

# CUTTING CONDITIONS

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## PMD

### Side Milling - Slot Milling

For horizontal milling, calculate by per tooth.

	Work Material	Tensile Strength / Hardness	Side Milling ap: 10mm ae:0,2D		Slot Milling ap: 3mm ae:1,0D	
			Cutting Speed Vc (m/min)	Feed per tooth fz (mm/t)	Cutting Speed Vc (m/min)	Feed per tooth fz (mm/t)
P	Mild Steel-Carbon Steel (S5400-S10C)	~180HB	180 (100~250)	0,25 (0,2~0,5)	180 (100~250)	0,12(0,05~0,2)
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	180 (100~250)	0,2(0,15~0,4)	180 (100~250)	0,11(0,05~0,2)
	Die Steel (SKD11-SKD61)	~280HB	150 (80~200)	0,2(0,15~0,4)	150 (80~200)	0,1(0,05~0,18)
M	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	150 (80~200)	0,18(0,15~0,4)	150 (80~200)	0,1(0,05~0,18)
	Stainless Steel (Wet) (SUS304-SUS420)	~250HB	80 (60~120)	0,18(0,15~0,4)	80 (60~120)	0,1(0,05~0,18)
K	Cast Iron (FC250)	~350N/mm <sup>2</sup>	180 (100~300)	0,25(0,15~0,5)	180 (100~300)	0,12(0,05~0,2)
	Ductile Cast Iron (FCD400)	~800N/mm <sup>2</sup>	180 (100~250)	0,15(0,1~0,4)	180 (100~250)	0,12(0,05~0,2)
N	Aluminium Alloy	~13%Si	300 (200~1.500)	0,3(0,2~0,5)	300 (200~1.500)	0,15(0,1~0,25)
S	Superalloy (Wet) (Inconel®718)	-	35 (25~60)	0,15 (0,1~0,3)	35 (25~60)	0,1(0,05~0,15)
	Titanium Alloy (Wet) (Ti-6Al-4V)	-	40 (30~120)	0,18(0,1~0,35)	40 (30~120)	0,1(0,08~0,25)
H	Pre-hardened Steel (NAK80)	40~43HRC	100 (40~150)	0,18(0,1~0,3)	90 (40~150)	0,1(0,08~0,2)
	Steel for Die Casting (DAC-MAGIC, DH31)	43~48HRC	80 (40~120)	0,12(0,08~0,2)	70 (40~120)	0,08(0,06~0,15)
	Hardened Steel (SKD11)	50~55HRC	60 (40~90)	0,1(0,05~0,2)	50 (40~90)	0,06(0,05~0,1)

## Drilling

For both counterboring and plunge milling

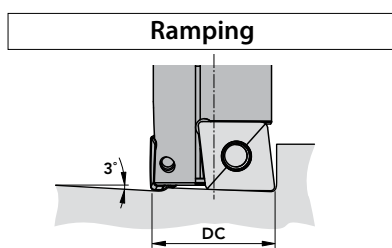
	Work Material	Tensile Strength / Hardness	Cutting Speed Vc (m/min)	Feed Rate f (mm/rev)		
				Ø20	Ø25	Ø32
P	Mild Steel-Carbon Steel (S5400-S10C)	~180HB	160(100~200)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	150(100~200)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
	Die Steel (SKD11-SKD61)	~280HB	120(80~180)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
M	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	130(80~180)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
	Cast Iron (FC250)	~350N/mm <sup>2</sup>	200(150~180)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
K	Ductile Cast Iron (FCD400)	~800N/mm <sup>2</sup>	160(100~220)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
N	Aluminium Alloy	~13%Si	200(100~800)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
S	Superalloy (Wet) (Inconel®718)	-	50(30~60)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
	Titanium Alloy (Wet) (Ti-6Al-4V)	-	60(30~100)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
H	Pre-hardened Steel (NAK80)	40~43HRC	100(60~120)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
	Steel for Die Casting (DAC-MAGIC, DH31)	43~48HRC	80(40~100)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
	Hardened Steel (SKD11)	50~55HRC	60(40~80)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)

\* Above recommended speed is for short shank type.

For long shank type, use the following cutting condition: cutting speed = 80% of the above settings.

1. The indicated speeds and feeds are for milling with water-soluble coolant.
2. The above cutting conditions are to be used as general guidelines. Adjustments may be necessary depending on actual cutting condition.
3. Inserts should be attached to the holder tightly in a very neat condition.
4. Fasten the work material to reduce the possibility of work deformation, deflection of machined surface, or vibration.

Set the maximum processing angle during ramping and helical drilling operations to less than 3°



The diagram illustrates a helical drilling operation. A tool is shown drilling into a workpiece at a 3° angle. The dimension DC is indicated as the depth of cut, and D0 Max. is indicated as the maximum diameter of the hole.

Unit: mm

(DC)	(D0 Max.)
20	37
25	47
32	61