

MV1000 SERIES

RECOMMENDED CUTTING CONDITIONS

VPX200/300

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)	140 (110–160)
	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)	100 (70–120)
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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MV1000 SERIES

RECOMMENDED CUTTING CONDITIONS

VPX200

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 0.10–0.25	≤8 0.10–0.25	≤8 0.10–0.25
			0.25–0.5DC	● ●	≤5 0.08–0.12	≤8 0.10–0.15	≤8 0.10–0.20	≤8 0.10–0.20	≤8 0.10–0.20
			0.5–0.75DC	● ●	≤4 0.08–0.12	≤6 0.08–0.12	≤6 0.10–0.15	≤6 0.10–0.15	≤6 0.10–0.15
			DC (Slot)	● ●	≤2 0.06–0.10	≤4 0.06–0.10	≤4 0.08–0.12	≤4 0.08–0.12	≤4 0.08–0.12
	Carbon steel Alloy steel	180–280HB	≤0.25DC	● ●	≤6 0.10–0.15	≤8 0.10–0.20	≤8 0.10–0.25	≤8 0.10–0.25	≤8 0.10–0.25
			0.25–0.5DC	● ●	≤5 0.08–0.12	≤8 0.10–0.15	≤8 0.10–0.20	≤8 0.10–0.20	≤8 0.10–0.20
			0.5–0.75DC	● ●	≤4 0.08–0.12	≤6 0.08–0.12	≤6 0.10–0.15	≤6 0.10–0.15	≤6 0.10–0.15
			DC (Slot)	● ●	≤2 0.06–0.10	≤4 0.06–0.10	≤4 0.08–0.12	≤4 0.08–0.12	≤4 0.08–0.12
		280–350HB	≤0.25DC	● ●	≤6 0.10–0.15	≤8 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 0.08–0.12	≤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 0.06–0.10	≤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	≤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	≤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	≤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	≤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	≤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	≤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	≤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	≤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	≤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.

MV1000 SERIES

RECOMMENDED CUTTING CONDITIONS

VPX300

DEPTH OF CUT / FEED PER TOOTH

DRY AND WET CUTTING

				DC				
Material	Properties	ae	Conditions	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

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- 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.