2026.04

B222E

ARP

ROUND INSERT CUTTER
FOR DIFFICULT TO CUT MATERIALS

MITSUBISHI MATERIALS

NEW

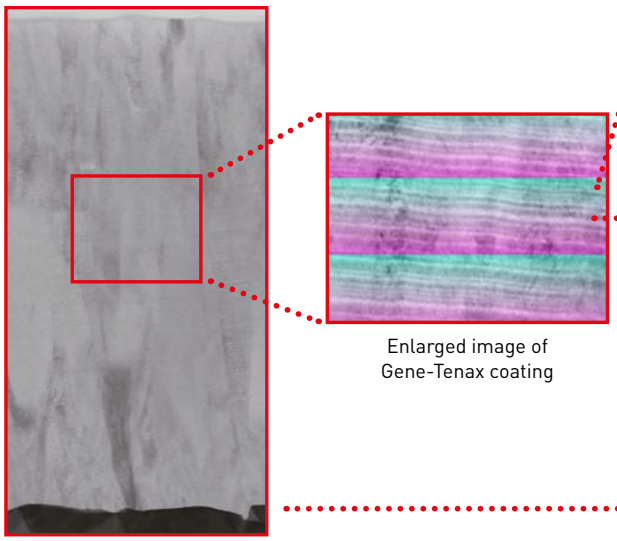
MP1220 / MP1230 / MP1240

MULTI-LAYER PVD COATING FOR MILLING

ONE INSERT SERIES TO SOLVE ALL PROBLEMS WHEN MACHINING STEELS, STAINLESS STEELS, HEAT RESISTANT AND TITANIUM ALLOYS.

GENE-TENAX COATING

By controlling the coating structure at the nano level, damage to the coating has been vastly reduced compared to conventional lamination. By successfully laminating multiple films, simultaneous strengthening of heat, wear and welding resistance is achieved. Additionally the coating is now much less prone to cracking and with the increased adhesive strength, the most stable grade for milling has been created.



Enlarged image of Gene-Tenax coating

Dedicated carbide base material

Al-RICH TECHNOLOGY AlTiN-BASED

Improved wear and heat resistance.

ORIGINAL AlTiN COMPOSITE FUNCTIONAL LAYER

Increasingly resistant to oxidation and welding.

Technology to improve adhesion strength.

ACHIEVES TOUGHNESS FOR A WIDE RANGE OF WORK MATERIALS

STEEL MACHINING DAMAGE

Cutting edge that is resistant to wear when machining steel

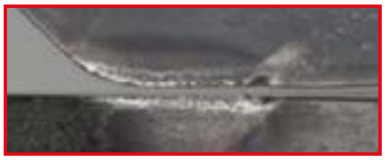
Thermal cracking

STAINLESS STEEL MACHINING DAMAGE

Cutting edge that is less susceptible to notching when machining stainless steel

Notching

HEAT RESISTANT AND TITANIUM ALLOYS MACHINING DAMAGE



Cutting edge that is resistant to chipping when machining heat resistant and titanium alloys

Chipped cutting edge

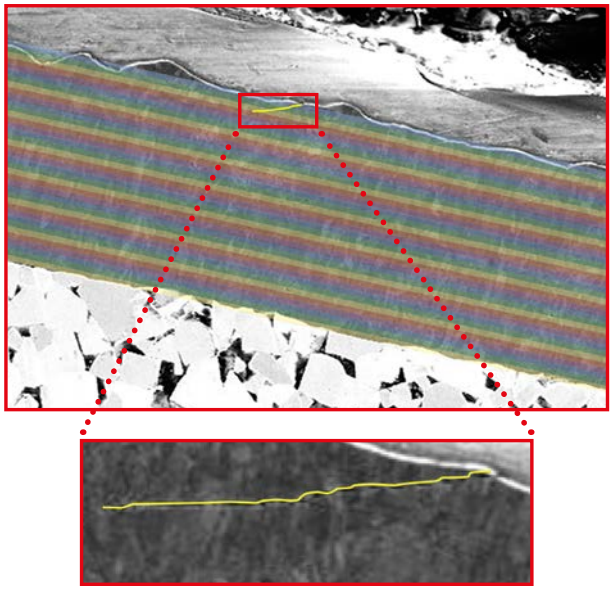
■ : MP1200 Series ■ : Conventional PVD

NEW

NEW MULTILAYER TECHNOLOGY

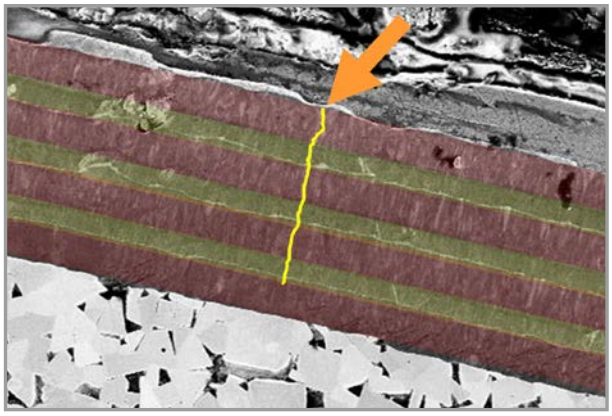
The adoption of a new multi-layer technology has succeeded in suppressing crack propagation and dramatically improved fracture resistance when compared to conventional technology.

MP1200 SERIES MULTI-LAYER TECHNOLOGY



Prevents cracks

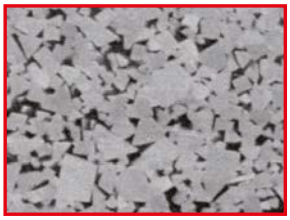
CONVENTIONAL LAYER TECHNOLOGY



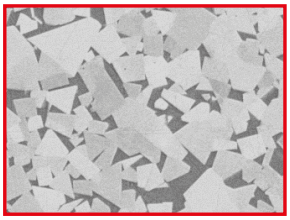
MULTI-GRADE SYSTEM

Using simulation technology, precise analysis of the cutting edge load and temperature when machining different workpiece materials was carried out. This led to the creation of different substrates for three different grades and ensures optimal performance for each type of workpiece material. Ensuring the best performance over a wide range of applications.

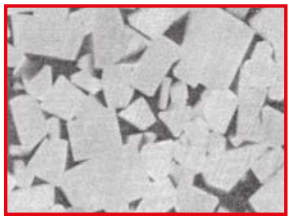
MP1220



MP1230



MP1240



2µm

SELECTION GUIDELINES

Steel, Carbon steel — **Stainless steel** — **Titanium alloys, Heat resistant alloys**

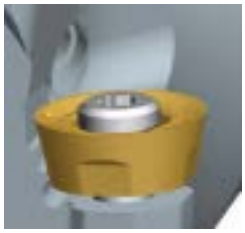
- Hard grade
- Stable cutting
- Emphasis on wear resistance and mechanical properties

- Tough grade
- Unstable cutting
- Emphasis on fracture resistance and thermal properties

ARP

HIGH ACCURACY RUN-OUT PROVIDES EFFICIENT MACHINING

STRONG CLAMPING SYSTEM
A wide seating face and 2 side location faces prevent inserts from moving during cutting.

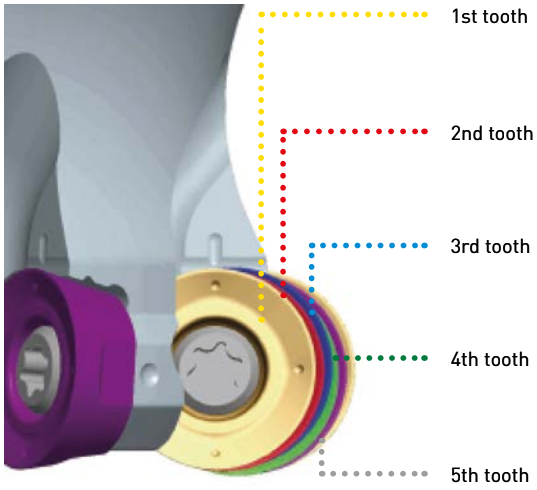


Easy indexing – No need to completely remove the clamping screw

OPTIMISED CHIP FLOW FOR LOW CUTTING RESISTANCE
Special rake face geometry on each section of the insert corresponds to the indexing position and therefore provides smooth chip flow for low cutting resistance at each index position.

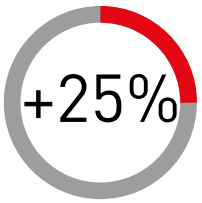
PRECISE INSERT POSITIONING PROVIDES RUN-OUT ACCURACY AND INCREASES TOOL LIFE

5 TOOTH CUTTER



Highly accurate seating realises minimal change of position and provides run-out accuracy after indexing the inserts.

Compared to conventional tools:
Axial runout shows a 25 % improvement



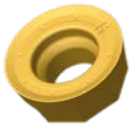
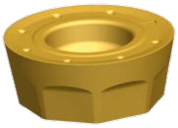
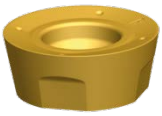
AXIAL RUN-OUT

NEW INDEXING SEAT FACES

The new advanced indexing design, plus the variety of new grades available significantly increases the effectiveness of the ARP series while also maintaining stability and economy.

Conventional New

THICKER AND WIDER INSERT TO PREVENT CRACKING
In order to minimize sudden failure of the insert under difficult cutting conditions, the insert has been redesigned. Now incorporating a wider core and increased thickness.

LOW DEPTH OF CUT	HIGH DEPTH OF CUT
	
	
	

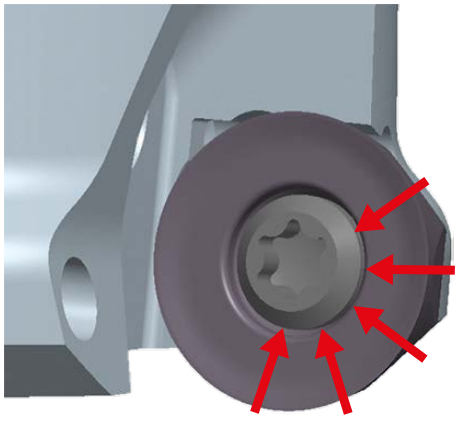
DESIGN
The design of the chipbreaker in combination with the reinforcement of the insert enables a significantly increased resistance to breakage.

SEATING FACES
Designed with 4 or 8 position indexing faces provides the optimum design depending on cutting requirements.

4 indexing seat faces = RPHT○○○○○○**E4-**○ / RPMT○○○○○○**E4-**○
8 indexing seat faces = RPMT○○○○○○**E8-**○

PREVENTING ROTATION
The use of the 4 or 8 position indexing faces also prevents rotation, thereby ensuring reliable clamping even under the toughest cutting conditions.

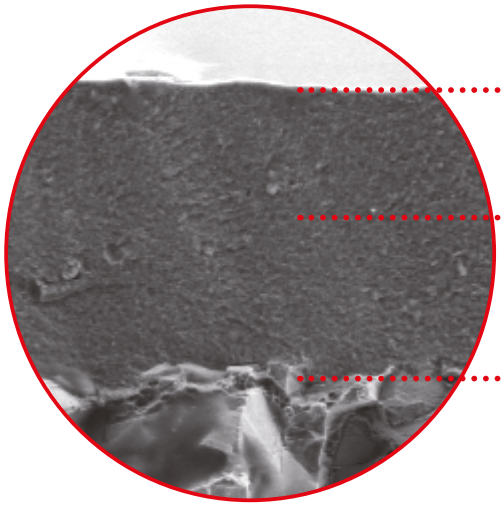
THE RAKE FACE DIRECTS CUTTING FORCES TOWARDS THE CENTRE



MP9140

PVD COATED GRADE FOR DIFFICULT TO CUT MATERIALS

SMOOTH COATING SURFACE PROVIDES EXCELLENT WELDING RESISTANCE

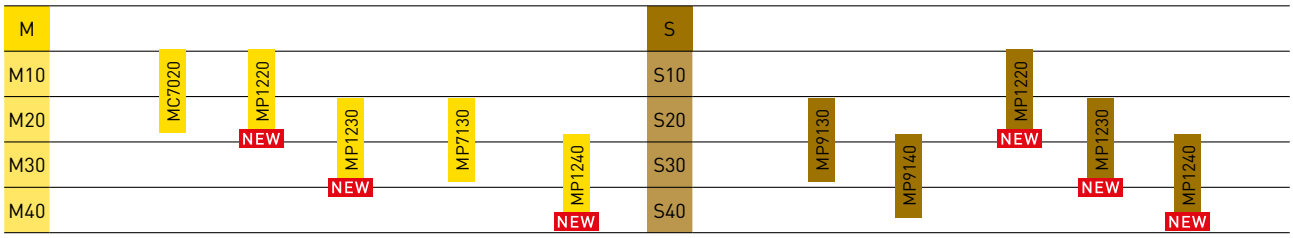


The smooth coating surface provides excellent welding resistance.

The high Al-rich AlTiN coating succeeds in dramatically improving wear and heat resistance.

Special cemented carbide substrate with improved fracture resistance.

APPLICATION RANGE



MP1230
Ideal for medium machining applications and for light interrupted cutting.

MP1240
The toughest grade for heavy machining and rough interrupted applications.

MC7020
Suppresses crater wear that occurs during high speed cutting. Achieves process stability in high efficiency machining conditions.

MP7130
For general milling of stainless steel.

MP9130
For interrupted and general milling of HRSA and titanium alloy.

MP9140
Focus on fracture resistance for difficult to cut Materials.

MV1000 SERIES

COATED CARBIDE GRADE FOR MILLING

ADVANCED WEAR RESISTANCE

By adopting the newly developed Al-Rich coating technology, the (Al,Ti)N with a high Al content ratio displays very high hardness. This greatly improves oxidation and wear resistance.

ADVANCED THERMAL SHOCK 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.

Graphical representation

EXCELLENT WELDING RESISTANCE

Smooth surface.

OUTSTANDING WEAR RESISTANCE

Newly developed Al-Rich coating.

EXCELLENT CHIPPING RESISTANCE FOR STABLE MACHINING

Newly developed bonding layer.

FRACTURE RESISTANCE FOR THE ULTIMATE STABILITY

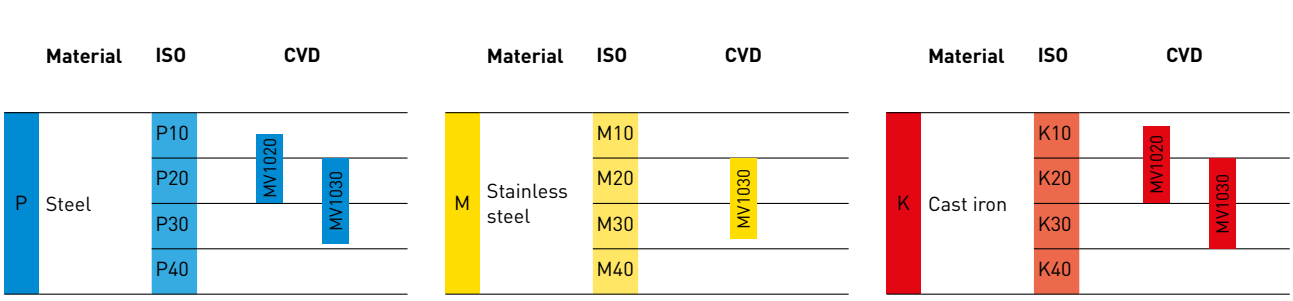
Exclusive cemented carbide substrate.

MV1020

This grade has advanced wear and thermal shock resistance and also achieves stable cutting at unprecedented cutting speeds, especially when machining steel and ductile cast iron, thus greatly reducing work time.

MV1030

The new Al-Rich coating also provides excellent wear resistance. An unprecedented performance against sudden breakage was also realised especially during problematic wet cutting and when machining stainless steels.



1. Dry cutting is recommended for machining stainless steel with MV1030.

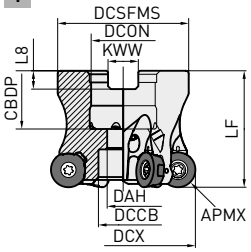
ARP5/6

MULTI FUNCTIONAL MILLING

M S

GAMP :+4°
GAMF :-6°

1



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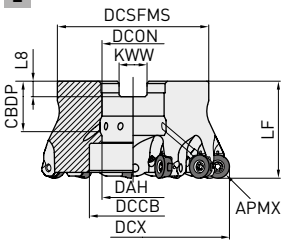
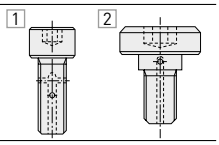


Right hand tool holder only.

DC	Set bolt	Geometry	
Ø40	HSC08025H	1	
Ø50,Ø52,Ø63	HSC10030H		
Ø66,Ø80	HSC12035H		
Ø100	MBA16033H	2	

ARBOR TYPE

Order number	Stock	Cutting edge R	APMX	DCON	DCX	LF	RMPX	A1	AZ	WT	ZEFP	Type
ARP5P-040A05AR	●		5.0	16	40	40	2.8°	2.0	1.30	0.15	5	1
ARP5P-042A05AR	●		5.0	16	42	40	2.8°	2.5	1.40	0.16	5	1
ARP5P-050A06AR	●		5.0	22	50	40	2.9°	2.0	1.85	0.27	6	1
ARP5P-052A06AR	●		5.0	22	52	40	3.0°	2.5	2.00	0.29	6	1
ARP5P-063A07AR	●	5	5.0	22	63	40	3.0°	2.5	2.50	0.46	7	1
ARP5P-042A06AR	●		5.0	16	42	40	2.8°	2.5	1.40	1.6	6	1
ARP5P-050A07AR	●		5.0	22	50	40	2.9°	2.0	1.85	0.27	7	1
ARP5P-052A07AR	●		5.0	22	52	40	3.0°	2.5	2.00	0.29	7	1
ARP5P-063A08AR	●		5.0	22	63	40	3.0°	2.5	2.50	0.46	8	1
ARP6P-040A04AR	●		6.0	16	40	40	2.7°	2.0	1.15	0.15	4	1
ARP6P-050A05AR	●		6.0	22	50	40	2.9°	2.0	1.70	0.26	5	1
ARP6P-052A05AR	●		6.0	22	52	40	2.9°	2.5	1.80	0.28	5	1
ARP6P-063A06AR	●		6.0	22	63	40	3.1°	2.5	2.50	0.44	6	1
ARP6P-066X06AR	●		6.0	27	66	50	2.9°	2.5	2.50	0.64	6	1
ARP6P-080A08AR	●		6.0	27	80	50	2.3°	2.5	2.50	0.88	8	1
ARP6P-100B09AR	●	6	6.0	32	100	50	1.7°	2.5	2.50	1.47	9	2
ARP6P-050A06AR	●		6.0	22	50	40	2.9°	2.0	1.70	0.25	6	1
ARP6P-052A06AR	●		6.0	22	52	40	2.9°	2.5	1.80	0.27	6	1
ARP6P-063A07AR	●		6.0	22	63	40	3.1°	2.5	2.50	0.44	7	1
ARP6P-066X07AR	●		6.0	27	66	50	2.9°	2.5	2.50	0.64	7	1
ARP6P-080A09AR	●		6.0	27	80	50	2.3°	2.5	2.50	0.88	9	1
ARP6P-100B11AR	●		6.0	32	100	50	1.7°	2.5	2.50	1.45	11	2

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

ARP5/6

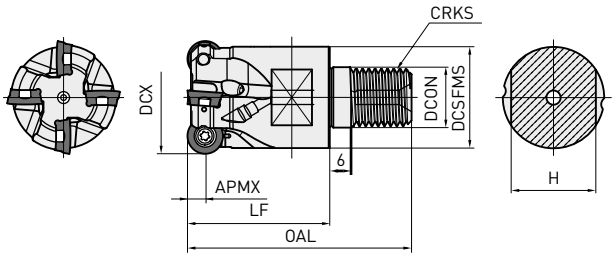
MOUNTING DIMENSIONS

Order number	DCSFMS	CBDP	DAH	DCCB	KWW	L8
ARP5P-040A05AR	34	18	9	14	8.4	5.6
ARP5P-042A05AR	34	18	9	14	8.4	5.6
ARP5P-050A06AR	45	20	11	17	10.4	6.3
ARP5P-052A06AR	45	20	11	17	10.4	6.3
ARP5P-063A07AR	50	20	11	17	10.4	6.3
ARP5P-042A06AR	34	18	9	14	8.4	5.6
ARP5P-050A07AR	45	20	11	17	10.4	6.3
ARP5P-052A07AR	45	20	11	17	10.4	6.3
ARP5P-063A08AR	50	20	11	17	10.4	6.3
ARP6P-040A04AR	34	18	9	13.4	8.4	5.6
ARP6P-050A05AR	45	20	11	17	10.4	6.3
ARP6P-052A05AR	45	20	11	17	10.4	6.3
ARP6P-063A06AR	50	20	11	17	10.4	6.3
ARP6P-066X06AR	56	23	13	20	12.4	7
ARP6P-080A08AR	56	23	13	20	12.4	7
ARP6P-100B09AR	78	26	45	32	14.4	8
ARP6P-050A06AR	45	20	11	17	10.4	6.3
ARP6P-052A06AR	45	20	11	17	10.4	6.3
ARP6P-063A07AR	50	20	11	17	10.4	6.3
ARP6P-066X07AR	56	23	13	20	12.4	7
ARP6P-080A09AR	56	23	13	20	12.4	7
ARP6P-100B11AR	78	26	45	32	14.4	8

ARP5/6

MULTI FUNCTIONAL MILLING

M S



GAMP :+4°
GAMF :-6°–-7°

SCREW IN TYPE

Order number	Stock	Cutting edge R	APMX	DCON	DCX	LF	H	RMPX	A1	AZ	WT	ZEFP
ARP5PR2502AM1235	●	5	5.0	12.5	25	140	19	1.8°	—	0.40	0.10	2
ARP5PR3203AM1640	●		5.0	17.0	32	150	24	1.9°	1.0	0.65	0.16	3
ARP5PR2503AM1235	●		5.0	12.5	25	180	19	1.8°	—	0.40	0.09	3
ARP5PR3204AM1640	●		5.0	17.5	32	200	24	1.9°	1.0	0.65	0.15	4
ARP6PR3202AM1640	●	6	6.0	17.0	32	150	24	2.0°	1.0	0.60	0.18	2
ARP6PR3203AM1640	●		6.0	17.0	32	150	24	2.0°	1.0	0.60	0.17	3
ARP6PR4003AM1640	●		6.0	17.0	40	150	24	2.7°	2.5	1.15	0.20	3
ARP6PR4004AM1640	●		6.0	17.0	40	200	24	2.7°	2.5	1.15	0.20	4

1/1

13 Vc

MOUNTING DIMENSIONS

Order number	DCON	DCX	DCSFMS	OAL	CRKS
ARP5PR2502AM1235	12.5	25	23.5	57	M12
ARP5PR3203AM1640	17.0	32	28.5	63	M16
ARP5PR2503AM1235	12.5	25	23.5	57	M12
ARP5PR3204AM1640	17.5	32	28.5	63	M16
ARP6PR3202AM1640	17.0	32	28.5	63	M16
ARP6PR3203AM1640	17.0	32	28.5	63	M16
ARP6PR4003AM1640	17.0	40	28.5	63	M16
ARP6PR4004AM1640	17.0	40	28.5	63	M16

1/1

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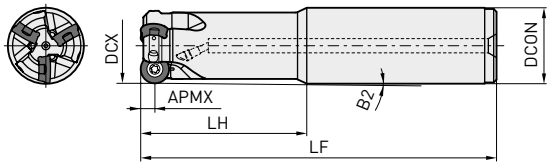
ARP5/6

MULTI FUNCTIONAL MILLING

M S

GAMP :+4°
GAMF :-6°--7°

1



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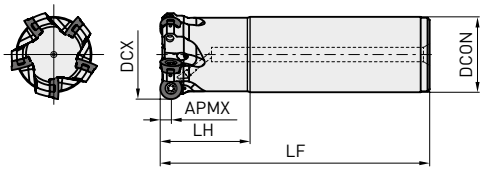


Right hand tool holder only.

SHANK TYPE

Order number	Stock	Cutting edge R	APMX	DCON	DCX	LF	LH	B2	RMPX	A1	AZ	WT	ZEFP	Type
ARP5PR2503SA25M	★	5	5.0	25	25	140	60	1.10°	1.8°	1.0	0.40	0.42	3	1
ARP5PR3204SA32M	★		5.0	32	32	150	70	0.92°	1.9°	1.0	0.65	0.77	4	1
ARP5PR2502SA25L	★		5.0	25	25	180	80	0.80°	1.8°	1.0	0.40	0.56	2	1
ARP5PR3203SA32L	★		5.0	32	32	200	120	0.51°	1.9°	1.0	0.65	1.01	3	1
ARP6PR3203SA32M	★	6	6.0	32	32	150	70	0.94°	2.0°	1.0	0.60	0.76	3	1
ARP6PR4004SA32M	★		6.0	32	40	150	50	—	2.7°	2.5	1.15	0.85	4	2
ARP6PR5005SA42M	★		6.0	42	50	150	50	—	2.9°	2.5	1.70	1.47	5	2
ARP6PR3202SA32L	★		6.0	32	32	200	120	0.52°	2.0°	1.0	0.60	1.00	2	1
ARP6PR4003SA32L	★		6.0	32	40	250	50	—	2.7°	2.5	1.15	1.48	3	2
ARP6PR5004SA42L	★		6.0	42	50	250	50	—	2.9°	2.5	1.70	2.53	4	2

1/1

13 Vc

SPARE PARTS

Tool holder number	Insert screw *	Wrench	Anti-seize lubricant	Coolant nozzle	Insert
ARP5	TPS351B	TIP10D	MK1KS	HSD04004H	RPMT1040M0E4-o
ARP6	TPS4	TIP15D	MK1KS	HSD04004H	RPMT1248M0E4-o

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

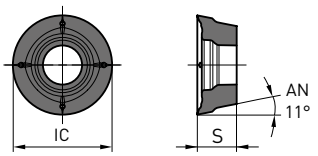
● : Inventory maintained. ★ : Inventory maintained in Japan.

ARP5/6

INSERTS

M	Stainless steel	
S	Heat-resistant alloy, Titanium alloy	

Cutting conditions: ●: Stable cutting ◔: General cutting ✤: Unstable cutting
Honing: E: Round T: Chamfer

Order number	Class	Honing	NEW MP1220	NEW MP1230	NEW MP1240	MV1020	MV1030	MC7020	MP7130	MP9130	MP9140	IC	S	Geometry
RPHT1040M0E4-L	H	E	●	●	●			●	●	●		10	3.97	
RPHT1248M0E4-L	H	E	●	●	★			●	●	●		12	4.76	
RPHT1040M0E4-M	H	E	●	●	●			●	●	●		10	3.97	
RPHT1248M0E4-M	H	E	●	●	●			●	●	●		12	4.76	
RPHT1040M0E4-R	H	E	★	●	●			●	●	●		10	3.97	
RPHT1248M0E4-R	H	E	★	●	●			●	●	●		12	4.76	
RPMT1040M0E4-L	M	E						●	●	●		10	3.97	
RPMT1040M0E4-L2	M	E	●	●	●	●	●				●	10	3.97	
RPMT1040M0E8-L1	M	E	●	●	★	●	●	●	●	●	●	10	3.97	
RPMT1248M0E4-L	M	E						●	●	●		12	4.76	
RPMT1248M0E4-L2	M	E	●	●	●	●	●				●	12	4.76	
RPMT1248M0E8-L1	M	E	●	●	●	●	●	●	●	●	●	12	4.76	
RPMT1040M0E4-M	M	E						●	●	●		10	3.97	
RPMT1040M0E4-M2	M	E	●	●	●	●	●				●	10	3.97	
RPMT1040M0E8-M1	M	E	●	●	●	●	●	●	●	●	●	10	3.97	
RPMT1248M0E4-M	M	E						●	●	●		12	4.76	
RPMT1248M0E4-M2	M	E	●	●	●	●	●				●	12	4.76	
RPMT1248M0E8-M1	M	E	●	●	●	●	●	●	●	●	●	12	4.76	
RPMT1040M0E4-R	M	E						●	●	●		10	3.97	
RPMT1040M0E4-R2	M	E	★	●	●	●	●					10	3.97	
RPMT1040M0E8-R1	M	E	★	●	●	●	●	●	●	●		10	3.97	
RPMT1248M0E4-R	M	E						●	●	●		12	4.76	
RPMT1248M0E4-R2	M	E	★	●	●	●	●					12	4.76	
RPMT1248M0E8-R1	M	E	★	●	●	●	●	●	●	●		12	4.76	

ARP5 / 6

RECOMMENDED CUTTING CONDITIONS

DRY CUTTING

	Material	Hardness	Grade	Vc	fz
M	Austenitic stainless steel	≤200HB	MV1020	250 (200 – 300)	0.2 (0.1 – 0.35)
			MV1030	220 (170 – 270)	0.2 (0.1 – 0.35)
			MC7020	220 (170 – 270)	0.2 (0.1 – 0.35)
			MP1220	—	—
			MP1230	200 (150 – 250)	0.2 (0.1 – 0.35)
			MP7130	200 (150 – 250)	0.2 (0.1 – 0.35)
			MP1240	180 (130 – 230)	0.2 (0.1 – 0.35)
		>200HB	MV1020	220 (170 – 270)	0.2 (0.1 – 0.35)
			MV1030	190 (140 – 240)	0.2 (0.1 – 0.35)
			MC7020	190 (140 – 240)	0.2 (0.1 – 0.35)
			MP1220	—	—
			MP1230	170 (120 – 220)	0.2 (0.1 – 0.35)
			MP7130	170 (120 – 220)	0.2 (0.1 – 0.35)
			MP1240	150 (100 – 200)	0.2 (0.1 – 0.35)
	Duplex steel Two-phase stainless steel	≤280HB	MV1020	250 (200 – 300)	0.2 (0.1 – 0.35)
			MV1030	220 (170 – 270)	0.2 (0.1 – 0.35)
			MC7020	180 (130 – 230)	0.2 (0.1 – 0.35)
			MP1220	—	—
			MP1230	160 (110 – 210)	0.2 (0.1 – 0.35)
			MP7130	160 (110 – 210)	0.2 (0.1 – 0.35)
			MP1240	140 (90 – 190)	0.2 (0.1 – 0.35)
	Ferritic and martensitic stainless steel	—	MP1220	200 (150 – 250)	0.2 (0.1 – 0.35)
			MP1230	200 (150 – 250)	0.2 (0.1 – 0.35)
			MP1240	180 (130 – 230)	0.2 (0.1 – 0.35)
		≤200MPa	MV1020	270 (220 – 320)	0.2 (0.1 – 0.35)
			MV1030	240 (190 – 290)	0.2 (0.1 – 0.35)
			MC7020	240 (190 – 290)	0.2 (0.1 – 0.35)
			MP7130	200 (150 – 250)	0.2 (0.1 – 0.35)
		>200HB	MV1020	270 (220 – 320)	0.2 (0.1 – 0.35)
			MV1030	240 (190 – 290)	0.2 (0.1 – 0.35)
			MC7020	240 (190 – 290)	0.2 (0.1 – 0.35)
			MP7130	200 (150 – 250)	0.2 (0.1 – 0.35)
		<450HB	MC7020	170 (120 – 220)	0.2 (0.1 – 0.35)
			MP7130	150 (100 – 200)	0.2 (0.1 – 0.35)
	PH stainless steel	<450HB	MV1020	190 (140 – 240)	0.2 (0.1 – 0.35)
			MV1030	170 (120 – 220)	0.2 (0.1 – 0.35)
			MP1220	—	—
			MP1230	150 (100 – 200)	0.2 (0.1 – 0.35)
			MP1240	130 (80 – 180)	0.2 (0.1 – 0.35)

1 / 1

1. Actual cutting conditions are estimated to avoid chatter and vibration when used on stable applications.
   Make appropriate adjustments when chatter or insert chipping occurs during machining.
   Use with lower conditions for long overhang applications or when pocket machinig.
2. On workpiece entry, reduce the feed by 70 %. For ramping, drilling and plunging, reduce by 50 %.
3. Internal coolant is recommended for titanium alloy and heat resistant alloy machining.

ARP5 / 6

RECOMMENDED CUTTING CONDITIONS

WET CUTTING

	Material	Hardness	Grade	Vc	fz
M	Austenitic stainless steel	≤200HB	MV1020	180 (130 – 230)	0.2 (0.1 – 0.35)
			MV1030	150 (100 – 200)	0.2 (0.1 – 0.35)
			MC7020	150 (100 – 200)	0.2 (0.1 – 0.35)
			MP1220	—	—
			MP1230	130 (80 – 180)	0.2 (0.1 – 0.35)
			MP7130	130 (80 – 180)	0.2 (0.1 – 0.35)
			MP1240	110 (60 – 160)	0.2 (0.1 – 0.35)
		>200HB	MV1020	150 (100 – 200)	0.2 (0.1 – 0.35)
			MV1030	130 (80 – 180)	0.2 (0.1 – 0.35)
			MC7020	120 (70 – 170)	0.2 (0.1 – 0.35)
			MP1220	—	—
			MP1230	100 (80 – 150)	0.2 (0.1 – 0.35)
			MP7130	100 (80 – 150)	0.2 (0.1 – 0.35)
			MP1240	80 (60 – 130)	0.2 (0.1 – 0.35)
	Duplex steel Two-phase stainless steel	≤280HB	MV1020	180 (130 – 230)	0.2 (0.1 – 0.35)
			MV1030	150 (100 – 200)	0.2 (0.1 – 0.35)
			MC7020	120 (70 – 170)	0.2 (0.1 – 0.35)
			MP1220	—	—
			MP1230	100 (80 – 150)	0.2 (0.1 – 0.35)
			MP7130	100 (80 – 150)	0.2 (0.1 – 0.35)
			MP1240	80 (60 – 130)	0.2 (0.1 – 0.35)
	Ferritic and martensitic stainless steel	—	MP1220	130 (80 – 180)	0.2 (0.1 – 0.35)
			MP1230	130 (80 – 180)	0.2 (0.1 – 0.35)
			MP1240	110 (60 – 160)	0.2 (0.1 – 0.35)
		≤200MPa	MV1020	190 (140 – 240)	0.2 (0.1 – 0.35)
			MV1030	170 (120 – 220)	0.2 (0.1 – 0.35)
			MC7020	170 (120 – 220)	0.2 (0.1 – 0.35)
			MP7130	130 (80 – 180)	0.2 (0.1 – 0.35)
		>200HB	MV1020	190 (140 – 240)	0.2 (0.1 – 0.35)
			MV1030	170 (120 – 220)	0.2 (0.1 – 0.35)
			MC7020	170 (120 – 220)	0.2 (0.1 – 0.35)
			MP7130	130 (80 – 180)	0.2 (0.1 – 0.35)
		<450HB	MC7020	110 (60 – 160)	0.2 (0.1 – 0.35)
			MP7130	90 (50 – 140)	0.2 (0.1 – 0.35)
	PH stainless steel	<450HB	MV1020	130 (80 – 180)	0.2 (0.1 – 0.35)
			MV1030	120 (70 – 170)	0.2 (0.1 – 0.35)
			MP1220	—	—
			MP1230	90 (50 – 140)	0.2 (0.1 – 0.35)
			MP1240	70 (30 – 120)	0.2 (0.1 – 0.35)

1/2

1. Actual cutting conditions are estimated to avoid chatter and vibration when used on stable applications.
   Make appropriate adjustments when chatter or insert chipping occurs during machining.
   Use with lower conditions for long overhang applications or when pocket machinig.
2. On workpiece entry, reduce the feed by 70 %. For ramping, drilling and plunging, reduce by 50 %.
3. Internal coolant is recommended for titanium alloy and heat resistant alloy machining.

ARP5/6

WET CUTTING

	Material	Hardness	Grade	Vc	fz
S	Titanium alloy	—	MP1220	50 (35 – 60)	0.1 (0.05 – 0.15)
			MP1230	45 (30 – 55)	0.1 (0.05 – 0.15)
			MP1240	40 (30 – 50)	0.1 (0.05 – 0.15)
			MP9130	45 (30 – 55)	0.1 (0.05 – 0.15)
			MP9140	40 (30 – 50)	0.1 (0.05 – 0.15)
	Heat resistant alloy	—	MP1220	40 (20 – 50)	0.1 (0.05 – 0.15)
			MP1230	35 (15 – 45)	0.1 (0.05 – 0.15)
			MP1240	30 (15 – 40)	0.1 (0.05 – 0.15)
			MP9130	35 (15 – 45)	0.1 (0.05 – 0.15)
			MP9140	30 (15 – 40)	0.1 (0.05 – 0.15)

1. Actual cutting conditions are estimated to avoid chatter and vibration when used on stable applications.
   Make appropriate adjustments when chatter or insert chipping occurs during machining.
   Use with lower conditions for long overhang applications or when pocket machinig.
2. On workpiece entry, reduce the feed by 70 %. For ramping, drilling and plunging, reduce by 50 %.
3. Internal coolant is recommended for titanium alloy and heat resistant alloy machining.

CORRECTION RATIO (F) BASED ON THE (AP) AXIAL CUTTING DEPTH

Holder	ap = 0.5 mm	ap = 1 mm	ap = 1.5 mm	ap = 2 mm	ap = 2.5 mm	ap = 3 mm	ap = 3.5 mm	ap = 4 mm	ap = 5 mm	ap = 6 mm
ARP5	2.3	1.5	1.2	1.1	1.0	0.9	0.8	0.8	0.8	—
ARP6	2.5	1.7	1.3	1.1	1.0	1.0	0.9	0.9	0.8	0.8

SYMBOLS

Recommended cutting conditions

Completely new products or expansions released in the current Spring or Autumn product launch and are not included in the latest version of the General Catalogue.

Products or expansions that have already been introduced in one of the previous Spring or Autumn product launches but are not included in the latest General Catalogue.

APPLICATION

Face milling

Chamfer milling

Shoulder milling with R

Face milling close to a wall

Shoulder milling

Side milling

Slot milling

Ramping

Pocket milling

Slot milling with R

Copy milling

T-Slot milling

MACHINING TYPE

Roughing

Medium cutting

Light cutting

Pre-finishing

Finishing

Fine-finishing

TOOL MATERIAL

Ultra micro grain carbide
Ultra micro grain carbide substrate material.

Cubic boron nitride
Mitsubishi Materials' original CBN material.

Ceramic
For high speed efficient machining of super alloys due to the excellent high temperature strength property.

High hardness powder metallurgy HSS
High hardness powder metallurgy HSS substrate material.

High grade high alloy HSS
High grade high alloy HSS substrate material.

Cobalt high speed steel
Cobalt high speed steel substrate material.

High speed steel
High speed steel substrate material.

SYMBOLS

COATING

SMART MIRACLE coating
New smooth and dense coating technology for high efficiency milling of difficult to cut materials.

CRN coating
Newly developed CrN coating for Copper Electrodes machining.

Violet coating
Increased tool life of 2-3 times more than TiN coated products.

DP coating
New generation coating suitable for a wide range of materials.

MIRACLE coating
The original Miracle (Al,Ti)N coating.
Also suitable for dry cutting.

(Al, Ti)N coating
(Al,Ti)N highly versatile application range.

(Al,Ti,Cr)N multi-layer coating
For carbon, alloy and hardened steels.

IMPACT MIRACLE coating
Single phase nano crystal coating technology has higher film hardness and heat resistance.

MIRACLE coating
The original MIRACLE (Al,Ti)N coating.
Also suitable for dry cutting.

VFR coating
The (AlCrSi)N/(AlTiSti)N PVD multilayer coating is ideal for machining of extremely hard materials up to 70 HRC.

DLC coating
Hardness similar to CVD diamond coating achieved with high adhesion strength.

Diamond coating
Suitable for CFRP and CFRP-aluminium materials.

Diamond coating
Suitable for graphite machining.

Diamond coating
The original CVD diamond coating.

CVD Diamond coating
Unique multi-layer micro-grain diamond crystal control technology drastically improves wear resistance and smoothness.

CUTTING EDGE PROPERTIES

Sharp corner edge
Indicates the end mill has a sharp corner edge.

Gash land
Indicates the end mill cutting edge has a protective chamfer.

Rake angle

Helix angle
Indicates the helix angle of the end mill.

Point angle
Indicates the drill point angle.

Roughing flute geometry

Variable helix

Rounded gash

Corner angle

WEB THINNING

X type point geometry
X web thinning used at the drill point.

XR type point geometry
XR web thinning used at the drill point.

S type point geometry
Easy cutting geometry.

N type point geometry
Effective when the point web is thick.

Chipbreaker

SYMBOLS

TOLERANCES	
	**Tolerance of taper angle** Indicates the tolerance of the taper angle.
	**R tolerance** Indicates the radial tolerance of a ball nose end mill.
	**R tolerance** Indicates the radial tolerance of the corner radius.
	**R tolerance** Indicates the radial tolerance of a cutter with a corner radius.
	**Outside diameter tolerance** Indicates the diameter tolerance of the end mill.
	**Peak tolerance** Indicates the tolerance for the end diameter.
	**Shank diameter tolerance**
	**Shank diameter tolerance**
	**Drill tolerance / diameter**
COOLANT HOLES	
	**External coolant**
	**Internal coolant**
	**Internal coolant**
	**Centered, internal coolant hole**
	**Radial, internal coolant holes**
	**Internal coolant holes**
	**Internal coolant holes**

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