number	Class	Honing	Coated				Dimensions (mm)					Geometry			
					MP6120	MP6130	MC5020	VP15TF			IC	RE	BS		S	APMX	
General Cutting		NNMU130532ZEN-M	M	E	●	●	●	●				13.4	3.2	—	5.57	1.6	
Unstable Cutting		NNMU130532ZEN-R	M	E	●	●	●	●				13.4	3.2	—	5.47	1.6	

M

INDEXABLE MILLING

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

RECOMMENDED CUTTING CONDITIONS

■ Dry Cutting

	Work 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, we recommended to reduce the cutting speed and the feed rate by 70-80%.

INDEXABLE MILLING

FACE MILLING <GENERAL CUTTING>



AHX640S

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



Fig. 1
ø63
ø80

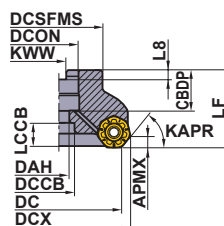


Fig. 2
ø100
ø125
ø160

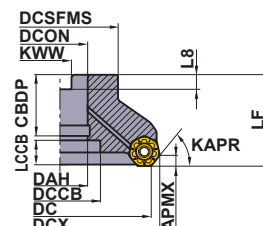
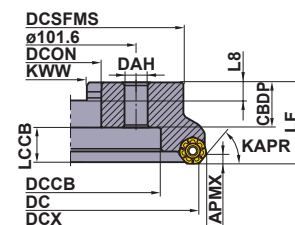


Fig. 3
ø200



Right hand tool holder only.

DC	Set Bolt	Geometry
ø63	HSC10030H	
ø80	HSC12035H	
ø100	MBA16033H	
ø125	MBA20040H	
ø160	MBA24045H	
ø200	—	

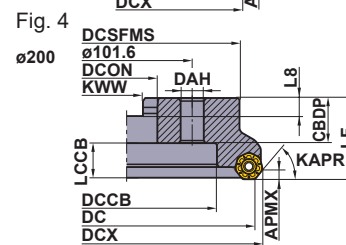
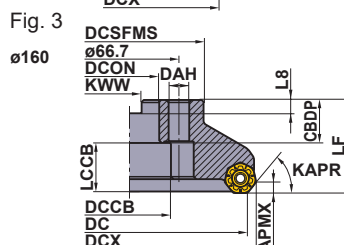
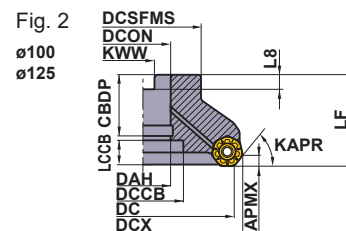
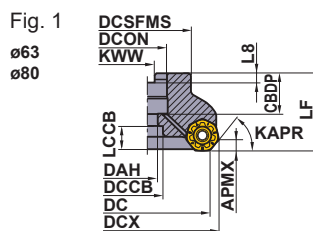
KAPR : 50°
GAMP : -6° GAMF : -5°

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

M

INDEXABLE MILLING

● : Inventory maintained in Japan.



Right hand tool holder only.

DC	Set Bolt	Geometry	
φ63	HSC10030H	①	
φ80	HSC12035H		
φ100	MBA16033H	②	
φ125	MBA20040H		
φ160	—	—	—
φ200	—	—	—

Metric Standard

KAPR : 50°
GAMP : -6° GAMF : -5°

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

MOUNTING DIMENSION > M052
SPARE PARTS > Q001
TECHNICAL DATA > R001

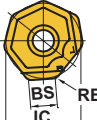
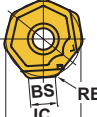
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M

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INSERTS

Work Material		P	Steel												Cutting Conditions (Guide) :		Honing : E : Round					
		M	Stainless Steel												●	: Stable Cutting		●	: General Cutting	✱	: Unstable Cutting	
		K	Cast Iron																			
		N	Non-ferrous Metal																			
		S	Heat-resistant Alloy, Titanium Alloy																			
		H	Hardened Steel																			
Application	Shape	Order Number	Class	Honing	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	8	6		
For Steel General Cutting		NNMU200708ZEN-MP	M	E								●				20	0.8	1	8	6		
For Stainless Steel		NNMU200712ZER-MM	M	E			●									20	1.2	1	8	6		
For Cast Iron General Cutting		NNMU200608ZEN-MK	M	E							●	●	●			20	0.8	1	6.55	6		
For Cast Iron Strong Cutting Edge Type		NNMU200608ZEN-HK	M	E							●	●	●			20	0.8	1	6.55	6		
For Titanium Alloy and Heat Resistant Alloy		NNMU200712ZER-L	M	E				●	●							20	1.2	1	8	6		
For Steel Wiper		WNEU2007ZEN7C-M	E	E	●											20	0.8	7.2	6.9	0.5		
General Cutting Wiper		WNEU2007ZEN7C-WP	E	E								●				20	0.8	7.1	6.9	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.

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

■ Instructions for Use of Wiper inserts

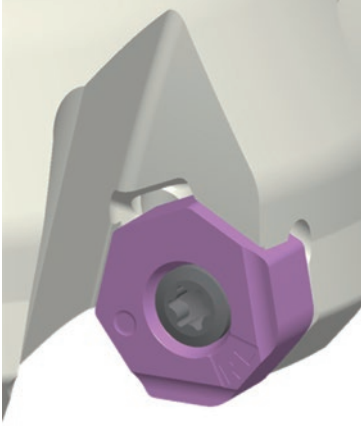


Fig.1



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.

RECOMMENDED CUTTING CONDITIONS

■ Dry Cutting

	Work 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
	Pre-hardened 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
	Alloy Tool 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 Martensitic Stainless Steel	≤200HB	MP7030	MM	200(150—250)	0.2(0.1—0.3)	≤5	≤0.8DC
	Ferritic and Martensitic 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) We recommend wet cutting with internal coolant for titanium alloy and heat resistant alloy.

Note3) When clamp rigidity is low and tool overhang is long, we recommended to reduce the cutting speed and the feed rate by 30%.

Wet Cutting

	Work 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 Martensitic Stainless Steel	≤200HB	MP7030	MM	125 (100—150)	0.15 (0.1—0.2)	≤5	≤0.8DC
	Ferritic and Martensitic 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) We recommend wet cutting with internal coolant for titanium alloy and heat resistant alloy.

Note3) When clamp rigidity is low and tool overhang is long, we recommended to reduce the cutting speed and the feed rate by 30%.

Cutting Conditions with Wiper Insert

	Work 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, we recommended to reduce the cutting speed and the feed rate by 70-80%.

Note 2) Please use WP geometry insert in combination with MP or M geometry inserts, and use WK geometry insert in combination with MK or HK geometry inserts

M

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AHX440S, AHX475S, AHX640S Mounting Dimensions

Fig. 1

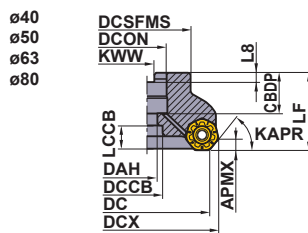


Fig. 2

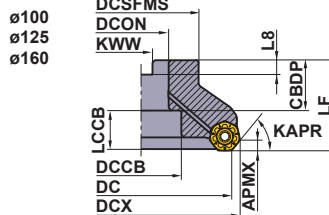
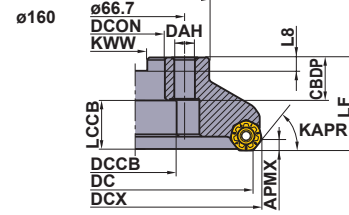
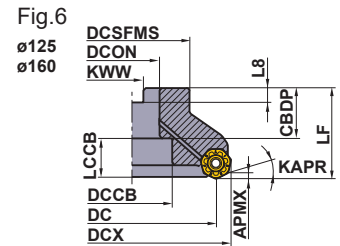
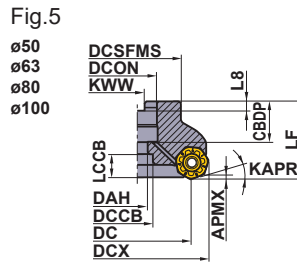
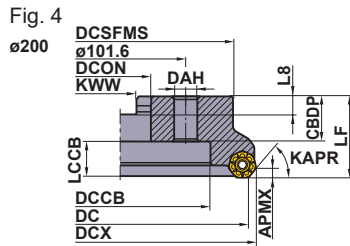


Fig. 3



Right hand tool holder only.

DCON (mm)	DC (mm)	Order Number	Dimensions(mm)							Fig.
			CDBP	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



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

M

INDEXABLE MILLING

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FACE MILLING

<HIGH FEED CUTTING FOR CAST IRON>



TOOL NEWS



AHX640W

P M **K** N S H

Cast Iron



Right Hand Tool Holder

KAPR : 50°

GAMP : -6° GAMF : -4°

Fig.1
ø80

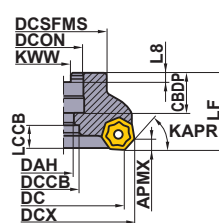


Fig.2
ø100
ø125
ø160

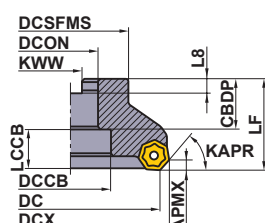


Fig.3
ø200
ø250

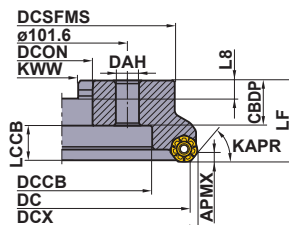
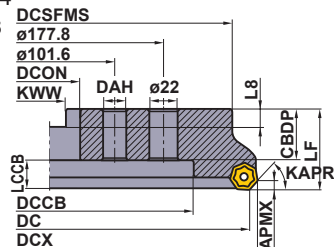


Fig.4
ø315



Right hand tool holder shown.

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

INDEXABLE MILLING

M

● : Inventory maintained in Japan.

M054



Metric Standard

KAPR : 50°
GAMP : -6° GAMF : -4°

Right Hand Tool Holder

Fig.1
ø80

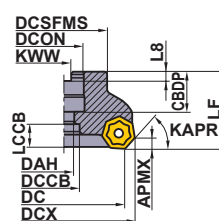


Fig.2
ø100
ø125

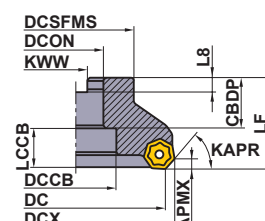


Fig.3
ø160

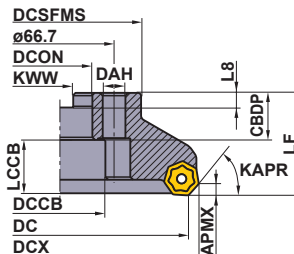


Fig.4
ø200
ø250

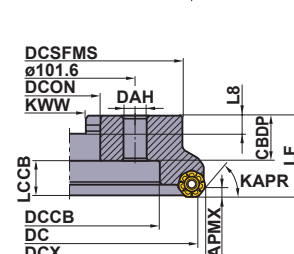
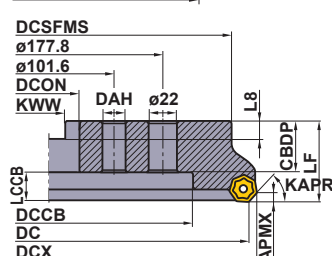


Fig.5
ø315



Right hand tool holder shown.

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

MOUNTING DIMENSION > M058
SPARE PARTS > Q001
TECHNICAL DATA > R001

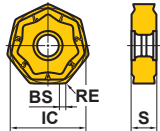
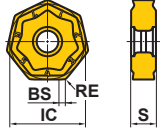
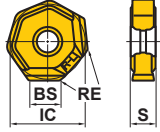
M055

M

INDEXABLE MILLING

INDEXABLE MILLING

INSERTS

Work Material	K	Cast Iron				●	●	✳	Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✳ : Unstable Cutting					
Shape	Order Number	Class	Honing	Coated			Dimensions(mm)					Geometry		
				MC5020	VP15TF	VP20RT	IC	RE	BS	S	APMX			
 General Cutting	NNMU200608ZEN-MK	M	E	●	●	●	20	0.8	1.0	6.55	6			
 Strong Cutting Edge Type	NNMU200608ZEN-HK	M	E	●	●	●	20	0.8	1.0	6.55	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

M

INDEXABLE MILLING

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

M056

RECOMMENDED CUTTING CONDITIONS

■ Dry-Wet Cutting

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

*Please use 2-3 pcs of Wiper inserts in case of 'over 6mm/rev'.

Note 1) With reference to the above examples, adjust the cutting conditions according to the use environment.

Note 2) Tool life when wet cutting is short compared to dry cutting.

■ Finishing (Use of Wiper Inserts)

Work Material	Grade	ap (mm)	vc (m/min)	fz (mm/t.)
K	Gray Cast Iron	< 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)	

AHX640W Mounting Dimensions

Fig.1

ø80

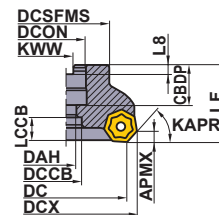
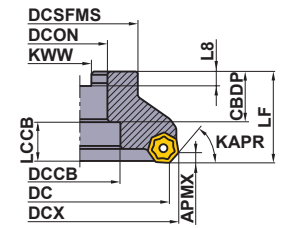


Fig.2

ø100
ø125
ø160

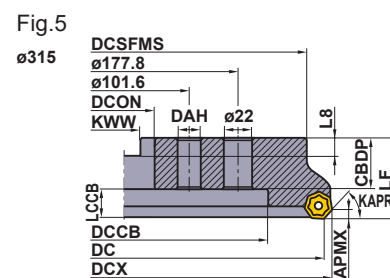
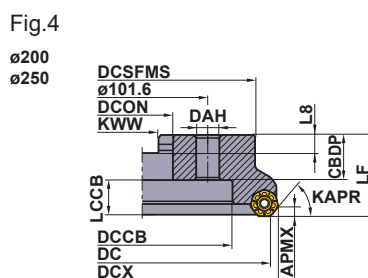
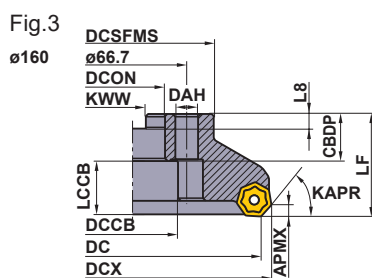


Right hand tool holder shown.

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

M

INDEXABLE MILLING



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

INDEXABLE MILLING

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
ø63

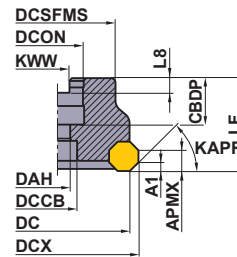
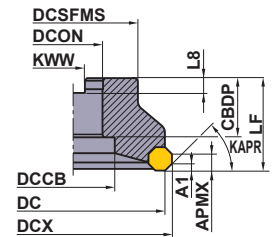


Fig.2
ø80
ø100
ø125
ø160



ARBOR TYPE

KAPR : 45°

GAMP : -5°

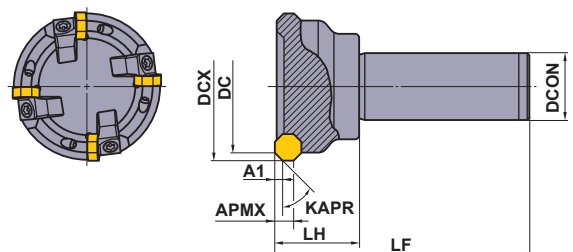
GAMF : -9°—-6°

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	CBDB	DAH	DCCB	DCSFMS	KWW	L8					
Coarse Pitch	AOX445-063A04R	●	4	63	70.8	40	22	20	11	—	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.

* WT : Tool Weight



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

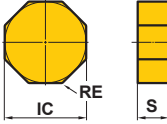
* WT : Tool Weight

SPARE PARTS

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

* Clamp Torque (N · m) : LS15T=8.0

INSERTS

Work Material	K	Cast Iron			Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting			Honing : E : Round	
Shape	Order Number	Class	CBN		Dimensions(mm)			Geometry	
			BC5030		IC	RE	S		
	SL-ONEN120404ASN	E	●		12.7	0.4	4.76		

RECOMMENDED CUTTING CONDITIONS

Work 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.

M

INDEXABLE MILLING

INDEXABLE MILLING

FACE MILLING

<HEAVY CUTTING>

SE515



P

Steel

M

Stainless Steel

K

Cast Iron

N

S

H



- 20° positive insert.
- High rake angle.
- High rigidity due to carbide shim.

Fig.1
ø100

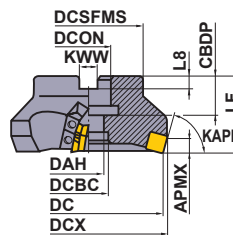
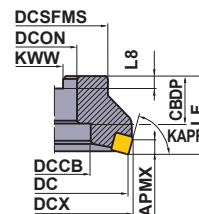


Fig.2
ø125
ø160



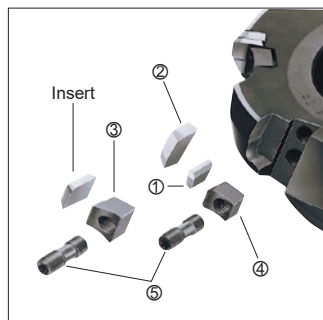
Right hand tool holder only.

KAPR : 75°

GAMP : +19° GAMF : +5°

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	SE515R0405D	▲	5	100	108.9	63	31.75	32	17	—	80	12.7	8	2.3	11.5	1
	SE515R0506E	▲	6	125	133.6	63	38.1	38	—	60	80	15.9	10	3.5	11.5	2
	SE515R0608F	▲	8	160	168.3	63	50.8	38	—	80	90	19.1	11	5.6	11.5	2
Close Pitch	SE515R0407D	▲	7	100	108.9	63	31.75	32	17	—	90	12.7	8	2.3	11.5	1
	SE515R0509E	▲	9	125	133.6	63	38.1	38	—	60	120	15.9	10	3.5	11.5	2
	SE515R0611F	▲	11	160	168.3	63	50.8	38	—	80	120	19.1	11	5.6	11.5	2

* WT : Tool Weight



SPARE PARTS

Tool Holder Number	①	②	③	④	⑤	*		
	Locator	Shim	Wedge-T	Wedge-S	Clamp Screw	Wrench	Set Bolt	
SE515R0405D 0407D								HSC16035
SE515R0506E SE515R0611F	SPSE515R	STSE515R	CWSE545TR	CWSE545SN	LS15T	TKY25T		—

* Clamp Torque (N • m) : LS15T=8.0

INDEXABLE MILLING

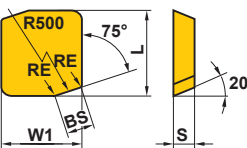
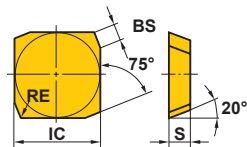
M

● : Inventory maintained in Japan. ▲ : Inventory maintained in Japan. To be replaced by new products.
(10 inserts in one case)

M062

INSERTS

Work Material	P	Steel	●	●			●	●	●	Cutting Conditions (Guide) :					
	M	Stainless Steel	●	●			●	●	●						
Shape	K	Cast Iron	●	●			●	●	●	Honing :					
Order Number	Class	Honing	Coated			Cermet		Carbide		Dimensions(mm)					
			F7030	VP15TF		NX2525	NX4545	UT120T		W1	L	IC	S	BS	RE
	SECN1504EFTR1	C	T				●			—	—	15.875	4.76	1.4	1.0
	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
	SEKN1504EFTR1	K	T					●		—	—	15.875	4.76	1.4	—
	SEKN1504EFSR1	K	S	●						—	—	15.875	4.76	1.4	—
 Wiper	WEC53EFTR5C	C	T				●			15.875	16.903	—	4.76	5	1.0



RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t.)
P Mild Steel	≤180HB	F7030	200 (160—250)	0.2 (0.1—0.3)
		VP15TF	180 (100—250)	
		NX4545	140 (80—200)	
Carbon Steel Alloy Steel	180—280HB	F7030	200 (160—250)	0.2 (0.1—0.3)
		VP15TF	180 (100—250)	
		NX4545	140 (80—200)	
	280—350HB	VP15TF	120 (80—160)	0.15 (0.1—0.2)

Work Material	Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t.)
M Stainless Steel	≤200HB	VP15TF	150 (100—200)	0.2 (0.1—0.3)
K Cast Iron	Tensile Strength ≤450MPa	VP15TF	160 (100—220)	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

M

INDEXABLE MILLING

INDEXABLE MILLING

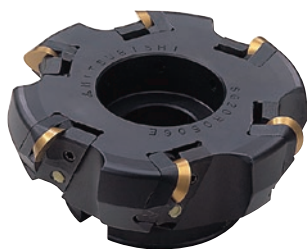
FACE MILLING

<CUTTING FOR DIFFICULT-TO-CUT MATERIALS>



SG20

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



- 30° positive insert.
- High rake angle.
- Round shape insert with a strong cutting edge.
- Suitable for difficult-to-cut materials.

Fig.1
ø80
ø100

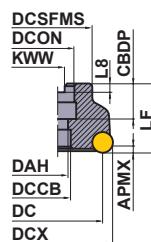
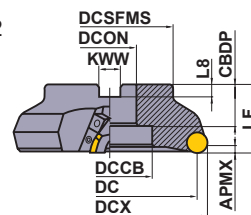


Fig.2
ø125
ø160



Right hand tool holder only.

GAMP: +24° GAMF: +9°

Order Number	Stock	Number of Teeth	Dimensions(mm)										WT* (kg)	APMX (mm)	Fig.
	R		DC	DCX	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8			
SG20R0304C	●	4	80	101.2	50	25.4	26	13	—	60	9.5	6	1.5	8	1
SG20R0405D	●	5	100	121.4	63	31.75	32	17	—	80	12.7	8	2.9	8	1
SG20R0506E	●	6	125	146.4	63	38.1	38	—	60	90	15.9	10	3.8	8	2
SG20R0608F	●	8	160	181.4	63	50.8	38	—	80	120	19.1	11	6.1	8	2

* WT : Tool Weight

M

INDEXABLE MILLING

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

INSERTS

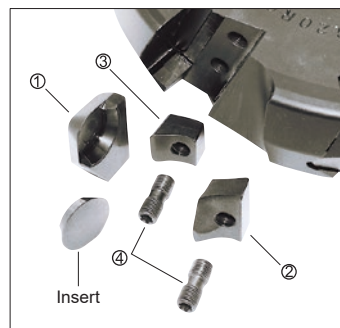
Work Material	P	Steel	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ●	● ● ● ● </
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RECOMMENDED CUTTING CONDITIONS

Work Material		Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t.)	Recommended Max. Depth of Cut (mm)
P	Carbon Steel Alloy Steel	≤180HB	VP15TF	180 (100—250)	0.35 (0.2—0.5)	4.5
			NX2525	175 (150—200)	0.25 (0.2—0.3)	4.5
		280—350HB	VP15TF	180 (100—250)	0.3 (0.2—0.4)	4.5
			NX2525	165 (130—200)	0.25 (0.2—0.3)	4.5
M	Stainless Steel	≤200HB	VP15TF	150 (100—200)	0.35 (0.2—0.5)	3
K	Gray Cast Iron	Tensile Strength ≤350MPa	VP15TF	160 (100—220)	0.4 (0.3—0.5)	4.5
H	Hardened Steel	40—60HRC	VP15TF	80 (50—100)	0.2 (0.1—0.3)	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



SPARE PARTS

Tool Holder Number	①	②	③	④	*		
	Locator	Wedge-T	Wedge-S	Clamp Screw	Wrench	Set Bolt	
SG20R0304C	SPSG20R	CWSG20TR	CWSG20SN	LS15T	TKY25T	—	
SG20R0405D						HSC16035	
SG20R0506E						—	
SG20R0608F						—	

* Clamp Torque (N • m) : LS15T=8.0

M

INDEXABLE MILLING

INDEXABLE MILLING

FACE MILLING

<FOR HIGH-EFFICIENCY FINISHING OF ALUMINIUM ALLOYS>



FMAX

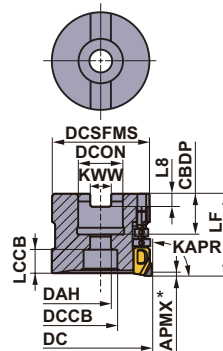
P M K **N** S H

Non-ferrous Metal



Fig.1

ø40
ø50
ø63



Right hand tool holder only.

ARBOR TYPE

KAPR: 90°

GAMP: +5° GAMF: -6° - -3°

DC (mm)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)		WT (kg)	RPMX (min-1)	Fig.
					LF	DCON			
NEW 40	FMAX-040A04R	●	○	4	40	16	0.24	30000	1
NEW 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	Tool Holder Type	Insert Clamp Screw	Micro Adjustment Nut	Large Adjustment Screw	Balance Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
40	FMAX-040	TSS04505S	KSN2	KSS2	HSS04004G	HSC08030H	TKY10T	RKY25S
50	FMAX-050	TSS04505S	KSN2	KSS2	HSS04004G	HSC10030H	TKY10T	RKY25S
63	FMAX-063	TSS04505S	KSN2	KSS2	HSS04004G	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.

● : Inventory maintained in Japan.



Fig.2
ø80
ø160

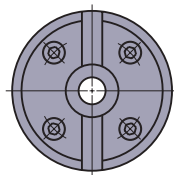
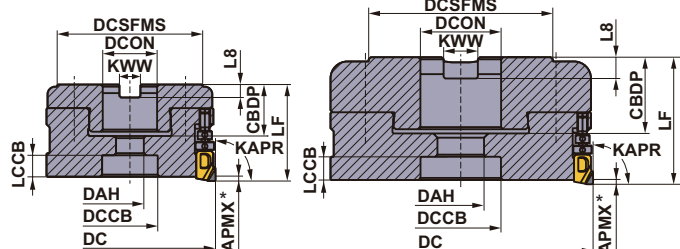
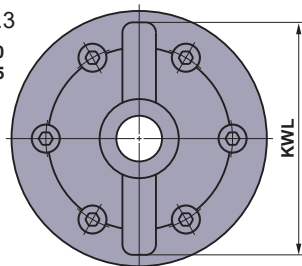


Fig.3
ø100
ø125



Right hand tool holder only.

Arbor Type

KAPR: 90°

GAMP: +5° GAMP: 0°

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	2
80	FMAXR08014C	●	○	14	45	25.4	1.09	24500	2
100	FMAXR10012D	●	○	12	50	31.75	1.85	22000	3
100	FMAXR10018D	●	○	18	50	31.75	1.81	22000	3
125	FMAXR12516E	●	○	16	60	38.1	3.33	19600	3
125	FMAXR12524E	●	○	24	60	38.1	3.27	19600	3
NEW 160	FMAXR16016D	●	○	16	63	31.75	3.30	10000	2
NEW 160	FMAXR16024D	●	○	24	63	31.75	3.39	10000	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	
25.4	80	FMAXR08010C	24	13	26	11	68	9.5	6	—	2
25.4	80	FMAXR08014C	24	13	26	11	68	9.5	6	—	2
31.75	100	FMAXR10012D	32	17	32	10	79	12.7	8	90	3
31.75	100	FMAXR10018D	32	17	32	10	79	12.7	8	90	3
38.1	125	FMAXR12516E	36	22	38	12	88	15.9	10	112	3
38.1	125	FMAXR12524E	36	22	38	12	88	15.9	10	112	3
31.75	160	FMAXR16016D	38	17	53	10	75	12.7	8	—	2
31.75	160	FMAXR16024D	38	17	53	10	75	12.7	8	—	2

SPARE PARTS

DC	Tool Holder Type	Insert Clamp Screw *	Micro Adjustment Nut	Large Adjustment Screw	Balance Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
80	FMAXR080	TSS04505S	KSN2	KSS2	HSS05005G	HSCX12030H	TKY10T	RKY25S
100	FMAXR100	TSS04505S	KSN2	KSS2	HSS06006G	HSCX16035H	TKY10T	RKY25S
125	FMAXR125	TSS04505S	KSN2	KSS2	HSS08008G	HSCX20035H	TKY10T	RKY25S
160	FMAXR160	TSS04505S	KSN2	KSS2	HSS08008G	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.

INDEXABLE MILLING

Metric Standard



The cutter bore diameter DCON is indicated in millimetres.

Arbor Type

KAPR: 90°
GAMP: +5° GAMF: 0°

Fig.1
ø80
ø160

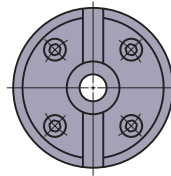
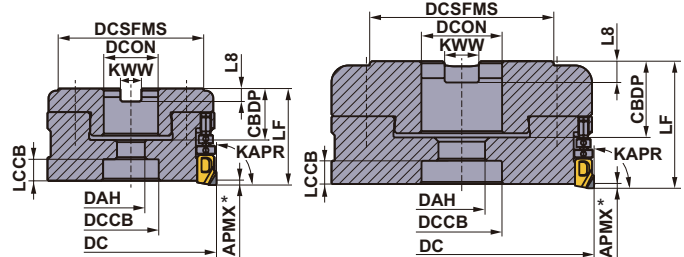
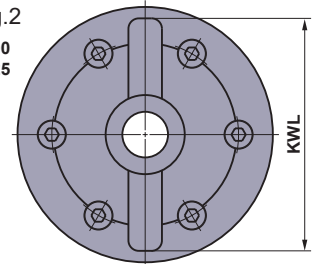


Fig.2
ø100
ø125



Right hand tool holder only.

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

M

SPARE PARTS

DC	Tool Holder Type	Insert Clamp Screw*	Micro Adjustment Nut	Large Adjustment Screw	Balance Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
80	FMAX-080	TSS04505S	KSN2	KSS2	HSS05005G	HSCX12030H	TKY10T	RKY25S
100	FMAX-100	TSS04505S	KSN2	KSS2	HSS06006G	HSCX16035H	TKY10T	RKY25S
125	FMAX-125	TSS04505S	KSN2	KSS2	HSS08008G	HSCX20035H	TKY10T	RKY25S

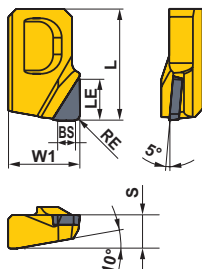
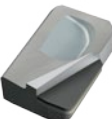
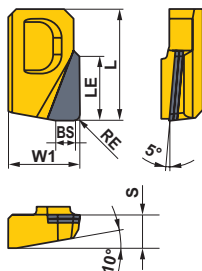
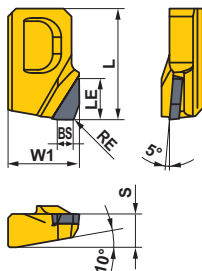
* Clamp Torque (N · m) : TSS04505S=3.5

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

INDEXABLE MILLING

● : Inventory maintained. (PCD inserts are available in 1 piece in one case)

INSERTS

Work Material	N	Non-ferrous Metal		●	●	Cutting Conditions :					
					● : Stable Cutting	● : General Cutting	✖ : Unstable Cutting				
Shape	Order Number	MD220	MD2030	Dimensions (mm)						Geometry	
				L	LE	W1	S	BS	RE		
	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		
General Purpose											
	NEW GOER1408PXFR2-8	●		14.0	8.0	9.0	4.2	2.0	0.8		
Long Edge											
	NEW GOER1401ZXFR2	●		14.0	5.0	9.0	4.2	2.0	0.1		
Burr Prevention											

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.

RECOMMENDED CUTTING CONDITIONS

Wet cutting

Work Material	Characteristics	Grade	vc (m/min)	Depth of Cut (mm)		fz (mm/t.)
				ae	ap	
N	Aluminium Alloy	MD2030 MD220	2500 (2000—3000)	≤ 0.2 DC	≤ 3.0(0.5—3.0)	0.08 (0.05—0.2)
				≤ 0.5 DC	≤ 2.5(0.5—2.5)	
				≤ 0.8 DC	≤ 2.0(0.5—2.0)	
		MD2030 MD220	2500 (2000—3000)	≤ 0.2 DC	≤ 3.0(0.5—3.0)	0.08 (0.05—0.2)
				≤ 0.5 DC	≤ 2.5(0.5—2.5)	
				≤ 0.8 DC	≤ 2.0(0.5—2.0)	
		MD2030 MD220	600 (400—800)	≤ 0.2 DC	≤ 3.0(0.5—3.0)	0.08 (0.05—0.2)
				≤ 0.5 DC	≤ 2.5(0.5—2.5)	
				≤ 0.8 DC	≤ 2.0(0.5—2.0)	
		MD2030 MD220	600 (400—800)	≤ 0.2 DC	≤ 3.0(0.5—3.0)	0.08 (0.05—0.2)
				≤ 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 depending on the width of cut.

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

Note 3) Wet cutting is recommended.

INDEXABLE MILLING

FACE MILLING

<HIGH SPEED FINISHING ALUMINIUM ALLOY >



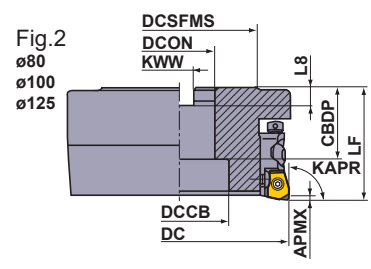
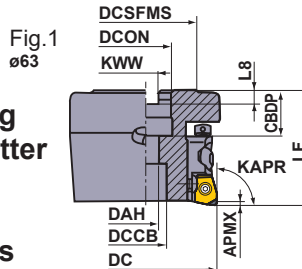
V10000

P M K **N** S H

Non-ferrous Metal



- Insert with PCD.
- Light weight, strong aluminium alloy cutter body.
- Anti-Fly insert mechanism enables high speed milling.
- Adjustable cutting edge run-out function.



Right hand tool holder only.

KAPR :90°

GAMP:+8° GAMF:+8°

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				
V10000-063A04R	●	4	63	50	22	20	11	—	45	10.4	6.3	0.5	1.5	25000	1
V10000R0305C	●	5	80	50	25.4	26	—	38	60	9.5	6	0.6	1.5	22300	2
V10000R0406D	●	6	100	50	31.75	32	—	45	70	12.7	8	0.9	1.5	20000	2
V10000R0508E	●	8	125	63	38.1	35	—	60	80	15.9	10	1.8	1.5	17800	2

* WT : Tool Weight

SPARE PARTS

Tool Holder Number		*	*	*				
	Cartridge	Cartridge Clamp Screw-A	Cartridge Clamp Screw-B	Insert Clamp Screw	Run-out Adjust Screw	Balance Adjust Screw	Wrench	Wrench
V10000-063A04R I V10000R0508E	VCT13R	HBH06016	HBH04008	CS350790T	KS1	HSS05005	HKY25R HKY40R	TKY10R

* Clamp Torque (N · m) : CS350790T=3.5, HBH06016=8.0, HBH04008=4.0

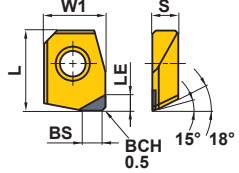
M

INDEXABLE MILLING

● : Inventory maintained in Japan. (1 insert in one case)

M070

INSERTS

Work Material	N	Non-ferrous Metal		Cutting Conditions (Guide) :						
				● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting						
Shape	Order Number	Class	PCD	Dimensions(mm)						Geometry
	NP-GDCW1240PDFR2	C	MD220	L	W1	IC	S	BS	LE	
			●	12	9.5	—	4	2	2	

RECOMMENDED CUTTING CONDITIONS

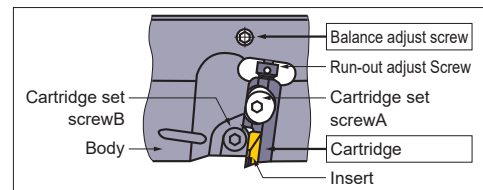
Work Material	Silicon (%)	Cutting Speed (m/min)	Feed per Tooth (mm/t.)	Depth of Cut (mm)
N Aluminium Alloy	≤ 16	—6500	—0.2	—0.5
	≥ 16	—1000		

NOTE ON ROTATIONAL BALANCE

- At the time of shipping, the cutter body is balanced by using a special high accuracy master insert in order that it will conform to balance quality G6.3 based on ISO 1940/1 (approximate value at the maximum revolution for each cutter diameter). In order to keep good rotational balance, do not adjust the balance screw (HSS05005) located on the outer surface of the body.
- Rotational balance will change after exchanging cartridges. If you use the cutter at the same revolution as that of the following table or higher, re-balancing is necessary after exchanging cartridges. Please contact Mitsubishi Materials to re-balance the cutter.

Note 1) If the revolution is the same as or lower than the value indicated above, the cutter can be used with a standard arbor. (Do not use long shank type arbors or special arbors, as the overhang could make it dangerous to use.)

Note 2) If the revolution is higher than the value indicated above, please set the balance as follows : (Arbor + cutter) ≤ G6.3



Diameter of cutter (mm)	Revolution requiring re-balancing (min ⁻¹)
63	17000
80	14500
100	14000
125	Re-balancing not necessary up to the max. revolution

INDEXABLE MILLING

FACE MILLING

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



NF10000



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

Fig.1
ø80
ø100

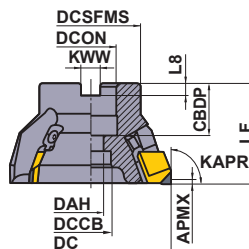
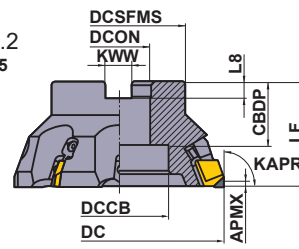


Fig.2
ø125



Right hand tool holder only.

KAPR :90°

GAMP: +10° GAMF: +5°

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)									*2 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	—	50	9.5	6	1.0	4.0	1.0	16000	1
	NF10000R0406D	●	6	100	63	31.75	32	17	—	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	—	50	9.5	6	1.0	4.0	1.0	16000	1
	NF10000R0408D	●	8	100	63	31.75	32	17	—	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

*1 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.

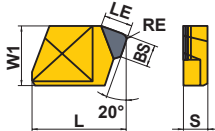
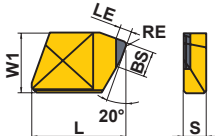
*2 WT : Tool Weight

M

INDEXABLE MILLING

● : Inventory maintained in Japan. (1 insert in one case)

INSERTS

Work Material	K	Cast Iron					Cutting Conditions (Guide) :						
	N	Non-ferrous Metal	●		●		● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting						
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 I NF10000R0510E	CWAF10R1	LS10T	TKY25T

* Clamp Torque (N · m) : LS10T=8.0

RECOMMENDED CUTTING CONDITIONS

	Work 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

M

INDEXABLE MILLING

INDEXABLE MILLING

FACE MILLING

<GENERAL HIGH FEED FINISHING>



FF3000



Steel



Stainless Steel



Cast Iron



Non-ferrous Metal



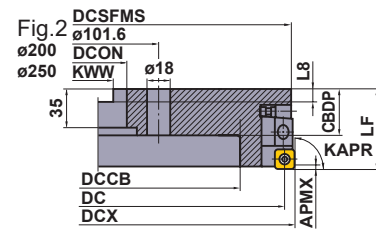
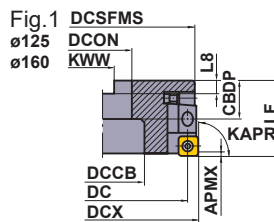
S



H



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



Right hand tool holder only.

KAPR :90°

GAMP :+5° GAMF :-15°

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

* WT : Tool Weight

SPARE PARTS

Tool Holder Number						
	Cartridge	Shim	Lock Pin	Cartridge Clamp Screw	Washer	Radial Spring
FF3000R0502E FF3000R1002K	FFCSR	FFSS	FFP	HBH08040	FFW	FFRP
	Adjusting Wedge	Adjusting Screw	Lever	Lever Screw	Axial Spring	Wrench
	FFAWR	LS3	FFL	FFLB	HP3	①HKY25L ②HKY40T

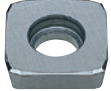
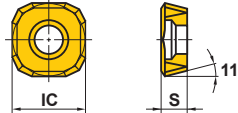
* Clamp Torque (N・m) : FFP=2.2, HBH08040=9.5

M

INDEXABLE MILLING

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

INSERTS

Work Material	P	Steel	●			Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting			
	M	Stainless Steel	●						
	K	Cast Iron	●		●				
	N	Non-ferrous Metal			●				
Shape	Order Number	Class	Cermet		Carbide	Dimensions(mm)		Geometry	
			NX2525		HT105T		IC		S
	SPCA53Z	C	●				15.88	4.8	
	SPCG53Z	C	●		●		15.88	4.8	

RECOMMENDED CUTTING CONDITIONS

	Work 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)
			HT105T	120 (100-150)	
N	Aluminium Alloy	—	HT105T	≤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

M

INDEXABLE MILLING

INDEXABLE MILLING

SHOULDER MILLING

<FOR CAST IRON>

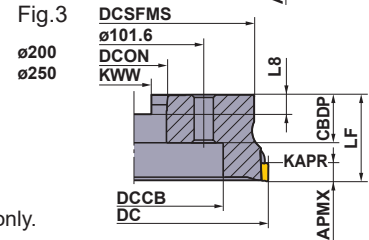
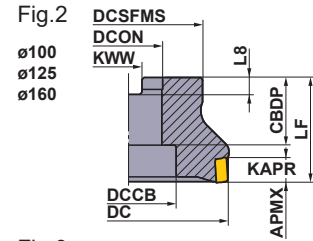
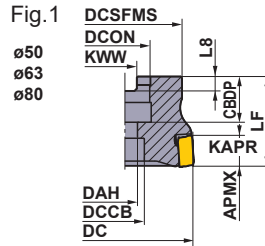
VOX400

P M **K** N S H

Cast Iron



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



Right hand tool holder only.

ARBOR TYPE

KAPR :90°
GAMP:-6° GAMF:-18°

Type	Order Number	Stock	Number of Teeth	Dimensions(mm)									*2	APMX (mm)	Fig.	*1		
				DC	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8	WT (kg)			Clamp Screw		
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	

*1 Clamp Torque (N・m) : CS401160T=3.5

*2 WT : Tool Weight

● : Inventory maintained in Japan.

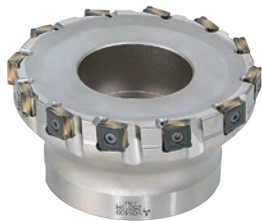


Fig.1

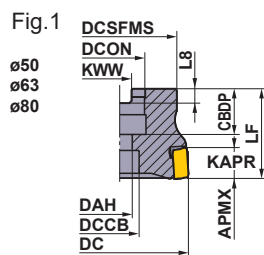


Fig.2

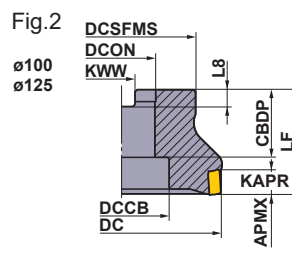
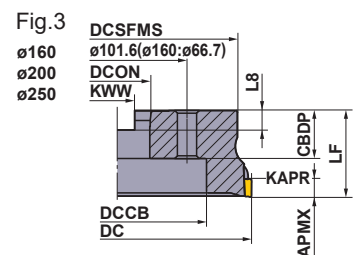


Fig.3



Right hand tool holder only.

For metric arbor

The cutter bore diameter DCON is indicated in millimetre.

ARBOR TYPE

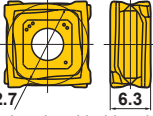
Type	Order Number	Stock R	Number of Teeth	Dimensions(mm)									*2 WT (kg)	APMX (mm)	Fig.	*1 	
				DC	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8	Clamp Screw			Wrench	
Coarse Pitch	VOX400-050A03R	●	3	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1	CS401160T	TKY15T
	VOX400-063A04R	●	4	63	40	22	20	11	17	50	10.4	6.3	0.6	10	1	CS401160T	TKY15T
	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

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

*2 WT : Tool Weight

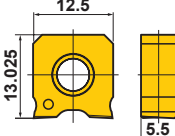
INDEXABLE MILLING

INSERTS

Work Material	K	Cast Iron			Cutting Conditions (Guide) :
					● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting
Shape	Order Number	Class	Honing	Coated	Geometry
				MC5020 VP15TF	
	SONX1206PER SONX1206PEL	N N	E E	● ●	 ø12.7/6.3 Right hand tool holder shown.

✱ Left hand insert use for the side cutter (special products).
Please refer to the TOOL NEWS B242B Side Cutter Series.

WIPER INSERTS

Work Material	K	Cast Iron			Cutting Conditions (Guide) :
					● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting
Shape	Order Number	Class	Honing	Coated	Geometry
				VP15TF	
	WOEX1206PER5C	E E	E E	● ●	 12.5 13.025 5.5

RECOMMENDED CUTTING CONDITIONS

■ VOX400 (Standard Pitch)

Work 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)

Work 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)

Work 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.

Work 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)

Work 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)

Work Material	Tensile Strength	Insert Grade	Cutting Speed (m/min)	φ 100			φ 125			
				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)

Work 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.

M

INDEXABLE MILLING

INDEXABLE MILLING

SHOULDER MILLING

<GENERAL CUTTING>



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

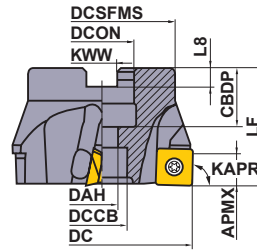


Fig.2
ø80
ø100
ø125
ø160

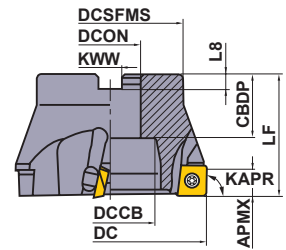
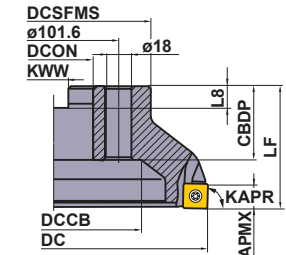


Fig.3
ø200
ø250



ARBOR TYPE

No coolant hole

KAPR :90°

GAMP :+11°

GAMF :-9°—-11°

Right hand tool holder only.

Type	Order Number	Stock R	Number of Teeth	Dimensions(mm)									WT [*] (kg)	APMX (mm)	Fig.
				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

* WT : Tool Weight

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.



For metric arbor

The cutter bore diameter DCON is indicated in millimetre.

Fig.1

ø50
ø63

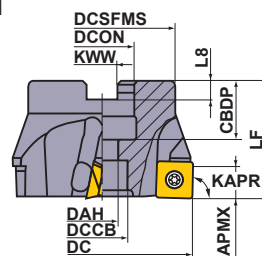


Fig.2

ø80
ø100
ø125

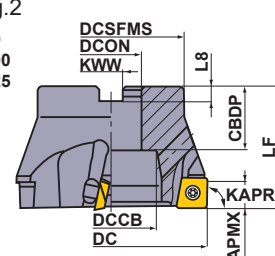


Fig.3

ø160

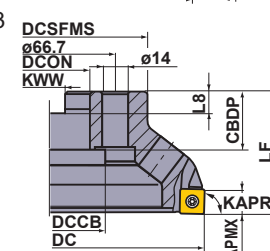
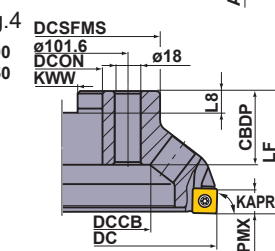


Fig.4

ø200
ø250



ARBOR TYPE

No coolant hole

KAPR :90°

GAMP: +11°

GAMF: -9°—-11°

Right hand tool holder only.

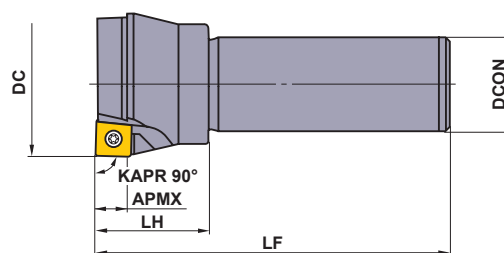
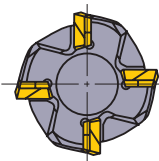
Type	Order Number	Stock R	Number of Teeth	Dimensions(mm)									WT (kg)	APMX (mm)	Fig.
				DC	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8			
Coarse Pitch	ASX400-050A03R	●	3	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1
	ASX400-063A04R	●	4	63	40	22	20	11	17	50	10.4	6.3	0.5	10	1
	ASX400-080B04R	●	4	80	50	27	29	—	38	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

★ WT : Tool Weight

M

INDEXABLE MILLING

INDEXABLE MILLING



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

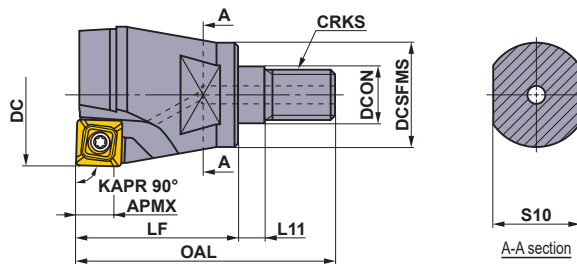
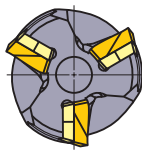
Tool Holder Number		 *	 *		
	Shim	Shim Screw	Clamp Screw	Wrench (Insert)	Wrench (Shim)
ASX400	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R

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

M

INDEXABLE MILLING

● : Inventory maintained in Japan.



SCREW-IN TYPE

Right hand tool holder only.

With Coolant Hole

Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)									*1 WT		*2 	*2 		
	R			DC	DCON	DCSFMS	OAL	LF	L11	S10	CRKS	APMX	(kg)	Shim	Shim Screw	Clamp Screw	Wrench (Insert)	Wrench (Shim)
ASX400R322AM1640	●	○	2	32	17	29	63	40	6	24	M16	10	0.3	—	WCS503507H	TPS35	TIP15T	HKY35R
ASX400R403AM1645	●	○	3	40	17	29	68	45	6	24	M16	10	0.3	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R

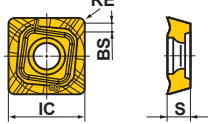
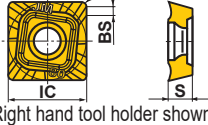
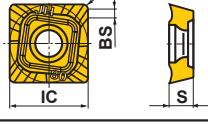
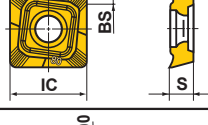
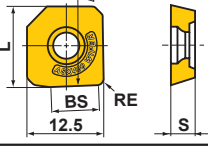
*1 WT : Tool Weight

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

Note 1) For screw-in type arbors, refer to page M269.

INDEXABLE MILLING

INSERTS

Work Material		P	Steel															Cutting Conditions (Guide) :					Honing :						
		M	Stainless Steel	K	Cast Iron	N	Non-ferrous Metal	S	Heat-resistant Alloy, Titanium Alloy	H	Hardened Steel																		
Application	Shape	Order Number	Class	Honing	Coated														Cermets					Carbide					
					F7030	MC5020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT	NX4545	NX2525	HT110	HT105T	L	IC	S	BS	RE	Dimensions (mm)					Geometry
Finish—Light Cutting		SOET12T308PEER-JL	E	E	●		●	●	●	●	●	●	●	●	●				—	12.7	3.97	1.4	0.8						
Light—Rough Cutting		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		SOMT12T308PEER-JH	M	E	●	●	●	●	●	●	●	●	●	●					—	12.7	3.97	1.4	0.8						
Heavy Interrupted Cutting		SOMT12T320PEER-FT	M	E		●	●				●	●	●						—	12.7	3.97	0.5	2.0						
For Aluminium Alloy		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							

M

INDEXABLE MILLING

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

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)	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)

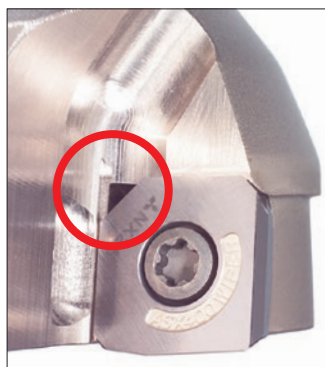
● Table Feed (mm/min)=Feed per Tooth x Number of Teeth x Cutter Revolution

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 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.

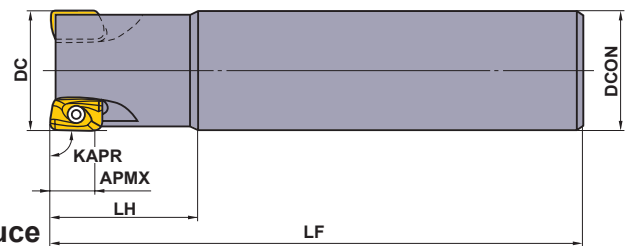
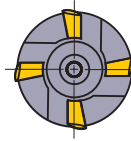
INDEXABLE MILLING

SHOULDER MILLING



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

KAPR : 90°

Right hand tool holder only.

Type	Order Number	Stock	Number of Teeth	Dimensions(mm)					Clamp Screw	Wrench	Insert
				DC	LF	DCON	LH	APMX			
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

Work Material	P	Steel					
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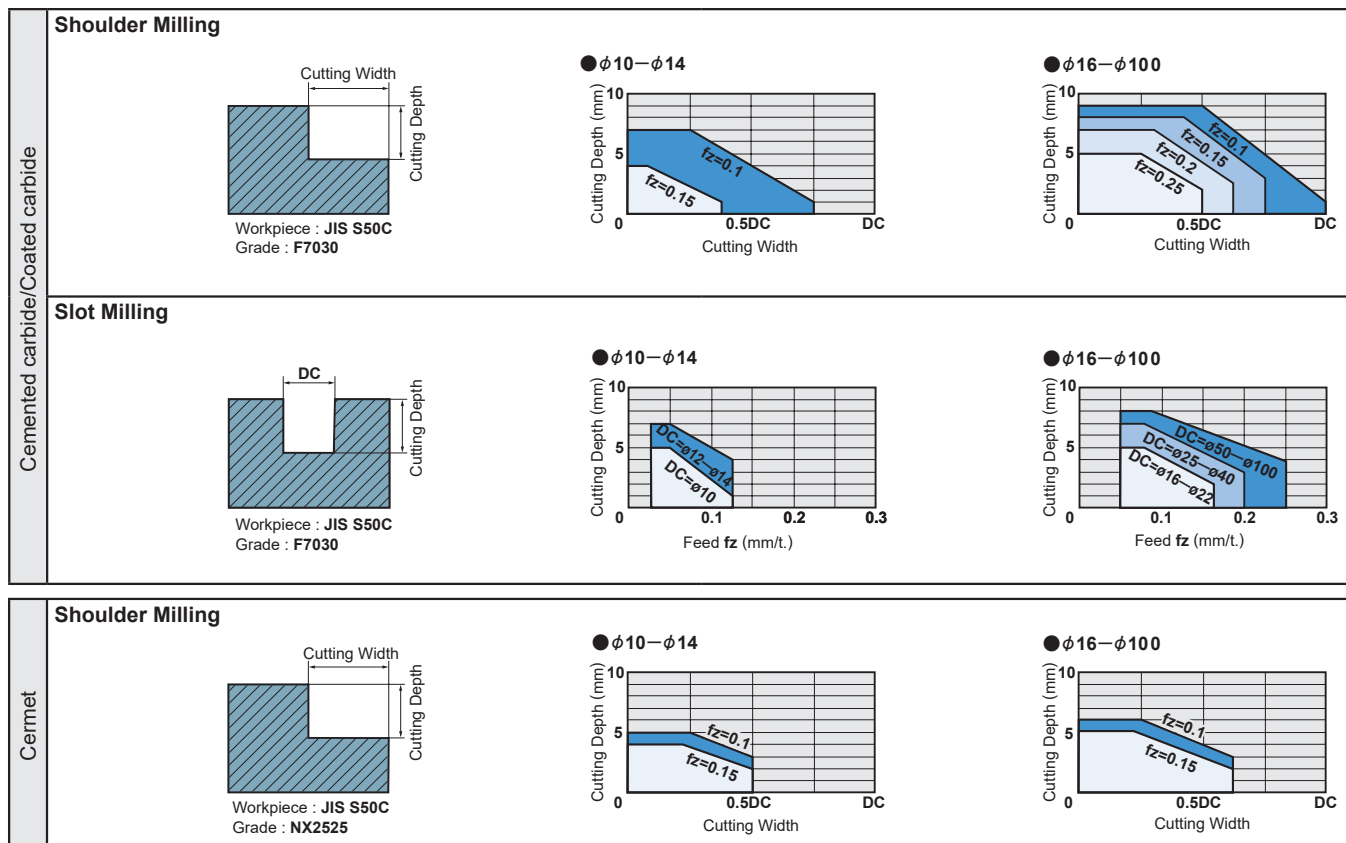
RECOMMENDED CUTTING CONDITIONS

	Work 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



Note 1) In each of the above graphs cutting performance is shown for carbon steel (JIS S50C).

In case of alloy steels, reduce the conditions by 20—30%.

Note 2) In the case of deep slot milling, air blow should be used.

Note 3) The diameter "DC" is taken from the tools peripheral cutting edge.

SIDE CUTTER



VAS400

P

M

K

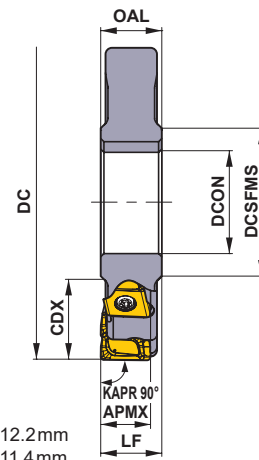
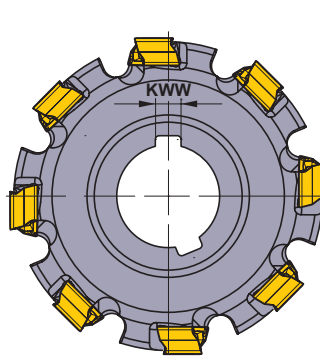
N

S

H

Steel

Cast Iron

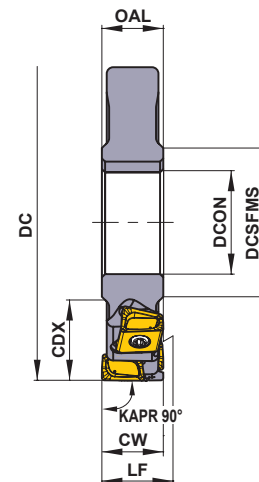
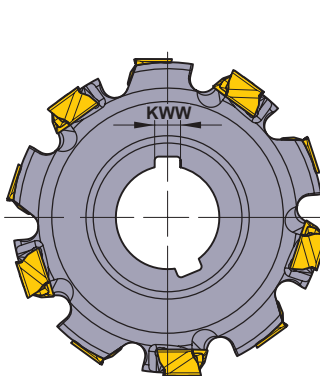
Max. Cutting Diameter **DC** : $\phi 400$ mmMax. Depth of Cut **APMX** : RE1<3.0mmRE1 $\geq$ 3.0mm

12.2mm

11.4mm

■ HALF SIDE

DC (mm)	Effective No. of Teeth	Dimensions (mm)						Insert Type
		LF	CDX	DCON	DCSFMS	OAL	KWW	
80	8	≥ 18	20	27	40	≥ 18	7	LNGU13
100	10	≥ 18	27	32	46	≥ 18	8	LNGU13
125	12	≥ 18	35	40	55	≥ 18	10	LNGU13
160	14	≥ 18	52.5	40	55	≥ 18	10	LNGU13

Largest Width **CW** : 100mmMax. Cutting Diameter **DC** : $\phi 400$ mm

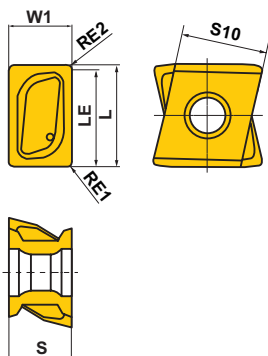
■ FULL SIDE

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	≥ 18	18—24	20	27	40	≥ 18	7	LNGU13
100	5	10	≥ 18	18—24	27	32	46	≥ 18	8	LNGU13
125	6	12	≥ 18	18—24	35	40	55	≥ 18	10	LNGU13
160	7	14	≥ 18	18—24	52.5	40	55	≥ 18	10	LNGU13

*1 In case of adjustment piece specification. LF : ≥ 24 *2 CW of RE1<3.0mm is 24mm, and RE1 $\geq$ 3.0mm is 22.8mm. Multilevel designs available for CW over each sizes.

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

INSERTS

Work Material	P	Steel				Cutting Conditions (Guide) :									
	K	Cast Iron				● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting									
						Honing : E : Round									
Shape	Order Number	Hand	Class	Honing	Coated		Dimensions (mm)							Geometry	
					MP6120	VP15TF	L	LE	S	S10	RE1	RE2	W1		
	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	
	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	

NEW

Right hand insert shown

Right hand insert shown.

M

INDEXABLE MILLING



VAS500

P

Steel

M

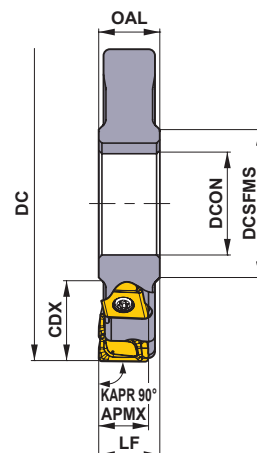
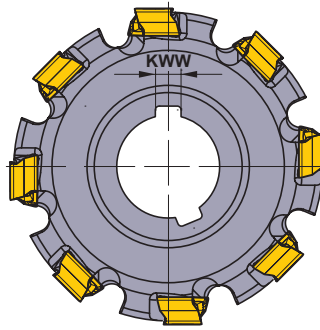
K

Cast Iron

N

S

H

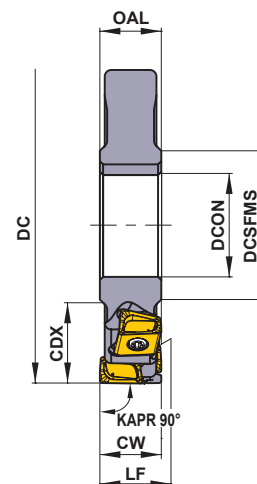
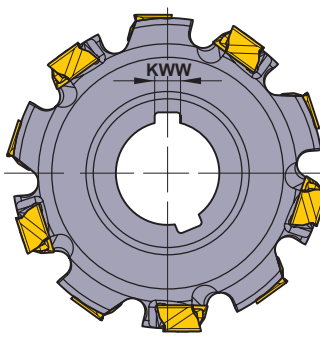


Max. Cutting Diameter **DC** : $\phi 660$ mm
 Max. Depth of Cut **APMX** : RE1<3.0mm 16.2mm
 RE1 $\geq$ 3.0mm 15.4mm

■ HALF SIDE

DC (mm)	Effective No. of Teeth	Dimensions(mm)						Insert Type
		LF	CDX	DCON	DCSFMS	OAL	KWW	
100	8	≥ 23	27	32	46	≥ 23	8	LNGU17
125	10	≥ 23	35	40	55	≥ 23	10	LNGU17
160	12	≥ 23	52.5	40	55	≥ 23	10	LNGU17
200	16	≥ 23	65	50	70	≥ 23	12	LNGU17

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



■ FULL SIDE

Largest Width **CW** : 100mm
 Max. Cutting Diameter **DC** : $\phi 660$ mm

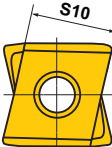
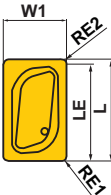
DC (mm)	Effective No. of Teeth	Total No. of Teeth	Dimensions(mm)							Insert Type
			LF *1	CW *2	CDX	DCON	DCSFMS	OAL	KWW	
100	4	8	≥ 23	23 - 32	27	32	46	≥ 23	8	LNGU17
125	5	10	≥ 23	23 - 32	35	40	55	≥ 23	10	LNGU17
160	6	12	≥ 23	23 - 32	52.5	40	55	≥ 23	10	LNGU17
200	8	16	≥ 23	23 - 32	65	50	70	≥ 23	12	LNGU17

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

*2 CW of RE1<3.0mm is 32mm, and RE1 $\geq$ 3.0mm is 30.8mm. Multilevel designs available for CW over each sizes.

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

INSERTS

Work Material	P	Steel	  	Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting Honing : E : Round										
	K	Cast Iron												
Shape	Order Number	Hand	Class	Honing	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.

Right hand insert shown.

M

INDEXABLE MILLING

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

TECHNICAL DATA

➤ R001

M093



VOS400

P

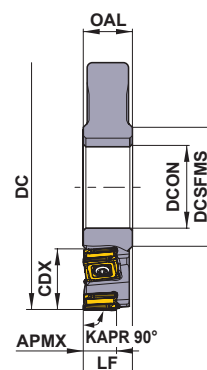
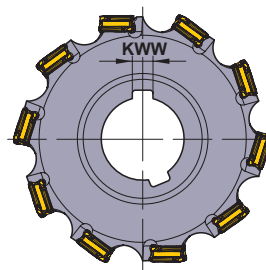
M

K

N

S

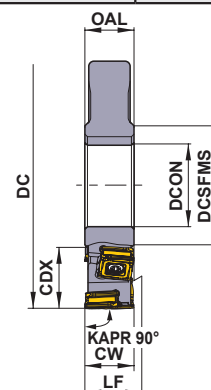
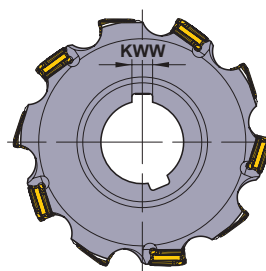
H



■ HALF SIDE

Max. Cutting Diameter **DC** : $\phi 400$ mm

DC (mm)	Effective No. of Teeth	Dimensions (mm)						APMX (mm)
		LF	CDX	DCON	DCSFMS	OAL	KWW	
80	8	≥ 16	20	27	40	≥ 16.8	7	10.0
100	10	≥ 16	27	32	46	≥ 16.8	8	10.0
125	12	≥ 16	35	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** : $\phi 400$ 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	27	40	≥ 16	7
100	5	10	≥ 16	16 – 20	27	32	46	≥ 16	8
125	6	12	≥ 16	16 – 20	35	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	Honing	Coated	Dimensions (mm)		Geometry
						IC	S	
	SONX1206PER	R	N	E	●	12.7	6.3	
	SONX1206PEL	L	N	E	●	12.7	6.3	

Right hand insert shown.

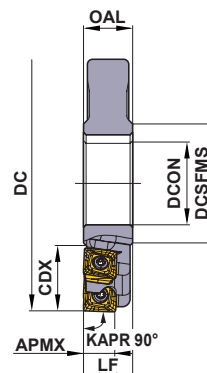
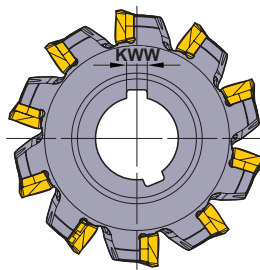
● : Inventory maintained in Japan. (10 inserts in one case)

SIDE CUTTER



ASX400

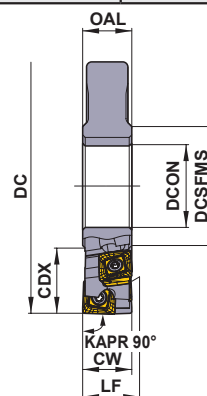
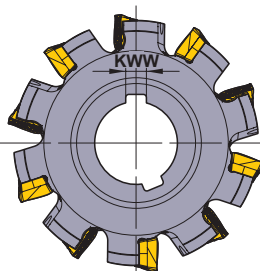
P M K N S H



■ HALF SIDE

Max. Cutting Diameter **DC** : $\phi 400$ mm

DC (mm)	Effective No. of Teeth	Dimensions (mm)						APMX (mm)
		LF	CDX	DCON	DCSFMS	OAL	KWW	
80	8	≥ 16	20	27	40	≥ 16.8	7	10.0
100	10	≥ 16	27	32	46	≥ 16.8	8	10.0
125	12	≥ 16	35	40	55	≥ 16.8	10	10.0
160	14	≥ 16	52.5	40	55	≥ 16.8	10	10.0



Largest Width **CW** : 100 mm
Max. Cutting Diameter **DC** : $\phi 400$ mm

■ 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	27	40	≥ 16	7
100	5	10	≥ 16	16 – 20	27	32	46	≥ 16	8
125	6	12	≥ 16	16 – 20	35	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	Honing	Coated	Dimensions (mm)				Geometry
						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.

INDEXABLE MILLING

MULTI FUNCTIONAL MILLING



APX3000

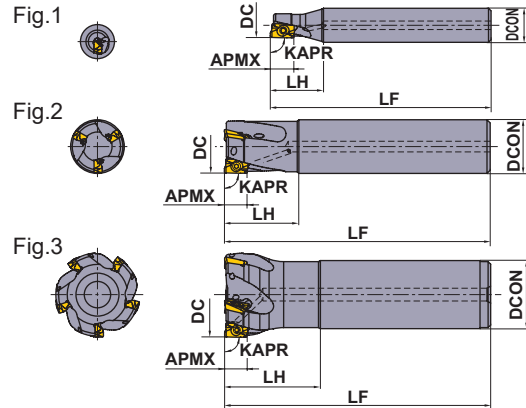
P	M	K	N	S	H
Steel	Stainless Steel	Cast Iron	Non-ferrous Metal	Heat Resistant Alloy	Hardened Steel



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

SHANK TYPE

KAPR : 90°
With Coolant Hole



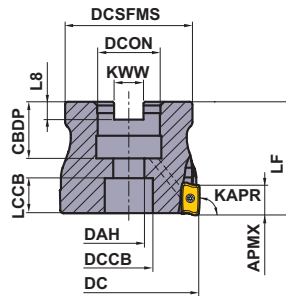
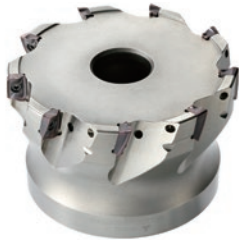
Right hand tool holder only.

DC (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)			WT (kg)	APMX (mm)	RMPX	RPMX (min ⁻¹)	Fig.	Insert Type
				DCON	LF	LH						
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 M099.

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.



Right hand tool holder only.

ARBOR TYPE

KAPR :90°

GAMP:+7°—+21° GAMF:+15°—+27°

With Coolant Hole

DC	Set Bolt	Geometry
32, 40	HSC08030H	
50, 63	HSC10030H	
80	HSC12035H	
100	HSC16040H	

DC (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm)		WT (kg)	APMX (mm)	RMPX	RPMX (min ⁻¹)	 Insert Type
				LF	DCON					
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 $RE \geq 2.4\text{mm}$, machining of the holder is required as shown on page M099.

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

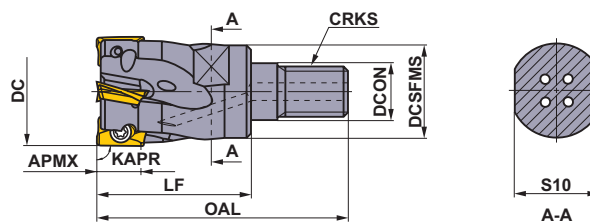
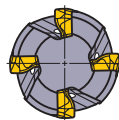
SPARE PARTS

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 > Q001
TECHNICAL DATA > R001

INDEXABLE MILLING



SCREW-IN TYPE

KAPR : 90°
With Coolant Hole

Right hand tool holder only.

DC (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm)						WT (kg)	APMX (mm)	RMPX	Insert Type
				DCON	DCSFMS	OAL	LF	S10	CRKS				
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 $RE \geq 2.4\text{mm}$, machining of the holder is required as shown on page M099.

Note 2) For screw-in type arbors, refer to pages M269.

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

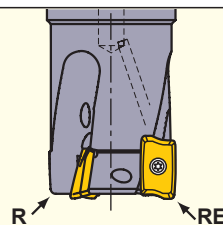
INSERTS

Work Material	P	Steels																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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* Corner radius RE is different from the work material of R shape depending on the axial rake angle of the body.

Note on Use of Inserts with Large Corner Radii

When using inserts with corner radius $RE \geq R2.4\text{mm}$, please machine the holder with a radius form as shown on the right table.



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

R : Holder End Radius
RE : Insert Corner Radius

M

INDEXABLE MILLING

INDEXABLE MILLING

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED

Work 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	—	GM	—	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

Work Material			Characteristics	ae (mm)	DC		DC		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	

M

INDEXABLE MILLING

Work 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
S	Titanium Alloy	≤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	≤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.

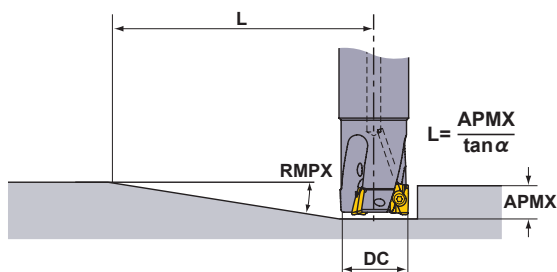
- When using the long shank type and extra long shank type.
- When using long tool overhang with the standard or arbor type.
- When the application has poor clamping rigidity or when using a low rigidity machine.

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

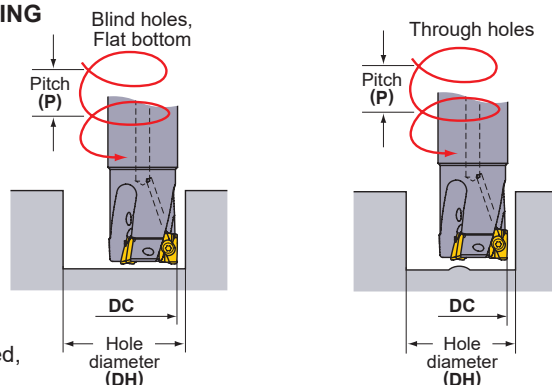
Note 4) For heavy interrupted and unstable cutting, the H breaker is first recommendation.

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 could be continuous.

In this case, decrease the ramping angle or feed per tooth.

*1 $L = (10 / \tan \alpha)$. Cutters' moving distance until depth of cut reaches 10mm at a maximum ramping angle.

*2 In case corner radius of 0.8mm. Other than that, find with the below formula.

$$\{(\text{cutting edge diameter DC}) - (\text{corner radius}) - 0.2\} \times 2$$

INDEXABLE MILLING

MULTI FUNCTIONAL MILLING



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

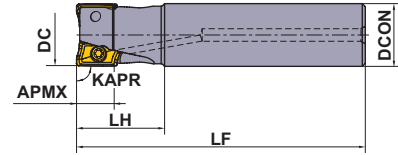
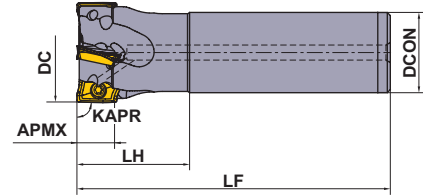
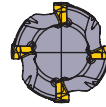


Fig.2



Right hand tool holder only.

SHANK TYPE

KAPR : 90°
With Coolant Hole

DC (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)			WT (kg)	APMX (mm)	RMPX	RPMX (min ⁻¹)	Fig.	Insert Type
				DCON	LF	LH						
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 M105.

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

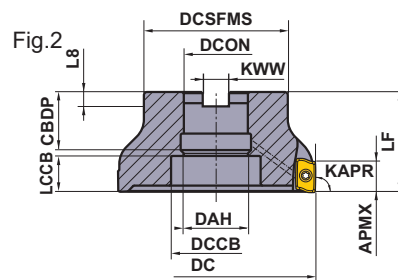
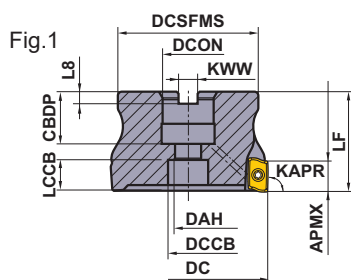
* Clamp Torque (N · m) : TPS4 = 4.0, TPS43 = 4.0

● : Inventory maintained in Japan.



ARBOR TYPE

KAPR :90°
GAMP: +15°—+22° GAMP: +21°—+28°
With Coolant Hole



Right hand tool holder only.

DC	Set Bolt	Geometry	
40	HSC08030H	①	
50, 63	HSC10030H		
80	HSC12035H		
100	HSC16040H		
125	MBA20040H	②	
160	MBA24045H		

DC (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm)		WT (kg)	APMX (mm)	RMPX	RPMX (min ⁻¹)	Fig.	Insert Type
				LF	DCON						
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 $RE \geq 3.2\text{mm}$, machining of the holder is required as shown on page M105.

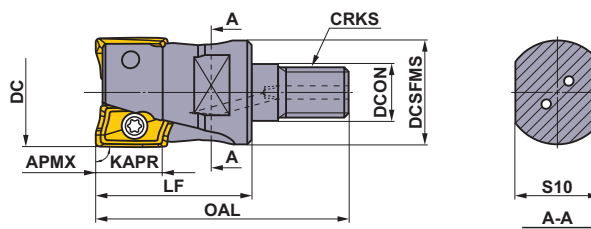
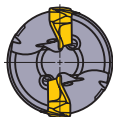
Note 2) The maximum spindle speeds RPMX are set to ensure tool and insert stability.

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

INDEXABLE MILLING



SCREW-IN TYPE

With Coolant Hole

Right hand tool holder only.

DC (mm)	Order Number	Stock R	Number of Teeth	Dimensions(mm)						WT (kg)	APMX (mm)	RMPX	Insert Type
				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 $RE \geq 3.2\text{mm}$, machining of the holder is required as shown on page M105.

Note 2) For screw-in type arbors, refer to page M269.

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

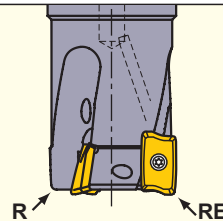
INSERTS

Work Material	P	Steels	● ●
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* Corner radius RE is different from the work material of R shape depending on the axial rake angle of the body.

Note on Use of Inserts with Large Corner Radii

When using inserts with corner radius $RE \geq R3.2\text{mm}$, please machine the holder with a radius form as shown on the right table.



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

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED

Work 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

Work 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	≤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
		180—350HB	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
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	0.10
							0.07

	Work 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
				≤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.

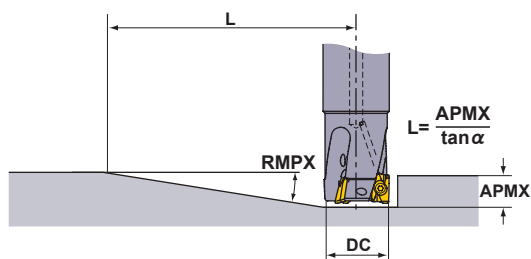
- When using the long shank type and extra long shank type.
- When using long tool overhang with the standard or arbor type.
- When the application has poor clamping rigidity or when using a low rigidity machine.

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

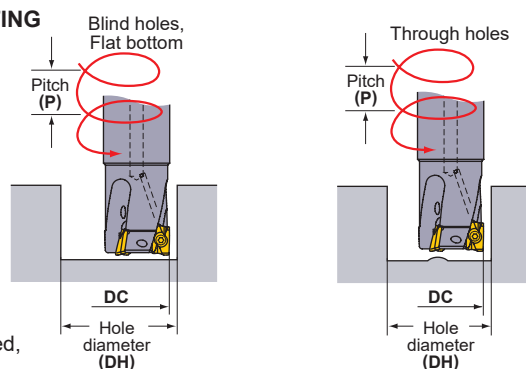
Note 4) For heavy interrupted and unstable cutting, the H breaker is first recommendation.

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	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)
	RMPX							
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 could be continuous.

In this case, decrease the ramping angle or feed per tooth.

*1 $L = 15 / \tan \alpha$. Cutters' moving distance until depth of cut reaches 15mm at a maximum ramping angle.

*2 In case corner radius of 0.8mm. Other than that, find with the below formula.

$$\{(\text{cutting edge diameter DC}) - (\text{corner radius}) - 0.2\} \times 2$$

■ 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.

INDEXABLE MILLING

MULTI-FUNCTIONAL MILLING



VPX200

NEW

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



Fig.1

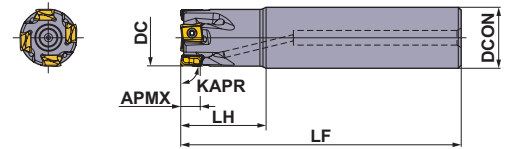
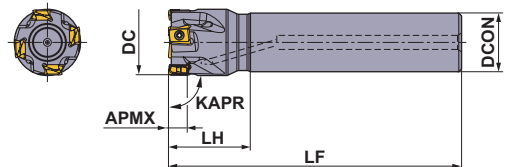


Fig.2



Right hand tool holder only.

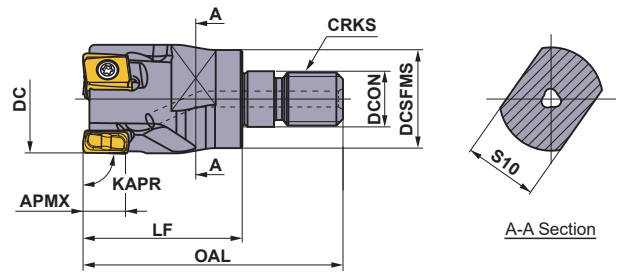
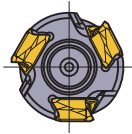
SHANK TYPE

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
				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.



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
				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	28.5	63	40	24	M16	0.21	8	0.71°	LOGU09
32	VPX200R3204AM1640	●	4	17	28.5	63	40	24	M16	0.21	8	0.71°	LOGU09
32	VPX200R3205AM1640	●	5	17	28.5	63	40	24	M16	0.21	8	0.71°	LOGU09
35	VPX200R3503AM1640	●	3	17	28.5	63	40	24	M16	0.24	8	0.63°	LOGU09
35	VPX200R3505AM1640	●	5	17	28.5	63	40	24	M16	0.23	8	0.63°	LOGU09
40	VPX200R4004AM1640	●	4	17	28.5	63	40	24	M16	0.26	8	0.54°	LOGU09
40	VPX200R4006AM1640	●	6	17	28.5	63	40	24	M16	0.26	8	0.54°	LOGU09

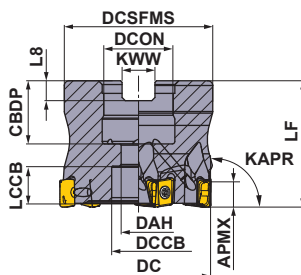
Note 1) For screw-in type arbors, refer to page M269.

SPARE PARTS

DC	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

INDEXABLE MILLING



Right hand tool holder only.

DC	Set Bolt	Geometry
φ32, φ40	HSC08025H	
φ50, φ63	HSC10030H	

ARBOR TYPE

KAPR: 90°
GAMP: -6° GAMP: -25°
With Coolant Hole

DC (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)		WT (kg)	APMX (mm)	RMPX	Max. Spindle Speed (min ⁻¹)	
		R		LF	DCON					Insert Type
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

DC	Tool Holder Type			
		Clamp Screw	Wrench	Anti-seize Lubricant
32	VPX200-032	TPS27F2	TIP07F	MK1KS
40	VPX200-040	TPS27F2	TIP07F	MK1KS
50	VPX200-050	TPS27F2	TIP07F	MK1KS
63	VPX200-063	TPS27F2	TIP07F	MK1KS

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

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

Work Material	P	Steel											Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting							
	M	Stainless Steel																		
	K	Cast Iron																		
	N	Non-ferrous Metal																		
	S	Heat-resistant Alloy, Titanium Alloy																		
	H	Hardened Steel																		
Shape	Order Number	Class	Honing	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		

RECOMMENDED CUTTING CONDITIONS

Breaker Selection Table by Work Material Cutting State

	Work 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
	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	—
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.

Cutting Conditions (Guide) :

● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting

Dry cutting Cutting Speed

Work 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, work material or attachment of work 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.

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Depth of Cut / Feed per Tooth

Work 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

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.)
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M

INDEXABLE MILLING

RECOMMENDED CUTTING CONDITIONS

■ Dry cutting

Depth of Cut / Feed per Tooth

Work 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.)
M	Austenitic Stainless Steel	≤0.25DC	● ● ●	≤6	0.1 -0.15	≤8	0.1 -0.2	≤8	0.1 -0.2
			● ● ●	≤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	0.06-0.1	≤8	0.08-0.12	≤8	0.08-0.12
		0.5-0.75DC	● ● ●	≤4	0.06-0.1	≤6	0.08-0.12	≤6	0.08-0.12
			● ● ●	≤4	0.06-0.08	≤6	0.06-0.1	≤6	0.06-0.1
		DC(Slot)	● ● ●	≤2	0.06-0.1	≤4	0.06-0.1	≤4	0.06-0.1
			● ● ●	≤2	0.06-0.08	≤4	0.06-0.08	≤4	0.06-0.08
	Duplex Stainless Steel	≤0.25DC	● ● ●	≤6	0.1 -0.15	≤8	0.1 -0.2	≤8	0.1 -0.2
			● ● ●	≤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	0.06-0.1	≤8	0.08-0.12	≤8	0.08-0.12
		0.5-0.75DC	● ● ●	≤4	0.06-0.1	≤6	0.08-0.12	≤6	0.08-0.12
			● ● ●	≤4	0.06-0.08	≤6	0.06-0.1	≤6	0.06-0.1
		DC(Slot)	● ● ●	≤2	0.06-0.1	≤4	0.06-0.1	≤4	0.06-0.1
			● ● ●	≤2	0.06-0.08	≤4	0.06-0.08	≤4	0.06-0.08
	Ferritic and Martensitic Stainless Steel	≤0.25DC	● ● ●	≤6	0.1 -0.15	≤8	0.1 -0.2	≤8	0.1 -0.2
			● ● ●	≤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	0.06-0.1	≤8	0.08-0.12	≤8	0.08-0.12
		0.5-0.75DC	● ● ●	≤4	0.06-0.1	≤6	0.08-0.12	≤6	0.08-0.12
			● ● ●	≤4	0.06-0.08	≤6	0.06-0.1	≤6	0.06-0.1
		DC(Slot)	● ● ●	≤2	0.06-0.1	≤4	0.06-0.1	≤4	0.06-0.1
			● ● ●	≤2	0.06-0.08	≤4	0.06-0.08	≤4	0.06-0.08
	Precipitation Hardening Stainless Steel	≤0.25DC	● ● ●	≤6	0.1 -0.15	≤8	0.1 -0.15	≤8	0.1 -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	0.06-0.1	≤8	0.08-0.12	≤8	0.08-0.12
		0.5-0.75DC	● ● ●	≤4	0.06-0.1	≤6	0.06-0.1	≤6	0.06-0.1
			● ● ●	≤4	0.06-0.08	≤6	0.06-0.08	≤6	0.06-0.08
		DC(Slot)	● ● ●	≤2	0.06-0.1	≤4	0.06-0.1	≤4	0.06-0.1
			● ● ●	≤2	0.06-0.08	≤4	0.06-0.08	≤4	0.06-0.08
K	Gray Cast Iron	≤0.25DC	● ● ●	≤6	0.1 -0.15	≤8	0.1 -0.2	≤8	0.1 -0.25
			● ● ●	≤6	0.08-0.12	≤8	0.08-0.15	≤8	0.1 -0.2
		0.25-0.5DC	● ● ●	≤5	0.08-0.12	≤8	0.08-0.15	≤8	0.1 -0.2
			● ● ●	≤5	0.06-0.1	≤8	0.08-0.12	≤8	0.1 -0.15
		0.5-0.75DC	● ● ●	≤4	0.08-0.12	≤6	0.08-0.12	≤6	0.1 -0.15
			● ● ●	≤4	0.08-0.12	≤6	0.06-0.1	≤6	0.08-0.12
		DC(Slot)	● ● ●	≤2	0.06-0.1	≤4	0.06-0.1	≤4	0.08-0.15
			● ● ●	≤2	0.06-0.08	≤4	0.06-0.08	≤4	0.08-0.1
	Ductile Cast Iron	≤0.25DC	● ● ●	≤6	0.1 -0.15	≤8	0.1 -0.2	≤8	0.1 -0.2
			● ● ●	≤6	0.08-0.12	≤8	0.1 -0.15	≤8	0.1 -0.15
		0.25-0.5DC	● ● ●	≤5	0.08-0.12	≤8	0.1 -0.15	≤8	0.1 -0.15
			● ● ●	≤5	0.06-0.1	≤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	0.06-0.1	≤6	0.06-0.1
		DC(Slot)	● ● ●	≤2	0.06-0.1	≤4	0.06-0.1	≤4	0.06-0.1
			● ● ●	≤2	0.06-0.08	≤4	0.06-0.08	≤4	0.06-0.08
N	Aluminium Alloy	≤0.25DC	● ● ●	≤6	0.1 -0.2	≤8	0.1 -0.25	≤8	0.1 -0.25
			● ● ●	≤6	0.1 -0.15	≤8	0.1 -0.2	≤8	0.1 -0.2
			● ● ●	≤5	0.1 -0.15	≤8	0.1 -0.2	≤8	0.1 -0.2
			● ● ●	≤5	0.08-0.12	≤8	0.1 -0.15	≤8	0.1 -0.15
		0.25-0.5DC	● ● ●	≤4	0.08-0.12	≤6	0.06-0.15	≤6	0.08-0.15
			● ● ●	≤4	0.06-0.1	≤6	0.06-0.15	≤6	0.08-0.15
			● ● ●	≤4	0.06-0.1	≤6	0.06-0.15	≤6	0.08-0.15
			● ● ●	≤2	0.06-0.1	≤4	0.06-0.15	≤4	0.08-0.15
H	Hardened Steel	≤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
			● ● ●	≤3	0.08-0.12	≤3	0.08-0.12	≤3	0.08-0.12
			● ● ●	≤3	0.06-0.1	≤3	0.08-0.1	≤3	0.06-0.1
		0.25-0.5DC	● ● ●	≤2	0.06-0.1	≤2	0.08-0.1	≤2	0.06-0.1
			● ● ●	≤2	0.06-0.08	≤2	0.06-0.08	≤2	0.06-0.08
			● ● ●	≤1	0.06-0.1	≤1	0.06-0.1	≤1	0.06-0.1
			● ● ●	≤1	0.06-0.08	≤1	0.06-0.08	≤1	0.06-0.08

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Cutting Conditions (Guide) :

● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting

Wet Cutting Cutting Speed

	Work 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)
			● ●	MP9120,VP15TF	40 (30—60)	40 (30—60)	40 (30—60)	40 (30—60)
H	Hardened Steel	Hardness 40—55HRC	● ● ✖	VP15TF	90 (70—100)	85 (60—100)	70 (50—80)	70 (50—80)
			● ● ✖	VP15TF	90 (70—100)	85 (60—100)	70 (50—80)	70 (50—80)

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M

INDEXABLE MILLING

RECOMMENDED CUTTING CONDITIONS

■ Wet Cutting

Depth of Cut / Feed per Tooth

Work 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	0.1 —0.15	≤8	0.1 —0.2	≤8	0.1 —0.25
			0.25—0.5DC	● ● ● *	≤5	0.1 —0.15	≤8	0.1 —0.15	≤8	0.1 —0.2
			0.5—0.75DC	● ● ● *	≤4	0.08—0.12	≤6	0.08—0.12	≤6	0.1 —0.15
			DC(Slot)	● ● ● *	≤2	0.06—0.1	≤4	0.06—0.1	≤4	0.08—0.12
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	≤0.25DC	● ● ● *	≤6	0.1 —0.15	≤8	0.1 —0.2	≤8	0.1 —0.25
			0.25—0.5DC	● ● ● *	≤5	0.08—0.12	≤8	0.1 —0.15	≤8	0.1 —0.2
			0.5—0.75DC	● ● ● *	≤4	0.08—0.12	≤6	0.08—0.12	≤6	0.1 —0.15
			DC(Slot)	● ● ● *	≤2	0.06—0.1	≤4	0.06—0.1	≤4	0.08—0.12
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280—350HB ≤350HB (Annealing)	≤0.25DC	● ● ● *	≤6	0.1 —0.15	≤8	0.1 —0.15	≤8	0.1 —0.2
			0.25—0.5DC	● ● ● *	≤5	0.08—0.12	≤8	0.08—0.12	≤8	0.1 —0.15
			0.5—0.75DC	● ● ● *	≤4	0.08—0.12	≤6	0.06—0.1	≤6	0.08—0.12
			DC(Slot)	● ● ● *	≤2	0.06—0.1	≤4	0.06—0.1	≤4	0.06—0.1
	Pre-hardened Steel	Hardness 35—45HRC	≤0.25DC	● ● ● *	≤6	0.1 —0.15	≤8	0.1 —0.15	≤8	0.1 —0.2
			0.25—0.5DC	● ● ● *	≤5	0.08—0.12	≤8	0.08—0.12	≤8	0.1 —0.15
			0.5—0.75DC	● ● ● *	≤4	0.08—0.12	≤6	0.06—0.1	≤6	0.08—0.12
			DC(Slot)	● ● ● *	≤2	0.06—0.1	≤4	0.06—0.1	≤4	0.06—0.1
M	Austenitic Stainless Steel	—	≤0.25DC	● ● ● *	≤6	0.1 —0.15	≤8	0.1 —0.2	≤8	0.1 —0.2
			0.25—0.5DC	● ● ● *	≤5	0.08—0.12	≤8	0.08—0.15	≤8	0.08—0.15
			0.5—0.75DC	● ● ● *	≤4	0.06—0.1	≤6	0.08—0.12	≤6	0.08—0.12
			DC(Slot)	● ● ● *	≤2	0.06—0.1	≤4	0.06—0.1	≤4	0.06—0.1
				● ● ● *	≤2	0.06—0.08	≤4	0.06—0.08	≤4	0.06—0.08
	Duplex Stainless Steel	Hardness ≤280HB	≤0.25DC	● ● ● *	≤6	0.1 —0.15	≤8	0.1 —0.2	≤8	0.1 —0.2
			0.25—0.5DC	● ● ● *	≤5	0.08—0.12	≤8	0.08—0.15	≤8	0.08—0.12
			0.5—0.75DC	● ● ● *	≤4	0.06—0.1	≤6	0.08—0.12	≤6	0.08—0.12
			DC(Slot)	● ● ● *	≤2	0.06—0.1	≤4	0.06—0.1	≤4	0.06—0.1
				● ● ● *	≤2	0.06—0.08	≤4	0.06—0.08	≤4	0.06—0.08
	Ferritic and Martensitic Stainless Steel	—	≤0.25DC	● ● ● *	≤6	0.1 —0.15	≤8	0.1 —0.2	≤8	0.1 —0.2
			0.25—0.5DC	● ● ● *	≤5	0.08—0.12	≤8	0.08—0.15	≤8	0.08—0.15
			0.5—0.75DC	● ● ● *	≤4	0.06—0.1	≤6	0.08—0.12	≤6	0.08—0.12
			DC(Slot)	● ● ● *	≤2	0.06—0.1	≤4	0.06—0.1	≤4	0.05—0.1
				● ● ● *	≤2	0.06—0.08	≤4	0.06—0.08	≤4	0.05—0.08
	Precipitation Hardening Stainless Steel	Hardness <450HB	≤0.25DC	● ● ● *	≤6	0.1 —0.15	≤8	0.1 —0.15	≤8	0.1 —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—0.1	≤6	0.06—0.1	≤6	0.05—0.1
			DC(Slot)	● ● ● *	≤2	0.06—0.1	≤4	0.06—0.1	≤4	0.05—0.1
				● ● ● *	≤2	0.06—0.08	≤4	0.06—0.08	≤4	0.05—0.08
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤0.25DC	● ● ● *	≤6	0.1 —0.15	≤8	0.1 —0.2	≤8	0.1 —0.25
			0.25—0.5DC	● ● ● *	≤5	0.08—0.12	≤8	0.08—0.15	≤8	0.1 —0.2
			0.5—0.75DC	● ● ● *	≤4	0.08—0.12	≤6	0.06—0.1	≤6	0.1 —0.15
			DC(Slot)	● ● ● *	≤2	0.06—0.1	≤4	0.06—0.1	≤4	0.08—0.15
				● ● ● *	≤2	0.06—0.08	≤4	0.06—0.08	≤4	0.06—0.1
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤0.25DC	● ● ● *	≤6	0.1 —0.15	≤8	0.1 —0.2	≤8	0.1 —0.2
			0.25—0.5DC	● ● ● *	≤5	0.08—0.12	≤8	0.1 —0.15	≤8	0.1 —0.15
			0.5—0.75DC	● ● ● *	≤4	0.08—0.12	≤6	0.08—0.12	≤6	0.08—0.12
			DC(Slot)	● ● ● *	≤2	0.06—0.1	≤4	0.06—0.1	≤4	0.06—0.1
				● ● ● *	≤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, work material or attachment of work 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

Work 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.)
N	Aluminium Alloy	Content Si < 5%	≤0.25DC	● ● ✖	≤6 0.1 -0.2	≤8 0.1 -0.25	≤8 0.1 -0.2	≤8 0.1 -0.2	≤8 0.1 -0.2
			0.25-0.5DC	● ● ✖	≤5 0.1 -0.15	≤8 0.1 -0.2	≤8 0.1 -0.2	≤8 0.1 -0.2	≤8 0.1 -0.2
			0.5-0.75DC	● ● ✖	≤4 0.08-0.12	≤6 0.06-0.15	≤6 0.06-0.15	≤6 0.08-0.15	≤6 0.08-0.15
			DC(Slot)	● ● ✖	≤2 0.06-0.1	≤4 0.06-0.15	≤4 0.06-0.15	≤4 0.08-0.15	≤4 0.08-0.15
			DC(Slot)	● ● ✖	≤2 0.06-0.08	≤4 0.06-0.12	≤4 0.06-0.12	≤4 0.08-0.12	≤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	≤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	≤8 0.08-0.12	≤8 0.08-0.12
			0.5-0.75DC	● ● ✖	≤4 0.06-0.1	≤6 0.06-0.1	≤6 0.06-0.1	≤6 0.06-0.1	≤6 0.06-0.1
			DC(Slot)	● ● ✖	≤2 0.06-0.1	≤4 0.06-0.1	≤4 0.06-0.1	≤4 0.06-0.1	≤4 0.06-0.1
	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	≤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	≤8 0.08-0.12	≤8 0.08-0.12
			0.5-0.75DC	● ● ✖	≤4 0.06-0.1	≤6 0.06-0.1	≤6 0.06-0.1	≤6 0.06-0.1	≤6 0.06-0.1
			DC(Slot)	● ● ✖	≤2 0.06-0.1	≤4 0.06-0.1	≤4 0.06-0.1	≤4 0.06-0.1	≤4 0.06-0.1
	Heat Resistant Alloy	—	≤0.25DC	● ● ✖	≤6 0.08-0.12	≤8 0.08-0.12	≤8 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	≤8 0.08-0.12	≤8 0.08-0.12
			0.5-0.75DC	● ● ✖	≤4 0.06-0.1	≤6 0.06-0.1	≤6 0.06-0.1	≤6 0.06-0.1	≤6 0.06-0.1
			DC(Slot)	● ● ✖	≤2 0.06-0.1	≤4 0.06-0.1	≤4 0.06-0.1	≤4 0.06-0.1	≤4 0.06-0.1
H	Hardened Steel	Hardness 40-55HRC	≤0.25DC	● ● ✖	≤4 0.08-0.15	≤4 0.08-0.15	≤4 0.08-0.15	≤4 0.08-0.15	≤4 0.08-0.15
			0.25-0.5DC	● ● ✖	≤3 0.08-0.12	≤3 0.08-0.12	≤3 0.08-0.12	≤3 0.08-0.12	≤3 0.08-0.12
			0.5-0.75DC	● ● ✖	≤2 0.06-0.1	≤2 0.06-0.1	≤2 0.06-0.1	≤2 0.06-0.1	≤2 0.06-0.1
			DC(Slot)	● ● ✖	≤1 0.06-0.1	≤1 0.06-0.1	≤1 0.06-0.1	≤1 0.06-0.1	≤1 0.06-0.1
			DC(Slot)	● ● ✖	≤1 0.06-0.1	≤1 0.06-0.1	≤1 0.06-0.1	≤1 0.06-0.1	≤1 0.06-0.1

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, work material or attachment of work material is low
- Corner radius during pocket machining

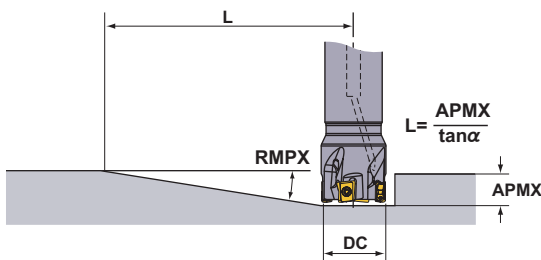
Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.

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

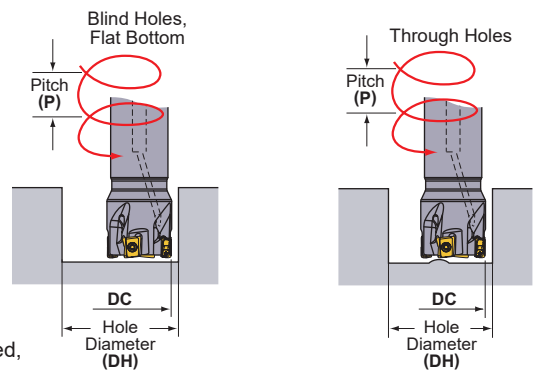
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

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

Note 1) When machining a highly ductile work 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 $L (= 8/\tan \alpha)$.

M

INDEXABLE MILLING

INDEXABLE 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)
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
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 work 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 $L (= 8/\tan \alpha)$.

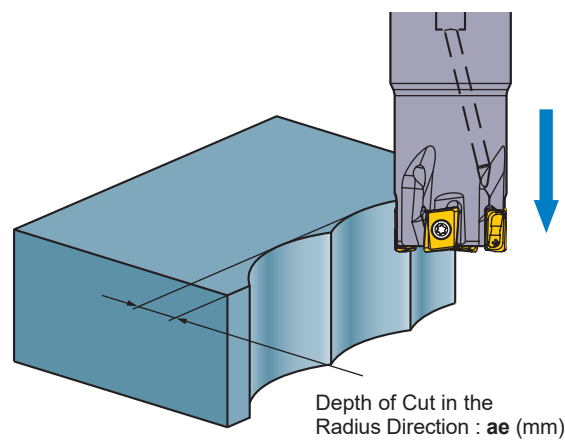
M

INDEXABLE MILLING

■ 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.

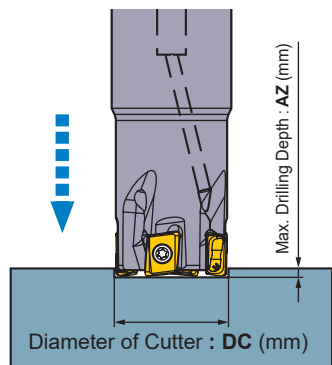
● Plunging



DC (mm)	ae (mm)
16	3.9
18	3.9
20	3.9
22	4
25	4
28	4
30	4
32	4
35	4
40	4
50	4
63	4

Note 1) No step feed necessary.

● Drilling



DC (mm)	AZ (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

Note 1) Exercise due caution as chips scatter easily.

Note 2) Use compressed air to eliminate chips (or coolant for when machining aluminium alloy).

INDEXABLE MILLING

MULTI-FUNCTIONAL MILLING



VPX300

NEW

P

Steel

M

Stainless Steel

K

Cast Iron

N

Non-ferrous Metal

S

Heat Resistant Alloy

H

Hardened Steel



Fig.1

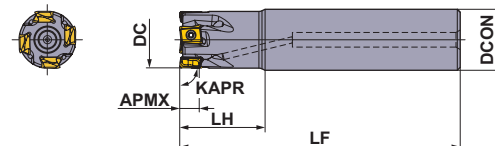
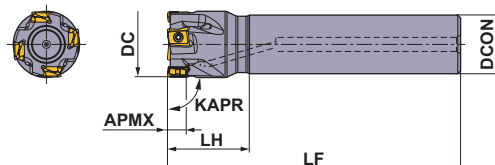


Fig.2



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
				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

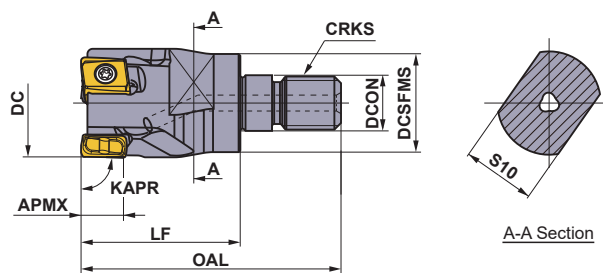
Note 1) The maximum spindle speeds are set to ensure tool and insert stability.

Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

M

INDEXABLE MILLING

● : Inventory maintained in Japan.



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	28.5	63	40	24	M16	0.20	11	1.47°	LOGU12
32	VPX300R3203AM1640	●	3	17	28.5	63	40	24	M16	0.19	11	1.47°	LOGU12
35	VPX300R3502AM1640	●	2	17	28.5	63	40	24	M16	0.22	11	1.28°	LOGU12
35	VPX300R3503AM1640	●	3	17	28.5	63	40	24	M16	0.22	11	1.28°	LOGU12
40	VPX300R4003AM1640	●	3	17	28.5	63	40	24	M16	0.26	11	1.06°	LOGU12
40	VPX300R4004AM1640	●	4	17	28.5	63	40	24	M16	0.26	11	1.06°	LOGU12

Note 1) For screw-in type arbors, refer to page M269.

SPARE PARTS

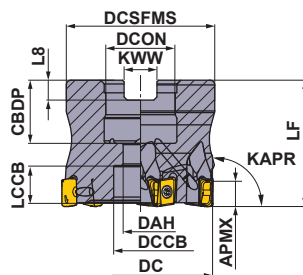
DC	Tool Holder Type	*		
		Clamp Screw	Wrench	Anti-seize Lubricant
25	VPX300R25	TPS40F1	TIP15W	MK1KS
28	VPX300R28	TPS40F1	TIP15W	MK1KS
30	VPX300R30	TPS40F1	TIP15W	MK1KS
32	VPX300R32	TPS40F1	TIP15W	MK1KS
35	VPX300R35	TPS40F1	TIP15W	MK1KS
40	VPX300R40	TPS40F1	TIP15W	MK1KS
50	VPX300R50	TPS40F1	TIP15W	MK1KS

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

M

INDEXABLE MILLING

INDEXABLE MILLING



Right hand tool holder only.

DC	Set Bolt	Geometry
φ40	HSC08025H	
φ50, φ63	HSC10030H	
φ80	HSC12035H	

ARBOR TYPE

KAPR:90°
GAMP: -6° GAMF: -22.5°
With Coolant Hole

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	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
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

DC	Tool Holder Type			
		Clamp Screw	Wrench	Anti-seize Lubricant
40	VPX300-040	TPS40F1	TIP15W	MK1KS
50	VPX300-050	TPS40F1	TIP15W	MK1KS
63	VPX300-063	TPS40F1	TIP15W	MK1KS
80	VPX300R080	TPS40F1	TIP15W	MK1KS
80	VPX300-080	TPS40F1	TIP15W	MK1KS

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

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

Work Material	P	Steel	C	A	F	M	H	K	N	S	H	Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting	Honing : E : Round F : Sharp						
	M	Stainless Steel												K	Cast Iron	N	Non-ferrous Metal	S	Heat-resistant Alloy, Titanium Alloy
Shape	Order Number	Class	Honing	Coated						Carbide	Dimensions(mm)					Geometry			
				MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF		TF15		L	RE	LE	S	BS	
	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	

[illegible]

INDEXABLE MILLING

RECOMMENDED CUTTING CONDITIONS

■ Dry Cutting Cutting Speed

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

Depth of Cut / Feed per Tooth

Work Material	Characteristics	ae (mm)	Cutting Conditions	DC (mm)			
				ø25		ø28—ø80	
				ap (mm)	fz (mm/t.)	ap (mm)	fz (mm/t.)
P	Mild Steel	≤0.25DC	● ● ✱	≤11	0.1 —0.2	≤11	0.1 —0.3
		0.25—0.5DC	● ● ✱	≤11	0.1 —0.15	≤11	0.1 —0.25
		0.5—0.75DC	● ● ✱	≤8	0.08—0.12	≤8	0.1 —0.2
		DC(Slot)	● ● ✱	≤5	0.06—0.1	≤5	0.08—0.15
	Carbon Steel Alloy Steel Alloy Tool Steel	≤0.25DC	● ● ✱	≤11	0.1 —0.2	≤11	0.1 —0.3
		0.25—0.5DC	● ● ✱	≤11	0.1 —0.15	≤11	0.1 —0.25
		0.5—0.75DC	● ● ✱	≤8	0.08—0.12	≤8	0.1 —0.2
		DC(Slot)	● ● ✱	≤5	0.06—0.1	≤5	0.08—0.15
	Carbon Steel Alloy Steel Alloy Tool Steel	≤0.25DC	● ● ✱	≤11	0.1 —0.15	≤11	0.1 —0.25
		0.25—0.5DC	● ● ✱	≤11	0.08—0.12	≤11	0.1 —0.2
		0.5—0.75DC	● ● ✱	≤8	0.06—0.1	≤8	0.1 —0.15
		DC(Slot)	● ● ✱	≤5	0.06—0.1	≤5	0.08—0.12
	Pre-hardened Steel	≤0.25DC	● ● ✱	≤11	0.1 —0.15	≤11	0.1 —0.25
		0.25—0.5DC	● ● ✱	≤11	0.08—0.12	≤11	0.1 —0.2
		0.5—0.75DC	● ● ✱	≤8	0.06—0.1	≤8	0.1 —0.15
		DC(Slot)	● ● ✱	≤5	0.06—0.1	≤5	0.08—0.12

Cutting Conditions (Guide) :

● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting

■ Dry Cutting

Depth of Cut / Feed per Tooth

Work Material	Characteristics	ae (mm)	Cutting Conditions	DC (mm)			
				ø25		ø28-ø80	
				ap (mm)	fz (mm/t.)	ap (mm)	fz (mm/t.)
M	Austenitic Stainless Steel	—	≤0.25DC	● ● ✖	≤11 0.1 -0.2	≤11 0.1 -0.2	≤11 0.1 -0.2
				● ● ✖	0.08 -0.15	≤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 -0.15
				● ● ✖	0.08 -0.12	≤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 0.08 -0.12
				● ● ✖	0.06 -0.1	≤8 0.06 -0.1	≤8 0.06 -0.1
			DC(Slot)	● ● ✖	≤5 0.06 -0.1	≤5 0.06 -0.1	≤5 0.06 -0.1
				● ● ✖	0.06 -0.08	≤5 0.06 -0.08	≤5 0.06 -0.08
	Duplex Stainless Steel	Hardness ≤280HB	≤0.25DC	● ● ✖	≤11 0.1 -0.2	≤11 0.1 -0.2	≤11 0.1 -0.2
				● ● ✖	0.08 -0.15	≤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 -0.15
				● ● ✖	0.08 -0.12	≤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 0.08 -0.12
				● ● ✖	0.06 -0.1	≤8 0.06 -0.1	≤8 0.06 -0.1
			DC(Slot)	● ● ✖	≤5 0.06 -0.1	≤5 0.06 -0.1	≤5 0.06 -0.1
				● ● ✖	0.06 -0.08	≤5 0.06 -0.08	≤5 0.06 -0.08
	Ferritic and Martensitic Stainless Steel	—	≤0.25DC	● ● ✖	≤11 0.1 -0.2	≤11 0.1 -0.2	≤11 0.1 -0.2
				● ● ✖	0.08 -0.15	≤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 -0.15
				● ● ✖	0.08 -0.12	≤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 0.08 -0.12
				● ● ✖	0.06 -0.1	≤8 0.06 -0.1	≤8 0.06 -0.1
			DC(Slot)	● ● ✖	≤5 0.06 -0.1	≤5 0.06 -0.1	≤5 0.06 -0.1
				● ● ✖	0.06 -0.08	≤5 0.06 -0.08	≤5 0.06 -0.08
	Precipitation Hardening Stainless Steel	Hardness <450HB	≤0.25DC	● ● ✖	≤11 0.1 -0.15	≤11 0.1 -0.15	≤11 0.1 -0.15
				● ● ✖	0.08 -0.12	≤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
				● ● ✖	0.08 -0.12	≤11 0.06 -0.1	≤11 0.06 -0.1
			0.5-0.75DC	● ● ✖	≤8 0.06 -0.1	≤8 0.06 -0.1	≤8 0.06 -0.1
				● ● ✖	0.06 -0.08	≤8 0.06 -0.08	≤8 0.06 -0.08
			DC(Slot)	● ● ✖	≤5 0.06 -0.1	≤5 0.06 -0.1	≤5 0.06 -0.1
				● ● ✖	0.06 -0.08	≤5 0.06 -0.08	≤5 0.06 -0.08
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤0.25DC	● ● ✖	≤11 0.1 -0.2	≤11 0.1 -0.2	≤11 0.1 -0.3
				● ● ✖	0.08 -0.15	≤11 0.1 -0.25	≤11 0.1 -0.25
			0.25-0.5DC	● ● ✖	≤11 0.08 -0.15	≤11 0.1 -0.25	≤11 0.1 -0.25
				● ● ✖	0.08 -0.12	≤11 0.1 -0.2	≤11 0.1 -0.2
			0.5-0.75DC	● ● ✖	≤8 0.08 -0.12	≤8 0.08 -0.15	≤8 0.08 -0.15
				● ● ✖	0.06 -0.1	≤8 0.08 -0.15	≤8 0.08 -0.15
			DC(Slot)	● ● ✖	≤5 0.06 -0.1	≤5 0.08 -0.15	≤5 0.08 -0.15
				● ● ✖	0.06 -0.08	≤5 0.08 -0.12	≤5 0.08 -0.12
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤0.25DC	● ● ✖	≤11 0.1 -0.2	≤11 0.1 -0.25	≤11 0.1 -0.25
				● ● ✖	0.1 -0.15	≤11 0.1 -0.2	≤11 0.1 -0.2
			0.25-0.5DC	● ● ✖	≤11 0.1 -0.15	≤11 0.1 -0.15	≤11 0.1 -0.15
				● ● ✖	0.08 -0.12	≤11 0.1 -0.15	≤11 0.1 -0.15
			0.5-0.75DC	● ● ✖	≤8 0.08 -0.12	≤8 0.08 -0.12	≤8 0.08 -0.12
				● ● ✖	0.08 -0.12	≤8 0.08 -0.12	≤8 0.08 -0.12
			DC(Slot)	● ● ✖	≤5 0.06 -0.1	≤5 0.08 -0.12	≤5 0.08 -0.12
				● ● ✖	0.06 -0.08	≤5 0.06 -0.1	≤5 0.06 -0.1
N	Aluminium Alloy	Content Si < 5%	≤0.25DC	● ● ✖	≤11 0.1 -0.25	≤11 0.1 -0.25	≤11 0.1 -0.25
				● ● ✖	0.1 -0.2	≤11 0.1 -0.2	≤11 0.1 -0.2
			0.25-0.5DC	● ● ✖	≤11 0.1 -0.2	≤11 0.1 -0.2	≤11 0.1 -0.2
				● ● ✖	0.1 -0.15	≤11 0.1 -0.15	≤11 0.1 -0.15
			0.5-0.75DC	● ● ✖	≤8 0.06 -0.15	≤8 0.08 -0.15	≤8 0.08 -0.15
				● ● ✖	0.06 -0.15	≤8 0.08 -0.15	≤8 0.08 -0.15
			DC(Slot)	● ● ✖	≤5 0.06 -0.15	≤5 0.08 -0.15	≤5 0.08 -0.15
				● ● ✖	0.06 -0.15	≤5 0.08 -0.12	≤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 -0.15
				● ● ✖	0.08 -0.12	≤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 0.08 -0.12
				● ● ✖	0.06 -0.1	≤4 0.06 -0.1	≤4 0.06 -0.1
			0.5-0.75DC	● ● ✖	≤3 0.06 -0.1	≤3 0.06 -0.1	≤3 0.06 -0.1
				● ● ✖	0.06 -0.08	≤3 0.06 -0.08	≤3 0.06 -0.08
			DC(Slot)	● ● ✖	≤2 0.06 -0.1	≤2 0.06 -0.1	≤2 0.06 -0.1
				● ● ✖	0.06 -0.08	≤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, work material or attachment of work 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.

M

INDEXABLE MILLING

RECOMMENDED CUTTING CONDITIONS

Wet Cutting Cutting Speed

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

Work 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	0.1 —0.2	≤11	0.1 —0.3
			0.25—0.5DC	● ● ● ✖	≤11	0.1 —0.15	≤11	0.1 —0.25
			0.5—0.75DC	● ● ● ✖	≤8	0.08—0.12	≤8	0.1 —0.2
			DC(Slot)	● ● ● ✖	≤5	0.06—0.1	≤5	0.08—0.15
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	≤0.25DC	● ● ● ✖	≤11	0.1 —0.2	≤11	0.1 —0.3
			0.25—0.5DC	● ● ● ✖	≤11	0.1 —0.15	≤11	0.1 —0.25
			0.5—0.75DC	● ● ● ✖	≤8	0.08—0.12	≤8	0.1 —0.2
			DC(Slot)	● ● ● ✖	≤5	0.06—0.1	≤5	0.08—0.15
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280—350HB ≤350HB (Annealing)	≤0.25DC	● ● ● ✖	≤11	0.1 —0.15	≤11	0.1 —0.25
			0.25—0.5DC	● ● ● ✖	≤11	0.08—0.12	≤11	0.1 —0.2
			0.5—0.75DC	● ● ● ✖	≤8	0.06—0.1	≤8	0.1 —0.15
			DC(Slot)	● ● ● ✖	≤5	0.06—0.1	≤5	0.08—0.12
	Pre-hardened Steel	Hardness 35—45HRC	≤0.25DC	● ● ● ✖	≤11	0.1 —0.15	≤11	0.1 —0.25
			0.25—0.5DC	● ● ● ✖	≤11	0.08—0.12	≤11	0.1 —0.2
			0.5—0.75DC	● ● ● ✖	≤8	0.06—0.1	≤8	0.1 —0.15
			DC(Slot)	● ● ● ✖	≤5	0.06—0.1	≤5	0.08—0.12
M	Austenitic Stainless Steel	—	≤0.25DC	● ● ● ✖	≤11	0.1 —0.2	≤11	0.1 —0.2
				● ● ● ✖	≤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—0.1	≤11	0.08—0.12
			0.5—0.75DC	● ● ● ✖	≤8	0.06—0.1	≤8	0.08—0.12
				● ● ● ✖	≤8	0.06—0.1	≤8	0.06—0.1
			DC(Slot)	● ● ● ✖	≤5	0.06—0.1	≤5	0.06—0.1
				● ● ● ✖	≤5	0.06—0.08	≤5	0.06—0.08
	Duplex Stainless Steel	Hardness ≤280HB	≤0.25DC	● ● ● ✖	≤11	0.1 —0.2	≤11	0.1 —0.2
				● ● ● ✖	≤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—0.1	≤8	0.06—0.1
			DC(Slot)	● ● ● ✖	≤5	0.06—0.1	≤5	0.06—0.1
				● ● ● ✖	≤5	0.06—0.08	≤5	0.06—0.08
	Ferritic and Martensitic Stainless Steel	—	≤0.25DC	● ● ● ✖	≤11	0.1 —0.2	≤11	0.1 —0.2
				● ● ● ✖	≤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—0.1	≤8	0.06—0.1
			DC(Slot)	● ● ● ✖	≤5	0.06—0.1	≤5	0.06—0.1
				● ● ● ✖	≤5	0.06—0.08	≤5	0.06—0.08
	Precipitation Hardening Stainless Steel	Hardness <450HB	≤0.25DC	● ● ● ✖	≤11	0.1 —0.15	≤11	0.1 —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—0.1	≤8	0.06—0.1
				● ● ● ✖	≤8	0.06—0.08	≤8	0.06—0.08
			DC(Slot)	● ● ● ✖	≤5	0.06—0.1	≤5	0.06—0.1
				● ● ● ✖	≤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, work material or attachment of work 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.

M

INDEXABLE MILLING

RECOMMENDED CUTTING CONDITIONS

Wet Cutting

Depth of Cut / Feed per Tooth

Work 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 0.1 —0.2	≤11	0.1 —0.3
				● ● ✖	≤11 0.08—0.15	≤11	0.1 —0.25
			0.25—0.5DC	● ●	≤11 0.08—0.15	≤11	0.1 —0.25
				● ● ✖	≤11 0.08—0.12	≤11	0.1 —0.2
			0.5—0.75DC	● ●	≤8 0.08—0.12	≤8	0.1 —0.2
				● ● ✖	≤8 0.06—0.1	≤8	0.08—0.15
			DC(Slot)	● ●	≤5 0.06—0.1	≤5	0.08—0.15
				● ● ✖	≤5 0.06—0.08	≤5	0.08—0.12
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤0.25DC	● ●	≤11 0.1 —0.2	≤11	0.1 —0.25
				● ● ✖	≤11 0.1 —0.15	≤11	0.1 —0.2
			0.25—0.5DC	● ●	≤11 0.1 —0.15	≤11	0.1 —0.2
				● ● ✖	≤11 0.08—0.12	≤11	0.1 —0.15
			0.5—0.75DC	● ●	≤8 0.08—0.12	≤8	0.1 —0.15
				● ● ✖	≤8 0.06—0.1	≤8	0.08—0.12
			DC(Slot)	● ●	≤5 0.06—0.1	≤5	0.08—0.12
				● ● ✖	≤5 0.06—0.08	≤5	0.06—0.1
N	Aluminium Alloy	Si<5%	≤0.25DC	● ●	≤11 0.1 —0.25	≤11	0.1 —0.25
				● ● ✖	≤11 0.1 —0.2	≤11	0.1 —0.2
			0.25—0.5DC	● ●	≤11 0.1 —0.2	≤11	0.1 —0.2
				● ● ✖	≤11 0.1 —0.15	≤11	0.1 —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—0.1	≤8	0.06—0.1
			DC(Slot)	● ● ✖	≤5 0.06—0.1	≤5	0.06—0.1
	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—0.1	≤8	0.06—0.1
			DC(Slot)	● ● ✖	≤5 0.06—0.1	≤5	0.06—0.1
	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—0.1	≤8	0.06—0.1
			DC(Slot)	● ● ✖	≤5 0.06—0.1	≤5	0.06—0.1
H	Hardened Steel	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—0.1	≤4	0.06—0.1
			0.5—0.75DC	● ●	≤3 0.06—0.1	≤3	0.06—0.1
				● ● ✖	≤3 0.06—0.1	≤3	0.06—0.08
			DC(Slot)	● ●	≤2 0.06—0.1	≤2	0.06—0.1
				● ● ✖	≤2 0.06—0.1	≤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.

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- Rigidity of machine, work material or attachment of work material is low
- Corner radius during pocket machining

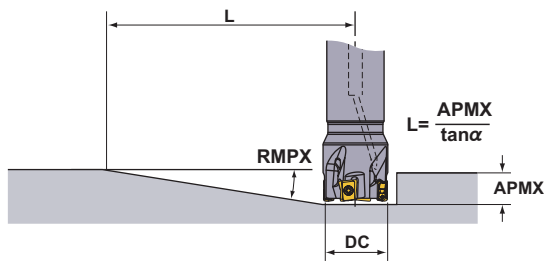
Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.

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

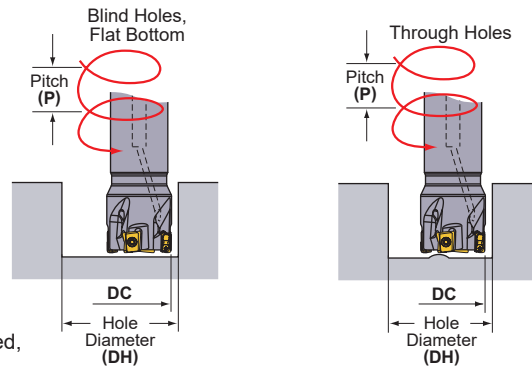
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

■ 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
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
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
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
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
35	0.2	1.28°	493	63	2	62.8	1.9	56.6	1.5

Note 1) When machining a highly ductile work material with the ramping angles in the table above, chips may be elongated.

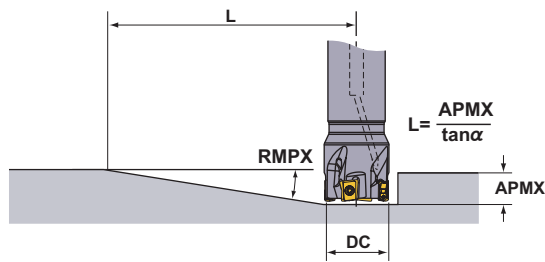
* Shows the distance until a maximum depth of cut of 11 mm is achieved at the maximum ramping angle $L (= 11/\tan \alpha)$.

M

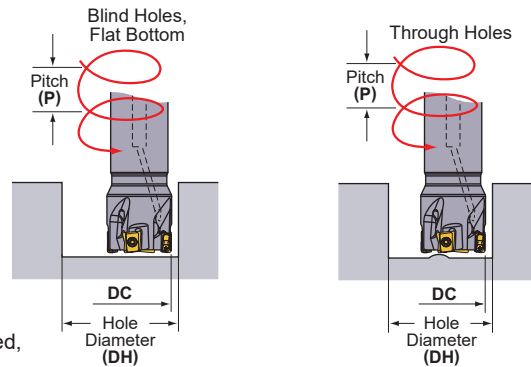
INDEXABLE MILLING

■ 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)
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
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
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
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
80	3.2	0.45	1401	152.8	1.8	152.7	1.8	146.5	1.6

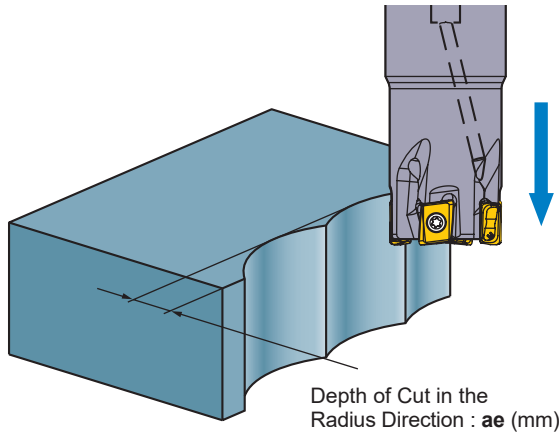
Note 1) When machining a highly ductile work material with the ramping angles in the table above, chips may be elongated.

* Shows the distance until a maximum depth of cut of 11 mm is achieved at the maximum ramping angle $L (= 11/\tan \alpha)$.

■ 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.

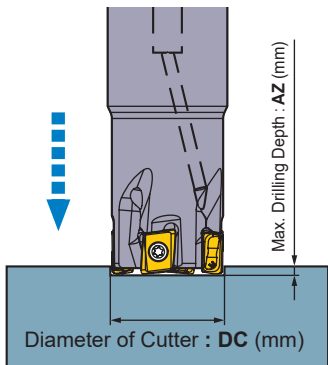
● Plunging



DC (mm)	ae (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

Note1) No step feed necessary.

● Drilling



DC (mm)	AZ (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).

INDEXABLE MILLING

MULTI FUNCTIONAL MILLING

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



AXD4000

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



Fig.1

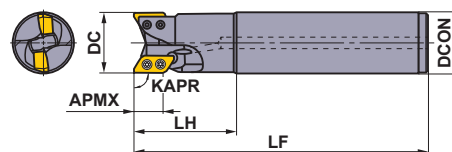
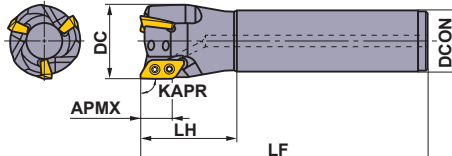


Fig.2



SHANK TYPE

KAPR : 90°

Right hand tool holder only.

Type	Insert Corner Radius	Order Number	Stock	Number of Teeth	Dimensions(mm)				APMX (mm)	Max. Allowable Revolution (min ⁻¹)	Fig.	Clamp Screw	Wrench	Anti-seize Lubricant	Insert
					DC	LF	LH	DCON							
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 M147.

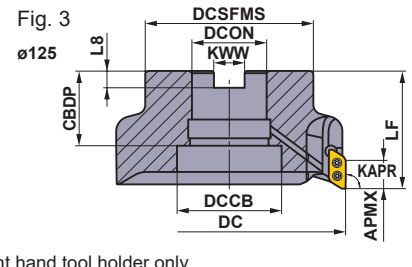
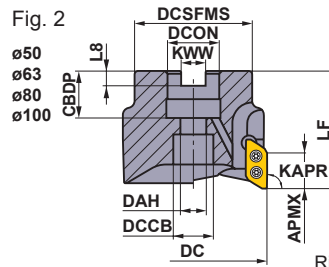
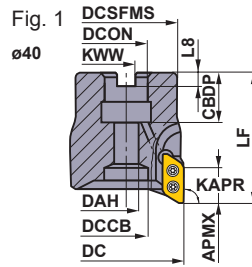
Note 2) When using the tool at high spindle speeds, ensure that the tool and chuck are correctly balanced.

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.



Right hand tool holder only.

ARBOR TYPE

KAPR :90°

GAMP :+14°-15° GAMF :+21°-+26°

Cutter Diameter DC	Set Bolt	Geometry		
φ40	HFF08043H	①	①	③
φ50, φ63	HSC10030H	②		
φ80	HSC12035H			
φ100	HSC16040H	③		
φ125	MBA20040H			

Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	Dimensions(mm)								WT *2 (kg)	APMX (mm)	Max. Allowable Revolution (min ⁻¹)	Fig.					
					DC	LF	DCON	CBDP	DAH	BD	KWW	L8									DCCB
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 *2 (kg)	APMX (mm)	Max. Allowable Revolution (min ⁻¹)	Fig.					
					DC	LF	DCON	CBDP	DAH	BD	KWW	L8									DCCB
RE	R																				
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	
B Type	4.0 - 5.0	AXD4000-125B07RA	●	7	125	63	40	40	—	90	16.4	9	56	2.8	15.5	20000	3	TS3SB	TKY08D	MK1KS	
		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 M147.

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.

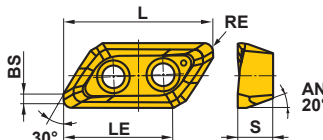
*1 Clamp Torque (N · m) : TS3SB=1.5

Use the clamp screw by setting the bundled screw.

*2 WT : Tool Weight

INDEXABLE MILLING

INSERTS

Work Material	P	Steel		C						Cutting Conditions (Guide):					
	N	Aluminium Alloy								●	:Stable Cutting	●	:General Cutting	✱	:Unstable Cutting
	S	Titanium Alloy								Honoring:					
Shape	Order Number	Class	Honoring	Stock				Dimensions (mm)					Geometry		
				Coated		Carbide		L	LE	S	BS	RE [*]			
				LC15TF	MP6120	MP9120	TF15								
	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	0.2	0.8		
		XDGX175012PDER-GM	G E		●	●			23	17	5	0.9	1.2		
		XDGX175016PDER-GM	G E		●	●			22	15.9	5	1.4	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	0.4	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	1.4	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	0.4	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.

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

■ Holder And Insert Corner Radius Combination

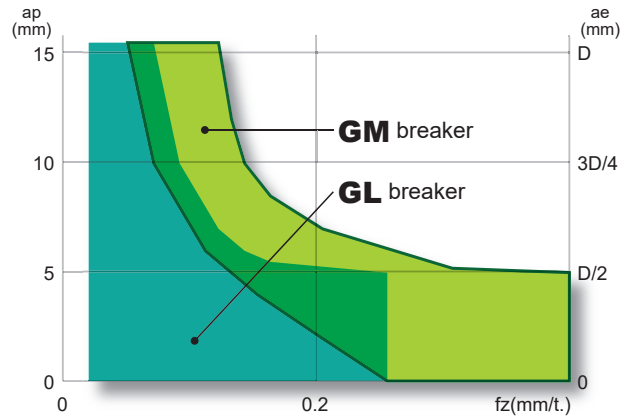
Holder	A Type Holder								B Type Holder	
	AXD4000—  A AXD4000R—  A								AXD4000—  B AXD4000R—  B	
Applicable Insert Corner R (RE)	 R0.4	 R0.8	 R1.2	 R1.6	 R2.0	 R2.4	 R3.0	 R3.2	 R4.0	 R5.0
	XDGX 175004PD R	XDGX 175008PD R	XDGX 175012PD R	XDGX 175016PD R	XDGX 175020PD R	XDGX 175024PD R	XDGX 175030PD R	XDGX 175032PD R	XDGX 175040PD R	XDGX 175050PD R

Not interchangeable with the corresponding inserts of the A type and B type holders.

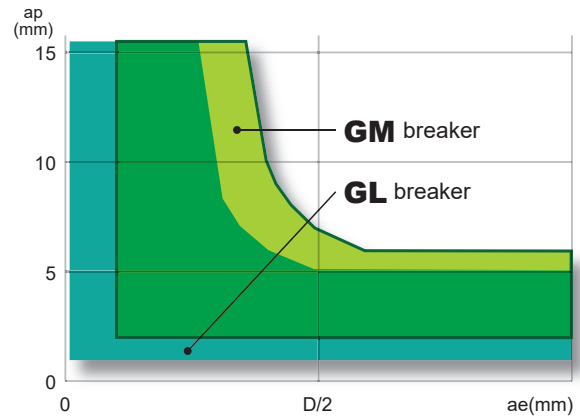
AXD4000 Selection of insert

It is necessary to choose the best insert according to the cutting conditions. Please select an insert from the tables below.
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

Sharp cutting edge

Sharp cutting edge

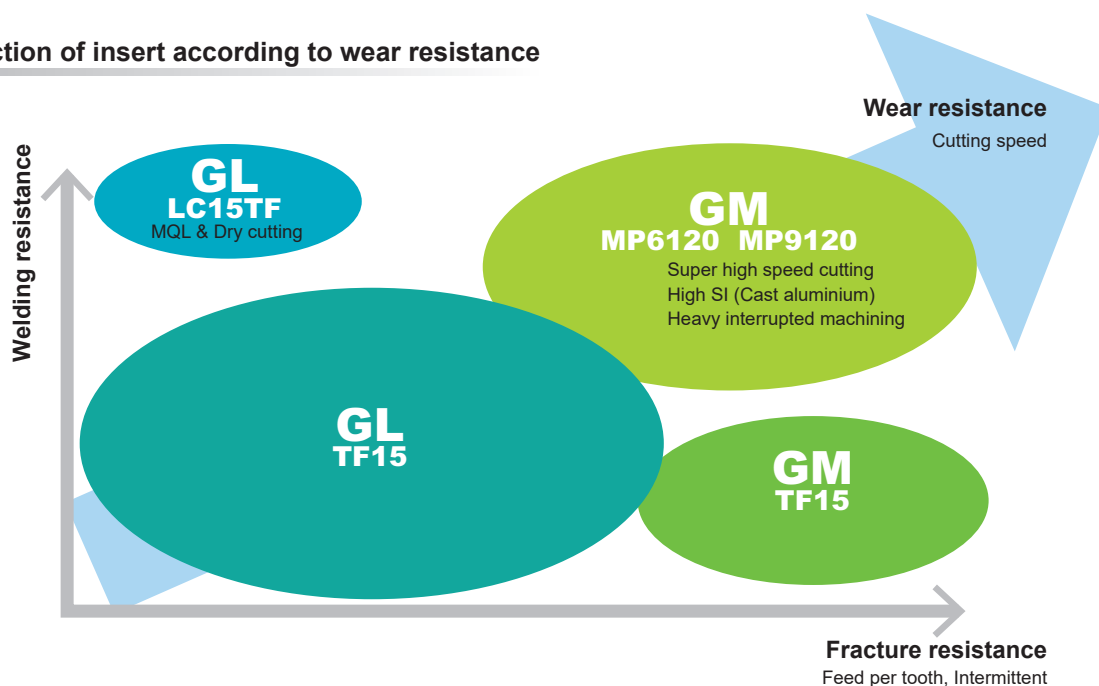
PVD coating and Round-type honing

GL
TF15/LC15TF
Low cutting 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



M

INDEXABLE MILLING

RECOMMENDED CUTTING CONDITIONS

■ Cutting Speed

Work Material			Greade	Breaker	Cutting Speed vc (mm/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

Work 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
					≤ 10	≤ 0.05	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15
					≤ 14.5	≤ 0.05	≤ 0.10	≤ 0.10	≤ 0.12	—
			GM	≤0.5 DC	≤ 5	≤ 0.05	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.18
					≤ 10	—	≤ 0.10	≤ 0.12	≤ 0.12	≤ 0.15
					≤ 14.5	—	≤ 0.08	≤ 0.10	≤ 0.10	—
			GM	≤0.75 DC	≤ 5	≤ 0.05	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15
					≤ 10	—	≤ 0.10	≤ 0.10	≤ 0.12	≤ 0.12
					DC (Slot)	≤ 5	≤ 0.05	≤ 0.10	≤ 0.12	≤ 0.12
	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
					≤ 10	≤ 0.05	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15
					≤ 14.5	≤ 0.05	≤ 0.10	≤ 0.10	≤ 0.12	—
			GM	≤0.5 DC	≤ 5	≤ 0.05	≤ 0.12	≤ 0.15	≤ 0.15	≤ 0.18
					≤ 10	—	≤ 0.10	≤ 0.12	≤ 0.12	≤ 0.15
					≤ 14.5	—	≤ 0.08	≤ 0.10	≤ 0.10	—
			GM	≤0.75 DC	≤ 5	≤ 0.05	≤ 0.12	≤ 0.12	≤ 0.15	≤ 0.15
					≤ 10	—	≤ 0.10	≤ 0.10	≤ 0.12	≤ 0.12
					DC (Slot)	≤ 5	≤ 0.05	≤ 0.10	≤ 0.12	≤ 0.12

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.

Work 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)	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)	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)	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.

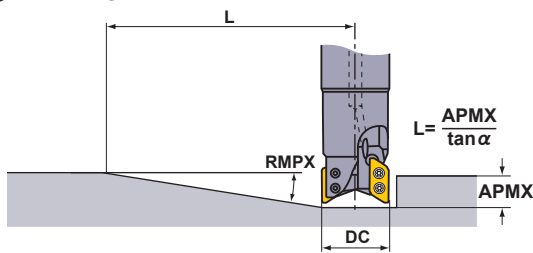
Note 2) Note, vibrations may occur in the following conditions.

- 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.

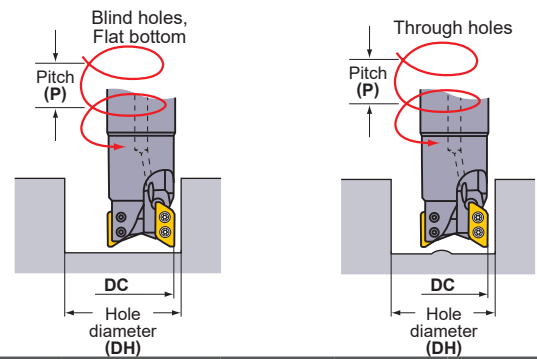
INDEXABLE MILLING

■ 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:

$L = (\text{maximum depth of cut APMX} / \tan \alpha)$. 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. $\{(\text{cutting edge diameter DC}) - (\text{corner radius RE}) - 0.25\} \times 2$

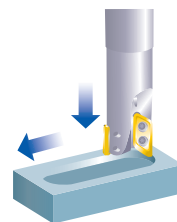
*3 Corner radius of 2.4mm. For other corner radii, use the following formula. $\{(\text{cutting edge diameter DC}) - (\text{corner radius RE}) - 0.25\} \times 2$

*4 Corner radius of 3.2mm. For other corner radii, use the following formula. $\{(\text{cutting edge diameter DC}) - (\text{corner radius RE}) - 0.25\} \times 2$

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.



M

INDEXABLE MILLING

INDEXABLE MILLING

MULTI FUNCTIONAL MILLING

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



AXD7000

P	M	K	N	S	H
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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

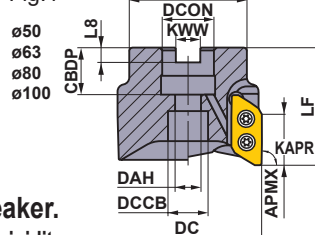
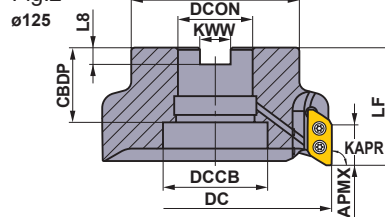


Fig.2



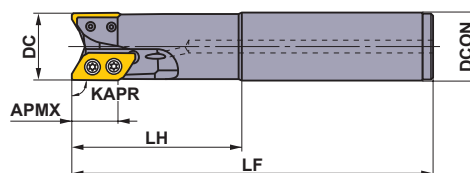
Right hand tool holder only.

Cutter Diameter DC	Set Bolt	Geometry
φ50, φ63	HSC10030H	
φ80	HSC12035H	
φ100	HSC16040H	
φ125	MBA20040H	

ARBOR TYPE

KAPR:90°
GAMP:+11° GAMF:+26°—+29°

Type	Insert Corner Radius	Order Number	Stock	Number of Teeth	Dimensions (mm)								*2 WT (kg)	APMX	Max. Allowable Revolution (min ⁻¹)	Fig.					
					RE	R	DC	LF	DCON	CBDP	DAH	BD					KWW	L8	DCCB	(mm)	Clamp Screw
A Type	0.8 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 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

KAPR:90°

Right hand tool holder only.

Type	Insert Corner Radius RE	Order Number	Stock	Number of Teeth	Dimensions (mm)				APMX (mm)	Max. Allowable Revolution (min ⁻¹)	Clamp Screw	Wrench	Anti-seize Lubricant	Insert
A Type	0.8 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 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 M147.

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.

*1 Clamp Torque (N · m) : TS4SB=3.5, TS4SBL=3.5

Use the clamp screw by setting the bundled screw.

*2 WT : Tool Weight

● : Inventory maintained in Japan.



Fig.1

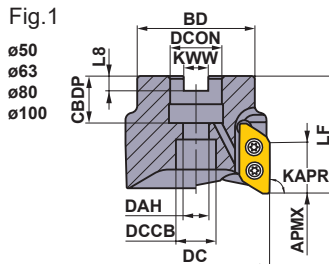
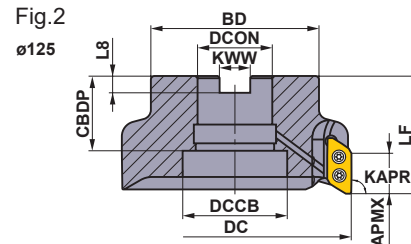


Fig.2



Right hand tool holder only.

For metric arbor

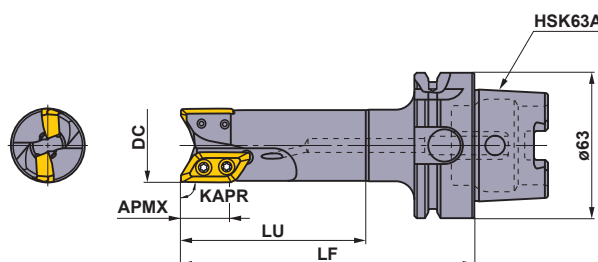
The cutter bore diameter DCON is indicated in millimetre.

Cutter Diameter DC	Set Bolt	Geometry	
ø50, ø63	HSC10030H	①	
ø80	HSC12035H		
ø100	HSC16040H		
ø125	MBA20040H	②	

ARBOR TYPE

KAPR: 90°
GAMP: +11° GAMF: +26°—+29°

Type	Insert Corner Radius	Order Number	Stock	Number of Teeth	Dimensions (mm)								*2 WT (kg)	APMX (mm)	Max. Allowable Revolution (min ⁻¹)	Fig.					
					R	DC	LF	DCON	CBDP	DAH	BD	KWW					L8	DCCB	Clamp Screw	Wrench	Anti-seize Lubricant
A Type	0.8 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 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

KAPR: 90°

Right hand tool holder only.

Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	Dimensions (mm)			APMX (mm)	Max. Allowable Revolution (min ⁻¹)				
					DC	LF	LU						
A Type	0.8 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 M147.

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.

*1 Clamp Torque (N • m) : TS4SB=3.5, TS4SBL=3.5

Use the clamp screw by setting the bundled screw.

*2 WT : Tool Weight

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INSERTS

Work Material	P	Steel		●																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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* GLA breaker corner R (RE) is designed with almost same corner R as a machined corner R of workpiece.

* Be careful because corner R (RE) has a different shape machined workpiece R.

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)	 R0.8	 R1.6	 R2.0	 R3.0	 R3.2	 R4.0	 R5.0
	XDGX 227008P DFR-GL	XDGX 227016P DFR-GL	XDGX 227020P DFR-GL	XDGX 227030P DFR-GL	XDGX 227032P DFR-GL	XDGX 227040P DFR-GL	XDGX 227050P DFR-GL

Not interchangeable with the corresponding inserts of the A type and B type holders.

RECOMMENDED CUTTING CONDITIONS

■ Cutting Speed

Work Material			Greade	Breaker	Cutting Speed vc (mm/min)
P	Mild Steel (SS400, S10C etc)	≤180HB	MP6120	GLA	200 (150—220)
	Carbon Steel Alloy Steel (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

Work 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 (SS400, S10C etc)	≤180HB	GLA	≤0.25 DC	≤ 5	≤ 0.18	≤ 0.2	≤ 0.2
					≤ 10	≤ 0.15	≤ 0.18	≤ 0.18
					≤ 15	≤ 0.12	≤ 0.15	≤ 0.15
					≤ 20	≤ 0.1	≤ 0.12	—
				≤0.5 DC	≤ 5	≤ 0.18	≤ 0.2	≤ 0.2
					≤ 10	≤ 0.15	≤ 0.18	≤ 0.18
					≤ 15	≤ 0.12	≤ 0.15	≤ 0.15
					≤ 20	≤ 0.1	≤ 0.12	—
				≤0.75 DC	≤ 5	≤ 0.15	≤ 0.15	≤ 0.18
					≤ 10	≤ 0.12	≤ 0.12	≤ 0.15
					≤ 15	≤ 0.1	≤ 0.1	≤ 0.12
				DC (Slot)	≤ 5	≤ 0.12	≤ 0.15	≤ 0.18
					≤ 10	≤ 0.1	≤ 0.12	≤ 0.15
	Carbon Steel Alloy Steel (S45C, SCM440 etc)	180—280HB	GLA	≤0.25 DC	≤ 5	≤ 0.18	≤ 0.2	≤ 0.2
					≤ 10	≤ 0.15	≤ 0.18	≤ 0.18
					≤ 15	≤ 0.12	≤ 0.15	≤ 0.15
					≤ 20	≤ 0.1	≤ 0.12	—
				≤0.5 DC	≤ 5	≤ 0.18	≤ 0.2	≤ 0.2
					≤ 10	≤ 0.15	≤ 0.18	≤ 0.18
					≤ 15	≤ 0.12	≤ 0.15	≤ 0.15
					≤ 20	≤ 0.1	≤ 0.12	—
				≤0.75 DC	≤ 5	≤ 0.15	≤ 0.15	≤ 0.18
					≤ 10	≤ 0.12	≤ 0.12	≤ 0.15
					≤ 15	≤ 0.1	≤ 0.1	≤ 0.12
				DC (Slot)	≤ 5	≤ 0.12	≤ 0.15	≤ 0.18
					≤ 10	≤ 0.1	≤ 0.12	≤ 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.

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RECOMMENDED CUTTING CONDITIONS

■ Depth of Cut / Feed per Tooth

Work 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%	≤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%	≤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)	—	≤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.

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

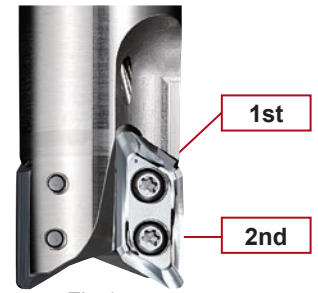
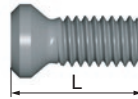


Fig.1

- 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	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	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 better based on ISO1940. It is also recommended to replace the clamp screws with new ones when changing inserts. Furthermore, ensure to use machines that are provided with safety measures in case of cutter breakage.

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

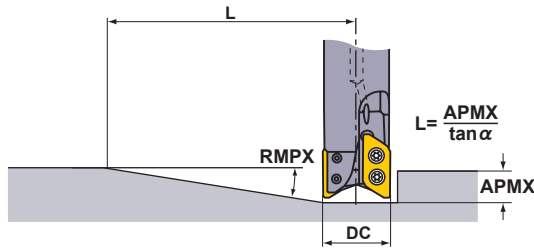
Cutting Edge Diameter DC (mm)	ø32	ø40	ø50	ø63	ø80	ø100	ø125
Max. Allowable Revolution (min ⁻¹)	9500	7600	6000	4800	3800	3000	2400

- 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 when handling the indexable inserts.

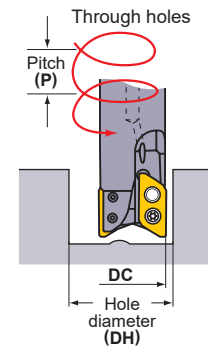
INDEXABLE MILLING

■ 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
B type	32	0.8 - 2.4	4°	301
		3, 3.2	4°	301
	100	0.8 - 2.4	3°	401
		3, 3.2	3°	401
	125	0.8 - 2.4	3°	401
		3, 3.2	3°	401
	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
B type	100	0.8 - 2.4	177	14
		3, 3.2	177	13
	125	0.8 - 2.4	227	15
		3, 3.2	227	13
	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

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 = $L / \tan \alpha$). Cutters' moving distance until depth of cut reaches APMX at a 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.

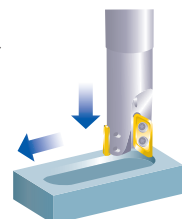
Other than that, find with the below formula.

{(cutting edge diameter DC) - (corner radius) - (Width of wiper edge BS) - 0.1} × 2

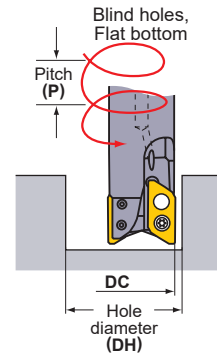
■ Max. Drilling Depth (Aluminium Alloy)

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. (mm) *2	P max. (mm)	DH min. (mm) *3	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 = $15 / \tan \alpha$). Cutters' moving distance until depth of cut reaches APMX at a 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.

$\{(cutting\ edge\ diameter\ DC) - (corner\ radius) - 0.3\} \times 2$

*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.

$\{(cutting\ edge\ diameter\ DC) - (corner\ radius) - (Width\ of\ wiper\ edge\ BS) - 0.1\} \times 2$

INDEXABLE MILLING

MULTI FUNCTIONAL MILLING

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



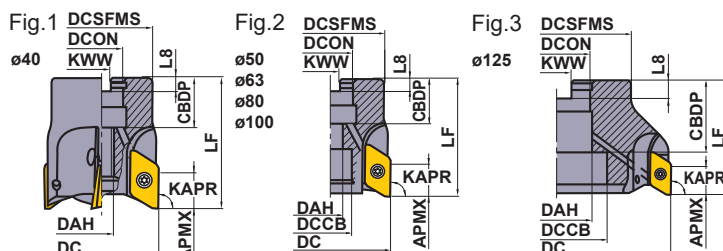
BXD4000

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.

- The set bolts in the right table are supplied with respective cutter.



Right hand tool holder only.

Cutter Diameter DC	Set Bolt	Geometry		
φ40	HFF08043H	①	①	③
φ50, φ63	HSC10030H	②	②	③
φ80	HSC12035H	②	②	③
φ100	HSC16040H	②	②	③
φ125	MBA20040H	③	③	③

■ ARBOR TYPE KAPR :90°
GAMP: +14°—+15° GAMF: +13°—+16°

Type	Insert Radius RE	Order Number	Stock R	Number of Teeth	Dimensions(mm)								WT*3 (kg)	APMX (mm)	RMPX*2	Max. Allowable Revolution (min ⁻¹)	Fig.	*1			
					DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8						DCCB			Clamp Screw
A type	0.4 ┃ 3.2	BXD4000-040A03RA	●	3	40	50	16	18	8.5	32	8.4	5.6	—	0.3	15	9°	29000	1	TS4SL	TKY15W	XDGT1550 PDOR-GOO
		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	
		BXD4000R08005CA	●	5	80	50	25.4	26	13	60	9.5	6	20	1.1	15	3°	19000	2	TS4SL	TKY15W	
		BXD4000R10006DA	●	6	100	63	31.75	32	17	70	12.7	8	26	2.0	15	3°	16000	2	TS4SL	TKY15W	
		BXD4000R12507EA	●	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	—	0.3	15	9°	29000	1	TS4SL	TKY15W	XDGT1550 PDOR-GOO
		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	
		BXD4000R08005CB	●	5	80	50	25.4	26	13	60	9.5	6	20	1.1	15	3°	19000	2	TS4SL	TKY15W	
		BXD4000R10006DB	●	6	100	63	31.75	32	17	70	12.7	8	26	2.0	15	3°	16000	2	TS4SL	TKY15W	
		BXD4000R12507EB	●	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.

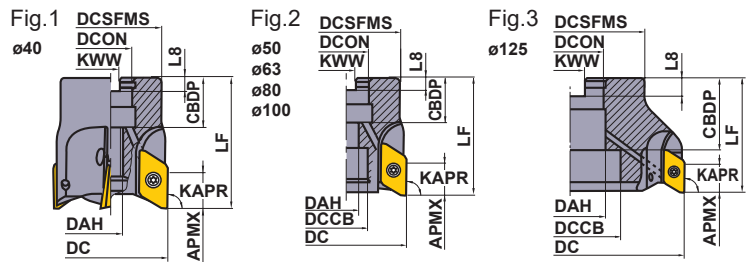
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

*1 Clamp Torque (N • m) : TS4SL=4.0

*2 RMPX : Max. Ramping Angle

*3 WT : Tool Weight

● : Inventory maintained in Japan.



Right hand tool holder only.

For metric arbor

The cutter bore diameter DCON is indicated in millimetre.

ARBOR TYPE

KAPR :90°
GAMP: +14°—+15° GAMP: +13°—+16°

Cutter Diameter DC	Set Bolt	Geometry		
ø40	HFF08043H	①	①	②
ø50, ø63	HSC10030H	②	③	③
ø80	HSC12035H			
ø100	HSC16040H	③		
ø125	MBA20040H			

Type	Insert Radius RE	Order Number	Stock R	Number of Teeth	Dimensions(mm)								WT *3 (kg)	APMX (mm)	RMPX *2	Max. Allowable Revolution (min ⁻¹)	Fig.	*1			
					DC	LF	DCON	CBDP	DAH	DCSEMS	KWW	L8						DCCB			Clamp Screw
A type	0.4 — 3.2	BXD4000-040A03RA	●	3	40	50	16	18	8.5	32	8.4	5.6	—	0.3	15	9°	29000	1	TS4SL	TKY15W	XDGT1550 PDOR-GOO
		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 — 5.0	BXD4000-040A03RB	●	3	40	50	16	18	8.5	32	8.4	5.6	—	0.3	15	9°	29000	1	TS4SL	TKY15W	XDGT1550 PDOR-GOO
		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.

*1 Clamp Torque (N · m) : TS4SL=4.0 *2 RMPX : Max. Ramping Angle *3 WT : Tool Weight

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

* ø20mm with one tooth balancing is necessary to adjust sensitively.

- Even when operating under the maximum allowable spindle speed, if the spindle speed is equal to or higher than the values shown in table 2, it is recommended that the balance quality (with the arbor or milling chuck) conforms to G40 or better based on ISO1940. It is also recommended to replace the clamp screws with new ones when changing inserts. Furthermore, ensure to use machines that are provided with safety measures in case of cutter breakage.

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.

INDEXABLE MILLING



Fig.1 Straight Shank

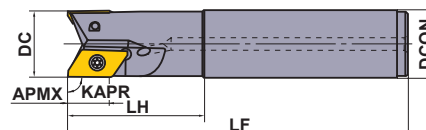
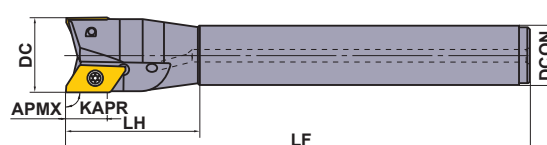


Fig.2 Offset Shank



SHANK TYPE

KAPR :90°

Right hand tool holder only.

Type	Insert Radius RE	Shank Type	Order Number	Stock R	Number of Teeth	Dimensions(mm)					*2 RMPX	Max. Allowable Revolution (min ⁻¹)	Fig.	*1 Clamp Screw	Wrench	Insert
						DC	APMX	LF	LH	DCON						
Type A	0.4 — 3.2	Standard	BXD4000R201SA20SA	●	1	20	15	110	35	20	28°	15000	1	TS4SL	TKY15W	XDGT1550 PDOR-G
			BXD4000R252SA25SA	●	2	25	15	125	50	25	20°	38000	1	TS4SL	TKY15W	
			BXD4000R282SA25SA	●	2	28	15	125	50	25	17°	35000	2	TS4SL	TKY15W	
			BXD4000R322SA32SA	●	2	32	15	150	50	32	13°	33000	1	TS4SL	TKY15W	
			BXD4000R352SA32SA	●	2	35	15	150	50	32	11°	31000	2	TS4SL	TKY15W	
			BXD4000R403SA32SA	●	3	40	15	170	80	32	9°	29000	2	TS4SL	TKY15W	
			BXD4000R403SA42SA	●	3	40	15	170	80	42	9°	29000	1	TS4SL	TKY15W	
		Long	BXD4000R252SA25LA	●	2	25	15	170	80	25	20°	38000	1	TS4SL	TKY15W	XDGT1550 PDOR-GL
			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 — 5.0	Standard	BXD4000R201SA20SB	●	1	20	15	110	35	20	28°	15000	1	TS4SL	TKY15W	XDGT1550 PDOR-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.

*1 Clamp Torque (N · m) : TS4SL=4.0 *2 RMPX : Max. Ramping Angle

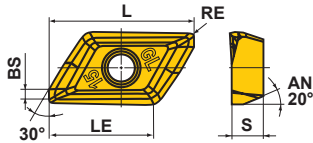
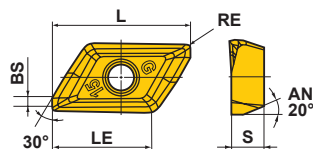
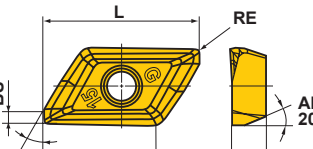
HOLDER AND INSERT CORNER RADIUS COMBINATION

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. (10 inserts in one case)

Work Material	P	Steel													Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting
	M	Stainless Steel													
	K	Cast Iron													
	N	Non-ferrous Metal													
	S	Heat-resistant Alloy, Titanium Alloy													
	H	Hardened Steel													
Honing : E : Round F : Sharp															
Shape	Order Number	Class	Honing	Stock					Dimensions(mm)					Geometry	
				Coated			Carbide		L	LE	S	BS	RE		
				VP15TF	LC15TF										TF15
	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

	Work 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 $\phi 20$ 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).

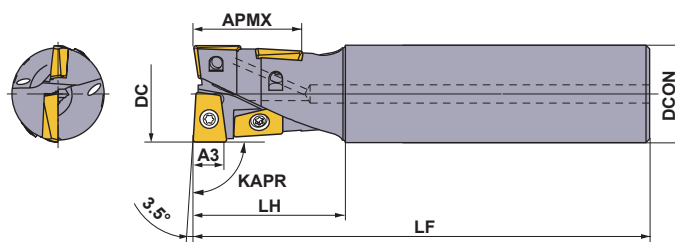
INDEXABLE MILLING

MULTI FUNCTIONAL MILLING



AQX

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



- The center bottom cutting edge enables drilling without previously formed hole.
- With through coolant holes.

STANDARD EDGE TYPE KAPR : 90°

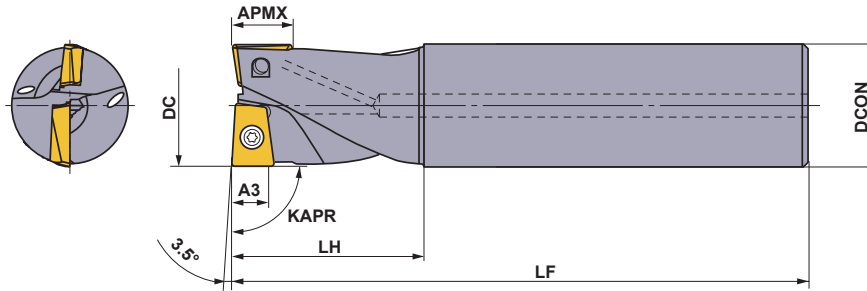
Right hand tool holder only.

Type	Order Number	Stock	Coolant Hole	Dimensions (mm)					APMX (mm)	*3	① ② ③	Insert
				DC	LF	DCON	LH	A3 ^{*1}				
Standard	AQXR164SA16S	●	○	16	120	16	30	4.5	17.6	TS2A	①TKY06F	QOG/MT0830R-G1/M2
	AQXR164SN16S	●	—	16	120	16	30	4.5	17.6	TS2A	①TKY06F	
	AQXR174SA16S	●	○	17	120	16	30	4.5	17.6	TS2A	①TKY06F	
	AQXR174SN16S	●	—	17	120	16	30	4.5	17.6	TS2A	①TKY06F	
	AQXR204SA20S	●	○	20	130	20	35	6	22	TS25	①TKY08F	QOG/MT1035R-G1/M2
	AQXR204SN20S	●	—	20	130	20	35	6	22	TS25	①TKY08F	
	AQXR214SA20S	●	○	21	130	20	35	6	22	TS25	①TKY08F	
	AQXR214SN20S	●	—	21	130	20	35	6	22	TS25	①TKY08F	
	AQXR254SA25S	●	○	25	140	25	40	7.5	27.5	TS33	②TKY08D	QOG/MT1342R-G1/M2
	AQXR254SN25S	●	—	25	140	25	40	7.5	27.5	TS33	②TKY08D	
	AQXR264SA25S	●	○	26	140	25	40	7.5	27.5	TS33	②TKY08D	
	AQXR264SN25S	●	—	26	140	25	40	7.5	27.5	TS33	②TKY08D	
	AQXR324SA32S	●	○	32	150	32	50	9.5	35.2	TS407	②TKY15D	QOG/MT1651R-G1/M2
	AQXR324SN32S	●	—	32	150	32	50	9.5	35.2	TS407	②TKY15D	
	AQXR334SA32S	●	○	33	150	32	50	9.5	35.2	TS407	②TKY15D	
	AQXR334SN32S	●	—	33	150	32	50	9.5	35.2	TS407	②TKY15D	
	AQXR354SA32S	●	○	35	150	32	50	11	40	TS407	②TKY15D	QOG/MT1856R-G1/M2
	AQXR354SN32S	●	—	35	150	32	50	11	40	TS407	②TKY15D	
	AQXR404SA32S	●	○	40	160	32	60	12	44	TS55	②TKY25D	QOG/MT2062R-G1/M2
	AQXR404SN32S	●	—	40	160	32	60	12	44	TS55	②TKY25D	
Long	AQXR504SA42S	●	○	50	170	42	70	15	55	TS6S	③TKY30T	QOG/MT2576R-G1/M2
	AQXR504SN42S	●	—	50	170	42	70	15	55	TS6S	③TKY30T	
	AQXR164SA16L	●	○	16	175	16	50	4.5	17.6	TS2A	①TKY06F	QOG/MT0830R-G1/M2
	AQXR164SN16L	●	—	16	175	16	50	4.5	17.6	TS2A	①TKY06F	
	AQXR174SA16L	●	○	17	175	16	30	4.5	17.6	TS2A	①TKY06F	
	AQXR174SN16L	●	—	17	175	16	30	4.5	17.6	TS2A	①TKY06F	
	AQXR204SA20L	●	○	20	185	20	60	6	22	TS25	①TKY08F	QOG/MT1035R-G1/M2
	AQXR204SN20L	●	—	20	185	20	60	6	22	TS25	①TKY08F	
	AQXR214SA20L	●	○	21	185	20	35	6	22	TS25	①TKY08F	
	AQXR214SN20L	●	—	21	185	20	35	6	22	TS25	①TKY08F	
	AQXR254SA25L	●	○	25	220	25	75	7.5	27.5	TS33	②TKY08D	QOG/MT1342R-G1/M2
	AQXR254SN25L	●	—	25	220	25	75	7.5	27.5	TS33	②TKY08D	
	AQXR264SA25L	●	○	26	220	25	40	7.5	27.5	TS33	②TKY08D	
	AQXR264SN25L	●	—	26	220	25	40	7.5	27.5	TS33	②TKY08D	
	AQXR324SA32L	●	○	32	230	32	90	9.5	35.2	TS407	②TKY15D	QOG/MT1651R-G1/M2
	AQXR324SN32L	●	—	32	230	32	90	9.5	35.2	TS407	②TKY15D	
	AQXR334SA32L	●	○	33	230	32	50	9.5	35.2	TS407	②TKY15D	
	AQXR334SN32L	●	—	33	230	32	50	9.5	35.2	TS407	②TKY15D	
	AQXR354SA32L	●	○	35	230	32	50	11	40	TS407	②TKY15D	QOG/MT1856R-G1/M2
	AQXR354SN32L	●	—	35	230	32	50	11	40	TS407	②TKY15D	
	AQXR404SA32L	●	○	40	240	32	60	12	44	TS55	②TKY25D	QOG/MT2062R-G1/M2
	AQXR404SN32L	●	—	40	240	32	60	12	44	TS55	②TKY25D	
	AQXR504SA42L	●	○	50	250	42	70	15	55	TS6S	③TKY30T	QOG/MT2576R-G1/M2
	AQXR504SN42L	●	—	50	250	42	70	15	55	TS6S	③TKY30T	

*1 Dimension A3 represents the depth of cut when the cutting edge consists of 2 inserts. *2 APMX : Maximum depth of cut.

*3 Clamp Torque (N・m) : TS2A=0.6, TS25=1.0, TS33=1.0, TS407=3.5, TS55=7.5, TS6S=10.0

● : Inventory maintained in Japan.



Number of Teeth : 2
KAPR : 90°

Right hand tool holder only.

SHORT EDGE TYPE

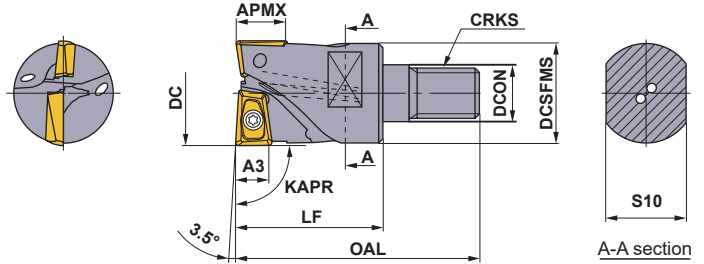
Type	Order Number	Stock	Coolant Hole	Dimensions (mm)					APMX ^{*2} (mm)	*3 Clamp Screw	Wrench	Insert
				DC	LF	DCON	LH	A3 ^{*1}				
Standard	AQXR162SA16S	●	○	16	120	16	30	4.5	7.4	TS2A	①TKY06F	QOG/MT0830R-G1/M2
	AQXR162SN16S	●	—	16	120	16	30	4.5	7.4	TS2A	①TKY06F	
	AQXR172SA16S	●	○	17	120	16	30	4.5	7.4	TS2A	①TKY06F	
	AQXR172SN16S	●	—	17	120	16	30	4.5	7.4	TS2A	①TKY06F	
	AQXR202SA20S	●	○	20	130	20	35	6	9.2	TS25	①TKY08F	QOG/MT1035R-G1/M2
	AQXR202SN20S	●	—	20	130	20	35	6	9.2	TS25	①TKY08F	
	AQXR212SA20S	●	○	21	130	20	35	6	9.2	TS25	①TKY08F	
	AQXR212SN20S	●	—	21	130	20	35	6	9.2	TS25	①TKY08F	
	AQXR252SA25S	●	○	25	140	25	40	7.5	11.5	TS33	②TKY08D	QOG/MT1342R-G1/M2
	AQXR252SN25S	●	—	25	140	25	40	7.5	11.5	TS33	②TKY08D	
	AQXR262SA25S	●	○	26	140	25	40	7.5	11.5	TS33	②TKY08D	
	AQXR262SN25S	●	—	26	140	25	40	7.5	11.5	TS33	②TKY08D	
	AQXR322SA32S	●	○	32	150	32	50	9.5	14.5	TS407	②TKY15D	QOG/MT1651R-G1/M2
	AQXR322SN32S	●	—	32	150	32	50	9.5	14.5	TS407	②TKY15D	
	AQXR332SA32S	●	○	33	150	32	50	9.5	14.5	TS407	②TKY15D	
	AQXR332SN32S	●	—	33	150	32	50	9.5	14.5	TS407	②TKY15D	
	AQXR352SA32S	●	○	35	150	32	50	11	16	TS407	②TKY15D	QOG/MT1856R-G1/M2
	AQXR352SN32S	●	—	35	150	32	50	11	16	TS407	②TKY15D	
	AQXR402SA32S	●	○	40	160	32	60	12	18	TS55	②TKY25D	QOG/MT2062R-G1/M2
	AQXR402SN32S	●	—	40	160	32	60	12	18	TS55	②TKY25D	
Long	AQXR502SA42S	●	○	50	170	42	70	15	23	TS6S	③TKY30T	QOG/MT2576R-G1/M2
	AQXR502SN42S	●	—	50	170	42	70	15	23	TS6S	③TKY30T	
	AQXR162SA16L	●	○	16	175	16	50	4.5	7.4	TS2A	①TKY06F	QOG/MT0830R-G1/M2
	AQXR162SN16L	●	—	16	175	16	50	4.5	7.4	TS2A	①TKY06F	
	AQXR172SA16L	●	○	17	175	16	30	4.5	7.4	TS2A	①TKY06F	
	AQXR172SN16L	●	—	17	175	16	30	4.5	7.4	TS2A	①TKY06F	
	AQXR202SA20L	●	○	20	185	20	60	6	9.2	TS25	①TKY08F	QOG/MT1035R-G1/M2
	AQXR202SN20L	●	—	20	185	20	60	6	9.2	TS25	①TKY08F	
	AQXR212SA20L	●	○	21	185	20	35	6	9.2	TS25	①TKY08F	
	AQXR212SN20L	●	—	21	185	20	35	6	9.2	TS25	①TKY08F	
	AQXR252SA25L	●	○	25	220	25	75	7.5	11.5	TS33	②TKY08D	QOG/MT1342R-G1/M2
	AQXR252SN25L	●	—	25	220	25	75	7.5	11.5	TS33	②TKY08D	
	AQXR262SA25L	●	○	26	220	25	40	7.5	11.5	TS33	②TKY08D	
	AQXR262SN25L	●	—	26	220	25	40	7.5	11.5	TS33	②TKY08D	
	AQXR322SA32L	●	○	32	230	32	90	9.5	14.5	TS407	②TKY15D	QOG/MT1651R-G1/M2
	AQXR322SN32L	●	—	32	230	32	90	9.5	14.5	TS407	②TKY15D	
	AQXR332SA32L	●	○	33	230	32	50	9.5	14.5	TS407	②TKY15D	
	AQXR332SN32L	●	—	33	230	32	50	9.5	14.5	TS407	②TKY15D	
	AQXR352SA32L	●	○	35	230	32	50	11	16	TS407	②TKY15D	QOG/MT1856R-G1/M2
	AQXR352SN32L	●	—	35	230	32	50	11	16	TS407	②TKY15D	
	AQXR402SA32L	●	○	40	240	32	60	12	18	TS55	②TKY25D	QOG/MT2062R-G1/M2
	AQXR402SN32L	●	—	40	240	32	60	12	18	TS55	②TKY25D	
	AQXR502SA42L	●	○	50	250	42	70	15	23	TS6S	③TKY30T	QOG/MT2576R-G1/M2
	AQXR502SN42L	●	—	50	250	42	70	15	23	TS6S	③TKY30T	

*1 Dimension A3 represents the depth of cut when the cutting edge consists of 2 inserts.

*2 APMX : Maximum depth of cut.

*3 Clamp Torque (N · m) : TS2A=0.6, TS25=1.0, TS33=1.0, TS407=3.5, TS55=7.5, TS6S=10.0

INDEXABLE MILLING



SCREW-IN TYPE

Number of Teeth : 2
KAPR : 90°

Right hand tool holder only.

Order Number	Stock	Coolant Hole	Dimensions (mm)							APMX (mm)	WT (kg)	*2	①	②	Insert Type
			DC	DCON	DCSFMS	OAL	LF	S10	CRKS						
AQXR162M08A30	●	○	16	8.5	14.7	48	30	10	M8	4.5	7.4	0.1	TS2A	①TKY06F	QO T0830R
AQXR172M08A30	●	○	17	8.5	14.5	48	30	10	M8	4.5	7.4	0.1	TS2A	①TKY06F	
AQXR202M10A30	●	○	20	10.5	18.6	49	30	14	M10	6	9.2	0.2	TS25	①TKY08F	QO T1035R
AQXR212M10A30	●	○	21	10.5	18.5	49	30	14	M10	6	9.2	0.2	TS25	①TKY08F	
AQXR252M12A35	●	○	25	12.5	23.5	57	35	19	M12	7.5	11.5	0.2	TS33	②TKY08D	QO T1342R
AQXR262M12A35	●	○	26	12.5	23.5	57	35	19	M12	7.5	11.5	0.2	TS33	②TKY08D	
AQXR322M16A40	●	○	32	17	28.5	63	40	24	M16	9.5	14.5	0.3	TS407	②TKY15D	QO T1651R
AQXR332M16A40	●	○	33	17	28.5	63	40	24	M16	9.5	14.5	0.3	TS407	②TKY15D	
AQXR352M16A40	●	○	35	17	28.5	63	40	24	M16	11	16	0.3	TS407	②TKY15D	QO T1856R
AQXR402M16A45	●	○	40	17	28.5	68	45	24	M16	12	18	0.3	TS55	②TKY25D	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 M269.

M

INDEXABLE MILLING

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

ARBORS	➤ M269
SPARE PARTS	➤ Q001
TECHNICAL DATA	➤ R001

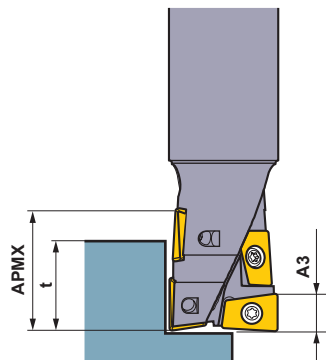
Work Material	P	Steel	●	●		●	●		●	●	●										Cutting Conditions (Guide): ●: Stable Cutting ●: General Cutting ✖: Unstable Cutting	Honing: E: Round F: Sharp
	M	Stainless Steel																				
Shape	Order Number	DC	Class	Honing	Coated				Carbide		Dimensions (mm)					Geometry						
					MP6120	MP6130	MP7130	MP7140	MP9120	VP15TF	VP30RT	HT110			LE1		LE2	LE3	S	RE		
	QOMT0830R-M2	φ 16,17	M	E	●	●	●	●	●	●	●				7.3	4.4	7.3	3	0.8			
	QOMT1035R-M2	φ 20,21	M	E	●	●	●	●	●	●	●				9.5	5.9	9.3	3.5	0.8			
	QOMT1342R-M2	φ 25,26	M	E	●	●	●	●	●	●	●				12	7.6	11.6	4.2	0.8			
	QOMT1651R-M2	φ 32,33	M	E	●	●	●	●	●	●	●				15.4	9.9	14.6	5.1	0.8			
	QOMT1856R-M2	φ 35	M	E	●	●	●	●	●	●	●				16.9	10.9	16	5.6	0.8			
	QOMT2062R-M2	φ 40	M	E	●	●	●	●	●	●	●				19.4	12.6	18.1	6.2	0.8			
	QOMT2576R-M2	φ 50	M	E	●	●	●	●	●	●	●				24.8	16.1	23.1	7.6	0.8			
	QOGT0830R-G1	φ 16,17	G	E*	●				●	●	●	●			7.7	4.9	7.3	3	0.4			
	QOGT1035R-G1	φ 20,21	G	E*	●				●	●	●	●			9.9	6.4	9.3	3.5	0.4			
	QOGT1342R-G1	φ 25,26	G	E*	●				●	●	●	●			12.4	8.1	11.6	4.2	0.4			
	QOGT1651R-G1	φ 32,33	G	E*	●				●	●	●	●			15.8	10.4	14.6	5.1	0.4			
	QOGT1856R-G1	φ 35	G	E*	●				●	●	●	●			17.3	11.4	16	5.6	0.4			
	QOGT2062R-G1	φ 40	G	E*	●				●	●	●	●			19.8	13.1	18.1	6.2	0.4			
	QOGT2576R-G1	φ 50	G	E*	●				●	●	●	●			25.2	16.6	23.1	7.6	0.4			

■ CUTTING SPEED

M INDEXABLE MILLING

M157

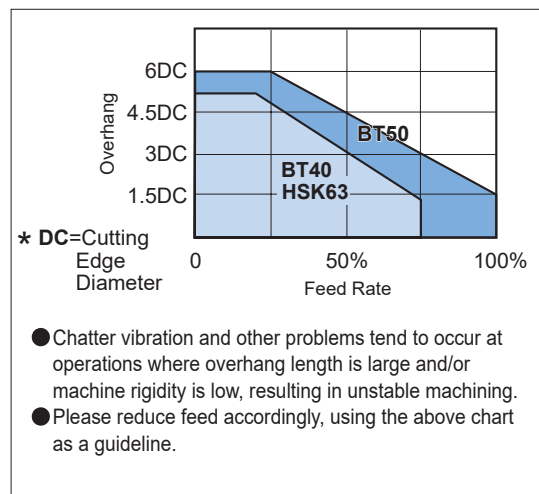
RECOMMENDED CUTTING CONDITIONS



● 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)
φ 16, 17	12 — 14
φ 20, 21	14 — 17
φ 25, 26	17 — 22
φ 32, 33	22 — 28
φ 35	25 — 32
φ 40	28 — 35
φ 50	35 — 45

* Figures for A3 and APMX are shown in the standard holder tables on the previous pages.



CUTTING CONDITIONS FOR SHOULDER MILLING

Work Material	No.	Hardness	φ 16, 17			φ 20, 21			φ 25, 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	≤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
M	Carbon Steel Alloy Steel	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	—	≤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	—	≤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	—	≤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	—	≤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	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

Work Material	No.	Hardness	φ 32, 33			φ 35			φ 40			φ 50		
			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	≤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
M	Carbon Steel Alloy Steel	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	—	≤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	—	≤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	—	≤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	—	≤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	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), please reduce the feed rate by 20%.

Note 3) For the details of No., Please refer to the cutting speed on page M157.

SLOT MILLING

Work 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
				—	—	—	—	—	—

Work 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), please reduce the feed rate by 20%.

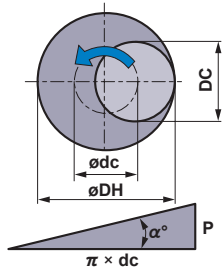
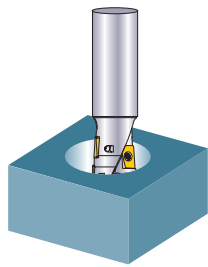
Note 3) For the details of No., Please refer to the cutting speed on page M157.

M

INDEXABLE MILLING

RECOMMENDED CUTTING CONDITIONS

■ FOR HELICAL CUTTING



● How to derive a locus of the center of the tool.

● Depth of cut for each pass.

● 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 a G1 breaker insert (VP15TF), please reduce the feed rate by 20%.

$$\phi dc = \phi DH - DC$$

Locus of the center of the tool Desired hole diameter Cutting edge diameter

$$P = \pi \times dc \times \tan \alpha^\circ$$

(Note) $\alpha^\circ \leq 3^\circ$

Work Material	No.	Hardness	$\phi 16, 17$				$\phi 20, 21$				$\phi 25, 26$			
			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	$\leq 180\text{HB}$	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	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	$\leq 350\text{MPa}$	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	—	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	—	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	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

Work Material	No.	Hardness	$\phi 32, 33$				$\phi 35$				$\phi 40$				$\phi 50$			
			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	$\leq 180\text{HB}$	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	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	$\leq 350\text{MPa}$	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	—	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	—	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	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

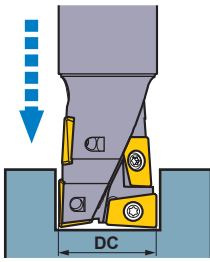
Note 1) Helical grooving is strongly recommended for machining tempered steel.

Note 2) When using G1 breaker (VP15TF), please reduce the feed rate by 20%.

Note 3) For the details of No., Please refer to the cutting speed on page M157.

■ FOR DRILLING AND PLUNGING

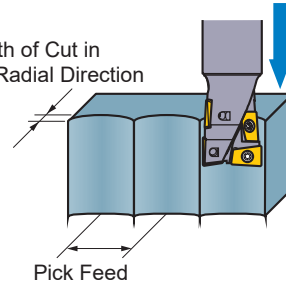
● Drilling



- 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

Depth of Cut in the Radial Direction



- The feed for plunging is the same as the feed for drilling.
- No step feed necessary.
- Please refer to the following table for the depth of cut at plunging operations.

Depth of Cut in the Radial Direction	≤ 0.4DC
Pick Feed	≤ 0.5DC

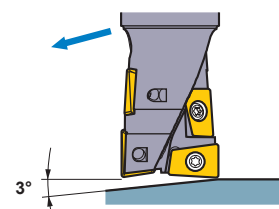
Work Material		No.	Hardness	φ16, 17		φ20, 21		φ25, 26		φ32, 33, 35		φ40		φ50	
				fr (mm/rev)	Step (mm)	fr (mm/rev)	Step (mm)	fr (mm/rev)	Step (mm)	fr (mm/rev)	Step (mm)	fr (mm/rev)	Step (mm)	fr (mm/rev)	Step (mm)
P	Mild Steel	1	≤180HB	0.035	0.2	0.045	0.3	0.05	0.3	0.055	0.3	0.06	0.3	0.065	0.3
	Carbon 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 G1 breaker (VP15TF), please reduce the feed rate by 20%.

Note 3) For the details of No., Please refer to the cutting speed on page M157.

■ 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 by 40% from the cutting conditions.

INDEXABLE MILLING

MULTI FUNCTIONAL MILLING



AJX

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



Fig.1

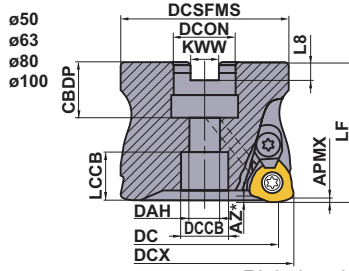
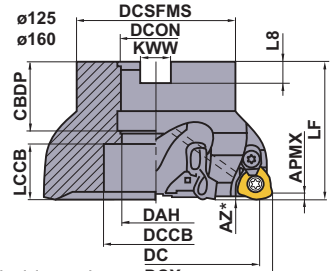


Fig.2



Right hand tool holder only.

(mm)

DCX		Set Bolt	Geometry	
DCON inch size	DCON mm size			
φ50, φ63	φ50, φ63	HSC10030H	①	
	φ80	HSC12035H		
φ80, φ100	φ100	HSC16040H	②	
φ125	φ125, φ160	MBA20040H		
φ160		MBA24045H		

ARBOR TYPE

AJX09
GAMP :+8°
GAMF :-6°

AJX12
GAMP :+8°
GAMF :-5°—-4°

AJX14
GAMP :+8°
GAMF :-5°—-3°

With Coolant Hole

DCX = mm size, DCON = inch size

(mm)

DCX	Order Number	Stock R	Number of Teeth	DC	LF	DCON	WT (kg)	APMX	RMPX	Fig.	Insert Type
50	AJX12R05003B	●	3	38.3	50	22.225	0.4	1.2	2°	1	JDM1204
50	AJX12R05004B	●	4	38.3	50	22.225	0.4	1.2	2°	1	JDM1204
50	AJX09R05005B	●	5	40	50	22.225	0.5	1.2	1.1°	1	JDM09T3
63	AJX14R06303B	●	3	51.1	50	22.225	0.7	1.2	2.8°	1	JDM1405
63	AJX14R06304B	●	4	51.1	50	22.225	0.7	1.2	2.8°	1	JDM1405
63	AJX12R06305B	●	5	51.3	50	22.225	0.9	1.2	1.5°	1	JDM1204
80	AJX14R08004D	●	4	68.1	63	31.75	1.3	1.2	1.8°	1	JDM1405
80	AJX14R08005D	●	5	68.1	63	31.75	1.3	1.2	1.8°	1	JDM1405
80	AJX12R08006D	●	6	68.3	63	31.75	1.7	1.2	1.1°	1	JDM1204
100	AJX14R10005D	●	5	88.1	63	31.75	2.4	1.2	1.2°	1	JDM1405
100	AJX14R10006D	●	6	88.1	63	31.75	2.4	1.2	1.2°	1	JDM1405
100	AJX12R10007D	●	7	88.3	63	31.75	2.9	1.2	0.8°	1	JDM1204
125	AJX14R12505E	●	5	113.2	63	38.1	3.3	1.2	0.8°	2	JDM1405
125	AJX14R12507E	●	7	113.2	63	38.1	3.3	1.2	0.8°	2	JDM1405
160	AJX14R16006F	●	6	148.2	63	50.8	5	1.2	0.5°	2	JDM1405
160	AJX14R16008F	●	8	148.2	63	50.8	5	1.2	0.5°	2	JDM1405

DCX = mm size, DCON = mm size

(mm)

DCX	Order Number	Stock R	Number of Teeth	DC	LF	DCON	WT (kg)	APMX	RMPX	Fig.	Insert Type
50	AJX12-050A03R	●	3	38.3	50	22	0.4	1.2	2°	1	JDM1204
50	AJX12-050A04R	●	4	38.3	50	22	0.4	1.2	2°	1	JDM1204
50	AJX09-050A05R	●	5	40	50	22	0.5	1.2	1.1°	1	JDM09T3
63	AJX14-063A03R	●	3	51.1	50	22	0.7	1.2	2.8°	1	JDM1405
63	AJX14-063A04R	●	4	51.1	50	22	0.7	1.2	2.8°	1	JDM1405
63	AJX12-063A05R	●	5	51.3	50	22	0.9	1.2	1.5°	1	JDM1204
80	AJX14-080A04R	●	4	68.1	50	27	1.2	1.2	1.8°	1	JDM1405
80	AJX14-080A05R	●	5	68.1	50	27	1.2	1.2	1.8°	1	JDM1405
80	AJX12-080A06R	●	6	68.3	50	27	1.2	1.2	1.1°	1	JDM1204
100	AJX14-100A05R	●	5	88.1	63	32	2.4	1.2	1.2°	1	JDM1405
100	AJX14-100A06R	●	6	88.1	63	32	2.4	1.2	1.2°	1	JDM1405
100	AJX12-100A07R	●	7	88.3	63	32	2.6	1.2	0.8°	1	JDM1204
125	AJX14-125B05R	●	5	113.2	63	40	3.3	1.2	0.8°	2	JDM1405
125	AJX14-125B07R	●	7	113.2	63	40	3.3	1.2	0.8°	2	JDM1405
160	AJX14-160B06R	●	6	148.2	63	40	5	1.2	0.5°	2	JDM1405
160	AJX14-160B08R	●	8	148.2	63	40	5	1.2	0.5°	2	JDM1405

* Refer to page M169, for the max. drilling depth (AZ).

Note 1) Refer to page M169, for the max. depth of cut (APMX) and max. drilling depth (AZ).

● : Inventory maintained in Japan.

Mounting Dimensions

DCX = mm size, DCON = inch size

(mm)

DCX	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
50	AJX12R05003B	22.225	19	11	17	18.28	47	8.4	5	1
50	AJX12R05004B	22.225	19	11	17	18.28	47	8.4	5	1
50	AJX09R05005B	22.225	19	11	17	18.31	47	8.4	5	1
63	AJX14R06303B	22.225	19	11	17	18.16	60	8.4	5	1
63	AJX14R06304B	22.225	19	11	17	18.16	60	8.4	5	1
63	AJX12R06305B	22.225	19	11	17	18.28	60	8.4	5	1
80	AJX14R08004D	31.75	32	17	26	20.16	76	12.7	8	1
80	AJX14R08005D	31.75	32	17	26	20.16	76	12.7	8	1
80	AJX12R08006D	31.75	32	17	26	20.28	76	12.7	8	1
100	AJX14R10005D	31.75	32	17	26	20.16	96	12.7	8	1
100	AJX14R10006D	31.75	32	17	26	20.16	96	12.7	8	1
100	AJX12R10007D	31.75	32	17	26	20.28	96	12.7	8	1
125	AJX14R12505E	38.1	40	—	56	22.14	100	15.9	10	2
125	AJX14R12507E	38.1	40	—	56	22.14	100	15.9	10	2
160	AJX14R16006F	50.8	43	—	72	19.14	100	19.1	11	2
160	AJX14R16008F	50.8	43	—	72	19.14	100	19.1	11	2

DCX = mm size, DCON = mm size

(mm)

DCX	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
50	AJX12-050A03R	22	20	11	17	17.28	47	10.4	6.3	1
50	AJX12-050A04R	22	20	11	17	17.28	47	10.4	6.3	1
50	AJX09-050A05R	22	20	11	17	17.31	47	10.4	6.3	1
63	AJX14-063A03R	22	20	11	17	17.16	60	10.4	6.3	1
63	AJX14-063A04R	22	20	11	17	17.16	60	10.4	6.3	1
63	AJX12-063A05R	22	20	11	17	17.28	60	10.4	6.3	1
80	AJX14-080A04R	27	23	13	19	16.16	76	12.4	7	1
80	AJX14-080A05R	27	23	13	19	16.16	76	12.4	7	1
80	AJX12-080A06R	27	23	13	19	16.28	76	12.4	7	1
100	AJX14-100A05R	32	26	17	26	26.16	96	14.4	8	1
100	AJX14-100A06R	32	26	17	26	26.16	96	14.4	8	1
100	AJX12-100A07R	32	26	17	26	26.28	96	14.4	8	1
125	AJX14-125B05R	40	40	—	56	22.14	100	16.4	9	2
125	AJX14-125B07R	40	40	—	56	22.14	100	16.4	9	2
160	AJX14-160B06R	40	40	—	56	22.14	100	16.4	9	2
160	AJX14-160B08R	40	40	—	56	22.14	100	16.4	9	2

SPARE PARTS

(mm)

Tool Holder Type	 *		 *		
	Clamp Screw	Clamp Bridge	Clamp Bridge Screw	Spring	Wrench
AJX09	TS351	AMS3	AJS3010T10	ASS2	TKY10D
AJX12	TS43	AMS4	AJS4012T15	ASS2	TKY15T
AJX14	TS54	AMS5	AJS5014T25	ASS3	TKY25T

* Clamp Torque (N · m) : TS351=2.5, TS43=3.5, TS54=7.5, AJS3010T10=2.5, AJS4012T15=3.5, AJS5014T25=7.5

M

INDEXABLE MILLING

INDEXABLE MILLING



Fig.1

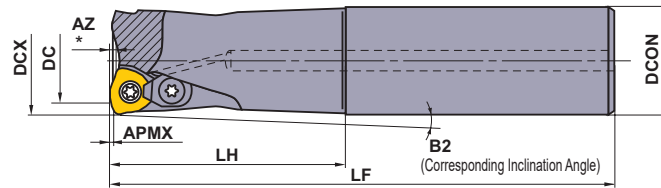
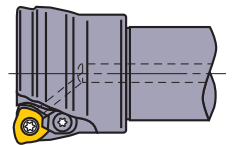


Fig.2



SHANK TYPE

Right hand tool holder only.

With Coolant Hole

(mm)

DCX	Order Number	Stock R	Number of Teeth	LF	DC	LH	DCON	B2	APMX	RMPX	Fig.	Insert Type
16	AJX06R162SA16SS	●	2	70	8.9	20	16	3.5°	0.6	3°	1	JOM06T2
16	AJX06R162SA16S	●	2	110	8.9	30	16	2.25°	0.6	3°	1	JOM06T2
16	AJX06R162SA16L	●	2	150	8.9	70	16	0.93°	0.6	3°	1	JOM06T2
16	AJX06R162SA16EL	●	2	200	8.9	100	16	0.64°	0.6	3°	1	JOM06T2
17	AJX06R172SA16SS	●	2	70	9.9	20	16	—	0.6	2.5°	1	JOM06T2
17	AJX06R172SA16S	●	2	110	9.9	20	16	—	0.6	2.5°	1	JOM06T2
17	AJX06R172SA16L	●	2	150	9.9	20	16	—	0.6	2.5°	1	JOM06T2
17	AJX06R172SA16EL	●	2	200	9.9	20	16	—	0.6	2.5°	1	JOM06T2
20	AJX08R202SA20S	●	2	130	11.4	50	20	1.34°	0.9	3.5°	1	JOM0803
20	AJX06R203SA20S	●	3	130	12.9	50	20	1.31°	0.6	1.5°	1	JOM06T2
20	AJX08R202SA20L	●	2	180	11.4	100	20	0.65°	0.9	3.5°	1	JOM0803
20	AJX06R203SA20L	●	3	180	12.9	100	20	0.64°	0.6	1.5°	1	JOM06T2
20	AJX08R202SA20EL	●	2	250	11.4	130	20	0.5°	0.9	3.5°	1	JOM0803
22	AJX08R222SA20S	●	2	130	13.4	30	20	—	0.9	3°	1	JOM0803
22	AJX06R223SA20S	●	3	130	14.9	30	20	—	0.6	1°	1	JOM06T2
22	AJX08R222SA20L	●	2	180	13.4	30	20	—	0.9	3°	1	JOM0803
22	AJX06R223SA20L	●	3	180	14.9	30	20	—	0.6	1°	1	JOM06T2
22	AJX08R222SA20EL	●	2	250	13.4	30	20	—	0.9	3°	1	JOM0803
25	AJX09R252SA25S	●	2	140	14.9	60	25	1.1°	1.2	4°	1	JDM09T3
25	AJX08R253SA25S	●	3	140	16.4	60	25	1.1°	0.9	2°	1	JOM0803
25	AJX09R252SA25L	●	2	200	14.9	120	25	0.54°	1.2	4°	1	JDM09T3
25	AJX08R253SA25L	●	3	200	16.4	120	25	0.54°	0.9	2°	1	JOM0803
25	AJX09R252SA25EL	●	2	300	14.9	180	25	0.36°	1.2	4°	1	JDM09T3
28	AJX09R282SA25S	●	2	140	17.9	40	25	—	1.2	3°	1	JDM09T3
28	AJX08R283SA25S	●	3	140	19.4	40	25	—	0.9	1.7°	1	JOM0803
28	AJX09R282SA25L	●	2	200	17.9	40	25	—	1.2	3°	1	JDM09T3
28	AJX08R283SA25L	●	3	200	19.4	40	25	—	0.9	1.7°	1	JOM0803
28	AJX09R282SA25EL	●	2	300	17.9	40	25	—	1.2	3°	1	JDM09T3
30	AJX12R302SA32S	●	2	150	18.3	70	32	1.82°	1.2	4.5°	1	JDM1204
30	AJX09R303SA32S	●	3	150	20	70	32	1.79°	1.2	2.7°	1	JDM09T3
30	AJX12R302SA32L	●	2	200	18.3	120	32	1.04°	1.2	4.5°	1	JDM1204
30	AJX09R303SA32L	●	3	200	20	120	32	1.03°	1.2	2.7°	1	JDM09T3
30	AJX12R302SA32EL	●	2	300	18.3	180	32	0.69°	1.2	4.5°	1	JDM1204
32	AJX12R322SA32S	●	2	150	20.3	70	32	0.96°	1.2	4°	1	JDM1204
32	AJX09R323SA32S	●	3	150	21.9	70	32	0.94°	1.2	2.5°	1	JDM09T3
32	AJX12R322SA32L	●	2	200	20.3	120	32	0.55°	1.2	4°	1	JDM1204
32	AJX09R323SA32L	●	3	200	21.9	120	32	0.54°	1.2	2.5°	1	JDM09T3
32	AJX12R322SA32EL	●	2	300	20.3	180	32	0.36°	1.2	4°	1	JDM1204
35	AJX12R352SA32S	●	2	150	23.3	50	32	—	1.2	3.5°	1	JDM1204
35	AJX09R353SA32S	●	3	150	24.9	50	32	—	1.2	2°	1	JDM09T3
35	AJX12R352SA32L	●	2	200	23.3	50	32	—	1.2	3.5°	1	JDM1204
35	AJX09R353SA32L	●	3	200	24.9	50	32	—	1.2	2°	1	JDM09T3
35	AJX12R352SA32EL	●	2	300	23.3	50	32	—	1.2	3.5°	1	JDM1204

* Refer to page M169, for the max. drilling depth (AZ).

Note 1) Refer to page M169, for the max. depth of cut (APMX) and max. drilling depth (AZ).

● : Inventory maintained in Japan.

(mm)

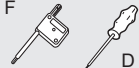
DCX	Order Number	Stock	Number of Teeth	LF	DC	LH	DCON	B2	APMX	RMPX	Fig.	Insert Type
		R										
40	AJX12R403SA32S	●	3	150	28.3	50	32	—	1.2	3°	1	JDM1204
40	AJX09R404SA32S	●	4	150	29.9	50	32	—	1.2	1.5°	1	JDM09T3
40	AJX12R403SA32L	●	3	250	28.3	50	32	—	1.2	3°	1	JDM1204
40	AJX09R404SA32L	●	4	250	29.9	50	32	—	1.2	1.5°	1	JDM09T3
40	AJX12R402SA32EL	●	2	350	28.3	50	32	—	1.2	3°	1	JDM1204
40	AJX12R403SA42S	●	3	150	28.3	70	42	1.79°	1.2	3°	1	JDM1204
40	AJX09R404SA42S	●	4	150	29.9	70	42	1.8°	1.2	1.5°	1	JDM09T3
40	AJX12R403SA42L	●	3	250	28.3	70	42	1.79°	1.2	3°	1	JDM1204
40	AJX09R404SA42L	●	4	250	29.9	70	42	1.8°	1.2	1.5°	1	JDM09T3
40	AJX12R402SA42EL	●	2	350	28.3	70	42	1.79°	1.2	3°	1	JDM1204
50	AJX14R503SA42S	●	3	150	38.2	50	42	—	1.2	4.2°	1	JDM1405
50	AJX14R503SA42L	●	3	250	38.1	50	42	—	1.2	4.2°	1	JDM1405
63	AJX14R634SA42S	●	4	150	51.1	50	42	—	1.2	2.8°	2	JDM1405
63	AJX14R634SA42L	●	4	250	51.1	50	42	—	1.2	2.8°	2	JDM1405

* Refer to page M169, for the max. drilling depth (AZ).

Note 1) Refer to page M169, for the max. depth of cut (APMX) and max. drilling depth (AZ).

SPARE PARTS

(mm)

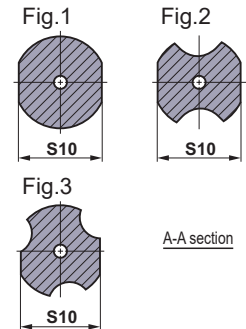
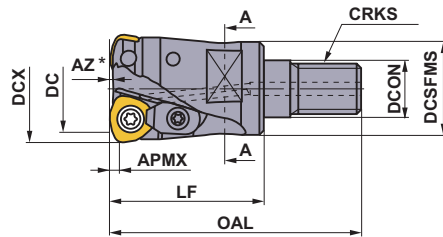
Tool Holder Type					
	Clamp Screw	Clamp Bridge	Clamp Bridge Screw	Spring	Wrench
AJX06R162	TS25	—	—	—	TKY08F
AJX06R172	TS25	—	—	—	TKY08F
AJX06R203	TS25	—	—	—	TKY08F
AJX06R223	TS25	—	—	—	TKY08F
AJX08R202	TS33	—	—	—	TKY08D
AJX08R222	TS33	—	—	—	TKY08D
AJX08R253	TS33	—	—	—	TKY08D
AJX08R283	TS33	—	—	—	TKY08D
AJX09R252	TS351	AMS3	AJS3010T10	ASS2	TKY10D
AJX09R282	TS351	AMS3	AJS3010T10	ASS2	TKY10D
AJX09R303	TS351	AMS3	AJS3010T10	ASS2	TKY10D
AJX09R323	TS351	AMS3	AJS3010T10	ASS2	TKY10D
AJX09R353	TS351	AMS3	AJS3010T10	ASS2	TKY10D
AJX09R404	TS351	AMS3	AJS3010T10	ASS2	TKY10D
AJX12R302	TS407	AMS4	AJS4012T15	ASS2	TKY15D
AJX12R322	TS43	AMS4	AJS4012T15	ASS2	TKY15D
AJX12R352	TS43	AMS4	AJS4012T15	ASS2	TKY15D
AJX12R402	TS43	AMS4	AJS4012T15	ASS2	TKY15D
AJX12R403	TS43	AMS4	AJS4012T15	ASS2	TKY15D
AJX14R503	TS54	AMS5	AJS5014T25	ASS3	TKY25D
AJX14R634	TS54	AMS5	AJS5014T25	ASS3	TKY25D

* Clamp Torque (N · m) : TS25=1.0, TS33=1.0, TS351=2.5, TS407=3.5, TS43=3.5, TS54=7.5, AJS3010T10=2.5, AJS4012T15=3.5, AJS5014T25=7.5

M

INDEXABLE MILLING

INDEXABLE MILLING



SCREW-IN TYPE

With Coolant Hole

Right hand tool holder only.

(mm)

DCX	Order Number	Stock	Number of Teeth	DC	LF	OAL	DCON	DCSFMS	S10	CRKS	WT (kg)	APMX	RMPX	Fig.	Shank Type	Insert Type
		R														
16	AJX06R162AM0830	●	2	8.9	30	48	8.5	13	10	M8	0.1	0.6	3°	1	SC16M08	JOM06T2
17	AJX06R172AM0830	●	2	9.9	30	48	8.5	13	10	M8	0.1	0.6	2.5°	1	SC16M08	JOM06T2
20	AJX08R202AM1030	●	2	11.4	30	49	10.5	18	14	M10	0.1	0.9	3.5°	2	SC20M10	JOM0803
20	AJX06R203AM1030	●	3	12.9	30	49	10.5	18	14	M10	0.1	0.6	1.5°	3	SC20M10	JOM06T2
22	AJX08R222AM1030	●	2	13.4	30	49	10.5	18	14	M10	0.1	0.9	3°	2	SC20M10	JOM0803
22	AJX06R223AM1030	●	3	14.9	30	49	10.5	18	14	M10	0.1	0.6	1°	3	SC20M10	JOM06T2
25	AJX09R252AM1235	●	2	14.9	35	57	12.5	21	19	M12	0.2	1.2	4°	2	SC25M12	JDM09T3
25	AJX08R253AM1235	●	3	16.4	35	57	12.5	21	19	M12	0.1	0.9	2°	1	SC25M12	JOM0803
28	AJX09R282AM1235	●	2	17.9	35	57	12.5	21	19	M12	0.2	1.2	3°	2	SC25M12	JDM09T3
28	AJX08R283AM1235	●	3	19.4	35	57	12.5	21	19	M12	0.1	0.9	1.7°	1	SC25M12	JOM0803
30	AJX12R302AM1645	●	2	18.3	45	68	17	29	24	M16	0.3	1.2	4.5°	2	SC32M16	JDM1204
30	AJX09R303AM1645	●	3	20	45	68	17	29	24	M16	0.2	1.2	2.7°	1	SC32M16	JDM09T3
32	AJX12R322AM1645	●	2	20.3	45	68	17	29	24	M16	0.3	1.2	4°	2	SC32M16	JDM1204
32	AJX09R323AM1645	●	3	21.9	45	68	17	29	24	M16	0.2	1.2	2.5°	1	SC32M16	JDM09T3
35	AJX12R352AM1645	●	2	23.3	45	68	17	29	24	M16	0.3	1.2	3.5°	2	SC32M16	JDM1204
35	AJX09R353AM1645	●	3	24.9	45	68	17	29	24	M16	0.2	1.2	2°	1	SC32M16	JDM09T3
40	AJX12R403AM1645	●	3	28.3	45	68	17	29	24	M16	0.3	1.2	3°	2	SC32M16	JDM1204
40	AJX09R404AM1645	●	4	29.9	45	68	17	29	24	M16	0.2	1.2	1.5°	1	SC32M16	JDM09T3

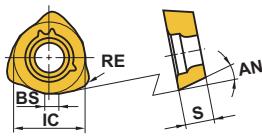
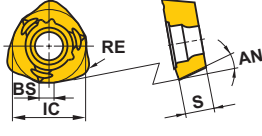
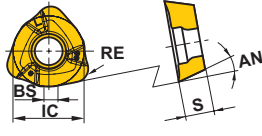
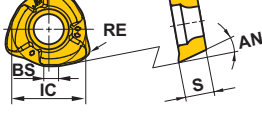
* Refer to page M169, for the max. drilling depth (AZ).

Note 1) Refer to page M169, for the max. depth of cut (APMX) and max. drilling depth (AZ).

Note 2) For screw-in type arbors, refer to page M269.

INSERTS

(mm)

Work Material	P	Steel	●	●	✱								●	✱	Cutting Conditions : ● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting			
	M	Stainless Steel				●	✱						●	✱				
	K	Cast Iron	●										✱	✱				
	S	Heat-resistant Alloy, Titanium Alloy							●	✱	✱		●	✱				
	H	Hardened Materials											●					
Shape	Order Number	Class	Coated										Dimensions (inch)					Geometry
			FH7020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	NEW MP9140	VP15TF	VP30RT	AN	IC	S	BS	RE	
	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	
	JDMT120420ZDSR-ST	M	●	●	●	●	●				●	●	15°	12	4.76	2.5	2	
	JDMT140520ZDSR-ST	M	●	●	●	●	●				●	●	15°	14	5.56	2.8	2	
	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	
	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.

● = NEW

M

INDEXABLE MILLING

ARBORS > M269
SPARE PARTS > Q001
TECHNICAL DATA > R001

M167

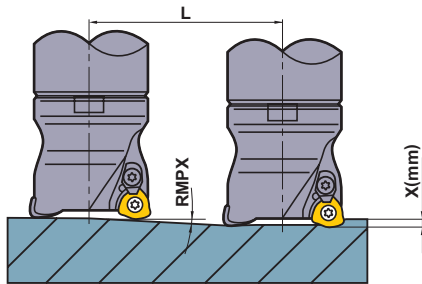
RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED

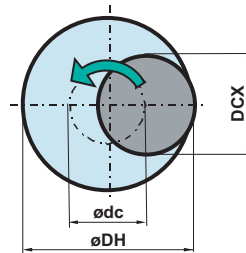
Workpiece Material		Characteristics	Cutting Speed (m/min) for Different Grades			
P			FH7020	MP6120	MP6130	VP30RT
	Mild Steels	Hardness ≤180HB	170 (120—220)	150 (100—200)	130 (80—180)	110 (60—160)
	Carbon Steels Alloy Steels	Hardness 180—280HB	150 (100—200)	130 (80—180)	110 (60—160)	90 (40—140)
	Carbon 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.

$$\phi_{dc} = \phi_{DH} - DCX$$

Locus of the center 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 (60% of the calculated feed rate or less).
- 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.

(mm)

Tool Holder Type		DCX	DC	APMX		Ramping					Helical Drilling		AZ
						RMPX	L Required distance for X mm depth				DH		
				FT/JM/ST Breaker	JL Breaker		X=1	X=1.2	X=1.5	X=2	Min	Max	
Shank type/Screw-in type	AJX06	16	8.9	1	0.6	3°	19.1	—	—	—	23	29	0.3
	AJX06	17	9.9	1	0.6	2.5°	22.9	—	—	—	25	31	0.3
	AJX06	20	12.9	1	0.6	1.5°	38.2	—	—	—	31	37	0.3
	AJX06	22	14.9	1	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	—	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	1.2	4°	14.3	17.2	21.5	28.6	33	46	1
	AJX09	28	17.9	2	1.2	3°	19.1	22.9	28.6	38.1	39	52	1
	AJX09	30	20	2	1.2	2.7°	21.2	25.4	31.8	42.4	43	56	1
	AJX09	32	21.9	2	1.2	2.5°	22.9	27.5	34.4	45.8	47	60	1
	AJX09	35	24.9	2	1.2	2°	28.6	34.4	43	57.3	53	66	1
	AJX09	40	29.9	2	1.2	1.5°	38.2	45.8	57.3	76.4	63	76	1
	AJX12	30	18.3	2	1.2	4.5°	12.7	15.2	19	25.4	39	56	1.5
	AJX12	32	20.3	2	1.2	4°	14.3	17.2	21.4	28.6	41	60	1.5
	AJX12	35	23.3	2	1.2	3.5°	16.3	19.6	24.5	32.7	47	66	1.5
	AJX12	40	28.3	2	1.2	3°	19.1	22.9	28.6	38.2	57	76	1.5
AJX14	50	38.2	2	1.2	4.2°	13.6	16.3	20.4	27.2	72	96	2	
AJX14	63	51.1	2	1.2	2.8°	20.4	24.5	30.7	40.9	98	122	2	
Arbor type	AJX09	50	40	2	1.2	1.1°	52.1	62.5	78.1	104.2	83	96	1
	AJX12	50	38.3	2	1.2	2°	28.6	34.4	43	57.3	77	96	1.5
	AJX12	63	51.3	2	1.2	1.5°	38.2	45.8	57.3	76.4	103	122	1.5
	AJX12	80	68.3	2	1.2	1.1°	52.1	62.5	78.1	104.2	137	156	1.5
	AJX12	100	88.3	2	1.2	0.8°	71.6	85.9	107.4	143.2	177	196	1.5
	AJX14	63	51.1	2	1.2	2.8°	20.4	24.5	30.7	40.9	98	122	2
	AJX14	80	68.1	2	1.2	1.8°	31.8	38.2	47.7	63.6	132	156	2
	AJX14	100	88.1	2	1.2	1.2°	47.7	57.3	71.6	95.5	172	196	2
	AJX14	125	113.2	2	1.2	0.8°	71.6	85.9	107.4	143.2	222	246	2
	AJX14	160	148.2	2	1.2	0.5°	114.6	137.5	171.9	229.2	292	316	2

M

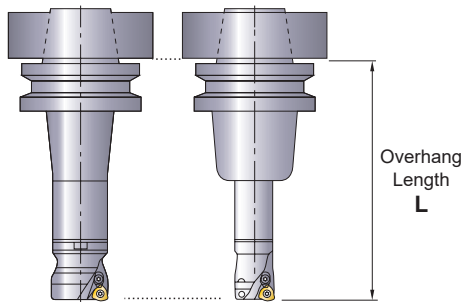
INDEXABLE MILLING

RECOMMENDED CUTTING CONDITIONS

■ DEPTH OF CUT / FEED

	Work Material	Characteristics	Shank Type / Screw-in Type								
			DCX=ø16, ø17			DCX=ø20, ø22			DCX=ø25, ø28		
			L	ap	fz (mm/t.)	L	ap	fz (mm/t.)	L	ap	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
	Titanium Alloy		180	0.4	0.4	210	0.6	0.4	230	0.8	0.4
		—	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 $n(\text{min}^{-1}) = (\text{Recommended Cutting Speed} \times 1000) \div (\text{DCX} \times 3.14)$

③ Table Feed Rate

$$vf(\text{mm/min}) = n \times \text{Feed per Tooth} \times \text{Number of Teeth}$$

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 blow while machining to discharging chips effectively.

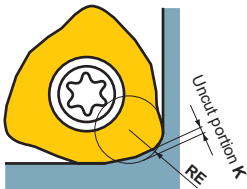
⑩ The maximum depth of cut of JL breaker is different in the insert size. 06 size is up to 0.6mm, 08 size is up to 0.9mm, and 09,12,14 size is up to 1.2mm.

(mm)

	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			DCX=ø80, ø100, ø125, ø160		
	L	ap	fz (mm/t.)	L	ap	fz (mm/t.)	L	ap	fz (mm/t.)	L	ap	fz (mm/t.)	L	ap	fz (mm/t.)	L	ap	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 AJAX, please programme as an R3 radius cutter. The approximate uncut portions for the programme are as follows.

(mm)			
Insert Size	Breaker	Approx. RE	Uncut Portion K
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.

M

INDEXABLE MILLING

INDEXABLE MILLING

MULTI-FUNCTIONAL MILLING



WJX

NEW
P

Steel

M

Stainless Steel

K

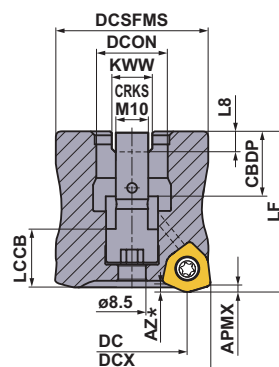
Cast Iron

N
S

Heat Resistant Alloy

H

Hardened Steel


 ø50
ø52


Right hand tool holder only.
The set bolt is built in.
A 7mm Allen wrench is used to tighten the set bolt.

ARBOR TYPE (ø50, ø52 Size)

With Coolant Hole

GAMP: -7° GAMF: -10°

DCX (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)			WT (kg)	APMX (mm)	RMPX	RPMX (min ⁻¹)
		R		DC	LF	DCON				
50	WJX14-050A03AR	●	3	34.5	50	22	0.4	2	4.4°	5000
50	WJX14-050A04AR	●	4	34.5	50	22	0.4	2	4.4°	5000
50	WJX14R05003BA	●	3	34.5	50	22.225	0.4	2	4.4°	5000
50	WJX14R05004BA	●	4	34.5	50	22.225	0.4	2	4.4°	5000
52	WJX14-052A04AR	●	4	36.5	50	22	0.4	2	4.1°	5000

* Refer to page M178, 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.

Note 3) The milling cutter has a built-in set bolt. The set bolt cannot be replaced.

Therefore, absolutely do not disassemble the milling cutter.

Mounting Dimensions

DCX (mm)	Order Number	Dimensions(mm)					
		DCON	CBDP	LCCB	DCSFMS	KWW	L8
50	WJX14-050A03AR	22	20	18.3	47	10.4	6.3
50	WJX14-050A04AR	22	20	18.3	47	10.4	6.3
50	WJX14R05003BA	22.225	20	18.3	47	8.4	5
50	WJX14R05004BA	22.225	20	18.3	47	8.4	5
52	WJX14-052A04AR	22	20	18.3	47	10.4	6.3

Spare Parts

Tool Holder Type			
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WJX14	TS5R	TKY20T	MK1KS

* Clamp Torque (N · m) : TS5R = 5.0

● : Inventory maintained in Japan.



Fig.1
ø63
ø66
ø80
ø100

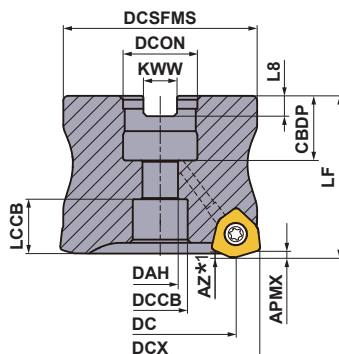
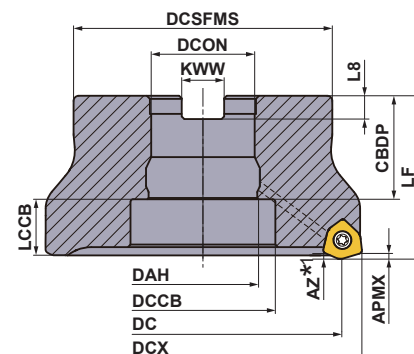


Fig.2
ø125
ø160



Right hand tool holder only.

DCX		Set Bolt	Geometry	
DCON inch size	DCON mm size			
ø63	ø63(22)	HSC10030H	①	
	ø63(27), ø66, ø80	HSC12035H		
ø80, ø100	ø100	HSC16040H		
ø125	ø125, ø160	MBA20040H		
ø160		MBA24045H	②	

ARBOR TYPE

With Coolant Hole

GAMP: -6° GAMF: -10°

DCX (mm)	Order Number	Stock	Number of Teeth	Dimensions(mm)			WT (kg)	APMX (mm)	RMPX	RPMX (min ⁻¹)	Fig.
		R		DC	LF	DCON					
63	WJX14-063A04AR	●	4	47.5	50	22	0.7	2	3°	18200	1
63	WJX14-063A05AR	●	5	47.5	50	22	0.7	2	3°	18200	1
63	WJX14R06304BA	●	4	47.5	50	22.225	0.7	2	3°	18200	1
63	WJX14R06305BA	●	5	47.5	50	22.225	0.7	2	3°	18200	1
63	WJX14-063X05AR	●	5	47.5	50	27	0.6	2	3°	18200	1
66	WJX14-066X05AR	●	5	50.4	50	27	0.7	2	2.8°	17700	1
80	WJX14-080A05AR	●	5	64.4	50	27	1.2	2	2.1°	15600	1
80	WJX14-080A06AR	●	6	64.4	50	27	1.2	2	2.1°	15600	1
80	WJX14R08005DA	●	5	64.4	63	31.75	1.4	2	2.1°	15600	1
80	WJX14R08006DA	●	6	64.4	63	31.75	1.4	2	2.1°	15600	1
100	WJX14R10006DA	●	6	84.4	63	31.75	2.5	2	1.5°	13500	1
100	WJX14R10007DA	●	7	84.4	63	31.75	2.5	2	1.5°	13500	1
100	WJX14-100A06AR	●	6	84.4	63	32	2.5	2	1.5°	13500	1
100	WJX14-100A07AR	●	7	84.4	63	32	2.5	2	1.5°	13500	1
125	WJX14R12507EA	●	7	109.4	63	38.1	3.2	2	1.2°	11600	2
125	WJX14R12509EA	●	9	109.4	63	38.1	3.1	2	1.2°	11600	2
125	WJX14-125B07AR	●	7	109.4	63	40	3.2	2	1.2°	11600	2
125	WJX14-125B09AR	●	9	109.4	63	40	3.1	2	1.2°	11600	2
160	WJX14-160B09AR	●	9	144.4	63	40	4.9	2	0.8°	9900	2
160	WJX14R16009FA	●	9	144.4	63	50.8	4.5	2	0.8°	9900	2

* Refer to page M178, 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	TKY20T	MK1KS

* Clamp Torque (N • m) : TS5R = 5.0

Mounting Dimensions

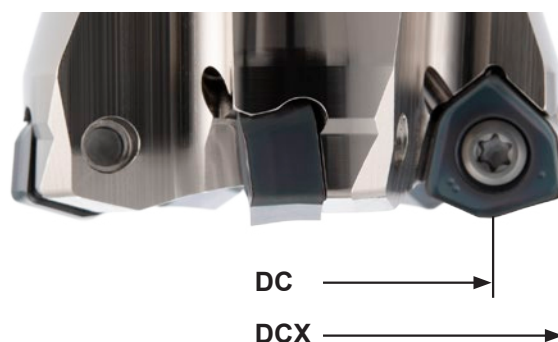
DCX (mm)	Order Number	Dimensions(mm)								Fig.
		DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	
63	WJX14-063A04AR	22	20	11	17	16.7	60	10.4	6.3	1
63	WJX14-063A05AR	22	20	11	17	16.7	60	10.4	6.3	1
63	WJX14R06304BA	22.225	19	11	17	17.7	60	8.4	5	1
63	WJX14R06305BA	22.225	19	11	17	17.7	60	8.4	5	1
63	WJX14-063X05AR	27	23	13	20	15.7	60	12.4	7	1
66	WJX14-066X05AR	27	23	13	20	15.7	60	12.4	7	1
80	WJX14-080A05AR	27	23	13	20	15.7	76	12.4	7	1
80	WJX14-080A06AR	27	23	13	20	15.7	76	12.4	7	1
80	WJX14R08005DA	31.75	32	17	26	19.7	76	12.7	8	1
80	WJX14R08006DA	31.75	32	17	26	19.7	76	12.7	8	1
100	WJX14R10006DA	31.75	32	17	26	19.7	96	12.7	8	1
100	WJX14R10007DA	31.75	32	17	26	19.7	96	12.7	8	1
100	WJX14-100A06AR	32	26	17	26	25.7	96	14.4	8	1
100	WJX14-100A07AR	32	26	17	26	25.7	96	14.4	8	1
125	WJX14R12507EA	38.1	40	40	56	21.7	100	15.9	10	2
125	WJX14R12509EA	38.1	40	40	56	21.7	100	15.9	10	2
125	WJX14-125B07AR	40	40	42	56	21.7	100	16.4	9	2
125	WJX14-125B09AR	40	40	42	56	21.7	100	16.4	9	2
160	WJX14-160B09AR	40	40	42	56	21.7	100	16.4	9	2
160	WJX14R16009FA	50.8	43	53	72	18.7	100	19.1	11	2

M

INDEXABLE MILLING

■ 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.

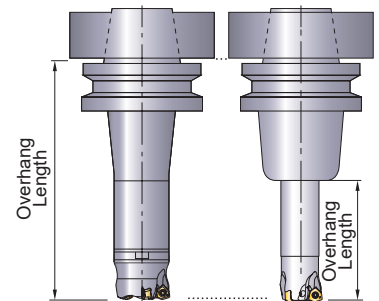


RECOMMENDED CUTTING CONDITIONS

■ Correction Value According to Overhang Length

Multiply the recommended cutting conditions on pages M176 and M177 by the corrections factor x 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 Steels	<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		
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 blow when machining. When the air blow is less effective at discharging chips, we recommend wet cutting.

Note 2) When wet cutting, tool life may become shorter than dry cutting. When carrying out wet cutting for the applications recommended with dry cutting, reduce the cutting speed by 25%.

Note 3) When large vibration occurs, reduce the cutting conditions.

Note 4) For interrupted cutting, reduce the cutting speed and feed rate by 20%.

■ Depth of Cut / Feed per Tooth

	Workpiece Material	Characteristics	ap (mm)	DCX=50	DCX≥63
				fz (mm/t.)	fz (mm/t.)
P	Mild Steels	≤180HB	≤1	1.5(0.6—2.5)	1.7(0.6—2.8)
			≤1.5	1.3(0.6—2.0)	1.5(0.6—2.5)
			≤2	1.2(0.6—2.0)	1.3(0.6—2.5)
			≤2.5	0.8(0.3—1.5)	1.0(0.3—1.6)
			≤3	0.4(0.2—1.0)	0.5(0.2—1.2)
	Carbon Steels Alloy Steels	180—280HB	≤1	1.5(0.5—2.0)	1.7(0.5—2.5)
			≤1.5	1.2(0.5—1.7)	1.3(0.5—2.5)
			≤2	1.0(0.5—1.5)	1.2(0.5—2.0)
			≤2.5	0.7(0.3—1.2)	0.9(0.3—1.5)
			≤3	0.3(0.2—0.8)	0.4(0.2—1.0)
	Carbon Steels Alloy Steels	280—350HB	≤1	1.5(0.5—2.0)	1.7(0.5—2.5)
			≤1.5	1.2(0.5—1.7)	1.3(0.5—2.2)
			≤2	1.0(0.5—1.5)	1.2(0.5—2.0)
			≤2.5	0.7(0.3—1.2)	0.9(0.3—1.5)
			≤3	0.3(0.2—0.8)	0.4(0.2—1.0)
	Alloy Tool Steels	≤350HB (Annealing)	≤1	1.5(0.5—2.0)	1.7(0.5—2.5)
			≤1.5	1.2(0.5—1.7)	1.3(0.5—2.2)
			≤2	1.0(0.5—1.5)	1.2(0.5—2.0)
			≤2.5	0.7(0.3—1.2)	0.9(0.3—1.5)
			≤3	0.3(0.2—0.8)	0.4(0.2—1.0)
	Pre-hardened Steels	35—45HRC	≤1	1.3(0.4—1.7)	1.5(0.4—2.0)
			≤1.5	1.0(0.4—1.5)	1.2(0.4—1.5)
			≤2	0.8(0.4—1.2)	1.0(0.4—1.3)
M	Austenitic Stainless Steels	≤200HB	≤1	1.0(0.5—1.2)	1.0(0.5—1.2)
			≤1.5	1.0(0.5—1.0)	1.0(0.5—1.0)
	Austenitic Stainless Steels	>200HB	≤1	1.0(0.5—1.2)	1.0(0.5—1.2)
			≤1.5	1.0(0.5—1.0)	1.0(0.5—1.0)
	Ferritic and Martensitic Stainless Steels	≤200HB	≤1	1.0(0.5—1.2)	1.0(0.5—1.2)
			≤1.5	1.0(0.5—1.0)	1.0(0.5—1.0)
	Duplex Stainless Steels	≤280HB	≤1	0.8(0.4—1.0)	0.8(0.4—1.0)
			≤1.5	0.8(0.4—0.8)	0.8(0.4—0.8)
	Precipitation Hardening Stainless Steels	<450HB	≤1	0.8(0.4—1.0)	0.8(0.4—1.0)
			≤1.5	0.8(0.4—0.8)	0.8(0.4—0.8)
K	Gray Cast Irons	≤350MPa	≤1	1.7(0.6—2.5)	1.8(0.6—2.8)
			≤1.5	1.5(0.6—2.0)	1.7(0.6—2.5)
			≤2	1.3(0.6—2.0)	1.5(0.6—2.5)
			≤2.5	0.8(0.3—1.5)	1.0(0.3—1.6)
			≤3	0.4(0.2—1.0)	0.5(0.2—1.2)
	Ductile Cast Irons	≤450MPa	≤1	1.5(0.5—2.0)	1.7(0.5—2.5)
			≤1.5	1.3(0.5—1.8)	1.5(0.5—2.0)
			≤2	1.2(0.5—1.8)	1.3(0.5—2.0)
			≤2.5	0.7(0.3—1.2)	0.9(0.3—1.5)
			≤3	0.3(0.2—0.8)	0.4(0.2—1.0)
	Ductile Cast Irons	≤800MPa	≤1	1.3(0.4—1.8)	1.5(0.4—2.0)
			≤1.5	1.2(0.4—1.5)	1.3(0.4—1.8)
			≤2	1.0(0.4—1.5)	1.2(0.4—1.8)
S	Heat Resistant Alloys	—	≤1	1.0(0.3—1.3)	1.0(0.3—1.3)
			≤1.5	0.8(0.3—1.2)	0.8(0.3—1.2)
			≤2	0.7(0.3—1.2)	0.7(0.3—1.2)
H	Hardened Steels	40—55HRC	≤1	0.8(0.3—1.2)	0.8(0.3—1.2)
			≤1.5	0.6(0.3—1.0)	0.6(0.3—1.0)
			≤2	0.5(0.3—0.8)	0.5(0.3—0.8)

Note 1) To discharge chips effectively, use an air blow when machining. When the air blow is less effective at discharging chips, we recommend wet cutting.

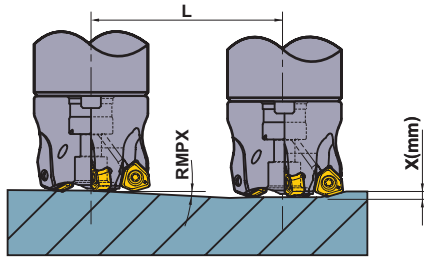
Note 2) When large vibration occurs, reduce the cutting conditions.

Note 3) For interrupted cutting, reduce the cutting speed and feed rate by 20%.

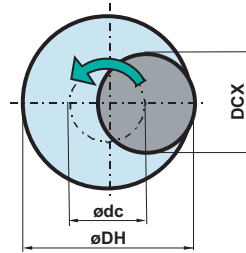
Note 4) If ap is set at 2mm or more, avoid machining on the walls or ramping.

Maximum Capacities by Mode

■ Ramping



■ Helical Milling



● How to derive a locus of the center of the tool.

$$\phi dc = \phi DH - DCX$$

Locus of the Center 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
WX14-100	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

DCX = Cutting Dia. Max.

APMX = Depth of Cut Max.

DC = Cutting Dia.

RMPX = Ramping Angle Max.

DH = Desired Hole Dia.

AZ = Plunge Depth Max.

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 center 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 0.2mm/rev or less.

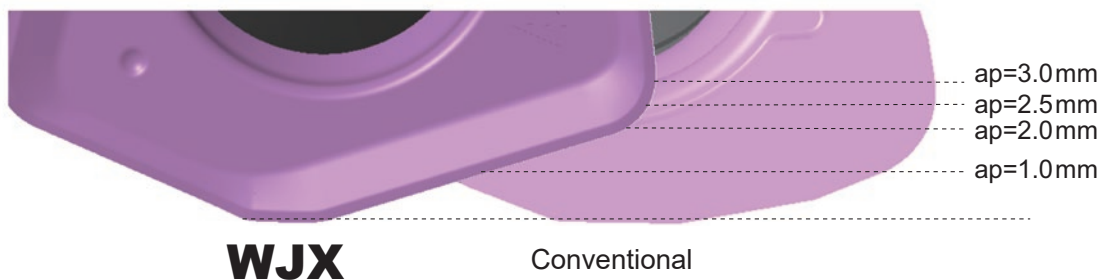
OPERATIONAL GUIDANCE

■ Depth of Cut

The straight cutting edge is 2.0mm at maximum depth of cut (APMX).

When plane cutting steels and cast irons, the depth of cut can be set at up to 3.0mm until you reach the corner radius.

When you exceed 2.0mm, you will need to decrease the feed rate. See the cutting conditions on page M177 for reference.

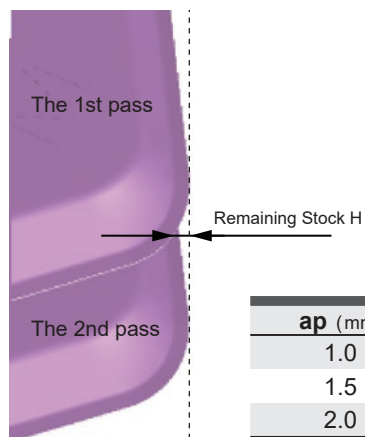
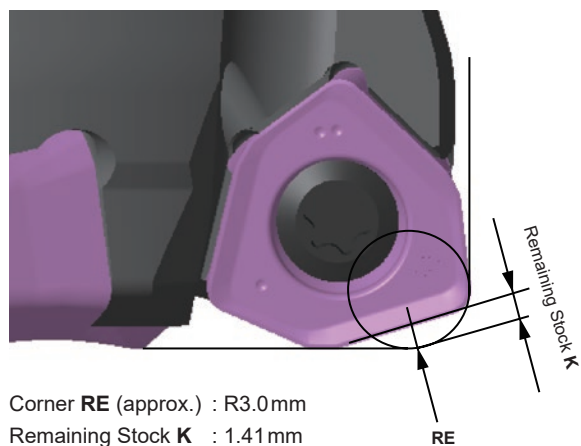


■ Remaining Stock

When using the WJX, please program as a radius cutter.

The approximate remaining stock **K** for the program is shown below.

Also see the table on the right for the remaining stock **H** of the vertical wall.



ap (mm)	Remaining Stock H (mm)
1.0	0.05
1.5	0.08
2.0	0.12

INDEXABLE MILLING

MULTI FUNCTIONAL MILLING

42°
KAPR



OCTACUT

P

Steel

M

Stainless Steel

K

Cast Iron

N

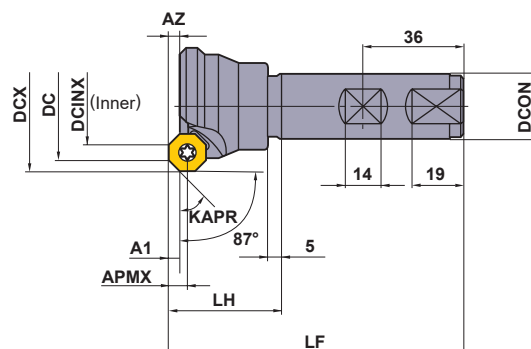
S

H

Hardened Steel



- 20° positive insert.
- For octagonal and round type inserts.
- Multi-functional machining.



SHANK TYPE

KAPR :42°

Right hand tool holder only.

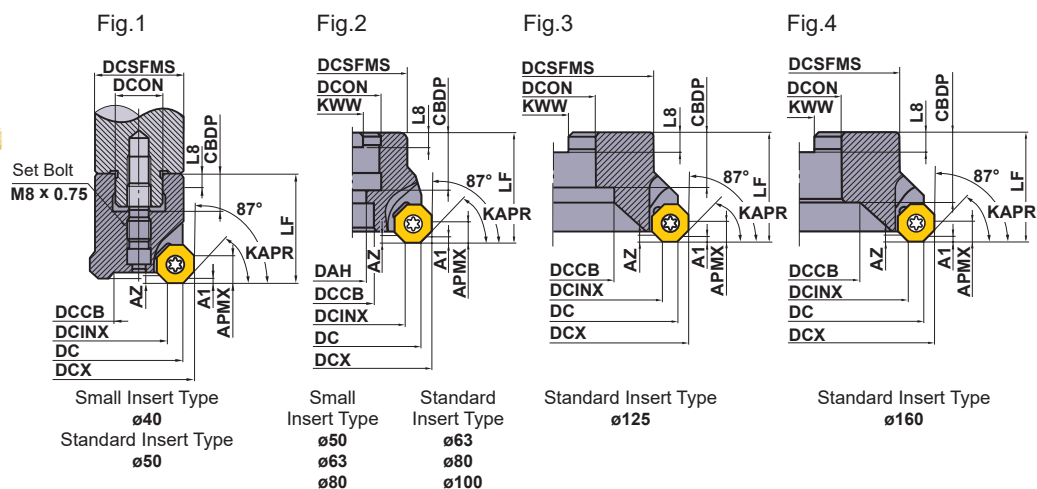
Order Number	Stock	Number of Teeth	Dimensions (mm)									* Clamp Screw	Wrench	Insert
			DCX	DC	DCINX	LF	DCON	LH	A1	APMX	AZ			
OCTACUT322S32RB	●	2	32	23.6	13.1	125	32	45	2.5	7	3	CS350990T	①TKY10F	
OCTACUT403S32RB	●	3	40	31.7	21.2	125	32	45	2.5	7	3	CS350990T	①TKY10F	①OEMX12T3○○○○○ ②REMX12T3○○○○○
OCTACUT504S32RB	●	4	50	41.9	31.4	125	32	45	2.5	7	3	CS350990T	①TKY10F	
OCTACUT634S32RB	●	4	63	54.9	44.5	125	32	45	2.5	7	3	CS350990T	①TKY10F	
OCTACUT503S32R	●	3	50	38.3	24.5	125	32	45	3	9	4	CS501290T	②TKY25T	①OEMX1705○○○○○ ②REMX1705○○○○○
OCTACUT634S32R	●	4	63	51.4	37.6	125	32	45	3	9	4	CS501290T	②TKY25T	

* Clamp Torque (N・m) : CS350990T=2.5, CS501290T=7.5

M

INDEXABLE MILLING

● : Inventory maintained in Japan.



ARBOR TYPE KAPR :42° GAMP:+13° GAMF:-4° 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	CBDF	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

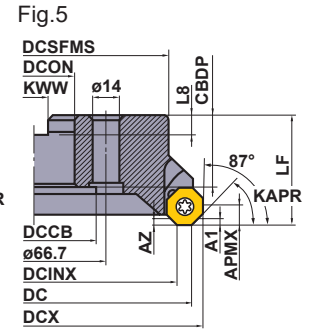
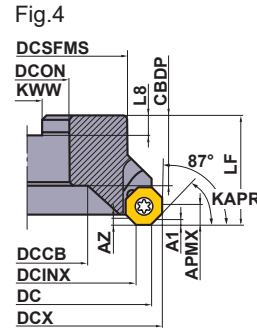
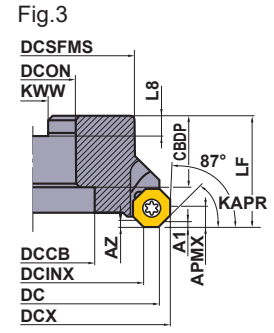
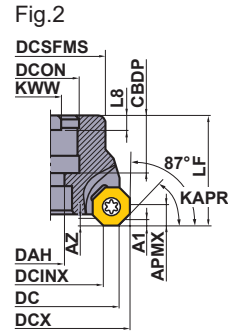
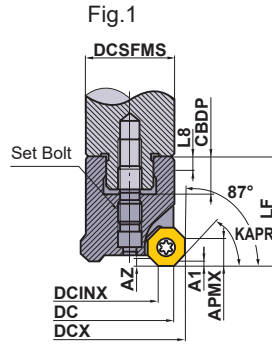
* WT : Tool Weight

SPARE PARTS

Tool Holder Number	 *					
	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

INDEXABLE MILLING



For metric arbor

The cutter bore diameter DCON is indicated in millimetre.

ARBOR TYPE KAPR :42°
GAMP:+13° GAMF:-4°

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	—	—	8.4	33	5.6	0.4	2.5	7	3	1
OCTACUT0504ARB	●	4	50	41.9	31.4	50	22	20	11	—	10.4	42.5	6.3	0.5	2.5	7	3	2
OCTACUT0634ARB	●	4	63	54.9	44.5	50	22	20	11	—	10.4	44	6.3	0.7	2.5	7	3	2
OCTACUT0805ARB	●	5	80	71.9	61.5	50	27	23	13	—	12.4	53	7	1.2	2.5	7	3	2
OCTACUT0503AR	●	3	50	38.3	24.5	50	22	20	—	—	10.4	41	6.3	0.5	3	9	4	1
OCTACUT0634AR	●	4	63	51.4	37.6	50	22	20	11	—	10.4	44	6.3	0.7	3	9	4	2
OCTACUT0805AR	●	5	80	68.4	54.7	50	27	23	13	—	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

* WT : Tool Weight

SPARE PARTS

Tool Holder Number	*					
OCTACUT0403ARB	CS350990T	TKY10F	—	HDS08030	—	①OEMX12T3○○○○○ ②REMX12T3○○○○○
OCTACUT0504ARB				—	BOES101	
OCTACUT0634ARB					—	
OCTACUT0805ARB					—	
OCTACUT0503AR	CS501290T	—	TKY25T	HDS10031	—	①OEMX1705○○○○○ ②REMX1705○○○○○
OCTACUT0634AR				—	BOES101	
OCTACUT0805AR					—	
OCTACUT1608CR					—	

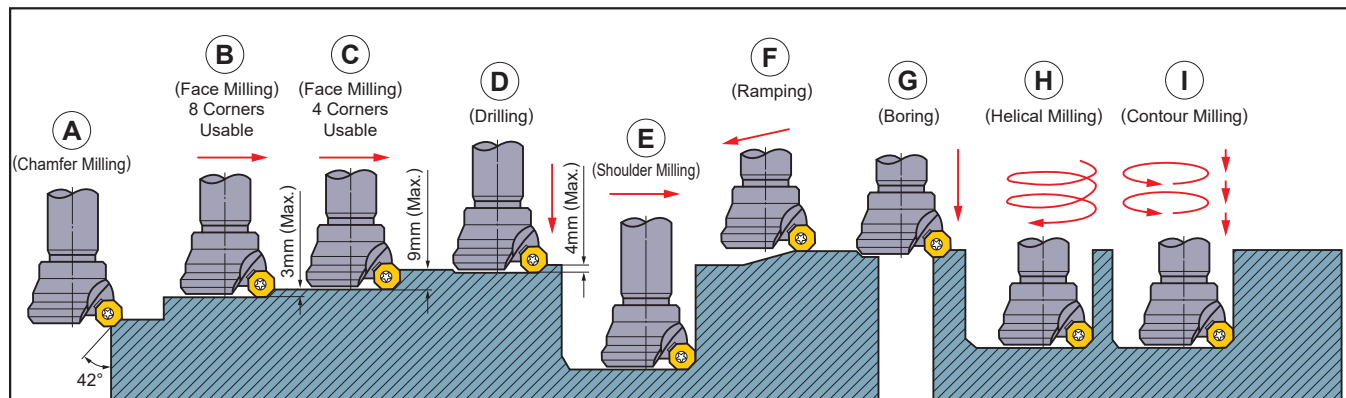
* Clamp Torque (N • m) : CS350990T=2.5, CS501290T=7.5

● : Inventory maintained in Japan. (10 inserts in one case) (CBN inserts are available in 1 piece in one case.)

[illegible]

*2 Insert with breaker.

RECOMMENDED CUTTING CONDITIONS



This list of recommended cutting conditions is for cutters with diameter $\leq \phi 80$. For cutters with diameter $> \phi 80$ increase cutting speed by 10%. Above sizes are for OEMX1705.

	Work Material	Hardness	Grade	Cutting Speed (m/min)	Cutting Mode	Feed per Tooth (mm/t.)
					A	0.2 (0.15—0.25)
P	Mild Steel	$\leq 180\text{HB}$	F7030	240 (180—300)	B	0.2 (0.15—0.25)
			VP15TF	180 (100—250)	C,E,F	0.2 (0.15—0.25)
		180—280HB	F7030	200 (140—240)	D,G,H,I	0.075 (0.05—0.1)
			VP15TF	180 (100—250)	A	0.2 (0.15—0.25)
	Carbon Steel Alloy Steel	280—380HB	F7030	150 (100—170)	B	0.2 (0.15—0.25)
			VP15TF	120 (80—160)	C,E,F	0.2 (0.15—0.25)
			F7030	150 (100—170)	D,G,H,I	0.075 (0.05—0.1)
			VP15TF	120 (80—160)	A	0.2 (0.15—0.25)
	Pre-Hardened Steel	35—45HRC	F7030	130 (90—160)	B	0.15 (0.1—0.2)
			VP15TF	120 (80—160)	C,E,F	0.1 (0.05—0.15)
			F7030	150 (100—170)	D,G,H,I	0.05 (0.025—0.075)
			VP15TF	120 (80—160)	A	0.15 (0.1—0.2)
M	Stainless Steel	$\leq 270\text{HB}$	F7030	200 (140—240)	B	0.15 (0.1—0.2)
					C,E,F	0.1 (0.05—0.15)
					D,G,H,I	0.05 (0.025—0.075)
					A	0.15 (0.1—0.2)
			VP15TF	150 (100—200)	B	0.15 (0.1—0.2)
					C,E,F	0.1 (0.05—0.15)
					D,G,H,I	0.075 (0.05—0.1)
					A	0.15 (0.1—0.2)

● Revolution (min^{-1}) = $(1000 \times \text{Cutting Speed}) \div (3.14 \times \text{DC})$

● Table Feed (mm/min) = Feed per Tooth $\times$ Number of Teeth $\times$ 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 drilling (0.5 mm steps are recommended).

Note 4) When chattering occurs, reduce cutting speed by 20—30 %.

Note 5) When using round inserts, make sure that the flat portion of the flank surface is secure against the insert seat wall.

	Work 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)
	Ductile Cast Iron	Tensile Strength 360—500MPa	VP15TF	160 (100—220)	B (D.O.C 0.1—0.5mm)	0.15 (0.1—0.2)
					A	0.25 (0.2—0.3)
					B	0.2 (0.15—0.25)
					C,E,F	0.1 (0.05—0.15)
H	Ductile Cast Iron	Tensile Strength 500—800MPa	VP15TF	140 (90—190)	D,G,H,I	0.05 (0.025—0.075)
					A	0.25 (0.2—0.3)
					B	0.2 (0.15—0.25)
					C,E,F	0.1 (0.05—0.15)
	Hardened Steel	45—60HRC	VP15TF	80 (50—100)	D,G,H,I	0.05 (0.025—0.075)
					A	0.15 (0.1—0.2)
					B	0.15 (0.1—0.2)
					C,E,F	0.1 (0.05—0.12)
			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.

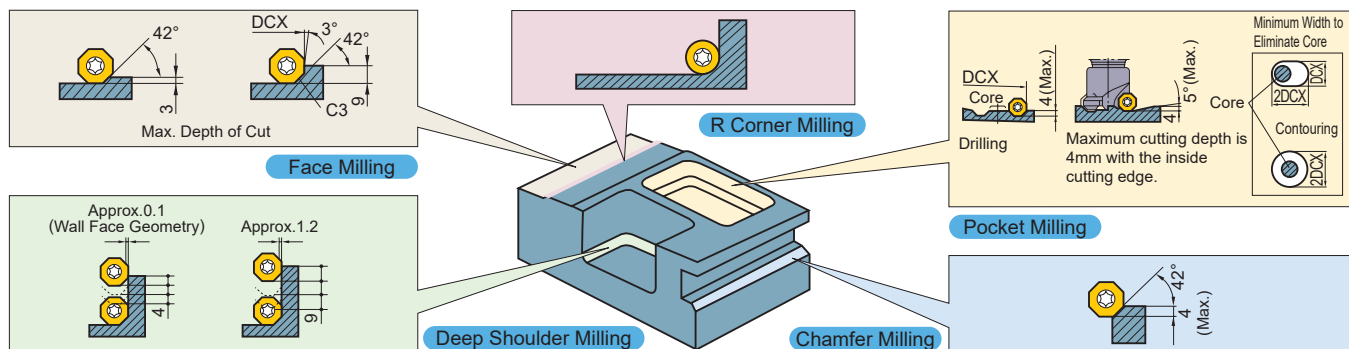
Note 2) More than 50mm shank length should be clamped in the milling chuck.

Note 3) Use step cutting when drilling (0.5 mm steps are recommended).

Note 4) When chattering occurs, reduce cutting speed by 20—30 %.

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.

M

INDEXABLE MILLING

INDEXABLE MILLING

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

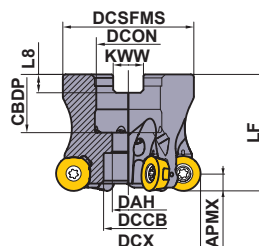
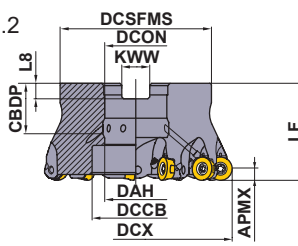


Fig.2



Cutter Diameter DCX	Set Bolt	Geometry	
φ80	HSC08025H	①	①
—	—	②	②
φ100	MBA16033H	②	②
—	—	②	②

ARBOR TYPE

GAMP: +4° GAMF: -6°

Type	Cutting Edge R (APMX)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)								WT (kg) [*]	Max. Depth of Cut (mm)			RMPX	Fig.	
						DCX	DCSFMS	LF	DCON	CBDP	DAH	DCCB	KWW		L8	APMX	A1			AZ
Fine Pitch	6	ARP6PR08008CA	●	○	8	80	56	50	25.4	26	13	20	9.5	6	0.89	6.0	2.5	2.5	2.3°	1
		ARP6PR10009DA	●	○	9	100	70	50	31.75	32	31.75	45	12.7	8	1.38	6.0	2.5	2.5	1.7°	2
Extra Fine Pitch	6	ARP6PR08009CA	●	○	9	80	56	50	25.4	26	13	20	9.5	6	0.89	6.0	2.5	2.5	2.3°	1
		ARP6PR10011DA	●	○	11	100	70	50	31.75	32	31.75	45	12.7	8	1.36	6.0	2.5	2.5	1.7°	2

* WT : Tool Weight

SPARE PARTS

Tool Holder Number	*1	Wrench	Anti-seize Lubricant	Insert
ARP5	TPS351B	TIP10D	MK1KS	RPOT1040M0E4-○
ARP6	TPS4	TIP15D	MK1KS	RPOT1248M0E4-○

*1 Clamp Torque (N · m) : TPS351B=2.5, TPS4=3.5

*2 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.	φ0.6mm	φ0.8mm	φ1.2mm	φ1.6mm
Order Number	HSD04004H06	HSD04004H08	HSD04004H12	HSD04004H16

* Clamp Torque (N · m) : HSD0400H○=1.5

*3 The part number for a blank screw without a through nozzle is HSS04004.

● : Inventory maintained in Japan.



For metric arbors

The cutter bore diameter DCON is indicated in millimetres.

Fig.1

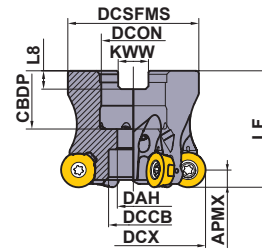
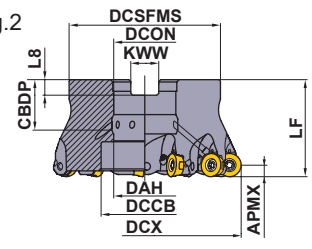


Fig.2



Right hand (R) only for the standard.

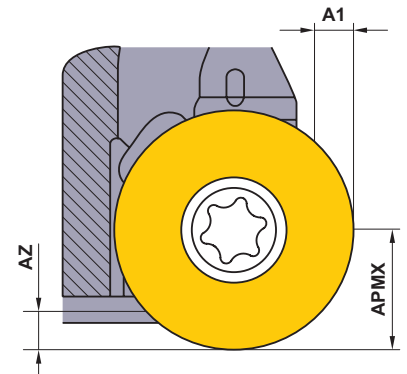
Cutter Diameter DCX	Set Bolt	Geometry	
φ40	HSC08025H	①	
φ50, φ63	HSC10030H		
φ80	HSC12035H		
φ100	MBA16033H		

ARBOR TYPE

GAMP: +4° GAMF: -6°

Type	Cutting Edge R (APMX)	Order Number	Stock R	Coolant Hole	Number of Teeth	Dimensions (mm)									WT (kg)	Max. Depth of Cut (mm)			RMPX	Fig.
						DCX	DCSFMS	LF	DCON	CBDP	DAH	DCCB	KWW	L8		APMX	A1	AZ		
Fine Pitch	5	ARP5P-040A05AR	●	○	5	40	34	40	16	18	9	14	8.4	5.6	0.15	5.0	2.0	1.30	2.8°	1
		ARP5P-050A06AR	●	○	6	50	45	40	22	20	11	17	10.4	6.3	0.27	5.0	2.0	1.85	2.9°	1
		ARP5P-063A07AR	●	○	7	63	50	40	22	20	11	17	10.4	6.3	0.46	5.0	2.5	2.50	3.0°	1
Extra Fine Pitch	5	ARP5P-050A07AR	●	○	7	50	45	40	22	20	11	17	10.4	6.3	0.27	5.0	2.0	1.85	2.9°	1
		ARP5P-063A08AR	●	○	8	63	50	40	22	20	11	17	10.4	6.3	0.46	5.0	2.5	2.50	3.0°	1
Fine Pitch	6	ARP6P-040A04AR	●	○	4	40	34	40	16	18	9	13.4	8.4	5.6	0.15	6.0	2.0	1.15	2.7°	1
		ARP6P-050A05AR	●	○	5	50	45	40	22	20	11	17	10.4	6.3	0.26	6.0	2.0	1.70	2.9°	1
		ARP6P-063A06AR	●	○	6	63	50	40	22	20	11	17	10.4	6.3	0.44	6.0	2.5	2.50	3.1°	1
		ARP6P-080A08AR	●	○	8	80	56	50	27	23	13	20	12.4	7	0.88	6.0	2.5	2.50	2.3°	1
		ARP6P-100B09AR	●	○	9	100	78	50	32	26	32	45	14.4	8	1.47	6.0	2.5	2.50	1.7°	2
Extra Fine Pitch	6	ARP6P-050A06AR	●	○	6	50	45	40	22	20	11	17	10.4	6.3	0.25	6.0	2.0	1.70	2.9°	1
		ARP6P-063A07AR	●	○	7	63	50	40	22	20	11	17	10.4	6.3	0.44	6.0	2.5	2.50	3.1°	1
		ARP6P-080A09AR	●	○	9	80	56	50	27	23	13	20	12.4	7	0.88	6.0	2.5	2.50	2.3°	1
		ARP6P-100B11AR	●	○	11	100	78	50	32	26	32	45	14.4	8	1.45	6.0	2.5	2.50	1.7°	2

* WT : Tool Weight



INDEXABLE MILLING

INDEXABLE MILLING

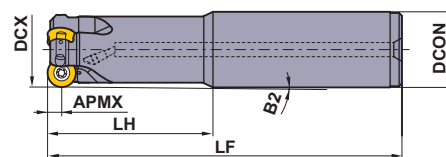


Fig.1

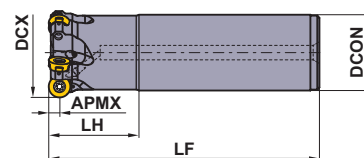


Fig.2

SHANK TYPE

GAMP: +4° GAMF: -6° ~ -7°

Type	Cutting Edge R (APMX)	Order Number	Stock R	Coolant Hole	Number of Teeth	Dimensions (mm)					WT* (kg)	Max. Depth of Cut (mm)			RMPX	Fig.
						DCX	DCON	LF	LH	B2		APMX	A1	AZ		
Standard	5	ARP5PR2503SA25M	●	○	3	25	25	140	60	1.10°	0.42	5.0	1.0	0.40	1.8°	1
		ARP5PR3204SA32M	●	○	4	32	32	150	70	0.92°	0.77	5.0	1.0	0.65	1.9°	1
Long	5	ARP5PR2502SA25L	●	○	2	25	25	180	80	0.80°	0.56	5.0	1.0	0.40	1.8°	1
		ARP5PR3203SA32L	●	○	3	32	32	200	120	0.51°	1.01	5.0	1.0	0.65	1.9°	1
Standard	6	ARP6PR3203SA32M	●	○	3	32	32	150	70	0.94°	0.76	6.0	1.0	0.60	2.0°	1
		ARP6PR4004SA32M	●	○	4	40	32	150	50	—	0.85	6.0	2.5	1.15	2.7°	2
		ARP6PR5005SA42M	●	○	5	50	42	150	50	—	1.47	6.0	2.5	1.70	2.9°	2
Long	6	ARP6PR3202SA32L	●	○	2	32	32	200	120	0.52°	1.00	6.0	1.0	0.60	2.0°	1
		ARP6PR4003SA32L	●	○	3	40	32	250	50	—	1.48	6.0	2.5	1.15	2.7°	2
		ARP6PR5004SA42L	●	○	4	50	42	250	50	—	2.53	6.0	2.5	1.70	2.9°	2

* WT : Tool Weight

SPARE PARTS

Tool Holder Number	 *1			
	Insert Screw	Wrench	Anti-seize Lubricant	Insert
ARP5	TPS351B	TIP10D	MK1KS	RPOT1040M0E4-○
ARP6	TPS4	TIP15D	MK1KS	RPOT1248M0E4-○

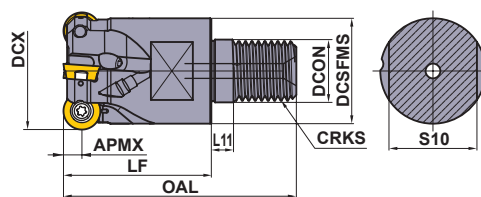
*1 Clamp Torque (N • m) : TPS351B=2.5, TPS4=3.5

*2 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

*3 The part number for a blank screw without a through nozzle is HSS04004.



SCREW-IN TYPE

GAMP: +4° GAMF: -6° — -7°

Type	Cutting Edge R (APMX)	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)								WT (kg)	Max. Depth of Cut (mm)			RMPX
			R			DCX	DCON	DCSFMS	OAL	LF	L11	S10	CRKS		APMX	A1	AZ	
Standard	5	ARP5PR2502AM1235	●	○	2	25	12.5	23.5	57	35	6	19	M12	0.10	5.0	—	0.40	1.8°
		ARP5PR3203AM1640	●	○	3	32	17.0	28.5	63	40	6	24	M16	0.16	5.0	1.0	0.65	1.9°
Fine Pitch	5	ARP5PR2503AM1235	●	○	3	25	12.5	23.5	57	35	6	19	M12	0.09	5.0	—	0.40	1.8°
		ARP5PR3204AM1640	●	○	4	32	17.0	28.5	63	40	6	24	M16	0.15	5.0	1.0	0.65	1.9°
Standard	6	ARP6PR3202AM1640	●	○	2	32	17.0	28.5	63	40	6	24	M16	0.18	6.0	1.0	0.60	2.0°
		ARP6PR4003AM1640	●	○	3	40	17.0	28.5	63	40	6	24	M16	0.20	6.0	2.5	1.15	2.7°
Fine Pitch	6	ARP6PR3203AM1640	●	○	3	32	17.0	28.5	63	40	6	24	M16	0.17	6.0	1.0	0.60	2.0°
		ARP6PR4004AM1640	●	○	4	40	17.0	28.5	63	40	6	24	M16	0.20	6.0	2.5	1.15	2.7°

* WT : Tool Weight

Note 1) For screw-in type arbors, refer to page M269.

INSERTS

Work Material	M	Stainless Steel	G	C	H	E	F	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG	CH	CI	CJ	CK	CL	CM	CN	CO	CP	CQ	CR	CS	CT	CU	CV	CW	CX	CY	CZ	DA	DB	DC	DD	DE	DF	DG	DH	DI	DJ	DK	DL	DM	DN	DO	DP	DQ	DR	DS	DT	DU	DV	DW	DX	DY	DZ	EA	EB	EC	ED	EE	EF	EG	EH	EI	EJ	EK	EL	EM	EN	EO	EP	EQ	ER	ES	ET	EU	EV	EW	EX	EY	EZ	FA	FB	FC	FD	FE	FF	FG	FH	FI	FJ	FK	FL	FM	FN	FO	FP	FQ	FR	FS	FT	FU	FV	FW	FX	FY	FZ	GA	GB	GC	GD	GE	GF	GG	GH	GI	GJ	GK	GL	GM	GN	GO	GP	GQ	GR	GS	GT	GU	GV	GW	GX	GY	GZ	HA	HB	HC	HD	HE	HF	HG	HH	HI	HJ	HK	HL	HM	HN	HO	HP	HQ	HR	HS	HT	HU	HV	HW	HX	HY	HZ	IA	IB	IC	ID	IE	IF	IG	IH	II	IJ	IK	IL	IM	IN	IO	IP	IQ	IR	IS	IT	IU	IV	IW	IX	IY	IZ	JA	JB	JC	JD	JE	JF	JG	JH	JI	JJ	JK	JL	JM	JN	JO	JP	JQ	JR	JS	JT	JU	JV	JW	JX	JY	JZ	KA	KB	KC	KD	KE	KF	KG	KH	KI	KJ	KK	KL	KM	KN	KO	KP	KQ	KR	KS	KT	KU	KV	KW	KX	KY	KZ	LA	LB	LC	LD	LE	LF	LG	LH	LI	LJ	LK	LM	LN	LO	LP	LQ	LR	LS	LT	LU	LV	LW	LX	LY	LZ	MA	MB	MC	MD	ME	MF	MG	MH	MI	MJ	MK	ML	MN	MO	MP	MQ	MR	MS	MT	MU	MV	MW	MX	MY	MZ	NA	NB	NC	ND	NE	NF	NG	NH	NI	NJ	NK	NL	NM	NN	NO	NP	NQ	NR	NS	NT	NU	NV	NW	NX	NY	NZ	OA	OB	OC	OD	OE	OF	OG	OH	OI	OJ	OK	OL	OM	ON	OO	OP	OQ	OR	OS	OT	OU	OV	OW	OX	OY	OZ	PA	PB	PC	PD	PE	PF	PG	PH	PI	PJ	PK	PL	PM	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW	PX	PY	PZ	QA	QB	QC	QD	QE	QF	QG	QH	QI	QJ	QK	QL	QM	QN	QO	QP	QQ	QR	QS	QT	QU	QV	QW	QX	QY	QZ	RA	RB	RC	RD	RE	RF	RG	RH	RI	RJ	RK	RL	RM	RN	RO	RP	RQ	RR	RS	RT	RU	RV	RW	RX	RY	RZ	SA	SB	SC	SD	SE	SF	SG	SH	SI	SJ	SK	SL	SM	SN	SO	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY	SZ	TA	TB	TC	TD	TE	TF	TG	TH	TI	TJ	TK	TL	TM	TN	TO	TP	TQ	TR	TS	TU	TV	TW	TX	TY	TZ	UA	UB	UC	UD	UE	UF	UG	UH	UI	UJ	UK	UL	UM	UN	UO	UP	UQ	UR	US	UT	UU	UV	UW	UX	UY	UZ	VA	VB	VC	VD	VE	VF	VG	VH	VI	VJ	VK	VL	VM	VN	VO	VP	VQ	VR	VS	VT	VU	VV	VW	VX	VY	VZ	WA	WB	WC	WD	WE	WF	WG	WH	WI	WJ	WK	WL	WM	WN	WO	WP	WQ	WR	WS	WT	WU	WV	WW	WX	WY	WZ	XA	XB	XC	XD	XE	XF	XG	XH	XI	XJ	XK	XL	XM	XN	XO	XP	XQ	XR	XS	XT	XU	XV	XW	XX	XY	XZ	YA	YB	YC	YD	YE	YF	YG	YH	YI	YJ	YK	YL	YM	YN	YO	YP	YQ	YR	YS	YT	YU	YV	YW	YX	YY	YZ	ZA	ZB	ZC	ZD	ZE	ZF	ZG	ZH	ZI	ZJ	ZK	ZL	ZM	ZN	ZO	ZP	ZQ	ZR	ZS	ZT	ZU	ZV	ZW	ZX	ZY	ZZ																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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RECOMMENDED CUTTING CONDITIONS

■ Dry cutting

	Work 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	≤200MPa	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

	Work 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	≤200MPa	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)
	Heat Resistant Alloy	—	MP9130	35 (15—45)	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 $a_p = 2.5\text{mm}$ with ARP5 axial cutting. With ARP6, use $a_p = 3\text{mm}$.

Use while matching the a_p fluctuation and correction value F of the respective table.

Ex. Feed for the recommended 1 blade when ARP5, SUS304, MP7130, $a_p=1$: $0.2\text{ mm/t.} \times 1.5$ (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.

When the coolant nozzle of separately sold is used, it is more effective.

MAXIMUM CAPACITIES BY EACH CUTTING

Cutting Edge	Maximum hole diameter	Order Number	Install	Type	Recommendation (mm)		Ramping	Helical Drilling		Drilling Depth	Plunging
APMX (mm)	DCX (mm)				ap	ae		Smallest hole DH min.(mm)	Largest hole DH max.(mm)		
5	25	ARP5PR2502AM1235	Screw-in	Standard	≤2.5	≤1.00DCX	1.8°	40	48	0.40	—
		ARP5PR2503AM1235	Screw-in	Fine Pitch	≤1.5	≤1.00DCX	1.8°	40	48	0.40	—
		ARP5PR2503SA25M	Shank	Standard	≤1.5	≤1.00DCX	1.8°	40	48	0.40	1.0
		ARP5PR2502SA25L	Shank	Long	≤1.5	≤1.00DCX	1.8°	40	48	0.40	1.0
	32	ARP5PR3203AM1640	Screw-in	Standard	≤2.5	≤1.00DCX	1.9°	54	62	0.65	1.0
		ARP5PR3204AM1640	Screw-in	Fine Pitch	≤2.5	≤1.00DCX	1.9°	54	62	0.65	1.0
		ARP5PR3204SA32M	Shank	Standard	≤2.5	≤1.00DCX	1.9°	54	62	0.65	1.0
		ARP5PR3203SA32L	Shank	Long	≤2.5	≤1.00DCX	1.9°	54	62	0.65	1.0
	40	ARP5P-040A05AR	Arbor	Fine Pitch	≤2.5	≤1.00DCX	2.8°	70	78	1.30	2.0
	50	ARP5P-050A06AR	Arbor	Fine Pitch	≤2.5	≤1.00DCX	2.9°	90	98	1.85	2.0
		ARP5P-050A07AR	Arbor	Extra Fine Pitch	≤1.5	≤1.00DCX	2.9°	90	98	1.85	2.0
	63	ARP5P-063A07AR	Arbor	Fine Pitch	≤2.5	≤0.75DCX	3.0°	116	124	2.50	2.5
		ARP5P-063A08AR	Arbor	Extra Fine Pitch	≤1.5	≤0.75DCX	3.0°	116	124	2.50	2.5
6	32	ARP6PR3202AM1640	Screw-in	Standard	≤3.5	≤1.00DCX	2.0°	52	62	0.60	1.0
		ARP6PR3203AM1640	Screw-in	Fine Pitch	≤3.5	≤1.00DCX	2.0°	52	62	0.60	1.0
		ARP6PR3203SA32M	Shank	Standard	≤3.5	≤1.00DCX	2.0°	52	62	0.60	1.0
		ARP6PR3202SA32L	Shank	Long	≤3.5	≤1.00DCX	2.0°	52	62	0.60	1.0
	40	ARP6PR4003AM1640	Screw-in	Standard	≤3.5	≤1.00DCX	2.7°	68	78	1.15	2.5
		ARP6PR4004AM1640	Screw-in	Fine Pitch	≤3.5	≤1.00DCX	2.7°	68	78	1.15	2.5
		ARP6PR4004SA32M	Shank	Standard	≤3.5	≤1.00DCX	2.7°	68	78	1.15	2.5
		ARP6PR4003SA32L	Shank	Long	≤3.5	≤1.00DCX	2.7°	68	78	1.15	2.5
		ARP6P-040A04AR	Arbor	Fine Pitch	≤3.5	≤1.00DCX	2.7°	68	78	1.15	2.0
	50	ARP6PR5005SA42M	Shank	Standard	≤3.5	≤1.00DCX	2.9°	88	98	1.70	2.5
		ARP6PR5004SA42L	Shank	Long	≤3.5	≤1.00DCX	2.9°	88	98	1.70	2.5
		ARP6P-050A05AR	Arbor	Fine Pitch	≤3.5	≤1.00DCX	2.9°	88	98	1.70	2.0
		ARP6P-050A06AR	Arbor	Extra Fine Pitch	≤2.5	≤1.00DCX	2.9°	88	98	1.70	2.0
	63	ARP6P-063A06AR	Arbor	Fine Pitch	≤3.5	≤0.75DCX	3.1°	114	124	2.50	2.5
		ARP6P-063A07AR	Arbor	Extra Fine Pitch	≤2.5	≤0.75DCX	3.1°	114	124	2.50	2.5
	80	ARP6PR08008CA	Arbor	Fine Pitch	≤3.5	≤0.60DCX	2.3°	148	158	2.50	2.5
		ARP6PR08009CA	Arbor	Extra Fine Pitch	≤2.5	≤0.60DCX	2.3°	148	158	2.50	2.5
	100	ARP6PR10009DA	Arbor	Fine Pitch	≤3.5	≤0.50DCX	1.7°	188	198	2.50	2.5
		ARP6PR10011DA	Arbor	Extra Fine Pitch	≤2.5	≤0.50DCX	1.7°	188	198	2.50	2.5

Note 1) Tool body durability may weaken, when the amount of axial cutting exceeds ARP5=5mm and ARP6=6mm.

Note 2) When drilling, be careful of long scattered cutting chips

Note 3) When cutting helical holes, do not exceed the largest APMX cutting depth per one rotation.

Note 4) Calculate using the following formula for center tool tracks and ϕ_{dc} when cutting helical holes : Center tool tracks ϕ_{dc} =desired hole diameter ϕ_{DH} tool diameter ϕ_{DCX}

Note 5) 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 6) Cutting chip pockets are small for extra-multiple cutting and small diameter cutters.

Use with caution the ae and ap feed due to the possibility of cutting blockage.

Note 7) When cutting large ae with large diameter cutter, blockage from long cuttings is possible.

Regulate ap and feed.

■ 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.

INDEXABLE MILLING

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.
- With through air & coolant holes.

Fig.1

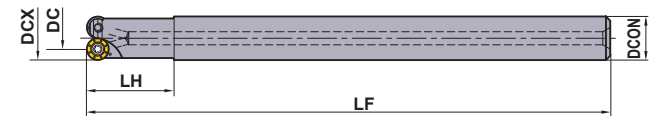


Fig.2 (Center Cutting Edge Type)

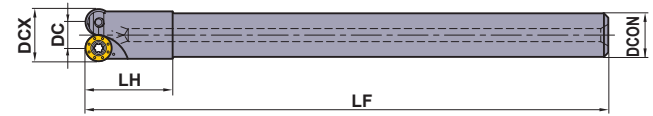
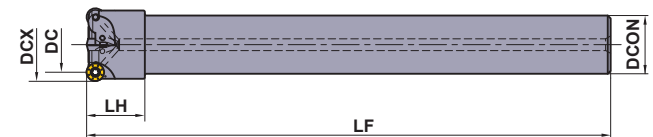


Fig.3 (Non-center Cutting Edge Type (Multi-tooth))



STEEL SHANK TYPE

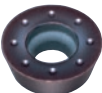
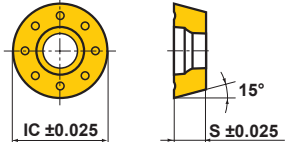
Right hand tool holder only.

Type	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)						Fig.	Clamp Screw	Wrench	Insert
		R			RE*2	DCX	DCON	DC	LF	LH				
Center Cutting	ARX25R102SA10S	●	○	2	2.5	10	10	5	120	20	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R122SA10S	●	○	2	3.0	12	10	6	120	20	2	TPS22S	TIP07FS	RDMW0620M0E
	ARX35R142SA12S	●	○	2	3.5	14	12	7	140	20	2	TPS22	TIP07FS	RDMW0724M0E
Non-center Cutting (Multi-tooth)	ARX25R122SA10S	●	○	2	2.5	12	10	7	120	20	3	TPS20	TIP06F	RDMW0517M0E
	ARX25R163SA16S	●	○	3	2.5	16	16	11	180	20	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R163SA16S	●	○	3	3.0	16	16	10	180	20	1	TPS22	TIP07FS	RDMW0620M0E
	ARX25R173SA16S	●	○	3	2.5	17	16	12	180	20	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R173SA16S	●	○	3	3.0	17	16	11	180	20	1	TPS22	TIP07FS	RDMW0620M0E
	ARX25R204SA20S	●	○	4	2.5	20	20	15	180	20	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R203SA20S	●	○	3	3.0	20	20	14	180	20	1	TPS22	TIP07FS	RDMW0620M0E
	ARX25R224SA20S	●	○	4	2.5	22	20	17	180	20	3	TPS20	TIP06F	RDMW0517M0E
	ARX30R224SA20S	●	○	4	3.0	22	20	16	180	20	3	TPS22	TIP07FS	RDMW0620M0E
	ARX25R255SA20S	●	○	5	2.5	25	20	20	180	20	3	TPS20	TIP06F	RDMW0517M0E
	ARX30R254SA20S	●	○	4	3.0	25	20	19	180	20	3	TPS22	TIP07FS	RDMW0620M0E

*1 Clamp Torque (N · m) : TPS20=0.5, TPS22S=0.5, TPS22=0.5

*2 RE is shown for insert corner R.

INSERTS

Work Material	P	Steel		Cutting Conditions (Guide) :			
	M	Stainless Steel		● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting			
	K	Cast Iron					
	H	Hardened Steel					
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. (10 inserts in one case)



Fig.1

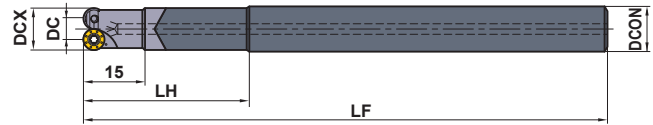


Fig.2

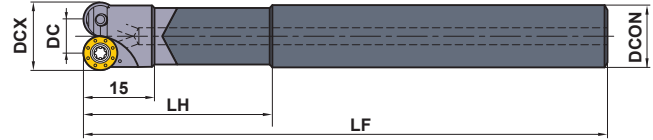
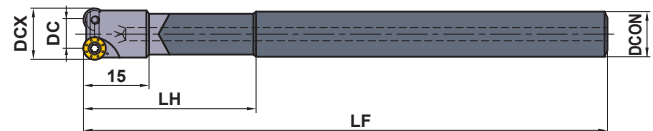


Fig.3



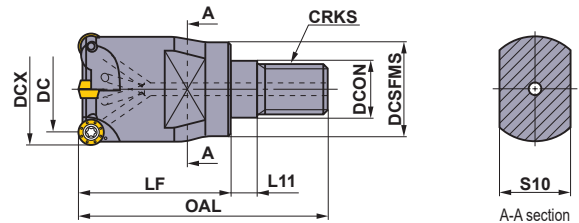
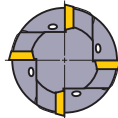
CARBIDE SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock	Coolant Hole	Number of Teeth	Dimensions (mm)						Fig.	*1 Clamp Screw	*2 Wrench	Insert
					RE*2	DCX	DCON	DC	LF	LH				
Center Cutting	ARX25R102SA10LW	●	○	2	2.5	10	10	5	150	40	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R122SA10LW	●	○	2	3.0	12	10	6	150	40	2	TPS22S	TIP07FS	RDMW0620M0E
	ARX35R142SA12LW	●	○	2	3.5	14	12	7	170	40	2	TPS22	TIP07FS	RDMW0724M0E
Non-center Cutting (Multi-tooth)	ARX25R122SA10LW	●	○	2	2.5	12	10	7	150	40	3	TPS20	TIP06F	RDMW0517M0E

*1 Clamp Torque (N · m) : TPS20=0.5, TPS22S=0.5, TPS22=0.5

*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)										*2 WT (kg)	*1 Clamp Screw	*2 Wrench	Insert
				RE*3	DCX	DCON	DC	DCSFMS	OAL	LF	L11	S10	CRKS				
ARX25R163M08A30	●	○	3	2.5	16	8.5	11	14.7	48	30	6	10	M8	0.1	TPS20	TIP06F	RDMW0517M0E
ARX25R173M08A30	●	○	3	2.5	17	8.5	12	14.5	48	30	6	10	M8	0.1	TPS20	TIP06F	RDMW0517M0E
ARX25R204M10A30	●	○	4	2.5	20	10.5	15	18.6	49	30	6	14	M10	0.2	TPS20	TIP06F	RDMW0517M0E
ARX25R224M10A30	●	○	4	2.5	22	10.5	17	18.5	49	30	6	14	M10	0.2	TPS20	TIP06F	RDMW0517M0E
ARX25R255M12A35	●	○	5	2.5	25	12.5	20	23.6	57	35	6	19	M12	0.2	TPS20	TIP06F	RDMW0517M0E
ARX30R163M08A30	●	○	3	3.0	16	8.5	11	14.6	48	30	6	10	M8	0.1	TPS22	TIP07FS	RDMW0620M0E
ARX30R173M08A30	●	○	3	3.0	17	8.5	12	14.5	48	30	6	10	M8	0.1	TPS22	TIP07FS	RDMW0620M0E
ARX30R203M10A30	●	○	3	3.0	20	10.5	15	18.5	49	30	6	14	M10	0.2	TPS22	TIP07FS	RDMW0620M0E
ARX30R224M10A30	●	○	4	3.0	22	10.5	17	18.5	49	30	6	14	M10	0.2	TPS22	TIP07FS	RDMW0620M0E
ARX30R254M12A35	●	○	4	3.0	25	12.5	20	23.4	57	35	6	19	M12	0.2	TPS22	TIP07FS	RDMW0620M0E

*1 Clamp Torque (N · m) : TPS20=0.5, TPS22=0.5

*2 WT : Tool Weight

*3 RE is shown for insert corner R.

Note 1) For screw-in type arbors, refer to page M269.

ARBORS	➤ M269
SPARE PARTS	➤ Q001
TECHNICAL DATA	➤ R001

M

INDEXABLE MILLING

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.
- Please note the setting of the depth of cut especially to prevent the fracture.
- Use with carbide shank recommended.
- The first recommended grade when machining hardened steel of less than 50HRC is VP15TF.

SHOULDER MILLING • POCKET MILLING • RAMPING • COPYING

Work Material	Hardness	Grade	Cutting Speed vc (m/min)	ARX25R	SA	S	ARX30R	SA	S	ARX35R	SA	S
				ARX25R	M	A	ARX30R	M	A	ARX35R	M	A
				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

Work Material	Hardness	Grade	Cutting Speed vc (m/min)	ARX25R	SA	S	ARX30R	SA	S	ARX35R	SA	S
				ARX25R	M	A	ARX30R	M	A	ARX35R	M	A
				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

Work Material	Hardness	Grade	Cutting Speed vc (m/min)	ARX25R	SA	S	ARX30R	SA	S	ARX35R	SA	S
				ARX25R	M	A	ARX30R	M	A	ARX35R	M	A
				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

Work Material	Hardness	Grade	Cutting Speed vc (m/min)	ARX25R	SA	S	ARX30R	SA	S	ARX35R	SA	S
				ARX25R	M	A	ARX30R	M	A	ARX35R	M	A
				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	

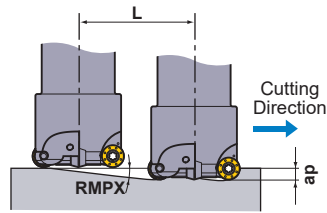
Note 1) For helical drilling, refer to the maximum capacities on page M195.

CUTTING MODE MAXIMUM CAPACITIES

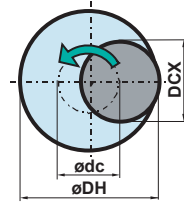
RAMPING

Finding a cutters' distance moved "L" when depth of cut reaches "ap" at a ramping angle of "α".

$$L = ap / \tan \alpha \text{ (mm)}$$



HELICAL DRILLING



● How to derive a locus of the center of the tool.

$$\phi_{dc} = \phi_{DH} - DCX$$

Locus of the center 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)	Corner RE (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)
Center Cutting	ARX25R102SA10S	10	2.5	2	90°	2.5	0	15	19
	ARX25R102SA10LW	10	2.5	2	90°	2.5	0	15	19
	ARX30R122SA10S	12	3.0	2	90°	3.0	0	18	23
	ARX30R122SA10LW	12	3.0	2	90°	3.0	0	18	23
	ARX35R142SA12S	14	3.5	2	90°	3.5	0	21	27
	ARX35R142SA12LW	14	3.5	2	90°	3.5	0	21	27
Non-center Cutting (Multi-tooth)	ARX25R122SA10S	12	2.5	2	27.17°	2.5	4.87	19	23
	ARX25R122SA10LW	12	2.5	2	27.17°	2.5	4.87	19	23
	ARX25R163M08A30	16	2.5	3	13.70°	2.5	10.76	27	31
	ARX25R163SA16S	16	2.5	3	13.70°	2.5	10.26	27	31
	ARX30R163M08A30	16	3.0	3	21.25°	3.0	7.71	26	31
	ARX30R163SA16S	16	3.0	3	21.25°	3.0	7.71	26	31
	ARX25R173M08A30	17	2.5	3	12.22°	2.5	11.54	29	33
	ARX25R173SA16S	17	2.5	3	12.22°	2.5	11.54	29	33
	ARX30R173M08A30	17	3.0	3	18.42°	3.0	9.01	28	33
	ARX30R173SA16S	17	3.0	3	18.42°	3.0	9.01	28	33
	ARX30R203M10A30	20	3.0	3	13.21°	3.0	12.78	34	39
	ARX30R203SA20S	20	3.0	3	13.21°	3.0	12.78	34	39
	ARX25R204M10A30	20	2.5	4	9.23°	2.5	15.38	35	39
	ARX25R204SA20S	20	2.5	4	9.23°	2.5	15.38	35	39
	ARX25R224M10A30	22	2.5	4	7.94°	2.5	17.92	39	43
	ARX25R224SA20S	22	2.5	4	7.94°	2.5	17.92	39	43
	ARX30R224M10A30	22	3.0	4	11.13°	3.0	15.25	38	43
	ARX30R224SA20S	22	3.0	4	11.13°	3.0	15.25	38	43
	ARX30R254M12A35	25	3.0	4	9.01°	3.0	18.92	44	49
	ARX30R254SA20S	25	3.0	4	9.01°	3.0	18.92	44	49
	ARX25R255M12A35	25	2.5	5	6.57°	2.5	21.71	45	49
	ARX25R255SA20S	25	2.5	5	6.57°	2.5	21.71	45	49

*1 RMPX : Max.Ramping Angle

*2 APMX : Max. Depth of Cut

M

INDEXABLE MILLING

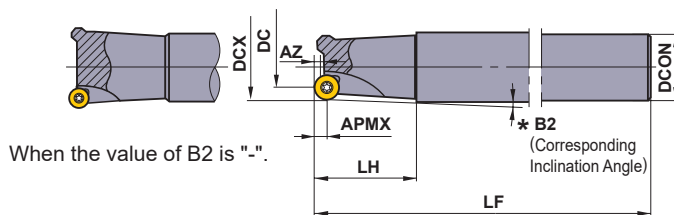
INDEXABLE MILLING

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 "-".

- 11° positive insert.
- Round shape insert with a strong cutting edge.
- Wide range of tools available.
- Suitable for mould machining.

*Please allow for an inclination angle of B2+1°

SHANK TYPE

Right hand tool holder only.

Cutting Edge R (APMX)	Type	Order Number	Stock	Number of Teeth	Dimensions (mm)							* Clamp Screw	Wrench	Insert	
					DCX	DC	LF	DCON	LH	AZ	B2				
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

Cutting Edge R (APMX)	Type	Order Number	Stock	Number of Teeth	Dimensions (mm)							 *		 	
					DCX	DC	LF	DCON	LH	AZ	B2	APMX	Clamp Screw	Wrench	Insert
		R													
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		

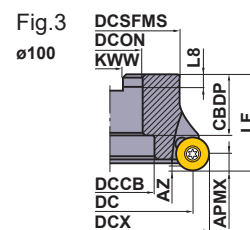
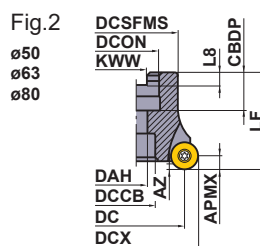
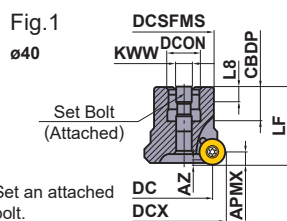
Note 1) R : Regular type L : Long type EL : Extra long type

* Clamp Torque (N · m) : TS43=3.5, TS54=7.5

M

INDEXABLE MILLING

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Right hand tool holder only.

ARBOR TYPE

GAMP:-7°—+5° GAMF:-15°—0°

Cutting Edge R (APMX)	Order Number	Stock R	Number of Teeth	Dimensions (mm)										WT* (kg)	Max. Depth of Cut (mm)		Fig.
				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	—	10.4	6.3	0.5	6	4	2
	BRP6PR05004B	●	4	50	37.8	43.1	63	22.225	29	11	—	8.4	5	0.5	6	4	2
	BRP6P-063A05R	●	5	63	50.8	56.1	50	22	20	11	—	10.4	6.3	0.7	6	4	2
	BRP6PR06305B	●	5	63	50.8	56.1	63	22.225	29	11	—	8.4	5	0.7	6	4	2
	BRP6PR08006C	●	6	80	67.8	72.8	50	25.4	26	13	—	9.5	6	1.2	6	4	2
8	BRP8P-063A04R	●	4	63	46.8	54.5	50	22	20	11	—	10.4	6.3	0.7	8	5.5	2
	BRP8PR06304B	●	4	63	46.8	54.5	63	22.225	29	11	—	8.4	5	0.7	8	5.5	2
	BRP8PR08005C	●	5	80	63.8	70.9	50	25.4	26	13	—	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

* WT : Tool Weight

SPARE PARTS

Tool Holder Number	 *			
	Clamp Screw	Wrench	Set Bolt	Insert
BRP6P-040A03R	TS43	TKY15D	HDS08030	①RPMW1204M0 ②RPMT1204M0E-JS
BRP6P-050A04R BRP6P-R08006C	TS43	TKY15D	—	
BRP8P	TS54	TKY25D	—	

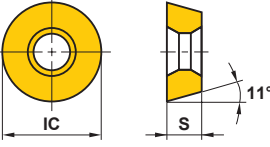
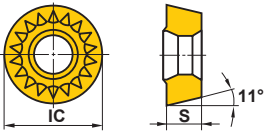
* Clamp Torque (N • m) : TS43=3.5, TS54=7.5

M

INDEXABLE MILLING

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

INSERTS

Work Material	P	Steel	●	●			●	●	Cutting Conditions (Guide) :	
	M	Stainless Steel	●	●			●	●		
	K	Cast Iron		●				●		
	S	Heat-resistant Alloy, Titanium Alloy		●				●		
	H	Hardened Steel	●							
Shape	Order Number	Class	Honing	Coated		Cermet	Carbide	Dimensions (mm)		Geometry
				F7030	VP15TF			IC	S	
						NX4545	UT120T			
	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	

M

INDEXABLE MILLING

INDEXABLE MILLING

RECOMMENDED CUTTING CONDITIONS

■ CUTTING SPEED (m/min)

	Work 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)

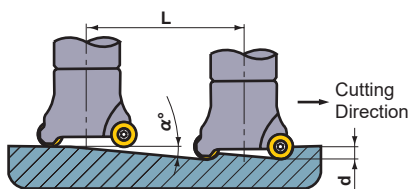
Note 1) Cutting speeds shown in bold type are for the recommended first choice grades.

■ 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.

$$L = \frac{d}{\tan \alpha} \text{ (mm)}$$

Type	Cutting Edge Diameter (φ)	Max. Ramping Angle RMPX	tan α	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

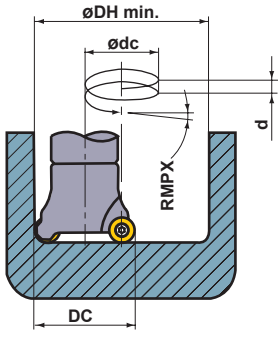
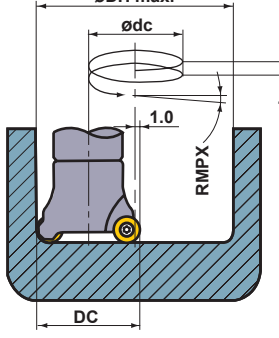
* “L” value is approximate rounded value.

M

INDEXABLE MILLING

HELICAL DRILLING

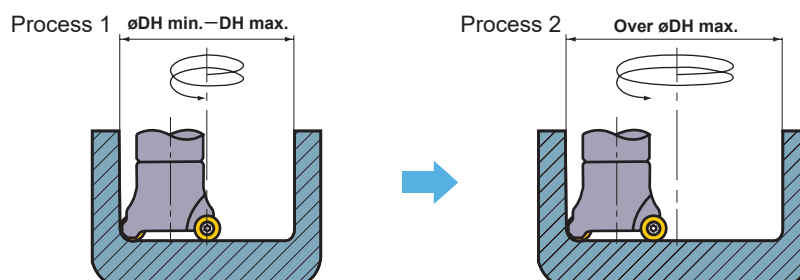
RELATIONSHIP BETWEEN HOLE DIAMETER AND DEPTH OF CUT

Type	Cutting Edge Diameter DC (mm)	Minimum Hole Diameter							Maximum Hole Diameter						
															
		*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.



INDEXABLE MILLING

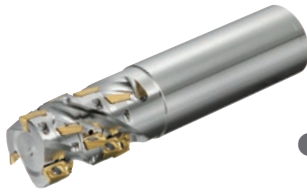
DEEP SHOULDER MILLING



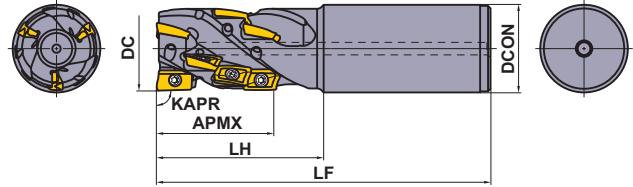
APX3000 NEW

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)	Insert Type
		R				DCON	LF	LH			
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 $RE \geq 2.4\text{mm}$, machining of the holder is required as shown on page M204.

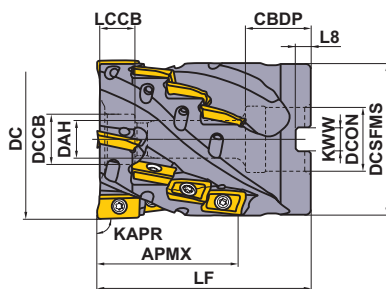
Note 2) Corner radius RE 0.8mm is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).

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



Right hand tool holder only.

SHELL TYPE

With Coolant Hole

KAPR: 90°
GAMP: +12° GAMF: +6°

DC	Set Bolt	Geometry
40	HSC08040	
50	HSC10045	

DC (mm)	Order Number	Stock	Number of Flutes	Total	Dimensions(mm)		WT (kg)	APMX (mm)	 Insert Type
		R			LF	DCON			
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 $RE \geq 2.4\text{mm}$, machining of the holder is required as shown on page M204.

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, 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

M

INDEXABLE MILLING

INDEXABLE MILLING

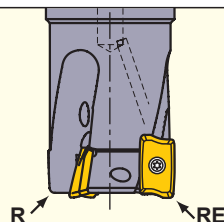
INSERTS

Work Material	P	Steels																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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* Corner radius RE is different from the work material of R shape depending on the axial rake angle of the body.

Note on Use of Inserts with Large Corner Radii

When using inserts with corner radius $RE \geq R2.4\text{mm}$, please machine the holder with a radius form as shown on the right table.



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

R : Holder End Radius
RE : Insert Corner Radius

M

INDEXABLE MILLING

RECOMMENDED CUTTING CONDITIONS

Cutting Speed

(mm)

Work Material		Insert				ae		
		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

(mm)

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

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

M

INDEXABLE MILLING

INDEXABLE MILLING

DEEP SHOULDER MILLING



APX4000

LONG CUTTING EDGE



Steel



Stainless Steel



Cast Iron



N



Heat Resistant Alloy



H



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

Fig.1

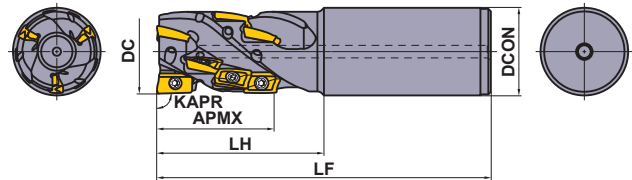
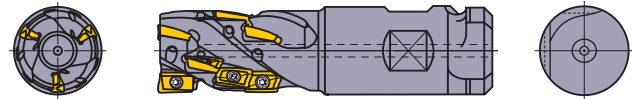


Fig.2



Right hand tool holder only.

SHANK TYPE

KAPR : 90°
With Coolant Hole

DC (mm)	Order Number	Stock R	Number of Flutes	Total	Dimensions(mm)			WT (kg)	APMX (mm)	Fig.	Insert Type
					DCON	LF	LH				
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 $RE \geq 3.2\text{mm}$, machining of the holder is required as shown on page M208.

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 cutting edge).

SPARE PARTS

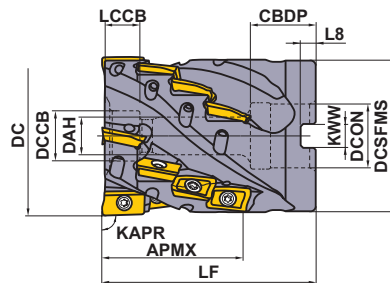
	*		
Clamp Screw		Wrench	Anti-seize Lubricant
TPS43		TIP15W	MK1KS

* Clamp Torque (N · m) : TPS43 = 4.0

M

INDEXABLE MILLING

● : Inventory maintained in Japan.



Right hand tool holder only.

DC	Set Bolt	Geometry
50	HSC10050	
63	HSC12070	

■ SHELL TYPE

With Coolant Hole

KAPR :90°
GAMP :+12° GAMF :+6°

DC (mm)	Order Number	Stock	Number of Flutes	Total	Dimensions(mm)		WT (kg)	APMX (mm)	 Insert Type
		R			LF	DCON			
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 $RE \geq 3.2\text{mm}$, machining of the holder is required as shown on page M208.

Note 2) Only corner radius RE 0.4mm and 0.8mm can be used for the peripheral cutting edges expect the bottom cutting edge (the end cutting edge).

Note 3) Coolant can be supplied from the end face of the centering location bore in the arbor. However, cannot be supplied from the set bolt.

Mounting Dimensions

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

M

INDEXABLE MILLING

INDEXABLE MILLING

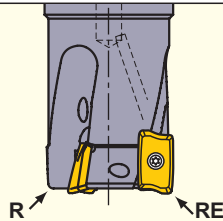
INSERTS

Work Material	P	Steels																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							</
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* Corner radius RE is different from the work material of R shape depending on the axial rake angle of the body.

Note on Use of Inserts with Large Corner Radii

When using inserts with corner radius $RE \geq R3.2\text{mm}$, please machine the holder with a radius form as shown on the right table.



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

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED

	Work Material	Hardness	Insert			Cutting Width a_e (mm)		
			Grade		Breaker	$\leq 0.15DC$	0.15–0.3DC	DC (Slot)
			1st Recommendation	2nd Recommendation				
P	Mild Steel	$\leq 180HB$	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	$\leq 270HB$	MP7130	VP15TF	M H	160(120–200)	120(100–140)	100(80–120)
K	Gray Cast Iron	$\leq 350MPa$	MC5020	VP15TF	H –	230(180–280)	190(140–240)	190(140–240)
	Ductile, Cast Iron	$\leq 800MPa$	MC5020	VP15TF	H –	190(140–220)	170(120–220)	170(120–220)
S	Titanium Alloy	$\leq 350HB$	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

Work Material		Characteristics	Cutting Width 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
	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 conditions are determined based on high rigidity machine and workpiece, where no vibration occurred. Please adjust processing conditions if the vibration is generated.

M

INDEXABLE MILLING

INDEXABLE MILLING

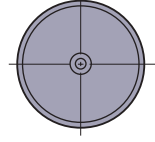
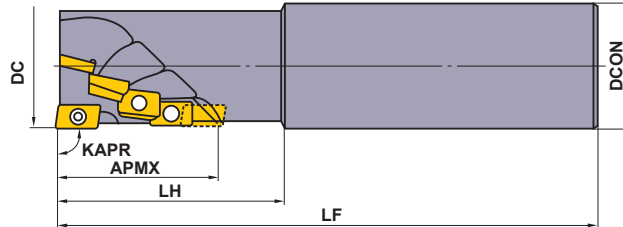
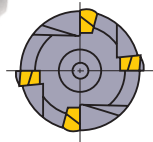
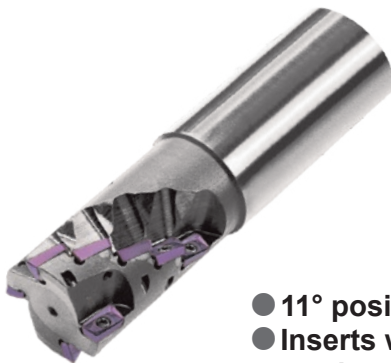
DEEP SHOULDER MILLING



BAP300

LONG CUTTING EDGE

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

KAPR : 90°

Right hand tool holder only.

Order Number	Stock	Number of Flutes	Total	Dimensions(mm)					* Clamp Screw	Wrench	Insert
	R			DC	LF	DCON	LH	APMX			
BAP300R2004ES20	▲	1	4	20	120	20	40	25	TS25	TKY08F	APG/MT1135 PDOR-M0/01/02
BAP300R2508ES25	▲	2	8	25	130	25	50	34	TS25	TKY08F	
BAP300R3212ES32	▲	2	12	32	140	32	60	43	TS25	TKY08F	
BAP300R4014ES42	▲	2	14	40	150	42	70	51	TS25	TKY08F	

* Clamp Torque (N · m) : TS25=1.0

INSERTS

Work Material	P	M	K	N	S	H	Cutting Conditions (Guide) :										Honing :
	Steels	Stainless Steels	Cast Irons	Non-ferrous Metal	Heat Resistant Alloys, Titanium Alloys	Hardened Steels	●	●	●	●	●	●	●	●	●	●	
Shape	Order Number		Class	Honing	Coated			Cermets		Carbide	Dimensions(mm)						Geometry
					F7030	VP15TF		NX2525	NX4545		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-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	

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

▲ : Product scheduled to be discontinued at the end of March 2020. APX3000 (M202) is alternative product.

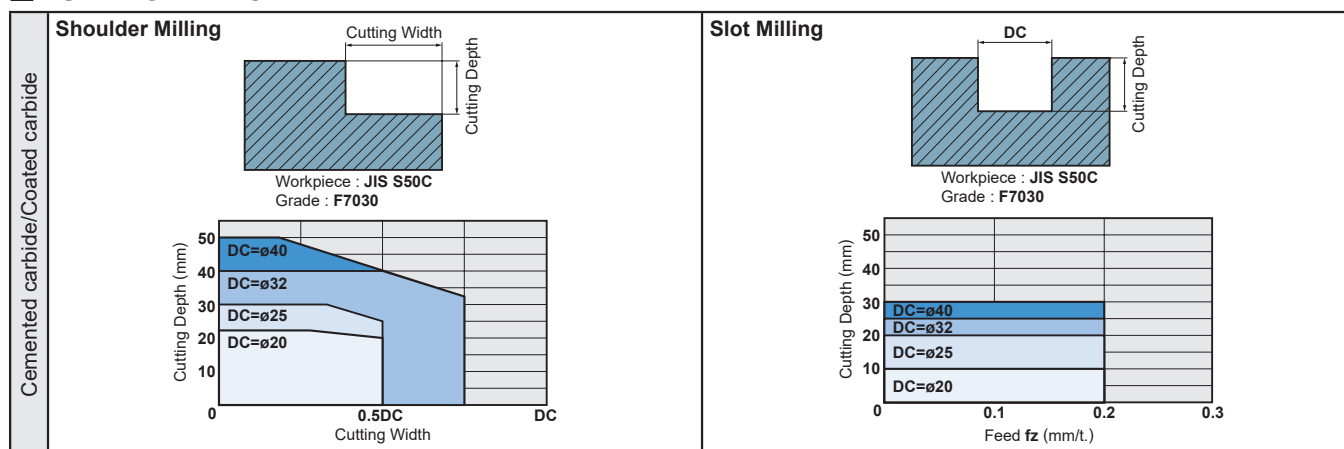
RECOMMENDED CUTTING CONDITIONS

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

CUTTING PERFORMANCE



Note 1) In each of the above graphs cutting performance is shown for carbon steel (JIS S50C).

In case of alloy steels, reduce the conditions by 20—30%.

Note 2) In the case of deep slot milling, air blow should be used.

Note 3) The diameter "DC" is taken from the tools peripheral cutting edge.

INDEXABLE MILLING

DEEP SHOULDER MILLING



DCCC

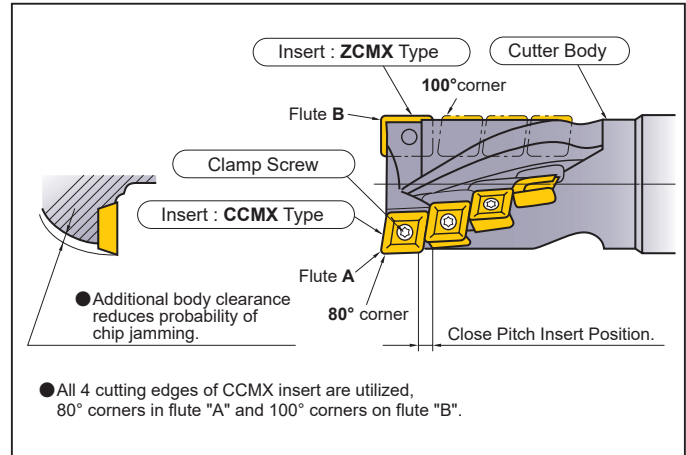
P	M	K	N	S	H
---	---	---	---	---	---

Steel Stainless Steel Cast Iron

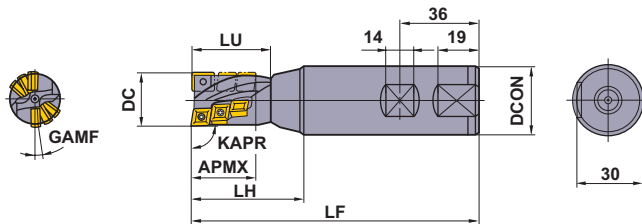


- Different helical flute angles prevents chattering.

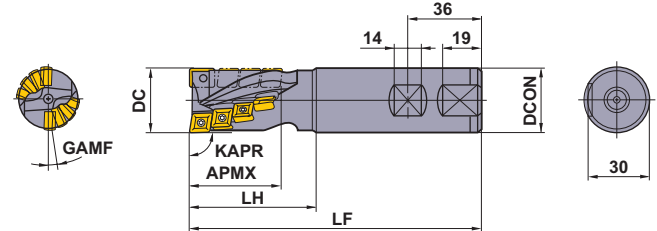
DESIGN FEATURES OF DCCC TYPE END MILL



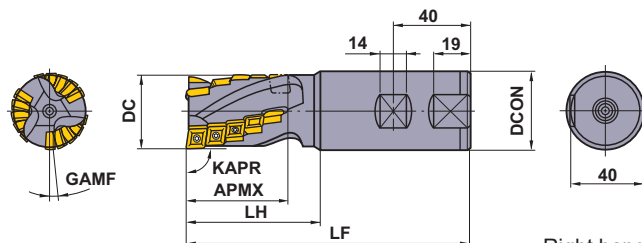
● φ25 2 flute



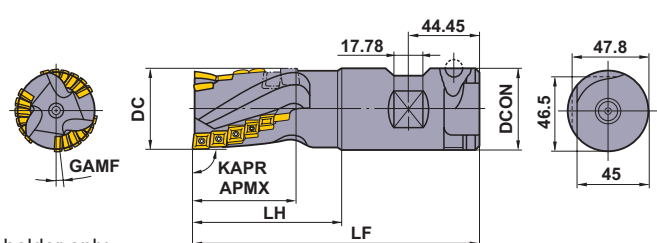
● φ32 2 flute



● φ40 3 flute



● φ50 (Combination Shank) 3 flute



Right hand tool holder only.

M

SHANK TYPE

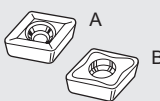
KAPR : 90°

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

* WT : Tools Weight (Kg)

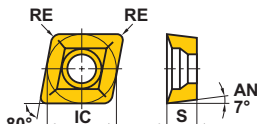
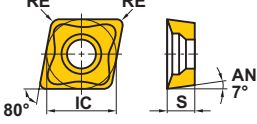
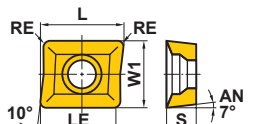
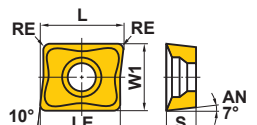
● : Inventory maintained in Japan. (10 inserts in one case)

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

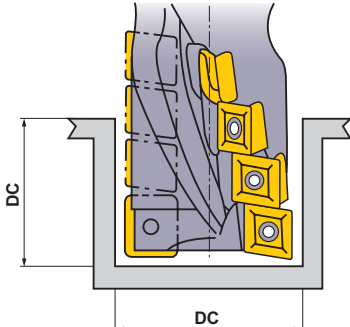
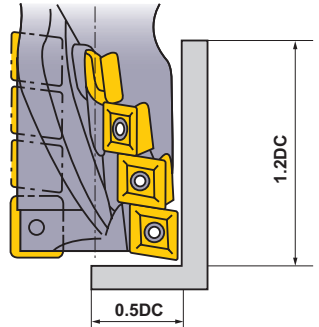
INSERTS

Work Material	P	Steel											Cutting Conditions (Guide) :		
	M	Stainless Steel											● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting		
	K	Cast Iron											Honing : E : Round		
Shape	Order Number	Class	Honing	Coated				Carbide	Dimensions (mm)						Geometry
				F7030	VP15TF	UP20M	UT120T		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	

M

INDEXABLE MILLING

RECOMMENDED CUTTING CONDITIONS

Cutting Mode	A : Slot Milling (APMX Short Type)	B : Shoulder Milling (APMX Short Type)
		

Work 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	UT120T A	120 (100–140)	200 (180–220)	200 (180–220)	230 (200–250)	230 (200–250)
			UT120T B	120 (100–140)	230 (200–250)	230 (200–250)	260 (240–280)	260 (240–280)

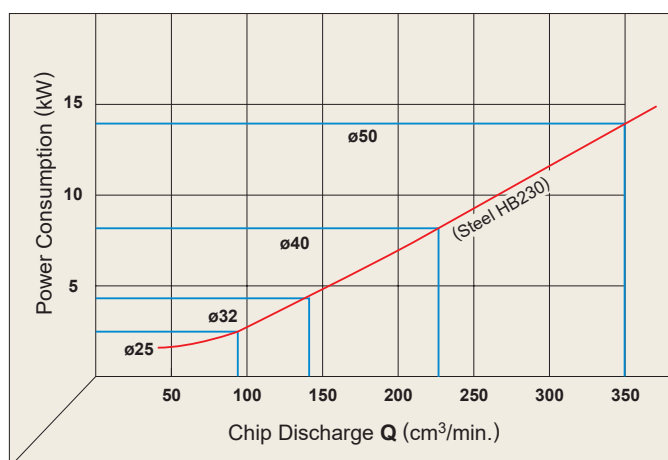
● Revolution (min⁻¹)=(1000 x Cutting Speed)÷(3.14 x DC)

● 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 (cm³/min.)=Table Feed x Depth of Cut x Cutting Width÷1000

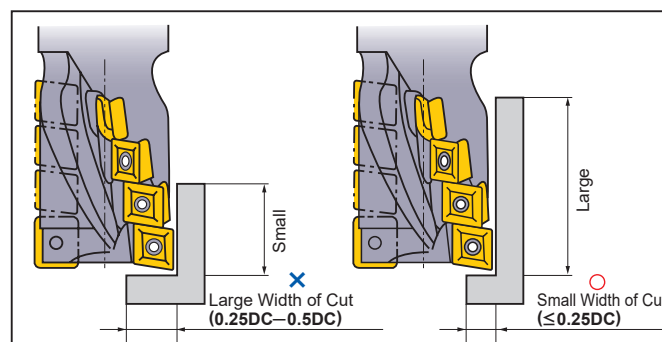


FOR USE OF APMX LONG TYPE

● 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



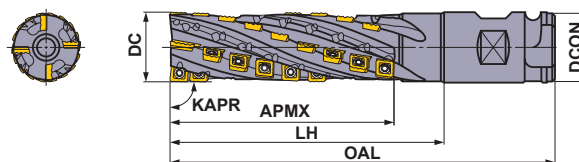
SPX

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

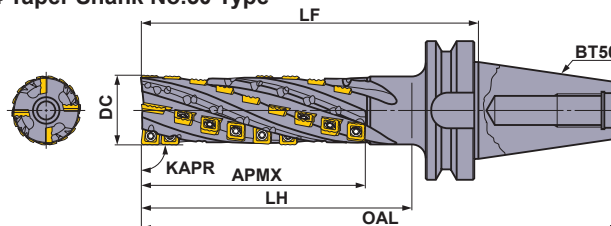


- Low cutting resistance due to the use of wavy inserts.
- Suitable for heavy cutting due to holder rigidity.

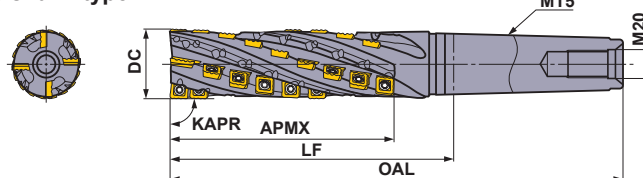
● Straight Shank Type (Combination Shank)



● 7/24 Taper Shank No.50 Type



● MT5 shank type



■ SHANK TYPE

KAPR :90°

Right hand tool holder only.

Type	Order Number	Stock R	Number of Teeth		Dimensions (mm)						Number of Insert		
											Bottom On-edge		
			Flutes	Total	DC	OAL	DCON	LH	LF	APMX	JPMX 190412-○○	MPMX 120412-○○	SPMX 120408-○○
Straight Shank (Combination Shank) Coarse Pitch	SPX4R05016WNES	●	4	16	50	180	50.8	100	—	72	2	2	12
	SPX4R05024WNS	●	4	24	50	220	50.8	140	—	110	2	2	20
	SPX4R05034WNM	●	4	34	50	270	50.8	190	—	157	2	2	30
7/24 Taper Shank (No. 50) Coarse Pitch	SPX4R05016BT50NES	●	4	16	50	249.8	—	100	148	72	2	2	12
	SPX4R05024BT50NS	●	4	24	50	289.8	—	140	188	110	2	2	20
	SPX4R05034BT50NM	●	4	34	50	339.8	—	190	238	157	2	2	30
	SPX4R06324BT50NS	●	4	24	63	289.8	—	140	188	110	2	2	20
	SPX4R06334BT50NM	●	4	34	63	339.8	—	190	238	157	2	2	30
	SPX4R06344BT50NL	●	4	44	63	389.8	—	240	288	205	2	2	40
	SPX4R06356BT50NX	●	4	56	63	439.8	—	290	338	261	2	2	52
MT5 shank type	SPX4R05024MT5NS	●	4	24	50	279.5	—	—	150	110	2	2	20
	SPX4R05034MT5NM	●	4	34	50	329.5	—	—	200	157	2	2	30

M

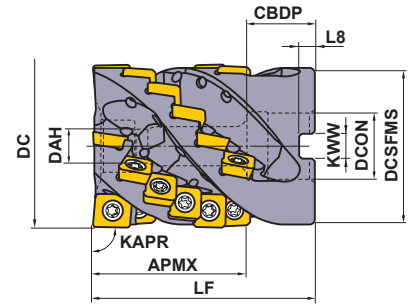
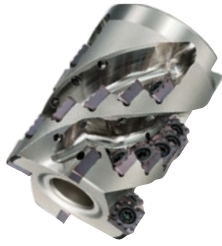
INDEXABLE MILLING

● : Inventory maintained in Japan.

SPARE PARTS > Q001
TECHNICAL DATA > R001

M215

INDEXABLE MILLING



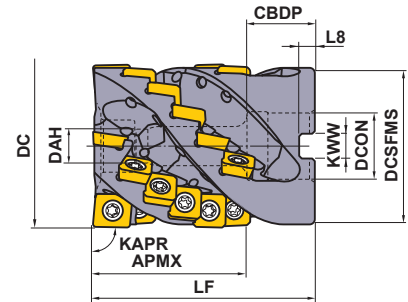
Right hand tool holder only.

Cutter Diameter DC	Set Bolt	Geometry
φ63	HSC12070	
φ80	16065	

■ SHELL TYPE KAPR :90°

Order Number	Stock	Number of Teeth		Dimensions (mm)									Number of Insert		
													Bottom On-edge A	Bottom On-edge B	Peripheral
	R	Flutes	Total	DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	APMX	JPMX 140412-00	MPMX 120412-00	SPMX 120408-00
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 center-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	Set Bolt	Geometry
φ63	HSC12070	
φ80	16065	

■ SHELL TYPE KAPR :90°

Order Number	Stock	Number of Teeth		Dimensions (mm)									Number of Insert		
													Bottom On-edge A	Bottom On-edge B	Peripheral
	R	Flutes	Total	DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	APMX	JPMX 140412-00	MPMX 120412-00	SPMX 120408-00
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 center-thru or side-thru arbors can't be used.

SPARE PARTS

Tool Holder Number						
	Clamp Screw	Wrench	Anti-seize Lubricant	Insert		
SPX	TS55	TKY25D	MK1KS	Bottom On-edge A JPMX140412-WH	Bottom On-edge B MPMX120412-WH	Peripheral SPMX120408-WH
				JPMX140412-JM	MPMX120412-JM	SPMX120408-JM

* Clamp Torque (N · m) : TS55=7.5

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

INSERTS

Work Material		P	Steel	●		●		Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting					
		M	Stainless Steel	●		●							
		K	Cast Iron	✖		✖							
		S	Heat-resistant Alloy, Titanium Alloy	●		✖							
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.

M

INDEXABLE MILLING

RECOMMENDED CUTTING CONDITIONS (SHANK TYPE)

■ CUTTING CONDITIONS FOR SHOULDER MILLING

Work Material		Hardness	Grade Breaker	Cutting Speed vc (m/min)	Cutting Width : ae (mm) Feed per Tooth : fz (mm/t.)								
					φ 50 (the last letter of order number for cutter body)			φ 63 (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 conditions are determined based on high rigidity machine and workpiece, where no vibration occurred. Please adjust processing conditions if the vibration is generated.

Note 2) If the cutting angle between the tool and workpiece exceeds 90° when machining corners, Reduce the cutting speed and table feed by 10-20% and ae by 50%. Also if possible, set a radius cutting path for corners.

■ SLOT MILLING

Work Material		Hardness	Grade Breaker	Cutting Speed vc (m/min)	Depth of Cut : ap : (mm) Feed per Tooth : fz (mm/t.)								
					φ 50 (the last letter of order number for cutter body)				φ 63 (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 conditions are determined based on high rigidity machine and workpiece, where no vibration occurred. Please adjust processing conditions if the vibration is generated.

Note 2) For slotting, please use high rigidity tools such as SPX4R05016WNE5/BT50NE5.

RECOMMENDED CUTTING CONDITIONS (SHELL TYPE)

■ SHOULDER MILLING

	Work 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 processing conditions if the vibration is generated.

■ SLOT MILLING

	Work 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 processing conditions if the vibration is generated.

M

INDEXABLE MILLING

INDEXABLE MILLING

DEEP SHOULDER MILLING

<CUTTING FOR TITANIUM ALLOY>



VFX5

P

M

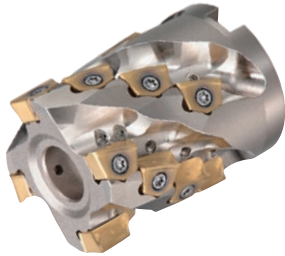
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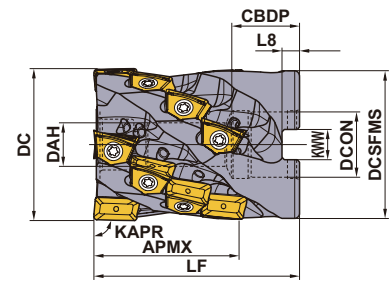
S

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

KAPR :90°

Order Number	Stock	Number of Flutes	Total	Dimensions (mm)								APMX (mm)	WT(kg)
				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

M

INDEXABLE MILLING

● : Inventory maintained in Japan.

SPARE PARTS

Order Number	 *2				 *3				Number of Insert	
	Clamp Screw	Number	Seal Washer	Wrench	Coolant Nozzle	Number	Anti-seize Lubricant	Set Bolt	End Cutting Edge	Peripheral*1 Cutting Edge
									XNMU1607 ○○R○○	XNMU1607 08R○○
VFX5-040A03A026R	TS352	6	W8-S1	TKY10D	HSD04004H08	9	MK1KS	HSC08040	3	3
VFX5-040A03A038R	TS352	9	W8-S1	TKY10D	HSD04004H08	12	MK1KS	HSC08050	3	6
VFX5-050X03A026R	TS352	6	W12-S1	TKY10D	HSD04004H08	9	MK1KS	HSC12035	3	3
VFX5-050X03A038R	TS352	9	W12-S1	TKY10D	HSD04004H08	12	MK1KS	HSC12045	3	6
VFX5-050A04A026R	TS352	8	W10-S1	TKY10D	HSD04004H08	12	MK1KS	HSC10035	4	4
VFX5-050A04A038R	TS352	12	W10-S1	TKY10D	HSD04004H08	16	MK1KS	HSC10045	4	8
VFX5-050X04A038R	TS352	12	W12-S1	TKY10D	HSD04004H08	16	MK1KS	HSC12045	4	8
VFX5-050A04A050R	TS352	16	W10-S1	TKY10D	HSD04004H08	20	MK1KS	HSC10055	4	12
VFX5-063A05A026R	TS352	10	W12-S1	TKY10D	HSD04004H08	15	MK1KS	HSC12045	5	5
VFX5-063A05A063R	TS352	25	W12-S1	TKY10D	HSD04004H08	30	MK1KS	HSC12070	5	20
VFX5-080A06A075R	TS352	36	W16-S1	TKY10D	HSD04004H08	42	MK1KS	HSC16080	6	30

*1 Only corner radius 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

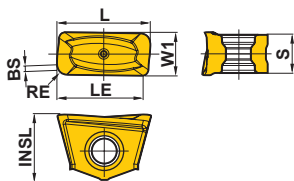
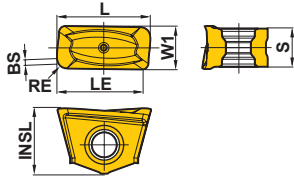
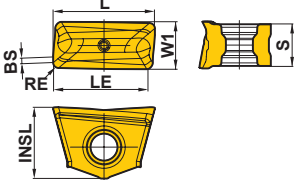
* Clamp Torque (N · m) : HSD0400H○○=1.5

*4 The part number for a blank screw without a through nozzle is HSS04004.

*5 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

INSERTS

Work Material	S	Heat-resistant Alloy, Titanium Alloy	✱			Cutting Conditions (Guide) :							
						● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting							
Shape	Order Number	Stock			Dimensions (mm)						Geometry		
		Coated			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

RECOMMENDED CUTTING CONDITIONS

■ VFX5

Work 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 (cm³/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 $ae = \text{tool diameter} \times 20\%$ is assumed to be 100 when shoulder cutting.

Note 4) The maximum depth of cut ($apmax$) varies according to the machine rigidity and power.

INDEXABLE MILLING

DEEP SHOULDER MILLING

<CUTTING FOR TITANIUM ALLOY>



VFX6

P

M

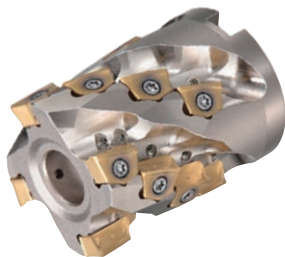
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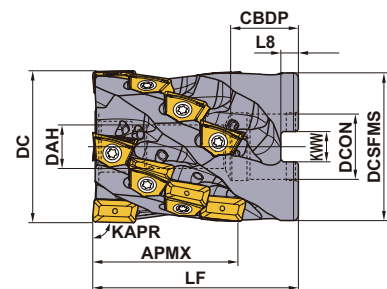
S

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

KAPR :90°

Order Number	Stock	Number of Flutes	Total	Dimensions (mm)								APMX (mm)	WT(kg)
				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

M

INDEXABLE MILLING

● : Inventory maintained in Japan.

SPARE PARTS

Order Number	 *2				 *3			Number of Insert		
	Clamp Screw	Number	Seal Washer	Wrench	Coolant Nozzle	Number	Anti-seize Lubricant	Set Bolt	End Cutting Edge	Peripheral *1
									XNMU1909 	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

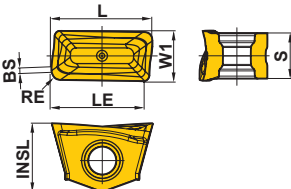
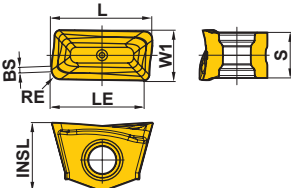
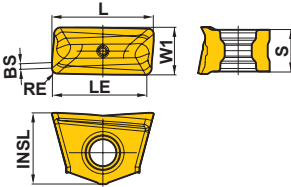
*4 The part number for a blank screw without a through nozzle is HSS04004.

*5 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

INDEXABLE MILLING

INSERTS

Work 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

RECOMMENDED CUTTING CONDITIONS

■ VFX6

Work 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	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-6Al-4V)	φ63	4	LS	25	126	60	0.08	40	153	7.0	527	30
			4	MS	25	126	38	0.08	40	92	4.0	303	50
			4	MS	30	152	60	0.10	61	92	3.8	241	70
			4	HS	30	152	60	0.10	61	46	2.1	133	80
		φ80	5	LS	25	99	75	0.08	40	239	10.8	1038	30
			5	MS	25	99	75	0.08	40	143	6.2	597	50
			5	MS	30	119	75	0.10	60	143	5.9	475	70
			5	HS	30	119	75	0.10	60	72	3.3	263	80
		φ100	6	LS	25	80	90	0.08	38	344	15.3	1841	30
			6	MS	25	80	90	0.08	38	206	8.8	1059	50
			6	MS	30	95	90	0.10	57	206	8.4	844	70
			6	HS	30	95	90	0.10	57	103	4.7	466	80
	Titanium Alloy (Ti-5Al-5V-5Mo-3Cr)	φ63	4	LS	25	126	60	0.08	40	153	7.0	527	30
			4	MS	25	126	38	0.08	40	92	4.0	303	50
			4	MS	30	152	60	0.10	61	92	3.8	241	70
			4	HS	30	152	60	0.10	61	46	2.1	133	80
		φ80	5	LS	25	99	75	0.08	40	239	10.8	1038	30
			5	MS	25	99	75	0.08	40	143	6.2	597	50
			5	MS	30	119	75	0.10	60	143	5.9	475	70
			5	HS	30	119	75	0.10	60	72	3.3	263	80
		φ100	6	LS	25	80	90	0.08	38	344	15.3	1841	30
			6	MS	25	80	90	0.08	38	206	8.8	1059	50
			6	MS	30	95	90	0.10	57	206	8.4	844	70
			6	HS	30	95	90	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 $ae = \text{tool diameter} \times 20\%$ 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

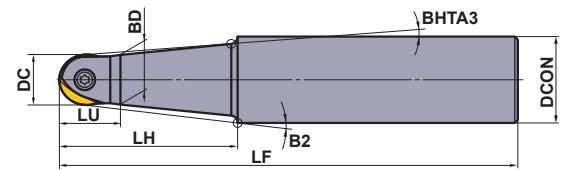


Fig.2

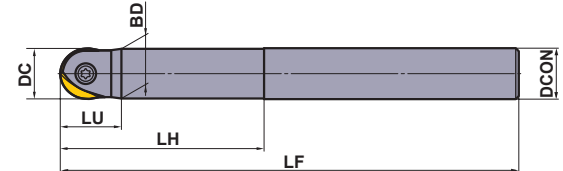
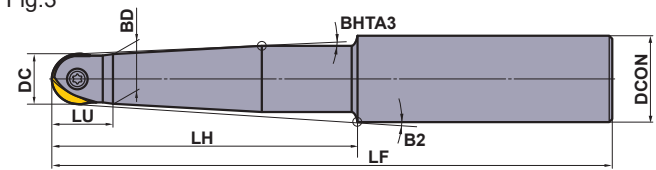


Fig.3



Right hand tool holder only.

STEEL SHANK TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)								Fig.	*1	①	②	Insert
				RE *2	DC	DCON	LF	BD	LH	LU	B2	BHTA3				
Standard	SRFH10S12M	●	1	5	10	12	110	9.5	40	13	1.63°	1.5°	1	RS3008T	①TKY08D	SRFT10 SRBT10
	SRFH12S16M	●	1	6	12	16	120	11.5	50	15	2.6°	1.5°	1	RS3510T	①TKY10D	SRFT12 SRBT12
	SRFH16S20M	●	1	8	16	20	130	15.5	50	20	2.73°	1.5°	1	RS4015T	②TKY15T	SRFT16 SRBT16
	SRFH20S25M	●	1	10	20	25	150	19.5	70	24	2.38°	1.5°	1	RS5020T	②TKY20T	SRFT20 SRBT20
	SRFH25S32M	●	1	12.5	25	32	180	24.5	80	30	2.97°	1.5°	1	RS6025T	②TKY25T	SRFT25 SRBT25
	SRFH30S32M	●	1	15	30	32	200	29.5	100	35	—	—	2	RS8030T	②TKY30T	SRFT30 SRBT30
	SRFH32S32M	●	1	16	32	32	200	31.5	100	35	—	—	2	RS8030T	②TKY30T	SRFT32 SRBT32
Semi-long	SRFH10S12L	●	1	5	10	12	150	9.5	60	13	1.5°	1.5°	1	RS3008T	①TKY08D	SRFT10 SRBT10
	SRFH12S16L	●	1	6	12	16	160	11.5	70	15	1.78°	1.5°	1	RS3510T	①TKY10D	SRFT12 SRBT12
	SRFH16S20L	●	1	8	16	20	160	15.5	70	20	1.85°	1.5°	1	RS4015T	②TKY15T	SRFT16 SRBT16
	SRFH20S25L	●	1	10	20	25	180	19.5	80	24	2.05°	1.5°	1	RS5020T	②TKY20T	SRFT20 SRBT20
	SRFH20S20L80	●	1	10	20	20	180	19.5	80	24	—	—	2	RS5020T	②TKY20T	SRFT20 SRBT20
	SRFH25S32L	●	1	12.5	25	32	200	24.5	100	30	2.28°	1.5°	1	RS6025T	②TKY25T	SRFT25 SRBT25
	SRFH25S25L100	●	1	12.5	25	25	200	24.5	100	30	—	—	2	RS6025T	②TKY25T	SRFT25 SRBT25
Long	SRFH30S32L	●	1	15	30	32	230	29.5	130	35	—	—	2	RS8030T	②TKY30T	SRFT30 SRBT30
	SRFH20S25E	●	1	10	20	25	220	19.5	120	24	1.5°	1.5°	3	RS5020T	②TKY20T	SRFT20 SRBT20
	SRFH20S20E120	●	1	10	20	20	220	19.5	120	24	—	—	2	RS5020T	②TKY20T	SRFT20 SRBT20
	SRFH25S32E	●	1	12.5	25	32	250	24.5	150	30	1.5°	1.5°	3	RS6025T	②TKY25T	SRFT25 SRBT25
	SRFH25S25E150	●	1	12.5	25	25	250	24.5	150	30	—	—	2	RS6025T	②TKY25T	SRFT25 SRBT25
	SRFH30S32E	●	1	15	30	32	300	29.5	200	35	—	—	2	RS8030T	②TKY30T	SRFT30 SRBT30

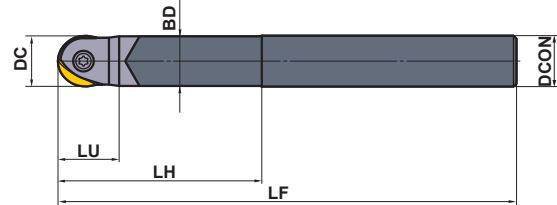
*1 Clamp Torque (N · m) : RS3008T=1.5, RS3510T=2.5, RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0

*2 RE is shown for insert corner R.

● : Inventory maintained in Japan.



Fig.1



Right hand tool holder only.

CARBIDE SHANK TYPE

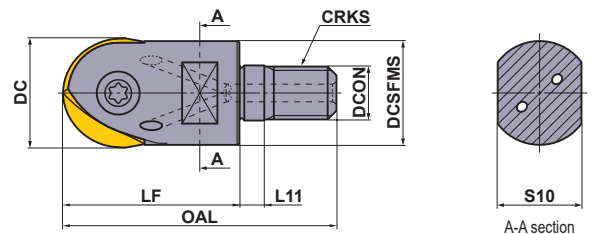
Type	Order Number	Stock	Number of Teeth	Dimensions (mm)							Fig.	*1	①	②	Insert
				RE*2	DC	DCON	LF	BD	LH	LU					
Standard	SRFH10S10MW	●	1	5	10	10	110	9.5	40	13	1	RS3008T	①TKY08D		SRFT10 SRBT10
	SRFH12S12MW	●	1	6	12	12	120	11.5	50	15	1	RS3510T	①TKY10D		SRFT12 SRBT12
	SRFH16S16MW	●	1	8	16	16	130	15.5	50	20	1	RS4015T	②TKY15T		SRFT16 SRBT16
	SRFH20S20MW	●	1	10	20	20	180	19.5	80	24	1	RS5020T	②TKY20T		SRFT20 SRBT20
	SRFH25S25MW	●	1	12.5	25	25	200	24.5	100	30	1	RS6025T	②TKY25T		SRFT25 SRBT25
	SRFH30S32MW	●	1	15	30	32	230	29.5	130	35	1	RS8030T	②TKY30T		SRFT30 SRBT30
Long	SRFH10S10LW	●	1	5	10	10	150	9.5	60	13	1	RS3008T	①TKY08D		SRFT10 SRBT10
	SRFH12S12LW	●	1	6	12	12	160	11.5	70	15	1	RS3510T	①TKY10D		SRFT12 SRBT12
	SRFH16S16LW	●	1	8	16	16	160	15.5	70	20	1	RS4015T	②TKY15T		SRFT16 SRBT16
	SRFH16S16EW	●	1	8	16	16	200	15.5	110	20	1	RS4015T	②TKY15T		SRFT16 SRBT16
	SRFH20S20LW	●	1	10	20	20	250	19.5	150	24	1	RS5020T	②TKY20T		SRFT20 SRBT20
	SRFH25S25LW	●	1	12.5	25	25	300	24.5	200	30	1	RS6025T	②TKY25T		SRFT25 SRBT25
	SRFH30S32LW	●	1	15	30	32	350	29.5	250	35	1	RS8030T	②TKY30T		SRFT30 SRBT30
				16	32	32	351	29.5	251	36					SRFT32 SRBT32

Note 1) SRFH30S32MW and SRFH30S32LW tool body can use both inserts SRFT30 and SRFT32.

However, the overall length size LF is different 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)										*2	*1	①	②	Insert
				RE*2	DC	DCON	DCSFMS	OAL	LF	L11	S10	CRKS	WT (kg)					
SRFH16AM0830	●	○	1	8	16	8.5	14.9	48	30	6	10	8	0.1	RS4015T	TKY15T			SRFT16 SRBT16
SRFH20AM1035	●	○	1	10	20	10.5	18.4	54	35	6	14	10	0.1	RS5020T	TKY20T			SRFT20 SRBT20
SRFH25AM1240	●	○	1	12.5	25	12.5	23.5	62	40	6	19	12	0.1	RS6025T	TKY25T			SRFT25 SRBT25
SRFH30AM1645	●	○	1	15	30	17	28.1	68	45	6	24	16	0.2	RS8030T	TKY30T			SRFT30 SRBT30
				16	32	17	28.1	69	46	6	24	16	0.2					SRFT32 SRBT32

Note 1) SRFH30AM1645 tool body can use both inserts SRFT30 and SRFT32. However, the overall length size OAL is different respectively.

Note 2) For screw-in type arbors, refer to page M269.

*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.

*3 WT : Tool Weight

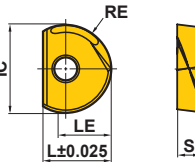
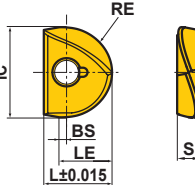
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SPARE PARTS	> Q001
TECHNICAL DATA	> R001

M

INDEXABLE MILLING

M229

INSERTS

Work Material	P	Steel	C F M K N H	● ● ●	Cutting Conditions :								
	M	Stainless Steel			● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting								
	K	Cast Iron											
	N	Non-ferrous Metal											
	H	Hardened Steel											
Shape	Order Number	Coated			Dimensions (mm)						Geometry		
		EP6120	VP15TF	MP8010	IC	RE		L	LE	BS		S	
						Corner R	Tolerance						
	SRBT10		●			10	5	±0.02	8.5	—	—	2.6	
	SRBT12		●			12	6	±0.02	10	—	—	3	
	SRBT16		●			16	8	±0.025	12	—	—	4	
	SRBT20		●			20	10	±0.025	15	—	—	5	
	SRBT25		●			25	12.5	±0.035	18.5	—	—	6	
	SRBT30		●			30	15	±0.035	22.5	—	—	7	
	SRBT32		●			32	16	±0.035	23.5	—	—	7	
	SRFT10	●	●	●		10	5	±0.06	8.5	5.5	0.5	2.6	
	SRFT12	●	●	●		12	6	±0.06	10	6.5	0.5	3	
	SRFT16	●	●	●		16	8	±0.06	12	9	1	4	
	SRFT20	●	●	●		20	10	±0.06	15	11	1	5	
	SRFT25	●	●	●		25	12.5	±0.06	18.5	13.5	1	6	
	SRFT30	●	●	●		30	15	±0.06	22.5	16	1	7	
	SRFT32	●	●	●		32	16	±0.06	23.5	17	1	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.



RECOMMENDED CUTTING CONDITIONS

	Work 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
K	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. Employing θ° ➡ Calculate cutting speed at point P.
(Cutting speed at the cutting depth border for oblique machining)

$$\text{Formula : Cutting Speed} = \frac{\pi \cdot DC \cdot \sin \theta \cdot n}{1000} \text{ (m/min)}$$

$$\theta^\circ = \cos^{-1} \left(\frac{DC - 2ap}{DC} \right) + 90 - \alpha$$

n : Spindle Speed (min⁻¹)

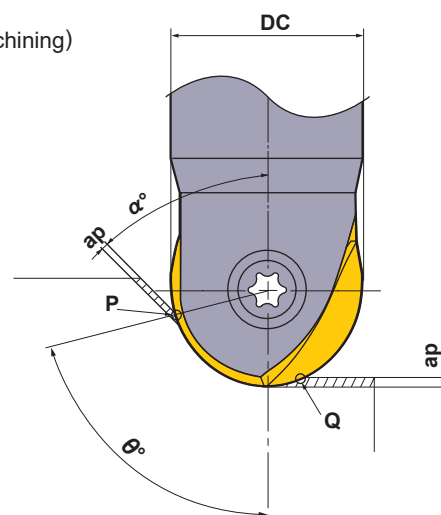
2. Employing ap ➡ Calculate cutting speed at point Q.
(Cutting speed at the cutting depth border)

$$\text{Formula : Cutting Speed} = \frac{2\pi n \sqrt{ap(DC - ap)}}{1000} \text{ (m/min)}$$

n : Spindle Speed (min⁻¹)

DC : Cutting Edge Diameter (mm)

ap : Depth of Cut (mm)



M

INDEXABLE MILLING

RADIUS END MILL



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

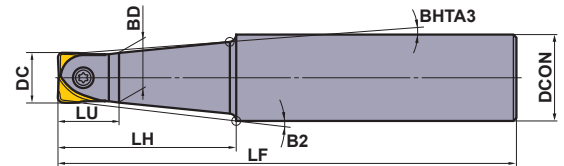


Fig.2

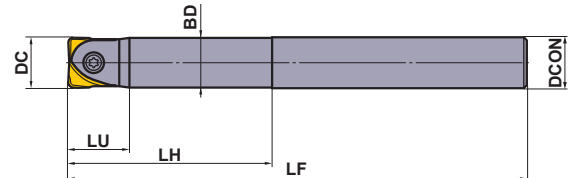
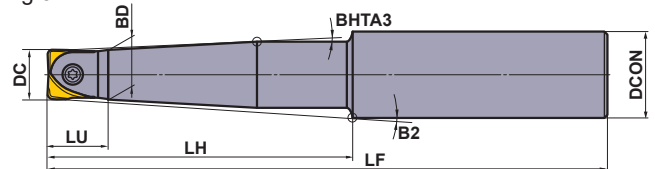


Fig.3



Right hand tool holder only.

STEEL SHANK TYPE

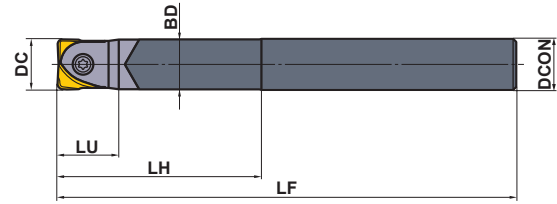
Type	Order Number	Stock	Number of Teeth	Dimensions (mm)								Fig.	Clamp Screw	Wrench	Insert
				DC	DCON	LF	BD	LH	LU	B2	BHTA3				
Standard	SRFH10S12M	●	1	10	12	110	9.5	40	13	1.63°	—	1	RS3008T	①TKY08D	SUFT10R
	SRFH12S16M	●	1	12	16	120	11.5	50	15	2.60°	—	1	RS3510T	①TKY10D	SUFT12R
	SRFH16S20M	●	1	16	20	130	15.5	50	20	2.73°	—	1	RS4015T	②TKY15T	SUFT16R
	SRFH20S25M	●	1	20	25	150	19.5	70	24	2.38°	1.5°	1	RS5020T	②TKY20T	SUFT20R
	SRFH25S32M	●	1	25	32	180	24.5	80	30	2.97°	1.5°	1	RS6025T	②TKY25T	SUFT25R
	SRFH30S32M	●	1	30	32	200	29.5	100	35	—	—	2	RS8030T	②TKY30T	SUFT30R
	SRFH32S32M	●	1	32	32	200	31.5	100	35	—	—	2	RS8030T	②TKY30T	SUFT32R
Semi-long	SRFH10S12L	●	1	10	12	150	9.5	60	13	1.5°	—	1	RS3008T	①TKY08D	SUFT10R
	SRFH12S16L	●	1	12	16	160	11.5	70	15	1.78°	—	1	RS3510T	①TKY10D	SUFT12R
	SRFH16S20L	●	1	16	20	160	15.5	70	20	1.85°	—	1	RS4015T	②TKY15T	SUFT16R
	SRFH20S25L	●	1	20	25	180	19.5	80	24	2.05°	1.5°	1	RS5020T	②TKY20T	SUFT20R
	SRFH20S20L80	●	1	20	20	180	19.5	80	24	—	—	2	RS5020T	②TKY20T	SUFT20R
	SRFH25S32L	●	1	25	32	200	24.5	100	30	2.28°	1.5°	1	RS6025T	②TKY25T	SUFT25R
	SRFH25S25L100	●	1	25	25	200	24.5	100	30	—	—	2	RS6025T	②TKY25T	SUFT25R
Long	SRFH30S32L	●	1	30	32	230	29.5	130	35	—	—	2	RS8030T	②TKY30T	SUFT30R
	SRFH20S25E	●	1	20	25	220	19.5	120	24	1.5°	1.5°	3	RS5020T	②TKY20T	SUFT20R
	SRFH20S20E120	●	1	20	20	220	19.5	120	24	—	—	2	RS5020T	②TKY20T	SUFT20R
	SRFH25S32E	●	1	25	32	250	24.5	150	30	1.5°	1.5°	3	RS6025T	②TKY25T	SUFT25R
	SRFH25S25E150	●	1	25	25	250	24.5	150	30	—	—	2	RS6025T	②TKY25T	SUFT25R
	SRFH30S32E	●	1	30	32	300	29.5	200	35	—	—	2	RS8030T	②TKY30T	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.



Fig.1



CARBIDE SHANK TYPE

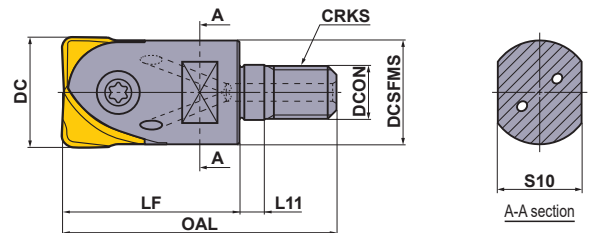
Right hand tool holder only.

Type	Order Number	Stock R	Number of Teeth	Dimensions (mm)						Fig.	* ① ②	Insert
				DC	DCON	LF	BD	LH	LU			
Standard	SRFH10S10MW	●	1	10	10	110	9.5	40	13	1	RS3008T	①TKY08D SUFT10R
	SRFH12S12MW	●	1	12	12	120	11.5	50	15	1	RS3510T	①TKY10D SUFT12R
	SRFH16S16MW	●	1	16	16	130	15.5	50	20	1	RS4015T	②TKY15T SUFT16R
	SRFH20S20MW	●	1	20	20	180	19.5	80	24	1	RS5020T	②TKY20T SUFT20R
	SRFH25S25MW	●	1	25	25	200	24.5	100	30	1	RS6025T	②TKY25T SUFT25R
	SRFH30S32MW	●	1	30	32	230	29.5	130	35	1	RS8030T	②TKY30T SUFT30R
Long	SRFH10S10LW	●	1	10	10	150	9.5	60	13	1	RS3008T	①TKY08D SUFT10R
	SRFH12S12LW	●	1	12	12	160	11.5	70	15	1	RS3510T	①TKY10D SUFT12R
	SRFH16S16LW	●	1	16	16	160	15.5	70	20	1	RS4015T	②TKY15T SUFT16R
	SRFH20S20LW	●	1	20	20	250	19.5	150	24	1	RS5020T	②TKY20T SUFT20R
	SRFH25S25LW	●	1	25	25	300	24.5	200	30	1	RS6025T	②TKY25T SUFT25R
	SRFH30S32LW	●	1	30	32	350	29.5	250	35	1	RS8030T	②TKY30T 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 size LF is different 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 R	Coolant Hole	Number of Teeth	Dimensions (mm)								*2 WT (kg)	*1 ① ②	Insert
				DC	DCON	DCSFMS	OAL	LF	L11	S10	CRKS			
SRFH16AM0830	●	○	1	16	8.5	14.9	48	30	6	10	8	0.1	RS4015T	TKY15T SUFT16R
SRFH20AM1035	●	○	1	20	10.5	18.4	54	35	6	14	10	0.1	RS5020T	TKY20T SUFT20R
SRFH25AM1240	●	○	1	25	12.5	23.5	62	40	6	19	12	0.1	RS6025T	TKY25T SUFT25R
SRFH30AM1645	●	○	1	30	17	28.1	68	45	6	24	16	0.2	RS8030T	TKY30T SUFT30R
				32	17	28.1	69	46	6	24	16			

Note 1) SRFH30AM1645 tool body can use both inserts SUFT30R and SUFT32R.

However, the overall length size OAL is different respectively.

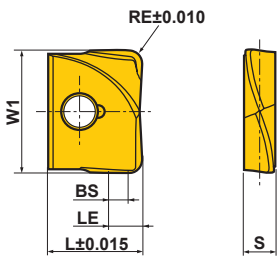
Note 2) For screw-in type arbors, refer to page M269.

*1 Clamp Torque (N · m) : RS4015T=3.3, RS5020T=5.0, RS6025T=7.5, RS8030T=10.0

*2 WT : Tool Weight

ARBORS	> M269
SPARE PARTS	> Q001
TECHNICAL DATA	> R001

INSERTS

Work Material	P	Steel					Cutting Conditions : ● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting					Geometry
	M	Stainless Steel										
	K	Cast Iron										
	H	Hardened Steel										
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. (2 inserts in one case)

RECOMMENDED CUTTING CONDITIONS

■ SHOULDER MILLING(When small width of cut.*)

	Work 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.*)

	Work 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 $n(\text{min}^{-1}) = 1000 \times \text{Cutting speed } vc \div \text{Diameter of cutting tool } DC \div 3.14$

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.

INDEXABLE MILLING

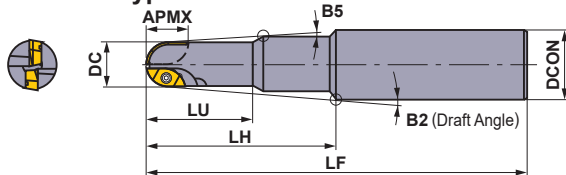
BALL NOSE END MILL

SRM2

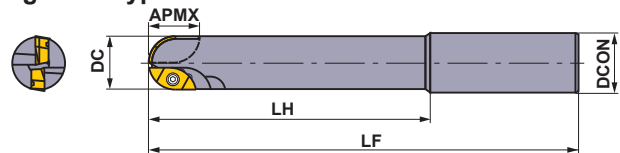


- Suitable for roughing to semi-finishing of small and medium moulds.
- High rigidity body design.
- Low resistance chipbreaker.
- Through coolant hole type.

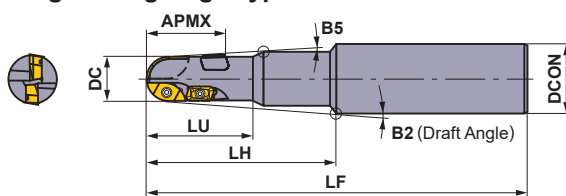
● Standard Type



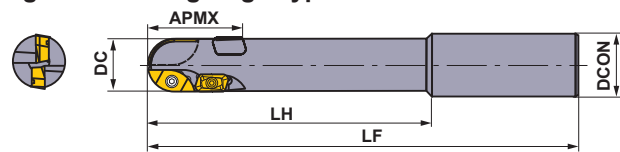
● Long Neck Type



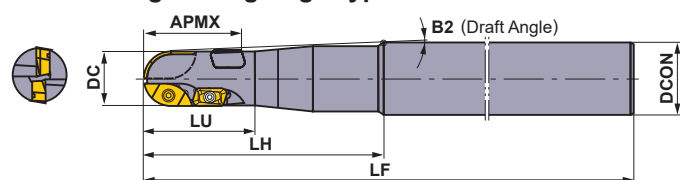
● Long Cutting Edge Type



● Long Neck Cutting Edge Type



● Extra Long Cutting Edge Type



Right hand tool holder only.

Type	Order Number	Stock R	Coolant Hole	Number of Teeth	Dimensions (mm)															
					*2 RE	DC	DCON	LF	LH	LU	APMX	B2	B5	Inner, Outer	Peripheral	Inner, Outer	Peripheral	Inner	Outer	Periphera
														Clamp	Screw	Wrench		Insert		
Standard	SRM2160SNM	●	—	2	8	16	20	130	50	25	12	2.8°	1.5°	TS25H	—	①TKY08D	—	SRG16C SRM16C-M	SRG16E SRM16E-M	—
	SRM2160SAM	●	○	2	8	16	20	130	50	25	12	2.8°	1.5°	TS25H	—	①TKY08D	—	SRG16C SRM16C-M	SRG16E SRM16E-M	—
	SRM2200SNM	●	—	2	10	20	25	150	70	35	14	2.45°	1.5°	TS32	—	①TKY08D	—	SRG20C SRM20C-M	SRG20E SRM20E-M	—
	SRM2200SAM	●	○	2	10	20	25	150	70	35	14	2.45°	1.5°	TS32	—	①TKY08D	—	SRG20C SRM20C-M	SRG20E SRM20E-M	—
	SRM2250SNM	●	—	2	12.5	25	32	180	80	40	19	3.22°	1.5°	TS43	—	②TKY15T	—	SRG25C SRM25C-M	SRG25E SRM25E-M	—
	SRM2250SAM	●	○	2	12.5	25	32	180	80	40	19	3.22°	1.5°	TS43	—	②TKY15T	—	SRG25C SRM25C-M	SRG25E SRM25E-M	—
	SRM2300SNM	●	—	2	15	30	32	200	100	50	24	0.73°	0.5°	TS55	—	②TKY25T	—	SRG30C SRM30C-M	SRG30E SRM30E-M	—
	SRM2300SAM	●	○	2	15	30	32	200	100	50	24	0.73°	0.5°	TS55	—	②TKY25T	—	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.

Type	Order Number	Stock R	Coolant Hole	Number of Teeth	Dimensions (mm)															
					*2 RE	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	①TKY08D	①TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-②
	SRM2200SAL	●	○	4	10	20	25	150	70	35	30	2.45°	1.5°	TS32	TS25	①TKY08D	①TKY08D	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	②TKY15T	③TKY08F	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	②TKY15T	③TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-②
	SRM2300SNL	●	—	4	15	30	32	200	100	50	44	0.73°	0.5°	TS55	TS43	②TKY25T	③TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-②
	SRM2300SAL	●	○	4	15	30	32	200	100	50	44	0.73°	0.5°	TS55	TS43	②TKY25T	③TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-②
Long Neck	SRM2160SNF	●	—	2	8	16	16	150	70	—	12	—	—	TS25H	—	①TKY08D	—	SRG16C SRM16C-M	SRG16E SRM16E-M	—
	SRM2160SAF	●	○	2	8	16	16	150	70	—	12	—	—	TS25H	—	①TKY08D	—	SRG16C SRM16C-M	SRG16E SRM16E-M	—
	SRM2200SNF	●	—	2	10	20	20	180	100	—	14	—	—	TS32	—	①TKY08D	—	SRG20C SRM20C-M	SRG20E SRM20E-M	—
	SRM2200SAF	●	○	2	10	20	20	180	100	—	14	—	—	TS32	—	①TKY08D	—	SRG20C SRM20C-M	SRG20E SRM20E-M	—
	SRM2250SNF	●	—	2	12.5	25	25	200	120	—	19	—	—	TS43	—	②TKY15T	—	SRG25C SRM25C-M	SRG25E SRM25E-M	—
	SRM2250SAF	●	○	2	12.5	25	25	200	120	—	19	—	—	TS43	—	②TKY15T	—	SRG25C SRM25C-M	SRG25E SRM25E-M	—
	SRM2300SNF	●	—	2	15	30	32	230	150	—	24	—	—	TS55	—	②TKY25T	—	SRG30C SRM30C-M	SRG30E SRM30E-M	—
	SRM2300SAF	●	○	2	15	30	32	230	150	—	24	—	—	TS55	—	②TKY25T	—	SRG30C SRM30C-M	SRG30E SRM30E-M	—
Long Neck Cutting Edge	SRM2200SNLF	●	—	4	10	20	20	180	100	—	30	—	—	TS32	TS25	①TKY08D	①TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-②
	SRM2200SALF	●	○	4	10	20	20	180	100	—	30	—	—	TS32	TS25	①TKY08D	①TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-②
	SRM2250SNLF	●	—	4	12.5	25	25	200	120	—	37	—	—	TS43	TS25	②TKY15T	③TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-②
	SRM2250SALF	●	○	4	12.5	25	25	200	120	—	37	—	—	TS43	TS25	②TKY15T	③TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-②
	SRM2300SNLF	●	—	4	15	30	32	230	150	—	44	—	—	TS55	TS43	②TKY25T	③TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-②
	SRM2300SALF	●	○	4	15	30	32	230	150	—	44	—	—	TS55	TS43	②TKY25T	③TKY15F	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	①TKY08D	①TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-②
	SRM2200SALL	●	○	4	10	20	25	250	120	35	30	1.5°	—	TS32	TS25	①TKY08D	①TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-②
	SRM2250SNLL	●	—	4	12.5	25	32	300	170	37	37	1.5°	—	TS43	TS25	②TKY15T	③TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-②
	SRM2250SALL	●	○	4	12.5	25	32	300	170	37	37	1.5°	—	TS43	TS25	②TKY15T	③TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-②
	SRM2300SNLL	●	—	4	15	30	32	350	100	50	44	1.5°	—	TS55	TS43	③TKY25T	③TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-②
	SRM2300SALL	●	○	4	15	30	32	350	100	50	44	1.5°	—	TS55	TS43	③TKY25T	③TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-②

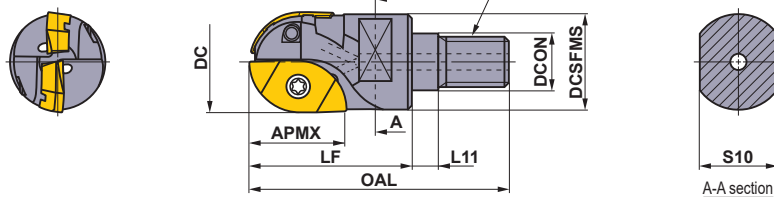
*1 Clamp Torque (N • m) : TS25H=1.7, TS25=1.0, TS32=2.0, TS43=3.5, TS55=7.5

*2 RE is shown for insert corner R.

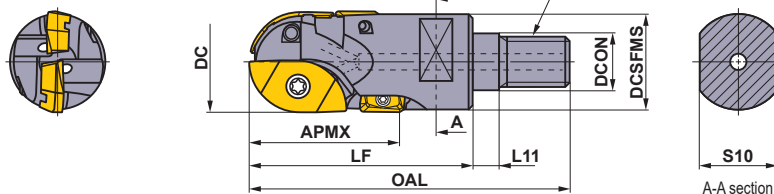
INDEXABLE MILLING



● Standard Type



● Long Cutting Edge Type



■ SCREW-IN TYPE

Right hand tool holder only.

Type	Order Number	Stock	Coolant Hole	Dimensions (mm)										*2 WT (kg)	*1 Inner, Outer Clamp Screw	*1 Peripheral Screw	① ② ③ Wrench	Inner	Outer	Peripheral
				RE	DC	DCON	DCSFMS	OAL	LF	L11	S10	CRKS	APMX							
Standard	SRM2160AM08S30	●	○	8	16	8.5	14.6	48	30	6	10	M8	12	0.1	TS25H	—	①TKY08D	SRG16C SRM16C-M	SRG16E SRM16E-M	—
	SRM2200AM10S35	●	○	10	20	10.5	18.6	54	35	6	14	M10	14	0.1	TS32	—	①TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	—
	SRM2250AM12S40	●	○	12.5	25	12.5	23.5	62	40	6	19	M12	19	0.2	TS43	—	②TKY15T	SRG25C SRM25C-M	SRG25E SRM25E-M	—
	SRM2300AM16S45	●	○	15	30	17	28.3	68	45	6	24	M16	24	0.2	TS55	—	②TKY25T	SRG30C SRM30C-M	SRG30E SRM30E-M	—
	SRM2320AM16S45	●	○	16	32	17	30.0	68	45	6	24	M16	28	0.2	TS55	—	②TKY25T	SRG32C SRM32C-M	SRG32E SRM32E-M	—
Long Cutting Edge	SRM2200AM10L45	●	○	10	20	10.5	18.6	64	45	6	14	M10	30	0.2	TS32	TS25	①TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-2
	SRM2250AM12L55	●	○	12.5	25	12.5	23.5	77	55	6	19	M12	37	0.3	TS43	TS25	②TKY15T ③TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-2
	SRM2300AM16L60	●	○	15	30	17	28.3	83	60	6	24	M16	44	0.3	TS55	TS43	②TKY25T ③TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-2
	SRM2320AM16L60	●	○	16	32	17	29.0	83	60	6	24	M16	44	0.3	TS55	TS43	②TKY25T ③TKY15F	SRG32C SRM32C-M	SRG32E SRM32E-M	APMT1604 PDER-2

Note 1) For screw-in type arbors, refer to page M269.

*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.

*3 WT : Tool Weight

INSERTS

Work Material		P	Steel										Cutting Conditions :											
		M	Stainless Steel										● : Stable Cutting	● : General Cutting	✱ : Unstable Cutting									
		K	Cast Iron																					
		S	Heat-resistant Alloy, Titanium Alloy																					
		H	Hardened Steel																					
Type	Shape	Order Number	Class	Coated				Dimensions (mm)							Geometry									
				F7030	MP6120	MP9120	VP15TF	RE	L	LE	W1	S	BS	AN		B9								
Inner		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		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		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		SRM16E-M	M		●	●	●	8	13.5	—	6.7	3.5	—	11°	—									
		SRM20E-M	M		●	●	●	10	15.5	—	8.5	4.6	—	9°	—									
		SRM25E-M	M		●	●	●	12.5	20.5	—	10.2	5.5	—	9°	—									
		SRM30E-M	M		●	●	●	15	25.2	—	12.2	7	—	9°	—									
		SRM32E-M	M		●	●	●	16	26.1	—	13.1	7	—	9°	—									
Peripheral	Strong Cutting Edge Type	APMT1135PDER-H2	M	●			●	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°	—									
★1																								

(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).

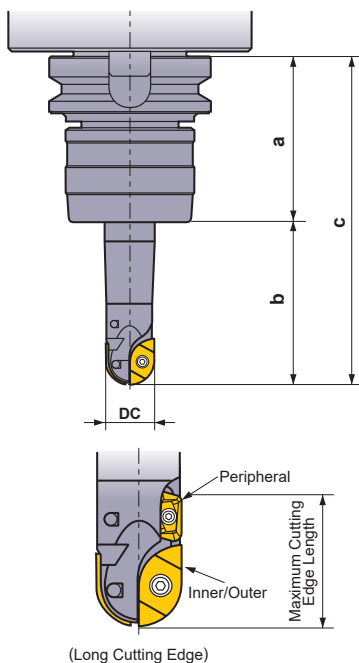
When cutting edge strength is particularly important, use the H breaker (APMT....PDER-H2).

M

INDEXABLE MILLING

RECOMMENDED CUTTING CONDITIONS

SRM2 Ø16—Ø32



Tool Overhang

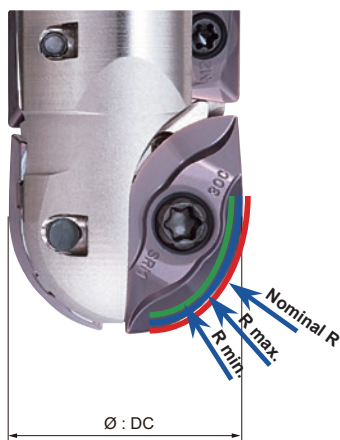
The recommended cutting conditions are chosen based on deflection, vibration and surface finish when using a BT50 arbor under the conditions below -"a", a length from a gauge line to the arbor end face and "b", neck length (tool overhang from the arbor).

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

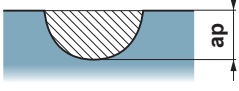
Cutting Edge Diameter DC	Nominal R	Tolerance	R min.	R max.
16	8	G	7.925	7.975
		M	7.910	7.970
20	10	G	9.925	9.975
		M	9.910	9.970
25	12.5	G	12.425	12.475
		M	12.410	12.470
30	15	G	14.925	14.975
		M	14.910	14.970

Dimensions with an insert mounted in the body

Cutting Edge Diameter DC	Tolerance	DC min.	DC max.
16	G	15.800	16.000
	M	15.770	15.990
20	G	19.800	20.000
	M	19.770	19.990
25	G	24.800	25.000
	M	24.770	24.990
30	G	29.800	30.000
	M	29.770	29.990

*M : Precision M class

SLOT MILLING

Cutting Mode	
	N : Revolution (min⁻¹) F : Table Feed (mm/min)

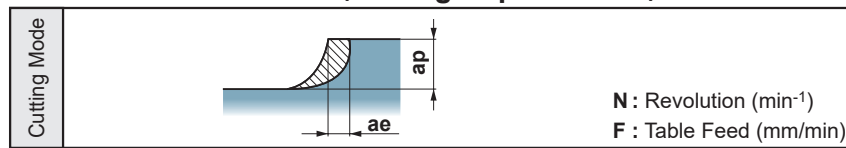
	Work Material	Hardness	Cutting Speed (m/min)	Insert Grade, Type	Holder Type	φ16			φ20			φ25			φ30		
						N	F	ap	N	F	ap	N	F	ap	N	F	ap
P	Carbon Steel Alloy Steel	180–280HB	160 (120–200)	MP6120 VP15TF Low Resistance Type	Standard	3183	382	6	2546	306	8	2037	489	12.5	1698	407	15
					Long Neck	3183	382	4	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

M

INDEXABLE MILLING

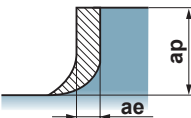
RECOMMENDED CUTTING CONDITIONS

■ SHOULDER MILLING (Cutting Depth : Small)



Work 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 burrs and welding due to chip jamming. For stainless steels, down-cutting (climb milling) is recommended.

	Work 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	—

M

INDEXABLE MILLING

INDEXABLE MILLING

BALL NOSE END MILL



SRM2 $\phi 40$ $\phi 50$

P

Steel

M

K

Cast Iron

N

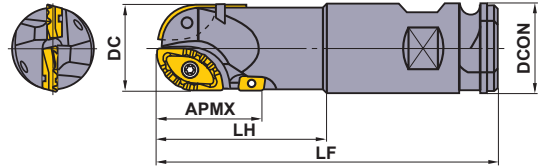
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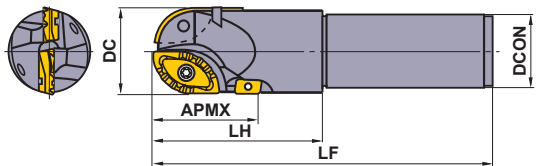


- Best for roughing of moulds.
- Low resistance chipbreaker.
- Highly rigid body.

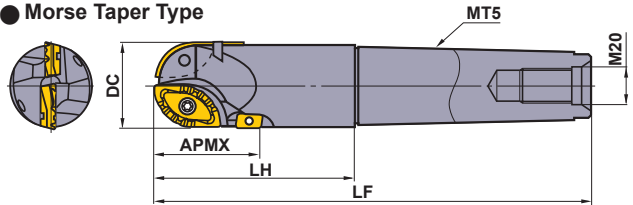
● Combination Type



● Straight Type



● Morse Taper Type



Right hand tool holder only.

Type		Order Number	Stock	Number of Flutes	Dimensions (mm)						 *1	 *1					
					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.

● : Inventory maintained in Japan. (10 inserts in one case)(Inserts with asterisk (*2) are available in 2 piece in one case)

INSERTS

Work Material		P	Steel	Cutting Conditions :													
		K	Cast Iron					● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting									
Type	Shape	Order Number	Class	Coated				Dimensions (mm)									
				F7030	VP15TF	VP20RT	VP30RT	RE	L	LE	W1	S	BS	AN	B9	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°	—		
Peripheral	Strong Cutting Edge Type	APMT1135PDER-H2	M	●	●			0.8	11.25	9	6.35	3.5	1.2	11°	—		
		APMT1604PDER-H2	M	●	●			0.8	11.71	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

Cutting Mode	A : Slot Milling	B : Shoulder Milling (Standard Type)	C : Shoulder Milling (Long Cutting Edge Type)

Work Material	Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t.)	Cutting Mode
P	Alloy Tool Steel	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	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	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	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	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	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

M

INDEXABLE MILLING

INDEXABLE MILLING

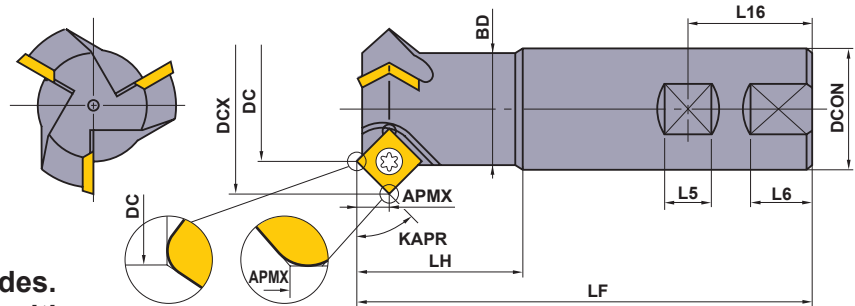
CHAMFER MILLING



CESP, CFSP, CGSP



- 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)										* Clamp Screw	① Wrench	Insert
			KAPR	DC	DCX	LF	DCON	BD	LH	L16	L5	L6	APMX		
CESPR081S20	●	1	60°	8	19.6	110	20	19.5	40	25	11	—	10.2	TS52	①TKY25R SPMW1203○○
CESPR161S20	●	1	60°	16	27.8	110	20	19.5	40	25	11	—	10.2	TS5	①TKY25R SPMW1203○○
CESPR323S32	●	3	60°	32	43.8	125	32	31.5	45	36	14	19	10.2	TS5	①TKY25R SPMW1203○○
CFSPR041S16S	●	1	45°	4	15.7	85	16	14.4	25	24	10	—	5.9	TS4	②TKY15F SPMW0903○○
CFSPR041S16L	●	1	45°	4	15.7	110	16	14.4	50	24	10	—	5.9	TS4	②TKY15F SPMW0903○○
CFSPR081S20	●	1	45°	8	24.6	110	20	19.5	40	25	11	—	8.3	TS5	①TKY25R SPMW1203○○
CFSPR161S20	●	1	45°	16	32.6	110	20	19.5	40	25	11	—	8.3	TS5	①TKY25R SPMW1203○○
CFSPR323S32	●	3	45°	32	48.6	125	32	31.5	45	36	14	19	8.3	TS5	①TKY25R SPMW1203○○
CGSPR081S20	●	1	30°	8	28.4	110	20	19.5	40	25	11	—	5.9	TS5	①TKY25R SPMW1203○○
CGSPR161S20	●	1	30°	16	36.4	110	20	19.5	40	25	11	—	5.9	TS5	①TKY25R SPMW1203○○
CGSPR323S32	●	3	30°	32	52.4	125	32	31.5	45	36	14	19	5.9	TS5	①TKY25R SPMW1203○○

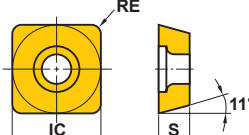
* Clamp Torque (N • m) : TS4=3.5, TS5=7.5, TS52=7.5

M

INDEXABLE MILLING

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

INSERTS

Work Material	P	Steel									Cutting Conditions :				
	K	Cast Iron	⚙️	⚙️			⚙️	⚙️		⚙️	⚙️	● : Stable Cutting	● : General Cutting	⚙️ : Unstable Cutting	
Shape	Order Number	Class	Honing	Coated			Cermet		Carbide		Dimensions (mm)			Geometry	
				VP15TF	UP20M				NX2525	NX4545	UTi20T	HTi10	IC		S
	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

Work 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



TSMP

P

Steel

M

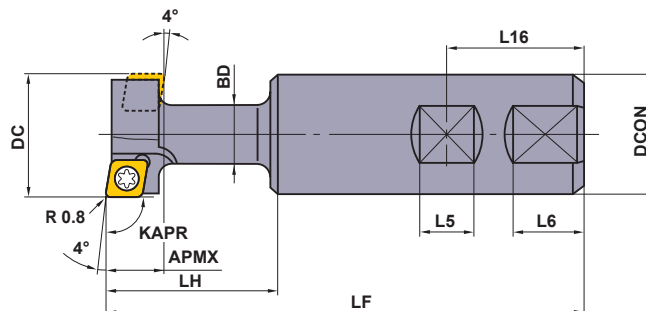
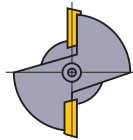
K

Cast Iron

N

S

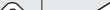
H



- 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.

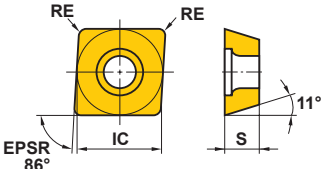
KAPR :90°

Right hand tool holder only.

Order Number	T Slot Nomenclature	Stock	Number of Teeth	Dimensions (mm)									 *		
				DC	LF	DCON	BD	LH	L16	L5	L6	APMX	Clamp Screw	Wrench	Insert
TSMPR25S25	14	●	2	25	112	25	12.5	33.2	32	12	17	11	TS3	①TKY08D	MPMW070308
TSMPR32S32	18	●	2	32	120	32	16	41.2	36	14	19	14	TS4	②TKY15R	MPMW090308
TSMPR40S32	22	●	2	40	130	32	20	51.2	36	14	19	18	TS5	②TKY25R	MPMW120408

* Clamp Torque (N • m) : TS3=1.0, TS4=3.5, TS5=7.5

INSERTS

Work Material	P	Steel	Carbide	Cutting Conditions :		
	K	Cast Iron		● : Stable Cutting	● : General Cutting	✱ : Unstable Cutting
Shape	Order Number	Class	UTi20T	Dimensions (mm)		
				IC	S	RE
	MPMW070308	M	●	7.94	3.18	0.8
	MPMW090308	M	●	9.525	3.18	0.8
	MPMW120408	M	●	12.7	4.76	0.8
						

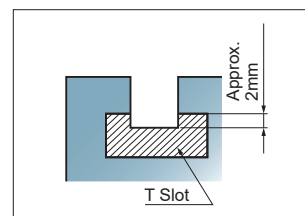
RECOMMENDED CUTTING CONDITIONS

Work 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.

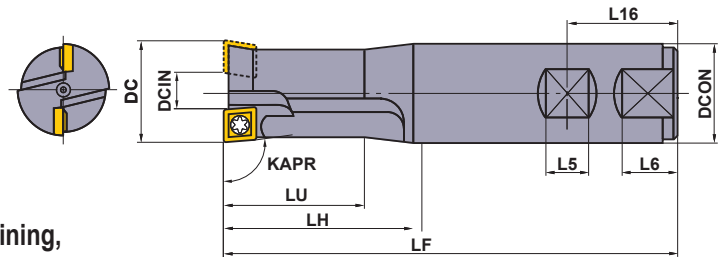


SPOT MILLING



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.

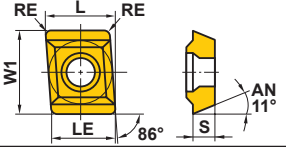
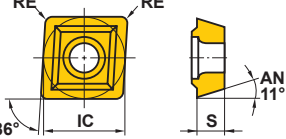
KAPR :94°

Right hand tool holder only.

Order Number	For Bolt Size	Stock	Number of Teeth	Dimensions (mm)									 *		
				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	①TKY08D	JPMT060204-E
CBJPR172S25	M10	●	2	17.5	5.3	115	25	35	26	32	12	17	TS3	①TKY08D	JPMT060204-E
CBJPR202S25	M12	●	2	20	7.8	120	25	40	30	32	12	17	TS3	①TKY08D	JPMT060204-E
CBJPR232S25	M14	●	2	23	10.8	126	25	46	34.5	32	12	17	TS3	①TKY08D	JPMT060204-E
CBMPR262S32	M16	●	2	26	8.5	132	32	52	39	36	14	19	TS4	②TKY15R	MPMT090308
CBMPR292S32	M18	●	2	29	11.5	138	32	58	43.5	36	14	19	TS4	②TKY15R	MPMT090308
CBMPR322S32	M20	●	2	32	14.5	144	32	64	59	36	14	19	TS4	②TKY15R	MPMT090308
CBMPR352S32	M22	●	2	35	17.5	150	32	70	70	36	14	19	TS4	②TKY15R	MPMT090308
CBMPR392S32	M24	●	2	39	21.5	158	32	78	78	36	14	19	TS4	②TKY15R	MPMT090308
CBMPR432S32	M27	●	2	43	25.5	166	32	86	86	36	14	19	TS4	②TKY15R	MPMT090308
CBMPR482S32	M30	●	2	48	30.5	176	32	96	96	36	14	19	TS4	②TKY15R	MPMT090308

* Clamp Torque (N • m) : TS3=1.0, TS4=3.5

INSERTS

Work Material		P	Steel	●	●			●		Cutting Conditions : ● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting					
		M	Stainless Steel	●	●			●							
		K	Cast Iron	✱	✱			✱	●						
Cutter Type	Shape	Order Number	Class	Coated			Carbide		Dimensions (mm)					Geometry	
				VP15TF	UP20M		UT120T	HT110	L	LE	IC	S	RE		
CBJP		JPMT060204-E	M	●	●			●		7.0	6.0	—	2.38	0.4	
CBMP		MPMT090308	M	●	●			●		—	—	9.525	3.18	0.8	

RECOMMENDED CUTTING CONDITIONS

Work 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

Steel

M

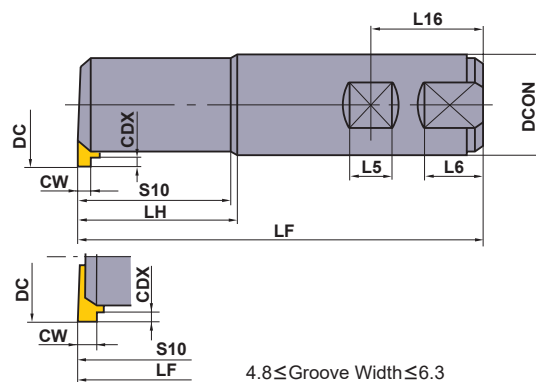
K

Cast Iron

N

S

H



- Side face grooving tool for machining centers.
- The minimum cutting diameter is $\phi 25\text{mm}$ for internal grooving.
- For groove widths of 1.25mm—6.0mm.

Right hand tool holder only.

Order Number	Stock Number of Teeth R	Dimensions (mm)							Geometry of Groove		DC (mm)	Insert Number
		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		
									$1.5 \leq CW \leq 4.0$	3.0		
KSMGR40S32	● 1	130	32	50	49	36	14	19	1.25	1.2	40	MGTL43○○○○
									1.45	1.5		
									$1.5 \leq CW \leq 2.3$	3.0		
									$2.5 \leq CW \leq 4.7$	4.5		
KSMGR40S32L	● 1	180	32	100	99	36	14	19	1.25	1.2	40	MGTL43○○○○
									1.45	1.5		
									$1.5 \leq CW \leq 2.3$	3.0		
									$2.5 \leq CW \leq 4.7$	4.5		
									$5.0 \leq CW \leq 6.0$	4.5		
		181.6	32	101.6	100.6	36	14	19				

M

INDEXABLE MILLING

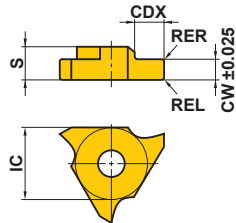
SPARE PARTS

Tool Holder Number					
	Clamp Lever	Spring	Lever Pin	Clamp Screw	Wrench
KSMGR25S25	LLCL13S	HLS2	—	LLCS105	①HKY20F
KSMGR40S32	LLCL24	—	LLP14	LLCS108	②HKY30R
KSMGR40S32L	LLCL24	—	LLP14	LLCS108	②HKY30R

* Clamp Torque (N • m) : LLCS105=1.5, LLCS108=3.3

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

INSERTS

Work Material	P	Steel				Cutting Conditions :				Geometry
	K	Cast Iron				● : Stable Cutting	● : General Cutting	✱ : Unstable Cutting		
Order Number	Grooving Width	Stock			Dimensions (mm)					
		Coated	Cermet	Carbide	IC	S	RER/L	CDX		
		VP20MF	NX2525	UTi20T						
	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

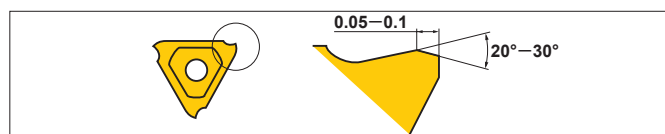
Work Material	Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t.)
P	Mild Steel	NX2525 UTi20T	130 (120—150)	0.225 (0.1—0.35)
			160 (120—200)	0.225 (0.1—0.35)
	Carbon Steel Alloy Steel	NX2525 UTi20T	110 (100—120)	0.2 (0.1—0.30)
			120 (100—140)	0.2 (0.1—0.30)
		UTi20T	110 (100—120)	0.175 (0.1—0.25)
			100 (80—125)	0.225 (0.1—0.35)
K	Cast Iron	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.



M

INDEXABLE MILLING

INDEXABLE MILLING

VERTICAL FEED MILLING



PMC

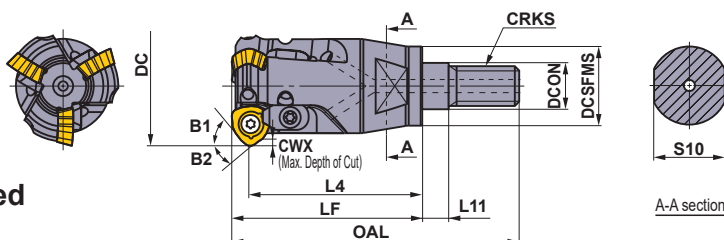
P	M	K	N	S	H
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Steel

Cast Iron



- For under-cutting trimmed 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)	Insert	Shank Arbor
				DC	DCON	DCSFMS	OAL	LF	L4	L11	S10	CRKS	CWX	B1	B2			
PMC08R252AM1035	●	○	2	25	10.5	18	58.7	39.7	35	6	14	M10	1.5	40.5°	35°	0.1	JOM080320 ZZSR-○○	SC20M10S ○○○○W
PMC09R323AM1245	●	○	3	32	12.5	21	72.5	50.5	45	6	19	M12	3	40.5°	35°	0.2	JDM09T320 ZDSR-○○	SC25M12S ○○○○W
PMC12R403AM1645	●	○	3	40	17	29	74.4	51.4	45	6	24	M16	3.5	42°	35°	0.3	JDM120420 ZDSR-○○	SC32M16S ○○○○W

* WT : Tool Weight

SPARE PARTS

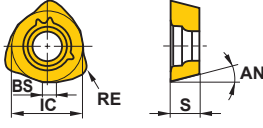
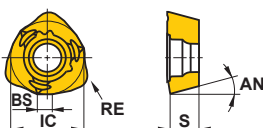
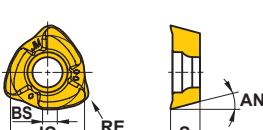
Order Number	*		*			
	Clamp Screw	Clamp Bridge	Clamp Bridge Screw	Spring	Wrench	Anti-seize Lubricant
PMC08R252AM1035	TS33	AMS3	AJS3010T10	ASS2	②TKY08D ①TKY10R	MK1KS
PMC09R323AM1245	TS351	AMS3	AJS3010T10	ASS2	②TKY10D	MK1KS
PMC12R403AM1645	TS43	AMS4	AJS4012T15	ASS2	②TKY15D	MK1KS

* Clamp Torque (N • m) : TS33=1.5, TS351=2.5, TS43=3.5, AJS3010T10=2.5, AJS4012T15=3.5

INDEXABLE MILLING

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

INSERTS

Work Material	P	Steel				Cutting Conditions :					PMC holder	Geometry
	K	Cast Iron				●	●	●	● : Stable Cutting	● : General 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

Work 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	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	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	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	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	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

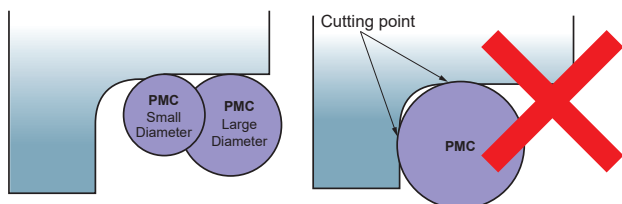
Note 1) The above cutting conditions are general guide lines. Adjustments maybe necessary depending on machine rigidity, workpiece geometry and clamping.

Note 2) A carbide shank extension is recommended to prevent vibrations.

NOTES ON MACHINING METHODS

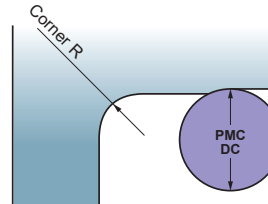
● How to choose an appropriate diameter tool.

Machine plain surfaces with a larger tool and corner radii with smaller diameter cutters.



● Relation of the cutter diameter and corner R size of work piece

A guide for the smallest possible workpiece radius that can be machined is from 0.6—0.7 x diameter of the tool.



Tool diameter DC(mm)	Corner R (mm)
ø25	R ≥ 17.5
ø32	R ≥ 22
ø40	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.

INDEXABLE MILLING

VERTICAL FEED MILLING



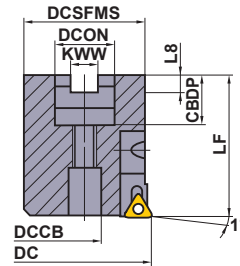
PMF

P	M	K	N	S	H
Steel		Cast Iron			

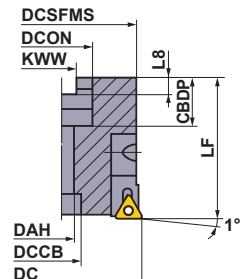


- 2 directional cutting with large overhang.
- Excellent straightness.
- Excellent wall accuracy.

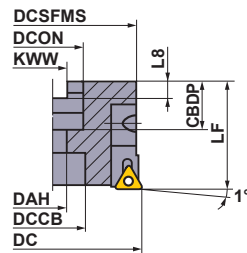
ø50



ø63



ø80

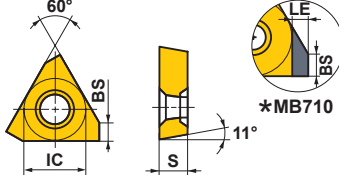


Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (mm)																
			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

Work Material	P	Steel					Cutting Conditions :							
	K	Cast Iron					● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting							
Shape	Order Number	Class	Coated				CBN		Dimensions (mm)				Geometry	
			VP15TF	AP10H			MB710			IC	LE	S		BS
	TPEW1303ZPER2	E	●	●					7.94	—	3.18	2		
	* TPEW1303ZPTR2	E					●		7.94	1.5	3.18	2		

M

INDEXABLE MILLING

● : Inventory maintained in Japan.

(10 inserts in one case) (CBN inserts are available in 1 piece in one case.)

RECOMMENDED CUTTING CONDITIONS

Work Material	Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t.)
P	Carbon Steel	VP15TF	250 (150—350)	0.1 (0.05—0.15)
	Alloy Steel		200 (100—300)	
K	Gray Cast Iron	AP10H	350 (200—500)	0.1 (0.05—0.15)
		MB710	1500 (1000—2000)	

Work Material	Hardness	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t.)
K	Ductile Cast Iron	AP10H	250 (150—350)	0.1 (0.05—0.15)
		MB710	1000 (800—1200)	
	Ductile Cast Iron	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.

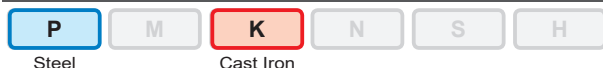
Note 3) For crossfeed cutting, the feed per tooth should be reduced to less than 0.05(mm/t.).

INDEXABLE MILLING

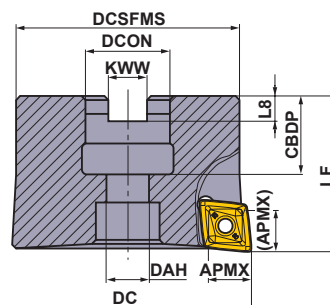
VERTICAL FEED MILLING



PMR

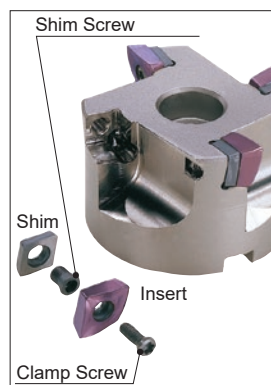


- 1 directional cutting with large overhang.
- Horizontal feed cutting and oblique cutting are also possible.
- Unique shape of curved edge gives high rigidity and low resistance.



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	①TPS35	①TIP15T	HKY35R	HSC10035
PMR406304A22R	STPMR4N	WCS503507H	①TPS35	①TIP15T	HKY35R	HSC10035
PMR408005A27R	STPMR4N	WCS503507H	①TPS35	①TIP15T	HKY35R	HSC12035
PMR405003BR	STPMR4N	WCS503507H	①TPS35	①TIP15T	HKY35R	HSC10035
PMR406304BR	STPMR4N	WCS503507H	①TPS35	①TIP15T	HKY35R	HSC10035
PMR408005DR	STPMR4N	WCS503507H	①TPS35	①TIP15T	HKY35R	HSC16040

* Clamp Torque (N • m) : TPS35=3.5, CSF401260T=5.0, WCS503507H=5.0, WCS604010H=7.0

Work Material	P	Steel	C			Cutting Conditions :				
	K	Cast Iron								
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	

Work 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

Note 3) If vibration occurs when machining, please reduce the depth of cut, and reduce the cutting speed by 20—50%.

BORING CUTTER

BMR



Cast Iron



Body with Peripheral Cutting Edge Run-out Regulator

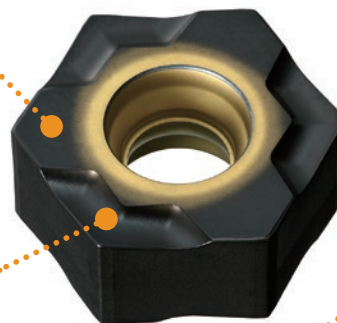
With peripheral cutting edge regulating function for possible use of economical M-class inserts.

* Cutter bodies are only available through special orders.

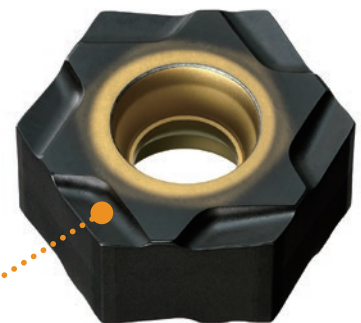
High Clamping Rigidity

High feed processing possible with improved fracture resistance.

Double-sided 6-corner type
(No hand)



Double-sided 12-corner type
(Right hand only)



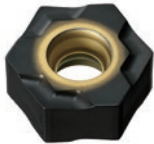
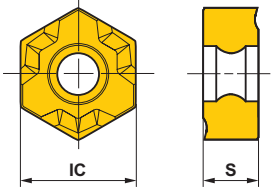
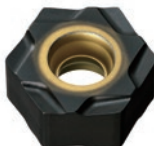
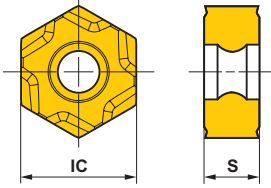
Double Positive Breaker

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

Work Material	K	Cast Iron		Cutting Conditions (Guide) :						
					● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting					
Shape	Order Number	Grade	Hand	Cutting edge	Stock	Dimensions (mm)		Geometry		
						IC	S			
	HNMX1206EN06-R	MC5015	—	6	●	12.7	6.0			
	HNMX1206ER12-R	MC5015	R	12	●	12.7	6.0			

RECOMMENDED CUTTING CONDITIONS

Work 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.

M

INDEXABLE MILLING

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

M261

QUICK CHANGE TYPE

<HIGH FEED CUTTING FOR CAST IRON>

FP490

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

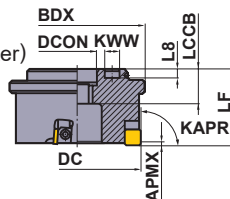


Fig.2

Q type
(Large
Diameter)
ø200
ø250
ø315
ø355
ø400
ø500

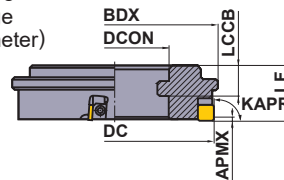
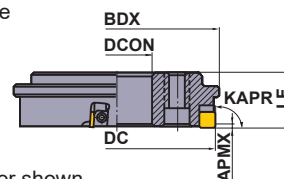


Fig.3

T type
ø250
ø315
ø355
ø400



KAPR: 90°

GAMP: +5° GAMF: +0°

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 Type ø80—ø160	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 Type ø200—ø500	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 Type ø250—ø400	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.

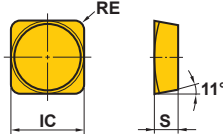
* WT : Tool Weight

M

INDEXABLE MILLING

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

INSERTS

Work Material	K	Cast Iron			Cutting Conditions :			
					● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting			
Shape	Order Number	Class	Carbide	Dimensions (mm)			Geometry	
			HT10 HT10T	IC	S	RE		
	SPEN424A	E	●	●	12.76	3.18	1.6	

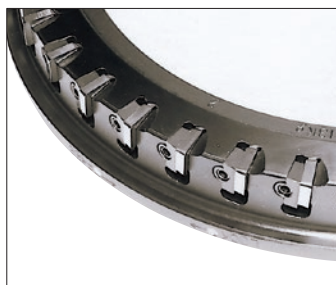
RECOMMENDED CUTTING CONDITIONS

Work Material	Tensile Strength	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t.)
K Gray Cast Iron	≤350MPa	HT10T	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 I FP490R/L1646T	CWS42SPR/L	LS14	HKY40T	120QSPK×80 (KANONN-SEIKI CO.)	6.35□×4 (KYOKUTO MFG CO.)

* Clamp Torque (N・m) : LS14=7.8

M

INDEXABLE MILLING

INDEXABLE MILLING

QUICK CHANGE TYPE

<HIGH FEED CUTTING FOR CAST IRON>

FP590

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

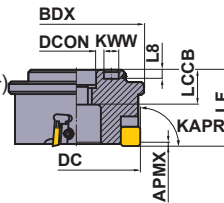


Fig.2

Q type
(Large
Diameter)
ø200
ø250
ø315
ø355
ø400
ø500

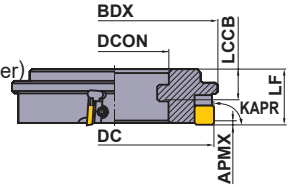
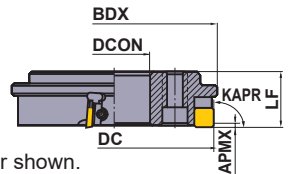


Fig.3

T type
ø250
ø315
ø355
ø400



KAPR: 90°
GAMP: +5° GAMP: +0°

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 Type ø125—ø160	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 Type ø200—ø500	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 Type ø250—ø400	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.

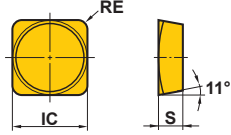
* WT : Tool Weight

M

INDEXABLE MILLING

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

INSERTS

Work Material	K	Cast Iron	●		Cutting Conditions :		
					● : Stable Cutting	● : General Cutting	✱ : Unstable Cutting
Shape	Order Number	Class	Carbide	Dimensions (mm)			Geometry
		HT105T		IC	S	RE	
	SPEN535A	E	●	15.875	4.76	2.0	

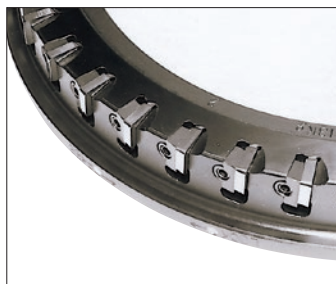
RECOMMENDED CUTTING CONDITIONS

Work Material	Tensile Strength	Grade	Cutting Speed (m/min)	Feed per Tooth (mm/t.)
K Gray Cast Iron	≤350MPa	HT105T	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 I FP590R/L1646T	CWS5	LS14	HKY40T	120QSPK×80 (KANONN-SEIKI CO.)	6.35□×4 (KYOKUTO MFG CO.)

* Clamp Torque (N・m) : LS14=7.8

M

INDEXABLE MILLING

QUICK CHANGE TYPE

<FINISHING FOR ALUMINIUM ALLOY>

FE404

P M K **N** S H

Non-ferrous Metal



- 21° positive insert.
- High rake and relief angle.
- Suitable for light alloy machining.
- Easy tool exchange.

Fig.1
Q type
(Small
Diameter)
ø100
ø125
ø160

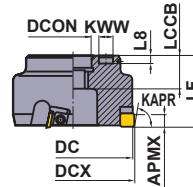


Fig.2
Q type
(Large
Diameter)
ø200
ø250
ø315
ø355
ø400
ø500

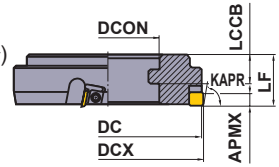
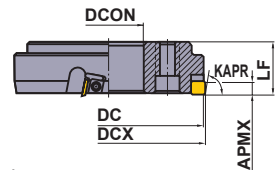


Fig.3
T type
ø250
ø315
ø355
ø400



KAPR:86°
GAMP:+11° GAMP:+9°

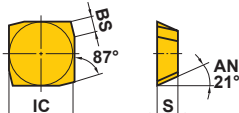
Right hand tool holder shown.

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	Refer to page M014. (Q Type ø100—ø160)	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	Refer to page M015. (Q Type ø200—ø500)	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	Refer to page M015. (T Type ø250—ø400)	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.

* WT : Tool Weight

INSERTS

Work Material	N	Non-ferrous Metal		●	Cutting Conditions :			Geometry
					● : Stable Cutting	● : General Cutting	✚ : Unstable Cutting	
Shape	Order Number	Class	Carbide	Dimensions (mm)				
			HT10	IC	S	BS		
	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.

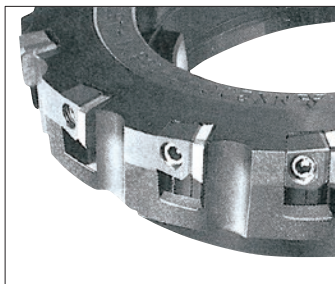
RECOMMENDED CUTTING CONDITIONS

Work 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}) = $(1000 \times \text{Cutting Speed}) \div (3.14 \times \text{DC})$

● 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 I FE404R/L1632T	CWS42SER/L	LS10	HKY40T	120QSPK×80 (KANONN-SEIKI CO.)	6.35□×4 (KYOKUTO MFG CO.)

* Clamp Torque (N · m) : LS10=8.2

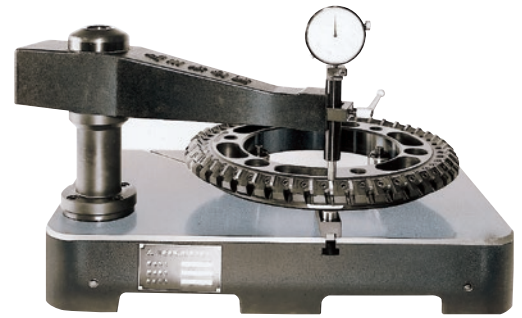
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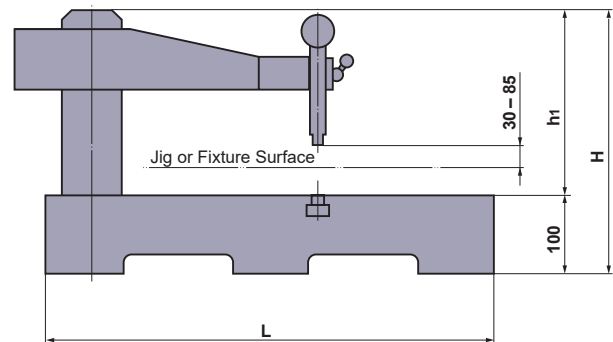
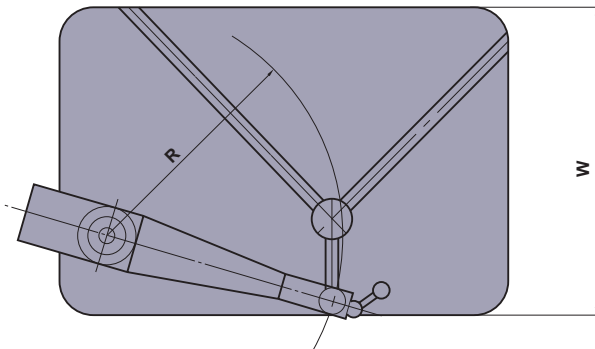
SETTING FIXTURE

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	h1	Cutter Diameter
SEF500	315	600	400	347	247	— $\phi 500$
SEF700	400	800	500	360	260	$\phi 315$ — $\phi 700$

Note 1) Please specify the order number when ordering.

Note 2) Please contact us regarding special spare parts order.

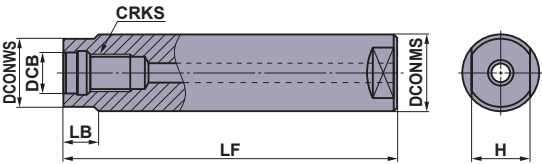
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Method of Insert Setting for One Piece Type.	① Set the needle using a height gauge which is the same height as the cutter. ② Move the needle to an insert. ③ Slide the insert to the point where it touches the needle. Tighten all the inserts tightly. (Use torque wrench.) (1—2N · m) ★ Screwing the inserts too tightly results in lower accuracy.	④ After temporary tightening, use a torque wrench to tighten firmly. (Use torque wrench.) (8 N · m) ⑤ Screw the inserts tightly according to the picture shown on the left. ⑥ Check run-out of all the inserts with a dial gauge. ★ For general milling, $\leq 10\mu\text{m}$ is the standard. For finishing, set the insert run out at $\leq 5\mu\text{m}$.
Method of Insert Setting for Two Piece Type.	① Set the height gauge at the same height as the cutter on the liners of slider, then set the needle. ② Put the cutter on the liners of the slider and move the rollers of the slider to the installation holes. ③ Make 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 thoroughly. 4. After all the inserts are taken out, clean the cutter body with oil or strong air blow. 5. Use a torque wrench or special wrench for tightening the clamp screws.

ARBORS

STRAIGHT SHANK ARBOR

	Type	Order Number	Stock	Dimensions (mm)						
				DCB	DCONMS	DCONWS	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	32	28.5	140	15	24	M16
		SC32M16S280L	●	17	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	32	28.5	140	15	24	M16
		SC32M16S280LW	●	17	32	28.5	280	15	24	M16

HOW TO INSTALL THE SCREW-IN HEAD

- ① Thoroughly clean the clamp section of the head and the arbor with an air blower or brush before installation.
- ② Tighten 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

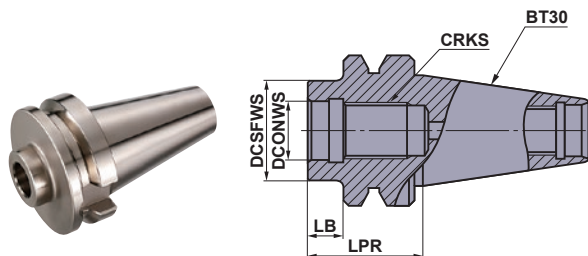


- Cutting tools become extremely hot during cutting. Never touch them with bare hands after operation as this may produce risk of injuries or burns.
- Do not handle the cutting tools with bare hands as this may cause injuries.

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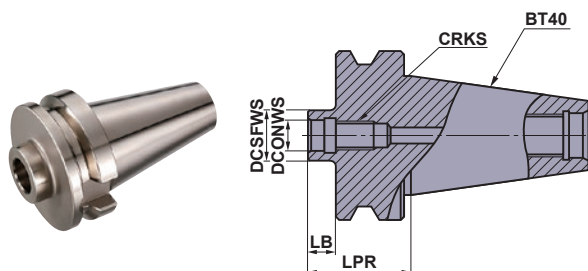
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■ BT30 SHANK ARBOR



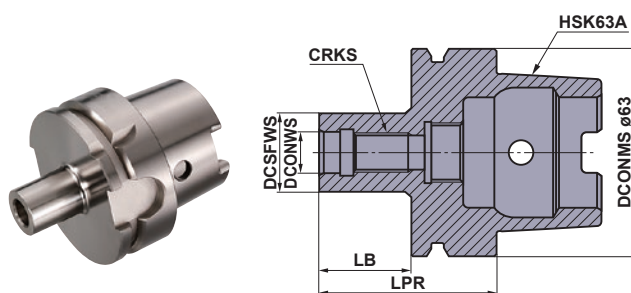
Order Number	Stock	Dimensions (mm)				
		DCONWS	DCSFWS	LPR	LB	CRKS
SC16M08S10-BT30	●	8.5	14.5	32	10	M8
SC20M10S10-BT30	●	10.5	18.5	32	10	M10
SC25M12S10-BT30	●	12.5	23.5	32	10	M12
SC32M16S10-BT30	●	17.0	28.5	32	10	M16

■ BT40 SHANK ARBOR



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



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

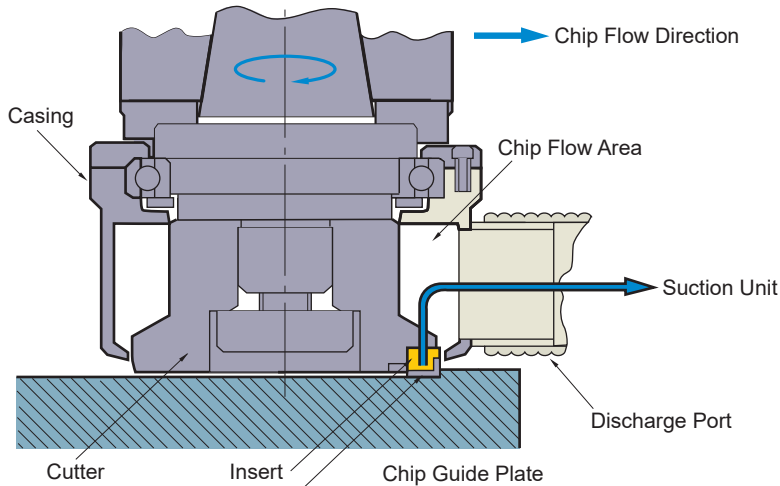
Note 1) The HSK63A shank type has a built-in coolant pipe for installation.

Qing SYSTEM

STRUCTURE CHIP COLLECTION METHOD

STRUCTURE

- Automatic continuous intake of chips while machining.
- Eliminates chip handling 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

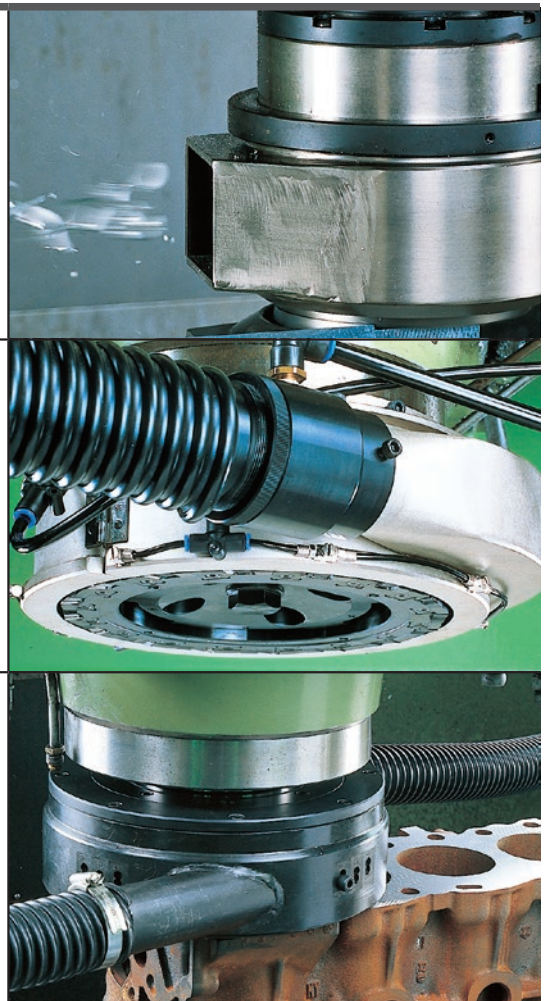
- ① Chips are discharged towards the chip conveyor because of the centrifugal force created by the cutter.
- ② Installation with an ATC(auto tool changer) on machining centers is possible.
- ③ Since there is no need for air or a dust collector, this method provides the lowest initial investment and running costs.
- ④ Chips cannot be transported (carried) directly over long distances.
- ⑤ High speed bearing required to suit high speed machining.

Double Air Type QWA

- ① Chip recovery using compressed air (factory air).
- ② Since air is also injected into the casing interior, wet cutting is also possible.
- ③ Achieves the same suction capabilities as a dust collector, thereby enabling low equipment costs.
- ④ Wet cutting is not recommended.

Vacuum Machine Type QSV

- ① Chip collection by use of a suction machine.
- ② Chip collection efficiency is high.
- ③ Special equipment is required, such as a mist collector for wet cutting.



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