

MSTAR END MILLS

MSMHZD

End mill, Medium cut length, 3 flute

CARBIDE

RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Work material	Carbon steel, Cast iron, Alloy steel (–30HRC)		Alloy steel, Tool steel, Pre-hardened steel		Austenitic stainless steel, Titanium alloy		Heat resistant alloys	
	Cf53, GG25		X40CrMoV51		X5CrNi1810, X5CrNiMo17122, Ti6Al4V		Inconel718	
Dia. (mm)	Revolution (min ⁻¹)	Feed rate (mm/min)	Revolution (min ⁻¹)	Feed rate (mm/min)	Revolution (min ⁻¹)	Feed rate (mm/min)	Revolution (min ⁻¹)	Feed rate (mm/min)
1	19000	600	13000	310	10000	200	9500	65
1.5	14000	600	9000	310	7500	210	6400	75
2	11000	600	7200	310	6000	210	4800	75
3	8500	770	5300	380	4400	220	3200	100
4	7200	850	4400	480	3700	250	2400	130
6	5300	940	3200	490	2700	270	1600	130
8	4000	1010	2400	560	2000	280	1200	120
10	3200	1000	1900	480	1600	300	950	110
12	2700	950	1600	440	1300	300	800	90
16	2000	720	1200	350	1000	260	600	70
20	1600	600	1000	290	800	240	480	60
Depth of cut	$\leq 0.2D$ ($D > \phi 3$) $\leq 0.1D$ ($D \leq \phi 3$)		$\leq 0.2D$ ($D > \phi 3$) $\leq 0.1D$ ($D \leq \phi 3$)		$\leq 0.05D$		$\leq 1.5D$	

D: Dia.

Plunging

Work material	Carbon steel, Cast iron, Alloy steel (–30HRC)		Alloy steel, Tool steel, Pre-hardened steel		Austenitic stainless steel, Titanium alloy	
	Cf53, GG25		X40CrMoV51		X5CrNi1810, X5CrNiMo17122, Ti6Al4V	
Dia. (mm)	Revolution (min ⁻¹)	Feed rate (mm/min)	Revolution (min ⁻¹)	Feed rate (mm/min)	Revolution (min ⁻¹)	Feed rate (mm/min)
1	13000	80	10000	50	6000	10
1.5	12000	120	8000	80	6000	20
2	11000	200	7200	140	6000	30
3	8500	250	5300	180	4200	50
4	7200	300	4400	210	3300	60
6	5300	300	3200	210	2200	70
8	4000	320	2400	220	1600	80
10	3200	340	1900	240	1300	70
12	2700	320	1600	220	1100	70
16	2000	250	1200	180	800	55
20	1600	200	1000	140	640	55
Depth of cut	$\leq 1D$ ($D \geq \phi 2$) $\leq 0.5D$ ($D < \phi 2$)		$\leq 0.5D$ ($D \geq \phi 2$) $\leq 0.2D$ ($D < \phi 2$)			

D: Dia.

Slotting

Work material	Carbon steel, Cast iron, Alloy steel (–30HRC)		Alloy steel, Tool steel, Pre-hardened steel		Austenitic stainless steel, Titanium alloy		Heat resistant alloys	
	Cf53, GG25		X40CrMoV51		X5CrNi1810, X5CrNiMo17122, Ti6Al4V		Inconel718	
Dia. (mm)	Revolution (min ⁻¹)	Feed rate (mm/min)	Revolution (min ⁻¹)	Feed rate (mm/min)	Revolution (min ⁻¹)	Feed rate (mm/min)	Revolution (min ⁻¹)	Feed rate (mm/min)
1	13000	130	10000	80	6000	30	5700	25
1.5	12000	250	8000	150	6000	60	3800	30
2	11000	500	7200	260	6000	130	2800	35
3	8500	640	5300	320	4200	130	1900	50
4	7200	650	4400	370	3300	140	1400	70
6	5300	720	3200	380	2200	140	950	70
8	4000	780	2400	430	1600	140	720	60
10	3200	770	1900	370	1300	150	570	50
12	2700	730	1600	340	1100	150	480	40
16	2000	600	1200	290	800	130	360	30
20	1600	500	1000	240	640	120	290	25
Depth of cut	$\leq 1D$ ($D \geq \phi 2$) $\leq 0.5D$ ($D < \phi 2$)		$\leq 0.5D$ ($D \geq \phi 2$) $\leq 0.2D$ ($D < \phi 2$)		$\leq 0.2D$			

D: Dia.

- 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
- 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
- 3) If the rigidity of the machine or the work materials installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately.