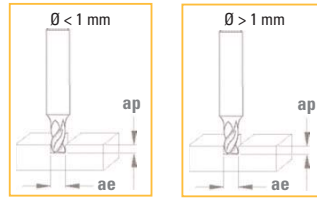


CUTTING CONDITIONS



Materials to be machined			CARBIDE		TiAlN		$\varnothing < 1 \text{ mm}$		$\varnothing > 1 \text{ mm}$	
			Vc [m/min]	Vc [m/min]	ap [mm]	ae [mm]	ap [mm]	ae [mm]	ap [mm]	ae [mm]
P	Unalloyed steel / Low alloyed steel	< 600 N/mm ²	70 100	90 110	< 0.5 x ØD1	1 x ØD1	< 1.0 x ØD1	1 x ØD1		
P	Unalloyed steel / Low alloyed steel	600 – 1500 N/mm ²	50 80	70 90	< 0.3 x ØD1	1 x ØD1	< 0.6 x ØD1	1 x ØD1		
P	Lead alloyed cutting steel		70 100		< 0.5 x ØD1	1 x ØD1	< 1 x ØD1	1 x ØD1		
P	High alloyed steel	700 – 1500 N/mm ²		40 70	< 0.2 x ØD1	1 x ØD1	< 0.5 x ØD1	1 x ØD1		
M	Stainless steel	400 – 700 N/mm ²	40 60	70 90	< 0.5 x ØD1	1 x ØD1	< 0.8 x ØD1	1 x ØD1		
M	DUPLEX stainless steel	> 800 N/mm ²		40 70	< 0.2 x ØD1	1 x ØD1	< 0.5 x ØD1	1 x ØD1		
K	Grey cast iron / Nodular pearlitic iron	< 250 HB	70 100	90 110	< 0.5 x ØD1	1 x ØD1	< 1 x ØD1	1 x ØD1		
K	Alloyed cast iron / Nodular pearlitic iron	> 250 HB	40 70	70 90	< 0.3 x ØD1	1 x ØD1	< 0.6 x ØD1	1 x ØD1		
K	Nodular ferritic cast iron / Malleable cast iron		70 100	90 110	< 0.3 x ØD1	1 x ØD1	< 0.6 x ØD1	1 x ØD1		
S	Special alloys / Heat resistant stainless steel	Inconel Nimonic Hastelloy		25 35			< 0.4 x ØD1	1 x ØD1		
S	Titanium, titanium alloys		30 45		< 0.30 x ØD1	1 x ØD1	< 0.5 x ØD1	1 x ØD1		
N	Copper alloys - easy to machine (brass - bronze)		140 160		< 0.5 x ØD1	1 x ØD1	< 1 x ØD1	1 x ØD1		
N	Copper alloys - difficult to machine / Aluminium bronze	(CuAlFe) (Ampco)	120 140	170 190	< 0.3 x ØD1	1 x ØD1	< 0.7 x ØD1	1 x ØD1		
N	Aluminium alloys	Si < 8%	180 260	230 340	< 0.6 x ØD1	1 x ØD1	< 1.2 x ØD1	1 x ØD1		
N	Cast aluminium	Si > 8%	140 160	210 230	< 0.4 x ØD1	1 x ØD1	< 0.9 x ØD1	1 x ØD1		
N	Graphite		140 160	200 220	< 0.6 x ØD1	1 x ØD1	< 0.9 x ØD1	1 x ØD1		
N	Plastic		240 260	300 340	< 0.6 x ØD1	1 x ØD1	< 1.2 x ØD1	1 x ØD1		
N	Gold, silver		140 160	200 220	< 0.6 x ØD1	1 x ØD1	< 0.9 x ØD1	1 x ØD1		

$$n \text{ [tr/min]} = \frac{Vc \text{ [m/min]} \times 1000}{\pi \times D_1 \text{ [mm]}}$$

$$Vf \text{ [mm/min]} = n \text{ [tr/min]} \times fz \text{ [mm]} \times Z$$

Feed per tooth fz [mm]

$\varnothing D_1$ 0.30 - 1.00	$\varnothing D_1$ 1.00 - 1.50	$\varnothing D_1$ 1.50 - 3.00	$\varnothing D_1$ 3.00 - 5.00	$\varnothing D_1$ 5.00 - 7.00	$\varnothing D_1$ 7.00 - 10.00	$\varnothing D_1$ 10.00 - 14.00	$\varnothing D_1$ 14.00 - 16.00	$\varnothing D_1$ 16.00 - 20.00
0.006 - 0.015	0.012 - 0.020	0.016 - 0.04	0.02 - 0.06	0.03 - 0.09	0.04 - 0.11	0.05 - 0.11	0.06 - 0.12	0.07 - 0.14
0.006 - 0.015	0.012 - 0.020	0.016 - 0.04	0.02 - 0.06	0.03 - 0.09	0.04 - 0.11	0.05 - 0.11	0.06 - 0.12	0.07 - 0.13
0.006 - 0.015	0.012 - 0.020	0.016 - 0.04	0.02 - 0.06	0.03 - 0.09	0.04 - 0.12	0.05 - 0.14	0.07 - 0.16	0.08 - 0.20
0.006 - 0.015	0.012 - 0.020	0.016 - 0.04	0.02 - 0.06	0.03 - 0.09	0.04 - 0.11	0.05 - 0.11	0.06 - 0.12	0.07 - 0.13
0.006 - 0.015	0.012 - 0.020	0.016 - 0.04	0.02 - 0.06	0.03 - 0.09	0.04 - 0.11	0.05 - 0.11	0.06 - 0.12	0.07 - 0.13
0.006 - 0.015	0.012 - 0.020	0.016 - 0.04	0.02 - 0.06	0.03 - 0.09	0.04 - 0.11	0.05 - 0.11	0.06 - 0.12	0.07 - 0.13
0.006 - 0.015	0.012 - 0.020	0.016 - 0.04	0.02 - 0.06	0.03 - 0.09	0.04 - 0.11	0.05 - 0.11	0.06 - 0.12	0.07 - 0.13
0.006 - 0.015	0.012 - 0.020	0.016 - 0.04	0.02 - 0.06	0.03 - 0.09	0.04 - 0.11	0.05 - 0.11	0.06 - 0.12	0.07 - 0.13
0.006 - 0.015	0.012 - 0.020	0.016 - 0.04	0.02 - 0.06	0.03 - 0.09	0.04 - 0.11	0.05 - 0.14	0.07 - 0.16	0.08 - 0.20
0.006 - 0.015	0.012 - 0.020	0.016 - 0.04	0.02 - 0.06	0.03 - 0.09	0.04 - 0.11	0.05 - 0.11	0.06 - 0.12	0.07 - 0.13
0.006 - 0.015	0.012 - 0.020	0.016 - 0.04	0.02 - 0.06	0.03 - 0.09	0.04 - 0.12	0.05 - 0.14	0.07 - 0.16	0.08 - 0.20
0.006 - 0.015	0.012 - 0.020	0.016 - 0.04	0.02 - 0.06	0.03 - 0.09	0.04 - 0.12	0.05 - 0.14	0.07 - 0.16	0.08 - 0.20
0.006 - 0.015	0.012 - 0.020	0.016 - 0.04	0.02 - 0.06	0.03 - 0.09	0.04 - 0.12	0.05 - 0.21	0.10 - 0.24	0.11 - 0.30
0.006 - 0.015	0.005 - 0.020	0.016 - 0.04	0.02 - 0.06	0.03 - 0.09	0.04 - 0.12	0.05 - 0.14	0.07 - 0.16	0.08 - 0.20