

***RV** type*

Radius Mill RV

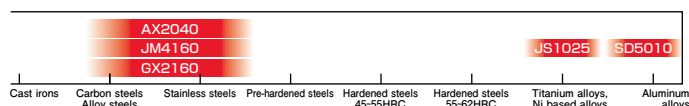


MOLDINO Tool Engineering, Ltd.

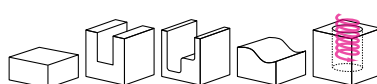
New Product News | No.1224E-11 | 2023-3

Achieves high-speed, high-performance cutting of stainless steel materials.

For turbine blade cutting.



Applications



Features

01

Lineup of breakers and coating materials suitable for difficult to cut materials

- 3 types of breakers are available for cutting stainless steels, titanium alloys, Ni based alloys, and aluminum alloys.

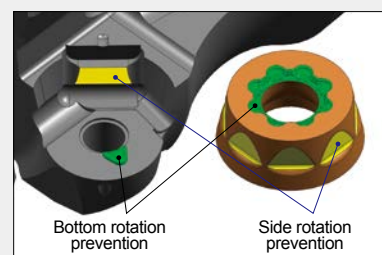
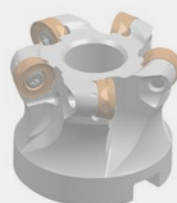
	Sharp-edge A8 Type	Easy cutting breaker B8 Type	Strong edge breaker C8 Type
Insert cross section			
Grade	JM4160	Stainless steels (Wet cutting)	
	AX2040 GX2160	Stainless steels (Dry cutting)	
	JS1025	Titanium alloys, Ni based alloys	—
	SD5010	Aluminum alloys	—

Features

02

We developed an original rotation-prevention mechanism to achieve secure indexing of inserts.

- Secure insert indexing is achieved with rotation-prevention mechanism in 2 locations.
- Improved attaching operability enables reliable error prevention.



AX2040 Features

C4t 4th generation CVD Coating

Welding Resistance

Applies an aluminum nitride layer with crystalline structure for excellent welding resistance.

Heat Resistance

New layer with high Al content suppresses the progression of heat cracking that occurs in dry high-speed cutting.

Toughness

New layer with new structure having high chipping resistance achieves long life.

Crater Resistance

Applies an aluminum titanium nitride layer with columnar structure for excellent crater wear resistance in dry high-speed cutting.

JM4160 Features

- Employs a carbide substrate with "AJ Coating", high toughness and chipping resistance.

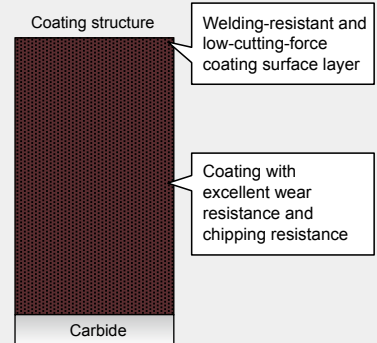
Features

- Employs a carbide substrate with high toughness and the new "AJ Coating" to improve wear resistance and chipping resistance when machining stainless steel materials.
- Employs AJ Coating with excellent welding resistance to reduce the welding of work material that occurs when machining stainless steel materials.

Function

- Improved adhesion and optimized coating structure improve the chipping resistance and results long tool life in the wet-cutting of stainless steel materials.

Layer structure AJ Coating



GX2160 Features

- Adopt smooth α alumina layer with excellent heat resistance and CVD coating with excellent wear resistance.

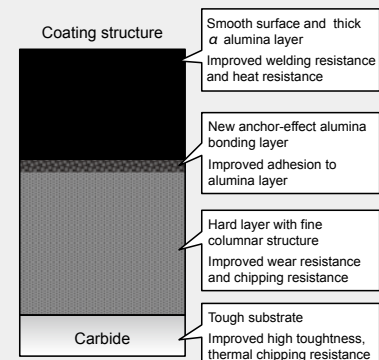
Features

- Increasing the fineness of the membrane's columnar structure improves wear resistance.

Function

- Adopt CVD Coating with excellent heat resistance improves wear resistance and provides long life when dry-cutting stainless steel materials.

Layer structure GX Coating

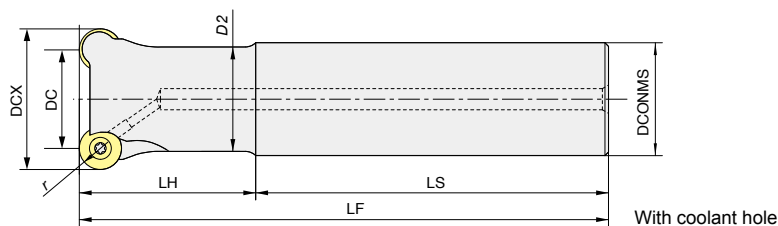


Line Up

Straight shank type

RV○S○○○R-○

Numeric figure in a circle ○ and alphabetical character comes in a square □.

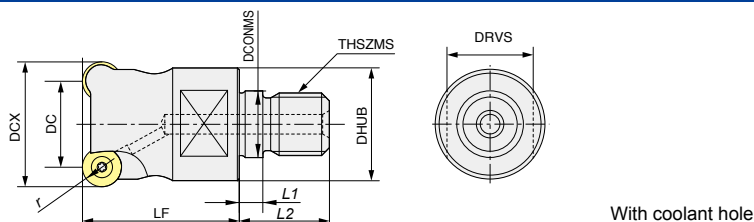


Item code		Stock	No. of flutes	Size(mm)								Inserts	
				r	DCX	DC	LF	DCONMS	LH	LS	D2		
Shank type	RV3S025R-3	●	3	5	25	15	140	25	60	80	21	RP□T10T3M0□N-○□	
	RV3S032R-4	●	4	5	32	22	150	32	70	80	28		
	RV3S040R-5	●	5	5	40	30	150	32	70	80	30		
	RV4S032R-3	●	3	6	32	20	150	32	70	80	28	RP□T1204M0□N-○□	
	RV4S040R-3	●	3	6	40	28	150	32	50	100	29.6		
	RV4S040R-4	●	4	6	40	28	150	32	50	100	29.6		

Modular Type

RV○M○○○R-○

Numeric figure in a circle ○ and alphabetical character comes in a square □.



Item code		Stock	No. of flutes	Size(mm)										Inserts	
				r	DCX	DC	LF	DCONMS	THSZMS	DHUB	L1	L2	DRVS		
Modular type	RV3M025R-3	●	3	5	25	15	35	12.5	M12	20.8	5.5	22	17	RP□T10T3M0□N-○□	
	RV3M032R-4	●	4	5	32	22	40	17	M16	28.8	6	23	22		
	※RV3M040R-5	●	5	5	40	30	40	17	M16	28.8	6	23	22		
	RV4M032R-3	●	3	6	32	20	40	17	M16	28.8	6	23	22	RP□T1204M0□N-○□	
	※RV4M040R-3	●	3	6	40	28	40	17	M16	28.8	6	23	22		
	※RV4M040R-4	●	4	6	40	28	40	17	M16	28.8	6	23	22		

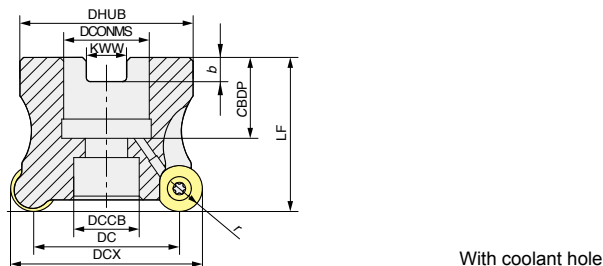
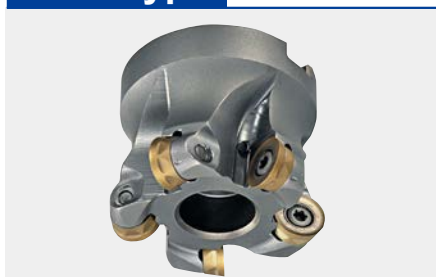
[Note] When ※ and carbide shank are used together as a set, there is no interference.

Do not apply lubricants such as grease, etc. to the "contact faces" and "modular screws" of the "modular mill", "dedicated shanks" and "dedicated arbor".

Bore type

RV○B○○○R-○/RV○B○○○RM-○

Numeric figure in a circle ○ and alphabetical character comes in a square □.

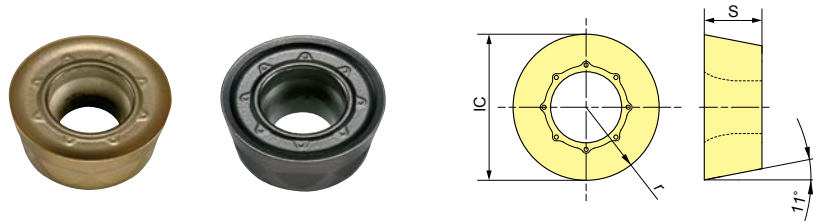


Item code		Stock	No. of flutes	Size(mm)										Inserts	
				r	DCX	DC	DHUB	LF	DCONMS	DCCB	KWW	b	CBDP		
Internal diameter inch size	RV4B050R-5	●	5	6	50	38	45	40	22.225	17	8.4	5	19	RP-ET1204M00N-30	
	RV4B063R-6	●	6	6	63	51	58	40	22.225	17	8.4	5	19		
	RV4B080R-7	●	7	6	80	68	76	63	31.75	26	12.7	8	32		
Internal diameter mm size	RV3B040RM-5	●	5	5	40	30	35	40	16	13.2	8.4	5.6	19	RP-ET10T3M00N-30	
	RV3B042RM-5	●	5	5	42	32	35	40	16	13.2	8.4	5.6	19		
	RV4B040RM-4	●	4	6	40	28	35	40	16	13.2	8.4	5.6	19		
	RV4B042RM-4	●	4	6	42	30	35	40	16	13.2	8.4	5.6	19	RP-ET1204M00N-30	
	RV4B050RM-5	●	5	6	50	38	45	40	22	17	10.4	6.3	20		
	RV4B063RM-6	●	6	6	63	51	58	40	22	17	10.4	6.3	20		
	RV4B080RM-7	●	7	6	80	68	76	50	27	20	12.4	7	22		

[Note] Arbor screw is not included.

● : Stocked Items. — Mark : Not manufactured.

Inserts

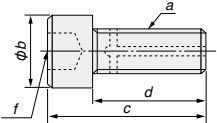
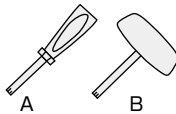


M	Stainless steels		■ (Dry)	■ (Wet)	■ (Dry)				
N	Aluminum alloys						■		■ General cutting
S	Titanium alloys					■			
Item code	Tolerance class	AX Coating	AJ Coating	GX Coating	JS Coating	SD Coating	Size(mm)		
		AX2040	JM4160	GX2160	JS1025	SD5010	r	IC	S
RPET10T3M0FN-A8	E	-	-	-	●	●	5	10	3.97
RPMT10T3M0EN-B8	M	●	●	●	-	-			
RPMT10T3M0EN-C8		●	●	●	-	-			
RPHT10T3M0EN-B8	H	●	●	●	●	-			
RPHT10T3M0EN-C8		●	●	●	-	-			
RPET1204M0FN-A8	E	-	-	-	●	●	6	12	4.76
RPMT1204M0EN-B8	M	●	●	●	-	-			
RPMT1204M0EN-C8		●	●	●	-	-			
RPHT1204M0EN-B8	H	●	●	●	●	-			
RPHT1204M0EN-C8		●	●	●	-	-			

[Note] Please note that the AX Coating, GX Coating and JS Coating do not cause a reaction in conductive touch sensors.

Parts

Numeric figure in a circle ○.

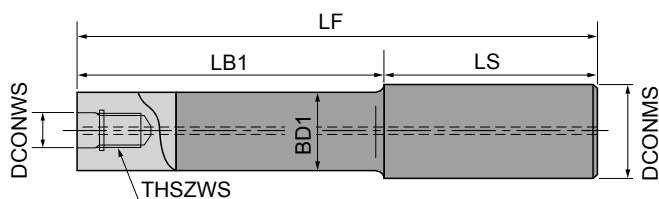
Parts		Clamp screw		Arbor screw※2							Screw driver / Wrench		Screw anti-seizure agent
Shape													
				Fastening torque (N·m)	Item code	a	φb	c	d	f			Shape
Cutter body													
Shank	RV3S0○○R-○	265-141	2.0	—	—	—	—	—	—	104-T10	A	P-37	
	RV4S0○○R-○	262-142	2.9	—	—	—	—	—	—	104-T15	A		
Modular	RV3M0○○R-○	265-141	2.0	—	—	—	—	—	—	104-T10	A		
	RV4M0○○R-○	262-142	2.9	—	—	—	—	—	—	104-T15	A		
Bore inch size	RV4B050R-5	262-142	2.9	100-178	M10×1.5	16	35	25	8	105-T15	B		
	RV4B063R-6	262-142	2.9	100-180※1	M16×2.0	24	51	35	14				
	RV4B080R-7	262-142	2.9	100-183	M8×1.25	13	33	25	6	104-T10	A		
Bore mm size	RV3B0○○R-○	265-141	2.0	100-183	M8×1.25	13	33	25	6	105-T15	B		
	RV4B040RM-4	262-142	2.9	100-183	M8×1.25	13	33	25	6				
	RV4B042RM-4	262-142	2.9	100-183	M8×1.25	13	33	25	6				
	RV4B050RM-5	262-142	2.9	100-178	M10×1.5	16	35	25	8				
	RV4B063RM-6	262-142	2.9	100-178	M10×1.5	16	35	25	8				
	RV4B080RM-7	262-142	2.9	100-179※1	M12×1.75	18	42	30	10				

※1 Part size for arbor screw for Ø80 is different due to inlay size. ※2 When supplying air or cutting oil to each cutting flute, please use this arbor screw.

[Note] The clamp screw is a consumable part. Since replacement life depends on the use environment, it is recommended that it be replaced at an early stage. Includes one spare clamp screw. Even with the screws included with the arbor, the arbor can be used as it is for center through.

The Shanks for Modular Mill

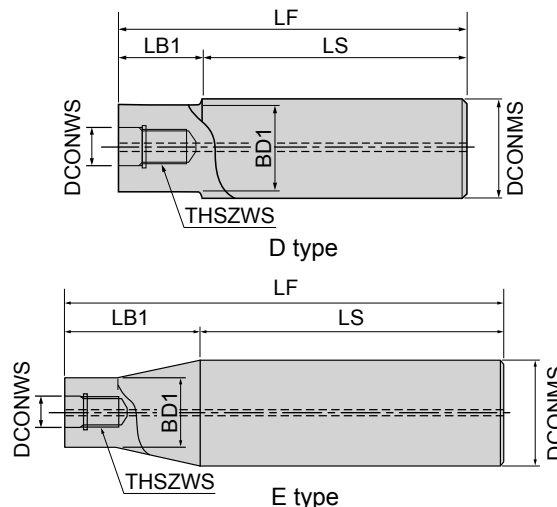
Carbide Shank



Item code	Stock	Size (mm)							Cutter body	With/without air hole
		DCONWS	THSZWS	LF	LB1	LS	BD1	DCONMS		
ASC25-12.5-145-65	●	12.5	M12	145	65	80	23	25	φ25 ^{※1}	○
ASC25-12.5-215-115	●			215	115	100				
ASC25-12.5-265-145	●			265	145	120				
ASC25-12.5-315-195	●	12.5	M12	315	195	120	23	25	φ25 ^{※1}	○
ASC25-12.5-265-65	●			265	65	200				
ASC25-12.5-315-65	●			315		250				
ASC32-17-160-80	●	17	M16	160	80	80	28	32	φ32 ^{※1} <φ40>	○
ASC32-17-210-110	●			210	110	100				
ASC32-17-260-140	●			260	140	120				
ASC32-17-310-190	●			310	190	120				
ASC32-17-360-240	●	17	M16	360	240	120	28	32	φ32 ^{※1} <φ40>	○
ASC32-17-260-80	●			260		180				
ASC32-17-310-80	●			310	80	230				
ASC32-17-360-80	●			360		280				

[Note] ① Commercial milling chucks or shrink-fit holders can be used.
 ② For the φ40 size, it is recommended that the overhang be 200mm or less.
 ③ For ※1, since the cutter diameter is smaller than the shank diameter, interference occurs at the shank.

Steel Shank



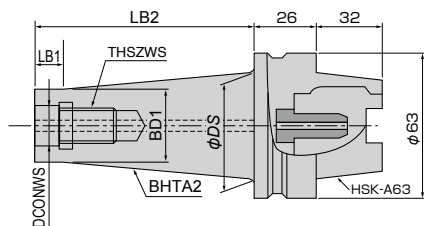
※For neck section or total length, additional machining to user specifications is possible.

Item code	Stock	Size (mm)							Type	Cutter body	With/without air hole
		DCONWS	THSZWS	LF	LB1	LS	BD1	DCONMS			
AS25-12.5-115-35	●	12.5	M12	115	35	80	23	25	D	φ25 ^{※1}	○
AS32-17-110-30	●	17	M16	110	30	80	28	32	D	φ32 ^{※1} φ40	○
AS42-17-360-90	●	17	M16	360	90	270	28	42	E	φ32 ^{※1} φ40 ^{※1}	○

[Note] ① Commercial milling chucks can be used.
 ② For ※1, since the cutter diameter is smaller than the shank diameter, interference occurs at the shank.

Modular Mill Arbor

HSK

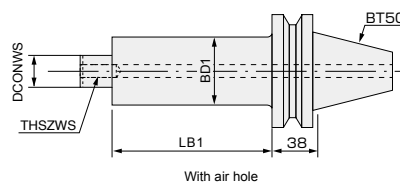


Item code	Stock	Size (mm)							With/without air hole
		DCONWS	THSZWS	BD1	φDS	LB2	LB1	BHTA2	
HSK-A63-12.5-35-21	●	12.5	M12	21	24.3	35	-	3°	○
HSK-A63-12.5-65-21	●				27.5	65	10	3°	
HSK-A63-12.5-65-21S	●				48	65	10	12°	
HSK-A63-12.5-115-21	●	17	M16	28	32.7	115	10	3°	○
HSK-A63-17-40-28	●				31.8	40	-	3°	
HSK-A63-17-60-28	●				33.9	60	10	3°	
HSK-A63-17-60-28S	●				48	60	10	9.5°	
HSK-A63-17-110-28	●				39.2	110	10	3°	

[Note] Coolant Pipe is attached.

Bore Type Arbor

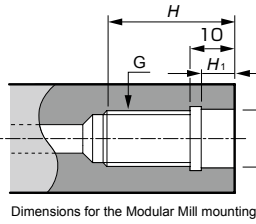
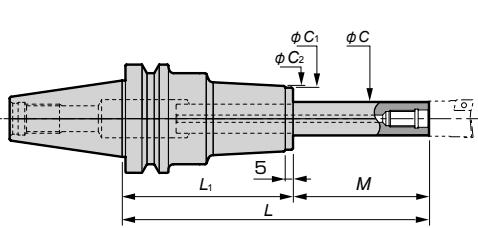
Arbor



Item code	Stock	Size (mm)				Weight (kgf)	Arbor screw	Cutter body
		DCONWS	THSZWS	LB1	BD1			
BT50-22.225-50-50	●	22.225	M10	50	47	4.3	100-174	RV4B050R-5
BT50-22.225-100-50	●			100		5.0		
BT50-22.225-150-50	●			150		5.7		
BT50-22.225-200-50	●			200		6.4		
BT50-22.225-250-50	●			250		7.1		
BT50-22.225-50-63	●	22.225	M10	50	60	4.8	100-174	RV4B063R-6
BT50-22.225-100-63	●			100		5.9		
BT50-22.225-150-63	●			150		7.0		
BT50-22.225-200-63	●			200		8.1		
BT50-22.225-250-63	●			250		9.3		
BT50-22.225-350-63	●			350		11.5		
BT50-31.75-80-80	●	31.75	M16	80	76	6.8	100-213	RV4B080R-7
BT50-31.75-130-80	●			130		8.5		
BT50-31.75-180-80	●			180		10.2		
BT50-31.75-260-80	●			260		12.9		
BT50-31.75-330-80	●			330		15.4		

[Note] The arbor screw for clamping a cutter is attached on an arbor, not to cutter bodies. In addition, since the included screw is for center-through use, when supplying air or cutting fluid to each individual flute, arbor screws (sold separately) are necessary.

Red screw arbor



Dimensions for the Modular Mill mounting

Caution

- Some of the indexable end mills cannot be attached to the RED screw arbor. Please check your indexable end mills for conformance to the dimensions, or please contact MOLDINO Tool Engineering, Ltd.
- Because cutting resistance is greater than the tool holder connection force associated with the machine spindle, please reduce the recommended cutting conditions by 50% for the RED screw arbors marked with ※. Otherwise, the tool holder shank may experience fretting corrosion or fall out of the machine spindle.

Item code	Stock	Size(mm)										Weight (kg)	Rigidity value (μm)
		G	φD	H	H ₁	φC	L	M	L ₁	φC ₁	φC ₂		
BT40-RSG12-125-M25							125		100			2.0	0.3
BT40-RSG12-155-M25							155	25	130			2.4	0.4
BT40-RSG12-185-M25							185		160			2.7	0.5
BT40-RSG12-150-M50							150		100			2.1	0.5
BT40-RSG12-180-M50							180	50	130			2.5	0.7
BT40-RSG12-210-M50							210		160			2.8	0.9
BT40-RSG12-175-M75							175		100			2.3	0.9
BT40-RSG12-205-M75							205	75	130			2.7	1.1
BT40-RSG12-235-M75							235		160			3.0	1.3
BT40-RSG12-200-M100							200		100			2.4	1.4
BT40-RSG12-230-M100							230	100	130			2.8	1.6
BT40-RSG12-260-M100							260		160			3.1	1.9
BT40-RSG12-225-M125							225		100			2.6	2.1
BT40-RSG12-255-M125							255	125	130			3.0	2.4
BT40-RSG12-285-M125							285		160			3.3	2.8
BT40-RSG16-125-M25							125	25				2.6	0.2
BT40-RSG16-150-M50							150	50				2.8	0.3
BT40-RSG16-175-M75							175	75	100	52	54	3.0	0.5
BT40-RSG16-200-M100							200	100				3.2	0.8
BT40-RSG16-225-M125 ※							225	125				3.4	1.2
BT50-RSG12-140-M25							140		115			4.6	0.2
BT50-RSG12-170-M25							170	25	145			5.0	0.3
BT50-RSG12-200-M25							200		175			5.8	0.4
BT50-RSG12-165-M50							165		115			4.7	0.5
BT50-RSG12-195-M50							195	50	145			5.1	0.6
BT50-RSG12-225-M50							225		175			5.9	0.6
BT50-RSG12-190-M75							190		115			4.9	0.8
BT50-RSG12-220-M75							220	75	145			5.3	1.0
BT50-RSG12-250-M75							250		175			6.1	1.0
BT50-RSG12-215-M100							215		115			5.0	1.3
BT50-RSG12-245-M100							245	100	145	43	45	5.4	1.5
BT50-RSG12-275-M100							275		175			6.2	1.6
BT50-RSG12-240-M125							240		115			5.2	2.1
BT50-RSG12-270-M125							270	125	145			5.6	2.3
BT50-RSG12-300-M125							300		175			6.4	2.4
BT50-RSG12-265-M150							265		115			5.3	3.0
BT50-RSG12-295-M150							295	150	145			5.7	3.3
BT50-RSG12-325-M150							325		175			6.5	3.4
BT50-RSG12-290-M175							290		115			5.5	4.2
BT50-RSG12-320-M175							320	175	145			5.9	4.6
BT50-RSG12-350-M175							350		175			6.7	4.6
BT50-RSG16-140-M25							140		115			4.8	0.2
BT50-RSG16-170-M25							170	25	145			5.4	0.2
BT50-RSG16-200-M25							200		175			6.6	0.2
BT50-RSG16-165-M50							165		115			5.0	0.3
BT50-RSG16-195-M50							195	50	145			5.6	0.4
BT50-RSG16-225-M50							225		175			6.8	0.4
BT50-RSG16-190-M75							190		115			5.3	0.5
BT50-RSG16-220-M75							220	75	145			5.9	0.6
BT50-RSG16-250-M75							250		175			7.0	0.6
BT50-RSG16-215-M100							215		115			5.5	0.7
BT50-RSG16-245-M100							245	100	145			6.1	0.9
BT50-RSG16-275-M100							275		175			7.2	0.9
BT50-RSG16-240-M125							240		115			5.7	1.1
BT50-RSG16-270-M125							270	125	145	52	54	6.3	1.3
BT50-RSG16-300-M125							300		175			7.4	1.3
BT50-RSG16-265-M150							265		115			5.9	1.6
BT50-RSG16-295-M150							295	150	145			6.5	1.8
BT50-RSG16-325-M150							325		175			7.7	1.8
BT50-RSG16-290-M175							290		115			6.1	2.2
BT50-RSG16-320-M175							320	175	145			6.7	2.4
BT50-RSG16-350-M175							350		175			7.9	2.5
BT50-RSG16-315-M200							315		115			6.3	3.0
BT50-RSG16-345-M200							345	200	145			6.9	3.2
BT50-RSG16-375-M200							375		175			8.1	3.3
BT50-RSG16-340-M225							340		115			6.5	3.9
BT50-RSG16-370-M225							370	225	145			7.1	4.1
BT50-RSG16-400-M225							400		175			8.3	4.2

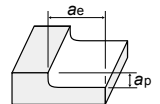
Item code		Stock	Size(mm)										Weight (kg)	Rigidity value (μm)
			G	φD	H	H ₁	φC	L	M	L ₁	φC ₁	φC ₂		
A63	A63-RSG8-105-M25		M8	8.5	18	6.5	15	105		80	30	32	1.3	0.6
	A63-RSG8-135-M25							135	25	110			1.4	0.7
	A63-RSG8-165-M25							165		140			1.9	0.8
	A63-RSG12-125-M25							125		100			1.9	0.3
	A63-RSG12-155-M25					155	25	130			2.3	0.4		
	A63-RSG12-185-M25					185		160			2.7	0.5		
	A63-RSG12-150-M50					150		100			2.0	0.5		
	A63-RSG12-180-M50					180	50	130			2.4	0.6		
	A63-RSG12-210-M50					210		160			2.8	0.8		
	A63-RSG12-175-M75					175		100			2.2	0.9		
	A63-RSG12-205-M75					205	75	130			2.6	1.0		
	A63-RSG12-235-M75		M12	12.5	22	6	24	235		160	43	45	3.0	1.3
	A63-RSG12-200-M100							200		100			2.3	1.4
	A63-RSG12-230-M100							230	100	130			2.7	1.6
	A63-RSG12-260-M100							260		160			3.1	1.9
	A63-RSG12-225-M125					225		100			2.5	2.1		
	A63-RSG12-255-M125					255	125	130			2.9	2.4		
	A63-RSG12-285-M125					285		160			3.3	2.7		
	A63-RSG12-250-M150					250		100			2.6	3.1		
	A63-RSG12-280-M150					280	150	130			3.0	3.4		
A63-RSG12-310-M150					310		160			3.4	3.8			
A63-RSG16-140-M25						140	25					2.8	0.2	
A63-RSG16-165-M50						165	50					3.2	0.4	
A63-RSG16-190-M75						190		115				3.6	0.6	
A63-RSG16-215-M100		M16	17	25	6	29	215	100		52	54	2.8	0.9	
A63-RSG16-240-M125 ※							240	125				2.8	1.3	
A63-RSG16-265-M150 ※							265	150				3.2	1.9	
A63-RSG16-290-M175 ※							290	175				3.6	2.5	
A100	A100-RSG12-140-M25		M12	12.5	22	6	24	140		115	43	45	3.4	0.3
	A100-RSG12-170-M25							170	25	145			3.7	0.4
	A100-RSG12-200-M25							200		175			4.7	0.4
	A100-RSG12-165-M50							165		115			3.5	0.5
	A100-RSG12-195-M50							195	50	145			3.8	0.6
	A100-RSG12-225-M50							225		175			4.8	0.6
	A100-RSG12-190-M75							190		115			3.7	0.8
	A100-RSG12-220-M75							220	75	145			4.0	1.0
	A100-RSG12-250-M75							250		175			5.0	1.0
	A100-RSG12-215-M100							215		115			3.8	1.4
	A100-RSG12-245-M100							245	100	145			4.1	1.6
	A100-RSG12-275-M100							275		175			5.1	1.6
	A100-RSG12-240-M125							240		115			4.0	2.1
	A100-RSG12-270-M125							270	125	145			4.3	2.4
	A100-RSG12-300-M125							300		175			5.3	2.4
	A100-RSG12-265-M150							265		115			4.1	3.0
	A100-RSG12-295-M150		295	150	145	4.4	3.4							
	A100-RSG12-325-M150		325		175	5.4	3.4							
	A100-RSG12-290-M175		290		115	4.3	4.3							
	A100-RSG12-320-M175		320	175	145	4.6	4.6							
	A100-RSG12-350-M175		350		175	5.6	4.6							
	A100-RSG16-140-M25		M16	17	25	6	29	140		115	52	54	4.0	0.2
	A100-RSG16-170-M25							170	25	145			4.5	0.2
	A100-RSG16-200-M25							200		175			5.7	0.2
	A100-RSG16-165-M50							165		115			4.2	0.3
	A100-RSG16-195-M50							195	50	145			4.7	0.4
	A100-RSG16-225-M50							225		175			5.9	0.4
	A100-RSG16-190-M75							190		115			4.5	0.5
	A100-RSG16-220-M75							220	75	145			5.0	0.6
	A100-RSG16-250-M75							250		175			6.1	0.6
	A100-RSG16-215-M100							215		115			4.7	0.8
	A100-RSG16-245-M100							245	100	145			5.2	0.9
A100-RSG16-275-M100		275							175	6.3			0.9	
A100-RSG16-240-M125		240							115	4.9			1.1	
A100-RSG16-270-M125		270						125	145	5.4			1.3	
A100-RSG16-300-M125		300							175	6.5			1.3	
A100-RSG16-265-M150		265							115	5.1			1.6	
A100-RSG16-295-M150		295						150	145	5.6			1.8	
A100-RSG16-325-M150		325							175	6.7			1.8	
A100-RSG16-290-M175		290							115	5.3			2.2	
A100-RSG16-320-M175		320						175	145	5.8			2.4	
A100-RSG16-350-M175		350		175	7.0	2.5								
A100-RSG16-315-M200		315		115	5.5	3.0								
A100-RSG16-345-M200		345	200	145	6.0	3.2								
A100-RSG16-375-M200		375		175	7.2	3.3								
A100-RSG16-340-M225		340		115	5.7	3.9								
A100-RSG16-370-M225		370	225	145	6.3	4.2								
A100-RSG16-400-M225		400		175	7.4	4.2								

Recommended Cutting Conditions

※Red indicates primary recommended grade.

Work material	Cutting method	Recommended grade	Breaker shape	Cutting speed V_c (m/min)	Depth of cut a_p (mm)	Feed rate f_z (mm/t)	Shank type(r5) Modular type(r5)						Bore type(r5)			
							$\phi 25$ -3 flutes		$\phi 32$ -4 flutes		$\phi 40$ -5 flutes		$\phi 40$ -5 flutes		$\phi 42$ -5 flutes	
							Revolution min^{-1}	Feed speed mm/min	Revolution min^{-1}	Feed speed mm/min	Revolution min^{-1}	Feed speed mm/min	Revolution min^{-1}	Feed speed mm/min	Revolution min^{-1}	Feed speed mm/min
Austenite type Ferrite type Stainless steels SUS304 SUS316 SUS430 etc	Dry cutting	AX2040 GX2160	-C8	180~220	2~	0.1~0.2	2,546	1,528	1,989	1,592	1,592	1,592	1,592	1,592	1,516	1,516
					1~2	0.2~0.3	$v_c=200\text{m/min}, f_z=0.2\text{mm/t}$						$v_c=200\text{m/min}, f_z=0.2\text{mm/t}$			
					~1	0.4~0.5										
	Wet cutting	JM4160	-B8	90~110	2~	0.1~0.2	1,273	764	995	796	796	796	796	796	758	758
					1~2	0.2~0.3	$v_c=100\text{m/min}, f_z=0.2\text{mm/t}$						$v_c=100\text{m/min}, f_z=0.2\text{mm/t}$			
					~1	0.4~0.5										
Martensite type Stainless steels SUS410 SUS420J2 etc	Dry cutting	AX2040 GX2160	-C8	200~240	2~	0.1~0.2	2,801	1,681	2,188	1,751	1,751	1,751	1,751	1,751	1,667	1,667
					1~2	0.2~0.3	$v_c=220\text{m/min}, f_z=0.2\text{mm/t}$						$v_c=220\text{m/min}, f_z=0.2\text{mm/t}$			
					~1	0.4~0.5										
	Wet cutting	JM4160	-B8	120~200	2~	0.1~0.2	2,037	1,222	1,592	1,273	1,273	1,273	1,273	1,273	1,213	1,213
					1~2	0.2~0.3	$v_c=160\text{m/min}, f_z=0.2\text{mm/t}$						$v_c=160\text{m/min}, f_z=0.2\text{mm/t}$			
					~1	0.4~0.5										
Precipitation-hardened type Stainless steels SUS630 SUS631 etc	Dry cutting	AX2040 GX2160	-C8	160~200	2~	0.1~0.2	2,292	1,375	1,790	1,432	1,432	1,432	1,432	1,432	1,364	1,364
					1~2	0.2~0.3	$v_c=180\text{m/min}, f_z=0.2\text{mm/t}$						$v_c=180\text{m/min}, f_z=0.2\text{mm/t}$			
					~1	0.4~0.5										
	Wet cutting	JM4160	-B8	100~180	2~	0.1~0.2	1,528	917	1,194	955	955	955	955	955	909	909
					1~2	0.2~0.3	$v_c=120\text{m/min}, f_z=0.2\text{mm/t}$						$v_c=120\text{m/min}, f_z=0.2\text{mm/t}$			
					~1	0.4~0.5										
Aluminum alloys A5052 etc	Dry cutting Wet cutting	SD5010	-A8	300~500	2~	0.1~0.2	3,820	2,292	2,984	2,387	2,387	2,387	2,387	2,387	2,274	2,274
					1~2	0.2~0.3	$v_c=300\text{m/min}, f_z=0.2\text{mm/t}$						$v_c=300\text{m/min}, f_z=0.2\text{mm/t}$			
					~1	0.4~0.5										
Titanium alloys Ti-6AL-4V etc	Wet cutting	JS1025	-B8 (Roughing) -A8 (Finishing)	30~50	~2	0.07~	509	153	398	159	318	159	318	159	303	152
						0.13	$v_c=40\text{m/min}, f_z=0.1\text{mm/t}$						$v_c=40\text{m/min}, f_z=0.1\text{mm/t}$			
Ni based alloys	Wet cutting	JS1025	-B8	30~40	~2	0.06~	446	107	348	111	279	111	279	111	265	106
						0.1	$v_c=35\text{m/min}, f_z=0.08\text{mm/t}$						$v_c=35\text{m/min}, f_z=0.08\text{mm/t}$			

- [Note] ①These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine and work-piece conditions.
 ②Please note that the AX Coating, GX Coating and JS Coating do not cause a reaction in conductive touch sensors.
 ③In order to avoid of insert breakage, please change insert earlier.
 ④Use the appropriate coolant for the work material and machining shape.



Adjustment of cutting conditions

- Feed rate and spindle revolution must be adjusted to correspond to tool overhang and machining conditions.
- Please consider the standard cutting conditions as 100% and adjust the machining conditions by referring to the right table.

		Overhang		
		<3DCX	3DCX~5DCX	5DCX<
Surfacing Shoulder cutting	Rotation speed	100%	70%	50%
	Feed rate	100%	70%	50%
Slotting	Rotation speed	100%	70%	50%
	Feed rate	70%	50%	35%
Ramping	Rotation speed	100%	70%	50%
	Feed rate	80%	55%	40%

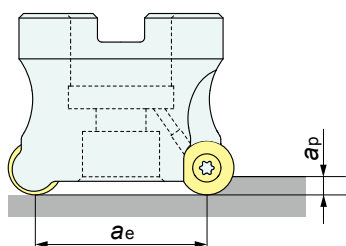
Work material	Cutting method	Shank type(r6)						Bore type(r6)									
		$\phi 32$ -3 flutes		$\phi 40$ -3 flutes		$\phi 40$ -4 flutes		$\phi 40$ -4 flutes		$\phi 42$ -4 flutes		$\phi 50$ -5 flutes		$\phi 63$ -6 flutes		$\phi 80$ -7 flutes	
		Revolution min ⁻¹	Feed speed mm/min	Revolution min ⁻¹	Feed speed mm/min	Revolution min ⁻¹	Feed speed mm/min	Revolution min ⁻¹	Feed speed mm/min	Revolution min ⁻¹	Feed speed mm/min	Revolution min ⁻¹	Feed speed mm/min	Revolution min ⁻¹	Feed speed mm/min	Revolution min ⁻¹	Feed speed mm/min
Austenite type Ferrite type Stainless steels SUS304 SUS316 SUS430 etc	Dry cutting	1,989	1,492	1,592	1,194	1,592	1,592	1,592	1,592	1,516	1,516	1,273	1,592	1,011	1,516	796	1,393
		$v_c=200\text{m/min}, f_z=0.25\text{mm/t}$						$v_c=200\text{m/min}, f_z=0.25\text{mm/t}$									
	Wet cutting	995	746	796	597	796	796	796	796	758	758	637	796	505	758	398	696
		$v_c=100\text{m/min}, f_z=0.25\text{mm/t}$						$v_c=100\text{m/min}, f_z=0.25\text{mm/t}$									
Martensite type Stainless steels SUS410 SUS420J2 etc	Dry cutting	2,188	1,641	1,751	1,313	1,751	1,751	1,751	1,751	1,667	1,667	1,401	1,751	1,112	1,667	875	1,532
		$v_c=220\text{m/min}, f_z=0.25\text{mm/t}$						$v_c=220\text{m/min}, f_z=0.25\text{mm/t}$									
	Wet cutting	1,592	1,194	1,273	955	1,273	1,273	1,273	1,273	1,213	1,213	1,019	1,273	808	1,213	637	1,114
		$v_c=160\text{m/min}, f_z=0.25\text{mm/t}$						$v_c=160\text{m/min}, f_z=0.25\text{mm/t}$									
Precipitation- hardened type Stainless steels SUS630 SUS631 etc	Dry cutting	1,790	1,343	1,432	1,074	1,432	1,432	1,432	1,432	1,364	1,364	1,146	1,432	909	1,364	716	1,253
		$v_c=180\text{m/min}, f_z=0.25\text{mm/t}$						$v_c=180\text{m/min}, f_z=0.25\text{mm/t}$									
	Wet cutting	1,194	895	955	716	955	955	955	955	909	909	764	955	606	909	477	835
		$v_c=120\text{m/min}, f_z=0.25\text{mm/t}$						$v_c=120\text{m/min}, f_z=0.25\text{mm/t}$									
Aluminum alloys A5052 etc	Dry cutting	2,984	2,238	2,387	1,790	2,387	2,387	2,387	2,387	2,274	2,274	1,910	2,387	1,516	2,274	1,194	2,089
	Wet cutting	$v_c=300\text{m/min}, f_z=0.25\text{mm/t}$						$v_c=300\text{m/min}, f_z=0.25\text{mm/t}$									
Titanium alloys Ti-6AL-4V etc	Wet cutting	398	119	318	95	318	127	318	127	303	121	255	127	202	121	159	111
		$v_c=40\text{m/min}, f_z=0.1\text{mm/t}$						$v_c=40\text{m/min}, f_z=0.1\text{mm/t}$									
Ni based alloys	Wet cutting	348	84	279	67	279	89	279	89	265	85	223	89	177	85	139	78
		$v_c=35\text{m/min}, f_z=0.08\text{mm/t}$						$v_c=35\text{m/min}, f_z=0.08\text{mm/t}$									

⚠️ Attentions on Safety

- ① The steel chips may cause cuts, burns or damages to eyes. Be sure to install the safety cover around the tool and wear the safety glasses when carrying out any works.
- ② Do not use non-water-soluble cutting oils. Such oils may result in fire.

Depth of cut

- a_p according to the size of the insert being used.
- It is recommended that a_e be set between 0.3DCX and 0.6DCX.

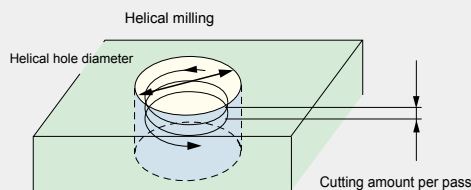
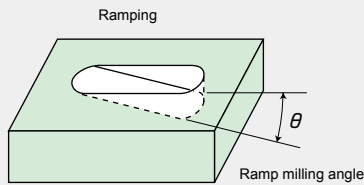


Inserts size	Recommended a_p	Maximum a_p	Recommended a_e
RPOT1204M0	1~3mm	6mm	0.3DCX~0.6DCX
RPOT10T3M0	1~2.5mm	5mm	

Cutting performance

Ramping, Helical Milling

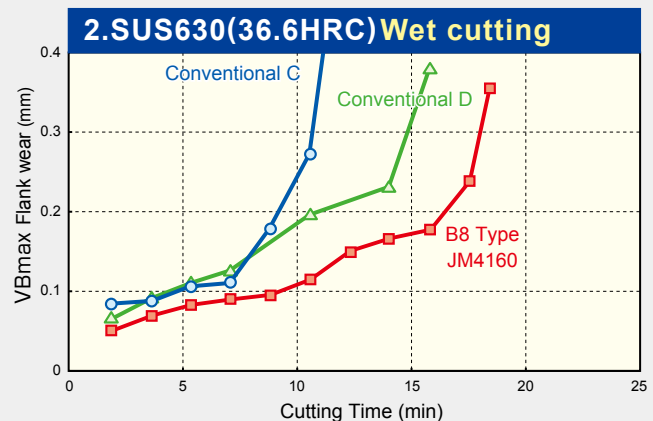
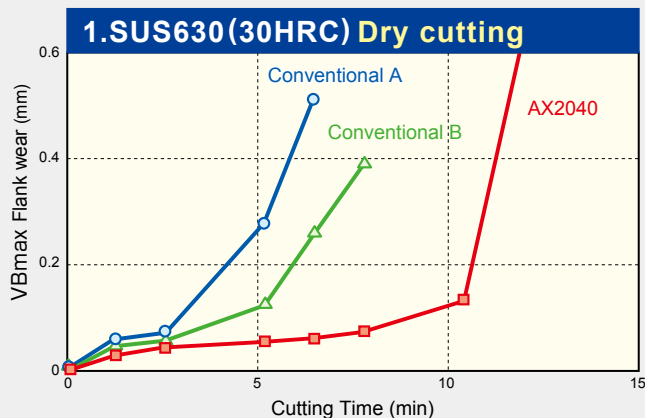
There are restrictions to ramp angle (θ) and adjust (Δp) because of designs of cutting edge.



(mm)

Tool dia. DCX	φ25	φ32	φ40	φ42	φ40	φ42	φ50	φ63	φ80
Inserts Size	RP-T10T3M0				RP-T1204M0				
Recommended ramp angle θ	1~1.5 degrees(Use below 3 degrees is recommended.)								
Recommended cutting amount mm	1~2	1.5~2.5	1.5~2.5	1.5~2.5	2~3	2~3	2~3	3	3
Hole Dia.	40~48	54~62	70~78	74~82	68~78	72~82	88~98	114~125	128~158

[Note] Due to swarf evacuation wear safety glasses in the vicinity of the operation.
For helical milling, since chips will accumulate inside the hole, use an air blower or supply coolant to remove chips.



Cutting conditions

Work Material	SUS630 (30HRC)	$V_c = 300 \text{ m/min} (n=1910 \text{ min}^{-1})$
Tool	RVB4050RM-5	$f_z = 0.4 \text{ mm/t} (V=764 \text{ mm/min})$
Insert	RPMT1204M0EN-C8	$\Delta p \times \Delta e = 2 \times 34 \text{ mm}$
		Dry
		Single-tip cutting

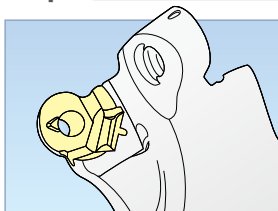
Cutting conditions

Work Material	SUS630 36.6HRC	$V_c = 150 \text{ m/min} (n=955 \text{ min}^{-1})$
Insert	RPMT1204M0EN-B8 JM4160	$f_z = 0.3 \text{ mm/t} (286 \text{ mm/min})$
Tool dia.	$\phi 50 \text{ mm}$	$\Delta p \times \Delta e = 1 \times 30 \text{ mm}$
Coolant	Water-soluble cutting fluid; Dilution ratio: 5 to 8%	
Overhang	60mm	

	User	Work material	Tools	Cutting conditions	Result
1	Company A	Plate SUS304	Body : RV4S040R-3 Insert : RPMT1204M0EN-B8 JM4160	Wet cutting $v_c = 200\text{m/min}$, $f_z = 0.15\text{mm/t}$, $a_p \times a_e = 1.5 \times 25\text{mm}$	50% higher efficiency than conventional tools. Tool life is also good.
2	Company B	Machine parts SUS304	Body : RV4S040R-3 Insert : RPMT1204M0EN-B8 JM4160	Wet cutting $v_c = 200\text{m/min}$, $f_z = 0.2\text{mm/t}$, $a_p \times a_e = 1.5 \times 20\text{mm}$	Good results with low wear amount.
3	Company C	Impeller SUS410	Body : RV4B080R-7 Insert : RPMT1204M0EN-B8 GX2160	Dry cutting $v_c = 200\text{m/min}$, $f_z = 0.5\text{mm/t}$, $a_p \times a_e = 2 \times 60\text{mm}$	Good; tool life is approximately 2 times that of conventional tools.
4	Company D	Blade Stainless steels SUS	Body : RV4B050R-5 Insert : RPMT1204M0EN-C8 GX2160	Dry cutting $v_c = 330\text{m/min}$, $f_z = 0.24\text{mm/t}$, $a_p \times a_e = 5 \times 12\text{mm}$	Good; tool life is approximately 2 times that of conventional tools.
5	Company E	Blade Stainless steels SUS	Body : RV4B050RM-5 Insert : RPMT1204M0EN-B8 JM4160	Wet cutting $v_c = 200\text{m/min}$, $f_z = 0.5\text{mm/t}$, $a_p \times a_e = 1 \times 35\text{mm}$	Good; tool life is approximately 1.5 to 2 times that of conventional tools.

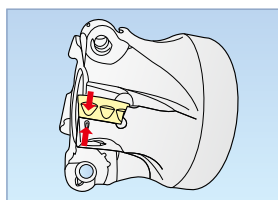
Cautions regarding attachment of inserts

Step1



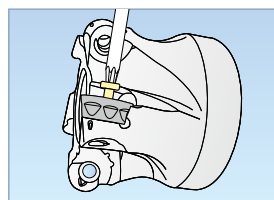
Check that there are no foreign materials in the area where the insert will be attached. (Use a blower, etc. to blow away any materials.)

Step2



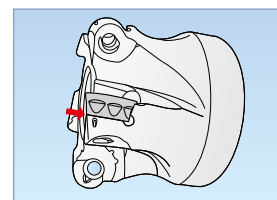
Align the body's mark with the insert's rotation-prevention section and set into place.

Step3



Insert and tighten screw.

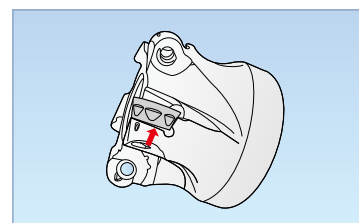
Step4



After attaching, check that there are no gaps between the insert and the seat surface.

Incorrect attachment example

The screw was strongly tightened with a gap between the insert and the seat surface, which could result in the insert breaking. In addition, if it is used without eliminating the gap, not only will the insert break but it could also lead to damage to the cutter body.





The diagrams and table data are examples of test results, and are not guaranteed values.
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Attentions on Safety

1. Attentions regarding handling

- (1) When removing the tool from the case (package), be careful not to drop it on your foot or drop it onto the tips of your bare fingers.
- (2) When actually setting the inserts, be careful not to touch the cutting flute directly with your bare hands.

2. Attentions regarding mounting

- (1) When preparing for use, be sure that the inserts are firmly mounted in place and that they are firmly mounted on the arbor, etc.
- (2) If abnormal chattering occurs during use, stop the machine immediately and remove the cause of the chattering.

3. Attentions during use

- (1) Before use, confirm the dimensions and direction of rotation of the tool and milling work material.
- (2) The numerical values in the standard cutting conditions table should be used as criteria when starting new work. The cutting conditions should be adjusted as appropriate when the cutting depth is large, the rigidity of the machine being used is low, or according to the conditions of the work material.
- (3) The inserts are made of a hard material. During use, they may break and fly off. In addition, cutting chips may also fly off. Since there is a danger of injury to workers, fire, or eye damage from such flying pieces, a safety cover should be installed and safety equipment such as safety glasses should be worn to create a safe environment for work.
 - Do not use where there is a risk of fire or explosion.
 - Do not use non-water-soluble cutting oils. Such oils may result in fire.
- (4) Do not use the tool for any purpose other than that for which it is intended, and do not modify it.

MOLDINO Tool Engineering, Ltd.

Head Office
 Hulic Ryogoku Bldg. 8F, 4-31-11, Ryogoku, Sumida-ku, Tokyo, Japan 130-0026
 International Sales Dept. : TEL +81-3-6890-5103 FAX +81-3-6890-5128

Official Web Site

<http://www.moldino.com/en/>

Database for selection Cutting Tool Products **[TOOL SEARCH]**

TOOLSEARCH

Search Web

Europe

MOLDINO Tool Engineering Europe GmbH
 Itterpark 12, 40724 Hilden, Germany.
 Tel +49-(0)2103-24820 Fax +49-(0)2103-248230

America

MITSUBISHI MATERIALS U.S.A. CORPORATION
DETROIT OFFICE Customer service
 41700 Gardenbrook Road, Suite 120, Novi, MI 48375-1320 U.S.A.
 Tel +1(248) 308-2620 Fax +1(248) 308-2627

Mexico

MMC METAL DE MEXICO, S.A. DE C.V.
 Av. La Cañada No.16, Parque Industrial Bernardo Quintana, El Marques, Querétaro, CP 76246, México
 Tel +52-442-1926800

Brazil

MMC METAL DO BRASIL LTDA.
 Rua Cincinato Braga, 340 13° andar, Bela Vista – CEP 01333-010 São Paulo – SP., Brasil
 Tel +55(11)3506-5600 Fax +55(11)3506-5677

Thailand

MMC Hardmetal (Thailand) Co., Ltd. MOLDINO Division
 622 Emporium Tower, Floor 22/1-4, Sukhumvit Road, Klong Tan, Klong Toei,
 Bangkok 10110, Thailand
 TEL:+66-(0)2-661-8175 FAX:+66-(0)2-661-8176

India

MMC Hardmetal India Pvt Ltd.
 H.O.: Prasad Enclave, #118/119, 1st Floor, 2nd Stage, 5th main, BBMP Ward #11, (New #38),
 Industrial Suburb, Yeshwanthpura, Bengaluru, 560 022, Karnataka, India.
 Tel +91-80-2204-3600

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