

Milling Cutter Speeds.

The following tables show the calculated maximum rotational and feed speeds for **High Speed Steel (HSS)** and **Tungsten Carbide (T/C)** cutters. The tables are from 3mm to 17mm and cover the most common commercial sizes. However for specialized cutters and "Old Stock" the two formulae are given below for the user to calculate the safe parameters with.

The Spindle Speed RPM is calculated using the following formula:

$$\text{RPM} = (\text{Cutting Factor} \times 1000) / (\text{Pi} \times \text{Diameter in mm})$$

Material	Cutting Factor HSS	Cutting Factor T/C
Aluminium	100	500
Brass	55	175
Mild Steel	25	100
Hardened Steel	N/A	50

The Feed Speed of the work across the table in millimetres per minute is calculated using the following formula:

$$\text{Feed Speed} = (\text{Flute Cut in mm}) \times (\text{Number of Flutes}) \times \text{RPM}$$

Material	Flute Cut HSS	Flute Cut T/C
Aluminium	0.15	0.3
Brass	0.1	0.2
Mild Steel	0.08	0.15
Hardened Steel	N/A	0.1

The tables are pre-calculated for 2 flute slot drills and 4 flute end mills.

	3mm HSS	3mmT/C	4mm HSS	4mmT/C	5mm HSS	5mmT/C
100						
200						
300						
400						
500						
600						
700						
800						
900						
1000						
1100						
1200						
1300						
1400						
1500						
1600					mild steel	
1700						
1800						
1900						
2000			mild steel			
2100						
2200						
2300					brass	
2400						
2500			brass			
2600	mild steel					
2700						
2800	brass					
2900						
3000	aluminium	aluminium brass mild steel hard steel	aluminium	aluminium brass mild steel hard steel	aluminium	aluminium brass mild steel hard steel

Feed Speed in mm per minute

2 Flutes

Alum. 900	1800	900	900	900	900
Brass 560	1200	500	1200	460	1200
M Stl 416	900	320	900	320	900
H Stl	600		600		600

4 Flutes

Alum. 1800	3600	1800	3600	1800	3600
Brass 1120	2400	1000	2400	920	2400
M Stl 832	1800	640	1800	640	1800
H Stl	1200		1200		1200

	6mm HSS	6mmT/C	7mm HSS	7mmT/C	8mm HSS	8mmT/C
100						
200						
300						
400						
500						
600						
700						
800						
900						
1000					mild steel	
1100			mild steel			
1200						
1300	mild steel					
1400						
1500						
1600						
1700						
1800					brass	
1900			brass			
2000						hard steel
2100						
2200	brass			hard steel		
2300						
2400						
2500						
2600		hard steel				
2700						
2800						
2900						
3000	aluminium	aluminium brass mild steel	aluminium	aluminium brass mild steel	aluminium	aluminium brass mild steel

Feed Speed in mm per minute

2 Flutes

Alum.	900	1800	900	1800	900	1800
Brass	440	1200	380	1200	360	1200
M Stl	208	900	176	900	160	900
H Stl		520		440		400

4 Flutes

Alum.	1800	3600	1800	3600	1800	3600
Brass	880	2400	760	2400	720	2400
M Stl	416	1800	352	1800	320	1800
H Stl		1040		880		800

	9mm HSS	9mmT/C	10mm HSS	10mmT/C	11mm HSS	11mmT/C
100						
200						
300						
400						
500						
600						
700					mild steel	
800			mild steel			
900	mild steel					
1000						
1100						
1200						
1300						
1400						hard steel
1500						
1600			brass	hard steel	brass	
1700	brass	hard steel				
1800						
1900						
2000						
2100						
2200						
2300						
2400						
2500						
2600						
2700						
2800						
2900					aluminium	mild steel
3000	aluminium	aluminium brass mild steel	aluminium	aluminium brass mild steel		aluminium brass

Feed Speed in mm per minute

2 Flutes

Alum.	900	1800	900	1800	900	1800
Brass	340	1200	320	1200	320	1200
M Stl	144	900	128	900	112	900
H Stl		340		320		280

4 Flutes

Alum.	1800	3600	1800	3600	1800	3600
Brass	680	2400	640	2400	640	2400
M Stl	288	900	256	900	224	900
H Stl		680		640		280

	12mm HSS	12mmT/C	13mm HSS	13mmT/C	14mm HSS	14mmT/C
100						
200						
300						
400						
500					mild steel	
600	mild steel		mild steel			
700						
800						
900						
1000						
1100						hard steel
1200				hard steel		
1300		hard steel			brass	
1400			brass			
1500	brass					
1600						
1700						
1800						
1900						
2000						
2100						
2200					aluminium	mild steel
2300						
2400			aluminium	mild steel		
2500						
2600	aluminium	mild steel				
2700						
2800						
2900						
3000		aluminium brass		aluminium brass		aluminium brass

Feed Speed in mm per minute

2 Flutes

Alum.	780	1800	720	1800	600	1800
Brass	300	1200	280	1200	260	1200
M Stl	96	780	96	720	80	660
H Stl		260		240		220

4 Flutes

Alum.	1560	3600	1440	3600	1200	3600
Brass	600	2400	560	2400	520	2400
M Stl	192	1560	96	1440	160	1320
H Stl		520		480		440

	15mm HSS	15mmT/C	16mm HSS	16mmT/C	17mm HSS	17mmT/C
100						
200						
300						
400					mild steel	
500	mild steel		mild steel			
600						
700						
800						
900						hard steel
1000		hard steel		hard steel	brass	
1100			brass			
1200	brass					
1300						
1400						
1500						
1600						
1700						
1800					aluminium	mild steel
1900			aluminium			
2000				mild steel		
2100	aluminium	mild steel				
2200						
2300						
2400						
2500						
2600						
2700						
2800						brass
2900				brass		
3000		aluminium brass		aluminium		aluminium

Feed Speed in mm per minute

2 Flutes

Alum.	630	1800	570	1800	540	1800
Brass	240	1200	220	1160	200	1120
M Stl	80	630	80	600	64	540
H Stl		200		200		180

4 Flutes

Alum.	1260	3600	1140	3600	1080	3600
Brass	480	2400	440	2320	400	2240
M Stl	160	1260	160	1200	128	1080
H Stl		400		400		360