

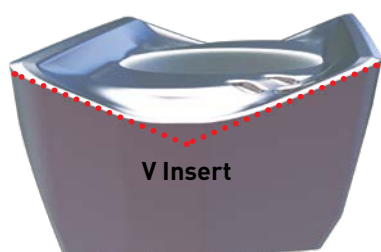
NEW

2026.10

B285E

RS0112

UNINTERRUPTED MACHINING
FOR HIGH EFFICIENCY AND STABLE PERFORMANCE



 **MITSUBISHI MATERIALS**

RS0112

MULTI-FUNCTION SHOULDER MILLING CUTTER

BY ENABLING UNINTERRUPTED MACHINING, SHOP-FLOOR WORKLOAD IS REDUCED AND OPERATIONAL EFFICIENCY IS IMPROVED.

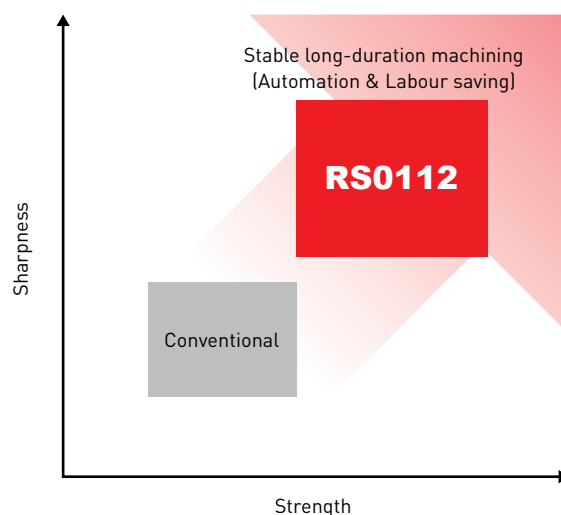


Please refer to the last page for more information on certified environmentally friendly products.

In today's machining environment, where automation and labour saving are increasingly advancing, higher productivity is strongly demanded.

Mitsubishi Materials' multi-functional shoulder milling cutter, the RS0112, features a proprietary V-insert geometry that delivers an excellent balance of sharp cutting performance and high strength. This enables stable, long-duration machining, making RS0112 an ideal solution not only for high-efficiency machining but also for meeting the growing needs of automation and reduced manpower.

By strongly supporting uninterrupted machining, RS0112 contributes to reducing shop-floor workload while further improving operational efficiency.



NEW V-INSERT GEOMETRY

- High sharpness creates high-precision surface finish
- Strength enables stable machining

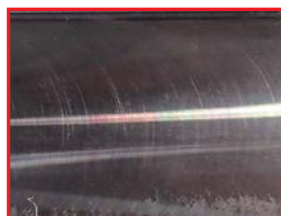
RS0112

HIGH-QUALITY SURFACE FINISH

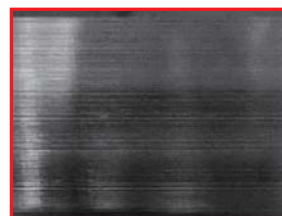
THE SURFACE FINISH ACHIEVED BY THE V-INSERT GEOMETRY ALSO REDUCES THE NEED FOR SECONDARY OPERATIONS.



INSERT CLOSE-UP



Bottom surface: $R_a=0.26 \mu\text{m}$



Wall surface accuracy: Step height= $18 \mu\text{m}$

See next page for details.

INSERT FEATURES

HIGH SHARPNESS CREATES HIGH-PRECISION SURFACE FINISH
STRENGTH ENABLES STABLE MACHINING

V-INSERT GEOMETRY

The wiper edge is designed with a positive geometry to reduce cutting resistance. A proprietary edge preparation process achieves both uniform and smooth honing. As a result, cutting sharpness is enhanced, producing excellent surface finishes.

IMPROVED SURFACE FINISH ACCURACY

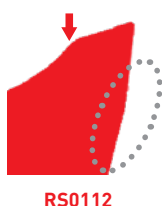
By adopting a high-precision, large-radius cutting edge, high accuracy is achieved on both bottom and wall surfaces.



IMPROVED CUTTING EDGE STRENGTH

Optimised flank face and rake angle geometry improves resistance to chipping.

Cutting load



RS0112

Cutting load



Conventional

SCM440: SURFACE FINISH COMPARISON

The low cutting-resistance design allows smooth chip evacuation, achieving a high-quality bottom surface and step-free wall surfaces.

Material	JIS SCM440
Cutter Dia. DC (mm)	25
Insert	MP1220 M
Vc (m/min)	250
fz (mm/t.)	0.1
ap (mm)	1
ae (mm)	25
Cutting mode	Dry cutting Single insert
Material	JIS SCM440
Cutter Dia. DC (mm)	25
Insert	MP1230 M
Vc (m/min)	160
fz (mm/t.)	0.1
ap (mm)	6.5 x 3
ae (mm)	3
Cutting mode	Dry cutting Single insert

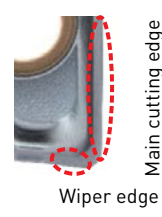
Bottom surface



Ra=0.2623 μm
Rz=1.6897 μm



Ra=0.3990 μm
Rz=1.9517 μm



Enhanced surface quality by a high-precision large-radius edge

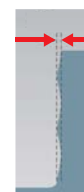
Wall surface



Step height: 18 μm



Step height: 52 μm

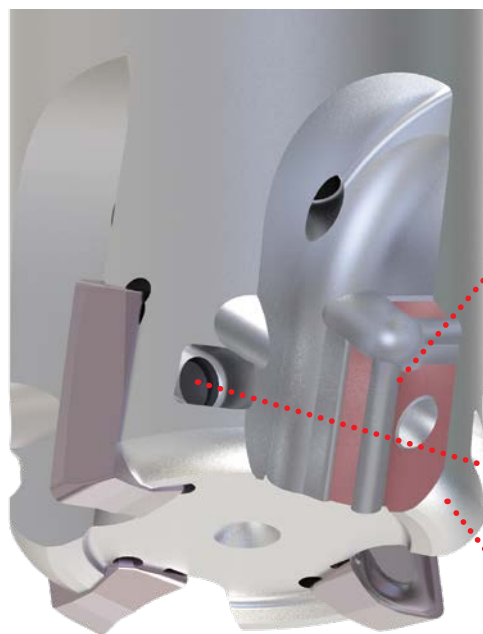


Wall surface step height

CUTTER BODY FEATURES

UNWAVERING DURABILITY

RS0112 has been developed with a strong focus on cutter body performance, delivering excellent durability.



50 % INCREASE COMPARED TO CONVENTIONAL PRODUCTS

The clamping contact surface area has been increased by 50 % compared to conventional products.



RS0112



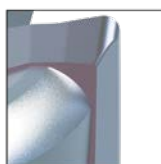
Conventional

40 % INCREASE COMPARED TO CONVENTIONAL PRODUCTS

By adopting a fine-pitch thread, the tightening torque has been increased by 40 % compared to conventional products, thereby preventing any loosening.

IMPROVED ABRASION RESISTANCE AND USABILITY

By increasing the clearance between the insert corner and the cutter body, damage to the cutter body is reduced in the event of insert breakage or during chip abrasion. In addition, even with a larger corner radius, no additional machining of the cutter body is required.



With RE 0.8 installed

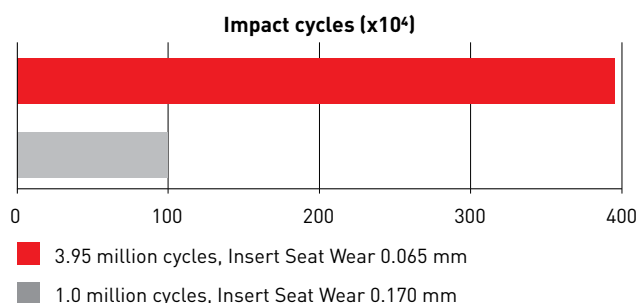


With RE 3.2 installed

SCM440: INSERT SEAT WEAR COMPARISON

Despite four times the number of impact cycles compared to conventional products, insert seat wear is evenly distributed, resulting in improved durability of the cutter body.

Material	JIS SCM440
Cutter Dia. DC (mm)	25
Vc (m/min)	200
fz (mm/t.)	0.15
ap (mm)	4
ae (mm)	12.5
Cutting mode	Dry cutting Single insert



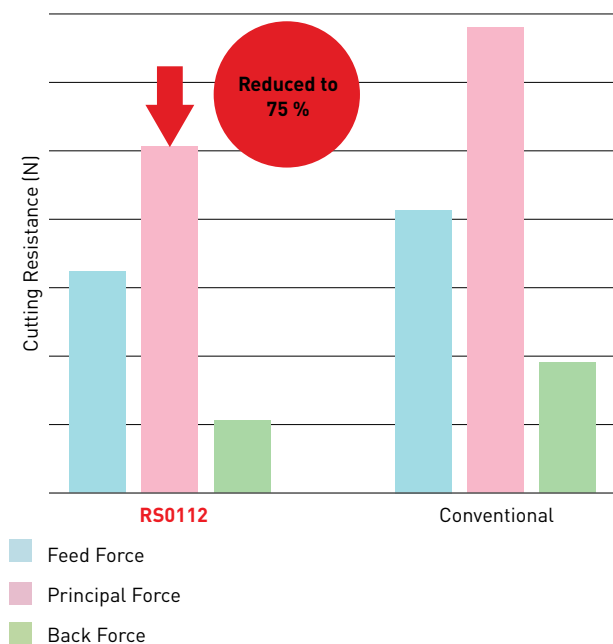
The impact cycle test is conducted to evaluate performance limits and does not guarantee actual product performance.

BALANCE BETWEEN CUTTING RESISTANCE AND FRACTURE RESISTANCE

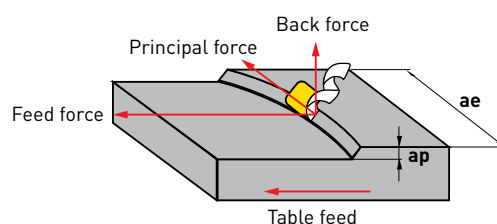
The cutter body is designed for extreme durability while reducing cutting resistance.

SCM440: CUTTING RESISTANCE COMPARISON

Compared to conventional products, all cutting resistance components – feed force, principal cutting force and back force – are reduced, enabling stable machining with lower machine loads.



Material	JIS SCM440
Cutter Dia. DC (mm)	25
Insert	MP1230 M
Vc (m/min)	160
fz (mm/t.)	0.1
ap (mm)	2
ae (mm)	5
Cutting mode	Dry cutting Single insert



SURFACE FINISH COMPARISON ON SMALL MACHINE TOOLS (BT30)

Stable machining is achieved even on small machine tools due to low cutting forces.

Material	JIS SUS304
Cutter Dia. DC (mm)	25, 3 flute
Insert	MV1230 M
Vc (m/min)	60
fz (mm/t.)	0.08
ap (mm)	1
ae (mm)	25
Cutting mode	Wet cutting, All Flutes
Machine	Vertical MC (BT30)



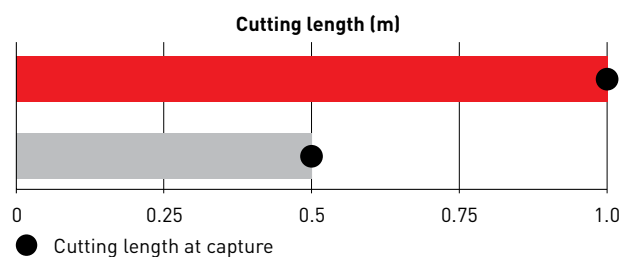
Load meter 27 %	Load meter 31 %
Chatter: None	Chatter: Occurs
Burr: Minor	Burr: Large

CUTTING PERFORMANCE

TI6AL4V: CUTTING LENGTH COMPARISON

Even when machining titanium alloy, significant extension of tool life is achieved without chipping.

Material	Ti6Al4V
Cutter Dia. DC (mm)	25
Insert	MP1230 M
Vc (m/min)	60
fz (mm/t.)	0.12
ap (mm)	4
ae (mm)	12.5 (0.5 DC)
Cutting mode	Wet cutting Single insert



Cutting length 1.0 m



Cutting length 0.5 m



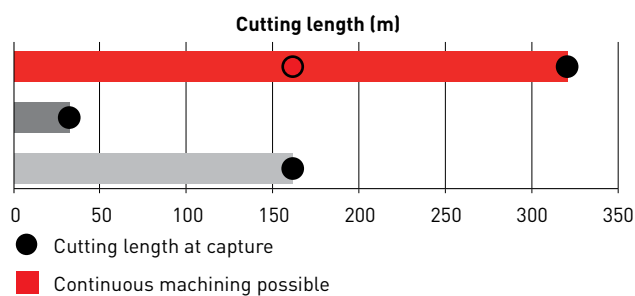
Micro chipping

V-insert geometry suppresses thermal cracking and prevents sudden failure.

SCM440: FRACTURE RESISTANCE COMPARISON

By reducing cutting resistance, cutting edge load is lowered, resulting in more than double the tool life of conventional products.

Material	JIS SCM440
Cutter Dia. DC (mm)	25
Insert	MV1030 M
Vc (m/min)	200
fz (mm/t.)	0.15
ap (mm)	4
ae (mm)	12.5 (0.5 DC)
Cutting mode	Dry cutting Single insert



161 m



32 m



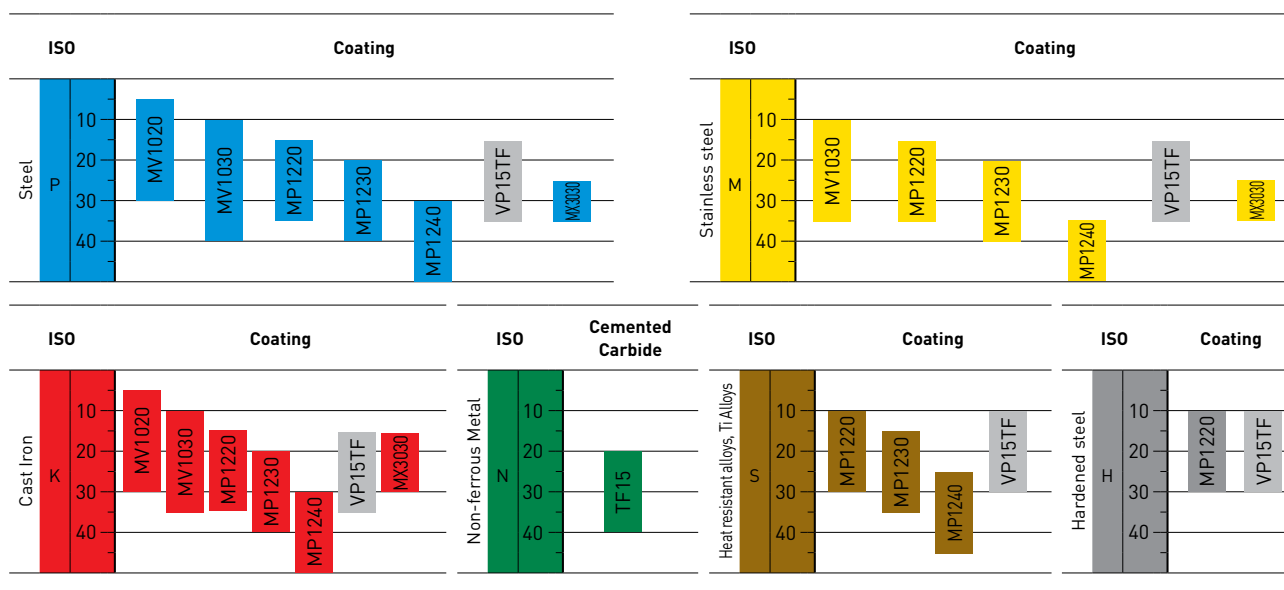
161 m



Micro chipping

COATING

RS0112 INSERTS ARE COMPATIBLE WITH A WIDE RANGE OF WORKPIECE MATERIALS



MP1200 SERIES

PVD COATED CARBIDE GRADE FOR MILLING

MP1220/MP1230/MP1240

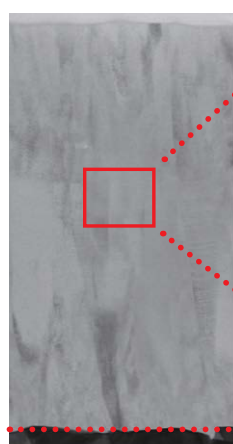


Please refer to the last page for more information on certified environmentally friendly products.

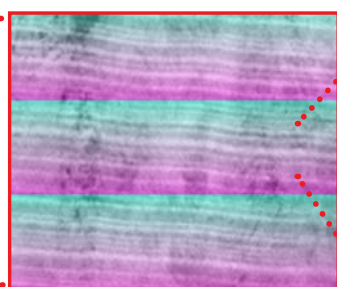
NEW MULTILAYER PVD COATING FOR MILLING

GENE-TENAX COATING

By controlling the coating structure at the nano level, suppression of damage to the coating is reduced compared to conventional lamination. By successfully laminating multiple films, simultaneous strengthening of wear, heat 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.



Dedicated carbide substrate



Enlarged image of Gene-Tenax coating

**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

MV1020 / MV1030

COATED CARBIDE GRADE FOR MILLING



Please refer to the last page for more information on certified environmentally friendly products.

NEWLY DEVELOPED AL-RICH COATING

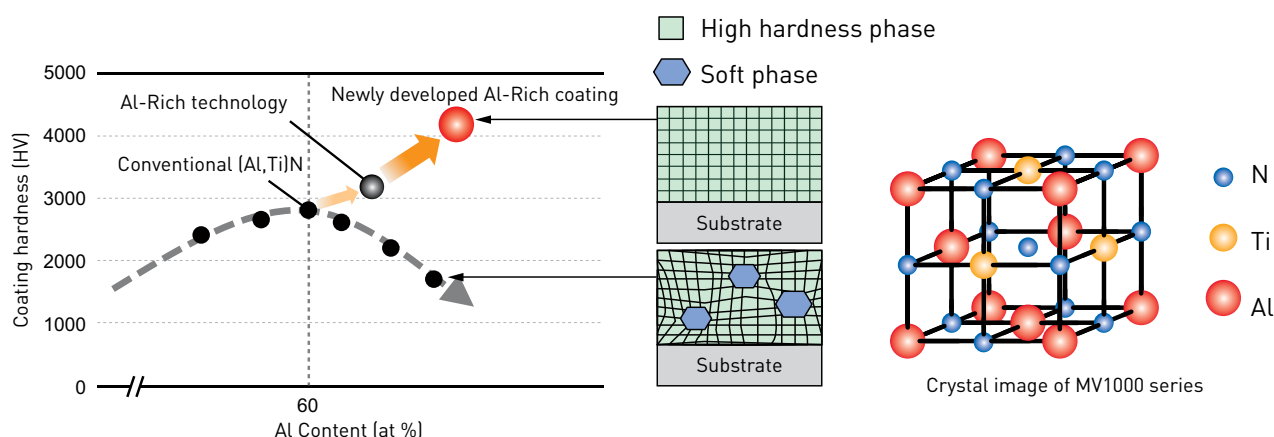
MV1030

ADVANCED WEAR AND THERMAL SHOCK RESISTANCE

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

The extreme heat resistance of this new series achieves amazing stability not only during dry cutting, but also when wet cutting where inserts are usually prone to thermal cracking.

MV1020 offers overwhelmingly superior performance in high-speed cutting, and MV1030 achieves stable performance during interrupted and stainless steel machining.



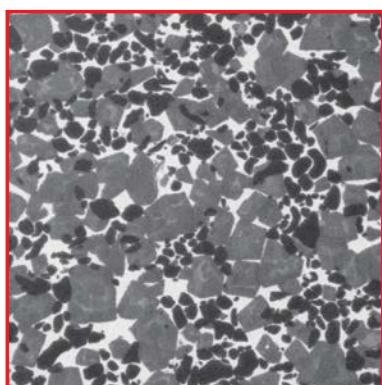
MX3030

CERMET GRADE FOR MILLING

MX3030 is a cermet grade with excellent fracture resistance, suitable for interrupted cutting and general machining applications.



Please refer to the last page for more information on certified environmentally friendly products.



MX3030

A special alloy is used for the binder material

Fracture resistance properties increased

High hardness Ti compound particles are used in the metal

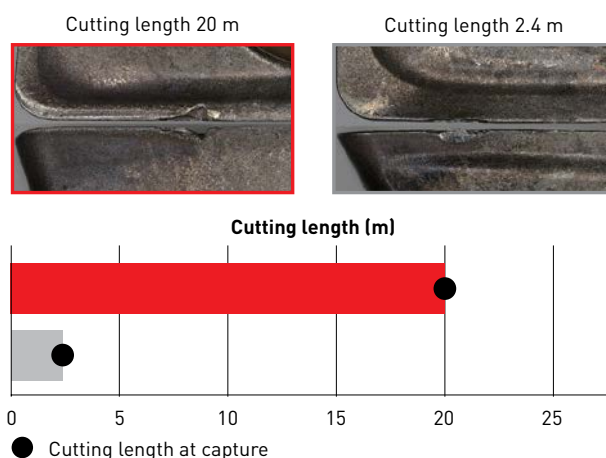
High wear resistance properties

CUTTING PERFORMANCE

SUS304: FRACTURE RESISTANCE COMPARISON (DRY CUTTING)

Low cutting resistance reduces edge chipping, delivering over eight times longer tool life than conventional products.

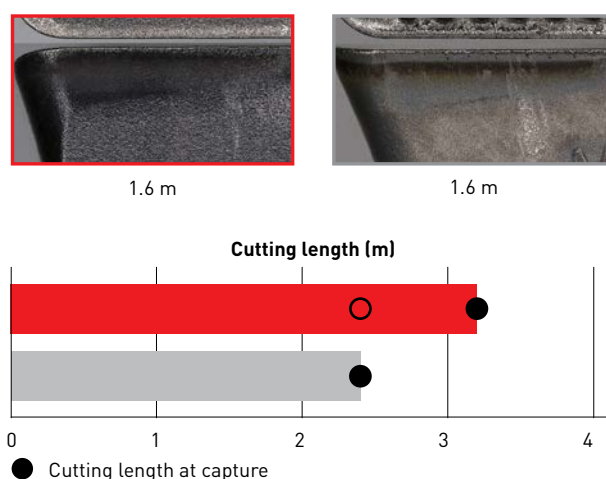
Material	JIS SUS304
Cutter Dia. DC (mm)	25
Insert	MV1030 M
Vc (m/min)	170
fz (mm/t.)	0.15
ap (mm)	4
ae (mm)	12.5 (0.5 DC)
Cutting mode	Dry cutting Single insert



SUS304: FRACTURE RESISTANCE COMPARISON (WET CUTTING)

Compared to conventional products, cutting edge thermal cracking is suppressed, achieving more than 1.25 times the tool life.

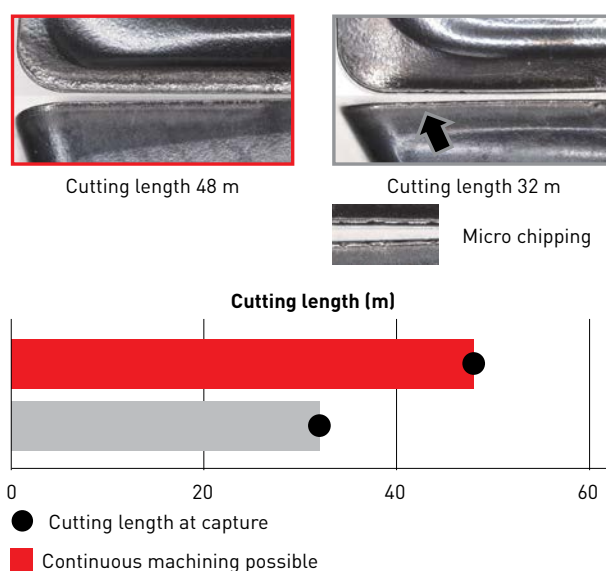
Material	JIS SUS304
Cutter Dia. DC (mm)	25
Insert	MV1030 M
Vc (m/min)	120
fz (mm/t.)	0.15
ap (mm)	4
ae (mm)	12.5 (0.5 DC)
Cutting mode	Wet cutting Single insert



FCD700: FRACTURE RESISTANCE COMPARISON

Compared to conventional products, the absence of micro chipping enables tool life of more than 1.5 times.

Material	JIS FCD700
Cutter Dia. DC (mm)	25
Insert	MV1030 M
Vc (m/min)	170
fz (mm/t.)	0.15
ap (mm)	4
ae (mm)	12.5 (0.5 DC)
Cutting mode	Dry cutting Single insert

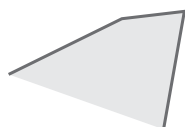


CHIPBREAKER SYSTEM

THREE CHIPBREAKER GEOMETRIES ARE AVAILABLE TO SUIT DIFFERENT MACHINING APPLICATIONS.

Focus on cutting edge sharpness

Focus on cutting edge strength

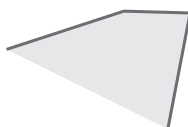


M Chipbreaker

General cutting
Stable cutting

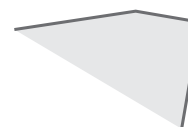
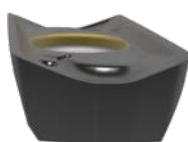


Aluminium alloys
Recommended G-Class insert



R Chipbreaker

Interrupted cutting
Unstable cutting



H Chipbreaker

Severe interrupted cutting
Unstable cutting

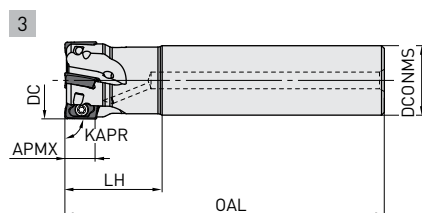
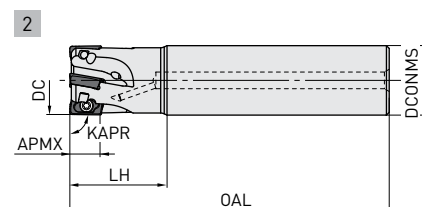
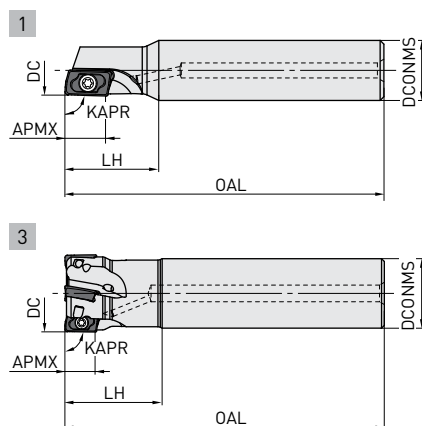


Recommended for
hardened steel

RS0112



MULTI-FUNCTION MILLING



SHANK TYPE

Order number	Stock	CSP	ZEFF	DC	OAL	DCONMS	LH	WT	APMX	RMPX	RPMX	Type
RS0112-1201S16SR	●	○	1	12	85	16	25	0.1	10	6.2°	10500	1
RS0112-1401S16SR	●	○	1	14	85	16	25	0.1	10	7.9°	9000	1
RS0112-1602S16SR	●	○	2	16	85	16	25	0.1	10	10.4°	20900	2
RS0112-1802S16SR	●	○	2	18	85	16	25	0.1	10	8.2°	19600	3
RS0112-1802S16LR	●	○	2	18	120	16	25	0.2	10	8.2°	19600	3
RS0112-2002S16SR	●	○	2	20	85	16	25	0.1	10	6.7°	18500	3
RS0112-2003S16SR	●	○	3	20	85	16	25	0.1	10	6.7°	18500	3
RS0112-2002S20SR	●	○	2	20	100	20	30	0.2	10	6.7°	18500	2
RS0112-2002S20LR	●	○	2	20	150	20	60	0.3	10	6.7°	18500	2
RS0112-2003S20SR	●	○	3	20	100	20	30	0.2	10	6.7°	18500	2
RS0112-2003S20LR	●	○	3	20	150	20	60	0.3	10	6.7°	18500	2
RS0112-2202S20SR	●	○	2	22	115	20	30	0.2	10	5.6°	17600	3
RS0112-2202S20LR	●	○	2	22	150	20	30	0.3	10	5.6°	17600	3
RS0112-2203S20SR	●	○	3	22	115	20	30	0.2	10	5.6°	17600	3
RS0112-2203S20LR	●	○	3	22	150	20	30	0.3	10	5.6°	17600	3
RS0112-2503S20SR	●	○	3	25	115	20	35	0.3	10	4.5°	16400	3
RS0112-2504S20SR	●	○	4	25	115	20	35	0.3	10	4.5°	16400	3
RS0112-2502S25SR	●	○	2	25	115	25	35	0.4	10	4.5°	16400	2
RS0112-2503S25SR	●	○	3	25	115	25	35	0.4	10	4.5°	16400	2
RS0112-2503S25LR	●	○	3	25	170	25	70	0.6	10	4.5°	16400	2
RS0112-2504S25SR	●	○	4	25	115	25	35	0.4	10	4.5°	16400	2
RS0112-2504S25LR	●	○	4	25	170	25	70	0.6	10	4.5°	16400	2
RS0112-2803S25SR	●	○	3	28	115	25	35	0.4	10	3.7°	15500	3
RS0112-2803S25LR	●	○	3	28	170	25	35	0.6	10	3.7°	15500	3
RS0112-2804S25SR	●	○	4	28	115	25	35	0.4	10	3.7°	15500	3
RS0112-2804S25LR	●	○	4	28	170	25	35	0.6	10	3.7°	15500	3

1/2

* CSP : ○ = With through coolant holes, — = Without through coolant holes

1. The rotational speed maximum (RPMX) is set to ensure tool and insert stability.

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

MULTI-FUNCTION MILLING – SHANK TYPE

Order number	Stock	CSP	ZEFF	DC	OAL	DCONMS	LH	WT	APMX	RMPX	RPMX	Type
RS0112-3003S25SR	●	○	3	30	125	25	35	0.4	10	3.4°	14900	3
RS0112-3004S25SR	●	○	4	30	125	25	35	0.4	10	3.4°	14900	3
RS0112-3203S32SR	●	○	3	32	125	32	45	0.7	10	3.1°	14400	2
RS0112-3203S32LR	●	○	3	32	190	32	90	1.1	10	3.1°	14400	2
RS0112-3204S32SR	●	○	4	32	125	32	45	0.7	10	3.1°	14400	2
RS0112-3205S32SR	●	○	5	32	125	32	45	0.7	10	3.1°	14400	2
RS0112-3205S32LR	●	○	5	32	190	32	90	1.0	10	3.1°	14400	2
RS0112-3503S32LR	●	○	3	35	190	32	45	1.1	10	2.7°	13700	3
RS0112-3505S32LR	●	○	5	35	190	32	45	1.1	10	2.7°	13700	3
RS0112-4004S32SR	●	○	4	40	125	32	45	0.7	10	2.2°	12800	3
RS0112-4006S32SR	●	○	6	40	125	32	45	0.7	10	2.2°	12800	3
RS0112-5005S32SR	●	○	5	50	125	32	45	0.9	10	1.7°	11300	3
RS0112-5007S32SR	●	○	7	50	125	32	45	0.8	10	1.7°	11300	3
												2/2

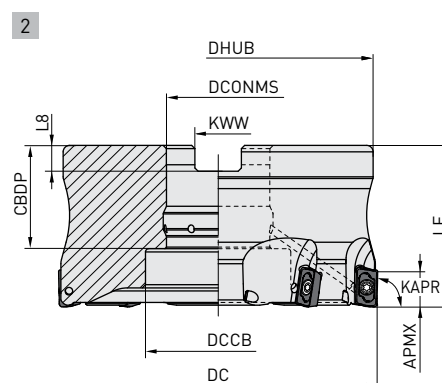
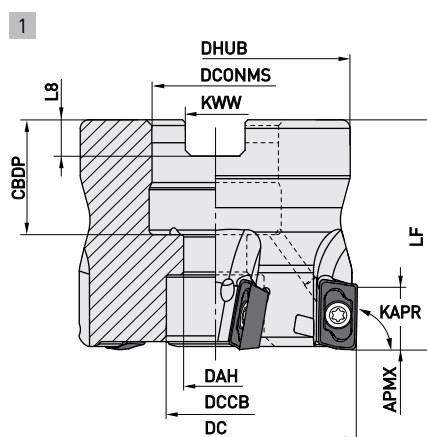
* CSP : ○ = With through coolant holes, — = Without through coolant holes

1. The rotational speed maximum (RPMX) is set to ensure tool and insert stability.
2. When using the tool at high spindle speeds, ensure that the tool and chuck are correctly balanced.

RS0112



MULTI-FUNCTION MILLING



SHANK TYPE

Order number	Stock	CSP	ZEFF	DC	LF	DCONMS	CBDP	DAH	DCCB	KWW	L8	DHUB	WT	APMX	RMPX	RPMX	Type
RS0112J08008AR	●	○	8	80	50	25.4	26	13	20	9.5	6	70	1.3	10	1.0°	8800	1
RS0112J08010AR	●	○	10	80	50	25.4	26	13	20	9.5	6	70	1.3	10	1.0°	8800	1
RS0112J10008BR	●	○	8	100	50	31.75	37	—	45	12.7	8	96	2.1	10	0.8°	7800	2
RS0112J10012BR	●	○	12	100	50	31.75	37	—	45	12.7	8	96	2.1	10	0.8°	7800	2

1/1

Order number	Stock	CSP	ZEFF	DC	LF	DCONMS	CBDP	DAH	DCCB	KWW	L8	DHUB	WT	APMX	RMPX	RPMX	Type
RS0112-03203AR	●	○	3	32	35	16	18	9	14	8.4	5.6	30	0.1	10	3.1°	11400	1
RS0112-03204AR	●	○	4	32	35	16	18	9	14	8.4	5.6	30	0.1	10	3.1°	11400	1
RS0112-03205AR	●	○	5	32	35	16	18	9	14	8.4	5.6	30	0.1	10	3.1°	11400	1
RS0112-04004AR	●	○	4	40	40	16	18	9	14	8.4	5.6	37	0.2	10	2.2°	12800	1
RS0112-04006AR	●	○	6	40	40	16	18	9	14	8.4	5.6	37	0.2	10	2.2°	12800	1
RS0112-05005AR	●	○	5	50	40	22	20	11	17	10.4	6.3	47	0.4	10	1.7°	11300	1
RS0112-05008AR	●	○	8	50	40	22	20	11	17	10.4	6.3	47	0.4	10	1.7°	11300	1
RS0112-06306AR	●	○	6	63	40	22	20	11	17	10.4	6.3	60	0.7	10	1.3°	10000	1
RS0112-06306XR	●	○	6	63	50	27	23	13	20	12.4	7	60	0.8	10	1.3°	10000	1
RS0112-06309AR	●	○	9	63	40	22	20	11	17	10.4	6.3	60	0.7	10	1.3°	10000	1
RS0112-06309XR	●	○	9	63	50	27	23	13	20	12.4	7	60	0.8	10	1.3°	10000	1
RS0112-08008AR	●	○	8	80	50	27	23	13	20	12.4	7	76	1.4	10	1.0°	8800	1
RS0112-08010AR	●	○	10	80	50	27	23	13	20	12.4	7	76	1.4	10	1.0°	8800	1
RS0112-10008BR	●	○	8	100	50	32	32	—	45	14.4	8	96	2.0	10	0.8°	7800	2
RS0112-10012BR	●	○	12	100	50	32	32	—	45	14.4	8	96	2.0	10	0.8°	7800	2

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* CSP : ○ = With through coolant holes, — = Without through coolant holes

1. The rotational speed maximum (RPMX) is set to ensure tool and insert stability.

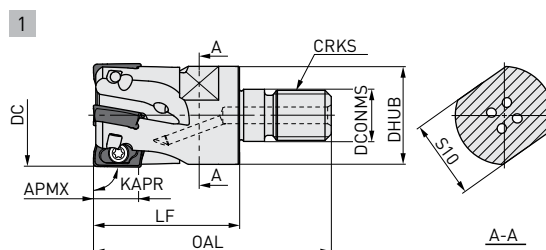
2. When using the tool at high spindle speeds, ensure that the tool and chuck are correctly balanced

3. A set bolt for the arbor is not included with the body.

RS0112



MULTI-FUNCTION MILLING



SCREW-IN TYPE

Order number	Stock	CSP	ZEFF	DC	LF	OAL	DCONMS	S10	DHUB	CRKS	WT	APMX	RMPX	RPMX	Type
RS0112-1602M0830R	●	○	2	16	30	48	8.5	10	14.5	M8	0.03	10	10.4°	20900	1
RS0112-1802M0830R	●	○	2	18	30	48	8.5	10	14.5	M8	0.03	10	8.2°	19600	1
RS0112-2002M1030R	●	○	2	20	30	49	10.5	14	18.5	M10	0.05	10	6.7°	18500	1
RS0112-2003M1030R	●	○	3	20	30	49	10.5	14	18.5	M10	0.05	10	6.7°	18500	1
RS0112-2202M1030R	●	○	2	22	30	49	10.5	14	18.5	M10	0.06	10	5.6°	17600	1
RS0112-2203M1030R	●	○	3	22	30	49	10.5	14	18.5	M10	0.05	10	5.6°	17600	1
RS0112-2503M1235R	●	○	3	25	35	57	12.5	19	23.5	M12	0.10	10	4.5°	16400	1
RS0112-2504M1235R	●	○	4	25	35	57	12.5	19	23.5	M12	0.10	10	4.5°	16400	1
RS0112-2803M1235R	●	○	3	28	35	57	12.5	19	23.5	M12	0.12	10	3.7°	15500	1
RS0112-2804M1235R	●	○	4	28	35	57	12.5	19	23.5	M12	0.12	10	3.7°	15500	1
RS0112-3203M1640R	●	○	3	32	40	63	17	24	28.5	M16	0.21	10	3.1°	14400	1
RS0112-3204M1640R	●	○	4	32	40	63	17	24	28.5	M16	0.20	10	3.1°	14400	1
RS0112-3205M1640R	●	○	5	32	40	63	17	24	28.5	M16	0.20	10	3.1°	14400	1
RS0112-3503M1640R	●	○	3	35	40	63	17	24	28.5	M16	0.23	10	2.7°	13700	1
RS0112-3505M1640R	●	○	5	35	40	63	17	24	28.5	M16	0.22	10	2.7°	13700	1
RS0112-4004M1640R	●	○	4	40	40	63	17	24	28.5	M16	0.27	10	2.2°	12800	1
RS0112-4006M1640R	●	○	6	40	40	63	17	24	28.5	M16	0.26	10	2.2°	12800	1

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* CSP : ○ = With through coolant holes, — = Without through coolant holes

1. The rotational speed maximum (RPMX) is set to ensure tool and insert stability.

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

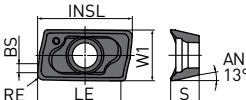
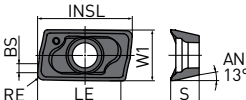
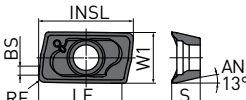
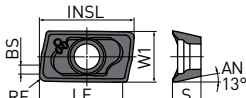
3. For screw-in type arbors, refer to page 27 and 28

INSERTS

		P	M	K	N	S	H			
Material	Steel	◆	◆	◆	◆	◆	◆	◆		
	Stainless steel		◆	◆	◆	◆	◆	◆		
	Cast Iron	◆	◆	◆	◆		◆	◆		
	Non-ferrous Metals								◆	
	Heat resistant alloys, Titanium alloys			◆	◆	◆	◆			
	Hardened steel			◆			◆			

Edge Preparation :

- E : Round
- F : Sharp
- S : Chamfer + Round
- T : Chamfer

Shape / Chipbreaker	Order number	Class	Edge Preparation	Coated							Cermel	Carbide									Geometry
				MV1020	MV1030	MP1220	MP1230	MP1240	VP15TF	MX3030	TF15		BS	LE	RE	W1	INSL	S	AN		
ALUMINIUM ALLOYS CUTTING																					
 M	RS0112G020FR-M	G	F								●	1.8	10	0.2	6.7	12.5	3.7	13			
	RS0112G040FR-M	G	F								●	1.6	10	0.4	6.7	12.5	3.7	13			
	RS0112G080FR-M	G	F								●	1.2	10	0.8	6.7	12.4	3.7	13			
	RS0112G100FR-M	G	F								●	1.0	10	1.0	6.7	12.4	3.7	13			
	RS0112G120FR-M	G	F								●	0.8	10	1.2	6.7	12.3	3.7	13			
	RS0112G160FR-M	G	F								●	0.6	10	1.6	6.7	12.3	3.7	13			
	RS0112G200FR-M	G	F								●	1.2	10	2.0	6.7	12.3	3.7	13			
	RS0112G240FR-M	G	F								●	0.7	10	2.4	6.7	12.2	3.7	13			
	RS0112G300FR-M	G	F								●	0.4	10	3.0	6.7	12.2	3.7	13			
RS0112G320FR-M	G	F								●	0.2	10	3.2	6.7	12.1	3.7	13				
GENERAL CUTTING																					
 M	RS0112M020ER-M	M	E	●	●	●	●	●	●			1.8	10	0.2	6.7	12.5	3.7	13			
	RS0112M040ER-M	M	E	●	●	●	●	●	●	●		1.6	10	0.4	6.7	12.5	3.7	13			
	RS0112M080ER-M	M	E	●	●	●	●	●	●	●		1.2	10	0.8	6.7	12.4	3.7	13			
	RS0112M100ER-M	M	E	●	●	●	●	●	●			1.0	10	1.0	6.7	12.4	3.7	13			
	RS0112M120ER-M	M	E	●	●	●	●	●	●			0.8	10	1.2	6.7	12.3	3.7	13			
	RS0112M160ER-M	M	E	●	●	●	●	●	●			0.6	10	1.6	6.7	12.3	3.7	13			
	RS0112M200ER-M	M	E	●	●	●	●	●	●			1.2	10	2.0	6.7	12.3	3.7	13			
	RS0112M240ER-M	M	E	●	●	●	●	●	●			0.7	10	2.4	6.7	12.2	3.7	13			
	RS0112M300ER-M	M	E	●	●	●	●	●	●			0.4	10	3.0	6.7	12.2	3.7	13			
RS0112M320ER-M	M	E	●	●	●	●	●	●			0.2	10	3.2	6.7	12.1	3.7	13				
INTERRUPTED CUTTING																					
 R	RS0112M020ER-R	M	E	●	●	●	●	●	●			1.8	10	0.2	6.7	12.5	3.7	13			
	RS0112M040ER-R	M	E	●	●	●	●	●	●			1.6	10	0.4	6.7	12.5	3.7	13			
	RS0112M080ER-R	M	E	●	●	●	●	●	●			1.2	10	0.8	6.7	12.4	3.7	13			
	RS0112M100ER-R	M	E	●	●	●	●	●	●			1.0	10	1.0	6.7	12.4	3.7	13			
	RS0112M120ER-R	M	E	●	●	●	●	●	●			0.8	10	1.2	6.7	12.3	3.7	13			
	RS0112M160ER-R	M	E	●	●	●	●	●	●			0.6	10	1.6	6.7	12.3	3.7	13			
	RS0112M200ER-R	M	E	●	●	●	●	●	●			1.2	10	2.0	6.7	12.3	3.7	13			
	RS0112M240ER-R	M	E	●	●	●	●	●	●			0.7	10	2.4	6.7	12.2	3.7	13			
	RS0112M300ER-R	M	E	●	●	●	●	●	●			0.4	10	3.0	6.7	12.2	3.7	13			
RS0112M320ER-R	M	E	●	●	●	●	●	●			0.2	10	3.2	6.7	12.1	3.7	13				
HEAVY INTERRUPTED CUTTING																					
 H	RS0112M080ER-H	M	E	●	●	●	●	●	●			1.2	10	0.8	6.7	12.4	3.7	13			

SPARE PARTS

Tool holder type



Clamp screw



Wrench



Anti-seize Lubricant

RS0112

TPS27F0

TIP08W

MK1KS

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* Clamp torque (N • m) : TPS27F0 = 1.4

SET BOLT (SOLD SEPARATELY)

Arbor type	Set bolt		Fig.	Reference dimensions (mm)								Geometry
	With coolant hole	Without coolant hole										
	Order number	Order number		a	b	c	d	e	f	g		
RS0112-03203AR	HSC08025H	—	1	13	M8 x 1.25	33	8	5	—	—	Fig.1	
RS0112-03204AR	HSC08025H	—	1	13	M8 x 1.25	33	8	5	—	—		
RS0112-03205AR	HSC08025H	—	1	13	M8 x 1.25	33	8	5	—	—		
RS0112-04004AR	HSC08025H	—	1	13	M8 x 1.25	33	8	5	—	—		
RS0112-04006AR	HSC08025H	—	1	13	M8 x 1.25	33	8	5	—	—		
RS0112-05005AR	HSC10030H	—	1	16	M10 x 1.5	40	10	6	—	—	Fig.2	
RS0112-05008AR	HSC10030H	—	1	16	M10 x 1.5	40	10	6	—	—		
RS0112-06306AR	HSC10030H	—	1	16	M10 x 1.5	40	10	6	—	—		
RS0112-06309AR	HSC10030H	—	1	16	M10 x 1.5	40	10	6	—	—		
RS0112-06306XR	HSC12035H	HSC12035	1	18	M12 x 1.75	47	12	10	—	—		
RS0112-06309XR	HSC12035H	HSC12035	1	18	M12 x 1.75	47	12	10	—	—		
RS0112-08008AR	HSC12035H	HSC12035	1	18	M12 x 1.75	47	12	10	—	—		
RS0112-08010AR	HSC12035H	HSC12035	1	18	M12 x 1.75	47	12	10	—	—		
RS0112-10008BR	MBA16033H	—	2	40	M16 x 2.0	43	10	14	6	23		
RS0112-10012BR	MBA16033H	—	2	40	M16 x 2.0	43	10	14	6	23		
RS0112J08008AR	HSC12035H	HSC12035	1	18	M12 x 1.75	47	12	10	—	—		
RS0112J08010AR	HSC12035H	HSC12035	1	18	M12 x 1.75	47	12	10	—	—		
RS0112J10008BR	MBA16033H	—	2	40	M16 x 2.0	43	10	14	6	23		
RS0112J10012BR	MBA16033H	—	2	40	M16 x 2.0	43	10	14	6	23		

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1. Please purchase the appropriate set bolt after confirming the reference dimensions.
The items with an order number listed under the Set Bolt columns are also sold by Mitsubishi Materials.
2. Internal coolant is necessary with the set bolt.

RECOMMENDED CUTTING CONDITIONS

CHIPBREAKER SELECTION TABLE

	Material	Properties	Cutting conditions	Chipbreaker		Grade	
				1st	2nd	1st	2nd
				Recommendation	Recommendation	Recommendation	Recommendation
P	Mild steel	Hardness $\leq 180\text{HB}$	● ● ✱	M	R	MV1030	MP1220
				R	M	MP1230	MP1240
	Carbon steel, Alloy steel, Alloy tool steel	Hardness 180 – 350HB	● ● ✱	M	R	MV1030	MP1220
		$\leq 350\text{HB}$ (Annealing)		R	M	MP1230	MP1240
M	Austenitic stainless steel	–	● ● ✱	M	R	MV1030	MP1230
				R	M	MP1230	MP1240
	Ferritic and martensitic, Stainless steel	–	● ● ✱	M	R	MV1030	MP1220
				R	M	MP1220	MP1230
	Precipitation Hardening, Stainless steel	Hardness < 450HB	● ● ✱	M	R	MV1030	MP1230
				R	M	MP1230	MP1240
K	Gray cast iron	Tensile strength $\leq 350\text{MPa}$	● ● ✱	M	R	MP1220	VP15TF
				R	H	MP1220	MP1230
	Ductile cast iron	Tensile strength $\leq 800\text{MPa}$	● ● ✱	M	R	MV1030	MP1220
				R	H	MP1220	MP1230
N	Aluminium alloys	Content Si < 5%	● ● ✱	M	—	TF15	—
S	Titanium alloys	–	● ● ✱	M	R	MP1220	MP1230
				M	R	MP1230	MP1240
	Heat resistant alloys	–	● ● ✱	M	R	MP1220	MP1230
				M	R	MP1230	MP1240
H	Hardened steel	Hardness 40 – 55HRC	● ● ✱	H	—	MP1220	VP15TF

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RECOMMENDED CUTTING CONDITIONS

DRY CUTTING

CUTTING SPEED

Material	Properties	Cutting conditions	Grade	ae			
				≤ 0.25 DC	0.25 – 0.5 DC	0.5 – 0.75 DC	DC (Slot)
				Vc			
P	Mild steel	Hardness ≤ 180HB	MV1020	280 (220 – 330)	270 (210 – 320)	220 (170 – 260)	220 (170 – 260)
			MV1030 MP1220 VP15TF	230 (180 – 270)	220 (170 – 260)	180 (140 – 210)	180 (140 – 210)
			MX3030	160 (120 – 200)	150 (110 – 190)	120 (100 – 150)	—
		✱	MP1230 MP1240	200 (150 – 240)	190 (140 – 230)	150 (110 – 180)	150 (110 – 180)
	Carbon steel, Alloy steel, Alloy tool steel	Hardness 180 – 350HB ≤ 350HB (Annealing)	MV1020	180 (140 – 210)	170 (130 – 200)	140 (110 – 160)	140 (110 – 160)
			MV1030 MP1220 VP15TF	180 (140 – 210)	170 (130 – 200)	140 (110 – 160)	140 (110 – 160)
			MX3030	140 (100 – 180)	130 (90 – 170)	100 (80 – 150)	—
		✱	MP1230 MP1240	150 (110 – 180)	140 (100 – 170)	110 (80 – 130)	110 (80 – 130)
M	Austenitic stainless steel	Hardness ≤ 200HB	MV1030	180 (140 – 210)	170 (130 – 200)	140 (110 – 160)	140 (110 – 160)
			MX3030	120 (80 – 140)	110 (80 – 130)	100 (80 – 120)	—
			MP1230 MP1240 VP15TF	180 (140 – 210)	170 (130 – 200)	140 (110 – 160)	140 (110 – 160)
		Hardness > 200HB	MV1030	150 (110 – 180)	140 (100 – 160)	110 (80 – 130)	110 (80 – 130)
			MX3030	120 (80 – 140)	110 (80 – 130)	100 (80 – 120)	—
			MP1230 MP1240 VP15TF	150 (110 – 180)	140 (100 – 160)	110 (80 – 130)	110 (80 – 130)
	Ferritic and martensitic Stainless steel	—	MV1030	180 (140 – 210)	170 (130 – 200)	140 (110 – 160)	140 (110 – 160)
			MP1220 MP1230 VP15TF	180 (140 – 210)	170 (130 – 200)	140 (110 – 160)	140 (110 – 160)
	Precipitation Hardening Stainless steel	Hardness < 450HB	MV1030	130 (100 – 160)	120 (80 – 140)	90 (60 – 110)	90 (60 – 110)
			MP1230 MP1240 VP15TF	130 (100 – 160)	120 (80 – 140)	90 (60 – 110)	90 (60 – 110)
K	Gray cast iron	Tensile strength ≤ 350MPa	MX3030	120 (80 – 140)	110 (80 – 130)	100 (80 – 120)	—
			MP1220 MP1230 VP15TF	200 (150 – 250)	190 (140 – 240)	160 (110 – 210)	160 (110 – 210)
	Ductile cast iron	Tensile strength ≤ 800MPa	MV1020	200 (140 – 250)	190 (130 – 240)	160 (120 – 210)	160 (120 – 210)
			MV1030	150 (100 – 200)	140 (90 – 190)	120 (80 – 170)	120 (80 – 170)
N	Aluminium alloys	Content Si < 5%	MP1220 MP1230 VP15TF	130 (100 – 150)	120 (90 – 140)	100 (80 – 120)	100 (80 – 120)
H	Hardened steel	Hardness 40 – 55HRC	MP1220 VP15TF	90 (70 – 100)	85 (60 – 100)	70 (50 – 80)	70 (50 – 80)

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- These cutting conditions should be referenced for standard shank types and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
- Chatter and vibration are more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
 - When tool overhang is long (using a long shank, screw-in type, etc.).
 - Rigidity of machine, workpiece material or attachment of workpiece material is low
 - Corner radius during pocket milling
- A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.
- Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)
- When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.
- Wet cutting with internal coolant is recommended for titanium and heat resistant alloys.

RECOMMENDED CUTTING CONDITIONS

WET CUTTING

CUTTING SPEED

Material		Properties	Cutting conditions	Grade	ae			
					≤ 0.25DC	0.25–0.5 DC	0.5–0.75 DC	DC (Slot)
Vc								
P	Mild steel	Hardness ≤ 180HB		MV1020	210 (150 – 290)	200 (140 – 270)	150 (110 – 180)	150 (110 – 180)
				MV1030 MP1220 VP15TF	140 (100 – 190)	130 (90 – 180)	100 (70 – 120)	100 (70 – 120)
				MP1230 MP1240	140 (100 – 190)	130 (90 – 180)	100 (70 – 120)	100 (70 – 120)
	Carbon steel, Alloy steel, Alloy tool steel	Hardness 180 – 350HB ≤ 350HB (Annealing)		MV1020	140 (110 – 160)	130 (90 – 130)	120 (80 – 140)	120 (80 – 140)
				MV1030 MP1220 VP15TF	120 (90 – 140)	110 (80 – 130)	100 (70 – 120)	100 (70 – 120)
				MP1230 MP1240	120 (90 – 140)	110 (80 – 130)	100 (70 – 120)	100 (70 – 120)
M	Austenitic stainless steel	Hardness ≤ 200HB		MV1030	120 (100 – 150)	110 (90 – 140)	90 (70 – 120)	90 (70 – 120)
				MP1230 MP1240	120 (100 – 150)	110 (90 – 140)	90 (70 – 120)	90 (70 – 120)
		Hardness > 200HB		MV1030 MP1230	100 (80 – 130)	90 (70 – 110)	70 (50 – 100)	70 (50 – 100)
				MV1030	120 (100 – 150)	110 (90 – 140)	90 (70 – 120)	90 (70 – 120)
	Ferritic and martensitic Stainless steel	—		MP1220 MP1230 VP15TF	120 (100 – 150)	110 (90 – 140)	90 (70 – 120)	90 (70 – 120)
				MV1030	90 (70 – 120)	80 (60 – 110)	60 (40 – 90)	60 (40 – 90)
	Precipitation Hardening Stainless steel	Hardness < 450HB		MP1230 MP1240	90 (70 – 120)	80 (60 – 110)	60 (40 – 90)	60 (40 – 90)
K	Gray cast iron	Tensile strength ≤ 350MPa		MP1220 MP1230 VP15TF	130 (100 – 150)	120 (90 – 140)	100 (80 – 120)	100 (80 – 120)
	Ductile cast iron	Tensile strength ≤ 800MPa		MV1020	170 (130 – 210)	160 (120 – 200)	140 (110 – 170)	140 (110 – 170)
				MV1030	130 (80 – 180)	120 (70 – 170)	100 (60 – 150)	100 (60 – 150)
				MP1220 MP1230 VP15TF	110 (80 – 140)	100 (70 – 130)	80 (60 – 120)	80 (60 – 120)
N	Aluminium alloys	Content Si < 5%		TF15	600 (200 – 1000)	600 (200 – 1000)	600 (200 – 1000)	600 (200 – 1000)
S	Titanium alloys (Ti-6Al-4V,etc.)	—		MP1220 MP1230 VP15TF	50 (40 – 70)	50 (40 – 70)	50 (40 – 70)	50 (40 – 70)
				MP1230 MP1240	40 (30 – 60)	40 (30 – 60)	40 (30 – 60)	40 (30 – 60)
	Heat resistant alloys	—		MP1220 MP1230 VP15TF	40 (30 – 60)	40 (30 – 60)	40 (30 – 60)	40 (30 – 60)
				MP1230 MP1240	30 (20 – 40)	30 (20 – 40)	30 (20 – 40)	30 (20 – 40)
H	Hardened steel	Hardness 40 – 55HRC		MP1220 VP15TF	90 (70 – 100)	85 (60 – 100)	70 (50 – 80)	70 (50 – 80)

1. These cutting conditions should be referenced for standard shank types and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
2. Chatter and vibration are more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
 - When tool overhang is long (using a long shank, screw-in type, etc.).
 - Rigidity of machine, workpiece material or attachment of workpiece material is low
 - Corner radius during pocket milling
3. A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.
4. Wet cutting is recommended, when focusing on the surface finish. [Tool life is shorter than for dry cutting.]
5. When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.
6. Wet cutting with internal coolant is recommended for titanium and heat resistant alloys.

RECOMMENDED CUTTING CONDITIONS

DEPTH OF CUT / FEED

Material	Properties	ae	Cutting conditions	DC						Cutting mode		
				Ø12 – Ø16		Ø18 – Ø25		Ø28 – Ø100				
				ap	fz	ap	fz	ap	fz			
P	Mild steel	Hardness ≤180HB	≤0.25DC	● ● ✱	≤6	0.10 – 0.15	≤8	0.10 – 0.20	≤10	0.10 – 0.25	Dry, Wet	
			0.25 – 0.5DC	● ● ✱	≤5	0.08 – 0.12	≤8	0.10 – 0.15	≤8	0.10 – 0.20	Dry, Wet	
			0.5 – 0.75DC	● ● ✱	≤4	0.08 – 0.12	≤6	0.08 – 0.12	≤6	0.10 – 0.15	Dry, Wet	
			DC (Slot)	● ● ✱	≤2	0.06 – 0.10	≤4	0.06 – 0.10	≤4	0.08 – 0.12	Dry, Wet	
	Carbon steel, Alloy steel, Alloy tool steel	Hardness 180 – 280HB	≤0.25DC	● ● ✱	≤6	0.10 – 0.15	≤8	0.10 – 0.20	≤10	0.10 – 0.25	Dry, Wet	
			0.25 – 0.5DC	● ● ✱	≤5	0.08 – 0.12	≤8	0.10 – 0.15	≤8	0.10 – 0.20	Dry, Wet	
			0.5 – 0.75DC	● ● ✱	≤4	0.08 – 0.12	≤6	0.08 – 0.12	≤6	0.10 – 0.15	Dry, Wet	
			DC (Slot)	● ● ✱	≤2	0.06 – 0.10	≤4	0.06 – 0.10	≤4	0.08 – 0.12	Dry, Wet	
	Carbon steel, Alloy steel, Alloy tool steel	Hardness 280 – 350HB ≤ 350HB (Annealing)	≤0.25DC	● ● ✱	≤6	0.10 – 0.15	≤8	0.10 – 0.15	≤10	0.10 – 0.20	Dry, Wet	
			0.25 – 0.5DC	● ● ✱	≤5	0.08 – 0.12	≤8	0.08 – 0.12	≤8	0.10 – 0.15	Dry, Wet	
			0.5 – 0.75DC	● ● ✱	≤4	0.08 – 0.12	≤6	0.06 – 0.10	≤6	0.08 – 0.12	Dry, Wet	
			DC (Slot)	● ● ✱	≤2	0.06 – 0.10	≤4	0.06 – 0.10	≤4	0.06 – 0.10	Dry, Wet	
M	Austenitic stainless steel	—	≤0.25DC	● ● ✱	≤6	0.10 – 0.15	≤8	0.10 – 0.20	≤10	0.10 – 0.20	Dry, Wet	
					✱	≤6	0.08 – 0.12	≤8	0.08 – 0.15	≤10	0.08 – 0.15	Dry, Wet
			0.25 – 0.5DC	● ● ✱	≤5	0.08 – 0.12	≤8	0.08 – 0.15	≤8	0.08 – 0.15	Dry, Wet	
					✱	≤5	0.06 – 0.10	≤8	0.08 – 0.12	≤8	0.08 – 0.12	Dry, Wet
			0.5 – 0.75DC	● ● ✱	≤4	0.06 – 0.10	≤6	0.08 – 0.12	≤6	0.08 – 0.12	Dry, Wet	
					✱	≤4	0.06 – 0.08	≤6	0.06 – 0.10	≤6	0.06 – 0.10	Dry, Wet
			DC (Slot)	● ● ✱	≤2	0.06 – 0.10	≤4	0.06 – 0.10	≤4	0.06 – 0.10	Dry, Wet	
					✱	≤2	0.06 – 0.08	≤4	0.06 – 0.08	≤4	0.06 – 0.08	Dry, Wet
	Ferritic and martensitic Stainless steel	—	≤0.25DC	● ● ✱	≤6	0.10 – 0.15	≤8	0.10 – 0.20	≤10	0.10 – 0.20	Dry, Wet	
					✱	≤6	0.08 – 0.12	≤8	0.08 – 0.15	≤10	0.08 – 0.15	Dry, Wet
			0.25 – 0.5DC	● ● ✱	≤5	0.08 – 0.12	≤8	0.08 – 0.15	≤8	0.08 – 0.15	Dry, Wet	
					✱	≤5	0.06 – 0.10	≤8	0.08 – 0.12	≤8	0.08 – 0.12	Dry, Wet
			0.5 – 0.75DC	● ● ✱	≤4	0.06 – 0.10	≤6	0.08 – 0.12	≤6	0.08 – 0.12	Dry, Wet	
					✱	≤4	0.06 – 0.08	≤6	0.06 – 0.10	≤6	0.05 – 0.10	Dry, Wet
			DC (Slot)	● ● ✱	≤2	0.06 – 0.10	≤4	0.06 – 0.10	≤4	0.05 – 0.10	Dry, Wet	
					✱	≤2	0.06 – 0.08	≤4	0.06 – 0.08	≤4	0.05 – 0.08	Dry, Wet
	Precipitation hardening stainless steel	Hardness < 450HB	≤0.25DC	● ● ✱	≤6	0.10 – 0.15	≤8	0.10 – 0.15	≤10	0.10 – 0.15	Dry, Wet	
					✱	≤6	0.08 – 0.12	≤8	0.08 – 0.12	≤10	0.08 – 0.12	Dry, Wet
			0.25 – 0.5DC	● ● ✱	≤5	0.08 – 0.12	≤8	0.08 – 0.12	≤8	0.08 – 0.12	Dry, Wet	
					✱	≤5	0.06 – 0.10	≤8	0.08 – 0.12	≤8	0.08 – 0.12	Dry, Wet
			0.5 – 0.75DC	● ● ✱	≤4	0.06 – 0.10	≤6	0.06 – 0.10	≤6	0.05 – 0.10	Dry, Wet	
					✱	≤4	0.06 – 0.08	≤6	0.06 – 0.08	≤6	0.05 – 0.08	Dry, Wet
			DC (Slot)	● ● ✱	≤2	0.06 – 0.10	≤4	0.06 – 0.10	≤4	0.05 – 0.10	Dry, Wet	
					✱	≤2	0.06 – 0.08	≤4	0.06 – 0.08	≤4	0.06 – 0.08	Dry, Wet

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- These cutting conditions should be referenced for standard shank types and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
- Chatter and vibration are more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
 - When tool overhang is long (using a long shank, screw-in type, etc.).
 - Rigidity of machine, workpiece material or attachment of workpiece material is low
 - Corner radius during pocket milling
- A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.
- Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)
- When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.
- Wet cutting with internal coolant is recommended for titanium and heat resistant alloys.

RECOMMENDED CUTTING CONDITIONS – DEPTH OF CUT / FEED

Material	Properties	ae	Cutting conditions	DC						Cutting mode				
				Ø12 – Ø16		Ø18 – Ø25		Ø28 – Ø100						
				ap	fz	ap	fz	ap	fz					
K	Gray cast iron	Tensile strength ≤ 350MPa	≤0.25DC	● ●	≤6	0.10 – 0.15	≤8	0.10 – 0.20	≤10	0.10 – 0.25	Dry, Wet			
				✱	≤6	0.08 – 0.12	≤8	0.08 – 0.15	≤10	0.10 – 0.20	Dry, Wet			
			0.25 – 0.5DC	● ●	≤5	0.08 – 0.12	≤8	0.08 – 0.15	≤8	0.10 – 0.20	Dry, Wet			
				✱	≤5	0.06 – 0.10	≤8	0.08 – 0.12	≤8	0.10 – 0.15	Dry, Wet			
			0.5 – 0.75DC	● ●	≤4	0.08 – 0.12	≤6	0.06 – 0.10	≤6	0.10 – 0.15	Dry, Wet			
				✱	≤4	0.08 – 0.12	≤6	0.06 – 0.10	≤6	0.08 – 0.12	Dry, Wet			
			DC (Slot)	● ●	≤2	0.06 – 0.10	≤4	0.06 – 0.10	≤4	0.08 – 0.15	Dry, Wet			
			✱	≤2	0.06 – 0.08	≤4	0.06 – 0.08	≤4	0.06 – 0.10	Dry, Wet				
		Ductile cast iron	Tensile strength ≤ 800MPa	≤0.25DC	● ●	≤6	0.10 – 0.15	≤8	0.10 – 0.20	≤10	0.10 – 0.20	Dry, Wet		
					✱	≤6	0.08 – 0.12	≤8	0.10 – 0.15	≤10	0.10 – 0.15	Dry, Wet		
				0.25 – 0.5DC	● ●	≤5	0.08 – 0.12	≤8	0.10 – 0.15	≤8	0.10 – 0.15	Dry, Wet		
					✱	≤5	0.06 – 0.10	≤8	0.08 – 0.12	≤8	0.08 – 0.12	Dry, Wet		
	0.5 – 0.75DC			● ●	≤4	0.08 – 0.12	≤6	0.08 – 0.12	≤6	0.08 – 0.12	Dry, Wet			
				✱	≤4	0.08 – 0.12	≤6	0.08 – 0.12	≤6	0.06 – 0.10	Dry, Wet			
		DC (Slot)	● ●	≤2	0.06 – 0.10	≤4	0.06 – 0.10	≤4	0.06 – 0.10	Dry, Wet				
		✱	≤2	0.06 – 0.08	≤4	0.06 – 0.08	≤4	0.06 – 0.08	Dry, Wet					
	N	Aluminium alloys	Content Si < 5%	≤0.25DC	● ●	≤6	0.10 – 0.20	≤8	0.10 – 0.25	≤10	0.10 – 0.25	Dry, Wet		
					✱	≤6	0.10 – 0.15	≤8	0.10 – 0.20	≤10	0.10 – 0.20	Dry, Wet		
0.25 – 0.5DC				● ●	≤5	0.10 – 0.15	≤8	0.10 – 0.20	≤8	0.10 – 0.20	Dry, Wet			
				✱	≤5	0.08 – 0.12	≤8	0.10 – 0.15	≤8	0.10 – 0.15	Dry, Wet			
0.5 – 0.75DC				● ●	≤4	0.08 – 0.12	≤6	0.06 – 0.15	≤6	0.08 – 0.15	Dry, Wet			
				✱	≤4	0.06 – 0.10	≤6	0.06 – 0.15	≤6	0.08 – 0.15	Dry, Wet			
				DC (Slot)	● ●	≤2	0.06 – 0.10	≤4	0.06 – 0.15	≤4	0.08 – 0.15	Dry, Wet		
				✱	≤2	0.06 – 0.08	≤4	0.06 – 0.12	≤4	0.08 – 0.12	Dry, Wet			
S				Titanium alloys (Ti-6Al-4V,etc.)	–	≤0.25DC	● ●	≤6	0.08 – 0.15	≤8	0.08 – 0.15	≤10	0.08 – 0.15	Wet
						0.25 – 0.5DC	● ●	≤5	0.08 – 0.12	≤8	0.08 – 0.12	≤8	0.08 – 0.12	Wet
	0.5 – 0.75DC	● ●	≤4			0.06 – 0.10	≤6	0.06 – 0.10	≤6	0.06 – 0.10	Wet			
	DC (Slot)	● ●	≤2			0.06 – 0.10	≤4	0.06 – 0.10	≤4	0.06 – 0.10	Wet			
		0.25DC	● ●	≤6	0.08 – 0.12	≤8	0.08 – 0.12	≤10	0.08 – 0.12	Wet				
		0.25 – 0.5DC	● ●	≤5	0.08 – 0.12	≤8	0.08 – 0.12	≤8	0.08 – 0.12	Wet				
		0.5 – 0.75DC	● ●	≤4	0.06 – 0.10	≤6	0.06 – 0.10	≤6	0.06 – 0.10	Wet				
		DC (Slot)	● ●	≤2	0.06 – 0.10	≤4	0.06 – 0.10	≤4	0.06 – 0.10	Wet				
Heat resistant alloys	–	≤0.25DC	● ●	≤6	0.08 – 0.12	≤8	0.08 – 0.12	≤10	0.08 – 0.12	Wet				
		0.25 – 0.5DC	● ●	≤5	0.08 – 0.12	≤8	0.08 – 0.12	≤8	0.08 – 0.12	Wet				
		0.5 – 0.75DC	● ●	≤4	0.06 – 0.10	≤6	0.06 – 0.10	≤6	0.06 – 0.10	Wet				
		DC (Slot)	● ●	≤2	0.06 – 0.08	≤4	0.06 – 0.10	≤4	0.06 – 0.08	Wet				
H	Hardened steel	Hardness 40 – 55HRC	≤0.25DC	● ●	≤4	0.08 – 0.15	≤4	0.08 – 0.15	≤4	0.08 – 0.15	Dry, Wet			
				✱	≤4	0.08 – 0.12	≤4	0.08 – 0.12	≤4	0.08 – 0.12	Dry, Wet			
			0.25 – 0.5DC	● ●	≤3	0.08 – 0.12	≤3	0.08 – 0.12	≤3	0.08 – 0.12	Dry, Wet			
				✱	≤3	0.06 – 0.10	≤3	0.06 – 0.10	≤3	0.06 – 0.10	Dry, Wet			
			0.5 – 0.75DC	● ●	≤2	0.06 – 0.10	≤2	0.06 – 0.10	≤2	0.06 – 0.10	Dry, Wet			
				✱	≤2	0.06 – 0.10	≤2	0.06 – 0.10	≤2	0.06 – 0.10	Dry, Wet			
				DC (Slot)	● ●	≤1	0.06 – 0.10	≤1	0.06 – 0.10	≤1	0.06 – 0.10	Dry, Wet		
				✱	≤1	0.06 – 0.08	≤1	0.06 – 0.08	≤1	0.06 – 0.08	Dry, Wet			

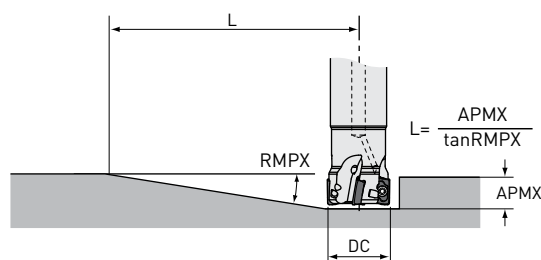
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- These cutting conditions should be referenced for standard shank types and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
- Chatter and vibration are more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
 - When tool overhang is long (using a long shank, screw-in type, etc.).
 - Rigidity of machine, workpiece material or attachment of workpiece material is low
 - Corner radius during pocket milling
- A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.
- Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)
- When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.
- Wet cutting with internal coolant is recommended for titanium and heat resistant alloys.

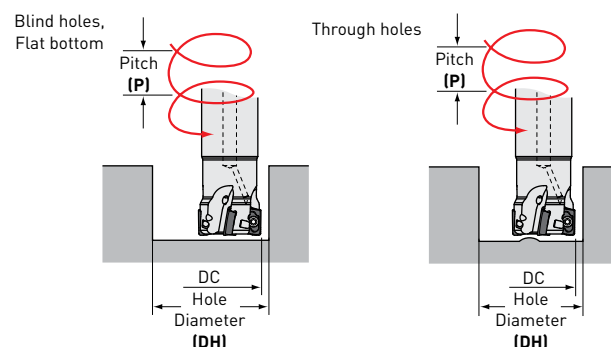
Cutting conditions : ● : Stable cutting ● : General cutting ✱ : Unstable cutting

RAMPING/HELICAL MILLING

RAMPING



HELICAL MILLING



Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

DC	RE	Ramping		Helical milling (Blind hole, Flat bottom)				Helical milling (Through hole)	
		RMPX	L *	DH max.	P max.	DH min.	P max.	DH min.	P max.
12	0.2	6.2°	93	23.0	3	19.58	2	15.6	1
	0.4	6.2°	93	22.6	3	19.60	2	15.6	1
	0.8	6.2°	93	21.8	3	19.64	2	15.6	1
	1.0	6.2°	93	21.4	3	19.66	2	15.6	1
	1.2	6.2°	93	21.0	3	19.68	2	15.6	1
	1.6	6.2°	93	20.2	2	19.06	2	15.6	1
	2.0	6.2°	93	19.4	2	17.43	1	15.6	1
	2.4	6.2°	93	18.6	2	17.49	1	15.6	1
	3.0	6.2°	93	17.4	1	17.58	1	15.6	1
	3.2	6.2°	93	17.0	1	17.60	1	15.6	1
14	0.2	7.9°	73	27.0	5	23.59	4	18.4	1
	0.4	7.9°	73	26.6	5	23.61	4	18.4	1
	0.8	7.9°	73	25.8	5	23.65	4	18.4	1
	1.0	7.9°	73	25.4	4	23.67	4	18.4	1
	1.2	7.9°	73	25.0	4	23.69	4	18.4	1
	1.6	7.9°	73	24.2	4	23.07	3	18.4	1
	2.0	7.9°	73	23.4	4	21.33	3	18.4	1
	2.4	7.9°	73	22.6	3	21.38	3	18.4	1
	3.0	7.9°	73	21.4	3	21.25	3	18.4	1
	3.2	7.9°	73	21.0	3	21.26	3	18.4	1
16	0.2	10.4°	55	31.0	8	27.63	6	20.6	2
	0.4	10.4°	55	30.6	8	27.65	6	20.6	2
	0.8	10.4°	55	29.8	7	27.70	6	20.6	2
	1.0	10.4°	55	29.4	7	27.72	6	20.6	2
	1.2	10.4°	55	29.0	7	27.74	6	20.6	2
	1.6	10.4°	55	28.2	7	27.14	6	20.6	2
	2.0	10.4°	55	27.4	6	25.34	5	20.6	2
	2.4	10.4°	55	26.6	6	25.39	5	20.6	2
	3.0	10.4°	55	25.4	5	25.12	5	20.6	2
	3.2	10.4°	55	25.0	5	25.12	5	20.6	2
18	0.2	8.2°	70	35.0	7	31.66	6	23.8	2
	0.4	8.2°	70	34.6	7	31.68	6	23.8	2
	0.8	8.2°	70	33.8	7	31.73	6	23.8	2
	1.0	8.2°	70	33.4	6	31.76	6	23.8	2
	1.2	8.2°	70	33.0	6	31.78	6	23.8	2
	1.6	8.2°	70	32.2	6	31.19	5	23.8	2
	2.0	8.2°	70	31.4	6	29.37	5	23.8	2
	2.4	8.2°	70	30.6	5	29.42	5	23.8	2
	3.0	8.2°	70	29.4	5	29.10	5	23.8	2
	3.2	8.2°	70	29.0	4	29.09	5	23.8	2

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* L [= APMX / tan RMPX]. Cutter travel distance until the depth of cut reaches APMX at the maximum ramping angle.
The maximum depth of cut APMX for RS0112 is 10 mm.

1. Reduce the table feed when performing ramping or helical machining.
2. During ramping and helical machining, particularly drilling operations, long continuous chips may be generated and scattered. Ensure adequate safety precautions are taken.

RAMPING/HELICAL MILLING

DC	RE	Ramping		Helical milling (Blind hole, Flat bottom)				Helical milling (Through hole)	
		RMPX	L *	DH max.	P max.	DH min.	P max.	DH min.	P max.
20	0.2	6.7°	86	39.0	7	35.66	5	27.7	2
	0.4	6.7°	86	38.6	6	35.68	5	27.7	2
	0.8	6.7°	86	37.8	6	35.73	5	27.7	2
	1.0	6.7°	86	37.4	6	35.76	5	27.7	2
	1.2	6.7°	86	37.0	6	35.78	5	27.7	2
	1.6	6.7°	86	36.2	5	35.19	5	27.7	2
	2.0	6.7°	86	35.4	5	33.37	4	27.7	2
	2.4	6.7°	86	34.6	5	33.42	4	27.7	2
	3.0	6.7°	86	33.4	4	33.10	4	27.7	2
	3.2	6.7°	86	33.0	4	33.09	4	27.7	2
22	0.2	5.6	102	43.0	6	39.70	5	31.3	2
	0.4	5.6	102	42.6	6	39.73	5	31.3	2
	0.8	5.6	102	41.8	6	39.79	5	31.3	2
	1.0	5.6	102	41.4	5	39.82	5	31.3	2
	1.2	5.6	102	41.0	5	39.84	5	31.3	2
	1.6	5.6	102	40.2	5	39.27	5	31.3	2
	2.0	5.6	102	39.4	5	37.43	4	31.3	2
	2.4	5.6	102	38.6	5	37.49	4	31.3	2
	3.0	5.6	102	37.4	4	37.11	4	31.3	2
	3.2	5.6	102	37.0	4	37.11	4	31.3	2
25	0.2	4.5	128	49.0	5	45.76	5	37.1	2
	0.4	4.5	128	48.6	5	45.79	5	37.1	2
	0.8	4.5	128	47.8	5	45.85	5	37.1	2
	1.0	4.5	128	47.4	5	45.89	5	37.1	2
	1.2	4.5	128	47.0	5	45.92	5	37.1	2
	1.6	4.5	128	46.2	5	45.36	5	37.1	2
	2.0	4.5	128	45.4	5	43.51	4	37.1	2
	2.4	4.5	128	44.6	4	43.58	4	37.1	2
	3.0	4.5	128	43.4	4	43.15	4	37.1	2
	3.2	4.5	128	43.0	4	43.15	4	37.1	2
28	0.2	3.7	155	55.0	5	51.75	4	43.1	3
	0.4	3.7	155	54.6	5	51.78	4	43.1	3
	0.8	3.7	155	53.8	5	51.85	4	43.1	3
	1.0	3.7	155	53.4	5	51.88	4	43.1	3
	1.2	3.7	155	53.0	5	51.91	4	43.1	3
	1.6	3.7	155	52.2	4	51.35	4	43.1	3
	2.0	3.7	155	51.4	4	49.51	4	43.1	3
	2.4	3.7	155	50.6	4	49.57	4	43.1	3
	3.0	3.7	155	49.4	4	49.15	4	43.1	3
	3.2	3.7	155	49.0	4	49.15	4	43.1	3
30	0.2	3.4	169	59.0	5	55.75	4	47.1	3
	0.4	3.4	169	58.6	5	55.78	4	47.1	3
	0.8	3.4	169	57.8	5	55.85	4	47.1	3
	1.0	3.4	169	57.4	5	55.88	4	47.1	3
	1.2	3.4	169	57.0	5	55.91	4	47.1	3
	1.6	3.4	169	56.2	4	55.35	4	47.1	3
	2.0	3.4	169	55.4	4	53.50	4	47.1	3
	2.4	3.4	169	54.6	4	53.57	4	47.1	3
	3.0	3.4	169	53.4	4	53.14	4	47.1	3
	3.2	3.4	169	53.0	4	53.14	4	47.1	3
32	0.2	3.1	185	63.0	5	59.65	4	51	3
	0.4	3.1	185	62.6	5	59.68	4	51	3
	0.8	3.1	185	61.8	5	59.74	4	51	3
	1.0	3.1	185	61.4	5	59.77	4	51	3
	1.2	3.1	185	61.0	4	59.81	4	51	3
	1.6	3.1	185	60.2	4	59.25	4	51	3
	2.0	3.1	185	59.4	4	57.40	4	51	3
	2.4	3.1	185	58.6	4	57.46	4	51	3
	3.0	3.1	185	57.4	4	57.04	4	51	3
	3.2	3.1	185	57.0	4	57.04	4	51	3

2/3

* L [= APMX / tan RMPX]. Cutter travel distance until the depth of cut reaches APMX at the maximum ramping angle.
The maximum depth of cut APMX for RS0112 is 10 mm.

1. Reduce the table feed when performing ramping or helical machining.
2. During ramping and helical machining, particularly drilling operations, long continuous chips may be generated and scattered. Ensure adequate safety precautions are taken.

RAMPING/HELICAL MILLING

DC	RE	Ramping		Helical milling (Blind hole, Flat bottom)				Helical milling (Through hole)	
		RMPX	L *	DH max.	P max.	DH min.	P max.	DH min.	P max.
35	0.2	2.7	213	69.0	5	65.74	4	57	3
	0.4	2.7	213	68.6	4	65.77	4	57	3
	0.8	2.7	213	67.8	4	65.84	4	57	3
	1.0	2.7	213	67.4	4	65.87	4	57	3
	1.2	2.7	213	67.0	4	65.90	4	57	3
	1.6	2.7	213	66.2	4	65.34	4	57	3
	2.0	2.7	213	65.4	4	63.50	4	57	3
	2.4	2.7	213	64.6	4	63.56	4	57	3
	3.0	2.7	213	63.4	4	63.14	4	57	3
40	0.2	2.2	261	79.0	4	75.64	4	67	3
	0.4	2.2	261	78.6	4	75.67	4	67	3
	0.8	2.2	261	77.8	4	75.73	4	67	3
	1.0	2.2	261	77.4	4	75.77	4	67	3
	1.2	2.2	261	77.0	4	75.80	4	67	3
	1.6	2.2	261	76.2	4	75.24	4	67	3
	2.0	2.2	261	75.4	4	73.39	4	67	3
	2.4	2.2	261	74.6	4	73.45	4	67	3
	3.0	2.2	261	73.4	4	73.04	3	67	3
50	0.2	1.7	337	99.0	4	95.63	4	87	3
	0.4	1.7	337	98.6	4	95.67	4	87	3
	0.8	1.7	337	97.8	4	95.73	4	87	3
	1.0	1.7	337	97.4	4	95.76	4	87	3
	1.2	1.7	337	97.0	4	95.80	4	87	3
	1.6	1.7	337	96.2	4	95.23	4	87	3
	2.0	1.7	337	95.4	4	93.39	4	87	3
	2.4	1.7	337	94.6	4	93.45	4	87	3
	3.0	1.7	337	93.4	4	93.03	4	87	3
63	0.2	1.3	441	125.0	4	121.63	4	113	3
	0.4	1.3	441	124.6	4	121.66	4	113	3
	0.8	1.3	441	123.8	4	121.73	4	113	3
	1.0	1.3	441	123.4	4	121.76	4	113	3
	1.2	1.3	441	123.0	4	121.79	4	113	3
	1.6	1.3	441	122.2	4	121.23	4	113	3
	2.0	1.3	441	121.4	4	119.38	4	113	3
	2.4	1.3	441	120.6	4	119.44	4	113	3
	3.0	1.3	441	119.4	4	119.03	3	113	3
80	0.2	1	573	159.0	4	155.63	4	147	3
	0.4	1	573	158.6	4	155.66	4	147	3
	0.8	1	573	157.8	4	155.72	4	147	3
	1.0	1	573	157.4	4	155.76	4	147	3
	1.2	1	573	157.0	4	155.79	4	147	3
	1.6	1	573	156.2	4	155.22	4	147	3
	2.0	1	573	155.4	4	153.38	4	147	3
	2.4	1	573	154.6	4	153.44	4	147	3
	3.0	1	573	153.4	4	153.03	4	147	3
100	0.2	0.8	717	199.0	4	195.62	4	187	3
	0.4	0.8	717	198.6	4	195.66	4	187	3
	0.8	0.8	717	197.8	4	195.72	4	187	3
	1.0	0.8	717	197.4	4	195.75	4	187	3
	1.2	0.8	717	197.0	4	195.79	4	187	3
	1.6	0.8	717	196.2	4	195.22	4	187	3
	2.0	0.8	717	195.4	4	193.38	4	187	3
	2.4	0.8	717	194.6	4	193.44	4	187	3
	3.0	0.8	717	193.4	4	193.03	4	187	3

3/3

* L (= APMX / tan RMPX). Cutter travel distance until the depth of cut reaches APMX at the maximum ramping angle.
The maximum depth of cut APMX for RS0112 is 10 mm.

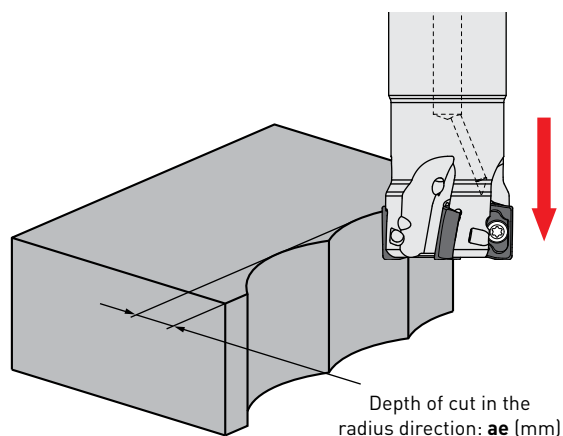
1. Reduce the table feed when performing ramping or helical machining.
2. During ramping and helical machining, particularly drilling operations, long continuous chips may be generated and scattered. Ensure adequate safety precautions are taken.

FOR PLUNGING AND DRILLING

See the tables to the right for cutting conditions. Follow the cutting conditions for slot milling regarding feed per tooth and cutting speed.

PLUNGING

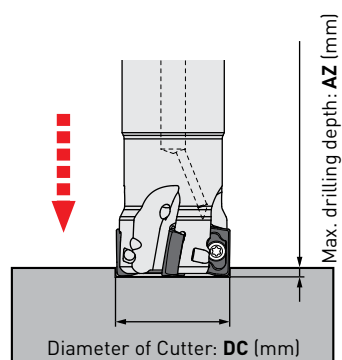
DC	ae max.
12	4.1
14	4.8
16	5.6
18	5.8
20	5.9
22	6.0
25	6.1
28	6.1
30	6.1
32	6.1
35	6.1
40	6.1
50	6.1
63	6.1
80	6.1
100	6.1



1. No step feed necessary.

DRILLING

DC	AZ max.
12	0.3
14	0.3
16	0.3
18	0.3
20	0.3
22	0.3
25	0.3
28	0.3
30	0.3
32	0.3
35	0.3
40	0.3
50	0.3
63	0.3
80	0.3
100	0.3



1. Exercise due caution as chips scatter easily.
2. Use compressed air to eliminate chips (or coolant for when machining aluminium alloy).

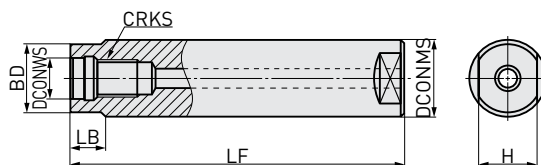
ARBORS

ARBORS FOR SCREW-IN TOOLS

STRAIGHT SHANK ARBOR



With coolant hole



Type	Order number	Stock	DCONWS	DCONMS	BD	LF	LB	H	CRKS
Steel shank type	SC16M08S100S	●	8.5	16	14.5	100	10	10	M8
	SC16M08S200L	●	8.5	16	14.5	200	10	10	M8
	SC20M10S120S	●	10.5	20	18.5	120	10	14	M10
	SC20M10S220L	●	10.5	20	18.5	220	10	14	M10
	SC25M12S125S	●	12.5	25	23.5	125	10	19	M12
	SC25M12S245L	●	12.5	25	23.5	245	10	19	M12
	SC32M16S140S	●	17.0	32	28.5	140	15	24	M16
	SC32M16S280L	●	17.0	32	28.5	280	15	24	M16
Carbide shank type	SC16M08S100SW	●	8.5	16	14.5	100	10	10	M8
	SC16M08S200LW	●	8.5	16	14.5	200	10	10	M8
	SC20M10S120SW	●	10.5	20	18.5	120	10	14	M10
	SC20M10S220LW	●	10.5	20	18.5	220	10	14	M10
	SC25M12S125SW	●	12.5	25	23.5	125	10	19	M12
	SC25M12S245LW	●	12.5	25	23.5	245	10	19	M12
	SC32M16S140SW	●	17.0	32	28.5	140	15	24	M16
	SC32M16S280LW	●	17.0	32	28.5	280	15	24	M16

1/1

HOW TO INSTALL THE SCREW-IN HEAD

- ① Thoroughly clean the clamp section of the head and the arbor with an air blower or brush before installation.
- ② Tighten the head at the recommended torque and ensure that there is no gap between the head and arbor.

Screw size	Recommended torque (N • m)	Wrench size
M8	23	10
M10	46	14
M12	80	19
M16	90	24



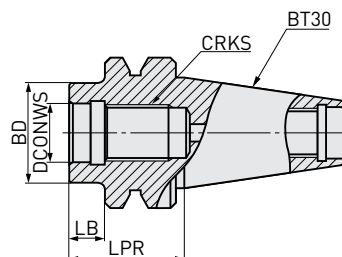
- Cutting tools become extremely hot during cutting. Never touch them with bare hands after operation as this may produce risk of injuries or burns.
- Do not handle the cutting edges with bare hands as this may cause injuries.

ARBORS – ARBORS FOR SCREW-IN TOOLS

BT30 SHANK ARBOR



With coolant hole

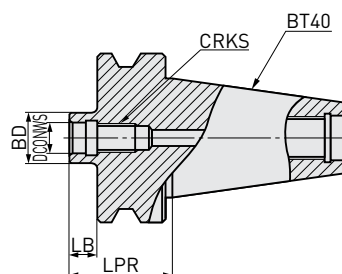


Order number	Stock	DCONWS	BD	LPR	LB	CRKS
SC16M08S10-BT30	●	8.5	14.5	32	10	M8
SC20M10S10-BT30	●	10.5	18.5	32	10	M10
SC25M12S10-BT30	●	12.5	23.5	32	10	M12
SC32M16S10-BT30	●	17.0	28.5	32	10	M16

BT40 SHANK ARBOR



With coolant hole

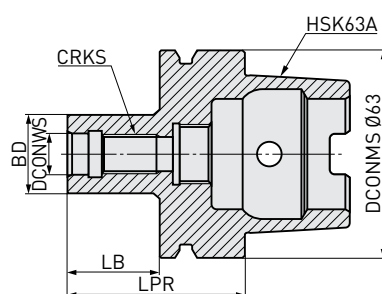


Order number	Stock	DCONWS	BD	LPR	LB	CRKS
SC16M08S10-BT40	●	8.5	14.5	37	10	M8
SC20M10S10-BT40	●	10.5	18.5	37	10	M10
SC25M12S10-BT40	●	12.5	23.5	37	10	M12
SC32M16S10-BT40	●	17.0	28.5	37	10	M16

HSK63A SHANK ARBOR



With coolant hole



Order number	Stock	DCONWS	BD	LPR	LB	CRKS
SC16M08S22-HSK63A	●	8.5	14.5	48	22	M8
SC20M10S24-HSK63A	●	10.5	18.5	50	24	M10
SC25M12S27-HSK63A	●	12.5	23.5	53	27	M12
SC32M16S28-HSK63A	●	17.0	28.5	54	28	M16

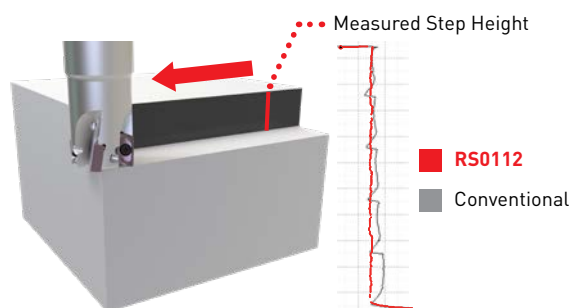
1. The HSK63A shank type has a built-in coolant pipe for installation.

CUSTOMER APPLICATION EXAMPLE 1:

COURTESY OF MASHIKO MANUFACTURING CO., LTD.

Compared to conventional products, the step height was reduced by 90%, and continuous machining was achieved without insert adhesion or flaking.

Material	JIS SS400
Component	Machine parts
Cutter Dia. DC (mm)	25, 4 flutes
Insert	MP1220 M
Vc (m/min)	95 – 118
fz (mm/t.)	0.07 – 0.08
ap (mm)	5 x 4
ae (mm)	0.2 (Finishing allowance)
Cutting mode	Dry cutting

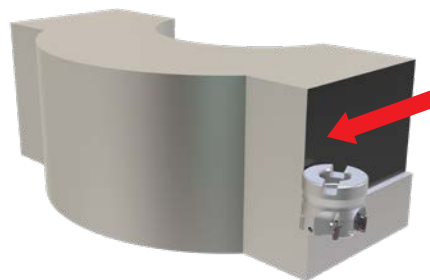


CUSTOMER APPLICATION EXAMPLE 2:

MACHINED MECHANICAL COMPONENT – S45C SHOULDER MILLING

Tool life was doubled compared to conventional products, with clearly superior results also achieved in surface finish quality.

Material	JIS S45C
Cutter Dia. DC (mm)	25, 5 flutes
Insert	MP1230 M
Vc (m/min)	188
fz (mm/t.)	0.125
ap (mm)	5
ae (mm)	5
Cutting mode	Mist machining

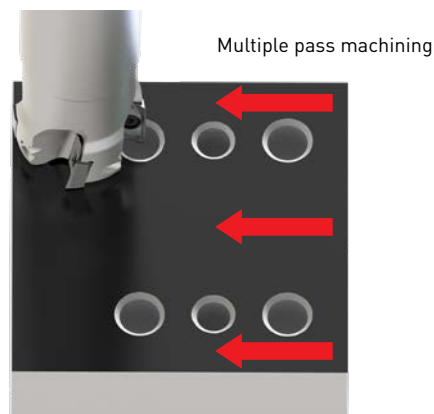


CUSTOMER APPLICATION EXAMPLE 3:

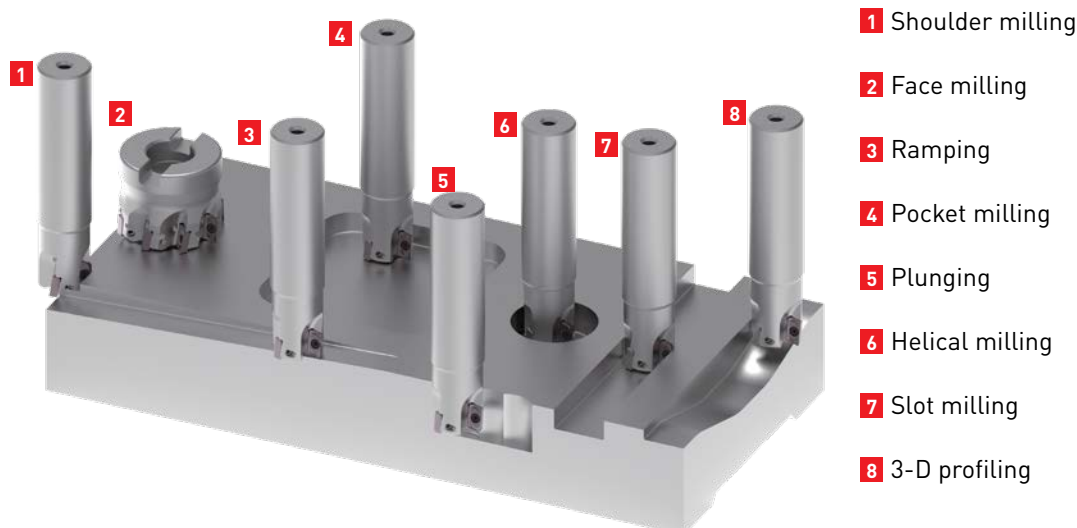
MECHANICAL PART MACHINING EXAMPLE – SS400 FACE MILLING

Even when the depth of cut (ap) was doubled compared to conventional products, no fracture occurred. As a result, productivity doubled and tool life increased by 2.5 times. In addition, machining noise was reduced and cutter path marks on the finished surface were eliminated.

Material	JIS SS400
Component	Machine parts
Cutter Dia. DC (mm)	40, 4 flutes
Insert	MP1230 M
Vc (m/min)	100
fz (mm/t.)	0.19
ap (mm)	Rough machining 0.4 mm x multiple passes → 0.8 mm x multiple passes Finish 0.2 mm
ae (mm)	19 – 40 (Finishing allowance)
Cutting mode	Wet cutting



MULTI-FUNCTIONAL MACHINING FOR AUTOMATION AND LABOUR SAVING



ENVIRONMENTALLY FRIENDLY PRODUCT

This product has been certified as an environmentally friendly product in the machine tool industry by the Japan Cutting & Wear-resistant Tool Association. This is a product unique to the industry, in harmony with the environment, and with the aim of fulfilling the social responsibilities of the machine tool industry. The Japan Cutting & Wear-resistant Tool Association evaluates the product's environmental impact during the manufacturing and usage stages and issues a certification according to the evaluation score.



RS0112



MP1200 Series



MV1030



MX3030

FOR PEOPLE, SOCIETY AND THE EARTH

More information about MITSUBISHI MATERIALS' efforts to address social and environmental issues can be found in the website below or by scanning the QR code.

<https://mmc.disclosure.site/en/>



SYMBOLS



Recommended cutting conditions

NEW

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.

NEW

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/[AlTiSi]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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GERMANY

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