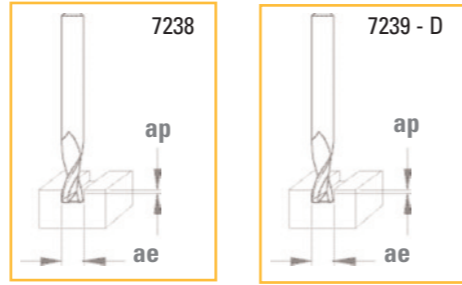


CUTTING CONDITIONS



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

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

Materials to be machined

			CARBIDE		TiAlN		ap [mm]	ae [mm]	ap [mm]	ae [mm]
			Vc [m/min]	Vc [m/min]	Vc [m/min]	Vc [m/min]				
<b>P</b>	Unalloyed steel / Low alloyed steel	< 600 N/mm <sup>2</sup>	70	100	90	110	< 0.10 x ØD1	1 x ØD1	< 0.04 x ØD1	1 x ØD1
<b>P</b>	Unalloyed steel / Low alloyed steel	600 – 1500 N/mm <sup>2</sup>			70	90	< 0.10 x ØD1	1 x ØD1	< 0.04 x ØD1	1 x ØD1
<b>P</b>	Lead alloyed cutting steel		70	100			< 0.12x ØD1	1 x ØD1	< 0.06 x ØD1	1 x ØD1
<b>P</b>	High alloyed steel	700 – 1500 N/mm <sup>2</sup>			40	70	< 0.10 x ØD1	1 x ØD1	< 0.04 x ØD1	1 x ØD1
<b>M</b>	Stainless steel	400 – 700 N/mm <sup>2</sup>			70	90	< 0.10x ØD1	1 x ØD1	< 0.04 x ØD1	1 x ØD1
<b>M</b>	DUPLEX stainless steel	> 800 N/mm <sup>2</sup>			40	70	< 0.10 x ØD1	1 x ØD1	< 0.04 x ØD1	1 x ØD1
<b>K</b>	Grey cast iron / Nodular pearlitic iron	< 250 HB	70	100	90	110	< 0.10 x ØD1	1 x ØD1	< 0.04 x ØD1	1 x ØD1
<b>K</b>	Alloyed cast iron / Nodular pearlitic iron	> 250 HB	40	70	70	90	< 0.10 x ØD1	1 x ØD1	< 0.04 x ØD1	1 x ØD1
<b>K</b>	Nodular ferritic cast iron / Malleable cast iron		70	100	90	110	< 0.10 x ØD1	1 x ØD1	< 0.04 x ØD1	1 x ØD1
<b>S</b>	Special alloys / Heat resistant stainless steel	Inconel Nimonic Hastelloy			25	35	< 0.10 x ØD1	1 x ØD1	< 0.04 x ØD1	1 x ØD1
<b>S</b>	Titanium, titanium alloys		30	45			< 0.10 x ØD1	1 x ØD1	< 0.04 x ØD1	1 x ØD1
<b>N</b>	Copper alloys - easy to machine (brass - bronze)		140	160			< 0.12 x ØD1	1 x ØD1	< 0.06 x ØD1	1 x ØD1
<b>N</b>	Copper alloys - difficult to machine / Aluminium bronze	(CuAlFe) (Ampco)	120	140	170	190	< 0.10 x ØD1	1 x ØD1	< 0.04 x ØD1	1 x ØD1
<b>N</b>	Aluminium alloys	Si < 8%	180	260	230	340	< 0.12 x ØD1	1 x ØD1	< 0.06 x ØD1	1 x ØD1
<b>N</b>	Cast aluminium	Si > 8%	140	160	210	230	< 0.12 x ØD1	1 x ØD1	< 0.06 x ØD1	1 x ØD1
<b>N</b>	Plastic		240	260	300	340	< 0.15 x ØD1	1 x ØD1	< 0.10 x ØD1	1 x ØD1
<b>N</b>	Gold, silver		140	160	200	220	< 0.12 x ØD1	1 x ØD1	< 0.06 x ØD1	1 x ØD1

Feed per tooth

fz [mm]

Ø D <sub>1</sub> 0.15 - 0.30	Ø D <sub>1</sub> 0.30 - 0.40	Ø D <sub>1</sub> 0.40 - 0.60	Ø D <sub>1</sub> 0.60 - 0.90	Ø D <sub>1</sub> 0.90 - 1.20	Ø D <sub>1</sub> 1.20 - 1.50	Ø D <sub>1</sub> 1.50 - 1.80	Ø D <sub>1</sub> 1.80 - 2.10	Ø D <sub>1</sub> 2.10 - 2.50	Ø D <sub>1</sub> 2.50 - 3.00
0.002 - 0.003	0.002 - 0.004	0.003 - 0.01	0.008 - 0.012	0.010 - 0.015	0.012 - 0.016	0.013 - 0.02	0.015 - 0.022	0.02 - 0.025	0.022 - 0.04
0.002 - 0.003	0.002 - 0.004	0.003 - 0.01	0.008 - 0.012	0.010 - 0.015	0.012 - 0.016	0.013 - 0.02	0.015 - 0.022	0.02 - 0.025	0.022 - 0.04
0.002 - 0.003	0.002 - 0.004	0.003 - 0.01	0.008 - 0.012	0.010 - 0.015	0.012 - 0.016	0.013 - 0.02	0.015 - 0.022	0.02 - 0.025	0.022 - 0.04
0.0003 - 0.0010	0.002 - 0.003	0.002 - 0.004	0.003 - 0.01	0.008 - 0.012	0.010 - 0.015	0.012 - 0.016	0.013 - 0.02	0.015 - 0.022	0.02 - 0.025
0.002 - 0.003	0.002 - 0.004	0.003 - 0.01	0.008 - 0.012	0.010 - 0.015	0.012 - 0.016	0.013 - 0.02	0.015 - 0.022	0.02 - 0.025	0.022 - 0.04
0.0003 - 0.0010	0.002 - 0.003	0.002 - 0.004	0.003 - 0.01	0.008 - 0.012	0.010 - 0.015	0.012 - 0.016	0.013 - 0.02	0.015 - 0.022	0.02 - 0.025
0.002 - 0.003	0.002 - 0.004	0.003 - 0.01	0.008 - 0.012	0.010 - 0.015	0.012 - 0.016	0.013 - 0.02	0.015 - 0.022	0.02 - 0.025	0.022 - 0.04
0.002 - 0.003	0.002 - 0.004	0.003 - 0.01	0.008 - 0.012	0.010 - 0.015	0.012 - 0.016	0.013 - 0.02	0.015 - 0.022	0.02 - 0.025	0.022 - 0.04
0.002 - 0.003	0.002 - 0.004	0.003 - 0.01	0.008 - 0.012	0.010 - 0.015	0.012 - 0.016	0.013 - 0.02	0.015 - 0.022	0.02 - 0.025	0.022 - 0.04
0.002 - 0.003	0.002 - 0.004	0.003 - 0.01	0.008 - 0.012	0.010 - 0.015	0.012 - 0.016	0.013 - 0.02	0.015 - 0.022	0.02 - 0.025	0.022 - 0.04
0.002 - 0.003	0.002 - 0.004	0.003 - 0.01	0.008 - 0.012	0.010 - 0.015	0.012 - 0.016	0.013 - 0.02	0.015 - 0.022	0.02 - 0.025	0.022 - 0.04
0.002 - 0.003	0.002 - 0.004	0.003 - 0.01	0.008 - 0.012	0.010 - 0.015	0.012 - 0.016	0.013 - 0.02	0.015 - 0.022	0.02 - 0.025	0.022 - 0.04
0.002 - 0.003	0.002 - 0.004	0.003 - 0.01	0.008 - 0.012	0.010 - 0.015	0.012 - 0.016	0.013 - 0.02	0.015 - 0.022	0.02 - 0.025	0.022 - 0.04
0.002 - 0.003	0.002 - 0.004	0.003 - 0.01	0.008 - 0.012	0.010 - 0.015	0.012 - 0.016	0.013 - 0.02	0.015 - 0.022	0.02 - 0.025	0.022 - 0.04

n and Vf are indicative and shall be adjusted according to L<sub>2</sub>

The plunging feed (Vfp) of an end mill Z = 2 (drilling) must be reduced by 40 to 80 % depending on the material to be machined