MITSUBISHI MATERIALS

APX 3000/4000

MULTI-FUNCTIONAL INDEXABLE CUTTER



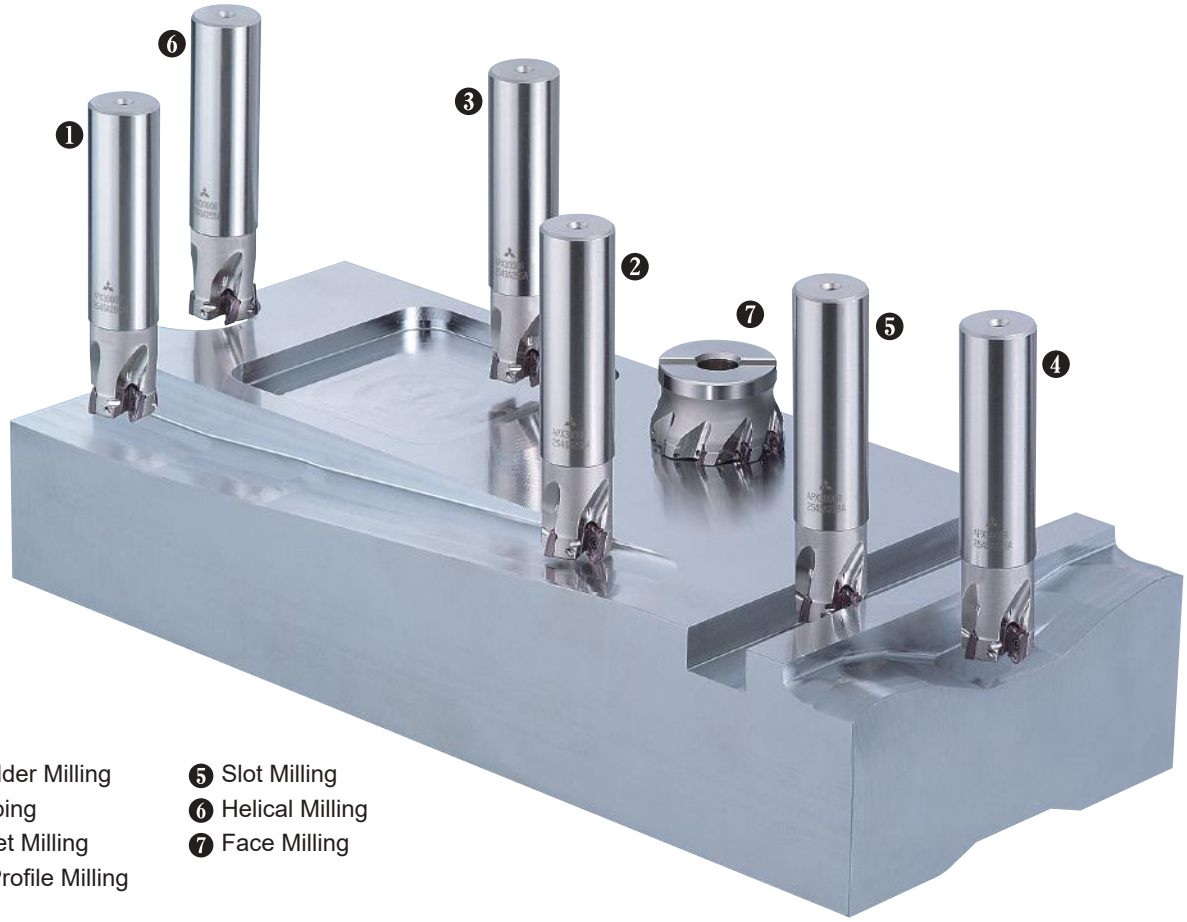


TOOL NEWS **B055A**



Multi-functional Indexable Cutter
APX3000/4000
Multi-functional

The APX is highly effective in various 3-D machining operations including excellent ramping capabilities.



❶ Shoulder Milling
❷ Ramping
❸ Pocket Milling
❹ 3-D Profile Milling
❺ Slot Milling
❻ Helical Milling
❼ Face Milling

High Rigidity Cutter Bodies

Rigidity has been increased by using a larger amount of backing metal behind the insert.
Resistance to corrosion and abrasion on the cutter bodies made possible by using a superior highly heat resistant alloy and a special surface treatment.
The cutter bodies are designed with through coolant throug to improve cooling and chip disposal.



Effective Deep Hole Machining

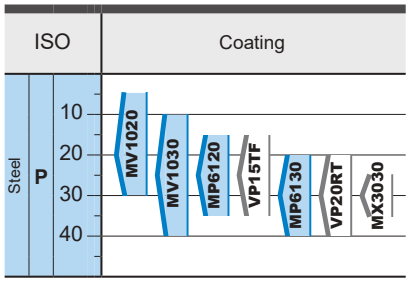
APX3000/4000, an extra long shank type is now available for difficult to reach applications.

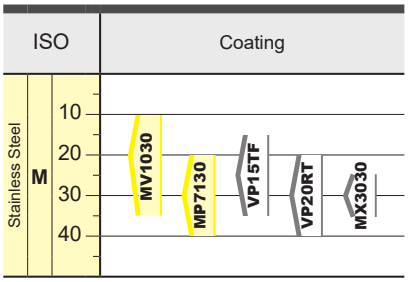
(Long, Extra Long Shank Type)

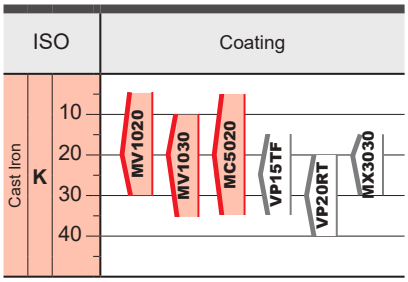


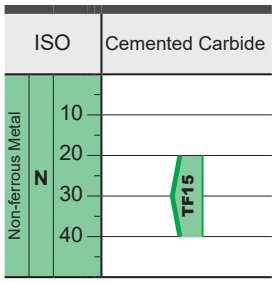
(Standard Shank Type)

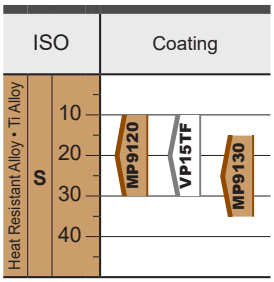
Insert Grades for a Wide Range of Materials

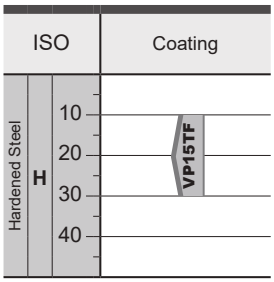






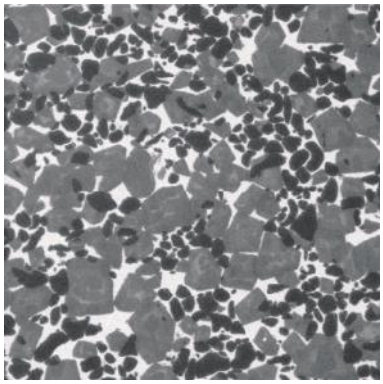






MX3030

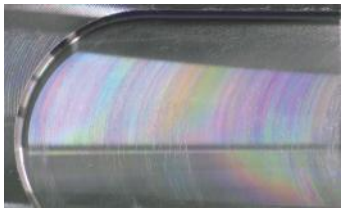
MX3030 is a cermet grade with excellent fracture resistance and is suitable for finish and light cutting.



MX3030

Finished surface comparison when machining 4140 alloy steel

The MX3030 grades has increased gloss and produces an excellent machined surface.



MX3030



Conventional

<Cutting Conditions>
Material : AISI 4140
Tool : APX3000R324SA32SA
Cutting Speed : vc=395 SFM
Feed per Tooth : fz=.003 IPT
Cutting Mode : Dry Cutting, Single Insert

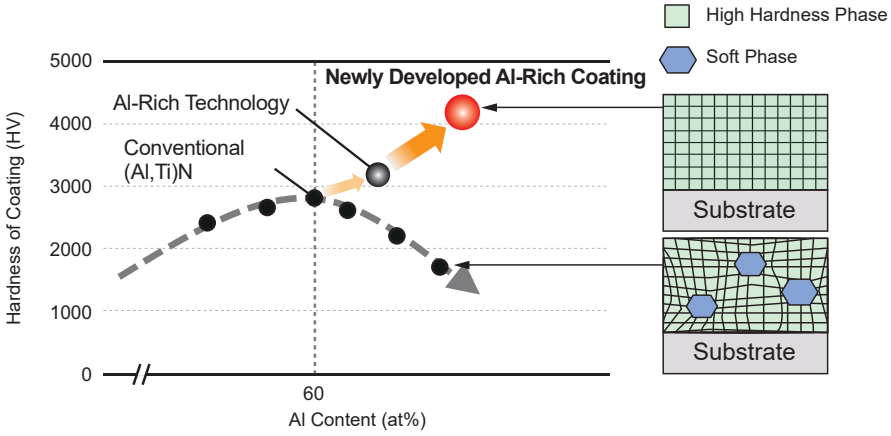
Coated Carbide Grade for Milling

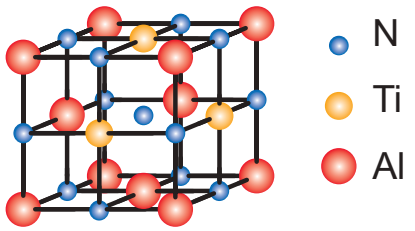
MV1020/MV1030

Newly Developed Al-Rich Coating

Advanced Wear and Thermal Shock Resistance

By adopting the newly developed Al-Rich coating technology, the (Al,Ti)N with a high Al content ratio displays a very high hardness. This greatly improves oxidation and wear resistance.
The extreme heat resistance of this new series achieves amazing stability not only during dry cutting, but also when wet cutting where inserts are usually prone to thermal cracking.
MV1020 offers overwhelmingly superior performance in high-speed cutting, and MV1030 achieves stable performance during interrupted and stainless steel machining.

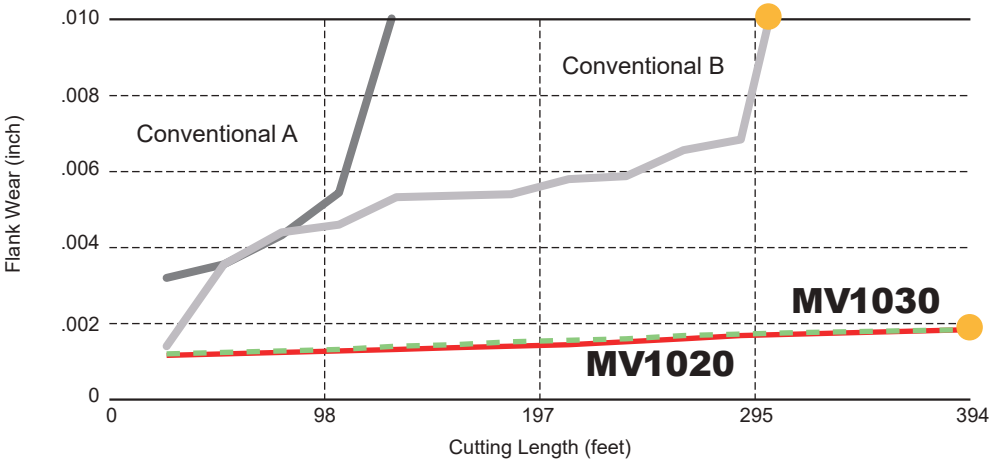




Crystal image of **MV1000** series

Comparison of wear resistance when machining 4140 alloy steel

Dry Cutting



<Cutting Conditions>
Material : AISI 4140
Tool : APX3000
Inserts : AOMT123608PEER-M
Cutting Speed : vc=590 SFM
Feed per Tooth : fz=.006 IPT
Depth of Cut : ap=.315 inch
Width of Cut : ae=.315 inch
Cutting Mode : Dry Cutting



Conventional B
Taken after cutting length of 315 feet



MV1020
Taken after cutting length of 394 feet

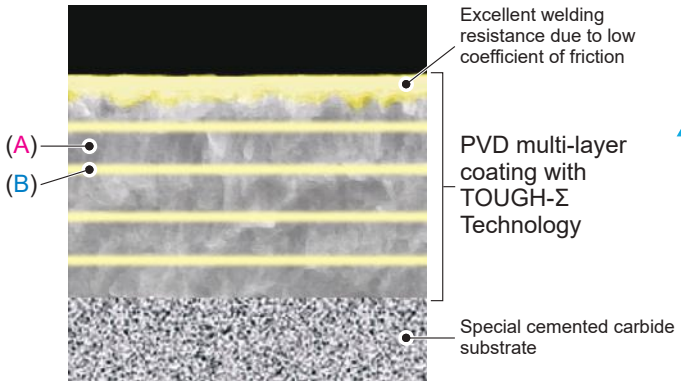


MV1030
Taken after cutting length of 394 feet

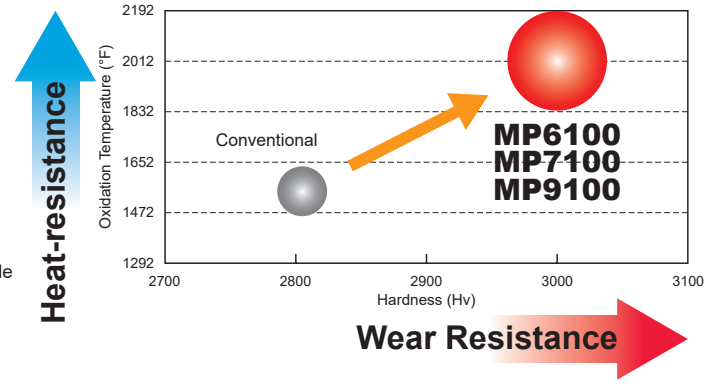
MP6100, MP7100, MP9100 - With Accumulated Al-Ti-Cr-N Based PVD Coating

TOUGH-Σ Technology

A fusion of the separate coating technologies; PVD and multi-layering provides extra toughness.



Dramatically Improving the Heat and Wear Resistance!



CVD Coated MC5020

With high wear resistance and outstanding fracture resistance, MC5020 is ideal for milling for cast irons.

MIRACLE Coated VP15TF

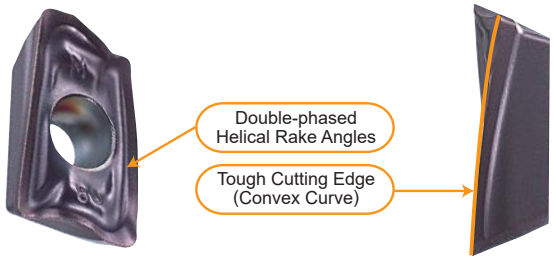
Stable machining properties are enabled when the coating is combined with a high wear and fracture resistant carbide substrate.

MIRACLE Coated VP20RT

Ideal for heavy interrupted cutting of stainless and general steels because of the excellent fracture resistance properties.

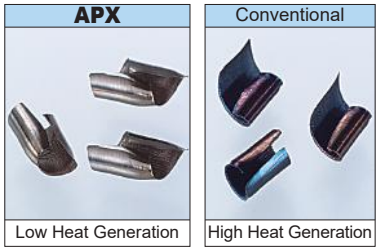
Low Cutting Resistance Inserts

Advanced simulation technology has been utilized to develop the inserts. Efficient machining on low rigidity machines and workpiece material is now possible and is ideal for thin wall or extended reach applications.



Ideal Heat Disposal and Chip Control

Heat generated during cutting has been reduced due to the APX's special geometry.
Ideal chip shape formed by the insert for easy disposal.

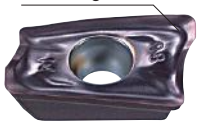


<Cutting Conditions>
Material : Alloy Steel
Tool : APX3000UR164SA16SA
Insert : AOMT123608PEER-M
Grade : VP15TF
Cutting Speed : vc=490 SFM
Feed per Tooth : fz=.006 IPT
Width of Cut : ae=.236 inch
Depth of Cut : ap=.236 inch

Insert Size

APX4000	APX3000
Max. Depth of Cut .591"	Max. Depth of Cut .394"
	

Insert Chipbreaker

General Use M (APX3000, APX4000)	Strong Cutting Edge Type H (APX3000, APX4000)	Aluminum Alloy Machining (Ground & Polished) GM (APX3000)
Rake Angle: 25°	Rake Angle: 7°	Rake Angle: 25°
		

Note 1) Rake angle when the insert is set in the cutter body.

MULTI-FUNCTIONAL MILLING

KAPR 90°

Finishing Roughing

Supports multi-functional machining.
Please refer to page 2 for details.

APX3000

P M K N S H



- Low resistance insert and high rigidity body.
- Ideal chip control.
- High wall accuracy can be produced by using this cutter and unique insert geometry.

Fig.1

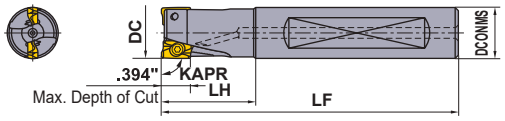


Fig.2

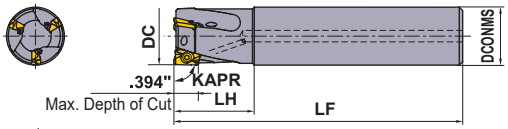


Fig.3

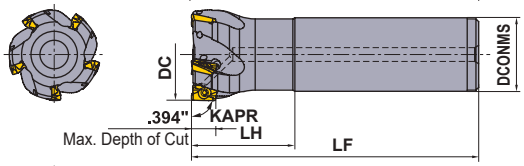
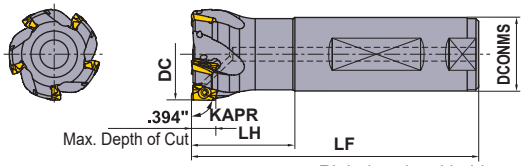


Fig.4



Shank Type

With Coolant Through

Right hand tool holder only.

Type		RE (inch)	Order Number	Stock R	Number of Teeth	Dimensions(inch) DC	DCONMS	LF	LH	RMPX	Fig.	*1 Insert Screw	Wrench	Anti-seize Lubricant
Standard	A Holders	.008 | .079	APX3000UR081FA10SA	●	1	.500	.625	3.250	1.120	6°	1	TPS25	TIP07F	MK1KS
			APX3000UR081SA08SA	●	1	.500	.500	3.250	1.120	6°	2	TPS25	TIP07F	MK1KS
			APX3000UR102FA10SA	●	2	.625	.625	3.625	1.190	11.5°	1	TPS25	TIP07F	MK1KS
			APX3000UR102SA10SA	●	2	.625	.625	3.625	1.190	11.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR122FA12SA	●	2	.750	.750	4.375	1.380	7.5°	1	TPS25	TIP07F	MK1KS
			APX3000UR122SA12SA	●	2	.750	.750	4.375	1.380	7.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR123FA12SA	●	3	.750	.750	4.375	1.380	7.5°	1	TPS25	TIP07F	MK1KS
			APX3000UR123SA12SA	●	3	.750	.750	4.375	1.380	7.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR163FA12SA	●	3	1.000	.750	4.375	1.570	4.5°	4	TPS25−1	TIP07F	MK1KS
			APX3000UR163SA12SA	●	3	1.000	.750	4.375	1.570	4.5°	3	TPS25−1	TIP07F	MK1KS
			APX3000UR164FA12SA	●	4	1.000	.750	4.375	1.570	4.5°	4	TPS25−1	TIP07F	MK1KS
			APX3000UR164SA12SA	●	4	1.000	.750	4.375	1.570	4.5°	3	TPS25−1	TIP07F	MK1KS
			APX3000UR163FA16SA	●	3	1.000	1.000	4.750	1.570	4.5°	1	TPS25−1	TIP07F	MK1KS
			APX3000UR163SA16SA	●	3	1.000	1.000	4.750	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR164FA16SA	●	4	1.000	1.000	4.750	1.570	4.5°	1	TPS25−1	TIP07F	MK1KS
			APX3000UR164SA16SA	●	4	1.000	1.000	4.750	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR205FA20SA	●	5	1.250	1.250	5.125	1.970	3.1°	1	TPS25−1	TIP07F	MK1KS
			APX3000UR205SA20SA	●	5	1.250	1.250	5.125	1.970	3.1°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR246FA20SA	●	6	1.500	1.250	5.125	1.970	2.3°	4	TPS25−1	TIP07F	MK1KS
			APX3000UR246SA20SA	●	6	1.500	1.250	5.125	1.970	2.3°	3	TPS25−1	TIP07F	MK1KS
	B Holders	.094 | .125	APX3000UR081SA08SB	●	1	.500	.500	3.250	1.120	6°	2	TPS25	TIP07F	MK1KS
			APX3000UR102SA10SB	●	2	.625	.625	3.625	1.190	11.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR122SA12SB	●	2	.750	.750	4.375	1.380	7.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR123SA12SB	●	3	.750	.750	4.375	1.380	7.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR163SA12SB	●	3	1.000	.750	4.375	1.570	4.5°	3	TPS25−1	TIP07F	MK1KS
			APX3000UR164SA12SB	●	4	1.000	.750	4.375	1.570	4.5°	3	TPS25−1	TIP07F	MK1KS
			APX3000UR163SA16SB	●	3	1.000	1.000	4.750	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR164SA16SB	●	4	1.000	1.000	4.750	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR205SA20SB	●	5	1.250	1.250	5.125	1.970	3.1°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR246SA20SB	●	6	1.500	1.250	5.125	1.970	2.3°	3	TPS25−1	TIP07F	MK1KS

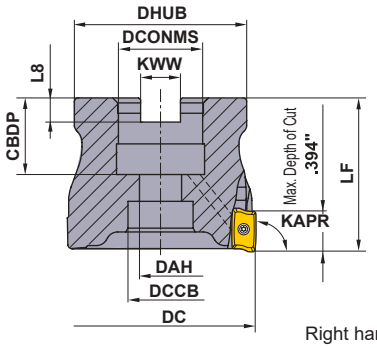
*1 Clamp Torque (lbf-in) : TPS25=8.9, TPS25−1=8.9

● : Inventory maintained.

Type		RE (inch)	Order Number	Stock	Number of Teeth	Dimensions(inch)				RMPX	Fig.	*1 Insert Screw	Wrench	Anti-seize Lubricant
				R		DC	DCONMS	LF	LH					
Long	A Holders	.008 I .079	**APX3000UR122SA12LA**	●	2	.750	.750	7.250	1.380	7.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR162SA16LA	●	2	1.000	1.000	8.500	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR163SA16LA	●	3	1.000	1.000	8.500	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR203SA20LA	●	3	1.250	1.250	9.000	1.970	3.1°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR204SA20LA	●	4	1.250	1.250	9.000	1.970	3.1°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR243SA20LA	●	3	1.500	1.250	9.000	1.970	2.3°	3	TPS25−1	TIP07F	MK1KS
			APX3000UR244SA20LA	●	4	1.500	1.250	9.000	1.970	2.3°	3	TPS25−1	TIP07F	MK1KS
	B Holders	.094 I .125	**APX3000UR122SA12LB**	●	2	.750	.750	7.250	1.380	7.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR162SA16LB	●	2	1.000	1.000	8.500	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR163SA16LB	●	3	1.000	1.000	8.500	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR203SA20LB	●	3	1.250	1.250	9.000	1.970	3.1°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR204SA20LB	●	4	1.250	1.250	9.000	1.970	3.1°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR243SA20LB	●	3	1.500	1.250	9.000	1.970	2.3°	3	TPS25−1	TIP07F	MK1KS
			APX3000UR244SA20LB	●	4	1.500	1.250	9.000	1.970	2.3°	3	TPS25−1	TIP07F	MK1KS

Note) When using inserts with corner radius RE≥.094"(2.4mm), B-Holders are required as shown on page 13.
*1 Clamp Torque (lbf-in) : TPS25=8.9, TPS25−1=8.9





Arbor Type

With Coolant Through

Right hand tool holder only.

Type	RE (inch)	Order Number	Stock	Number of Teeth	Dimensions (inch)									RMPX	*1			
			R		DC	LF	DCONMS	CBDP	DAH	DHUB	KWW	L8	DCCB		Insert Screw	Wrench	Anti-seize Lubricant	Coolant thru Set Bolt
A Holders	.008 I .079	**APX3000R1504A**	●	4	1.500	1.575	.750	.748	.415	1.320	.313	.187	.600	2.4°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R1505A	●	5	1.500	1.575	.750	.748	.415	1.320	.313	.187	.600	2.4°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R1506A	●	6	1.500	1.575	.750	.748	.415	1.320	.313	.187	.600	2.4°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R0205A	●	5	2.000	1.575	.750	.748	.415	1.811	.313	.187	.600	1.6°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R0207A	●	7	2.000	1.575	.750	.748	.415	1.811	.313	.187	.600	1.6°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R2506A	●	6	2.500	1.969	1.000	1.024	.539	2.360	.375	.219	.787	1.3°	TPS25−1	TIP07F	MK1KS	HSCU50014H
		APX3000R0306A	●	6	3.000	1.969	1.000	1.024	.539	2.756	.375	.219	.787	1.0°	TPS25−1	TIP07F	MK1KS	HSCU50014H
		APX3000R0309A	●	9	3.000	1.969	1.000	1.024	.539	2.756	.375	.219	.787	1.0°	TPS25−1	TIP07F	MK1KS	HSCU50014H
B Holders	.094 I .125	**APX3000R1504B**	●	4	1.500	1.575	.750	.748	.415	1.320	.313	.187	.600	2.5°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R1505B	●	5	1.500	1.575	.750	.748	.415	1.320	.313	.187	.600	2.5°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R1506B	●	6	1.500	1.575	.750	.748	.415	1.320	.313	.187	.600	2.5°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R0205B	●	5	2.000	1.575	.750	.748	.415	1.811	.313	.187	.600	1.6°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R0207B	●	7	2.000	1.575	.750	.748	.415	1.811	.313	.187	.600	1.6°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R2506B	●	6	2.500	1.969	1.000	1.024	.539	2.360	.375	.219	.787	1.3°	TPS25−1	TIP07F	MK1KS	HSCU50014H
		APX3000R0306B	●	6	3.000	1.969	1.000	1.024	.539	2.756	.375	.219	.787	1.0°	TPS25−1	TIP07F	MK1KS	HSCU50014H
		APX3000R0309B	●	9	3.000	1.969	1.000	1.024	.539	2.756	.375	.219	.787	1.0°	TPS25−1	TIP07F	MK1KS	HSCU50014H

Note) When using inserts with corner radius RE≥.094"(2.4mm), B-Holders are required as shown on page 11.

*1 Clamp Torque (lbf-in) : TPS25−1=8.9

*2 The cutter body includes a set bolt for an arbor.

Combination of Holder and Insert Corner Radius

Holder Type	**A** Holder							**B** Holder		
	APX3000○○○○○○○○○A							**APX3000○○○○○○○○○B**		
Insert Corner Radius (RE)	.008"	.016"	.031"	.039"	.047"	.063"	.079"	.094"	.118"	.125"

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



Metric Standard

Straight Shank Type (A Holders)

With Coolant Through

Fig.1

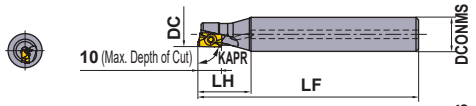


Fig.2

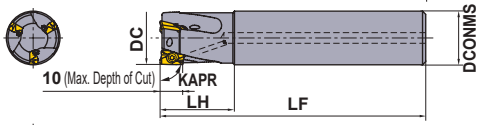
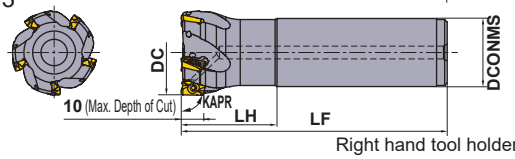


Fig.3

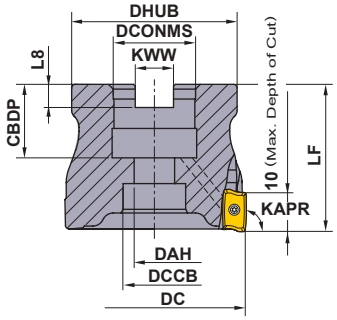


Right hand tool holder only.

Type	RE (inch)	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	DCONMS	LF	LH	RMPX	Fig.	✶1 Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
Standard	.008 – .079	**APX3000R121SA16SA**	★	1	12	16	85	25	6.0°	1	TPS25	TIP07F	MK1KS	AO□T1236
		APX3000R141SA16SA	★	1	14	16	85	25	6.0°	1	TPS25	TIP07F	MK1KS	
		APX3000R162SA16SA	★	2	16	16	85	25	11.3°	2	TPS25	TIP07F	MK1KS	
		APX3000R182SA16SA	★	2	18	16	85	25	8.6°	3	TPS25	TIP07F	MK1KS	
		APX3000R202SA20SA	★	2	20	20	100	30	6.9°	2	TPS25	TIP07F	MK1KS	
		APX3000R203SA20SA	★	3	20	20	100	30	6.9°	2	TPS25	TIP07F	MK1KS	
		APX3000R223SA20SA	★	3	22	20	115	30	5.7°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R252SA25SA	★	2	25	25	115	35	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R253SA25SA	★	3	25	25	115	35	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R254SA25SA	★	4	25	25	115	35	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R284SA25SA	★	4	28	25	115	35	3.8°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R304SA32SA	★	4	30	32	125	45	3.4°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R323SA32SA	★	3	32	32	125	45	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R324SA32SA	★	4	32	32	125	45	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R325SA32SA	★	5	32	32	125	45	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R403SA32SA	★	3	40	32	125	45	2.2°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R405SA32SA	★	5	40	32	125	45	2.2°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R406SA32SA	★	6	40	32	125	45	2.2°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R507SA32SA	★	7	50	32	125	45	1.7°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R638SA32SA	★	8	63	32	125	45	1.3°	3	TPS25−1	TIP07F	MK1KS	
Long	.008 – .079	**APX3000R182SA16LA**	★	2	18	16	120	25	8.6°	3	TPS25	TIP07F	MK1KS	
		APX3000R202SA20LA	★	2	20	20	150	60	6.9°	2	TPS25	TIP07F	MK1KS	
		APX3000R222SA20LA	★	2	22	20	150	30	5.7°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R252SA25LA	★	2	25	25	170	70	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R253SA25LA	★	3	25	25	170	70	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R282SA25LA	★	2	28	25	170	35	3.8°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R283SA25LA	★	3	28	25	170	35	3.8°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R322SA32LA	★	2	32	32	190	90	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R323SA32LA	★	3	32	32	190	90	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R352SA32LA	★	2	35	32	190	45	2.7°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R353SA32LA	★	3	35	32	190	45	2.7°	3	TPS25−1	TIP07F	MK1KS	
Extra Long	.008 – .079	**APX3000R182SA16ELA**	★	2	18	16	180	25	8.6°	3	TPS25	TIP07F	MK1KS	
		APX3000R202SA20ELA	★	2	20	20	200	70	6.9°	2	TPS25	TIP07F	MK1KS	
		APX3000R222SA20ELA	★	2	22	20	200	30	5.7°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R252SA25ELA	★	2	25	25	220	80	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R253SA25ELA	★	3	25	25	220	80	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R282SA25ELA	★	2	28	25	220	35	3.8°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R283SA25ELA	★	3	28	25	220	35	3.8°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R322SA32ELA	★	2	32	32	260	100	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R323SA32ELA	★	3	32	32	260	100	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R352SA32ELA	★	2	35	32	260	45	2.7°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R353SA32ELA	★	3	35	32	260	45	2.7°	3	TPS25−1	TIP07F	MK1KS	

Note) When using inserts with corner radius RE≥.094"(2.4mm), B-Holders are required as shown on page 13.
✶1 Clamp Torque (lbf-in) : TPS25=8.9, TPS25−1=8.9





Metric Standard

For Metric Arbors

Arbor Type (A Holders)

With Coolant Through

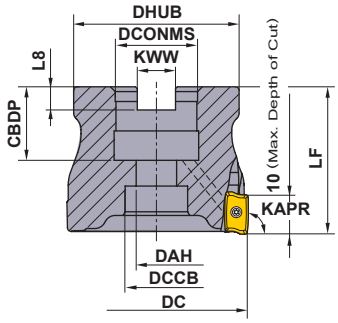
Right hand tool holder only.

RE (inch)	Order Number	Stock	Number of Teeth	Dimensions (mm)									RMPX	*1 Insert Screw	Wrench	Anti-seize Lubricant	Coolant thru Set Bolt
		R		DC	LF	DCONMS	CBDP	DAH	DHUB	KWW	L8	DCCB					
.008 I .079	APX3000-032A05RA	★	5	32	40	16	18	9	30	8.4	5.6	14	3.1°	TPS25−1	TIP07F	MK1KS	HSC08030H
	APX3000-040A06RA	★	6	40	40	16	18	9	34	8.4	5.6	14	2.2°	TPS25−1	TIP07F	MK1KS	HSC08030H
	APX3000-050A07RA	★	7	50	40	22	20	11	45	10.4	6.3	17	1.7°	TPS25−1	TIP07F	MK1KS	HSC10030H
	APX3000-063A08RA	★	8	63	40	22	20	11	55	10.4	6.3	17	1.3°	TPS25−1	TIP07F	MK1KS	HSC10030H
	APX3000-080A09RA	★	9	80	50	27	23	13	70	12.4	7	20	1.0°	TPS25−1	TIP07F	MK1KS	HSC12035H
	APX3000-100A11RA	★	11	100	63	32	26	17	80	14.4	8	26	0.8°	TPS25−1	TIP07F	MK1KS	HSC16040H

Note) When using inserts with corner radius RE≥.094"(2.4mm), B-Holders are required as shown on page 13.
*1 Clamp Torque (lbf-in) : TPS25−1=8.9
*2 Set bolt not included.

★ : Inventory maintained in Japan.





Metric Standard

For Inch Arbors

Arbor Type (A Holders)

With Coolant Through

Right hand tool holder only.

RE (inch)	Order Number	Stock	Number of Teeth	Dimensions (mm) [inch]									RMPX	✶1			
		R		DC	LF	DCONMS	CBDP	DAH	DHUB	KWW	L8	DCCB		Insert Screw	Wrench	Anti-seize Lubricant	Coolant thru Set Bolt
.008 | .079	**APX3000R08009CA**	★	9	80	50	25.4 [1.0"]	26	13	70	9.5	6	20	1.0°	TPS25−1	TIP07F	MK1KS	HSC12035H
	APX3000R10011DA	★	11	100	63	31.75 [1.25"]	32	17	80	12.7	8	26	0.8°	TPS25−1	TIP07F	MK1KS	HSC16040H

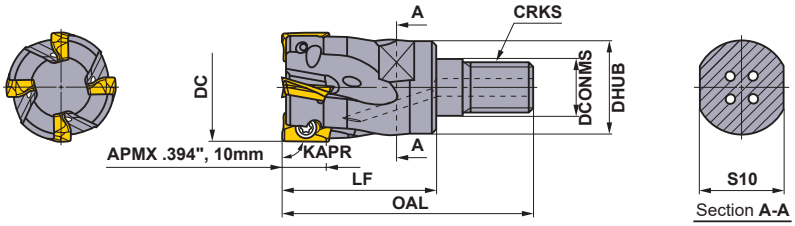
Note) When using inserts with corner radius RE≥.094"(2.4mm), B-Holders are required as shown on page 13.

✶1 Clamp Torque (lbf-in) : TPS25−1=8.9

✶2 Set bolt not included.

Multi-functional Indexable Cutter





Screw-in Type

With Coolant Through

Right hand tool holder only.

DC	Order Number	Stock	Number of Teeth	Dimensions (inch)						WT	*1			
				LF	OAL	DCONMS	DHUB	S10	CRKS *2	(lbs)	Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
.625	**APX3000UR102AM08A30**	●	2	1.181	1.890	.335	.512	.394	M8	.2	TPS25	TIP07F	MK1KS	AO□T1236
.750	**APX3000UR122AM10A30**	●	2	1.181	1.929	.413	.709	.551	M10	.2	TPS25	TIP07F	MK1KS	AO□T1236
.750	**APX3000UR123AM10A30**	●	3	1.181	1.929	.413	.709	.551	M10	.2	TPS25	TIP07F	MK1KS	AO□T1236
.875	**APX3000UR142AM10A30**	●	2	1.181	1.929	.413	.709	.551	M10	.2	TPS25-1	TIP07F	MK1KS	AO□T1236
.875	**APX3000UR143AM10A30**	●	3	1.181	1.929	.413	.709	.551	M10	.2	TPS25-1	TIP07F	MK1KS	AO□T1236
1.000	**APX3000UR163AM12A35**	●	3	1.378	2.244	.492	.827	.748	M12	.4	TPS25-1	TIP07F	MK1KS	AO□T1236
1.000	**APX3000UR164AM12A35**	●	4	1.378	2.244	.492	.827	.748	M12	.4	TPS25-1	TIP07F	MK1KS	AO□T1236
1.125	**APX3000UR184AM12A35**	●	4	1.378	2.244	.492	.827	.748	M12	.4	TPS25-1	TIP07F	MK1KS	AO□T1236
1.250	**APX3000UR205AM16A40**	●	5	1.575	2.480	.669	1.142	.945	M16	.7	TPS25-1	TIP07F	MK1KS	AO□T1236
1.375	**APX3000UR225AM16A40**	●	5	1.575	2.480	.669	1.142	.945	M16	.7	TPS25-1	TIP07F	MK1KS	AO□T1236

Note 1) When using inserts with corner radius RE>.094"(2.4mm), B-Holders are required as shown on page 13.
Note 2) For screw-in type arbors, refer to page 35-38.
*1 Clamp Torque (lbf-in) : TPS25=8.9, TPS25—1=8.9
*2 Clamp Torque of the Head (lbf-ft) : M8=17.1, M10=33.8, M12=59.2, M16=66.7

Metric Standard

Screw-in Type

With Coolant Through

DC	Order Number	Stock	Number of Teeth	Dimensions (mm)						WT	*1			
				LF	OAL	DCONMS	DHUB	S10	CRKS *2	(kg)	Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
16	**APX3000R162M08A30**	★	2	30	48	8.5	13	10	M8	0.1	TPS25	TIP07F	MK1KS	AO□T1236
18	**APX3000R182M08A30**	★	2	30	48	8.5	13	10	M8	0.1	TPS25	TIP07F	MK1KS	AO□T1236
20	**APX3000R203M10A30**	★	3	30	49	10.5	18	14	M10	0.1	TPS25	TIP07F	MK1KS	AO□T1236
22	**APX3000R223M10A30**	★	3	30	49	10.5	18	14	M10	0.1	TPS25-1	TIP07F	MK1KS	AO□T1236
25	**APX3000R254M12A35**	★	4	35	57	12.5	21	19	M12	0.2	TPS25-1	TIP07F	MK1KS	AO□T1236
28	**APX3000R284M12A35**	★	4	35	57	12.5	21	19	M12	0.2	TPS25-1	TIP07F	MK1KS	AO□T1236
30	**APX3000R304M16A40**	★	4	40	63	17	29	24	M16	0.3	TPS25-1	TIP07F	MK1KS	AO□T1236
32	**APX3000R325M16A40**	★	5	40	63	17	29	24	M16	0.3	TPS25-1	TIP07F	MK1KS	AO□T1236
35	**APX3000R355M16A40**	★	5	40	63	17	29	24	M16	0.3	TPS25-1	TIP07F	MK1KS	AO□T1236
40	**APX3000R406M16A40**	★	6	40	63	17	29	24	M16	0.3	TPS25-1	TIP07F	MK1KS	AO□T1236

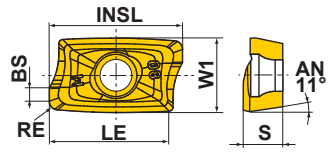
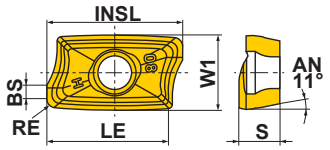
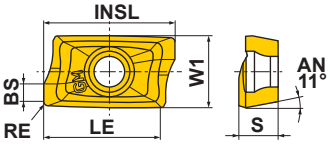
Note 1) When using inserts with corner radius RE>.094"(2.4mm), B-Holders are required as shown on page 13.
Note 2) For screw-in type arbors, refer to page 35-38.
*1 Clamp Torque (lbf-in) : TPS25=8.9, TPS25—1=8.9
*2 Clamp Torque of the Head (lbf-ft) : M8=17.1, M10=33.8, M12=59.2, M16=66.7

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

Inserts

Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metals
	S	Heat Resistant Alloys, Titanium Alloys
	H	Hardened Steel

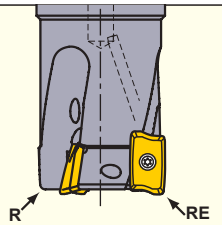
This is the selection guideline for APX.
Please note that the cutting conditions differ depending on multiple factors, for more details refer to the Recommended Cutting Conditions.
Edge Preparation :
E : Round **F :** Sharp Edge

Shape	Order Number	Class	Edge Preparation	Coated										Carbide		Dimensions (inch)						Geometry
				MC5020	MV1020	MV1030	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	VP20RT	MX3030	TF15		BS	LE	RE	W1	INSL	S	
General M	AOMT123602PEER-M	M	E		●	●	●	●	●	●	●	●	●				.071	.394	.008	.260	.472	.142	
	AOMT123604PEER-M	M	E		●	●	●	●	●	●	●	●	●	●			.063	.394	.016	.260	.472	.142	
	AOMT123608PEER-M	M	E		●	●	●	●	●	●	●	●	●	●			.047	.394	.031	.260	.472	.142	
	AOMT123610PEER-M	M	E		●	●	●	●	●	●	●	★	★				.039	.394	.039	.260	.472	.142	
	AOMT123612PEER-M	M	E		●	●	●	●	●	●	●	●	●				.031	.394	.047	.260	.472	.142	
	AOMT123616PEER-M	M	E		●	●	●	●	●	●	●	●	●				.016	.394	.063	.260	.472	.142	
	AOMT123620PEER-M	M	E		●	●	●	●	●	●	●	●	●				.016	.394	.079	.260	.472	.142	
	AOMT123624PEER-M	M	E		●	●	●	●	●	●	●	●	●				.016	.394	.094	.260	.472	.142	
	AOMT123630PEER-M	M	E		●	●	●	●	●	●	●	●	●				.016	.394	.118	.260	.472	.142	
	AOMT123632PEER-M	M	E		●	●	●	●	●	●	●	●	●				.016	.394	.126	.260	.472	.142	
Strong Cutting Edge Type H	AOMT123604PEER-H	M	E	●	●	●	●	●	●	●	●	●	●				.063	.394	.016	.260	.472	.142	
	AOMT123608PEER-H	M	E	●	●	●	●	●	●	●	●	●	●				.047	.394	.031	.260	.472	.142	
	AOMT123616PEER-H	M	E	●	●	●	●	●	●	●	●	●	●				.016	.394	.063	.260	.472	.142	
For Machining of Aluminum Alloys GM	AOGT123602PEFR-GM	G	F												●		.071	.394	.008	.260	.472	.142	
	AOGT123604PEFR-GM	G	F												●		.063	.394	.016	.260	.472	.142	
	AOGT123608PEFR-GM	G	F												●		.047	.394	.031	.260	.472	.142	

Note) For large R inserts
APX offers various nose radii for inserts, however one holder can not secure every insert radius.
We offer A-Holders that properly secures up to .079" radius.
We offer B-Holders that secures .094", .118" and .125" radius, only for popular inch sizes.
Customers may modify holders as below, so that larger nose radii can be secured.

Note on Use of Inserts with Large Corner Radii

When using inserts with corner radius RE≥R.094", please machine the holder with a radius form as shown on the right table.



RE	R
.094"	.106" (B-Holder)
.118"	
.125"	

R : Holder End Radius
RE : Insert Corner Radius

Or additional B-Holders are available as non stock, produced to order only.
"Order numbers"; Please add "B" to the end of the order number of A-Holders.
Ex) APX3000R160M08A30→APX3000R162M08A30B

Recommended Cutting Conditions

Cutting Speed

(inch)

	Material	Properties	Grade	Chipbreaker		Cutting Width **ae** ≤.25DC	.25—.5DC	.5—.75DC	DC (Slot)
						vc (SFM)			
P	Mild Steel	Hardness ≤180HB	MV1020	M	H	920(720—1080)	885(690—1050)	720(560—850)	720(560—850)
			MV1030, MP6120, VP15TF	M	H	755(590—885)	720(560—850)	590(460—690)	590(460—690)
			MP6130, VP20RT	M	H	655(490—785)	620(460—755)	490(360—590)	490(360—590)
			MX3030	M	—	525(395—655)	490(360—620)	395(330—490)	—
	Carbon Steel Alloy Steel	Hardness 180—280HB	MV1020	M	H	720(560—850)	690(525—785)	560(425—655)	560(425—655)
			MV1030	M	H	590(460—690)	560(425—655)	460(360—525)	460(360—525)
			MP6120, VP15TF	M	H	590(460—690)	560(425—655)	460(360—525)	460(360—525)
			MP6130, VP20RT	M	H	490(360—590)	460(330—560)	360(260—425)	360(260—425)
			MX3030	M	—	460(330—590)	425(295—560)	330(260—490)	—
		Hardness 280—350HB	MV1020, MV1030	M	H	590(460—690)	560(425—655)	460(360—525)	460(360—525)
			MP6120, VP15TF	M	H	590(460—690)	560(425—655)	460(360—525)	460(360—525)
			MP6130, VP20RT	M	H	490(360—590)	460(330—560)	360(260—425)	360(260—425)
			MX3030	M	—	460(330—590)	425(295—560)	330(260—490)	—
M	Stainless Steel	Hardness ≤200HB	MV1030	M	H	590(460—690)	560(425—655)	460(360—525)	460(360—525)
			MP7130, VP20RT	M	H	590(460—690)	560(425—655)	460(360—525)	460(360—525)
			MX3030	M	—	395(260—460)	360(260—425)	330(260—395)	—
		Hardness >200HB	MV1030	M	H	490(360—590)	460(330—525)	360(260—425)	360(260—425)
			MP7130, VP20RT	M	H	590(460—690)	560(425—655)	460(360—525)	460(360—525)
			MX3030	M	—	395(260—460)	360(260—425)	330(260—395)	—
K	Gray Cast Iron	Hardness ≤350MPa	MC5020	H	—	820(655—985)	785(620—950)	690(525—850)	460(360—525)
			VP15TF, VP20RT	H	M	590(460—690)	560(425—655)	460(360—525)	460(360—525)
			MX3030	M	—	395(260—460)	360(260—425)	330(260—395)	—
	Ductile Cast Iron	Tensile Strength ≤450MPa	MC5020, VP15TF	H	—	425(330—490)	395(295—460)	330(260—395)	330(260—395)
			MV1020	H	M	655(490—920)	620(460—885)	560(425—785)	560(425—785)
			MV1030	H	M	490(330—655)	460(295—620)	410(260—560)	330(260—395)
			MX3030	M	—	395(260—460)	360(260—425)	330(260—395)	—
		Tensile Strength ≤800MPa	MC5020, VP15TF	H	—	425(330—490)	395(295—460)	330(260—395)	330(260—395)
			MV1020	H	M	590(460—820)	560(425—785)	490(395—690)	490(395—690)
			MV1030	H	M	490(330—655)	460(295—620)	410(260—560)	410(260—560)
			MX3030	M	—	395(260—460)	360(260—425)	330(260—395)	—
N	Aluminum Alloys	—	TF15, MP9120	GM	M	1640(655—3280)	1640(655—3280)	1640(655—3280)	1640(655—3280)
S	Titanium Alloys	Hardness ≤350HB	MP9120, VP15TF	M	H	165(130—230)	165(130—230)	165(130—230)	165(130—230)
			MP9130, VP20RT	M	H	130(100—195)	130(100—195)	130(100—195)	130(100—195)
	Heat Resistant Alloys	—	MP9120, VP15TF	M	H	130(100—195)	130(100—195)	130(100—195)	130(100—195)
			MP9130, VP20RT	M	H	100(65—130)	100(65—130)	100(65—130)	100(65—130)
H	Hardened Steel	40—55HRC	VP15TF	H	—	295(230—330)	260(195—330)	230(165—260)	230(165—260)

Depth of Cut / Feed per Tooth

(inch)

	Material	Properties	Cutting Width **ae**	DC					
				ϕ.500"—ϕ.625"(ϕ12—ϕ16mm)		ϕ.750"—ϕ1.000"(ϕ20—ϕ25mm)		ϕ1.250"—ϕ3.000"(ϕ28—ϕ100mm)	
				Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)
P	Mild Steel Carbon Steel Alloy Steel	Hardness ≤180HB 180—350HB	≤.25DC	≤.157	.006	≤.197	.010	≤.197	.008
				.157—.276	.004	.197—.276	.008	.197—.276	.006
				—	—	.276—.335	.006	.276—.335	.004
				—	—	.335—.394	.004	.335—.394	.003
			.25—.5DC	≤.079	.006	≤.118	.010	≤.118	.008
				.078—.197	.004	.118—.217	.008	.118—.217	.006
				—	—	.217—.315	.006	.217—.315	.004
				—	—	.315—.394	.004	.315—.394	.003
			.5—.75DC	≤.157	.004	≤.157	.006	≤.118	.004
				—	—	.157—.394	.004	.118—.276	.003
			DC (Slot)	≤.118	.004	≤.157	.004	≤.118	.004
						.157—.276	.003	.118—.197	.003

(inch)

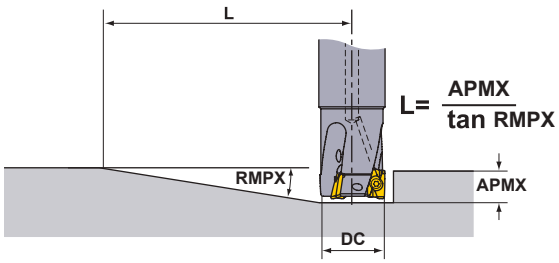
	Material	Properties	Cutting Width **ae**	DC					
				ϕ.500"–ϕ.625"(ϕ12–ϕ16mm)		ϕ.750"–ϕ1.000"(ϕ20–ϕ25mm)		ϕ1.250"–ϕ3.000"(ϕ28–ϕ100mm)	
				Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)
M	Stainless Steel	Hardness ≤270HB	≤.25DC	≤.157	.006	≤.197	.008	≤.197	.008
				.157–.276	.004	.197–.276	.006	.197–.276	.006
				–	–	.276–.335	.004	.276–.335	.004
				–	–	.335–.394	.003	.335–.394	.004
			.25–.5DC	≤.079	.006	≤.118	.008	≤.118	.008
				.078–.197	.004	.118–.217	.006	.118–.217	.006
				–	–	.217–.315	.004	.217–.315	.004
				–	–	.315–.394	.003	.315–.394	.003
			.5–.75DC	≤.157	.004	≤.157	.004	≤.118	.004
				–	–	.157–.394	.003	.118–.276	.003
			DC (Slot)	≤.157	.004	≤.157	.004	≤.118	.004
						.157–.276	.003	.118–.197	.003
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.25DC	≤.157	.006	≤.197	.010	≤.197	.008
				.157–.276	.004	.197–.276	.008	.197–.276	.006
				–	–	.276–.335	.006	.276–.335	.004
				–	–	.335–.394	.004	.335–.394	.003
			.25–.5DC	≤.079	.006	≤.118	.010	≤.118	.008
				.079–.197	.004	.118–.217	.008	.118–.217	.006
				–	–	.217–.315	.006	.217–.315	.004
				–	–	.315–.394	.004	.315–.394	.003
			.5–.75DC	≤.157	.004	≤.157	.006	≤.118	.004
				–	–	.157–.394	.004	.118–.276	.003
			DC (Slot)	≤.118	.004	≤.157	.004	≤.118	.004
						.157–.276	.003	.118–.197	.003
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤.25DC	≤.157	.004	≤.197	.008	≤.197	.008
				.157–.276	.003	.197–.276	.006	.197–.276	.006
				–	–	.276–.335	.004	.276–.335	.004
				–	–	.335–.394	.003	.335–.394	.003
			.25–.5DC	≤.079	.004	≤.118	.008	≤.118	.008
				.079–197	.003	.118–.217	.006	.118–.217	.006
				–	–	.217–.315	.004	.217–.315	.004
				–	–	.315–.394	.003	.315–.394	.003
			.5–.75DC	≤.157	.003	≤.157	.004	≤.118	.004
				–	–	.315–.394	.003	.118–.276	.003
			DC (Slot)	≤.118	.003	≤.157	.004	≤.118	.004
						.157–.276	.003	.118–.197	.003
N	Aluminum Alloys	–	≤.25DC	≤.157	.006	≤.157	.010	≤.157	.008
				.157–.276	.004	.157–.276	.006	.157–.276	.004
			.25–.5DC	≤.157	.004	≤.157	.008	≤.157	.008
				.157–.276	.004	.157–.276	.004	.157–.276	.004
			.5–.75DC	≤.197	.004	≤.197	.006	≤.197	.004
			DC (Slot)	≤.197	.004	≤.197	.008	≤.197	.006
S	Titanium Alloys	Hardness ≤350HB	≤.25DC	≤.157	.006	≤.157	.006	≤.157	.004
				.157–.276	.004	.157–.276	.004	.157–.276	.003
			.25–.5DC	≤.118	.002	≤.118	.002	≤.118	.002
	Heat Resistant Alloys	–	.5–.75DC	≤.079	.004	≤.079	.002	≤.079	.002
			DC (Slot)	≤.039	.002	≤.039	.002	≤.039	.002
H	Hardened Steel	Hardness 40–55HRC	≤.25DC	≤.157	.004	≤.197	.006	≤.197	.006
				.157–.276	.003	.197–.276	.004	.197–.276	.004
				–	–	.276–.335	.003	–	–
			.25–.5DC	≤.079	.004	≤.118	.006	≤.118	.006
				.079–.197	.003	.118–.217	.004	–	–
			.5–.75DC	≤.157	.003	≤.157	.003	≤.118	.003
			DC (Slot)	≤.118	.003	≤.157	.003	≤.118	.003

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

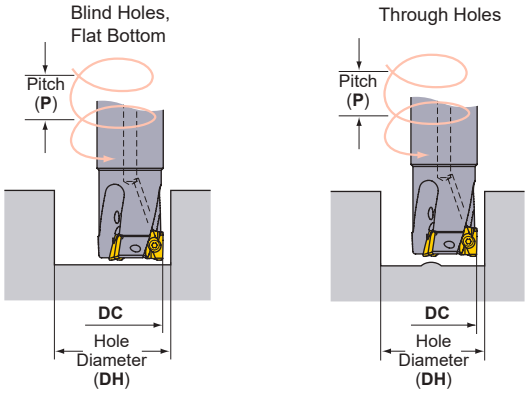
Note 3) In case of coarse and fine pitch cutters, the coarse pitch type is recommended to prevent vibration.
Note 4) For heavy interrupted and unstable cutting, the H chipbreaker is first recommendation.

Ramping/Helical Cutting

● **Ramping**



● **Helical Cutting**



Refer to the table below when using .031 inch radius for maximum ramping angle, pitch and minimum/maximum hole diameter. Use cutting conditions for slot milling to calculate speed and feed when ramping / helical cutting.

Cutting Edge Diameter **DC** (inch)	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
	Maximum Ramping Angle **RMPX**	Minimum Distance *1 **L** (inch)	Maximum Hole Diameter *2 **DH max.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)
.500	6.0°	3.8	0.92	.09	.87	.07	.63	.020
.625	11.5°	1.9	1.17	.35	1.1	.27	.79	.079
.750	7.5°	3.0	1.42	.19	1.35	.17	1.03	.079
1.000	4.5°	5.0	1.92	.23	1.85	.19	1.58	.079
1.250	3.1°	7.3	2.42	.17	2.35	.15	2.05	.079
1.500	2.3°	9.8	2.92	.15	2.85	.13	2.56	.079
2.000	1.6°	14.1	3.92	.07	3.85	.07	3.55	.079
2.500	1.3°	17.4	4.92	.07	4.85	.07	4.56	.079
3.000	1.0°	22.6	5.92	.07	5.85	.07	5.52	.079

*1 L(=.394"/tan RMPX). Cutters' moving distance until depth of cut reaches .394" at a maximum ramping angle.
*2 In case corner radius of .031". Other than that, find with the below formula.
{(cutting edge diameter DC) - (corner radius) - .008"} x 2
Note 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.

DEEP SHOULDER MILLING

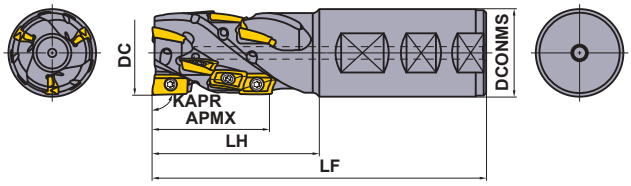
KAPR 90° Roughing

APX3000

Long Edge

P M K N S H





Shank Type (A Holders)

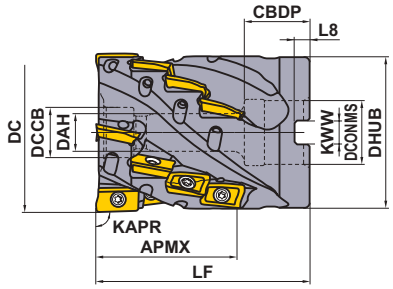
Right hand tool holder only.

RE	Order Number	Stock	Coolant Thru	*1 No.F	Total	Dimensions (inch)					*2 Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
		R				DC	DCONMS	LF	LH	APMX				
.008 I .079	APX3KUR121FN12S11A04	●	N	1	4	.750	.750	5.000	1.750	1.102	TPS25	TIP07F	MK1KS	AO□T1236
	APX3KUR162FA16S11A06	●	Y	2	6	1.000	1.000	5.000	1.750	1.102	TPS25-1	TIP07F	MK1KS	
	APX3KUR162FA16M14A08	●	Y	2	8	1.000	1.000	5.250	2.000	1.456	TPS25-1	TIP07F	MK1KS	
	APX3KUR202FA20S14A08	●	Y	2	8	1.250	1.250	5.250	2.000	1.456	TPS25-1	TIP07F	MK1KS	
	APX3KUR202FA20M18A10	●	Y	2	10	1.250	1.250	5.750	2.500	1.811	TPS25-1	TIP07F	MK1KS	
	APX3KUR243FA24S18A15	●	Y	3	15	1.500	1.500	5.750	2.500	1.811	TPS25-1	TIP07F	MK1KS	
	APX3KUR243FA24M21A18	●	Y	3	18	1.500	1.500	6.000	2.750	2.165	TPS25-1	TIP07F	MK1KS	

Y=Yes, N=No ＊1 Number of Flutes ＊2 Clamp Torque (lbf-in) : TPS25=8.9, TPS25-1=8.9

Note 1) When using inserts with corner radius RE≥ .094", machining of the holder is required as shown on page 13.
Note 2) Corner radius RE .031" is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008" and .016" can also be used.





Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ2.000"	HSCUF37520	

Shell Type (A Holders)

With Coolant Through

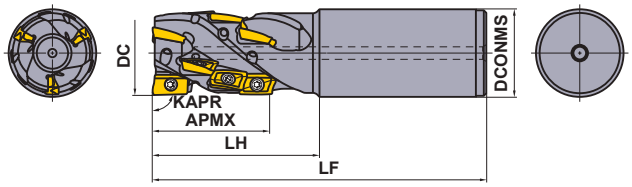
RE	Order Number	Stock	*1 No.F	Total	Dimensions (inch)										*2 Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
		R			DC	LF	DCONMS	CBDP	DAH	DCCB	DHUB	KWW	L8	APMX				
.008 I .079	APX3KUR2.0004AA18A20	●	4	20	2.000	2.500	.750	.750	.395	.630	1.936	.313	.187	1.811	TPS25-1	TIP07F	MK1KS	AO□T1236

＊1 Number of Flutes ＊2 Clamp Torque (lbf-in) : TPS25-1 = 8.9

Note 1) When using inserts with corner radius RE≥ .094", machining of the holder is required as shown on page 13.
Note 2) Corner radius RE .031" is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008" and .016" can also be used.
Note 3) Coolant can be supplied from the end face of the centering location bore in the arbor. However, it cannot be supplied from the set bolt.

● : Inventory maintained.





Metric Standard

Shank Type (A Holders)

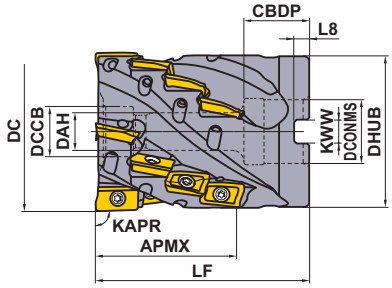
Right hand tool holder only.

RE (inch)	Order Number	Stock	Coolant Thru	No.F *1	Total	Dimensions (mm)					*2			
		R				DC	DCONMS	LF	LH	APMX	Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
.008 | .079	APX3KR2004SN20S028A	★	N	1	4	20	20	125	45	28	TPS25	TIP07F	MK1KS	AO□T1236
	APX3KR2506SA25S028A	★	Y	2	6	25	25	125	45	28	TPS25-1	TIP07F	MK1KS	
	APX3KR2508SA25M037A	★	Y	2	8	25	25	130	50	37	TPS25-1	TIP07F	MK1KS	
	APX3KR3208SA32S037A	★	Y	2	8	32	32	130	50	37	TPS25-1	TIP07F	MK1KS	
	APX3KR3210SA32M046A	★	Y	2	10	32	32	140	60	46	TPS25-1	TIP07F	MK1KS	
	APX3KR3212SA32S037A	★	Y	3	12	32	32	130	50	37	TPS25-1	TIP07F	MK1KS	
	APX3KR3215SA32M046A	★	Y	3	15	32	32	140	60	46	TPS25-1	TIP07F	MK1KS	
	APX3KR4015SA42S046A	★	Y	3	15	40	42	140	60	46	TPS25-1	TIP07F	MK1KS	
	APX3KR4018SA42M055A	★	Y	3	18	40	42	150	70	55	TPS25-1	TIP07F	MK1KS	

Y=Yes, N=No ＊1 Number of Flutes ＊2 Clamp Torque (lbf-in) : TPS25=8.9, TPS25-1=8.9

Note 1) When using inserts with corner radius RE≥.094", machining of the holder is required as shown on page 13.
Note 2) Corner radius RE .031" is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008" and .016" can also be used.





Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ40mm	HSC08040	
ϕ50mm	HSC10045	

The bore diameter (DCONMS) is equivalent to a metric size.

Metric Standard For Metric Arbors

Shell Type (A Holders)

With Coolant Through

RE (inch)	Order Number	Stock	No.F *1	Total	Dimensions (mm)										*2			
		R			DC	LF	DCONMS	CBDP	DAH	DCCB	DHUB	KWW	L8	APMX	Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
.008 | .079	APX3K-040A16A037RA	★	4	16	40	50	16	18	9	14	38.5	8.4	5.6	37	TPS25-1	TIP07F	MK1KS	AO□T1236
	APX3K-050A20A046RA	★	4	20	50	60	22	20	11	17	48.4	10.4	6.3	46	TPS25-1	TIP07F	MK1KS	

＊1 Number of Flutes ＊2 Clamp Torque (lbf-in) : TPS25-1 = 8.9

Note 1) When using inserts with corner radius RE≥.094", machining of the holder is required as shown on page 13.
Note 2) Corner radius RE .031" is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008" and .016" can also be used.
Note 3) Coolant can be supplied from the end face of the centering location bore in the arbor. However, it cannot be supplied from the set bolt.

★ : **Inventory maintained in Japan.**

Recommended Cutting Conditions

Cutting Speed

(inch)

	Material	Properties	Grade	Chipbreaker		Cutting Width **ae** ≤.25DC	.25–.75DC	DC (Slot)
						vc (SFM)		
P	Mild Steel	≤180HB	MV1020	M	H	655(490–785)	590(460–690)	490(360–590)
			MV1030, MP6120, VP15TF	M	H	590(460–720)	490(360–590)	395(330–460)
			MP6130, VP20RT	M	H	525(395–655)	425(330–525)	330(260–395)
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness ≤180–280 HB ≤350 HB (Annealing)	MV1020	M	H	590(460–720)	490(360–590)	395(330–460)
			MV1030, MP6120, VP15TF	M	H	490(330–655)	395(295–490)	330(260–395)
			MP6130, VP20RT	M	H	425(295–560)	295(230–360)	260(195–330)
	Pre-Hardened Steel	Hardness 35–45 HRC	MP6120, VP15TF	M	H	395(260–525)	330(230–425)	295(165–395)
			MP6130, VP20RT	M	H	330(230–425)	295(195–395)	230(165–330)
M	Stainless Steel	–	MV1030, MP7130	M	H	490(395–590)	395(330–460)	330(260–395)
K	Gray Cast Iron	Tensile Strength ≤350 Mpa	MC5020	H	–	655(490–820)	590(490–690)	–
			VP15TF	H	M	590(395–785)	490(330–655)	330(195–460)
	Ductile Cast Iron	Tensile Strength ≤800 Mpa	MV1020	H	M	590(460–720)	490(360–590)	330(260–395)
			MV1030, VP15TF	H	M	525(395–655)	460(330–590)	260(195–330)
N	Aluminum Alloys	–	TF15, MP9120	GM	M	1310(655–2625)	1310(655–2625)	1310(655–2625)
S	Titanium Alloys	Hardness ≤350 HB	MP9130	M	–	130(100–195)	130(100–195)	130(100–195)
			MP9120	M	–	165(130–230)	165(130–230)	165(130–230)
	Heat Resistant Alloys	–	MP9120, VP15TF	M	H	130(100–195)	130(100–195)	130(100–195)
			MP9130, VP20RT	M	H	100(65–130)	100(65–130)	100(65–130)

Recommended Cutting Conditions

Depth of Cut / Feed per Tooth

(inch)

Material		Properties	Cutting Width **ae**	DC					
				ø20		ø25		ø32—ø50	
				Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)
P	Mild Steel	Hardness ≤180HB	≤0.25DC	≤1.102	.006	≤1.457	.007	≤2.165	.008
			0.25-0.75DC	≤1.102	.005	≤1.457	.006	≤2.165	.007
			DC (Slot)	≤.709	.003	≤.709	.003	≤.709	.003
	Carbon Steel Alloy Steel	Hardness 180—280HB	≤0.25DC	≤1.102	.005	≤1.457	.006	≤2.165	.007
			0.25-0.75DC	≤1.102	.004	≤1.457	.005	≤2.165	.006
			DC (Slot)	≤.709	.003	≤.709	.003	≤.709	.003
	Alloy Tool Steel	Hardness ≤350HB (Annealing)	≤0.25DC	≤1.102	.005	≤1.457	.006	≤2.165	.007
			0.25-0.75DC	≤1.102	.004	≤1.457	.005	≤2.165	.006
			DC (Slot)	≤.709	.003	≤.709	.003	≤.709	.003
	Pre-hardened Steel	Hardness 35—45HRC	≤0.25DC	≤1.102	.005	≤1.457	.006	≤2.165	.007
			0.25-0.75DC	≤1.102	.004	≤1.457	.005	≤2.165	.006
			DC (Slot)	≤.709	.003	≤.709	.003	≤.709	.003
M	Ferritic and Martensitic Stainless Steel	—	≤0.25DC	≤1.102	.005	≤1.457	.006	≤2.165	.007
			0.25-0.75DC	≤1.102	.004	≤1.457	.005	≤2.165	.006
			DC (Slot)	≤.709	.003	≤.709	.003	≤.709	.003
	Duplex Stainless Steel	Hardness ≤280HB	≤0.25DC	≤1.102	.005	≤1.457	.006	≤2.165	.007
			0.25-0.75DC	≤1.102	.004	≤1.457	.005	≤2.165	.006
			DC (Slot)	≤.709	.003	≤.709	.003	≤.709	.003
	Precipitation Hardening Stainless Steel	Hardness <450HB	≤0.25DC	≤1.102	.005	≤1.457	.006	≤2.165	.007
			0.25-0.75DC	≤1.102	.004	≤1.457	.005	≤2.165	.006
			DC (Slot)	≤.709	.003	≤.709	.003	≤.709	.003
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤0.25DC	≤1.102	.006	≤1.457	.007	≤2.165	.008
			0.25-0.75DC	≤1.102	.005	≤1.457	.006	≤2.165	.007
			DC (Slot)	≤.709	.004	≤.709	.004	≤.709	.004
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤0.25DC	≤1.102	.005	≤1.457	.006	≤2.165	.007
			0.25-0.75DC	≤1.102	.004	≤1.457	.005	≤2.165	.006
			DC (Slot)	≤.709	.003	≤.709	.003	≤.709	.003
N	Aluminum Alloys		≤0.25DC	≤1.102	.006	≤1.457	.007	≤2.165	.008
			0.25-0.75DC	—	—	≤.354	.007	≤.354	.008
			DC (Slot)	—	—	≤.354	.007	≤.354	.008
S	Titanium Alloys	Hardness ≤350HB	≤0.25DC	≤1.102	.004	≤1.457	.004	≤2.165	.004
			0.25-0.75DC	—	—	—	—	—	—
			DC (Slot)	≤.709	.002	≤.709	.002	≤.709	.002
	Heat Resistant Alloys	—	≤0.25DC	≤1.102	.003	≤1.457	.003	≤2.165	.003
			0.25-0.75DC	—	—	—	—	—	—
			DC (Slot)	≤.709	.002	≤.709	.002	≤.709	.002

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

MULTI-FUNCTIONAL MILLING

KAPR 90°

Finishing Roughing

Supports multi-functional machining.
Please refer to page 2 for details.

APX4000

P M K N S H



Fig.1

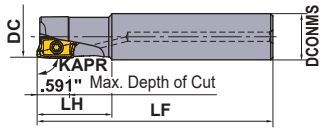


Fig.2

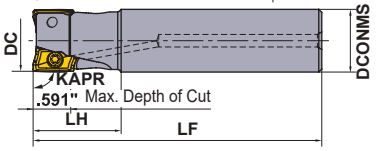


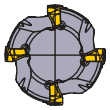
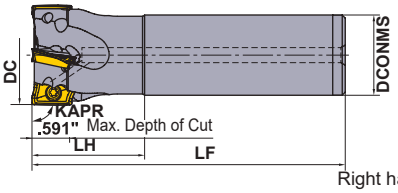
Fig.3



Fig.4

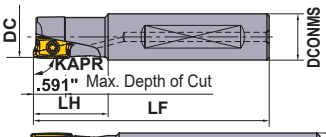


Fig.5

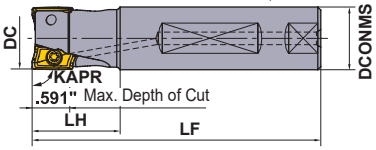
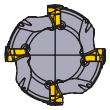
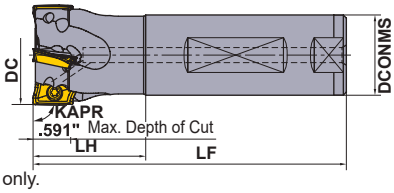


Fig.6



Right hand tool holder only.

Shank Type

With Coolant Through

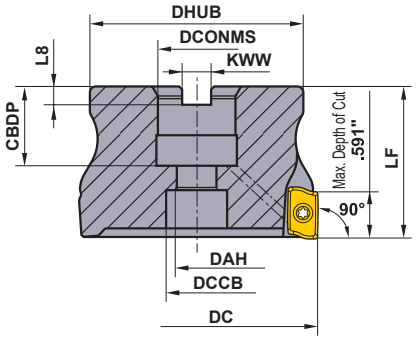
•APX4000UR○○○SA○○ = Ground shank : See figure 1, 2 and 3.
•APX4000UR○○○FA○○ = Flat shank : See figure 4 and 5.

Type		RE (inch)	Order Number	Stock R	Number of Teeth	Dimensions (inch) DC	DCONMS	LF	LH	RMPX	Fig.	✶1 Insert Screw	Wrench	Anti-seize Lubricant
Standard	A Holders	.016 | .079	APX4000UR121FA12SA	●	1	.750	.750	4.000	1.250	14°	4	TPS4S	TIP15W	MK1KS
			APX4000UR121SA12SA	●	1	.750	.750	4.000	1.250	14°	1	TPS4S	TIP15W	MK1KS
			APX4000UR162SA12SA	●	2	1.000	.750	4.000	1.250	11°	3	TPS4	TIP15W	MK1KS
			APX4000UR162FA16SA	●	2	1.000	1.000	4.500	1.250	11°	4	TPS4	TIP15W	MK1KS
			APX4000UR162SA16SA	●	2	1.000	1.000	4.500	1.250	11°	2	TPS4	TIP15W	MK1KS
			APX4000UR202FA20SA	●	2	1.250	1.250	5.000	1.750	7°	5	TPS4	TIP15W	MK1KS
			APX4000UR202SA20SA	●	2	1.250	1.250	5.000	1.750	7°	2	TPS4	TIP15W	MK1KS
			APX4000UR203FA20SA	●	3	1.250	1.250	5.000	1.750	7°	5	TPS4	TIP15W	MK1KS
			APX4000UR203SA20SA	●	3	1.250	1.250	5.000	1.750	7°	2	TPS4	TIP15W	MK1KS
			APX4000UR243FA20SA	●	3	1.500	1.250	5.000	1.750	7°	6	TPS43	TIP15W	MK1KS
			APX4000UR243SA20SA	●	3	1.500	1.250	5.000	1.750	7°	3	TPS43	TIP15W	MK1KS
			APX4000UR244FA20SA	●	4	1.500	1.250	5.000	1.750	7°	6	TPS43	TIP15W	MK1KS
			APX4000UR244SA20SA	●	4	1.500	1.250	5.000	1.750	7°	3	TPS43	TIP15W	MK1KS
	B Holders	.125 | .157	APX4000UR121FA12SB	●	1	.750	.750	4.000	1.250	14°	4	TPS4S	TIP15W	MK1KS
			APX4000UR162FA16SB	●	2	1.000	1.000	4.500	1.250	11°	5	TPS4	TIP15W	MK1KS
			APX4000UR202FA20SB	●	2	1.250	1.250	5.000	1.750	7°	5	TPS4	TIP15W	MK1KS
			APX4000UR203FA20SB	●	3	1.250	1.250	5.000	1.750	7°	5	TPS4	TIP15W	MK1KS
			APX4000UR243FA20SB	●	3	1.500	1.250	5.000	1.750	7°	6	TPS43	TIP15W	MK1KS
			APX4000UR244FA20SB	●	4	1.500	1.250	5.000	1.750	7°	6	TPS43	TIP15W	MK1KS
Long	A Holders	.016 | .079	APX4000UR162SA16LA	●	2	1.000	1.000	8.500	1.250	11°	2	TPS4	TIP15W	MK1KS
			APX4000UR202SA20LA	●	2	1.250	1.250	9.000	1.750	7°	2	TPS4	TIP15W	MK1KS
			APX4000UR203SA20LA	●	3	1.250	1.250	9.000	1.750	7°	2	TPS4	TIP15W	MK1KS
			APX4000UR243SA24LA	●	3	1.500	1.500	9.000	1.750	7°	2	TPS43	TIP15W	MK1KS
			APX4000UR244SA24LA	●	4	1.500	1.500	9.000	1.750	7°	2	TPS43	TIP15W	MK1KS
			APX4000UR243SA24ELA	●	3	1.500	1.500	14.000	1.750	7°	2	TPS43	TIP15W	MK1KS
	B Holders	.125 | .157	APX4000UR162SA16LB	●	2	1.000	1.000	8.500	1.250	11°	2	TPS4	TIP15W	MK1KS
			APX4000UR202SA20LB	●	2	1.250	1.250	9.000	1.750	7°	2	TPS4	TIP15W	MK1KS
			APX4000UR203SA20LB	●	3	1.250	1.250	9.000	1.750	7°	2	TPS4	TIP15W	MK1KS
			APX4000UR243SA24LB	●	3	1.500	1.500	9.000	1.750	7°	2	TPS43	TIP15W	MK1KS
			APX4000UR244SA24LB	●	4	1.500	1.500	9.000	1.750	7°	2	TPS43	TIP15W	MK1KS
			APX4000UR243SA24ELB	●	3	1.500	1.500	14.000	1.750	7°	2	TPS43	TIP15W	MK1KS

Note) When using inserts with corner radius RE≥.125"(3.2mm), B-Holders or C-Holders are required as shown on page 28.
✶1 Clamp Torque (lbf-in) : TPS4=35.6, TPS4S=31, TPS43=35.6

● : **Inventory maintained.**





Arbor Type

With Coolant Through

Right hand tool holder only.

Type	RE (inch)	Order Number	Stock R	Number of Teeth	Dimensions (inch) DC	LF	DCONMS	CBDP	DAH	DHUB	KWW	L8	DCCB	RMPX	★1 Insert Screw	Wrench	Anti-seize Lubricant	Coolant thru Set Bolt
A Holders	.016 I .079	APX4000UR0204A	●	4	2.000	1.625	.750	.748	.415	1.875	.313	.187	.600	4°	TPS43	TIP15W	MK1KS	HSCU37513H
		APX4000UR0205A	●	5	2.000	1.625	.750	.748	.415	1.875	.313	.187	.600	4°	TPS43	TIP15W	MK1KS	HSCU37513H
		APX4000UR2505CA	●	5	2.500	2.000	1.000	1.024	.539	2.375	.375	.219	.787	2°	TPS43	TIP15W	MK1KS	HSCU50014H
		APX4000UR0306DA	●	6	3.000	2.500	1.250	1.260	.669	2.874	.500	.281	1.024	2°	TPS43	TIP15W	MK1KS	HSCU62516H
		APX4000UR0307DA	●	7	3.000	2.500	1.250	1.260	.669	2.874	.500	.281	1.024	2°	TPS43	TIP15W	MK1KS	HSCU62516H
		APX4000UR0408EA	●	8	4.000	2.500	1.500	1.181	.787	3.799	.625	.375	1.181	1.5°	TPS43	TIP15W	MK1KS	HSCU75016H
B Holders	.125 I .157	APX4000UR0204B	●	4	2.000	1.625	.750	.748	.415	1.875	.313	.187	.600	4°	TPS43	TIP15W	MK1KS	HSCU37513H
		APX4000UR0205B	●	5	2.000	1.625	.750	.748	.415	1.875	.313	.187	.600	4°	TPS43	TIP15W	MK1KS	HSCU37513H
		APX4000UR2505CB	●	5	2.500	2.000	1.000	1.024	.539	2.375	.375	.219	.787	2°	TPS43	TIP15W	MK1KS	HSCU50014H
		APX4000UR0306DB	●	6	3.000	2.500	1.250	1.260	.669	2.874	.500	.281	1.024	2°	TPS43	TIP15W	MK1KS	HSCU62516H
		APX4000UR0307DB	●	7	3.000	2.500	1.250	1.260	.669	2.874	.500	.281	1.024	2°	TPS43	TIP15W	MK1KS	HSCU62516H
		APX4000UR0408EB	●	8	4.000	2.500	1.500	1.181	.787	3.799	.625	.375	1.181	1.5°	TPS43	TIP15W	MK1KS	HSCU75016H

Note) When using inserts with corner radius RE≥.197"(5.0mm), C-Holders are required as shown on page 28.
★1 Clamp Torque (lbf-in) : TPS43=35.6
★2 The cutter body includes a set bolt for an arbor.

Combination of Holder and Insert Corner Radius

Holder Type	A Holder APX4000UR○○○○○○○A						B Holder APX4000UR○○○○○○○B		C Holder APX4000UR○○○○○○○C	
Insert Corner Radius (RE)	.016"	.031"	.039"	.047"	.063"	.079"	.125"	.157"	.197"	.250"

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



Fig.1

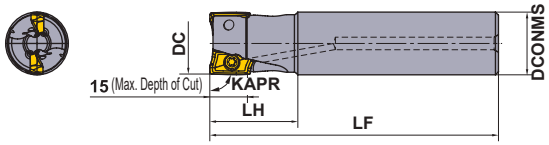
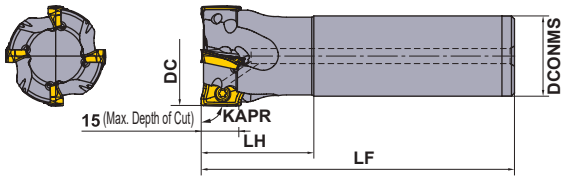


Fig.2



Metric Standard

Straight Shank Type (A Holders)

With Coolant Through

Right hand tool holder only.

Type	RE (inch)	Order Number	Stock	Number of Teeth	Dimensions (mm)				RMPX	Fig.	*1 Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
			R		DC	DCONMS	LF	LH						
Long	.016 I .079	**APX4000R252SA25SA**	★	2	25	25	115	35	11°	1	TPS4	TIP15W	MK1KS	
		APX4000R322SA32SA	★	2	32	32	125	45	7°	1	TPS4	TIP15W	MK1KS	
		APX4000R323SA32SA	★	3	32	32	125	45	7°	1	TPS4	TIP15W	MK1KS	
		APX4000R403SA32SA	★	3	40	32	125	45	6°	2	TPS43	TIP15W	MK1KS	
		APX4000R404SA32SA	★	4	40	32	125	45	6°	2	TPS43	TIP15W	MK1KS	
		APX4000R504SA32SA	★	4	50	32	125	45	4°	2	TPS43	TIP15W	MK1KS	
		APX4000R505SA32SA	★	5	50	32	125	45	4°	2	TPS43	TIP15W	MK1KS	
		APX4000R634SA32SA	★	4	63	32	125	45	3°	2	TPS43	TIP15W	MK1KS	
		APX4000R636SA32SA	★	6	63	32	125	45	3°	2	TPS43	TIP15W	MK1KS	
		APX4000R252SA25LA	★	2	25	25	170	35	11°	1	TPS4	TIP15W	MK1KS	
		APX4000R282SA25LA	★	2	28	25	170	35	9°	2	TPS4	TIP15W	MK1KS	
		APX4000R322SA32LA	★	2	32	32	190	45	7°	1	TPS4	TIP15W	MK1KS	
		APX4000R323SA32LA	★	3	32	32	190	45	7°	1	TPS4	TIP15W	MK1KS	
		APX4000R352SA32LA	★	2	35	32	190	45	6°	2	TPS4	TIP15W	MK1KS	AOMT1848
		APX4000R353SA32LA	★	3	35	32	190	45	6°	2	TPS4	TIP15W	MK1KS	
		APX4000R402SA32LA	★	2	40	32	190	45	6°	2	TPS43	TIP15W	MK1KS	
		APX4000R403SA32LA	★	3	40	32	190	45	6°	2	TPS43	TIP15W	MK1KS	
		APX4000R404SA32LA	★	4	40	32	190	45	6°	2	TPS43	TIP15W	MK1KS	
Extra Long	.016 I .079	**APX4000R252SA25ELA**	★	2	25	25	220	80	11°	1	TPS4	TIP15W	MK1KS	
		APX4000R282SA25ELA	★	2	28	25	220	35	9°	2	TPS4	TIP15W	MK1KS	
		APX4000R322SA32ELA	★	2	32	32	260	100	7°	1	TPS4	TIP15W	MK1KS	
		APX4000R323SA32ELA	★	3	32	32	260	100	7°	1	TPS4	TIP15W	MK1KS	
		APX4000R352SA32ELA	★	2	35	32	260	45	6°	2	TPS4	TIP15W	MK1KS	
		APX4000R353SA32ELA	★	3	35	32	260	45	6°	2	TPS4	TIP15W	MK1KS	
		APX4000R402SA32ELA	★	2	40	32	260	45	6°	2	TPS43	TIP15W	MK1KS	
		APX4000R403SA32ELA	★	3	40	32	260	45	6°	2	TPS43	TIP15W	MK1KS	
		APX4000R404SA32ELA	★	4	40	32	260	45	6°	2	TPS43	TIP15W	MK1KS	

Note) When using inserts with corner radius RE≥.125"(3.2mm), B-Holders or C-Holders are required as shown on page 28.

*1 Clamp Torque (lbf-in) : TPS4=35.6, TPS43=35.6



Fig.1

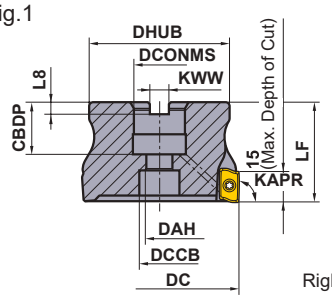
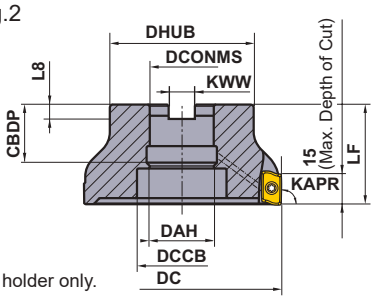
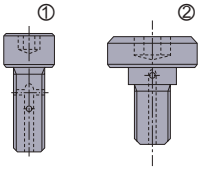


Fig.2



Right hand tool holder only.

Cutter Diameter DC	Set Bolt	Geometry
φ80	HSC12035H	①
φ100	HSC16040H	①
φ125	MBA20040H	②
φ160	MBA24045H	②



Metric Standard

For Inch Arbors

Arbor Type (A Holders)

With Coolant Through

RE (inch)	Order Number	Stock	Number of Teeth	Dimensions (mm) [inch]									WT	RMPX	Fig.	✶1			
		R		DC	LF	DCONMS	CBDP	DAH	DHUB	KWW	L8	DCCB	(kg)			Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
.016 | .079	APX4000R08007CA	★	7	80	50	25.4 [1.0"]	26	13	70	9.5	6	20	1.2	2°	1	TPS43	TIP15W	MK1KS	AOMT1848
	APX4000R10008DA	★	8	100	63	31.75 [1.25"]	32	17	80	12.7	8	26	2.1	1.5°	1	TPS43	TIP15W	MK1KS	
	APX4000R12509EA	★	9	125	63	38.1 [1.5"]	40	40	100	15.9	10	56	3.3	1°	2	TPS43	TIP15W	MK1KS	
	APX4000R16010FA	★	10	160	63	50.8 [2.0"]	40	53	100	19.1	11	72	4.8	1°	2	TPS43	TIP15W	MK1KS	

Note) When using inserts with corner radius RE≥.125"(3.2mm), B-Holders or C-Holders are required as shown on page 28.

✶1 Clamp Torque (lbf-in) : TPS43=35.6

✶2 Set bolt not included.

★ : **Inventory maintained in Japan.**



Fig.1

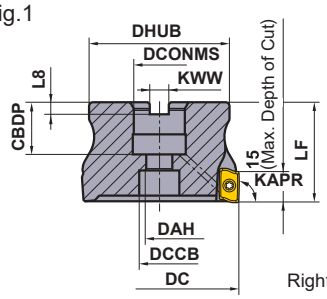
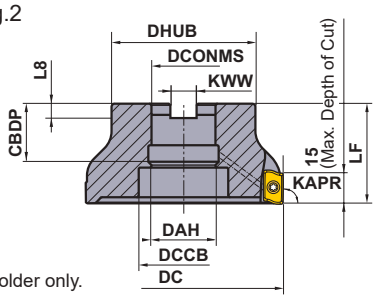
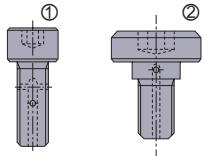


Fig.2



Right hand tool holder only.

Cutter Diameter **DC**	Set Bolt	Geometry
ϕ40	HSC08030H	①
ϕ50, ϕ63	HSC10030H	①
ϕ80	HSC12035H	①
ϕ100	HSC16040H	①
ϕ125	MBA20040H	②
ϕ160	MBA24045H	②



Metric Standard

For Metric Arbors

Arbor Type (A Holders)

With Coolant Through

RE (inch)	Order Number	Stock	Number of Teeth	Dimensions (mm)									WT	RMPX	Fig.	✶1			
		R		DC	LF	DCONMS	CBDP	DAH	DHUB	KWW	L8	DCCB	(kg)			Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
.016 I .079	**APX4000-040A04RA**	★	4	40	40	16	18	9	34	8.4	5.6	14	0.2	6°	1	TPS43	TIP15W	MK1KS	AOMT1848
	APX4000-050A05RA	★	5	50	40	22	20	11	45	10.4	6.3	17	0.3	4°	1	TPS43	TIP15W	MK1KS	
	APX4000-063A06RA	★	6	63	40	22	20	11	50	10.4	6.3	17	0.5	3°	1	TPS43	TIP15W	MK1KS	
	APX4000-080A07RA	★	7	80	50	27	23	13	60	12.4	7	20	1.2	2°	1	TPS43	TIP15W	MK1KS	
	APX4000-100A08RA	★	8	100	50	32	25	17	70	14.4	8	27	2.1	1.5°	1	TPS43	TIP15W	MK1KS	
	APX4000-125A09RA	★	9	125	63	40	40	42	90	16.4	9	56	3.3	1°	2	TPS43	TIP15W	MK1KS	
	APX4000-160A10RA	★	10	160	63	40	40	42	100	16.4	9	72	4.8	1°	2	TPS43	TIP15W	MK1KS	

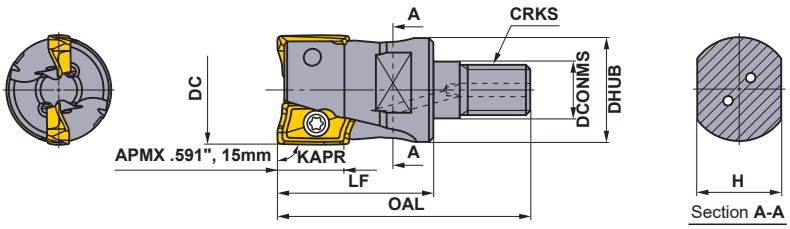
Note) When using inserts with corner radius RE≥.125"(3.2mm), B-Holders or C-Holders are required as shown on page 28.

✶1 Clamp Torque (lbf-in) : TPS43=35.6

✶2 Set bolt not included.

Multi-functional Indexable Cutter





Screw-in Type

With Coolant Through

Right hand tool holder only.

DC	Order Number	Stock	Number of Teeth	Dimensions (inch)						WT	*1			
				LF	OAL	DCONMS	DHUB	H	CRKS *2	(lbs)	Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
1.000	**APX4000UR162AM12A35**	●	2	1.378	2.244	.492	.925	.748	M12	.4	TPS4	TIP15W	MK1KS	AOMT1848
1.125	**APX4000UR182AM12A35**	●	2	1.378	2.244	.492	.925	.748	M12	.4	TPS4	TIP15W	MK1KS	AOMT1848
1.250	**APX4000UR203AM16A40**	●	3	1.575	2.480	.669	1.122	.945	M16	.7	TPS4	TIP15W	MK1KS	AOMT1848
1.375	**APX4000UR223AM16A40**	●	3	1.575	2.480	.669	1.122	.945	M16	.7	TPS4	TIP15W	MK1KS	AOMT1848

*1 Clamp Torque (lbf-in) : TPS4=35.6, TPS43=35.6

*2 Clamp Torque of the Head (lbf-ft) : M12=59.2, M16=66.7

Note 1)When using inserts with corner radius RE>.125"(3.2mm), B-Holders or C-Holders are required as shown on page 28.
Note 2) For screw-in type arbors, refer to page 36-39.

Metric Standard

Screw-in Type

With Coolant Through

DC	Order Number	Stock	Number of Teeth	Dimensions (mm)						WT	*1			
				LF	OAL	DCONMS	DHUB	H	CRKS *2	(kg)	Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
25	**APX4000R252M12A35**	★	2	35	57	12.5	23.5	19	M12	0.2	TPS4	TIP15W	MK1KS	AOMT1848
28	**APX4000R282M12A35**	★	2	35	57	12.5	23.5	19	M12	0.2	TPS4	TIP15W	MK1KS	AOMT1848
32	**APX4000R322M16A40**	★	2	40	63	17	28.5	24	M16	0.3	TPS4	TIP15W	MK1KS	AOMT1848
32	**APX4000R323M16A40**	★	3	40	63	17	28.5	24	M16	0.3	TPS4	TIP15W	MK1KS	AOMT1848
35	**APX4000R352M16A40**	★	2	40	63	17	28.5	24	M16	0.3	TPS4	TIP15W	MK1KS	AOMT1848
35	**APX4000R353M16A40**	★	3	40	63	17	28.5	24	M16	0.3	TPS4	TIP15W	MK1KS	AOMT1848
40	**APX4000R403M16A40**	★	3	40	63	17	28.5	24	M16	0.3	TPS43	TIP15W	MK1KS	AOMT1848
40	**APX4000R404M16A40**	★	4	40	63	17	28.5	24	M16	0.3	TPS43	TIP15W	MK1KS	AOMT1848

*1 Clamp Torque (N • m) : TPS4=35.6, TPS43=35.6

*2 Clamp Torque of the Head (N • m) : M12=59.2, M16=66.7

Note 1)When using inserts with corner radius RE>.125"(3.2mm), B-Holders or C-Holders are required as shown on page 28.
Note 2) For screw-in type arbors, refer to page 36-39.

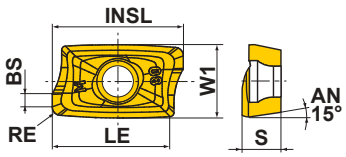
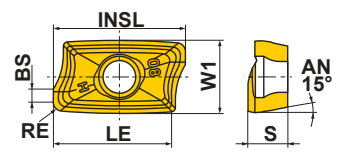
● : Inventory maintained. ★ : Inventory maintained in Japan.
<10 inserts in one case>

Inserts

Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metals
	S	Heat Resistant Alloys, Titanium Alloys
	H	Hardened Steel

This is the selection guideline for APX.
Please note that the cutting conditions differ depending on multiple factors, for more details refer to the Recommended Cutting Conditions.

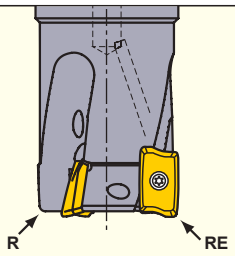
Edge Preparation :
E : Round **F :** Sharp Edge

Shape	Order Number	Class	Edge Preparation	Coated										Dimensions (inch)						Geometry
				MC5020	MV1020	MV1030	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	VP20RT	BS	LE	RE	W1	INSL	S	
General M	**AOMT184804PEER-M**	M	E		●	●	●	●	●	●	●	●	●	.071	.591	.016	.354	.709	.189	
	AOMT184808PEER-M	M	E		●	●	●	●	●	●	●	●	●	.055	.591	.031	.354	.709	.189	
	**AOMT184810PEER-M**	M	E		●	●	●			●	●	★		.039	.591	.039	.354	.709	.189	
	AOMT184812PEER-M	M	E		●	●	●			●	●	●		.031	.591	.047	.354	.709	.189	
	AOMT184816PEER-M	M	E		●	●	●	●	●	●	●	●	●	.016	.591	.063	.354	.709	.189	
	AOMT184820PEER-M	M	E		●	●	●			●	●	★		.016	.591	.079	.354	.709	.189	
Strong Cutting Edge Type H	**AOMT184804PEER-H**	M	E	●	●	●	●	●	●	●	●	●	●	.071	.591	.016	.354	.709	.189	
	AOMT184808PEER-H	M	E	●	●	●	●	●	●	●	●	●	●	.055	.591	.031	.354	.709	.189	
	AOMT184816PEER-H	M	E	●	●	●	●	●	●	●	●	●	●	.016	.591	.063	.354	.709	.189	
	**AOMT184832PEER-H**	M	E					●	●				●	.016	.591	.126	.354	.709	.189	
	AOMT184840PEER-H	M	E					●	●				●	.016	.591	.157	.354	.709	.189	
	AOMT184850PEER-H	M	E					●	●				●	—	.591	.197	.354	.709	.189	
	AOMT184864PEER-H	M	E					●	●				●	—	.591	.250	.354	.709	.189	

Note) For large R inserts
APX offers various nose radii for inserts, however one holder can not secure every insert radius.
We offer A-Holders that properly secures up to .079" radius.
We offer B-Holders that secures .125"and .157" radius, only for popular inch sizes.
Customers may modify holders as below, so that larger nose radii can be secured.

Note on Use of Inserts with Large Corner Radii

When using inserts with corner radius RE≥R.125", please machine the holder with a radius form as shown on the right table.



RE	R
.125"	.098" B-Holders
.157"	
.197"	.197" C-Holders
.250"	

R : Holder End Radius
RE : Insert Corner Radius

Or additional B-Holders and C-Holders are available as non stock, produced to order only.
"Order numbers"; Please replace the last letter "A" of A-Holders to "B" or "C".
In case of screw-in holders, please add "B" or "C" to the end of the order number of A-Holders.
Ex) APX4000R08007CA→APX4000R08007CC
APX4000R252M12A35→APX4000R252M12A35C

Recommended Cutting Conditions

Cutting Speed

(inch)

	Material	Properties	Grade	Chipbreaker		Cutting Width **ae** ≤.25DC	.25—.5DC	.5—.75DC	DC (Slot)
						vc (SFM)			
P	Mild Steel	Hardness ≤180HB	MV1020	M	H	920(720—1080)	885(690—1050)	720(560—850)	720(560—850)
			MV1030, MP6120, VP15TF	M	H	755(590—885)	720(560—850)	590(460—690)	590(460—690)
			MP6130, VP20RT	M	H	655(490—785)	620(460—755)	490(360—590)	490(360—590)
	Carbon Steel Alloy Steel	Hardness 180—280HB	MV1020	M	—	720(560—850)	690(525—785)	560(425—655)	—
			MV1030	M	H	590(460—690)	560(425—655)	460(360—525)	460(360—525)
			MP6120, VP15TF	M	H	590(460—690)	560(425—655)	460(360—525)	460(360—525)
			MP6130, VP20RT	M	H	490(360—590)	460(330—560)	360(260—425)	360(260—425)
		Hardness 280—350HB	MV1020, MV1030	M	H	590(460—690)	560(425—655)	460(360—525)	460(360—525)
			MP6120, VP15TF	M	—	590(460—690)	560(425—655)	460(360—525)	—
			MP6130, VP20RT	M	H	490(360—590)	460(330—560)	360(260—425)	360(260—425)
M	Stainless Steel	Hardness ≤200HB	MV1030	M	H	590(460—690)	560(425—655)	460(360—525)	460(360—525)
			MP7130, VP20RT	M	H	590(460—690)	560(425—655)	460(360—525)	460(360—525)
		Hardness >200HB	MV1030	M	—	490(360—590)	460(330—525)	360(260—425)	—
			MP7130, VP20RT	M	H	590(460—690)	560(425—655)	460(360—525)	460(360—525)
K	Gray Cast Iron	Tensile Strength ≤350MPa	MC5020	M	H	820(655—985)	785(620—950)	690(525—850)	460(360—525)
			VP15TF, VP20RT	M	—	590(460—690)	560(425—655)	460(360—525)	—
	Ductile Cast Iron	Tensile Strength ≤450MPa	MC5020, VP15TF	M	H	425(330—490)	395(295—460)	330(260—395)	330(260—395)
			MV1020	M	H	655(490—920)	620(460—885)	560(425—785)	560(425—785)
			MV1030	M	—	490(330—655)	460(295—620)	410(260—560)	—
		Tensile Strength ≤800MPa	MC5020, VP15TF	H	—	425(330—490)	395(295—460)	330(260—395)	330(260—395)
			MV1020	H	M	590(460—820)	560(425—785)	490(395—690)	490(395—690)
			MV1030	M	—	490(330—655)	460(295—620)	410(260—560)	330(260—560)
S	Titanium Alloys	Hardness ≤350HB	MP9120, VP15TF	H	—	165(130—230)	165(130—230)	165(130—230)	165(130—230)
			MP9130, VP20RT	H	M	130(100—195)	130(100—195)	130(100—195)	130(100—195)
	Heat Resistant Alloys	—	MP9120, VP15TF	H	M	130(100—195)	130(100—195)	130(100—195)	130(100—195)
			MP9130, VP20RT	M	—	100(65—130)	100(65—130)	100(65—130)	100(65—130)
H	Hardened Steel	40—55HRC	VP15TF	H	—	295(230—330)	280(195—330)	230(165—260)	230(165—260)

Depth of Cut / Feed per Tooth

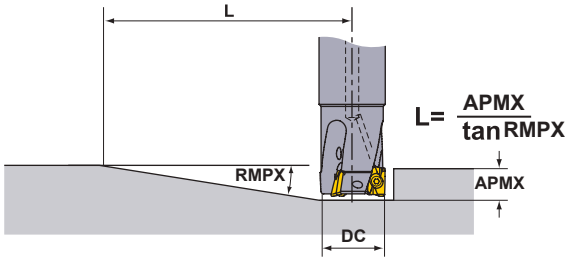
(inch)

Material		Properties	Cutting Width **ae**	Depth of Cut **ap**	Feed per Tooth **fz** (IPT) DC		
					ϕ.750"–ϕ1.500"(ϕ25–ϕ40mm)	ϕ2.000"–ϕ3.000"(ϕ50–ϕ80mm)	ϕ4.000"(ϕ100–ϕ160mm)
P	Mild Steel Carbon Steel Alloy Steel	Hardness ≤180HB	≤.5DC	≤.197	.012	.012	.010
				.197–.295	.010	.010	.008
				.295–.394	.008	.008	.006
				.394–.492	.006	.006	.004
				.492–.591	.004	.004	.003
			.5–.75DC	≤.197	.008	.008	.006
				.295–.394	.006	.006	.004
				.394–.591	.004	.004	.003
			DC (Slot)	≤.197	.006	.006	.006
				.197–.295	.004	.004	.004
				.295–.394	.003	.003	.003
		180–350HB	≤.5DC	≤.197	.012	.010	.010
				.197–.295	.010	.008	.008
				.295–.394	.008	.006	.006
				.394–.492	.006	.004	.004
				.492–.591	.004	.003	.003
			.5–.75DC	≤.197	.008	.006	.006
				.295–.394	.006	.004	.004
				.394–.591	.004	.003	.003
			DC (Slot)	≤.197	.006	.006	.006
				.197–.295	.004	.004	.004
				.295–.394	.003	.003	.003
M	Stainless Steel	Hardness ≤270HB	≤.5DC	≤.197	.012	.010	.010
				.197–.295	.010	.008	.008
				.295–.394	.008	.006	.006
				.394–.492	.006	.004	.004
				.492–.591	.004	.003	.003
			.5–.75DC	≤.197	.008	.006	.006
				.295–.394	.006	.004	.004
				.394–.591	.004	.003	.003
			DC (Slot)	≤.197	.006	.006	.006
				.197–.295	.004	.004	.004
				.295–.394	.003	.003	.003
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.5DC	≤.197	.012	.012	.010
				.197–.295	.010	.010	.008
				.295–.394	.008	.008	.006
				.394–.492	.006	.006	.004
				.492–.591	.004	.004	.003
			.5–.75DC	≤.197	.008	.008	.006
				.197–.394	.006	.006	.004
				.394–.591	.004	.004	.003
			DC (Slot)	≤.197	.006	.006	.006
				.197–.295	.004	.004	.004
				.295–.394	.003	.003	.003
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤.5DC	≤.197	.010	.010	.010
				.197–.295	.008	.008	.008
				.295–.394	.006	.006	.006
				.394–.492	.004	.004	.004
				.492–.591	.003	.003	.003
			.5–.75DC	≤.197	.008	.008	.006
				.197–.394	.006	.006	.004
				.394–.591	.004	.004	.003
			DC (Slot)	≤.197	.006	.006	.006
				.197–.295	.004	.004	.004
				.295–.394	.003	.003	.003
S	Titanium Alloys	Hardness ≤350HB	≤.25DC	≤.197	.006	.004	.004
				.197–.295	.004	.002	.002
				.295–.394	.002	–	–
			DC (Slot)	≤.197	.002	.002	.002
	Heat Resistant Alloys	–	≤.25DC	≤.079	.004	.002	.002
			DC (Slot)	≤.039	.002	.002	.002
H	Hardened Steel	Hardness 40–55HRC	≤.25DC	≤.197	.006	.006	.006
				.197–.295	.004	.004	.004
				.295–.394	.003	.003	.003
			.25–.5DC	≤.197	.004	.004	.004
				.197–.295	.003	.003	.003
			.5–.75DC	≤.197	.003	.003	.003
			DC (Slot)	≤.197	.003	.003	.003

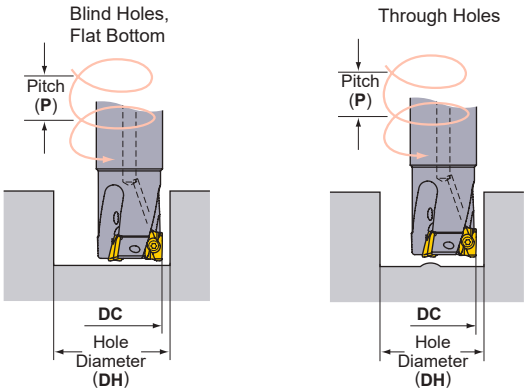
Note 1) These cutting conditions are a guide to the standard shank type and the arbor type.
Please make adjustments according to the machining conditions.
Note 2) Vibration is liable to occur in certain cases. Please reduce the depth of cut and / or reduce cutting conditions in the following cases.
• When using the long shank type and extra long shank type.
• When using long tool overhang with the standard or arbor type.
• When the application has poor clamping rigidity or when using a low rigidity machine.
Note 3) In case of coarse and fine pitch cutters, the coarse pitch type is recommended to prevent vibration.
Note 4) For heavy interrupted and unstable cutting, the H chipbreaker is first recommendation.

Ramping/Helical Cutting

Ramping



Helical Cutting



Refer to the table below when using .031 inch radius for maximum ramping angle, pitch and minimum/maximum hole diameter. Use cutting conditions for slot milling to calculate speed and feed when ramping / helical cutting.

Cutting Edge Diameter **DC** (inch)	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
	Maximum Ramping Angle **RMPX**	Minimum Distance *1 **L** (inch)	Maximum Hole Diameter *2 **DH max.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)
.750	14°	2.7	1.42	.51	1.31	.43	.80	.019
1.000	11°	3.4	1.92	.55	1.81	.47	1.30	.157
1.250	7°	5.4	2.42	.43	2.31	.39	1.80	.196
1.500	7°	5.4	2.92	.51	2.81	.47	2.30	.275
2.000	4°	9.4	3.92	.39	3.81	.39	3.30	.275
2.500	2°	18.8	4.92	.23	4.81	.23	4.30	.157
3.000	2°	18.8	5.92	.31	5.81	.27	5.30	.236
4.000	1.5°	25.1	7.92	.31	7.81	.27	7.30	.236

*1 L(=.591"/tan RMPX). Cutters' moving distance until depth of cut reaches .591" at a maximum ramping angle.
*2 In case corner radius of .031". Other than that, find with the below formula.
{(cutting edge diameter DC) - (corner radius) - .008"} x 2
Note 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.

DEEP SHOULDER MILLING

KAPR 90° Roughing

APX4000

P M K N S H

Long Edge



Fig.1

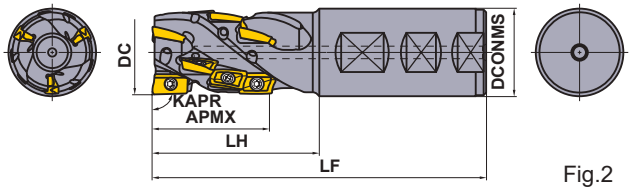
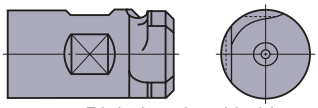


Fig.2

Combination Type



Right hand tool holder only.

Shank Type (A Holders)

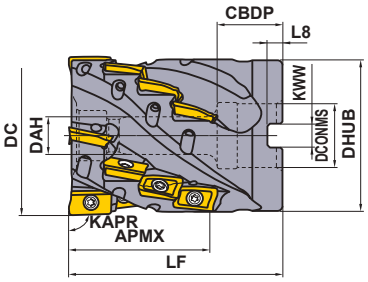
With Coolant Through

Order Number	Stock	Number of Flutes	Total	Dimensions (inch)					Fig.	* Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
	R			DC	DCONMS	LF	LH	APMX					
APX4KUR2408WA24S35A	●	2	8	1.500	1.500	6.500	3.250	2.200	1	TPS43	TIP15W	MK1KS	AOMT1848
APX4KUR2412WA24S35A	●	3	12	1.500	1.500	6.500	3.250	2.200	1	TPS43	TIP15W	MK1KS	
APX4KUR3212WA32S35A	●	3	12	2.000	2.000	6.500	3.250	2.200	2	TPS43	TIP15W	MK1KS	
APX4KUR3218WA32M53A	●	3	18	2.000	2.000	7.750	4.500	3.300	2	TPS43	TIP15W	MK1KS	

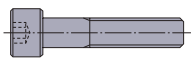
* Clamp Torque (lbf-in) : TPS43=35.4

Note 1) When using inserts with corner radius RE≥.125" on the bottom, B-Holders or C-Holders are required as shown on page 28.
Note 2) Only corner radius RE .016" and .031" can be used for the peripheral cutting edges expect the bottom cutting edge (the end cutting edge).
Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.





Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ2.000"	HSCUF37520	
ϕ2.500"	HSCUF50028	

Shell Type (A Holders)

With Coolant Through

Order Number	Stock	Number of Flutes	Total	Dimensions (inch)									* Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
	R			DC	LF	DCONMS	CBDP	DAH	DHUB	KWW	L8	APMX				
APX4KUR0209A16A	●	3	9	2.000	2.500	.750	1.063	.415	1.918	.313	.187	1.650	TPS43	TIP15W	MK1KS	AOMT1848
APX4KUR2516CA22A	●	4	16	2.500	3.500	1.000	1.339	.539	2.409	.375	.219	2.200	TPS43	TIP15W	MK1KS	

* Clamp Torque (lbf-in) : TPS43=35.4

Note 1) When using inserts with corner radius Re≥.125" on the bottom, B-Holders or C-Holders are required as shown on page 28.
Note 2) Only corner radius Re .016" and .031" can be used for the peripheral cutting edges expect the bottom cutting edge (the end cutting edge).
Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
Note 4) In case of internal coolant supply, please use a face mill arbor with through coolant channels; Regular center-thru or side-thru arbors can't be used.
Note 5) The cutter body includes a non-coolant through set bolt for an arbor.

● : Inventory maintained.

Multi-functional Indexable Cutter



Fig.1

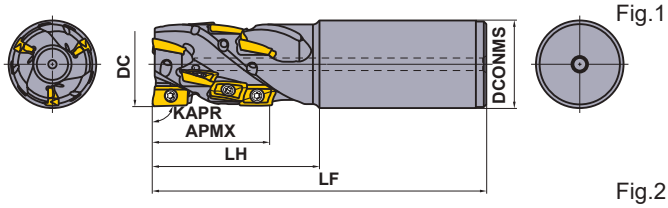
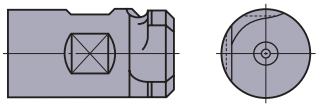


Fig.2

Combination Type



Right hand tool holder only.

Metric Standard

Shank Type (A Holders)

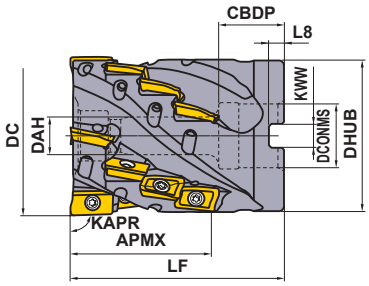
With Coolant Through

Order Number	Stock	Number of Flutes	Total	Dimensions (mm) [inch]					Fig.	*			
	R			DC	DCONMS	LF	LH	APMX		Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
APX4KR4008SA42S056A	★	2	8	40	42	160	80	56	1	TPS43	TIP15W	MK1KS	AOMT1848
APX4KR4012SA42S056A	★	3	12	40	42	160	80	56	1	TPS43	TIP15W	MK1KS	
APX4KR5012WA508S056A	★	3	12	50	50.8 [2.0"]	160	80	56	2	TPS43	TIP15W	MK1KS	
APX4KR5018WA508M084A	★	3	18	50	50.8 [2.0"]	190	110	84	2	TPS43	TIP15W	MK1KS	

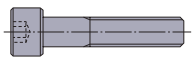
* Clamp Torque (lbf-in) : TPS43=35.4

Note 1) When using inserts with corner radius RE≥.125" on the bottom, B-Holders or C-Holders are required as shown on page 28.
Note 2) Only corner radius RE .016" and .031" can be used for the peripheral cutting edges except the bottom cutting edge (the end cutting edge).
Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.





Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ50mm	HSC10050	
ϕ63mm	HSC12070	

The bore diameter (DCONMS) is equivalent to a metric size.

Metric Standard

For Inch Arbors

Shell Type (A Holders)

With Coolant Through

Order Number	Stock	Number of Flutes	Total	Dimensions (mm) [inch]									*			
	R			DC	LF	DCONMS	CBDP	DAH	DHUB	KWW	L8	APMX	Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
APX4KR06316CA056A	★	4	16	63	85	25.4 [1.0"]	26	13	60.7	9.5	6	56	TPS43	TIP15W	MK1KS	AOMT1848

* Clamp Torque (lbf-in) : TPS43=35.4

Metric Standard

For Metric Arbors

Shell Type (A Holders)

With Coolant Through

Order Number	Stock	Number of Flutes	Total	Dimensions (mm)									*			
	R			DC	LF	DCONMS	CBDP	DAH	DHUB	KWW	L8	APMX	Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
APX4K-050A09A042RA	★	3	9	50	65	22	22	11	48	10.4	6.3	42	TPS43	TIP15W	MK1KS	AOMT1848
APX4K-063A16A056RA	★	4	16	63	85	27	28	13	60.7	12.4	7	56	TPS43	TIP15W	MK1KS	

* Clamp Torque (lbf-in) : TPS43=35.4

Note 1) When using inserts with corner radius RE≥.125" on the bottom, B-Holders or C-Holders are required as shown on page 28.
Note 2) Only corner radius RE .016" and .031" can be used for the peripheral cutting edges except the bottom cutting edge (the end cutting edge).
Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
Note 4) Coolant can be supplied from the end face of the centering location bore in the arbor. However, it cannot be supplied from the set bolt.
Note 5) Set bolt not included.

★ : **Inventory maintained in Japan.**

Recommended Cutting Conditions

Cutting Speed

(inch)

	Material	Properties	Grade	Chipbreaker		Cutting Width **ae** ≤.25DC	.25–.75DC	DC (Slot)
						vc (SFM)		
P	Mild Steel	Hardness ≤180HB	MV1020	M	H	755(590–920)	620(460–785)	620(460–785)
			MV1030, MP6120, VP15TF	M	H	655(525–820)	525(395–655)	460(395–525)
			MP6130, VP20RT	M	H	560(425–720)	425(295–560)	360(295–425)
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness ≤180–280 HB ≤350 HB (Annealing)	MV1020	M	H	590(460–720)	490(360–590)	395(330–460)
			MV1030, MP6120, VP15TF	M	H	525(395–655)	395(330–460)	330(260–395)
			MP6130, VP20RT	M	H	425(295–560)	295(230–360)	230(165–295)
M	Stainless Steel	–	MV1030, MP7130, VP15TF	M	H	525(395–655)	395(330–460)	330(260–395)
K	Gray Cast Iron	Tensile Strength ≤350 Mpa	MC5020	H	–	755(590–920)	620(460–785)	620(460–785)
			VP15TF	H	M	755(590–920)	620(460–785)	620(460–785)
	Ductile Cast Iron	Tensile Strength ≤800 Mpa	MV1020	H	M	590(460–720)	490(360–590)	395(330–460)
			MV1030, VP15TF	H	M	490(330–655)	460(295–620)	330(260–395)
S	Titanium Alloys	Hardness ≤350 HB	MP9120, VP15TF	M	–	165(130–230)	165(130–230)	165(130–230)
			MP9130, VP20RT	M	–	130(100–195)	130(100–195)	130(100–195)
	Heat Resistant Alloys	–	MP9120, VP15TF	M	H	130(100–195)	130(100–195)	130(100–195)
			MP9130, VP20RT	M	H	100(65–130)	100(65–130)	100(65–130)

Depth of Cut / Feed per Tooth

(inch)

	Material	Properties	Cutting Width **ae**	Depth of Cut **ap**	Feed per Tooth **fz** (IPT) **DC** ϕ1.5"(Max.ap=2.2") ϕ2.0"(Max.ap=1.65") ϕ40(Max.ap=56mm(2.205") ϕ50 (Max.ap=42mm(1.654")	ϕ2.0"(Max.ap=2.2") ϕ2.5"(Max.ap=2.2") ϕ50(Max.ap=56mm(2.205") ϕ63 (Max.ap=56mm(2.205")	ϕ2.0"(Max.ap=3.3") ϕ50(Max.ap=84mm(3.307")
P	Mild Steel	Hardness ≤180HB	≤.3DC	≤.787	.010	.010	.008
				.787–1.969	.008	.008	.006
				1.969–3.150	–	–	.004
			DC (Slot)	≤.787	.008	.008	.006
				.787–1.969	.006	.006	–
	Carbon Steel Alloy Steel	Hardness 180–350HB	≤.3DC	≤.787	.010	.010	.008
				.787–1.969	.008	.008	.006
				1.969–3.150	–	–	.004
			DC (Slot)	≤.787	.006	.006	.004
				.787–1.969	.004	.004	–
M	Stainless Steel	Hardness ≤270HB	≤.3DC	≤.787	.010	.010	.008
				.787–1.969	.008	.008	.006
				1.969–3.150	–	–	.004
			DC (Slot)	≤.394	.004	.004	.003
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.15DC	≤.394	.012	.012	.010
				.394–1.969	.010	.010	.008
				1.969–3.150	–	–	.006
			.15–.3DC	≤.394	.010	.010	.008
				.394–1.969	.008	.008	.006
				1.969–3.150	–	–	.004
			DC (Slot)	≤.394	.010	.010	.008
				.394–1.969	.008	.008	.006
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤.15DC	≤.787	.010	.010	.008
				.787–1.969	.008	.008	.006
				1.969–3.150	–	–	.004
			.15–.3DC	≤.787	.008	.008	.006
				.787–1.969	.006	.006	.004
				1.969–3.150	–	–	.003
			DC (Slot)	≤.394	.006	.006	.004
				.394–1.969	.004	.004	–
S	Titanium Alloys	Hardness ≤350HB	≤.15DC	≤.787	.004	.004	–
				.787–1.969	.004	.004	–
			DC (Slot)	≤1.969	.003	.003	–
	Heat Resistant Alloys	–	≤.15DC	≤.394	.003	.003	–
			DC (Slot)	≤.787	.002	.002	–

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

Operational Guidance

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

(Table 1) Maximum Spindle Speed RPMX

Cutting Edge Diameter **DC**	ϕ.500"	ϕ.625"	ϕ.750"	ϕ1.000"	ϕ1.250"	ϕ1.500"	ϕ2.000"	ϕ2.500"	ϕ3.000"	ϕ4.000"
Max. Spindle Speed **RPMX** (min^{-1})	9900	19000	16000	12000	9500	7600	6000	4800	3800	3100

Cutting Edge Diameter **DC**(mm)	ø12	ø14	ø16	ø18	ø20	ø22	ø25	ø28	ø30
Max. 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

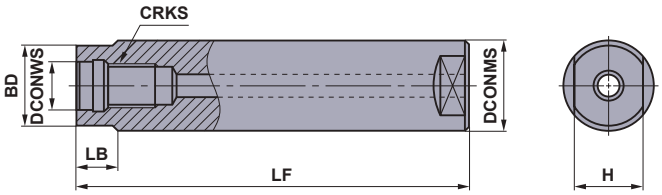
- It is recommended that flank wear does not exceed 0.3mm.

Memo

SCREW-IN HOLDERS

STRAIGHT SHANK TYPE





Steel Shank Type

(inch)

CRKS	Order Number	Stock	DCONMS	LF	DCONWS	BD	LB	H	WT (lbs)
M8	**SCU10M08S100S**	●	.625	3.937	.335	.571	.394	.394	.2
M8	**SCU10M08S200L**	●	.625	7.874	.335	.571	.394	.394	.7
M10	**SCU12M10S120S**	●	.750	4.724	.413	.728	.394	.551	.4
M10	**SCU12M10S220L**	●	.750	8.661	.413	.728	.394	.551	.9
M12	**SCU16M12S125S**	●	1.000	4.921	.492	.925	.394	.748	.9
M12	**SCU16M12S245L**	●	1.000	9.646	.492	.925	.394	.748	2.0
M16	**SCU20M16S140S**	●	1.250	5.512	.669	1.122	.591	.945	1.8
M16	**SCU20M16S280L**	●	1.250	11.024	.669	1.122	.591	.945	3.5

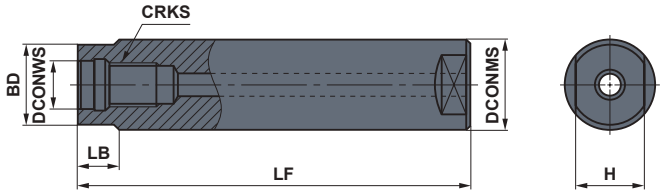
Metric Standard

(mm)

CRKS	Order Number	Stock	DCONMS	LF	DCONWS	BD	LB	H	WT (kg)
M8	**SC16M08S100S**	★	16	100	8.5	14.5	10	10	0.1
M8	**SC16M08S200L**	★	16	200	8.5	14.5	10	10	0.3
M10	**SC20M10S120S**	★	20	120	10.5	18.5	10	14	0.3
M10	**SC20M10S220L**	★	20	220	10.5	18.5	10	14	0.5
M12	**SC25M12S125S**	★	25	125	12.5	23.5	10	19	0.4
M12	**SC25M12S245L**	★	25	245	12.5	23.5	10	19	0.8
M16	**SC32M16S140S**	★	32	140	17	28.5	15	24	0.8
M16	**SC32M16S280L**	★	32	280	17	28.5	15	24	1.6

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





Carbide Shank Type

(inch)

CRKS	Order Number	Stock	DCONMS	LF	DCONWS	BD	LB	H	WT (lbs)
M8	**SCU10M08S100SW**	●	.625	3.937	.335	.571	.394	.394	.4
M8	**SCU10M08S200LW**	●	.625	7.874	.335	.571	.394	.394	1.1
M10	**SCU12M10S120SW**	●	.750	4.724	.413	.728	.394	.551	.9
M10	**SCU12M10S220LW**	●	.750	8.661	.413	.728	.394	.551	1.8
M12	**SCU16M12S125SW**	●	1.000	4.921	.492	.925	.394	.748	1.8
M12	**SCU16M12S245LW**	●	1.000	9.646	.492	.925	.394	.748	3.5
M16	**SCU20M16S140SW**	●	1.250	5.512	.669	1.122	.591	.945	3.1
M16	**SCU20M16S280LW**	●	1.250	11.024	1.250	1.122	.591	.945	6.4

Metric Standard

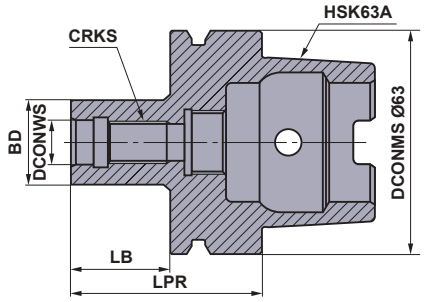
(mm)

CRKS	Order Number	Stock	DCONMS	LF	DCONWS	BD	LB	H	WT (kg)
M8	**SC16M08S100SW**	★	16	100	8.5	14.5	10	10	0.2
M8	**SC16M08S200LW**	★	16	200	8.5	14.5	10	10	0.5
M10	**SC20M10S120SW**	★	20	120	10.5	18.5	10	14	0.5
M10	**SC20M10S220LW**	★	20	220	10.5	18.5	10	14	0.9
M12	**SC25M12S125SW**	★	25	125	12.5	23.5	10	19	0.8
M12	**SC25M12S245LW**	★	25	245	12.5	23.5	10	19	1.5
M16	**SC32M16S140SW**	★	32	140	17	28.5	15	24	1.4
M16	**SC32M16S280LW**	★	32	280	17	28.5	15	24	2.8

SCREW-IN HOLDERS

HSK63A Shank Arbor





Metric Standard

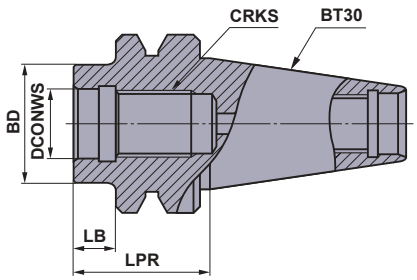
(mm)

CRKS	Order Number	Stock	DCONWS	BD	LPR	LB	WT (kg)
M8	**SC16M08S22-HSK63A**	★	8.5	14.5	48	22	0.7
M10	**SC20M10S24-HSK63A**	★	10.5	18.5	50	24	0.7
M12	**SC25M12S27-HSK63A**	★	12.5	23.5	53	27	0.7
M16	**SC32M16S28-HSK63A**	★	17	28.5	54	28	0.8

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

BT30 Shank Arbor





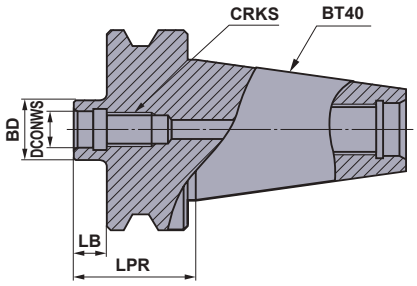
Metric Standard

(mm)

CRKS	Order Number	Stock	DCONWS	BD	LPR	LB	WT (kg)
M8	**SC16M08S10-BT30**	★	8.5	14.5	32	10	0.4
M10	**SC20M10S10-BT30**	★	10.5	18.5	32	10	0.4
M12	**SC25M12S10-BT30**	★	12.5	23.5	32	10	0.4
M16	**SC32M16S10-BT30**	★	17	28.5	32	10	0.4

BT40 Shank Arbor





Metric Standard

(mm)

CRKS	Order Number	Stock	DCONWS	BD	LPR	LB	WT (kg)
M8	**SC16M08S10-BT40**	★	8.5	14.5	37	10	1
M10	**SC20M10S10-BT40**	★	10.5	18.5	37	10	1
M12	**SC25M12S10-BT40**	★	12.5	23.5	37	10	1
M16	**SC32M16S10-BT40**	★	17	28.5	37	10	1

★ : Inventory maintained in Japan.

How to Install the Screw-in Head

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

②Tighten the head at the recommended torque and ensure that there is no gap between the head and arbor.

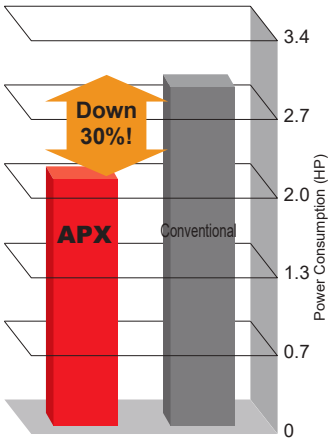


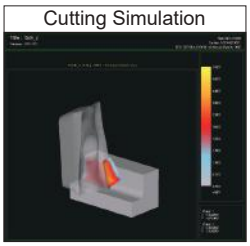
Screw Size	Recommended Torque (lbf-ft)	Wrench Size (inch)
M8	17.0	.394
M10	33.9	.551
M12	59.0	.748
M16	66.4	.945

- 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.

Cutting Performance

Power Consumption Comparison





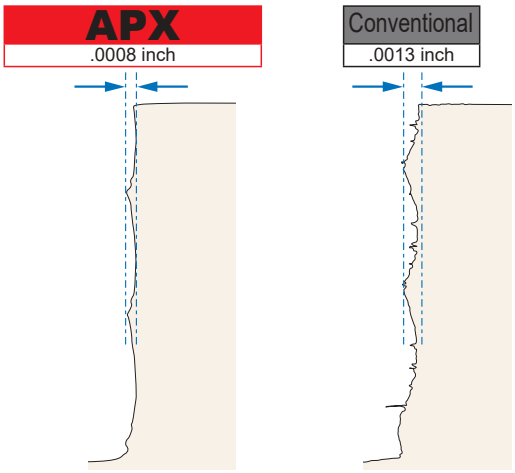
<Cutting Conditions>
Material : Alloy Steel
Tool : APX3000UR164SA16SA
Insert : AOMT123608PEER-M
Grade : VP15TF
Cutting Speed : vc=525 SFM
Feed per Tooth : fz=.008 IPT
Width of Cut : ae=.236 inch
Depth of Cut : ap=.354 inch
Cutting Mode : Single Insert

Wall Surface Accuracy

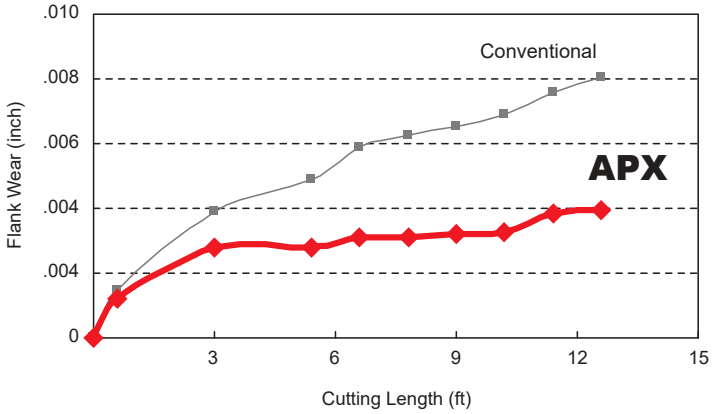
High wall accuracy can be produced by this body and unique insert geometry.

<Cutting Conditions>
Material : Alloy Steel
Tool : APX3000UR163SA16SA
Insert : AOMT123608PEER-M
Grade : VP15TF
Cutting Speed : vc=525 SFM
Feed per Tooth : fz=.006 IPT
Width of Cut : ae=.079 inch
Depth of Cut : ap=.236 inch





Wear Resistance



<Cutting Conditions>
Material : Alloy Steel
Tool : APX3000UR163SA16SA
Insert : AOMT123608PEER-M
Grade : VP15TF
Cutting Speed : vc=655 SFM
Feed per Tooth : fz=.008 IPT
Width of Cut : ae=.118 inch
Depth of Cut : ap=.197 inch
Cutting Mode : Air Blow

Cutting Performance

Application Examples in Ti-6AL-4V

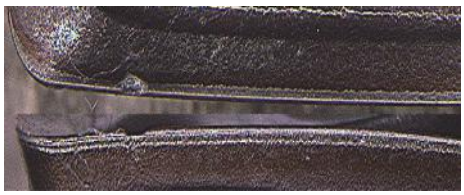
Achieved a longer and more stable tool life due to excellent resistance to chipping.

MP9130



Cutting Length 3.9 feet

Conventional



Cutting Length 2.5 feet

<Cutting Conditions>
Material : Ti-6Al-4V
Tool : APX3000R323SA32SA
Insert : AOMT123608PEER-M
Grade : MP9130
Cutting Speed : vc=100 SFM
Feed per Tooth : fz=.006 IPT
Width of Cut : ae=.315 inch
Depth of Cut : ap=.315 inch
Cutting Mode : Wet Cutting

Application Examples in Inconel718

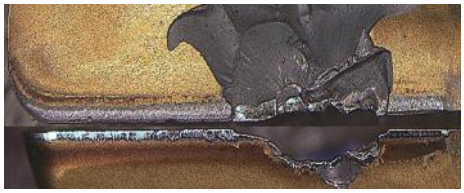
Superior wear and chipping resistance.

MP9130



Cutting Length 4.9 feet

Conventional



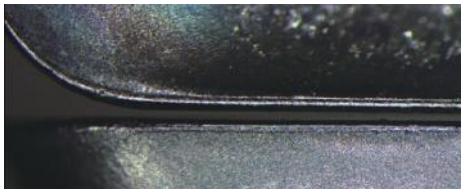
Cutting Length 3.9 feet

<Cutting Conditions>
Material : Inconel718
Tool : APX3000R324SA32SA
Insert : AOMT123608PEER-M
Grade : MP9130
Cutting Speed : vc=100 SFM
Feed per Tooth : fz=.006 IPT
Width of Cut : ae=.315 inch
Depth of Cut : ap=.315 inch
Cutting Mode : Wet Cutting

Application Examples in AISI 1055

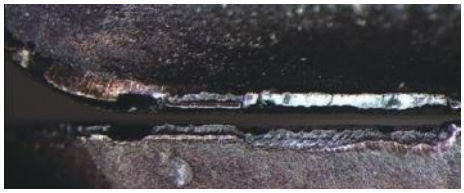
Excellent wear resistance!

MP6120



Cutting Length 91.9 feet
Can Continue Machining Up to 150.9 feet

Conventional A



Cutting Length 91.9 feet

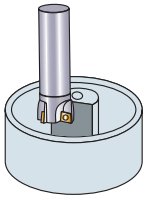
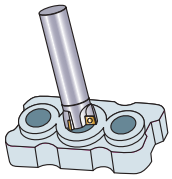
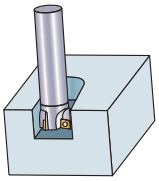
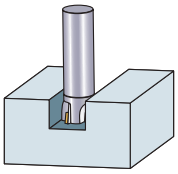
Conventional B

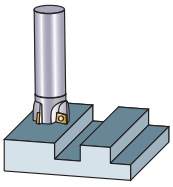
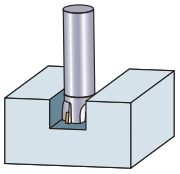
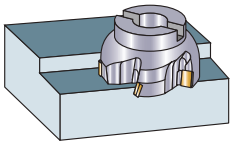
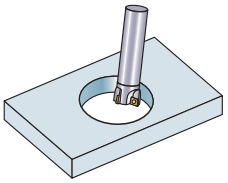


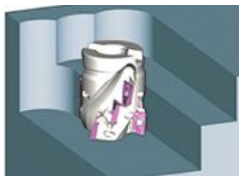
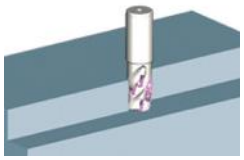
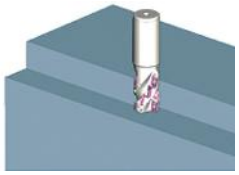
Cutting Length 49.2 feet

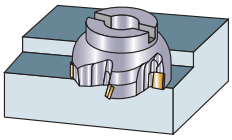
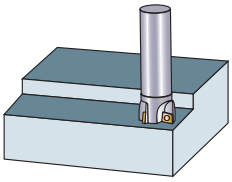
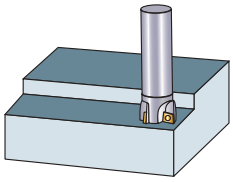
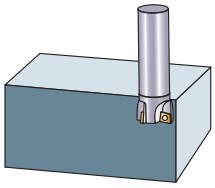
<Cutting Conditions>
Material : AISI 1055
Tool : APX3000R324SA32SA
Insert : AOMT123608PEER-M
Grade : MP6120
Cutting Speed : vc=655 SFM
Feed per Tooth : fz=.004 IPT
Width of Cut : ae=.079 inch
Depth of Cut : ap=.079 inch
Cutting Mode : Dry Cutting

Application Examples

Tool		APX3000UR102SA10SA	APX3000UR246SA20SA	APX3000UR164SA16SA	APX3000UR123SA12SA
Insert (Grade)		AOMT123616PEER-M(VP15TF)	AOMT123608PEER-H(MC5020)	AOMT123608PEER-M(VP15TF)	AOMT123608PEER-H(VP15TF)
Workpiece		Carbon Steel (AISI 1045) 	Gray Cast Iron (AISI class30) 	Carbon Steel (AISI 1055) 	Alloy Steel 
Cutting Conditions	Cutting Speed **vc** (SFM)	490	700	350	800
	Feed per Tooth **fz** (IPT)	.002	.006	.005	.005
	Depth of Cut **ap** (inch)	.059	.197	.118	.118
	Width of Cut **ae** (inch)	.059	1.181	.394—.984	.750
Cutting Mode		Wet Cutting	Dry Cutting	Dry Cutting	Wet Cutting
Machine		M/C-BT30	M/C-BT50	M/C-BT50	M/C-BT50
Results		Lower cutting noise and 2X tool life compared to a conventional product.	Reduced cutting noise, better surface finish and 2X the tool life compared to a conventional product.	Improved cutting performance and lower cutting resistance.	Tool life has been improved by 30% compared to a conventional product.

Tool		APX3000UR205SA20SA	APX3000UR205SA20SA	APX4000UR0307DA	APX4000UR244SA20SA
Insert (Grade)		AOMT123608PEER-M(VP20RT)	AOMT123608PEER-H(VP20RT)	AOMT184808PEER-M(VP15TF)	AOMT184808PEER-M(VP15TF)
Workpiece		Stainless Steel (AISI 420) 	Stainless Steel (AISI 420) 	Carbon Steel (AISI 1055) 	Mild Steel 
Cutting Conditions	Cutting Speed **vc** (SFM)	425	525	540	625
	Feed per Tooth **fz** (IPT)	.008	.003	.006	.010
	Depth of Cut **ap** (inch)	.010	.079	.118	.394
	Width of Cut **ae** (inch)	1.102	.984	1.969	.197
Cutting Mode		Wet Cutting	Wet Cutting	Wet Cutting	Wet Cutting
Machine		M/C-BT50	M/C-BT50	M/C-BT50	M/C-BT50
Results		Lower cutting resistance enabled stable machining even at 6X higher cutting conditions. 12X longer tool life.	2X tool life compared to a conventional product.	Better cutting performance and lower cutting resistance compared to a conventional product.	Cutting resistance is lower than the conventional product, thus allowing a stable machining performance.

Tool		APX4KUR0209A16A	APX4KUR0209A16A	APX4KUR2412WA24S35A	APX4KUR2412WA24S35A
Insert (Grade)	Bottom	AOMT184832PEER-H(VP20RT)	AOMT184832PEER-H(VP20RT)	AOMT184832PEER-H(VP20RT)	AOMT184832PEER-H(VP20RT)
	Peripheral	AOMT184808PEER-H(VP20RT)	AOMT184808PEER-H(VP20RT)	AOMT184808PEER-H(VP20RT)	AOMT184808PEER-H(VP20RT)
Workpiece		Titanium Alloy 	Stainless Steel 	Gray Cast Iron 	Alloy Steel 
Cutting Conditions	Cutting Speed **vc** (SFM)	115	260	410	330
	Feed per Tooth **fz** (IPT)	.003	.004	.012	.010
	Depth of Cut **ap** (inch)	.472–1.575	1.378	2.047	1.772
	Width of Cut **ae** (inch)	.394–.591	1.378	.315	.197
Cutting Mode		Wet Cutting	Wet Cutting	Dry Cutting	Dry Cutting
Machine		M/C-CAT50	M/C-CAT50	M/C-CAT50	M/C-CAT50
Results		3X tool life compared to a conventional product.	2.5X machining efficiency compared to a conventional product by shortening cycle times.	3X efficiency compared to a conventional product.	For stable, deep shoulder milling without vibration.

Tool		APX3000-040A06RA	APX3000UR123SA12SA	APX3000R254SA25SA	APX3000R254SA25SA
Insert (Grade)		AOMT123608PEER-M(MP9130)	AOMT123608PEER-M(MP7130)	AOMT123608PEER-M(MP7130)	AOMT123616PEER-M(MP6130)
Workpiece		WASPALOY 	AISI 420 	AISI 304 	AISI 4137 
Cutting Conditions	Cutting Speed **vc** (SFM)	100	400	460	655
	Feed per Tooth **fz** (IPT)	.001	.004	.004	.005
	Depth of Cut **ap** (inch)	.055	.010	.079	.098
	Width of Cut **ae** (inch)	.630	.020	.984	–
Cutting Mode		Wet Cutting	Dry Cutting	Dry Cutting	Dry Cutting
Results		2X tool life compared to conventional product which enabled to cut continuously without interruption.	Actual cutting time has been nearly 2X compared to conventional product.	Tool life has been improved by 25% compared to conventional product because of the superior fracture resistance.	1.5X longer tool life provided 140% processing efficiency.

The above application examples are customer's applications, so it can be different from the recommended conditions.

MITSUBISHI MATERIALS U.S.A.

MITSUBISHI MATERIALS U.S.A. CORPORATION

California Office
(Headquarters)

3535 Hyland Avenue, Suite 200
Costa Mesa, CA 92626
Customer Service: 800.523.0800
Technical Service: 800.486.2341

Chicago Office
(Engineering)

300 N. Martingale Road, Suite 500
Schaumburg, IL 60173
Main: 847.252.6300
Fax: 847.519.1732

MMC Metal de Mexico, S.A. DE C.V.

Av. La Cañada No.16,
Parque Industrial Bernardo
Quintana, El Marques,
Queretaro C.P. 76246 MEXICO
Main: +52.442.221.61.36
Fax: +52.442.221.61.34

North Carolina-MTEC
(Marketing & Technical Center)

105 Corporate Center Drive, Suite A
Mooresville, NC 28117
Main: 980.312.3100
Fax: 704.746.9292

Toronto Office
(Canada Branch)

600 Matheson Blvd. Unit 5 (Office)
Mississauga, ON L5R 4C1
Main: 905.814.0240
Fax: 905.814.0245

Detroit Office
(Moldino CS)

41700 Gardenbrook Road, Suite 120
Novi, MI 48375
Main: 248.308.2620
Fax: 248.308.2627

FOR YOUR SAFETY

- Don't handle inserts and chips without gloves.
- Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage.
- Please use safety covers and wear safety glasses.
- When using compounded cutting oils, please take fire precautions.
- When attaching inserts or spare parts, please use only the correct wrench or driver.
- When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

www.mmc-carbide.com/us

Tools specifications subject to change without notice.

B055A-US-2025.8