

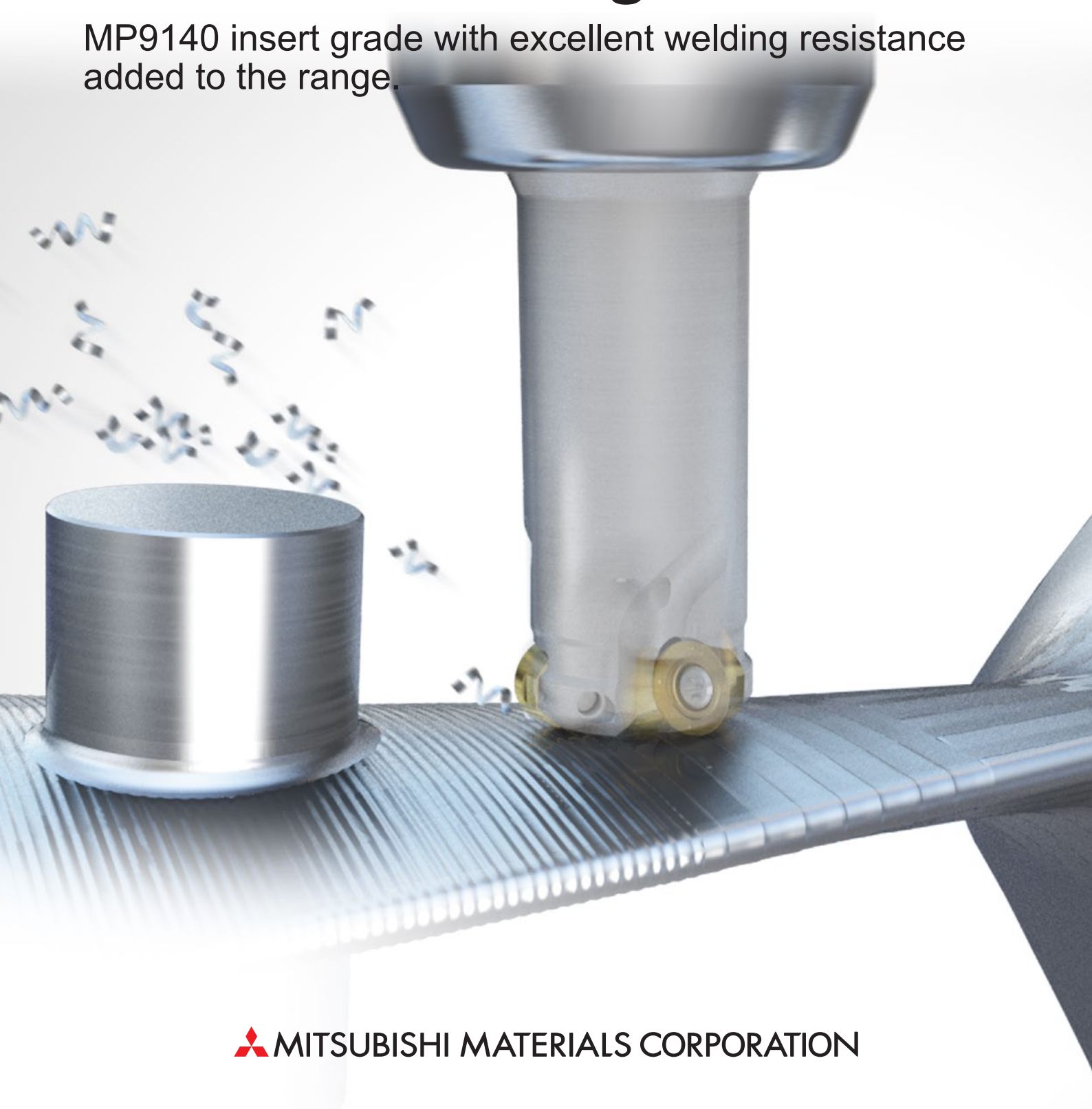
Round Insert Cutter for Difficult-to-cut Materials

ARP Series

Grade
Expansion

High Accuracy Run-out Provides Efficient Machining

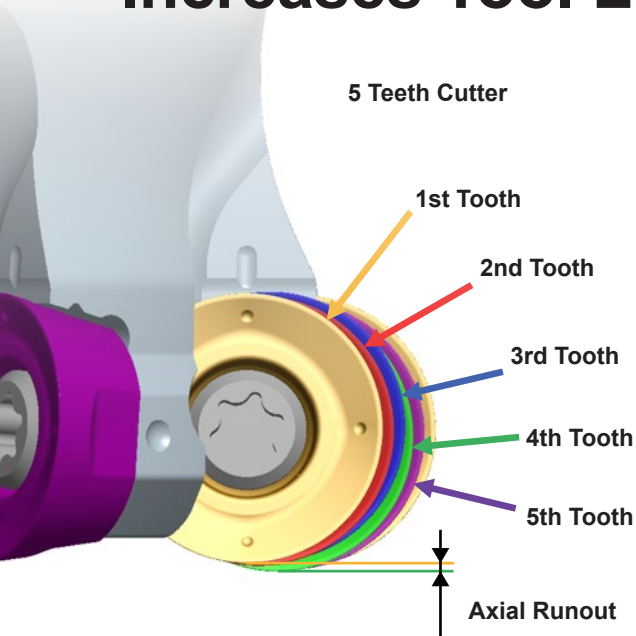
MP9140 insert grade with excellent welding resistance added to the range.



Round Insert Cutter for Difficult-to-cut Materials

ARP Series

Highest Level of Run-out Accuracy Increases Tool Life



Highly accurate seating realises minimal change of run-out accuracy when indexing the inserts.

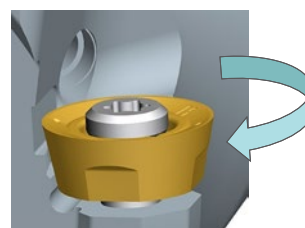
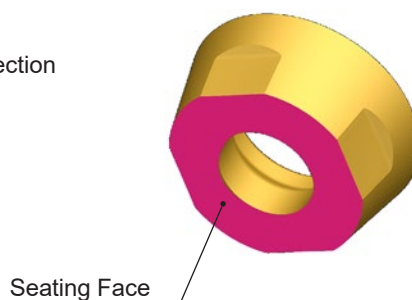
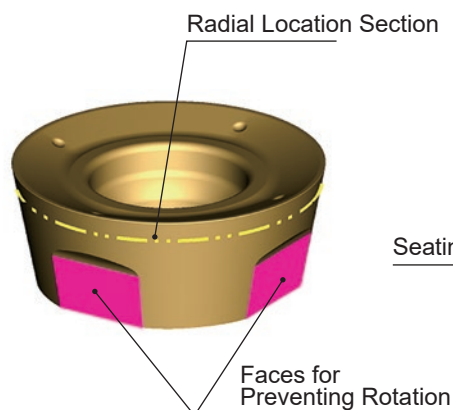
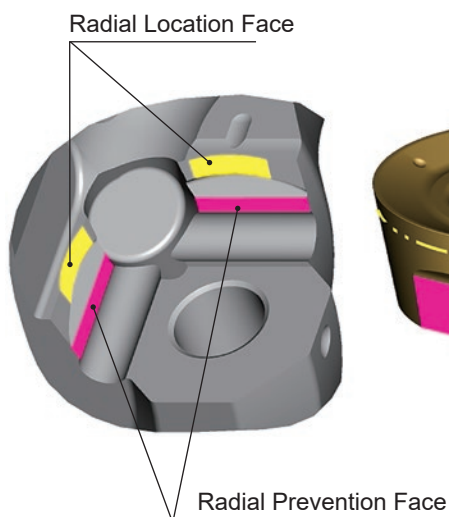
Compared to conventional tools

Axial runout
25%
improvement



Strong Clamping System

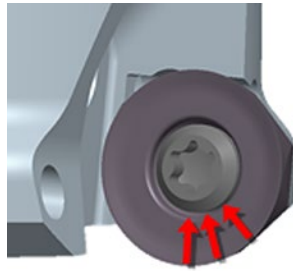
A wide seating face and 2 side location faces prevent inserts from moving during cutting.



Easy indexing - No need to completely remove the clamping screw.

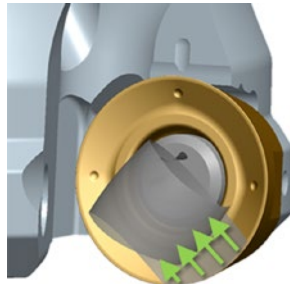
Choose 4 or 8 Indexing Faces According to the Depth of Cut

8 seating face inserts are economical for small depth of cut machining.

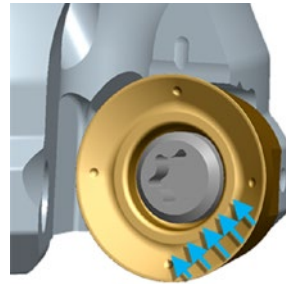


Rake design of 8 indexing face insert

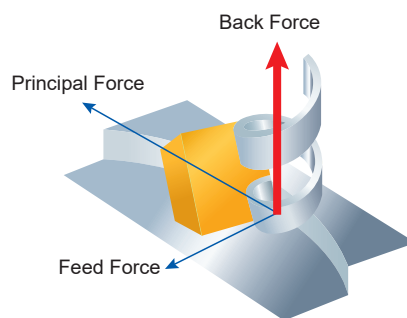
When the cutting depth is medium or higher, the rake face is in the same direction as the chip flow, achieving low cutting resistance. (4 indexing face insert)



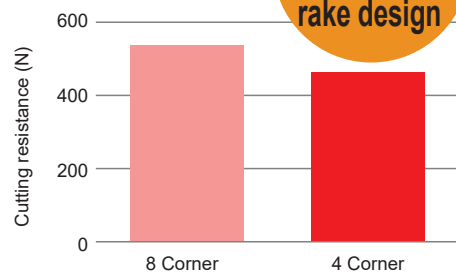
Even chip flow



Rake design of 4 indexing face insert

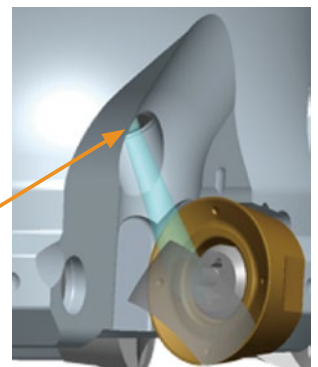
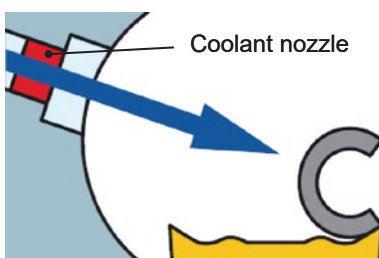


[Comparison of the back force]



Improved Chip Removal with Coolant

The internal coolant is directed slightly above the rake face of the cutting edge so that it is aimed directly at the chip. Forcibly ejecting the chips prevents them from welding to the cutting edge, enabling higher efficiency machining.



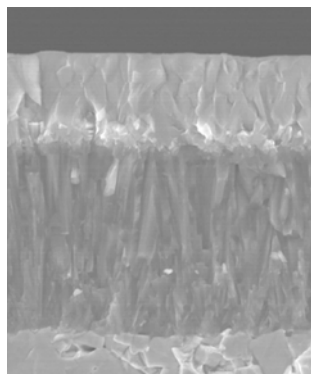
Use of the coolant nozzle discharges chips under high pressure and prevents welding of chips to the cutting edge.

CVD Coated Grade for Machining of Stainless Steels

MC7020

MC7020 has excellent wear, chipping and thermal crack resistance.

These features prevent the problems usually associated with machining stainless steel over prolonged periods.



Improved Wear Resistance

The micro-grain wear resistant Al_2O_3 and fibrous TiCN layers deliver excellent wear resistance when milling a wide range of cast irons.

Improved Fracture Resistance

Use of a specially developed cemented carbide that provides superior resistance to fracture and thermal cracking prevents the cutting edge from sudden fracturing.

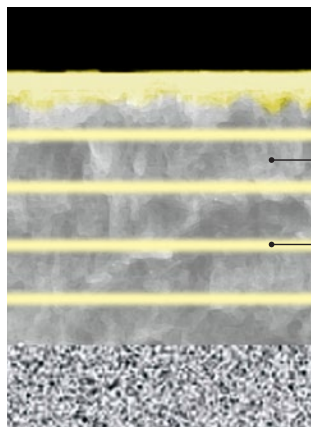
Reduced Abnormal Damage

An extremely smooth black super-smooth coating prevents abnormal damage such as weld chipping.

With Accumulated Al-Ti-Cr-N Based PVD Coating

MP7100, MP9100

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

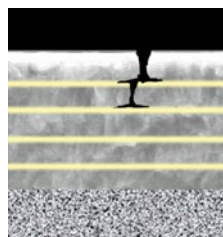


*Graphical representation.

Base Layer High Al-(Al, Ti)N

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

Each Grade Has a
Layer Suitable for Each
Application Area



*Graphical representation.

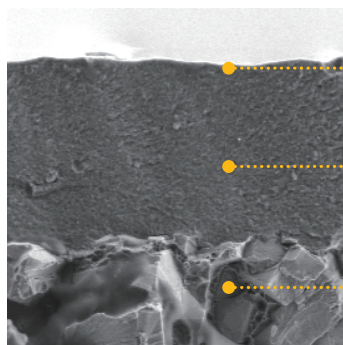
Multi-layering of the coating prevents any cracks penetrating through to the substrate.

M 	TiN	 Notching
	Tough Against Notching	
S 	CrN	 Welding by Chipping
	Tough Against Chipping	

PVD Coated Grade for Difficult-to-cut Materials

NEW MP9140

MP9140 Has Excellent Welding Resistance Due to the Smoothened Surface



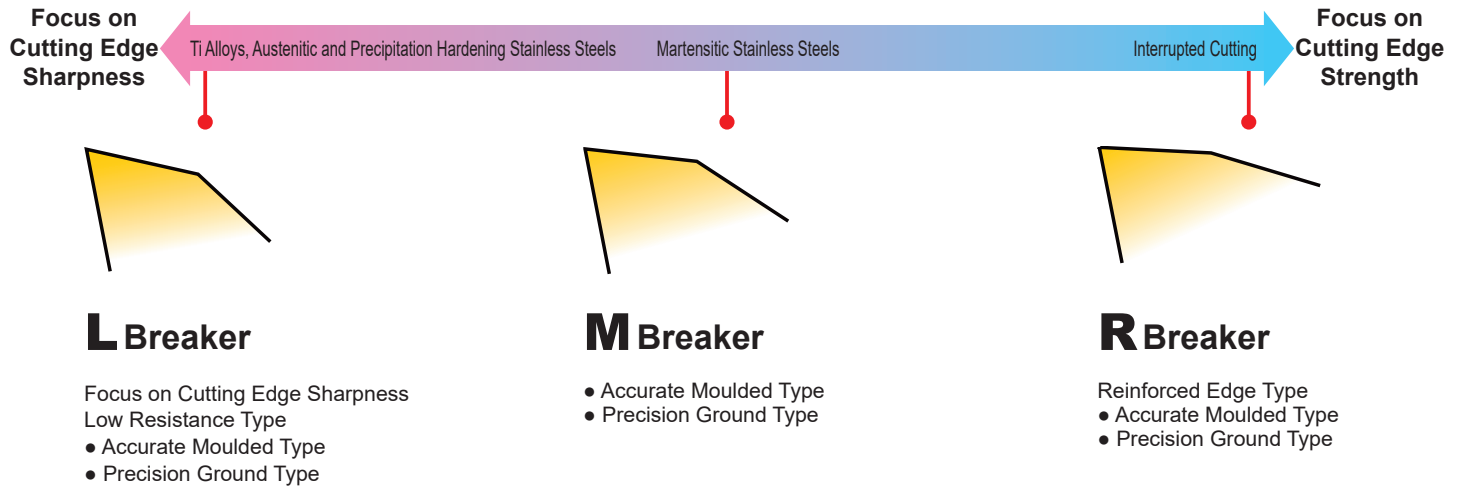
Smooth surfaces provide excellent welding resistance.

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

Special cemented carbide substrate with improved fracture resistance.

Breaker System

Breaker series for various applications



Workpiece Material	Cutting Condition		
	Light	General	Interrupted
M	L	M	R
S	L	M	R

	ISO	CVD	PVD
Stainless Steel M	10		
	20	MC7020	
	30		MP7130
	40		

	ISO	PVD
Heat Resistant Alloy • Ti Alloy S	10	
	20	MP9130
	30	
	40	MP9140

MULTI FUNCTIONAL MILLING



ARP

P M K N S H



Fig.1

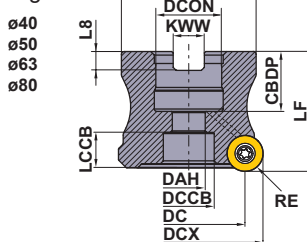
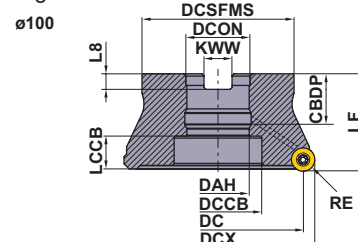


Fig.2



Right hand tool holder only.

DCX		Set Bolt	Geometry	
DCON inch size	DCON mm size			
—	φ40	HSC08025H	① ②	
—	φ50, φ63	HSC10030H		
φ80	φ80	HSC12035H		
φ100	φ100	MBA16033H		

Arbor Type

KAPR: R

GAMP: +4° GAMP: -6°

DCON=inch size, With Coolant Hole

(mm)

DCX	Order Number	Stock	RE	*1 No.T	DC	LF	DCON	WT (kg)	Max. Depth of Cut		RMPX	Fig.	Insert Type
		R							A1	AZ			
80	ARP6PR08008CA	●	6	8	68	50	25.4	0.9	2.5	2.5	2.3°	1	RPOT1248
80	ARP6PR08009CA	●	6	9	68	50	25.4	0.9	2.5	2.5	2.3°	1	RPOT1248
100	ARP6PR10009DA	●	6	9	88	50	31.75	1.4	2.5	2.5	1.7°	2	RPOT1248
100	ARP6PR10011DA	●	6	11	88	50	31.75	1.4	2.5	2.5	1.7°	2	RPOT1248

DCON=mm size, With Coolant Hole

(mm)

DCX	Order Number	Stock	RE	*1 No.T	DC	LF	DCON	WT (kg)	Max. Depth of Cut		RMPX	Fig.	Insert Type
		R							A1	AZ			
40	ARP5P-040A05AR	●	5	5	29.9	40	16	0.2	2.0	1.3	2.8°	1	RPOT1040
40	ARP6P-040A04AR	●	6	4	28	40	16	0.2	2.0	1.1	2.7°	1	RPOT1248
50	ARP5P-050A06AR	●	5	6	39.9	40	22	0.3	2.0	1.8	2.9°	1	RPOT1040
50	ARP5P-050A07AR	●	5	7	39.9	40	22	0.3	2.0	1.8	2.9°	1	RPOT1040
50	ARP6P-050A05AR	●	6	5	38	40	22	0.3	2.0	1.7	2.9°	1	RPOT1248
50	ARP6P-050A06AR	●	6	6	38	40	22	0.3	2.0	1.7	2.9°	1	RPOT1248
63	ARP5P-063A07AR	●	5	7	52.9	40	22	0.5	2.5	2.5	3.0°	1	RPOT1040
63	ARP5P-063A08AR	●	5	8	52.9	40	22	0.5	2.5	2.5	3.0°	1	RPOT1040
63	ARP6P-063A06AR	●	6	6	51	40	22	0.4	2.5	2.5	3.1°	1	RPOT1248
63	ARR6P-063A07AR	●	6	7	51	40	22	0.4	2.5	2.5	3.1°	1	RPOT1248
80	ARP6P-080A08AR	●	6	8	68	50	27	0.9	2.5	2.5	2.3°	1	RPOT1248
80	ARP6P-080A09AR	●	6	9	68	50	27	0.9	2.5	2.5	2.3°	1	RPOT1248
100	ARP6P-100B09AR	●	6	9	88	50	32	1.5	2.5	2.5	1.7°	2	RPOT1248
100	ARP6P-100B11AR	●	6	11	88	50	32	1.5	2.5	2.5	1.7°	2	RPOT1248

*1 Number of Teeth

Note 1) For the maximum width of cut (APMX), Please refer to page 9.

Dimensions and Symbols (ISO 13399 Compliance)

DCX = Cutting Diameter Maximum

RE = Corner Radius

DC = Cutting Diameter

LF = Functional Length

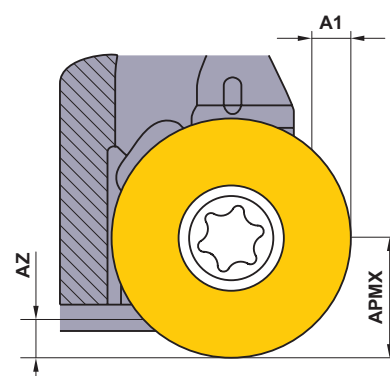
DCON = Connection Diameter

WT = Weight of Item

A1 = Max. Width of Cut in the Radius Direction

AZ = Plunge Depth Maximum

RMPX = Max.Ramping Angle



● : Inventory maintained in Japan.

Mounting Dimensions

(mm)

DCX	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
40	ARP5P-040A05AR	16	18	9	14	14.0	34	8.4	5.6	1
40	ARP6P-040A04AR	16	18	9	13.4	13.9	34	8.4	5.6	1
50	ARP5P-050A06AR	22	20	11	17	12.0	45	10.4	6.3	1
50	ARP5P-050A07AR	22	20	11	17	12.0	45	10.4	6.3	1
50	ARP6P-050A05AR	22	20	11	17	11.9	45	10.4	6.3	1
50	ARP6P-050A06AR	22	20	11	17	11.9	45	10.4	6.3	1
63	ARP5P-063A07AR	22	20	11	17	12.0	50	10.4	6.3	1
63	ARP5P-063A08AR	22	20	11	17	12.0	50	10.4	6.3	1
63	ARP6P-063A06AR	22	20	11	17	11.9	50	10.4	6.3	1
63	ARP6P-063A07AR	22	20	11	17	11.9	50	10.4	6.3	1
80	ARP6PR08008CA	25.4	26	20	13	14.9	56	9.5	6.0	1
80	ARP6PR08009CA	25.4	26	20	13	14.9	56	9.5	6.0	1
80	ARP6P-080A08AR	27	23	13	20	14.9	56	12.4	7.0	1
80	ARP6P-080A09AR	27	23	13	20	14.9	56	12.4	7.0	1
100	ARP6PR10009DA	31.75	32	31.75	45	11.9	70	12.7	8.0	2
100	ARP6PR10011DA	31.75	32	31.75	45	11.9	70	12.7	8.0	2
100	ARP6P-100B09AR	32	26	45	32	16.9	78	14.4	8.0	2
100	ARP6P-100B11AR	32	26	45	32	16.9	78	14.4	8.0	2

Spare Parts

(mm)

Tool Holder Type			
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
ARP5	TPS351B	TIP10D	MK1KS
ARP6	TPS4	TIP15D	MK1KS

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

	≤1Mpa (≤20 l/min.)	←Standard→	≥5Mpa (≥30 l/min.)	≥7Mpa (≥50 l/min.)	To Plug a Coolant Hole
Nozzle Dia.	ø0.6mm	ø0.8mm	ø1.2mm	ø1.6mm	—
Order Number	HSD04004H06	HSD04004H08	HSD04004H12	HSD04004H16	HSS04004

Note 1) Coolant nozzles are available with varying diameters for adjusting coolant pressure. Select nozzles as required by the specification.

Note 2) Use HSS04004 (JIS B 1177 flat point M4x4, clamp torque 1.5 Nm) to plug the coolant hole.

Dimensions and Symbols (ISO 13399 Compliance)

DCX = Cutting Diameter Maximum

DCON = Connection Diameter

CBDP = Connection Bore Depth

DAH = Diameter Access Hole

DCCB = Fixing Bolt Seat Diameter

LCCB = Counterbore Depth Connection Bore

DCSFMS = Contact Surface Diameter Machine Side

KWW = Keyway Width

L8 = Depth of Keyway

Round Insert Cutter for Difficult-to-cut Materials

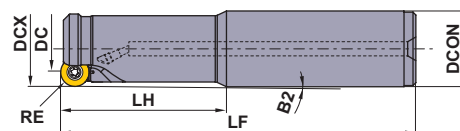


Fig.1

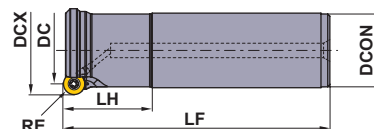


Fig.2

Arbor Type

KAPR: R
GAMP: +4° GAMP: -6°—-7°
With Coolant Hole

(mm)

DCX	Order Number	Stock	RE	*1 No.T	DC	LF	LH	DCON	B2	WT (kg)	Max. Depth of Cut		RMPX	Fig.	Insert Type
		R									A1	AZ			
25	ARP5PR2503SA25M	●	5	3	15	140	60	25	1.10°	0.4	1.0	0.40	1.8°	1	RPOT1040
25	ARP5PR2502SA25L	●	5	2	15	180	80	25	0.80°	0.6	1.0	0.40	1.8°	1	RPOT1040
32	ARP5PR3204SA32M	●	5	4	22	150	70	32	0.92°	0.8	1.0	0.65	1.9°	1	RPOT1040
32	ARP6PR3203SA32M	●	6	3	20	150	70	32	0.51°	0.8	1.0	0.60	2.0°	1	RPOT1248
32	ARP5PR3203SA32L	●	5	3	22	200	120	32	0.94°	1.0	1.0	0.65	1.9°	1	RPOT1040
32	ARP6PR3202SA32L	●	6	2	20	200	120	32	0.52°	1.0	1.0	0.60	2.0°	1	RPOT1248
40	ARP6PR4004SA32M	●	6	4	28	150	50	32	—	0.9	2.5	1.15	2.7°	2	RPOT1248
40	ARP6PR4003SA32L	●	6	3	28	250	50	32	—	1.5	2.5	1.15	2.7°	2	RPOT1248
50	ARP6PR5005SA42M	●	6	5	38	150	50	42	—	1.5	2.5	1.70	2.9°	2	RPOT1248
50	ARP6PR5004SA42L	●	6	4	38	250	50	42	—	2.5	2.5	1.70	2.9°	2	RPOT1248

*1 Number of Teeth

Note 1) For the maximum width of cut (APMX), Please refer to page 9.

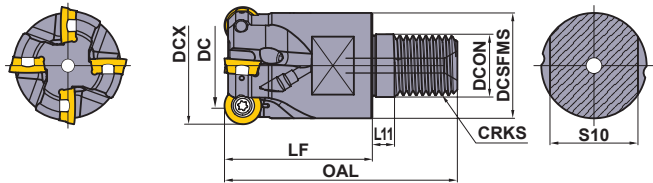
Dimensions and Symbols (ISO 13399 Compliance)

DCX = Cutting Diameter Maximum
RE = Corner Radius
DC = Cutting Diameter
LF = Functional Length

LH = Neck Length
DCON = Connection Diameter
WT = Weight of Item
A1 = Max. Width of Cut in the Radius Direction

AZ = Plunge Depth Maximum
RMPX = Max. Ramping Angle

● : Inventory maintained in Japan.



■ Screw-in Type

KAPR: R
GAMP: +4° GAMP: -6°—7°
With Coolant Hole

DCX	Order Number	Stock	RE	*1 No.T	DC	DCON	DCSFMS	OAL	LF	S10	CRKS	WT (kg)	Max. Depth of Cut		RMPX	Insert Type
		R											A1	AZ		
25	ARP5PR2502AM1235	●	5	2	15	12.5	23.5	57	35	19	M12	0.1	—	0.40	1.8°	RPOT1040
25	ARP5PR2503AM1235	●	5	3	15	12.5	23.5	57	35	19	M12	0.1	—	0.40	1.8°	RPOT1040
32	ARP5PR3203AM1640	●	5	3	22	17.0	28.5	63	40	24	M16	0.2	1.0	0.65	1.9°	RPOT1040
32	ARP5PR3204AM1640	●	5	4	22	17.0	28.5	63	40	24	M16	0.2	1.0	0.65	1.9°	RPOT1040
32	ARP6PR3202AM1640	●	6	2	20	17.0	28.5	63	40	24	M16	0.2	1.0	0.60	2.0°	RPOT1248
32	ARP6PR3203AM1640	●	6	3	20	17.0	28.5	63	40	24	M16	0.2	1.0	0.60	2.0°	RPOT1248
40	ARP6PR4003AM1640	●	6	3	28	17.0	28.5	63	40	24	M16	0.2	2.5	1.15	2.7°	RPOT1248
40	ARP6PR4004AM1640	●	6	4	28	17.0	28.5	63	40	24	M16	0.2	2.5	1.15	2.7°	RPOT1248

*1 Number of Teeth

Note 1) For the maximum width of cut (APMX), Please refer to page 9.

Spare Parts

Tool Holder Type	* (mm)		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
ARP5	TPS351B	TIP10D	MK1KS
ARP6	TPS4	TIP15D	MK1KS

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

	≤1Mpa (≤20 l/min.)	←Standard→	≥5Mpa (≥30 l/min.)	≥7Mpa (≥50 l/min.)	To Plug a Coolant Hole
Nozzle Dia.	ø0.6mm	ø0.8mm	ø1.2mm	ø1.6mm	—
Order Number	HSD04004H06	HSD04004H08	HSD04004H12	HSD04004H16	HSS04004

Note 1) Coolant nozzles are available with varying diameters for adjusting coolant pressure. Select nozzles as required by the specification.

Note 2) Use HSS04004 (JIS B 1177 flat point M4x4, clamp torque 1.5 Nm) to plug the coolant hole.

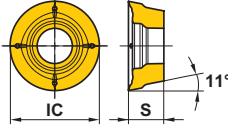
Dimensions and Symbols (ISO 13399 Compliance)

DCX = Cutting Diameter Maximum
RE = Corner Radius
DC = Cutting Diameter
DCON = Functional Length

DCSFMS = Contact Surface Diameter Machine Side
OAL = Overall Length
LF = Functional Length
CRKS = Connection Retention Knob Thread Size

WT = Weight of Item
A1 = Max. Width of Cut in the Radius Direction
AZ = Plunge Depth Maximum
RMPX = Max. Ramping Angle

Round Insert Cutter for Difficult-to-cut Materials

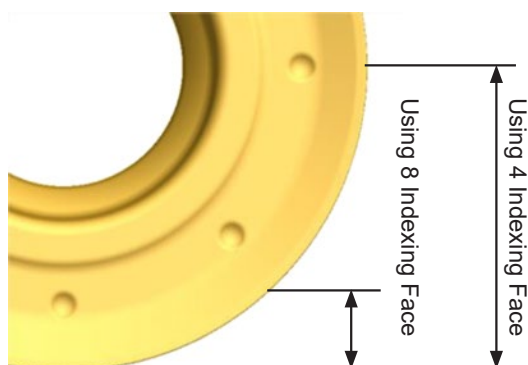
Inserts											(mm)			
Workpiece Material		M	Stainless Steels			G	G	+	Cutting Conditions (Guide) : ● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting Edge Preparation (Honing) : E : Round					
		S	Heat-resistant Alloys, Titanium Alloys											
Shape	Holder	Order Number	Type	Class	Edge Preparation	Coated				IC	S	APMX		Geometry
					MC7020	MP7130	MP9130	MP9140			4 Seats	8 Seats		
	ARP5	RPHT1040M0E4-L	Low Resistance, High Precision	H	E	●	●	●		10	3.97	5.0	—	
		RPMT1040M0E4-L	Low Resistance	M	E	●	●	●		10	3.97	5.0	—	
		NEW RPMT1040M0E8-L1	Low Resistance, 8 Seats	M	E	●	●	●	●	10	3.97	5.0	1.4	
		NEW RPMT1040M0E4-L2	Low Resistance, High Rigidity	M	E				●	10	3.97	5.0	—	
		RPHT1040M0E4-M	General, High Precision	H	E	●	●	●		10	3.97	5.0	—	
		RPMT1040M0E4-M	General Purpose	M	E	●	●	●		10	3.97	5.0	—	
		NEW RPMT1040M0E8-M1	General, 8 Seats	M	E	●	●	●	●	10	3.97	5.0	1.4	
		NEW RPMT1040M0E4-M2	General, High Rigidity	M	E				●	10	3.97	5.0	—	
		RPHT1040M0E4-R	Reinforced Edge, High Precision	H	E	●	●	●		10	3.97	5.0	—	
		RPMT1040M0E4-R	Reinforced Edge	M	E	●	●	●		10	3.97	5.0	—	
		NEW RPMT1040M0E8-R1	Reinforced Edge, 8 Seats	M	E	●	●	●		10	3.97	5.0	1.4	
	ARP6	RPHT1248M0E4-L	Low Resistance, High Precision	H	E	●	●	●		12	4.76	6.0	—	
		RPMT1248M0E4-L	Low Resistance	M	E	●	●	●		12	4.76	6.0	—	
		NEW RPMT1248M0E8-L1	Low Resistance, 8 Seats	M	E	●	●	●	●	12	4.76	6.0	1.7	
		NEW RPMT1248M0E4-L2	Low Resistance, High Rigidity	M	E				●	12	4.76	6.0	—	
		RPHT1248M0E4-M	General, High Precision	H	E	●	●	●		12	4.76	6.0	—	
		RPMT1248M0E4-M	General Purpose	M	E	●	●	●		12	4.76	6.0	—	
		NEW RPMT1248M0E8-M1	General, 8 Seats	M	E	●	●	●	●	12	4.76	6.0	1.7	
		NEW RPMT1248M0E4-M2	General, High Rigidity	M	E				●	12	4.76	6.0	—	
		RPHT1248M0E4-R	Reinforced Edge, High Precision	H	E	●	●	●		12	4.76	6.0	—	
		RPMT1248M0E4-R	Reinforced Edge	M	E	●	●	●		12	4.76	6.0	—	
		NEW RPMT1248M0E8-R1	Reinforced Edge, 8 Seats	M	E	●	●	●		12	4.76	6.0	1.7	

● = NEW

● = NEW

Depth of cut (ap) for 8 indexing face insert

8 indexing face type inserts can also be used at the same depth of cut as the 4 face type insert.



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

Recommended Cutting Conditions

■ Dry Cutting

	Workpiece Material	Preperities	Grade	vc (m/min)	fz (mm/t.)
M	Austenitic Stainless Steels	≤200HB	MC7020	220 (170—270)	0.2 (0.1—0.35)
			MP7130	200 (150—250)	0.2 (0.1—0.35)
	Austenitic Stainless Steels	>200HB	MC7020	190 (140—240)	0.2 (0.1—0.35)
			MP7130	170 (120—220)	0.2 (0.1—0.35)
	Two-phase Stainless Steels	≤280HB	MC7020	180 (130—230)	0.2 (0.1—0.35)
			MP7130	160 (110—210)	0.2 (0.1—0.35)
	Ferritic and Martensitic Stainless Steels	≤200MPa	MC7020	240 (190—290)	0.2 (0.1—0.35)
			MP7130	200 (150—250)	0.2 (0.1—0.35)
	Ferritic and Martensitic Stainless Steels	>200HB	MC7020	240 (190—290)	0.2 (0.1—0.35)
			MP7130	200 (150—250)	0.2 (0.1—0.35)
	Precipitation Hardening Stainless Steels	<450HB	MC7020	170 (120—220)	0.2 (0.1—0.35)
			MP7130	150 (100—200)	0.2 (0.1—0.35)

■ Wet Cutting

	Workpiece Material	Preperities	Grade	vc (m/min)	fz (mm/t.)
M	Austenitic Stainless Steels	≤200HB	MC7020	150 (100—200)	0.2 (0.1—0.35)
			MP7130	130 (80—180)	0.2 (0.1—0.35)
	Austenitic Stainless Steels	>200HB	MC7020	120 (70—170)	0.2 (0.1—0.35)
			MP7130	100 (80—150)	0.2 (0.1—0.35)
	Two-phase Stainless Steels	≤280HB	MC7020	120 (70—170)	0.2 (0.1—0.35)
			MP7130	100 (80—150)	0.2 (0.1—0.35)
	Ferritic and Martensitic Stainless Steels	≤200MPa	MC7020	170 (120—220)	0.2 (0.1—0.35)
			MP7130	130 (80—180)	0.2 (0.1—0.35)
	Ferritic and Martensitic Stainless Steels	>200HB	MC7020	170 (120—220)	0.2 (0.1—0.35)
			MP7130	130 (80—180)	0.2 (0.1—0.35)
	Precipitation Hardening Stainless Steels	<450HB	MC7020	110 (60—160)	0.2 (0.1—0.35)
			MP7130	90 (50—140)	0.2 (0.1—0.35)
S	Titanium Alloys	—	MP9130	45(30—55)	0.1(0.05—0.15)
			MP9140	40(30—50)	0.1(0.05—0.15)
	Heat Resistant Alloys	—	MP9130	35(15—45)	0.1(0.05—0.15)
			MP9140	30(15—40)	0.1(0.05—0.15)

* 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 machining.

* The standard feed per tooth setting for the ARP5 is set at $a_p = 2.5$ mm. For the ARP6, it is set at $a_p = 3$ mm. The feed (fz) can be adjusted by multiplying by the correction ratio value shown in the table below. E.g. Feed recommended when using ARP5, SUS304, MP7130, $a_p = 1$ is 0.2 mm (fz) multiplied by 1.5 (correction ratio F) = 0.3 mm (fz).

* On workpiece entry, reduce the feed by 70%. For ramping, drilling and plunging, reduce by 50%.

* Using the Internal coolant nozzle is recommended for titanium alloy and heat resistant alloy machining.

■ CORRECTION RATIO (F) BASED ON THE (AP) AXIAL CUTTING DEPTH Correction Ratio (F) based on the (ap) axial cutting depth

Holder	$a_p=0.5$ mm	$a_p=1$ mm	$a_p=1.5$ mm	$a_p=2$ mm	$a_p=2.5$ mm	$a_p=3$ mm	$a_p=3.5$ mm	$a_p=4$ mm	$a_p=5$ mm	$a_p=6$ 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

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

Round Insert Cutter for Difficult-to-cut Materials

Depth of Cut and Width of Cut

(mm)

Install Type	DCX	RE	Order Number	No. of Teeth	When using 4 indexing face insert	
					Depth of Cut ap	Width of Cut ae
Arbor	40	5	ARP5P-040A05AR	5	≤2.5	≤1.0DCX
		6	ARP6P-040A04AR	4	≤3.5	≤1.0DCX
	50	5	ARP5P-050A06AR	6	≤2.5	≤1.0DCX
			ARP5P-050A07AR	7	≤1.5	≤1.0DCX
		6	ARP6P-050A05AR	5	≤3.5	≤1.0DCX
			ARP6P-050A06AR	6	≤2.5	≤1.0DCX
	63	5	ARP5P-063A07AR	7	≤2.5	≤0.75DCX
			ARP5P-063A08AR	8	≤1.5	≤0.75DCX
		6	ARP6P-063A06AR	6	≤3.5	≤0.75DCX
			ARP6P-063A07AR	7	≤2.5	≤0.75DCX
	80	6	ARP6PR08008CA	8	≤3.5	≤0.6DCX
			ARP6PR08009CA	9	≤2.5	≤0.6DCX
	100	6	ARP6PR10009DA	9	≤3.5	≤0.5DCX
			ARP6PR10011DA	11	≤2.5	≤0.5DCX
Screw-in	25	5	ARP5PR2502AM1235	2	≤2.5	≤1.0DCX
			ARP5PR2503AM1235	3	≤1.5	≤1.0DCX
	32	5	ARP5PR3203AM1640	3	≤2.5	≤1.0DCX
			ARP5PR3204AM1640	4	≤2.5	≤1.0DCX
		6	ARP6PR3202AM1640	2	≤3.5	≤1.0DCX
			ARP6PR3203AM1640	3	≤3.5	≤1.0DCX
	40	6	ARP6PR4003AM1640	3	≤3.5	≤1.0DCX
			ARP6PR4004AM1640	4	≤3.5	≤1.0DCX

(mm)

Install Type	DCX	RE	Tool Holder Type	When using 4 indexing face insert	
				Depth of Cut ap	Width of Cut ae
Shank	25	5	ARP5PR25	≤1.5	≤1.0DCX
	32	5	ARP5PR32	≤2.5	≤1.0DCX
		6	ARP6PR32	≤3.5	≤1.0DCX
	40	6	ARP6PR40	≤3.5	≤1.0DCX
	50	6	ARP6PR50	≤3.5	≤1.0DCX

Maximum Capacities for Each Type

(mm)

Install Type	DCX	RE	Tool Holder Type	Ramping	Helical Drilling		Drilling Depth	Plunging
				RMPX	DH max.	DH min.	Maximum AZ	AE1
Arbor	40	5	ARP5P-040A	2.8°	70	78	1.30	2.0
		6	ARP6P-040A	2.7°	68	78	1.15	2.0
	50	5	ARP5P-050A	2.9°	90	98	1.85	2.0
		6	ARP6P-050A	2.9°	88	98	1.70	2.0
	63	5	ARP5P-063A	3.0°	116	124	2.50	2.5
		6	ARP6P-063A	3.1°	114	124	2.50	2.5
	80	6	ARP6PR080	2.3°	148	158	2.50	2.5
	100	6	ARP6PR100	1.7°	188	198	2.50	2.5
Shank	25	5	ARP5PR25	1.8°	40	48	0.40	1.0
	32	5	ARP5PR32	1.9°	54	62	0.65	1.0
		6	ARP6PR32	2.0°	52	62	0.60	1.0
	40	6	ARP6PR40	2.7°	68	78	1.15	2.5
	50	6	ARP6PR50	2.9°	88	98	1.70	2.5
Screw-in	25	5	ARP5PR25	1.8°	40	48	0.40	-
	32	5	ARP5PR32	1.9°	54	62	0.65	1.0
		6	ARP6PR32	2.0°	52	62	0.60	1.0
	40	6	ARP6PR40	2.7°	68	78	1.15	2.5

Note 1) When drilling long chips may be generated.

Note 2) When cutting helical holes, do not exceed the largest APMX cutting depth per rotation.

Note 3) Calculate using the following formula for center tool tracks and ϕ_{dc} when cutting helical holes: Center tool tracks ϕ_{dc} =desired hole diameter ϕ_{DH} tool diameter ϕ_{DCX}

Note 4) Use of air blow to disperse chips effectively is strongly recommended.

Note 5) Insert pockets are small in fine pitch and small diameter cutters therefore care should be taken to avoid chip jamming. Regulate the feed and speed accordingly.

Note 6) When machining with a large diameter cutter at high feed rates, chip jamming may occur. Regulate the feed and speed accordingly.

Advice for High Efficiency Machining

Fine and super fine pitch cutters improve efficiency by 10-20% when compared to a regular pitch type.

■ Comparison of Number of Teeth in the Arbor Type

DCX	ARP5		ARP6	
	Fine Pitch	Extra Fine Pitch	Fine Pitch	Extra Fine Pitch
40	5		4	
42	5	6		
50	6	7	5	6
63	7	8	6	7
80			8	9
100			9	11

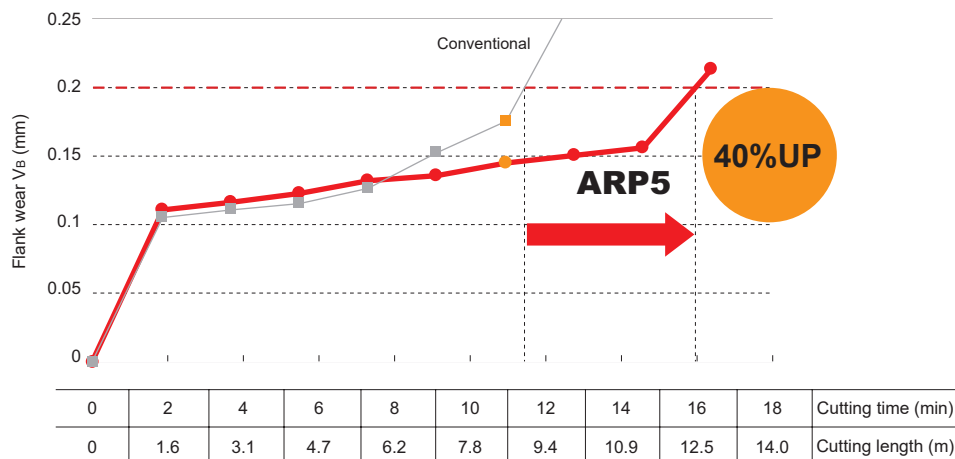
(mm)

Efficiency
10-20%
UP

Cutting Performance

JIS SUS420J1 Wear Resistance Comparison

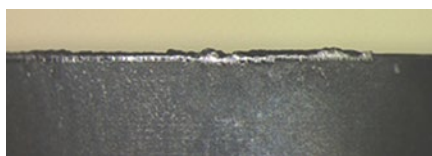
Tool life increased by at least 40% compared to conventional cutters.



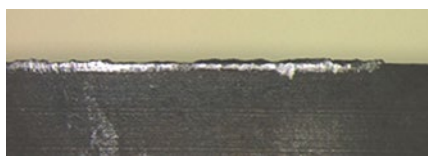
<Cutting Conditions>

Workpiece Material : JIS SUS420J1
 Cutter Dia. : DCX=ø50
 Insert : RPHT1040M0E4-R
 Grade : MC7020
 Cutting Speed : $v_c = 350$ m/min
 Feed per Tooth : $f_z = 0.35$ mm/t.
 Depth of Cut : $a_p = 2.5$ mm
 Width of Cut : $a_e = 25$ mm
 Cutting Mode : Dry Cutting
 Single insert

Cutting Length 8.4m



ARP5 ($V_b=0.141$)



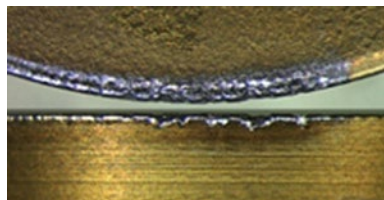
Conventional ($V_b=0.172$)

JIS SUS630 Chipping Resistance Comparison

Stable tool life achieved when machining precipitation hardening stainless steel.

Cutting Length 0.4m

ARP5



$V_b=0.140$ Minute chipping

Conventional A



$V_b=0.358$ Large chipping

Conventional B



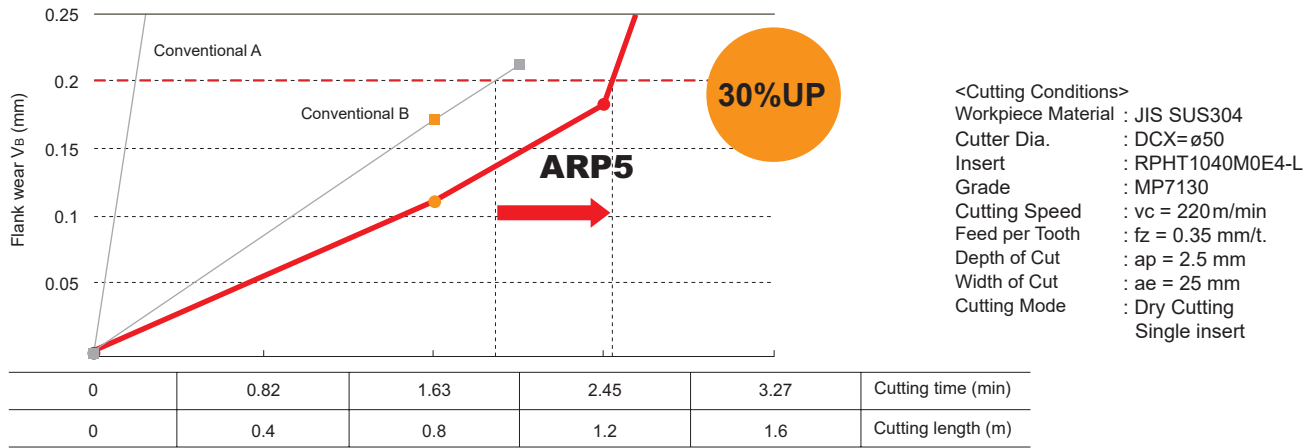
$V_b=0.172$ Chipping

<Cutting Conditions>

Workpiece Material : JIS SUS630
 Cutter Dia. : DCX=ø50
 Insert : RPHT1040M0E4-L
 Grade : MP7130
 Cutting Speed : $v_c = 350$ m/min
 Feed per Tooth : $f_z = 0.25$ mm/t.
 Depth of Cut : $a_p = 2.5$ mm
 Width of Cut : $a_e = 14$ mm
 Cutting Mode : Dry Cutting
 Single insert

JIS SUS304 Wear Resistance Comparison

Tool life increased by 30%.



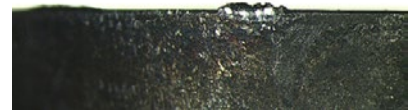
Cutting Length 0.8m



ARP5 (VB=0.112)



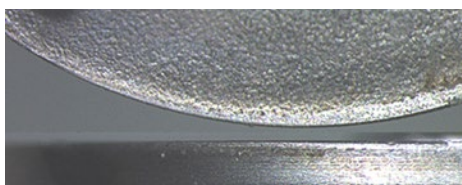
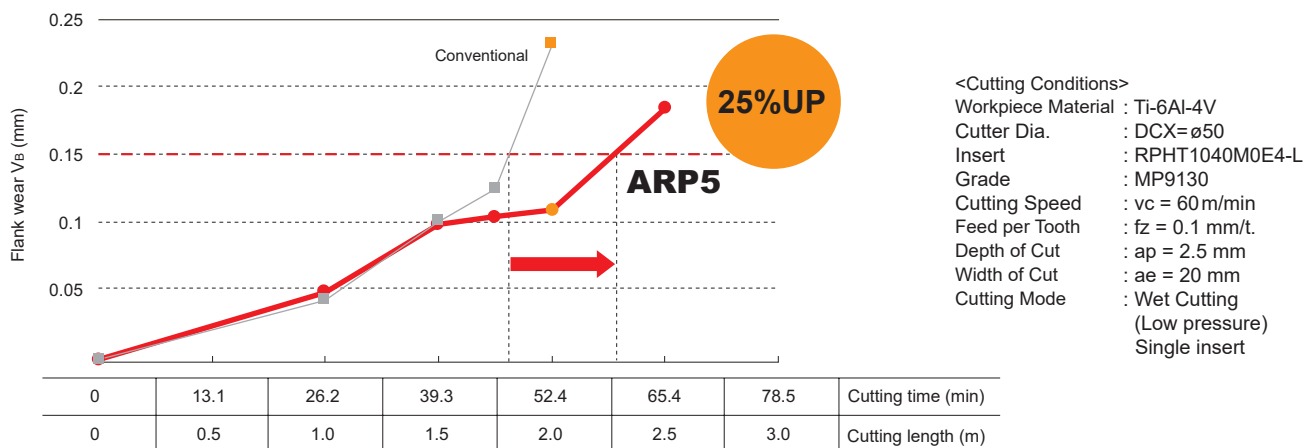
Conventional A (VB=1.608)



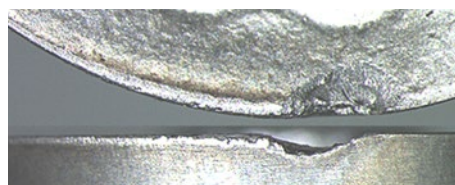
Conventional B (VB=0.171)

Ti-6Al-4V Wear Resistance Comparison

25% increase in tool life.



ARP5 (VB=0.110)



Conventional (VB=0.231)

Cutting Length 2.0m

Application Examples

Cutter Body		ARP6P-050A05AR	ARP6P-050A06AR	ARP6P-050A06AR
Insert (Grade)		RPHT1248M0E4-M (MC7020)	RPMT1248M0E4-R (MP7130)	RPMT1248M0E4-L (MP7130)
Workpiece		SUS403	Martensitic Stainless Steel	Martensitic Stainless Steel
				
Component		Power Generator Parts	Power Generator Parts	Aerospace Parts
Cutting Conditions	Cutting Speed vc (m/min)	283	250	200
	Feed per Tooth fz (mm/t.)	0.25	0.45	0.25
	Depth of Cut ap (mm)	3	2.5	1
	With of Cut ae (mm)	30	40	20
Cutting Mode		Air blow	M. Q. L.	Wet
Results		Further machining still possible after completing double the normal cutting length.	Machining efficiency increased by 20% and insert life by 30%.	Successfully completed component with improved cutting conditions and some tool life remaining. Cycle time reduced by 47%.

The applications examples above may differ from the recommended cutting conditions.

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.

MITSUBISHI MATERIALS CORPORATION

MMC HARDMETAL INDIA PVT LTD

Head Office

Prasad Enclave, #118/119, 1st Floor, 2nd Stage BBMP Ward #11,
(New #38), Industrial Suburb, Yeshwanthpura, Bengaluru-560 022
Karnataka, India, Tel : +91 80 2204 3600
E-mail : mb-mmci@mmc.co.jp

REGIONAL OFFICES:

Pune Office

Plot No, A-27 & A-28, H-Block,
Pimpri Waghere, Pimpri Industrial Area MIDC,
Pune - 411018, Maharashtra, India
Tel :: +91 020-27456959

Gurgaon Office

#407, 4th Floor, JMD Galleria, Sohna Road,
Opposite Malibu Town, Sector-48,
Gurgaon-122 001 Haryana, India.
Tel : +91 124 4089163

Chennai Office

MM Complex, 2nd Floor, Part 30/10 Hopman 2nd Street,
100 Feet Main Road, Alandur,
Chennai - 600 016 Tamilnadu, India.
Tel: +91 44 4550 7006

Ahmedabad Office

210, Sigma Arcade, 2nd Floor, Visat Circle,
Ahmedabad-Mehsana Road, Chandkheda,
Ahmedabad - 382 424, Gujarat, India.
Tel : +91 79 2329 9300

<http://www.mitsubishicarbide.com/en/>
(Tools specifications subject to change without notice.)