

# Correction factor by recommended cutting condition overhang length (SIDE MILLING)

Use by multiplying the recommended cutting condition on the next page by the correction factor by overhang length.

Refer to each recommended condition for the long cutting and offset type.

L/D	Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT				Austenitic stainless steel, Ferritic, Precipitation hardening stainless steel, Titanium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V			
	Cutting Speed (m/min)	Main Spindle Revolution (min <sup>-1</sup> )	Feed per Tooth (mm/tooth)	Cutting Width ae (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min <sup>-1</sup> )	Feed per Tooth (mm/tooth)	Cutting Width ae (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min <sup>-1</sup> )	Feed per Tooth (mm/tooth)	Cutting Width ae (mm)
2	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
3	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
4	80%	80%	90%	70%	80%	80%	90%	70%	80%	80%	90%	70%
5	60%	60%	80%	40%	60%	60%	80%	40%	60%	60%	80%	40%
6	50%	50%	70%	30%	50%	50%	70%	30%	50%	50%	70%	30%
7	40%	40%	70%	20%	40%	40%	70%	20%	30%	30%	60%	20%
8	40%	40%	60%	10%	40%	40%	60%	10%	30%	30%	50%	10%
9	30%	30%	60%	10%	30%	30%	60%	10%	20%	20%	50%	10%

L/D	Precipitation hardening stainless steel, Cobalt chromium alloy AISI 630, AISI 631				Heat resistant alloys Inconel718			
	Cutting Speed (m/min)	Main Spindle Revolution (min <sup>-1</sup> )	Feed per Tooth (mm/tooth)	Cutting Width ae (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min <sup>-1</sup> )	Feed per Tooth (mm/tooth)	Cutting Width ae (mm)
2	100%	100%	100%	100%	100%	100%	100%	100%
3	100%	100%	100%	100%	100%	100%	100%	100%
4	80%	80%	90%	70%	80%	80%	90%	70%
5	60%	60%	80%	40%	60%	60%	80%	40%
6	50%	50%	70%	30%	50%	50%	70%	30%
7	30%	30%	60%	20%	30%	30%	60%	20%
8	30%	30%	50%	10%	30%	30%	50%	10%
9	20%	20%	50%	10%	20%	20%	50%	10%

# RECOMMENDED CUTTING CONDITIONS

## Side milling

Dia DC (mm)	Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010						Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT						Austenitic stainless steel, Ferritic, Precipitation hardening stainless steel, Titanium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V					
	Cutting Speed (m/min)	Main Spindle Revolution (min <sup>-1</sup> )	Feed per Tooth (mm/tooth)	Table Feed per Min. (mm/min)	Depth of Cut ap (mm)	Cutting Width ae (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min <sup>-1</sup> )	Feed per Tooth (mm/tooth)	Table Feed per Min. (mm/min)	Depth of Cut ap (mm)	Cutting Width ae (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min <sup>-1</sup> )	Feed per Tooth (mm/tooth)	Table Feed per Min. (mm/min)	Depth of Cut ap (mm)	Cutting Width ae (mm)
10	150	4800	0.09	1700	10	2	120	3800	0.06	910	10	2	100	3200	0.075	960	10	2
12	150	4000	0.09	1400	12	2.4	120	3200	0.065	830	12	2.4	100	2700	0.08	860	12	2.4
16	150	3000	0.1	1200	16	3.2	120	2400	0.075	720	16	3.2	100	2000	0.09	720	16	3.2
20	150	2400	0.1	960	20	4	120	1900	0.075	570	20	4	100	1600	0.09	580	20	4
25	150	1900	0.12	910	25	5	120	1500	0.075	450	25	5	100	1300	0.09	470	25	5

Depth of cut

DC: Dia.

Dia DC (mm)	Precipitation hardening stainless steel, Cobalt chromium alloy AISI 630, AISI 631						Heat resistant alloys Inconel718					
	Cutting Speed (m/min)	Main Spindle Revolution (min <sup>-1</sup> )	Feed per Tooth (mm/tooth)	Table Feed per Min. (mm/min)	Depth of Cut ap (mm)	Cutting Width ae (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min <sup>-1</sup> )	Feed per Tooth (mm/tooth)	Table Feed per Min. (mm/min)	Depth of Cut ap (mm)	Cutting Width ae (mm)
10	75	2400	0.06	580	10	2	40	1300	0.04	210	10	1
12	75	2000	0.065	520	12	2.4	40	1100	0.045	200	12	1.2
16	75	1500	0.075	450	16	3.2	40	800	0.05	160	16	1.6
20	75	1200	0.075	360	20	4	40	640	0.05	130	20	2
25	75	950	0.075	290	25	5	40	510	0.05	100	25	2.5

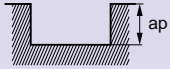
Depth of cut

DC: Dia.

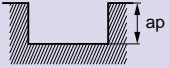
- 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
- 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
- 3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sound can occur.  
In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

# RECOMMENDED CUTTING CONDITIONS

## Slotting

Dia DC (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min <sup>-1</sup> )	Feed per Tooth (mm/tooth)	Table Feed per Min. (mm/min)	Depth of Cut ap (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min <sup>-1</sup> )	Feed per Tooth (mm/tooth)	Table Feed per Min. (mm/min)	Depth of Cut ap (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min <sup>-1</sup> )	Feed per Tooth (mm/tooth)	Table Feed per Min. (mm/min)	Depth of Cut ap (mm)
Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys			Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel			Austenitic stainless steel, Ferritic, Precipitation hardening stainless steel, Titanium alloy									
AISI 1045, AISI 4140, ASTM A36, AISI 1010			AISI P21, AISI P20, AISI 4340, SKD, SKT			AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V									
10	100	3200	0.04	510	5	80	2500	0.03	300	5	75	2400	0.03	290	5
12	100	2700	0.05	540	6	80	2100	0.04	340	6	75	2000	0.04	320	6
16	100	2000	0.07	560	8	80	1600	0.05	320	8	75	1500	0.06	360	8
20	100	1600	0.07	450	10	80	1300	0.05	260	10	75	1200	0.06	290	10
25	100	1300	0.08	420	12	80	1000	0.05	200	12	75	950	0.06	230	12
Depth of cut															

DC: Dia.

Dia DC (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min <sup>-1</sup> )	Feed per Tooth (mm/tooth)	Table Feed per Min. (mm/min)	Depth of Cut ap (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min <sup>-1</sup> )	Feed per Tooth (mm/tooth)	Table Feed per Min. (mm/min)	Depth of Cut ap (mm)
Precipitation hardening stainless steel, Cobalt chromium alloy					Heat resistant alloys					
AISI 630, AISI 631					Inconel718					
10	60	1900	0.025	190	5	30	950	0.02	76	2
12	60	1600	0.035	220	6	30	800	0.03	96	2.4
16	60	1200	0.05	240	8	30	600	0.05	120	3.2
20	60	950	0.05	190	10	30	480	0.05	96	4
25	60	760	0.05	150	12	30	380	0.05	76	5
Depth of cut										

DC: Dia.

- 1) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
- 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
- 3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sound can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.