


CUTTING CONDITIONS

Milling | Endmills | Cutting conditions


AE-VMS

Radius Type

Slot Milling

	Mild Steel • Carbon Steel • Cast Iron		Alloy Steel • Tool Steel		Prehardened Steel • Hardened Steel		Stainless Steel		Precipitation Stainless Steel		Titanium Alloy		Ni-Based Alloy											
	SS400 • S55C • FC250 ~750N/mm²		SCM • SKS • SKD ~30HRC		PX5 • NAK80 30~45HRC		SUS304 • SUS420 ≤200HB		SUS630		Ti-6Al-4V		Inconel 718											
Cutting Speed	100 (80-120) (m/min)		90 (70-110) (m/min)		80 (60-100) (m/min)		70 (50-80) (m/min)		70 (60-80) (m/min)		60 (50-70) (m/min)		25 (20-30) (m/min)											
Ø	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)										
3	10.600	790	9.600	590	8.500	410	7.400	380	8.540	430	7.430	410	3.180	160										
4	8.000	820	7.200	610	6.400	410	5.600	390	6.410	460	5.570	440	2.390	170										
5	6.400	870	5.700	680	5.100	490	4.500	450	5.120	490	4.460	470	1.910	180										
6	5.300	1.010	4.800	860	4.200	600	3.700	330	4.270	480	3.710	460	1.590	180										
8	4.000	870	3.600	680	3.200	580	2.800	330	2.750	450	2.390	430	1.190	200										
10	3.200	800	2.900	660	2.500	500	2.200	320	2.200	420	1.910	400	950	180										
12	2.700	770	2.400	640	2.100	490	1.900	300	1.830	420	1.590	400	800	180										
16	2.000	570	1.800	480	1.600	370	1.200	290	1.140	260	990	250	500	110										
20	1.600	460	1.400	370	1.300	300	900	230	920	270	800	260	400	120										
25	1.300	370	1.100	290	1.000	230	600	150	730	250	640	240	250	90										
Depth of cut	<table><tr><td>ap</td></tr><tr><td>1D</td></tr></table>						ap	1D	<table><tr><td>Dc</td><td>ap</td></tr><tr><td>Dc≤6</td><td>0,5D</td></tr><tr><td>6<Dc</td><td>1D</td></tr></table>		Dc	ap	Dc≤6	0,5D	6<Dc	1D	<table><tr><td>ap</td></tr><tr><td>0,25D</td></tr></table>						ap	0,25D
							ap																	
							1D																	
Dc	ap																							
Dc≤6	0,5D																							
6<Dc	1D																							
ap																								
0,25D																								


Side Milling

	Mild Steel • Carbon Steel • Cast Iron		Alloy Steel • Tool Steel		Prehardened Steel • Hardened Steel		Stainless Steel		Precipitation Stainless Steel		Titanium Alloy		Ni-Based Alloy					
	SS400 • S55C • FC250 ~750N/mm²		SCM • SKS • SKD ~30HRC		PX5 • NAK80 30~45HRC		SUS304 • SUS420 ≤200HB		SUS630		Ti-6Al-4V		Inconel 718					
Cutting Speed	130 (100-150) (m/min)		120 (100-150) (m/min)		100 (80-120) (m/min)		80 (60-100) (m/min)		80 (70-90) (m/min)		70 (60-80) (m/min)		30 (25-40) (m/min)					
Ø	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)				
3	13.800	1.660	12.700	1.070	10.600	760	8.000	480	9.760	510	8.490	480	4.240	220				
4	10.400	1.830	9.600	1.150	8.000	800	6.000	530	7.320	550	6.370	530	3.180	240				
5	8.300	1.990	7.600	1.220	6.400	900	4.800	560	5.860	560	5.090	540	2.550	250				
6	6.900	2.070	6.400	1.540	5.300	1.060	4.200	640	4.880	580	4.240	550	2.120	250				
8	5.200	1.770	4.800	1.540	4.000	1.040	3.200	610	3.200	450	2.790	430	1.590	230				
10	4.100	1.640	3.800	1.370	3.200	900	2.500	580	2.560	430	2.230	410	1.270	220				
12	3.500	1.400	3.200	1.280	2.700	760	2.100	530	2.140	420	1.860	400	1.060	210				
16	2.600	1.250	2.400	1.060	2.000	640	1.400	450	1.370	410	1.190	400	700	210				
20	2.100	1.010	1.900	840	1.600	510	1.100	370	1.100	390	950	380	560	200				
25	1.700	820	1.500	660	1.300	420	900	310	880	510	760	490	320	190				
Depth of cut																		
	<table><tr><td>ap</td><td>ae</td></tr><tr><td>1,5D</td><td>0,2D</td></tr></table>		ap	ae	1,5D	0,2D												
ap	ae																	
1,5D	0,2D																	

1. The above milling condition is a guideline for the overhang length is 3×D.
2. Use a rigid and precise machine and holder.
3. The rotational speed is calculated by the median of the recommended cutting speed. Adjustment may be necessary depending on the rigidity of the workpiece fixture and machine.
4. Please use a suitable fluid with high smoke retardant properties.
5. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.
6. Please use water-soluble oil when machining stainless steel.
7. Reduce speed and feed as well as depth of cut when high precision is required.
8. Adjust the speed and feed accordingly when the overhang length is longer than specified.

Fix rate cutting condition

DC≥Ø6

	Work Material	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm²		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB		Precipitation Stainless Steel SUS630		Titanium Alloy Ti-6Al-4V		Ni-Based Alloy Inconel 718	
Ø	L/D	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)	S (min ⁻¹)	F (mm/min)
Side Milling	4	80%		70%		70%		60%		60%		50%		50%	
	5	70%		60%		60%		50%		50%		50%		50%	
Slotting	4	90%		90%		80%		70%		70%		60%		60%	
	5	80%		80%		70%		70%		70%		60%		60%	