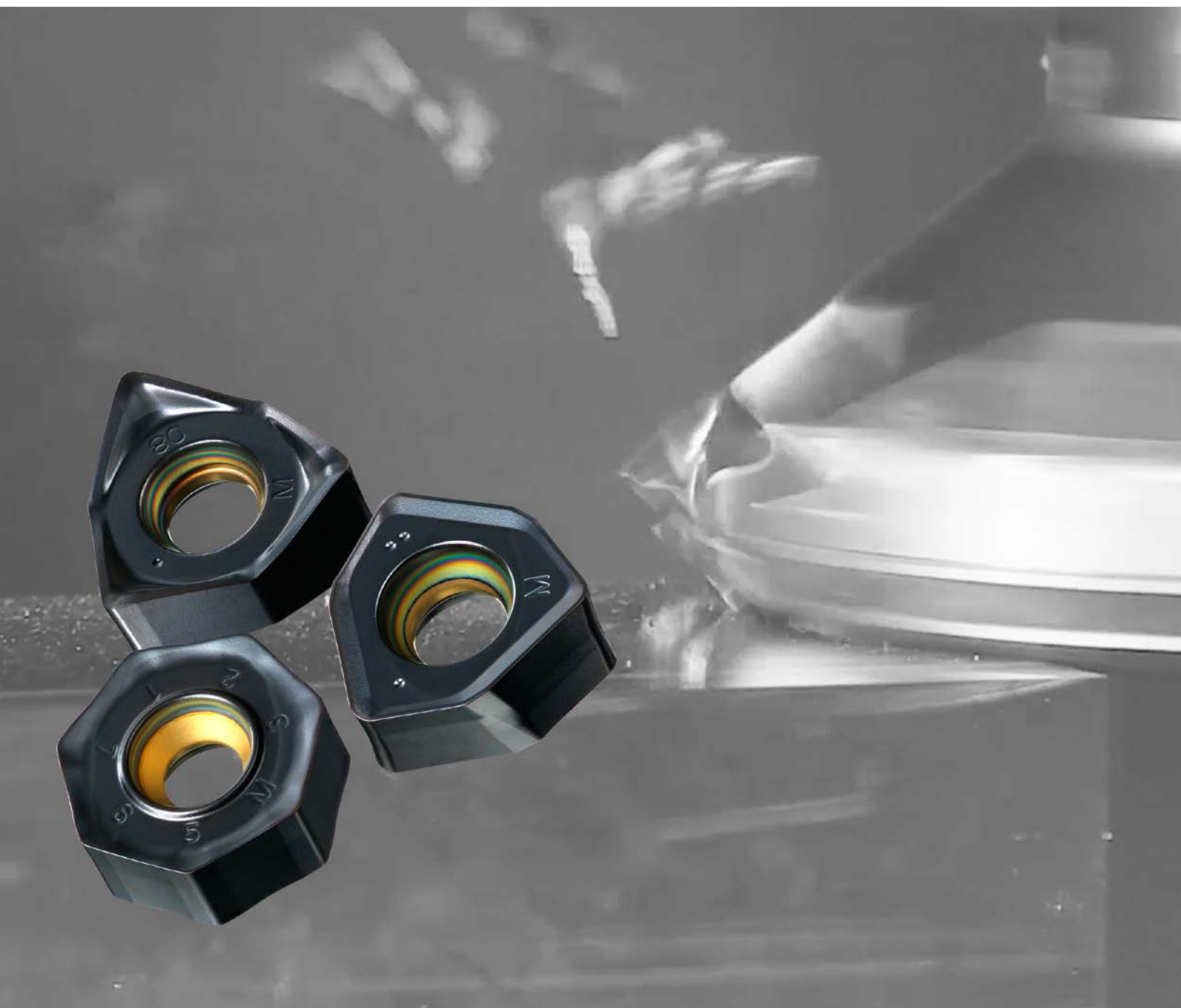


MV1000 SERIES

SETTING A NEW STANDARD FOR TOOL LIFE



MV1000 SERIES

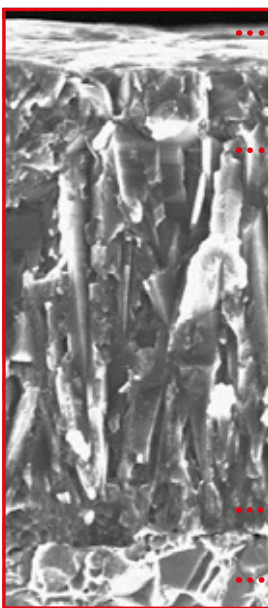
COATED CARBIDE GRADE FOR MILLING

ADVANCED WEAR RESISTANCE

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

ADVANCED THERMAL SHOCK RESISTANCE

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



EXCELLENT WELDING RESISTANCE

Smooth surface.

OUTSTANDING WEAR RESISTANCE

Newly developed Al-Rich coating.

EXCELLENT CHIPPING RESISTANCE FOR STABLE MACHINING

Newly developed bonding layer.

FRACTURE RESISTANCE FOR THE ULTIMATE STABILITY

Exclusive cemented carbide substrate.

Graphical representation

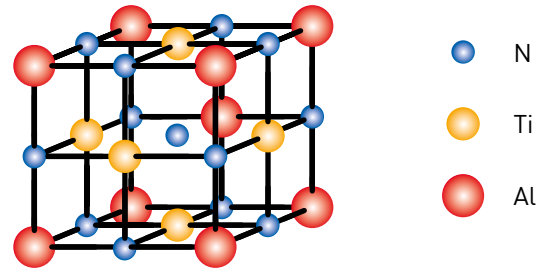


MV1000 SERIES

COMPLETE COATING TECHNOLOGY THAT REWRITES CURRENT TOOL LIFE STANDARDS

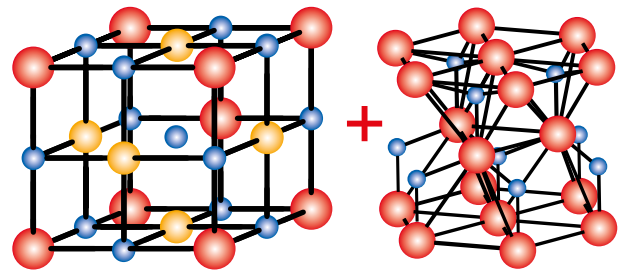
DUE TO THE NEWLY DEVELOPED AL-RICH COATING

Aluminium titanium nitride (Al,Ti)N is a compound of aluminium and titanium that is widely used as a coating for cutting tools due to its extremely hard and heat-resistant properties.



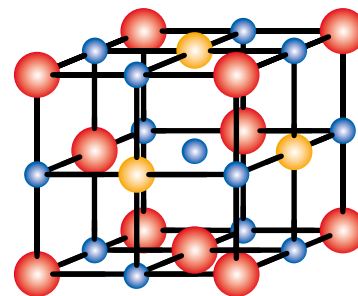
The combination of atoms with different sizes creates an exceptionally hard crystal structure.

The hardness of (Al,Ti)N increases as the Al content ratio increases, but with conventional technology, when the Al content ratio exceeds 60 %, the crystal structure changes and the hardness of (Al,Ti)N decreases.



When the Al ratio is over 60 %, a softer crystal phase is formed.

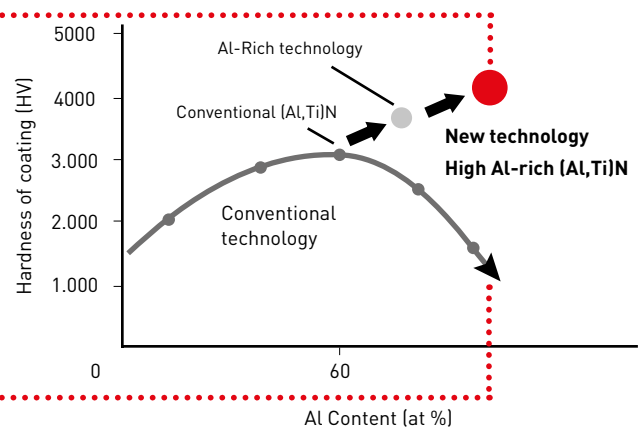
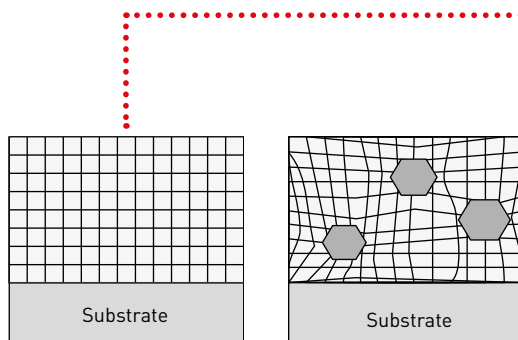
Using a new coating process based on Mitsubishi Materials' own original technology. This is a way in which the Al-Rich coating does not change its crystal structure even when the Al content is increased. This enables a higher Al content and provides a higher hardness (Al,Ti)N.



Crystal image of **MV1000** series

□ High hardness phase

⬡ Soft phase



MV1020 / MV1030

COATED CARBIDE GRADE FOR MILLING

MV1020

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

MV1030

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

Material	ISO	CVD	Material	ISO	CVD	Material	ISO	CVD
P Steel	P10	MV1020	M Stainless steel	M10		K Cast iron	K10	MV1020
	P20	MV1030		M20	MV1030		K20	MV1020
	P30			M30			K30	MV1030
	P40			M40			K40	

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

MV1000 SERIES

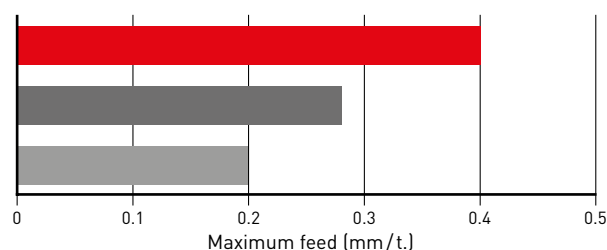
CUTTING PERFORMANCE

MV1030

COMPARISON OF FRACTURE RESISTANCE FOR INTERMITTENT CUTTING OF ALLOY STEEL

MV1030 is capable of high feed machining due to its excellent fracture resistance even during interrupted cutting.

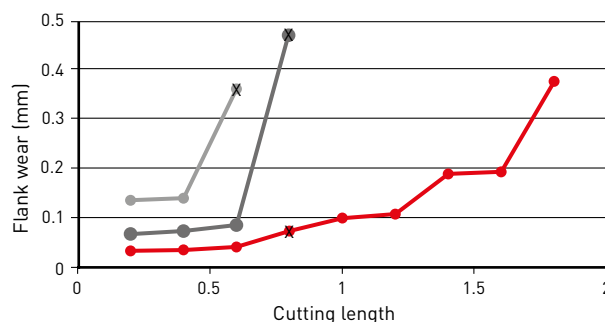
Material	DIN 41CrMo4
Tool	ASX445
Insert	SEMT13T3AGSN-JM
Vc (m/min)	200
ap (mm)	3.0
ae (mm)	100
Cutting mode	Dry cutting



COMPARISON OF WEAR RESISTANCE WHEN MACHINING STAINLESS STEEL

MV1030 suppresses damage at the cut border and can be expected to significantly improve tool life.

Material	DIN X5CrNi189
Tool	ASX445
Insert	SEMT13T3AGSN-JM
Vc (m/min)	180
fz (mm/t)	0.2
ap (mm)	2.0
ae (mm)	100
Cutting mode	Dry cutting Single insert



AFTER MACHINING 0.8 M



MV1030



Conventional A

AFTER MACHINING 0.6 M



Conventional B

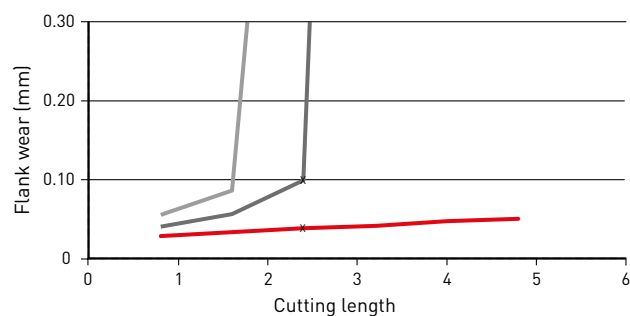
MV1000 SERIES

CUTTING PERFORMANCE

MV1020

COMPARISON OF WEAR RESISTANCE WHEN MACHINING ALLOY STEEL

Material	DIN 41CrMo4
Tool	WWX400
Insert	6NMU1409080PNER-M
Vc (m/min)	300
fz (mm/t)	0.15
ap (mm)	3.0
ae (mm)	52
Cutting mode	Dry cutting Single insert



TAKEN AFTER CUTTING LENGTH OF 2.4 M



MV1020



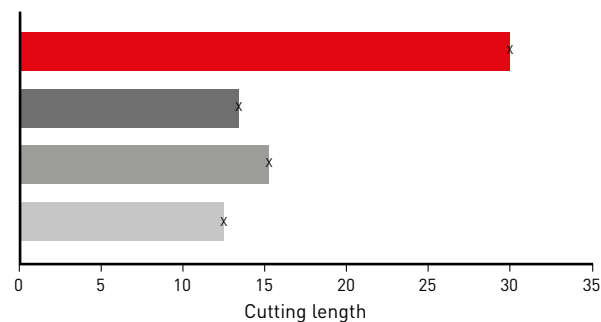
Conventional A



Conventional B

COMPARISON OF WEAR RESISTANCE WHEN MACHINING DUCTILE CAST IRON

Material	DIN GGG70
Tool	WJX14
Insert	JOMU140715ZZER-M
Vc (m/min)	220
fz (mm/t)	1.0
ap (mm)	1.0
ae (mm)	45
Cutting mode	Dry cutting Single insert



30.4 M



MV1020

13.6 M



Conventional A

15.2 M



Conventional B

12.8 M



Conventional C

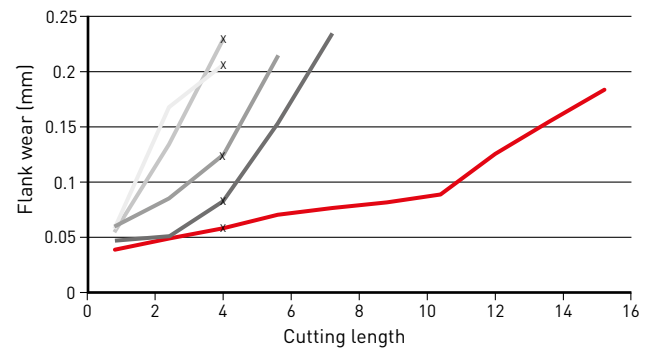
MV1000 SERIES

CUTTING PERFORMANCE

MV1020

COMPARISON OF WEAR RESISTANCE WHEN MACHINING DUCTILE CAST IRON

Material	DIN GGG70
Tool	AHX440
Insert	NNMU130508ZEN-M
Vc (m/min)	300
fz (mm/t)	0.1
ap (mm)	2.0
ae (mm)	52
Cutting mode	Dry cutting Single insert



TAKEN AFTER CUTTING LENGTH OF 4.0 M



MV1020



Conventional A



Conventional B



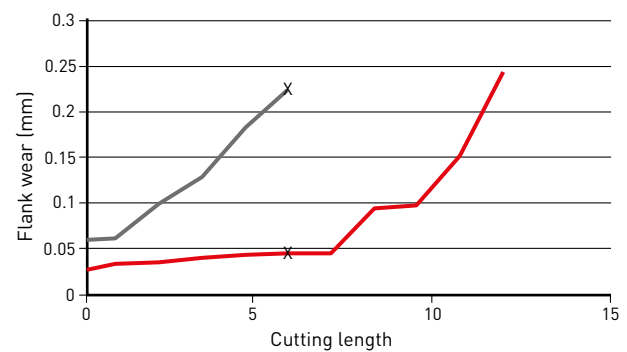
Conventional C



Conventional D

COMPARISON OF WEAR RESISTANCE WHEN MACHINING ALLOY STEEL

Material	DIN 41CrMo4
Tool	WSX445
Insert	SNMU140812ANER-M
Vc (m/min)	300
fz (mm/t)	0.2
ap (mm)	2.0
ae (mm)	100
Cutting mode	Dry cutting



TAKEN AFTER CUTTING LENGTH OF 6.0 M

12 M CUTTING LENGTH ACHIEVED



MV1020

CHIPPING OCCURS AT CUTTING LENGTH OF 6 M



Conventional A

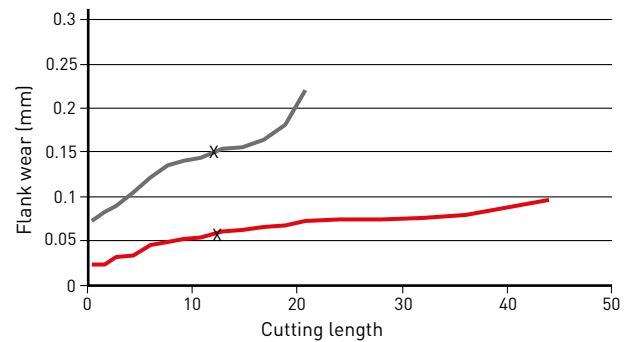
MV1000 SERIES

CUTTING PERFORMANCE

MV1020

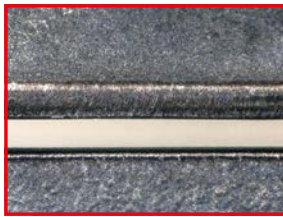
COMPARISON OF WEAR RESISTANCE FOR ROLLED STEEL

Material	DIN St 44-2
Tool	ASX445
Insert	SEMT13T3AGSN-JM
Vc (m/min)	300
fz (mm/t)	0.2
ap (mm)	2.0
ae (mm)	100
Cutting mode	Dry cutting



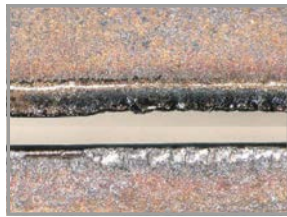
TAKEN AFTER CUTTING LENGTH OF 12.8 M

40 M CUTTING LENGTH
ACHIEVED



MV1020

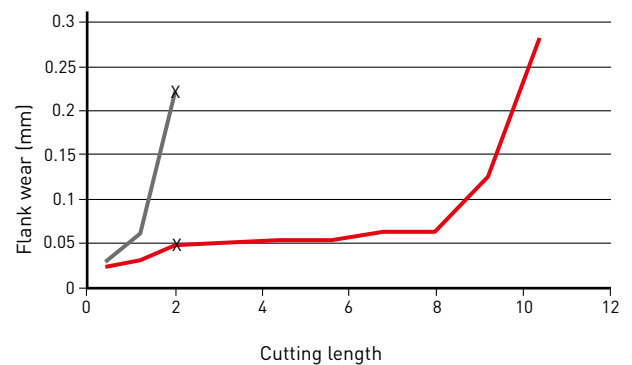
WEAR PROGRESSED AND THE
SUBSTRATE WAS EXPOSED



Conventional

COMPARISON OF WEAR RESISTANCE WHEN MACHINING CARBON STEEL

Material	DIN Ck55
Tool	ASX445
Insert	SEMT13T3AGSN-JM
Vc (m/min)	200
fz (mm/t)	0.2
ap (mm)	2.0
ae (mm)	100
Cutting mode	Wet cutting



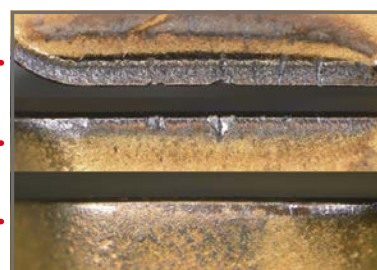
TAKEN AFTER CUTTING LENGTH OF 2.0 M

10 M CUTTING LENGTH ACHIEVED



MV1020

CHIPPING OCCURRED DUE TO THERMAL CRACKS
AT A CUTTING LENGTH OF 2 M



Conventional

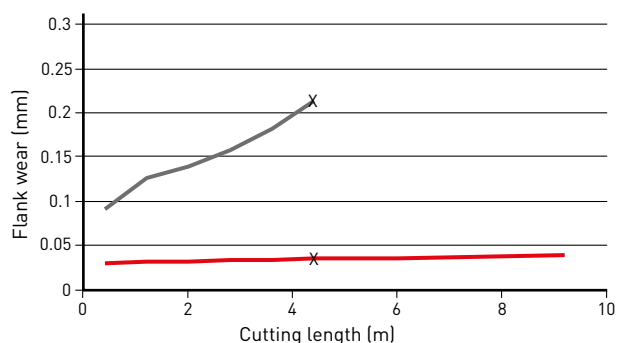
MV1000 SERIES

CUTTING PERFORMANCE

MV1020

COMPARISON OF WEAR RESISTANCE WHEN MACHINING DUCTILE CAST IRON

Material	DIN GGG40.5
Tool	ASX445
Insert	SEMT13T3AGSN-JM
Vc (m/min)	250
fz (mm/t)	0.2
ap (mm)	2.0
ae (mm)	100
Cutting mode	Dry cutting



TAKEN AFTER CUTTING LENGTH OF 4.4 M

ACHIEVES A CUTTING LENGTH OF 9 M OR MORE



MV1020

UNABLE TO CONTINUE MACHINING AFTER A CUT LENGTH OF 4.4 M

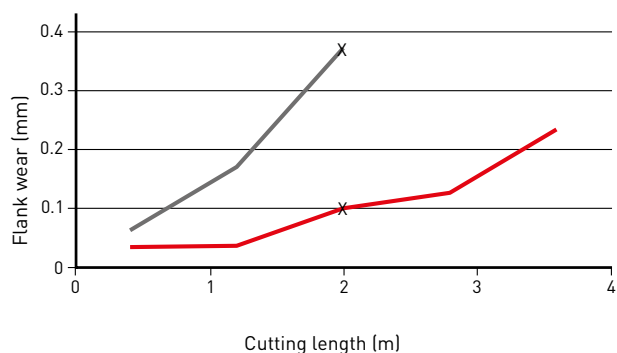


Conventional

COMPARISON OF WEAR RESISTANCE WHEN MACHINING DUCTILE CAST IRON

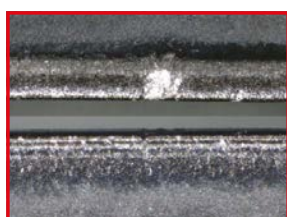
WET CUTTING

Material	DIN GGG70
Tool	ASX445
Insert	SEMT13T3AGSN-JM
Vc (m/min)	200
fz (mm/t)	0.2
ap (mm)	2.0
ae (mm)	100
Cutting mode	Wet cutting



TAKEN AFTER CUTTING LENGTH OF 2.0 M

3.5 M CUTTING LENGTH ACHIEVED



MV1020

UNABLE TO CONTINUE PROCESSING WITH A CUT LENGTH OF 2.0 M



Conventional

MV1000 SERIES

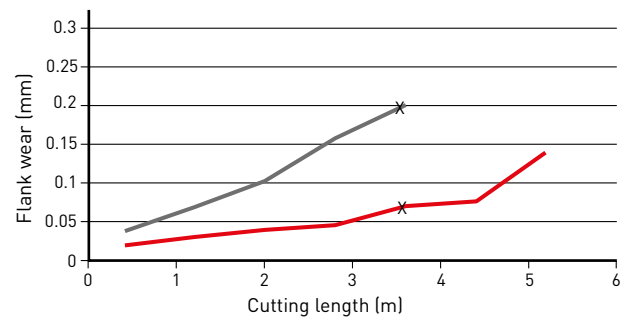
CUTTING PERFORMANCE

MV1020

COMPARISON OF WEAR RESISTANCE WHEN MACHINING DUCTILE CAST IRON

DRY CUTTING

Material	DIN GGG70
Tool	ASX445
Insert	SEMT13T3AGSN-JM
Vc (m/min)	200
fz (mm/t)	0.2
ap (mm)	2.0
ae (mm)	100
Cutting mode	Dry cutting



TAKEN AFTER CUTTING LENGTH OF 3.6 M

5.0 M CUTTING LENGTH
ACHIEVED



MV1020

CHIPPING OCCURRED DUE TO
PEELING OF THE COATING

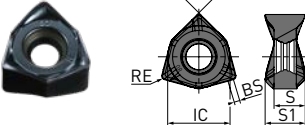
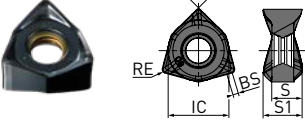
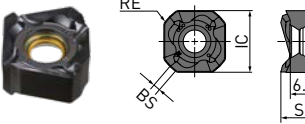
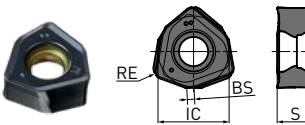
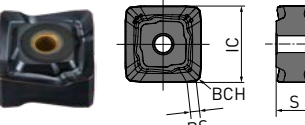


Conventional

MV1000 SERIES

INSERTS

P	Steel	◆	◆	Please note that the cutting conditions differ depending on multiple factors, for more details refer to the recommended cutting conditions. Honing: E: Round
M	Stainless steel		◆	
K	Cast iron	◆	◆	

Order number	Application	Class	Honing	MV1020	MV1030	IC	S	S1	BS	RE/BCH	Geometry
6NMU0906040PNER-M	General purpose cutting	M	E	●	●	9.0	5.3	6.1	1.6	0.4	WWX200 
6NMU0906080PNER-M	General purpose cutting	M	E	●	●	9.0	5.3	6.1	1.2	0.8	
6NMU0906080PNER-R	Cutting edge strength	M	E	●	●	9.0	5.3	6.1	1.2	0.8	
6NGU1409040PNER-L	Low cutting resistance	G	E	●	●	14.0	7.0	9.0	1.7	0.4	WWX400 
6NGU1409080PNER-L	Low cutting resistance	G	E	●	●	14.0	7.0	9.0	1.3	0.8	
6NGU1409040PNER-M	General purpose cutting	G	E	●	●	14.0	7.0	9.0	1.7	0.4	
6NGU1409080PNER-M	General purpose cutting	G	E	●	●	14.0	7.0	9.0	1.3	0.8	
6NMU1409040PNER-M	General purpose cutting	M	E	●	●	14.0	7.0	9.0	1.7	0.4	
6NMU1409080PNER-M	General purpose cutting	M	E	●	●	14.0	7.0	9.0	1.3	0.8	
6NMU1409160PNER-M	General purpose cutting	M	E	●	●	14.0	7.0	9.0	0.5	1.6	
6NMU1409200PNER-M	General purpose cutting	M	E	●	●	14.0	7.0	9.0	0.5	2.0	
6NMU1409080PNER-R	Cutting edge strength	M	E	●	●	14.0	7.0	9.0	1.3	0.8	
6NMU1409160PNER-R	Cutting edge strength	M	E	●	●	14.0	7.0	9.0	0.5	1.6	WSX445 
6NMU1409200PNER-R	Cutting edge strength	M	E	●	●	14.0	7.0	9.0	0.5	2.0	
SNGU140812ANER-L	Low cutting resistance	G	E	●	●	14.0	8.4	—	1.5	1.2	
SNGU140812ANER-M	General purpose cutting	G	E	●	●	14.0	8.4	—	1.5	1.2	
SNMU140812ANER-M	General purpose cutting	M	E	●	●	14.0	8.4	—	1.5	1.2	
SNMU140812ANER-R	Cutting edge strength	M	E	●	●	14.0	8.4	—	1.5	1.2	WJX 
SNMU140812ANER-H	Cutting edge strength	M	E	●	●	14.0	8.4	—	1.5	1.2	
JOMU090512ZZER-L	Low cutting resistance	M	E	●	●	9.525	4.73	—	0.88	1.2	
JOMU140715ZZER-L	Low cutting resistance	M	E	●	●	14.0	6.58	—	1.3	1.5	
JOMU090512ZZER-M	General purpose cutting	M	E	●	●	9.525	4.75	—	0.88	1.2	
JOMU140715ZZER-M	General purpose cutting	M	E	●	●	14.0	6.63	—	1.3	1.5	
JOMU090512ZZER-R	Cutting edge strength	M	E	●	●	9.525	4.83	—	0.88	1.2	
JOMU140715ZZER-R	Cutting edge strength	M	E	●	●	14.0	6.75	—	1.3	1.5	WSF406W 
SNMU1206C05ZNER-M	Cast iron milling	M	E	●	●	12.7	6.2	—	1.6	0.5	

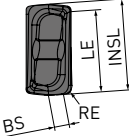
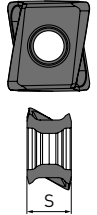
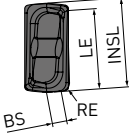
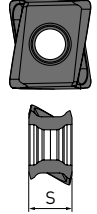
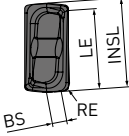
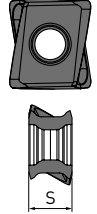
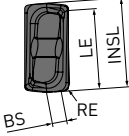
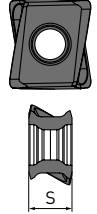
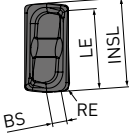
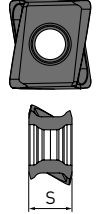
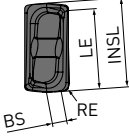
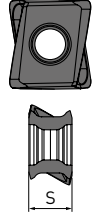
1/5

(10 inserts in one case)

16-24 

MV1000 SERIES – INSERTS

P	Steel	◆	◆	Please note that the cutting conditions differ depending on multiple factors, for more details refer to the recommended cutting conditions. Honing: E: Round
M	Stainless steel		◆	
K	Cast iron	◆	◆	

Order number	Application	Class	Honing	MV1020	MV1030	INSL	S	LE	BS	RE	Geometry
LOGU0904020PNER-L	Low cutting resistance	G	E	●	●	8.7	4.3	7.9	1.7	0.2	VPX200   
LOGU0904040PNER-L		G	E	●	●	8.7	4.3	7.9	1.5	0.4	
LOGU0904080PNER-L		G	E	●	●	8.7	4.3	7.9	1.2	0.8	
LOGU0904100PNER-L		G	E	●	●	8.7	4.3	7.9	1.0	1.0	
LOGU0904120PNER-L		G	E	●	●	8.7	4.3	7.9	0.8	1.2	
LOGU0904160PNER-L		G	E	●	●	8.7	4.3	7.9	0.5	1.6	
LOGU0904020PNER-M	General purpose cutting	G	E	●	●	8.7	4.3	7.9	1.7	0.2	VPX300   
LOGU0904040PNER-M		G	E	●	●	8.7	4.3	7.9	1.6	0.4	
LOGU0904080PNER-M		G	E	●	●	8.7	4.3	7.9	1.2	0.8	
LOGU0904100PNER-M		G	E	●	●	8.7	4.3	7.9	1.0	1.0	
LOGU0904120PNER-M		G	E	●	●	8.7	4.3	7.9	0.9	1.2	
LOGU0904160PNER-M		G	E	●	●	8.7	4.3	7.9	0.5	1.6	
LOGU1207020PNER-L	Low cutting resistance	G	E	●	●	12.4	7.0	11.3	3.0	0.2	VPX300   
LOGU1207040PNER-L		G	E	●	●	12.4	7.0	11.3	2.8	0.4	
LOGU1207080PNER-L		G	E	●	●	12.4	7.0	11.3	2.6	0.8	
LOGU1207100PNER-L		G	E	●	●	12.4	7.0	11.3	2.5	1.0	
LOGU1207120PNER-L		G	E	●	●	12.4	7.0	11.3	2.4	1.2	
LOGU1207160PNER-L		G	E	●	●	12.4	7.0	11.3	1.8	1.6	
LOGU1207200PNER-L	General purpose cutting	G	E	●	●	12.4	7.0	11.3	1.4	2.0	VPX300   
LOGU1207240PNER-L		G	E	●	●	12.4	7.0	11.3	1.2	2.4	
LOGU1207300PNER-L		G	E	●	●	12.4	7.0	11.3	0.6	3.0	
LOGU1207320PNER-L		G	E	●	●	12.4	7.0	11.3	0.4	3.2	
LOGU1207020PNER-M		G	E	●	●	12.4	7.0	11.3	3.0	0.2	
LOGU1207040PNER-M		G	E	●	●	12.4	7.0	11.3	2.8	0.4	
LOGU1207080PNER-M	General purpose cutting	G	E	●	●	12.4	7.0	11.3	2.4	0.8	VPX300   
LOGU1207100PNER-M		G	E	●	●	12.4	7.0	11.3	2.3	1.0	
LOGU1207120PNER-M		G	E	●	●	12.4	7.0	11.3	2.1	1.2	
LOGU1207160PNER-M		G	E	●	●	12.4	7.0	11.3	1.7	1.6	
LOGU1207200PNER-M		G	E	●	●	12.4	7.0	11.3	1.4	2.0	
LOGU1207240PNER-M		G	E	●	●	12.4	7.0	11.3	1.0	2.4	
LOGU1207300PNER-M	General purpose cutting	G	E	●	●	12.4	7.0	11.3	0.5	3.0	VPX300   
LOGU1207320PNER-M		G	E	●	●	12.4	7.0	11.3	0.3	3.2	

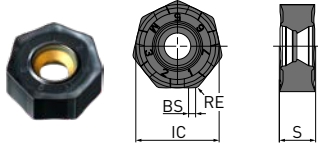
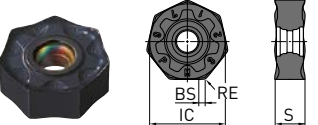
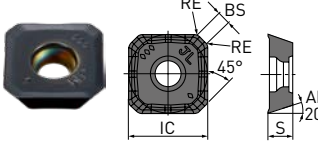
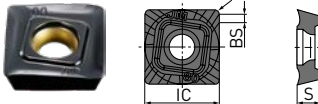
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[10 inserts in one case]

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MV1000 SERIES – INSERTS

P	Steel	◆	◆	Please note that the cutting conditions differ depending on multiple factors, for more details refer to the recommended cutting conditions. Honing: E: Round S: Chamfer + round
M	Stainless steel		◆	
K	Cast iron	◆	◆	

Order number	Application	Class	Honing	MV1020	MV1030	IC	S	S1	BS	RE	Geometry
NNMU130508ZER-L	Low cutting resistance	M	E	●	●	13.4	5.09	—	1.0	0.8	
NNMU130508ZEN-M	General purpose cutting	M	E	●	●	13.4	5.09	—	1.0	0.8	
NNMU130532ZEN-M	General purpose cutting	M	E	●	●	13.4	5.09	—	—	3.2	
NNMU130532ZEN-R	Cutting edge strength	M	E	●	●	13.4	5.09	—	—	3.2	
NEW NNMU200708ZEN-M	General purpose cutting	M	E	●	●	20.0	7.28	—	1.0	0.8	
NEW NNMU200712ZER-L	Low cutting resistance	M	E	●	●	20.0	7.24	—	1.0	0.8	
NEW NNMU200608ZEN-MK	General purpose cutting	M	E	●	●	20.0	6.1	—	1.0	0.8	
NEW NNMU200608ZEN-HK	Strong purpose cutting	M	E	●	●	20.0	6.1	—	1.0	0.8	
SEET13T3AGEN-JL	Finish-light cutting	E	E	●	●	13.4	3.97	—	1.9	1.5	
SEMT13T3AGSN-JM	Light-rough cutting	M	S	●	●	13.4	3.97	—	1.9	1.5	
SEMT13T3AGSN-JH	Medium-heavy cutting	M	S	●	●	13.4	3.97	—	1.9	1.5	
SEMT13T3AGSN-FT	Cast iron milling	M	S	●	●	13.4	3.97	—	1.9	1.5	
SOET12T308PEER-JL	Finish-light cutting	E	E	●	●	12.7	3.97	—	1.4	0.8	
SOMT12T308PEER-JM	Light-rough cutting	M	E	●	●	12.7	3.97	—	1.4	0.8	
SOMT12T308PEER-JH	Medium-heavy cutting	M	E	●	●	12.7	3.97	—	1.4	0.8	
SOMT12T320PEER-FT	Heavy interrupted cutting	M	E	●	●	12.7	3.97	—	0.5	2.0	

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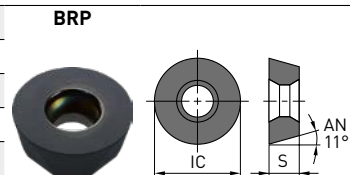
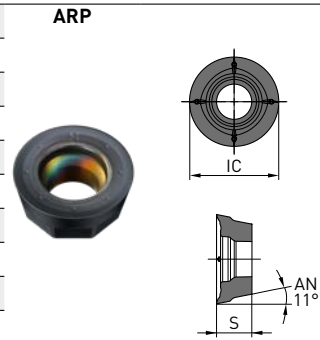
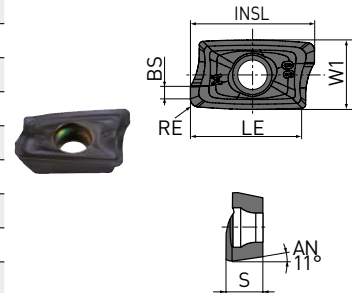
(10 inserts in one case)

28-30 

MV1000 SERIES – INSERTS

P	Steel	◆	◆	Please note that the cutting conditions differ depending on multiple factors, for more details refer to the recommended cutting conditions. Honing: E: Round S: Chamfer + round
M	Stainless steel	◆	◆	
K	Cast iron	◆	◆	

Order number	Application	Class	MV1020	MV1030	IC	S	BS	W1	RE	INSL	LE	Geometry
AOMT123602PEER-M	General purpose cutting	M	●	●	3.6	1.8	6.6	0.2	12	10		APX3000/4000
AOMT123604PEER-M	General purpose cutting	M	●	●	3.6	1.6	6.6	0.4	12	10		
AOMT123608PEER-M	General purpose cutting	M	●	●	3.6	1.2	6.6	0.6	12	10		
AOMT123610PEER-M	General purpose cutting	M	●	●	3.6	1.0	6.6	1	12	10		
AOMT123612PEER-M	General purpose cutting	M	●	●	3.6	0.8	6.6	1.2	12	10		
AOMT123616PEER-M	General purpose cutting	M	●	●	3.6	0.4	6.6	1.6	12	10		
AOMT123620PEER-M	General purpose cutting	M	●	●	3.6	0.4	6.6	2	12	10		
AOMT123624PEER-M	General purpose cutting	M	●	●	3.6	0.4	6.6	2.4	12	10		
AOMT123630PEER-M	General purpose cutting	M	●	●	3.6	0.4	6.6	3	12	10		
AOMT123632PEER-M	General purpose cutting	M	●	●	3.6	0.4	6.6	3.2	12	10		
AOMT123604PEER-H	Strong purpose cutting	M	●	●	3.6	1.6	6.6	0.4	12	10		
AOMT123608PEER-H	Strong purpose cutting	M	●	●	3.6	1.6	6.6	0.8	12	10		
AOMT123616PEER-H	Strong purpose cutting	M	●	●	3.6	0.4	6.6	1.6	12	10		
AOMT184804PEER-M	General purpose cutting	M	●	●	4.8	1.8	9.0	0.4	18	15		
AOMT184808PEER-M	General purpose cutting	M	●	●	4.8	1.4	9.0	0.8	18	15		
AOMT184810PEER-M	General purpose cutting	M	●	●	4.8	1.0	9.0	1	18	15		
AOMT184812PEER-M	General purpose cutting	M	●	●	4.8	0.8	9.0	1.2	18	15		
AOMT184816PEER-M	General purpose cutting	M	●	●	4.8	0.4	9.0	1.6	18	15		
AOMT184820PEER-M	General purpose cutting	M	●	●	4.8	0.4	9.0	2	18	15		
AOMT184804PEER-H	Strong purpose cutting	M	●	●	4.8	1.8	9.0	0.4	18	15		
AOMT184808PEER-H	Strong purpose cutting	M	●	●	4.8	1.4	9.0	0.8	18	15		
AOMT184816PEER-H	Strong purpose cutting	M	●	●	4.8	0.4	9.0	1.6	18	15		
RPMT1040M0E8-L1	Low cutting resistance	M	●	●	10	3.97						ARP
RPMT1040M0E4-L2	Low cutting resistance	M	●	●	10	3.97						
RPMT1040M0E8-M1	General purpose cutting	M	●	●	10	3.97						
RPMT1040M0E4-M2	General purpose cutting	M	●	●	10	3.97						
RPMT1040M0E8-R1	Strong purpose cutting	M	●	●	10	3.97						
RPMT1040M0E4-R2	Strong purpose cutting	M	●	●	10	3.97						
RPMT1248M0E8-L1	Low cutting resistance	M	●	●	12	4.76						
RPMT1248M0E4-L2	Low cutting resistance	M	●	●	12	4.76						
RPMT1248M0E8-M1	General purpose cutting	M	●	●	12	4.76						BRP
RPMT1248M0E4-M2	General purpose cutting	M	●	●	12	4.76						
RPMT1248M0E8-R1	Strong purpose cutting	M	●	●	12	4.76						
RPMT1248M0E4-R2	Strong purpose cutting	M	●	●	12	4.76						
RPMW10T3M0E	General purpose cutting	M	●	●	10	3.97						
RPMW1204M0E	General purpose cutting	M	●	●	12	4.76						
RPMW1606M0E	General purpose cutting	M	●	●	16	6.35						
RPMT08T2M0E-JS	Low cutting resistance	M	●	●	8	2.78						
RPMT10T3M0E-JS	Low cutting resistance	M	●	●	10	3.97						
RPMT1204M0E-JS	Low cutting resistance	M	●	●	12	4.76						
RPMT1606M0E-JS	Low cutting resistance	M	●	●	16	6.35						



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(10 inserts in one case)

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MV1000 SERIES – INSERTS

P	Steel	◆	◆	Please note that the cutting conditions differ depending on multiple factors, for more details refer to the recommended cutting conditions. Honing: E: Round S: Chamfer + round
M	Stainless steel	◆	◆	
K	Cast iron	◆	◆	

Order number	Application	Class	MV1020	MV1030	AN	IC	S	BS	RE	Geometry
JOMW06T215ZZSR-FT	Strong purpose cutting	M	●	●	13°	6.35	2.78	1.2	1.5	AJX
JOMW080320ZZSR-FT	Strong purpose cutting	M	●	●	13°	8	3.18	1.4	2	
JDMW09T320ZDSR-FT	Strong purpose cutting	M	●	●	15°	9.525	3.97	1.8	2	
JDMW120420ZDSR-FT	Strong purpose cutting	M	●	●	15°	12	4.76	2.5	2	
JDMW140520ZDSR-FT	Strong purpose cutting	M	●	●	15°	14	5.56	2.8	2	
JDMT120420ZDSR-ST	Strong purpose cutting	M	●	●	15°	12	4.76	2.5	2	
JDMT140520ZDSR-ST	Strong purpose cutting	M	●	●	15°	14	5.56	2.8	2	
JOMT06T216ZZER-JL	Low cutting resistance	M	●	●	13°	6.35	2.78	1.2	1.6	
JOMT080322ZZER-JL	Low cutting resistance	M	●	●	13°	8	3.18	1.4	2.2	
JDMT09T323ZDER-JL	Low cutting resistance	M	●	●	15°	9.525	3.97	1.2	1.5	
JDMT120423ZDER-JL	Low cutting resistance	M	●	●	15°	12	4.76	1.4	2	
JDMT140523ZDER-JL	Low cutting resistance	M	●	●	15°	14	5.56	1.8	2	
JOMT06T215ZZSR-JM	General purpose cutting	M	●	●	13°	6.35	2.78	1.2	1.5	
JOMT080320ZZSR-JM	General purpose cutting	M	●	●	13°	8	3.18	1.4	2	
JDMT09T320ZDSR-JM	General purpose cutting	M	●	●	15°	9.525	3.97	1.8	2	
JDMT120420ZDSR-JM	General purpose cutting	M	●	●	15°	12	4.76	2.5	2	
JDMT140520ZDSR-JM	General purpose cutting	M	●	●	15°	14	5.56	2.8	2	

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(10 inserts in one case)

WWX200/400

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED (DRY CUTTING)

Material	Properties	Conditions	MV1020			MV1030		
			ae			ae		
			≥0.5 DC	≥0.8 DC	DC (Slot)	≥0.5 DC	≥0.8 DC	DC (Slot)
			Vc			Vc		
P	Mild steel	≤180HB	● 300 [250–350]	● 280 [230–330]	● 250 [200–300]	● 230 [190–270]	● 210 [170–250]	● 190 [150–230]
			● 290 [240–340]	● 260 [210–320]	● 240 [190–290]	● 230 [190–270]	● 210 [170–250]	● 190 [150–230]
	Carbon steel Alloy steel	180–350HB	● 260 [210–310]	● 240 [190–280]	● 210 [160–260]	● 200 [160–240]	● 180 [140–220]	● 160 [120–200]
			● 250 [200–300]	● 230 [180–270]	● 200 [150–250]	● 200 [160–240]	● 180 [140–220]	● 160 [120–200]
M	Stainless steel	—	● —	● —	● —	● 180 [160–200]	● 160 [140–180]	● —
			● —	● —	● —	● 170 [150–190]	● 150 [130–170]	● —
K	Ductile cast iron	Tensile strength ≤450MPa	● 240 [200–310]	● 220 [170–280]	● 200 [150–260]	● 210 [170–250]	● 190 [150–230]	● 170 [130–210]
			● 230 [190–300]	● 210 [160–270]	● 190 [140–250]	● 210 [170–250]	● 190 [150–230]	● 170 [130–210]
		Tensile strength ≤800MPa	● 210 [160–280]	● 190 [140–250]	● 160 [120–210]	● 170 [130–210]	● 150 [110–190]	● 130 [90–170]
			● 200 [150–270]	● 180 [130–240]	● 150 [110–200]	● 170 [130–210]	● 150 [110–190]	● 130 [90–170]

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CUTTING SPEED (WET CUTTING)

Material	Properties	Conditions	MV1020			MV1030		
			ae			ae		
			≥0.5 DC	≥0.8 DC	DC (Slot)	≥0.5 DC	≥0.8 DC	DC (Slot)
			Vc			Vc		
P	Mild steel	≤180HB	● 220 [210–230]	● 190 [180–210]	● 180 [160–190]	● 140 [130–150]	● 120 [110–130]	● 110 [100–120]
			● 210 [200–220]	● 180 [170–200]	● 170 [150–180]	● 140 [130–150]	● 120 [110–130]	● 110 [100–120]
	Carbon steel Alloy steel	180–350HB	● 200 [190–210]	● 170 [160–190]	● 160 [150–170]	● 140 [130–150]	● 120 [110–130]	● 110 [100–120]
			● 190 [180–200]	● 160 [150–180]	● 150 [140–160]	● 140 [130–150]	● 120 [110–130]	● 110 [100–120]
K	Ductile cast iron	Tensile strength ≤450MPa	● 200 [180–240]	● 180 [150–220]	● 150 [130–200]	● 160 [140–180]	● 140 [120–160]	● 120 [100–140]
			● 190 [170–230]	● 170 [140–210]	● 140 [120–190]	● 160 [140–180]	● 140 [120–160]	● 120 [100–140]
		Tensile strength ≤800MPa	● 180 [170–210]	● 160 [150–190]	● 140 [120–160]	● 150 [140–160]	● 130 [120–140]	● 110 [100–120]
			● 170 [160–200]	● 150 [140–180]	● 120 [110–150]	● 150 [140–160]	● 130 [120–140]	● 110 [100–120]

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1. The recommended cutting speed has been calculated for a depth of cut 2 mm. Please reduce the cutting speed by an appropriate amount corresponding to the increase in cutting depth.

WWX400

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED (DRY CUTTING)

Material	Properties	Grade	Vc	
P	Mild steel	≤180HB	MV1020	305 (250 – 360)
		MV1030	235 (190 – 280)	
		MP6120	245 (200 – 290)	
		MP6130	235 (190 – 280)	
	Carbon steel Alloy steel	180 – 280HB	MV1020	260 (210 – 310)
			MV1030	200 (155 – 245)
			MP6120	205 (160 – 250)
			MP6130	200 (155 – 245)
		280 – 350HB	MV1020	260 (210 – 310)
			MV1030	200 (155 – 245)
			MP6120	200 (155 – 245)
			MP6130	195 (150 – 240)
M	Stainless steel	>200HB	MV1030	180 (155 – 200)
		MP7130	175 (150 – 200)	
		VP15TF	175 (150 – 200)	
K	Ductile cast iron	Tensile strength ≤450MPa	MV1020	255 (200 – 310)
			MV1030	205 (160 – 250)
			MP6120	205 (160 – 250)
			MP6130	205 (160 – 250)
		Tensile strength >450MPa	MV1020	225 (160 – 290)
			MV1030	170 (130 – 210)
			MP6120	170 (130 – 210)
			MP6130	170 (130 – 210)

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WWX200

RECOMMENDED CUTTING CONDITIONS

DEPTH OF CUT / FEED PER TOOTH

DRY AND WET CUTTING

Material	Properties	Conditions	ae					
			≥0.5 DC		≥0.8 DC		DC (Slot)	
			 ap	fz	 ap	fz	 ap	fz
P	Mild steel	≤180HB	● ● L, M	≤3.0 0.13 [0.10–0.15]	L, M	≤3.0 0.13 [0.10–0.15]	L, M	≤2.0 0.13 [0.10–0.15]
			● M, R	≤3.0 0.16 [0.10–0.20]	M, R	≤3.0 0.16 [0.10–0.20]	—	—
	Carbon steel Alloy steel	180–350HB	● ● L, M	≤3.0 0.13 [0.10–0.15]	L, M	≤3.0 0.13 [0.10–0.15]	L, M	≤2.0 0.13 [0.10–0.15]
			● M, R	≤3.0 0.16 [0.10–0.20]	M, R	≤3.0 0.16 [0.10–0.20]	—	—
K	Ductile cast iron	Tensile strength	● ● L, M	≤3.0 0.13 [0.10–0.15]	L, M	≤3.0 0.13 [0.10–0.15]	L, M	≤2.0 0.13 [0.10–0.15]
		≤450MPa	● M, R	≤3.0 0.16 [0.10–0.20]	M, R	≤3.0 0.16 [0.10–0.20]	—	—
		Tensile strength	● ● L, M	≤3.0 0.13 [0.10–0.15]	L, M	≤3.0 0.13 [0.10–0.15]	L, M	≤2.0 0.13 [0.10–0.15]
		≤800MPa	● M, R	≤3.0 0.16 [0.10–0.20]	M, R	≤3.0 0.16 [0.10–0.20]	—	—

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1. Refer to the above table and set up cutting conditions according to the application.

WWX400

DEPTH OF CUT / FEED PER TOOTH

DRY AND WET CUTTING

Material	Properties	Conditions	ae					
			≥0.5 DC		≥0.8 DC		DC (Slot)	
			 ap	fz	 ap	fz	 ap	fz
P	Mild steel	≤180HB	● ● L, M	≤4.0 0.13 [0.10–0.15]	L, M	≤3.0 0.13 [0.10–0.15]	L, M	≤2.0 0.13 [0.10–0.15]
			● M, R	≤4.0 0.16 [0.10–0.20]	M, R	≤3.0 0.16 [0.10–0.20]	—	—
	Carbon steel Alloy steel	180–350HB	● ● L, M	≤4.0 0.13 [0.10–0.15]	L, M	≤3.0 0.13 [0.10–0.15]	L, M	≤2.0 0.13 [0.10–0.15]
			● M, R	≤4.0 0.16 [0.10–0.20]	M, R	≤3.0 0.16 [0.10–0.20]	—	—
M	Stainless steel	—	● ● L, M	≤2.0 0.13 [0.10–0.15]	L, M	≤2.0 0.13 [0.10–0.15]	—	—
K	Ductile cast iron	Tensile strength	● ● L, M	≤4.0 0.13 [0.10–0.15]	L, M	≤3.0 0.13 [0.10–0.15]	L, M	≤2.0 0.13 [0.10–0.15]
		≤450MPa	● M, R	≤4.0 0.16 [0.10–0.20]	M, R	≤3.0 0.16 [0.10–0.20]	—	—
		Tensile strength	● ● L, M	≤4.0 0.13 [0.10–0.15]	L, M	≤3.0 0.13 [0.10–0.15]	L, M	≤2.0 0.13 [0.10–0.15]
		≤800MPa	● M, R	≤4.0 0.16 [0.10–0.20]	M, R	≤3.0 0.16 [0.10–0.20]	—	—

1/1

1. Refer to the above table and set up cutting conditions according to the application.

WSX445

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED

DRY AND WET CUTTING

Material		Properties	MV1020		MV1030	
			Vc		Vc	
			Dry cutting	Wet cutting	Dry cutting	Wet cutting
P	Mild steel	≤180HB	300 (200–400)	220 (120–320)	250 (200–300)	150 (100–200)
	Carbon steel	180–350HB	260 (170–350)	200 (100–300)	220 (170–270)	120 (80–160)
	Alloy steel	280–350HB	180 (100–250)	150 (100–200)	180 (100–250)	120 (80–160)
M	Stainless steel	—	—	—	200 (150–250)	—
K	Ductile cast iron	Tensile strength ≤450MPa	240 (130–350)	200 (130–250)	160 (110–240)	150 (100–200)
		Tensile strength ≤800MPa	220 (80–350)	180 (80–230)	180 (110–250)	140 (80–200)

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DEPTH OF CUT / FEED PER TOOTH

DRY AND WET CUTTING

Material			Properties											
														
					L		L, M		M		M, R		R, H	
			fz	ap	fz	ap	fz	ap	fz	ap	fz	ap	fz	ap
P	Mild steel	≤180HB	0.15 (0.1–0.2)	≤1.0	0.15 (0.1–0.2)	≤2.0	0.2 (0.15–0.25)	≤3.0	0.2 (0.15–0.25)	≤4.0	0.25 (0.2–0.3)	≤5.0		
	Carbon steel	180–350HB	0.15 (0.1–0.2)	≤1.0	0.15 (0.1–0.2)	≤2.0	0.2 (0.15–0.25)	≤3.0	0.2 (0.15–0.25)	≤4.0	0.25 (0.2–0.3)	≤5.0		
	Alloy steel	280–350HB	0.15 (0.1–0.2)	≤1.0	0.15 (0.1–0.2)	≤2.0	0.2 (0.15–0.25)	≤3.0	0.2 (0.15–0.25)	≤4.0	0.25 (0.2–0.3)	≤5.0		
M	Stainless steel	—	0.15 (0.1–0.2)	≤1.0	0.15 (0.1–0.2)	≤2.0	0.2 (0.15–0.25)	≤3.0	—	—	—	—		
K	Ductile cast iron	Tensile strength ≤450MPa	0.15 (0.1–0.2)	≤1.0	0.15 (0.1–0.2)	≤2.0	0.2 (0.15–0.25)	≤3.0	0.2 (0.15–0.25)	≤4.0	0.25 (0.2–0.3)	≤5.0		
		Tensile strength ≤800MPa	0.15 (0.1–0.2)	≤1.0	0.15 (0.1–0.2)	≤2.0	0.2 (0.15–0.25)	≤3.0	0.2 (0.15–0.25)	≤4.0	0.25 (0.2–0.3)	≤5.0		

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WJX09

CHIPBREAKER SELECTION TABLE

Material	Properties						
		L		M		R	
		Conditions	ap	Conditions	ap	Conditions	ap
P	Mild steel	● ●	≤1.0	● ●	≤1.5	● ✖	≤1.5
	Carbon steel, Alloy steel	● ●	≤1.0	● ●	≤1.5	● ✖	≤1.5
M	Stainless steel	● ●	≤1.0	● ●	≤1.0	—	—
K	Ductile cast iron	● ●	≤1.0	● ●	≤1.5	● ✖	≤1.5
	Tensile strength ≤800MPa	● ●	≤1.0	● ●	≤1.0	● ✖	≤1.0

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WJX14

CHIPBREAKER SELECTION TABLE

Material	Properties						
		L		M		R	
		Conditions	ap	Conditions	ap	Conditions	ap
P	Mild steel	● ●	≤2.0	● ●	≤3.0	● ✖	≤3.0
	Carbon steel, Alloy steel	● ●	≤2.0	● ●	≤3.0	● ✖	≤3.0
M	Stainless steel	● ●	≤2.0	● ●	≤1.5	—	—
K	Ductile cast iron	● ●	≤2.0	● ●	≤3.0	—	—
	Tensile strength ≤800MPa	● ●	≤2.0	● ●	≤2.0	—	—

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WJX09

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED (DRY CUTTING)

	Material	Properties	MV1020	MV1030
			Vc	Vc
P	Mild steel	≤180HB	230 (180–280)	160 (100–220)
	Carbon steel, Alloy steel	180–350HB	220 (170–270)	150 (80–220)
M	Stainless steel	≤200HB	—	160 (130–200)
		>200HB	—	140 (80–200)
K	Ductile cast iron	Tensile strength ≤450MPa	210 (160–260)	160 (120–210)
		Tensile strength ≤800MPa	190 (140–240)	130 (90–170)

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DEPTH OF CUT/FEED PER TOOTH

DRY CUTTING

	Material	Properties		ap	DCX = 25, 28 (Z=2)	DCX = 25, 28 (Z=3)	DCX ≥ 32
					fz	fz	fz
P	Mild steel	≤180HB	M, R	≤0.5	1.3 (0.4–2.0)	1.3 (0.4–2.0)	1.5 (0.5–2.0)
				≤1.0	1.0 (0.3–1.3)	0.8 (0.3–1.0)	1.2 (0.4–1.5)
				≤1.5	0.6 (0.3–1.0)	—	0.8 (0.4–1.2)
	Carbon steel Alloy steel	180–350HB	L	≤0.5	1.2 (0.4–1.6)	1.2 (0.4–1.6)	1.2 (0.4–1.6)
				≤1.0	0.8 (0.3–1.2)	0.8 (0.3–1.0)	1.0 (0.4–2.5)
				≤1.5	0.5 (0.3–0.7)	—	0.7 (0.3–1.0)
M	Stainless steel	—	L	≤0.5	0.8 (0.3–1.0)	0.8 (0.3–1.0)	0.8 (0.3–1.0)
				≤1.0	1.0 (0.4–1.2)	1.0 (0.4–1.2)	1.0 (0.4–1.2)
			M	≤0.5	0.6 (0.2–0.8)	0.6 (0.2–0.8)	0.6 (0.2–0.8)
				≤1.0	0.8 (0.3–1.0)	0.8 (0.3–1.0)	0.8 (0.3–1.0)
K	Ductile cast iron	Tensile strength ≤450MPa	M, R	≤0.5	1.3 (0.4–1.7)	1.3 (0.4–1.7)	1.5 (0.4–2.0)
				≤1.0	0.8 (0.3–1.0)	0.7 (0.3–0.9)	1.0 (0.3–1.3)
			L	≤1.5	0.5 (0.3–0.7)	—	0.7 (0.3–1.0)
				≤0.5	1.0 (0.3–1.3)	1.0 (0.3–1.3)	1.0 (0.3–1.3)
		Tensile strength ≤800MPa	M, R	≤1.0	0.8 (0.2–1.0)	0.7 (0.2–0.9)	0.8 (0.2–1.2)
				≤0.5	1.0 (0.2–1.5)	1.0 (0.2–1.5)	1.3 (0.3–1.7)
			L	≤1.0	0.8 (0.2–1.0)	0.6 (0.2–0.8)	1.0 (0.3–1.2)
				≤0.5	0.8 (0.3–1.2)	0.8 (0.3–1.2)	0.8 (0.3–1.2)

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1. To discharge chips effectively, use an air blow when machining. When the air blow is less effective at discharging chips, we recommend wet cutting.
2. When wet cutting, tool life may become shorter than dry cutting. When carrying out wet cutting for the applications recommended with dry cutting, reduce the cutting speed by 25 %.
3. When large vibration occurs, reduce the cutting conditions.
4. For interrupted cutting, reduce the cutting speed and feed rate by 20 %.

WJX14

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED (DRY CUTTING)

	Material	Properties	MV1020	MV1030
			Vc	Vc
P	Mild steel	≤180HB	220 (170 – 270)	130 (80 – 180)
	Carbon steel, Alloy steel	180 – 350HB	200 (150 – 250)	120 (60 – 180)
M	Stainless steel	≤200HB	—	160 (130 – 200)
		>200HB	—	140 (100 – 200)
K	Ductile cast iron	Tensile strength ≤450MPa	200 (150 – 250)	150 (100 – 200)
		Tensile strength ≤800MPa	180 (130 – 230)	120 (80 – 160)

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WJX14

DEPTH OF CUT / FEED PER TOOTH

DRY CUTTING

Material	Properties		ap	DCX = 50, 52	DCX ≥ 63		
				fz	fz		
P	Mild steel	≤180HB	M, R	≤1.0	1.5 [0.6 – 2.5]	1.7 [0.6 – 2.8]	
				≤1.5	1.3 [0.6 – 2.0]	1.5 [0.6 – 2.5]	
				≤2.0	1.2 [0.6 – 2.0]	1.3 [0.6 – 2.5]	
				≤2.5	0.8 [0.3 – 1.5]	1.0 [0.3 – 1.6]	
				≤3.0	0.4 [0.2 – 1.0]	0.5 [0.2 – 1.2]	
			L	≤1.0	1.2 [0.4 – 2.0]	1.2 [0.4 – 2.0]	
	≤1.5	1.0 [0.4 – 1.8]		1.0 [0.4 – 2.5]			
	≤2.0	0.8 [0.4 – 1.7]		0.8 [0.4 – 1.7]			
	Carbon steel Alloy steel	180 – 350HB	M, R	≤1.0	1.5 [0.5 – 2.0]	1.7 [0.5 – 2.5]	
				≤1.5	1.2 [0.5 – 1.7]	1.3 [0.5 – 2.2]	
				≤2.0	1.0 [0.5 – 1.5]	1.2 [0.5 – 2.0]	
				≤2.5	0.7 [0.3 – 1.2]	0.9 [0.3 – 1.5]	
				≤3.0	0.3 [0.2 – 0.8]	0.4 [0.2 – 1.0]	
L			≤1.0	1.0 [0.3 – 1.7]	1.0 [0.3 – 1.7]		
	≤1.5	0.8 [0.3 – 1.5]	0.8 [0.3 – 1.5]				
	≤2.0	0.7 [0.3 – 1.2]	0.7 [0.3 – 1.2]				
M	Stainless steel	≤200HB	M	≤1.0	1.0 [0.5 – 1.2]	1.0 [0.5 – 1.2]	
				≤1.5	1.0 [0.5 – 1.0]	1.0 [0.5 – 1.0]	
			L	≤1.0	0.8 [0.3 – 1.2]	0.8 [0.3 – 1.2]	
				≤1.5	0.8 [0.3 – 1.0]	0.8 [0.3 – 1.0]	
			>200HB	M	≤1.0	1.0 [0.5 – 1.2]	1.0 [0.5 – 1.2]
					≤1.5	1.0 [0.5 – 1.0]	1.0 [0.5 – 1.0]
	L	≤1.0		0.8 [0.3 – 1.2]	0.8 [0.3 – 1.2]		
		≤1.5		0.8 [0.3 – 1.0]	0.8 [0.3 – 1.0]		
	K	Ductile cast iron	Tensile strength ≤450MPa	MR	≤1.0	1.5 [0.5 – 2.0]	1.7 [0.5 – 2.5]
					≤1.5	1.3 [0.5 – 1.8]	1.5 [0.5 – 2.0]
					≤2.0	1.2 [0.5 – 1.8]	1.3 [0.5 – 2.0]
					≤2.5	0.7 [0.3 – 1.2]	0.9 [0.3 – 1.5]
≤3.0					0.3 [0.2 – 0.8]	0.4 [0.2 – 1.0]	
L				≤1.0	1.2 [0.3 – 2.0]	1.2 [0.3 – 2.0]	
				≤1.5	1.0 [0.3 – 1.7]	1.0 [0.3 – 1.7]	
				≤2.0	0.8 [0.3 – 1.5]	0.8 [0.3 – 1.5]	
Tensile strength ≤800MPa			M	≤1.0	1.3 [0.4 – 1.8]	1.5 [0.4 – 2.0]	
				≤1.5	1.2 [0.4 – 1.5]	1.3 [0.4 – 1.8]	
				≤2.0	1.0 [0.4 – 1.5]	1.2 [0.4 – 1.8]	
			L	≤1.0	1.0 [0.3 – 1.7]	1.0 [0.3 – 1.7]	
				≤1.5	0.8 [0.3 – 1.5]	0.8 [0.3 – 1.5]	
				≤2.0	0.7 [0.3 – 1.2]	0.7 [0.3 – 1.2]	

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1. To discharge chips effectively, use an air blow when machining. When the air blow is less effective at discharging chips, we recommend wet cutting.
2. When wet cutting, tool life may become shorter than dry cutting. When carrying out wet cutting for the applications recommended with dry cutting, reduce the cutting speed by 25 %.
3. When large vibration occurs, reduce the cutting conditions.
4. For interrupted cutting, reduce the cutting speed and feed rate by 20 %.

WSF406W

RECOMMENDED CUTTING CONDITIONS

DRY CUTTING

Material	Properties	Conditions	ap	Vc		fz	ae
				MV1020	MV1030		
Gray cast iron	Tensile strength ≤350MPa	●	ap ≤ 0.5 mm	300 (250–300)	150 (100–200)	0.13 (0.08–0.20)	≤0.8DC
			ap ≤ 2.0 mm	250 (210–300)	150 (100–200)	0.15 (0.10–0.25)	≤0.8DC
			2.0 mm < ap ≤ 4.0 mm	220 (190–260)	140 (80–200)	0.13 (0.10–0.20)	≤0.8DC
			4.0 mm < ap ≤ 7.5 mm	200 (180–230)	110 (60–160)	0.10 (0.08–0.15)	≤0.8DC
		●	ap ≤ 0.5 mm	250 (210–300)	150 (100–200)	0.13 (0.08–0.20)	≤0.8DC
			ap ≤ 2.0 mm	220 (190–260)	150 (100–200)	0.15 (0.10–0.25)	≤0.8DC
			2.0 mm < ap ≤ 4.0 mm	200 (180–230)	140 (80–200)	0.13 (0.10–0.20)	≤0.8DC
			4.0 mm < ap ≤ 7.5 mm	180 (160–210)	110 (60–160)	0.10 (0.08–0.15)	≤0.8DC
		✖	ap ≤ 0.5 mm	220 (190–260)	140 (80–200)	0.13 (0.08–0.20)	≤0.8DC
			ap ≤ 2.0 mm	200 (180–230)	140 (80–200)	0.15 (0.10–0.25)	≤0.8DC
			2.0 mm < ap ≤ 4.0 mm	180 (160–210)	110 (60–160)	0.13 (0.10–0.20)	≤0.8DC
			4.0 mm < ap ≤ 7.5 mm	150 (100–180)	80 (40–120)	0.10 (0.08–0.15)	≤0.8DC
Ductile cast iron	Tensile strength ≤450MPa	●	ap ≤ 0.5 mm	230 (200–250)	110 (60–160)	0.13 (0.08–0.20)	≤0.8DC
			ap ≤ 2.0 mm	200 (170–230)	110 (60–160)	0.15 (0.10–0.25)	≤0.8DC
			2.0 mm < ap ≤ 4.0 mm	180 (150–210)	90 (50–130)	0.13 (0.10–0.20)	≤0.8DC
			4.0 mm < ap ≤ 7.5 mm	160 (130–190)	70 (40–100)	0.10 (0.08–0.15)	≤0.8DC
		●	ap ≤ 0.5 mm	200 (170–230)	110 (60–160)	0.13 (0.08–0.20)	≤0.8DC
			ap ≤ 2.0 mm	180 (150–210)	110 (60–160)	0.15 (0.10–0.25)	≤0.8DC
			2.0 mm < ap ≤ 4.0 mm	160 (130–190)	90 (50–130)	0.13 (0.10–0.20)	≤0.8DC
			4.0 mm < ap ≤ 7.5 mm	140 (110–170)	70 (40–100)	0.10 (0.08–0.15)	≤0.8DC
		✖	ap ≤ 0.5 mm	180 (150–200)	90 (50–130)	0.13 (0.08–0.20)	≤0.8DC
			ap ≤ 2.0 mm	160 (130–190)	90 (50–130)	0.15 (0.10–0.25)	≤0.8DC
			2.0 mm < ap ≤ 4.0 mm	140 (110–170)	70 (40–100)	0.13 (0.10–0.20)	≤0.8DC
			4.0 mm < ap ≤ 7.5 mm	120 (90–150)	60 (30– 90)	0.10 (0.08–0.15)	≤0.8DC
	Tensile strength ≤800MPa	●	ap ≤ 0.5 mm	230 (200–250)	110 (60–160)	0.13 (0.08–0.20)	≤0.8DC
			ap ≤ 2.0 mm	200 (170–230)	110 (60–160)	0.15 (0.10–0.25)	≤0.8DC
			2.0 mm < ap ≤ 4.0 mm	180 (150–210)	90 (50–130)	0.13 (0.10–0.20)	≤0.8DC
			4.0 mm < ap ≤ 7.5 mm	160 (130–190)	70 (40–100)	0.10 (0.08–0.15)	≤0.8DC
		●	ap ≤ 0.5 mm	200 (170–230)	110 (60–160)	0.13 (0.08–0.20)	≤0.8DC
			ap ≤ 2.0 mm	180 (150–210)	110 (60–160)	0.15 (0.10–0.25)	≤0.8DC
			2.0 mm < ap ≤ 4.0 mm	160 (130–190)	90 (50–130)	0.13 (0.10–0.20)	≤0.8DC
			4.0 mm < ap ≤ 7.5 mm	140 (110–170)	70 (40–100)	0.10 (0.08–0.15)	≤0.8DC
		✖	ap ≤ 0.5 mm	180 (150–210)	90 (50–130)	0.13 (0.08–0.20)	≤0.8DC
			ap ≤ 2.0 mm	160 (130–190)	90 (50–130)	0.15 (0.10–0.25)	≤0.8DC
			2.0 mm < ap ≤ 4.0 mm	140 (110–170)	70 (40–100)	0.13 (0.10–0.20)	≤0.8DC
			4.0 mm < ap ≤ 7.5 mm	120 (90–150)	60 (30– 90)	0.10 (0.08–0.15)	≤0.8DC

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VPX200/300

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED (DRY CUTTING)

Material	Properties	Conditions	Recommendation 1st 2nd	ae							
				≤0.25 DC		0.25 – 0.5 DC		0.5 – 0.75 DC		DC (Slot)	
				MV1020	MV1030	MV1020	MV1030	MV1020	MV1030	MV1020	MV1030
P	Mild steel	≤180HB	●●	L	M	280 (220–330)	230 (180–270)	270 (210–320)	220 (170–260)	220 (170–260)	180 (140–210)
	Carbon steel	180–280HB	●●	L	M	220 (170–260)	180 (140–210)	210 (160–240)	170 (130–200)	170 (130–200)	170 (130–200)
	Alloy steel	280–350HB	●●	L	M	180 (140–210)	180 (140–210)	170 (130–200)	170 (130–200)	140 (110–160)	140 (110–160)
M	Stainless steel	≤200HB	●●	L	M	—	180 (140–210)	—	170 (130–200)	—	140 (110–160)
		>200HB	●●	L	M	—	150 (110–180)	—	140 (100–160)	—	110 (80–130)
K	Ductile cast iron	Tensile strength ≤450MPa	●●	M	L	200 (150–280)	150 (100–200)	190 (140–270)	140 (90–190)	170 (130–240)	125 (80–170)
		Tensile strength ≤800MPa	●●	M	L	180 (140–250)	150 (100–200)	170 (130–240)	140 (90–190)	150 (120–210)	125 (80–170)

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WET CUTTING

Material	Properties	Conditions	Recommendation 1st 2nd	ae							
				≤0.25 DC		0.25 – 0.5 DC		0.5 – 0.75 DC		DC (Slot)	
				MV1020	MV1030	MV1020	MV1030	MV1020	MV1030	MV1020	MV1030
P	Mild steel	≤180HB	●●	L	M	210 (150–290)	140 (100–190)	200 (140–270)	130 (90–180)	150 (110–180)	100 (70–120)
	Carbon steel	180–280HB	●●	L	M	180 (140–210)	120 (90–140)	170 (120–200)	110 (80–130)	150 (110–180)	100 (70–120)
	Alloy steel	280–350HB	●●	L	M	140 (110–160)	120 (90–140)	130 (90–150)	110 (80–130)	120 (80–140)	120 (80–140)
K	Ductile cast iron	Tensile strength ≤450MPa	●●	M	L	180 (150–240)	130 (80–180)	170 (140–230)	120 (70–170)	150 (130–200)	105 (60–150)
		Tensile strength ≤800MPa	●●	M	L	160 (130–210)	130 (80–180)	150 (120–200)	120 (70–170)	130 (110–170)	105 (60–150)

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VPX200

RECOMMENDED CUTTING CONDITIONS

DEPTH OF CUT / FEED PER TOOTH

DRY AND WET CUTTING

Material	Properties	ae	Conditions	DC					
				Ø 16 - Ø 18		Ø 20 - Ø 25		Ø 28 - Ø 63	
				ap	fz	ap	fz	ap	fz
P	Mild steel	≤180HB	≤0.25DC	● ●	≤6 0.10 - 0.15	≤8 0.10 - 0.20	≤8 0.10 - 0.20	≤8 0.10 - 0.25	
			0.25 - 0.5DC	● ●	≤5 0.08 - 0.12	≤8 0.10 - 0.15	≤8 0.10 - 0.15	≤8 0.10 - 0.20	
			0.5 - 0.75DC	● ●	≤4 0.08 - 0.12	≤6 0.08 - 0.12	≤6 0.08 - 0.12	≤6 0.10 - 0.15	
			DC (Slot)	● ●	≤2 0.06 - 0.10	≤4 0.06 - 0.10	≤4 0.06 - 0.10	≤4 0.08 - 0.12	
	Carbon steel Alloy steel	180 - 280HB	≤0.25DC	● ●	≤6 0.10 - 0.15	≤8 0.10 - 0.20	≤8 0.10 - 0.20	≤8 0.10 - 0.25	
			0.25 - 0.5DC	● ●	≤5 0.08 - 0.12	≤8 0.10 - 0.15	≤8 0.10 - 0.15	≤8 0.10 - 0.20	
			0.5 - 0.75DC	● ●	≤4 0.08 - 0.12	≤6 0.08 - 0.12	≤6 0.08 - 0.12	≤6 0.10 - 0.15	
			DC (Slot)	● ●	≤2 0.06 - 0.10	≤4 0.06 - 0.10	≤4 0.06 - 0.10	≤4 0.08 - 0.12	
		280 - 350HB	≤0.25DC	● ●	≤6 0.10 - 0.15	≤8 0.10 - 0.15	≤8 0.10 - 0.15	≤8 0.10 - 0.20	
			0.25 - 0.5DC	● ●	≤5 0.08 - 0.12	≤8 0.08 - 0.12	≤8 0.08 - 0.12	≤8 0.10 - 0.15	
			0.5 - 0.75DC	● ●	≤4 0.08 - 0.12	≤6 0.06 - 0.10	≤6 0.06 - 0.10	≤6 0.08 - 0.12	
			DC (Slot)	● ●	≤2 0.06 - 0.10	≤4 0.06 - 0.10	≤4 0.06 - 0.10	≤4 0.06 - 0.10	
M	Stainless steel	—	≤0.25DC	● ●	≤6 0.10 - 0.15	≤8 0.10 - 0.20	≤8 0.10 - 0.20	≤8 0.10 - 0.20	
			0.25 - 0.5DC	● ●	≤5 0.08 - 0.12	≤8 0.08 - 0.15	≤8 0.08 - 0.15	≤8 0.08 - 0.15	
			0.5 - 0.75DC	● ●	≤4 0.06 - 0.10	≤6 0.08 - 0.12	≤6 0.08 - 0.12	≤6 0.08 - 0.12	
			DC (Slot)	● ●	≤2 0.06 - 0.10	≤4 0.06 - 0.10	≤4 0.06 - 0.10	≤4 0.06 - 0.10	
K	Ductile cast iron	Tensile strength ≤800MPa	≤0.25DC	● ●	≤6 0.10 - 0.15	≤8 0.10 - 0.20	≤8 0.10 - 0.20	≤8 0.10 - 0.20	
			0.25 - 0.5DC	● ●	≤5 0.08 - 0.12	≤8 0.10 - 0.15	≤8 0.10 - 0.15	≤8 0.10 - 0.15	
			0.5 - 0.75DC	● ●	≤4 0.08 - 0.12	≤6 0.08 - 0.12	≤6 0.08 - 0.12	≤6 0.08 - 0.12	
			DC (Slot)	● ●	≤2 0.06 - 0.10	≤4 0.06 - 0.10	≤4 0.06 - 0.10	≤4 0.06 - 0.10	

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- These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types.
If there is chatter, insert chipping, etc. during machining, alter conditions accordingly
- Chattering vibration is 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. (Service 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 use a new clamp screw periodically.

VPX300

RECOMMENDED CUTTING CONDITIONS

DEPTH OF CUT / FEED PER TOOTH

DRY AND WET CUTTING

Material	Properties	ae	Conditions	DC				
				Ø 25		Ø 28 – Ø 80		
				ap	fz	ap	fz	
P	Mild steel	≤180HB	≤0.25DC	●●	≤11	0.10 – 0.20	≤11	0.10 – 0.30
			0.25 – 0.5DC	●●	≤11	0.10 – 0.15	≤11	0.10 – 0.25
			0.5 – 0.75DC	●●	≤8	0.08 – 0.12	≤8	0.10 – 0.20
			DC (Slot)	●●	≤5	0.06 – 0.10	≤5	0.08 – 0.15
	Carbon steel Alloy steel	180 – 280HB	≤0.25DC	●●	≤11	0.10 – 0.20	≤11	0.10 – 0.30
			0.25 – 0.5DC	●●	≤11	0.10 – 0.15	≤11	0.10 – 0.25
			0.5 – 0.75DC	●●	≤8	0.08 – 0.12	≤8	0.10 – 0.20
			DC (Slot)	●●	≤5	0.06 – 0.10	≤5	0.08 – 0.15
		280 – 350HB	≤0.25DC	●●	≤11	0.10 – 0.15	≤11	0.10 – 0.25
			0.25 – 0.5DC	●●	≤11	0.08 – 0.12	≤11	0.10 – 0.20
			0.5 – 0.75DC	●●	≤8	0.06 – 0.10	≤8	0.10 – 0.15
			DC (Slot)	●●	≤5	0.06 – 0.10	≤5	0.08 – 0.12
M	Stainless steel	—	≤0.25DC	●●	≤11	0.10 – 0.20	≤11	0.10 – 0.20
			0.25 – 0.5DC	●●	≤11	0.08 – 0.15	≤11	0.08 – 0.15
			0.5 – 0.75DC	●●	≤8	0.08 – 0.12	≤8	0.08 – 0.12
			DC (Slot)	●●	≤5	0.06 – 0.10	≤5	0.06 – 0.10
K	Ductile cast iron	Tensile strength ≤800MPa	≤0.25DC	●●	≤11	0.10 – 0.20	≤11	0.10 – 0.25
			0.25 – 0.5DC	●●	≤11	0.10 – 0.15	≤11	0.10 – 0.20
			0.5 – 0.75DC	●●	≤8	0.08 – 0.12	≤8	0.10 – 0.15
			DC (Slot)	●●	≤5	0.06 – 0.10	≤5	0.08 – 0.12

1/1

- These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types.
If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
- Chattering vibration is 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. (Service 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 renew the clamp screw periodically.

AHX440S

RECOMMENDED CUTTING CONDITIONS

DRY CUTTING

Material		Properties	Vc		fz	ap	ae
			MV1020	MV1030			
P	Mild steel	≤180HB	300 (200 – 400)	245 (190 – 300)	0.3 (0.2 – 0.4)	≤3	≤0.8 DC
	Carbon steel	180 – 280HB	260 (170 – 350)	210 (150 – 270)	0.3 (0.2 – 0.4)	≤3	≤0.8 DC
	Alloy steel	280 – 350HB	180 (100 – 250)	135 (90 – 180)	0.3 (0.2 – 0.4)	≤3	≤0.8 DC
M	Stainless steel	≤200HB	—	185 (120 – 250)	0.2 (0.1 – 0.3)	≤3	≤0.8 DC
		>200HB	—	140 (80 – 200)	0.2 (0.1 – 0.3)	≤3	≤0.8 DC
K	Ductile cast iron	Tensile strength ≤450MPa	240 (130 – 350)	185 (120 – 250)	0.2 (0.1 – 0.3)	≤3	≤0.8 DC
		Tensile strength ≤800MPa	220 (80 – 350)	150 (100 – 200)	0.2 (0.1 – 0.3)	≤3	≤0.8 DC
1/1							

1/1

1. Refer to the above table and set up cutting conditions according to cutting applications.
2. When placing emphasis on surface finish quality, wet cutting is recommended. (tool life is lowered as compared to dry cutting)
3. The recommended depth of cut differs according to insert geometry.
4. When clamp rigidity is low and tool overhang is long, we recommended to reduce the cutting speed and the feed rate by 30 %.
5. Recommended wet cutting for good surface finishing of stainless steel. (Tool life is short compared to wet cutting.)

AHX475S

RECOMMENDED CUTTING CONDITIONS

DRY CUTTING

Material	Properties		Vc		fz	ap	ae
			MV1020	MV1030			
P	Mild steel	≤180HB	R 220 (170–270)	140 (80–200)	0.6	≤1.6	≤0.5 DC
			R 220 (170–270)	140 (80–200)	0.8	≤1.6	0.5 DC < ae ≤ 0.8 DC
			M 220 (170–270)	140 (80–200)	1.0	≤1.6	0.8 DC < ae ≤ DC
	Carbon steel Alloy steel	180–280HB	R 200 (150–250)	120 (60–180)	0.6	≤1.6	≤0.5 DC
			R 200 (150–250)	120 (60–180)	0.8	≤1.6	0.5 DC < ae ≤ 0.8 DC
			M 200 (150–250)	120 (60–180)	1.0	≤1.6	0.8 DC < ae ≤ DC
		280–350HB	R 150 (100–200)	90 (30–150)	0.5	≤1.6	≤0.5 DC
			R 150 (100–200)	90 (30–150)	0.6	≤1.6	0.5 DC < ae ≤ 0.8 DC
			R 150 (100–200)	90 (30–150)	0.7	≤1.6	0.8 DC < ae ≤ DC
K	Ductile cast iron	Tensile strength ≤450MPa	R 200 (150–250)	140 (80–200)	0.6	≤1.6	≤0.5 DC
			R 200 (150–250)	140 (80–200)	0.8	≤1.6	0.5 DC < ae ≤ 0.8 DC
			M 200 (150–250)	140 (80–200)	1.0	≤1.6	0.8 DC < ae ≤ DC
		Tensile strength ≤800MPa	R 180 (130–230)	140 (80–200)	0.5	≤1.6	≤0.5 DC
			R 180 (130–230)	140 (80–200)	0.6	≤1.6	0.5 DC < ae ≤ 0.8 DC
			R 180 (130–230)	140 (80–200)	0.7	≤1.6	0.8 DC < ae ≤ DC

1/1

1. When clamp rigidity is low and tool overhang is long, we recommended to reduce the cutting speed and the feed rate by 30 %.

AHX640S

RECOMMENDED CUTTING CONDITIONS

DRY CUTTING

	Material	Properties		Vc		fz	ap	ae
				MV1020	MV1030			
P	Mild steel	≤180HB	M, L	300 (200–400)	245 (190–300)	0.3 (0.2–0.4)	≤5	≤0.8 DC
	Carbon steel	180–280HB	M, L	260 (170–350)	210 (150–270)	0.3 (0.2–0.4)	≤5	≤0.8 DC
	Alloy steel	280–350HB	M, L	180 (100–250)	135 (90–180)	0.3 (0.2–0.4)	≤5	≤0.8 DC
M	Stainless steel	≤200HB	L	—	185 (120–250)	0.2 (0.1–0.3)	≤5	≤0.8 DC
		>200HB	L	—	140 (80–200)	0.2 (0.1–0.3)	≤5	≤0.8 DC
	PH stainless steel	<450HB	L	—	130 (100–160)	0.2 (0.1–0.3)	≤5	≤0.8 DC
K	Gray cast iron	Tensile strength ≤450MPa	M, MK, HK	240 (130–350)	185 (120–250)	0.2 (0.1–0.3)	≤5	≤0.8 DC
		Tensile strength ≤800MPa	M, MK, HK	220 (80–350)	150 (100–200)	0.2 (0.1–0.3)	≤5	≤0.8 DC

1/1

ASX445

RECOMMENDED CUTTING CONDITIONS

DRY AND WET CUTTING

Material	Properties	Vc		fz		fz		fz	
		MV1020	MV1030						
P	Mild steel	≤180HB	300 (200–400)	275 (200–350)	0.15 (0.1–0.2)	JL	0.2 (0.1–0.3)	JM	0.3 (0.2–0.4)
	Carbon steel	180–350HB	260 (170–350)	235 (170–300)	0.15 (0.1–0.2)	JL	0.2 (0.1–0.3)	JM	0.3 (0.2–0.4)
	Alloy steel	280–350HB	180 (100–250)	165 (100–230)	0.15 (0.1–0.2)	JL	0.2 (0.1–0.3)	JM	0.3 (0.2–0.4)
M	Stainless steel	—	—	220 (170–270)	0.15 (0.1–0.2)	JL	0.2 (0.1–0.3)	JM	0.3 (0.2–0.4)
K	Ductile cast iron	Tensile strength ≤450MPa	240 (130–350)	190 (130–250)	0.15 (0.1–0.2)	JL	0.2 (0.1–0.3)	JM	0.3 (0.2–0.4)
		Tensile strength >450MPa	220 (80–350)	110 (80–150)	0.15 (0.1–0.2)	JL	0.2 (0.1–0.3)	JM	0.3 (0.2–0.4)

1/1

ASX400

RECOMMENDED CUTTING CONDITIONS

DRY AND WET CUTTING

Material	Properties	Vc		fz		fz		fz	
		MV1020	MV1030						
P	Mild steel	≤180HB	300 (200–400)	275 (200–350)	0.18 (0.08–0.28)	JL	0.20 (0.10–0.30)	JM	0.25 (0.10–0.35)
	Carbon steel	180–350HB	260 (170–350)	235 (170–300)	0.15 (0.07–0.23)	JL	0.18 (0.10–0.28)	JM	0.20 (0.10–0.30)
	Alloy steel	280–350HB	180 (100–250)	165 (100–230)	0.13 (0.06–0.20)	JL	0.15 (0.10–0.25)	JM	0.18 (0.10–0.28)
M	Stainless steel	—	—	220 (170–270)	0.15 (0.07–0.23)	JL	0.18 (0.10–0.28)	JM	0.20 (0.10–0.30)
K	Ductile cast iron	Tensile strength ≤450MPa	240 (130–350)	190 (130–250)	0.18 (0.10–0.28)	JL	0.20 (0.10–0.30)	JM	0.25 (0.10–0.35)
		Tensile strength >450MPa	220 (80–350)	110 (80–150)	0.18 (0.10–0.28)	JL	0.20 (0.10–0.30)	JM	0.25 (0.10–0.35)

1/1

APX3000 / 4000

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED (DRY CUTTING)

Material	Properties	Conditions	Recommendation 1st 2nd	ae							
				≤0.25 DC		0.25 – 0.5 DC		0.5 – 0.75 DC		DC (Slot)	
				MV1020	MV1030	MV1020	MV1030	MV1020	MV1030	MV1020	MV1030
P	Mild steel	≤180HB	● ●	L	M	280 (220–330)	230 (180–270)	270 (210–320)	220 (170–260)	220 (170–260)	180 (140–210)
	Carbon steel	180–280HB	● ●	L	M	220 (170–260)	180 (140–210)	210 (160–240)	170 (130–200)	170 (130–200)	170 (130–200)
	Alloy steel	280–350HB	● ●	L	M	180 (140–210)	180 (140–210)	170 (130–200)	170 (130–200)	140 (110–160)	140 (110–160)
M	Austenitic stainless steel	≤200HB	● ●	L	M	—	180 (140–210)	—	170 (130–200)	—	140 (110–160)
		>200HB	● ●	L	M	—	150 (110–180)	—	140 (100–160)	—	110 (80–130)
	PH stainless steel	<450HB	● ●	L	M	—	140 (110–170)	—	140 (110–170)	—	140 (110–170)
K	Gray cast iron	≤450HB	● ●	M	L	200 (150–280)	150 (100–200)	190 (140–270)	140 (90–190)	170 (130–240)	125 (80–170)
	Ductile cast iron	≤800MPa	● ●	M	L	180 (140–250)	150 (100–200)	170 (130–240)	140 (90–190)	150 (120–210)	125 (80–170)

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ARP5/6

RECOMMENDED CUTTING CONDITIONS

DRY CUTTING

Material	Properties	MV1020	MV1030
		Vc	Vc
M	Austenitic stainless steel		
	≤200HB	250 (200 – 300)	220 (170 – 270)
	>200HB	220 (170 – 270)	190 (140 – 240)
	Duplex steel		
	≤280HB	250 (200 – 300)	220 (170 – 270)
	Ferritic and martensitic stainless steel		
	≤200HB	270 (220 – 320)	240 (190 – 290)
	>200HB	270 (220 – 320)	240 (190 – 290)
	PH stainless steel		
	<450HB	190 (140 – 240)	170 (120 – 220)

1/1

WET CUTTING

Material	Properties	MV1020	MV1030
		Vc	Vc
M	Austenitic stainless steel		
	≤200HB	180 (130 – 230)	150 (100 – 200)
	>200HB	150 (100 – 200)	130 (80 – 180)
	Duplex steel		
	≤280HB	180 (130 – 230)	150 (100 – 200)
	Ferritic and martensitic stainless steel		
	≤200HB	190 (140 – 240)	170 (120 – 220)
	>200HB	190 (140 – 240)	170 (120 – 220)
	PH stainless steel		
	<450HB	130 (80 – 180)	120 (70 – 170)

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BRP

RECOMMENDED CUTTING CONDITIONS

DRY CUTTING

	Material	Properties	MV1020	MV1030
			Vc	Vc
P	Mild steel	≤180HB	300 (200 – 400)	250 (200 – 300)
	Carbon steel	180 – 280HB	260 (170 – 350)	220 (170 – 270)
	Alloy steel	280 – 350HB	180 (100 – 250)	135 (90 – 180)
M	Austenitic stainless steel	≤200HB	250 (200 – 300)	220 (170 – 270)
		>200HB	220 (170 – 270)	190 (140 – 240)
	PH stainless steel	<450HB	190 (140 – 240)	170 (120 – 220)
K	Gray cast iron	≤450MPa	240 (130 – 350)	190 (130 – 250)
	Ductile cast iron	≤800MPa	220 (80 – 350)	110 (80 – 150)

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FEED PER TOOTH (mm/t.)

Type	Depth of cut (mm)							
	1	2	3	4	5	6	7	8
BRP4	0.40	0.30	0.20	0.10	—	—	—	—
BRP5	0.40	0.35	0.30	0.20	0.10	—	—	—
BRP6	0.50	0.40	0.30	0.25	0.23	0.20	—	—
BRP8	0.60	0.50	0.45	0.40	0.33	0.30	0.25	0.20

AJX

RECOMMENDED CUTTING CONDITIONS

CUTTING SPEED (DRY CUTTING)

	Material	Properties	MV1020	MV1030
			Vc	Vc
P	Mild steel	≤180HB	230 (180 – 280)	160 (100 – 220)
	Carbon steel	180 – 350HB	220 (170 – 270)	150 (80 – 220)
	Alloy steel	280 – 350HBB	180 (100 – 250)	140 (70 – 210)
	Alloy tool steel	≤350HB	180 (100 – 250)	140 (70 – 210)
M	Austenitic stainless steel	≤200HB	—	160 (130 – 200)
		>200HB	—	140 (80 – 200)
	PH stainless steel	<450HB	—	140 (80 – 200)
K	Gray cast iron	≤450MPa	210 (160 – 260)	160 (120 – 210)
	Ductile cast iron	≤800MPa	190 (140 – 240)	130 (90 – 170)

1/1

SYMBOLS

 Recommended cutting conditions	MACHINING TYPE
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.	 Roughing
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.	 Medium cutting
APPLICATION	 Light cutting
 Face milling	 Pre-finishing
 Chamfer milling	 Finishing
 Shoulder milling with R	 Fine-finishing
 Face milling close to a wall	TOOL MATERIAL
 Shoulder milling	 Ultra micro grain carbide Ultra micro grain carbide substrate material.
 Side milling	 Cubic boron nitride Mitsubishi Materials' original CBN material.
 Slot milling	 Ceramic For high speed efficient machining of super alloys due to the excellent high temperature strength property.
 Ramping	 High hardness powder metallurgy HSS High hardness powder metallurgy HSS substrate material.
 Pocket milling	 High grade high alloy HSS High grade high alloy HSS substrate material.
 Slot milling with R	 Cobalt high speed steel Cobalt high speed steel substrate material.
 Copy milling	 High speed steel High speed steel substrate material.
 T-Slot milling	

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

MEMO

MEMO

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