

CUTTING CONDITIONS

MACHINING WITH A FIXED WORKPIECE

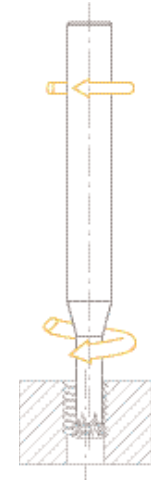
Materials to be machined			CARBIDE		TIALN		CUTINOX	
			Vc [m/min]		Vc [m/min]		Vc [m/min]	
P	Unalloyed steel / Low alloyed steel	< 600 N/mm ²	65	80	70	100		
P	Unalloyed steel / Low alloyed steel	600 – 1500 N/mm ²			40	60		
P	High alloyed steel	700 – 1500 N/mm ²			25	50	60	80
M	Stainless steel	400 – 700 N/mm ²	35	40	40	60	70	90
M	DUPLEx stainless steel	> 800 N/mm ²			25	50	60	80
K	Tool steel and cast iron	> 1500 N/mm ² (50 - 65 HRC)	65	80	70	100		
K	Grey cast iron / Nodular pearlitic iron	< 250 HB	35	40	40	60		
K	Alloyed cast iron / Nodular pearlitic iron	> 250 HB	35	40	40	60		
S	Special alloys / Heat resistant stainless steel	Inconel Nimonic Hastelloy			25	50	40	60
S	Titanium, titanium alloys		15	35				

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

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

Feed per tooth **f [mm]**

Feed per tooth f [mm]					
Ø D ₁ 0.20 - 0.60	Ø D ₁ 0.60 - 1.20	Ø D ₁ 1.20 - 2.00	Ø D ₁ 2.00 - 3.00	Ø D ₁ 3.00 - 5.00	Ø D ₁ 5.00 - 8.00
0.003 - 0.006	0.004 - 0.01	0.01 - 0.03	0.02 - 0.04	0.03 - 0.05	0.04 - 0.07
0.003 - 0.006	0.004 - 0.01	0.01 - 0.03	0.02 - 0.04	0.03 - 0.05	0.04 - 0.07
0.003 - 0.006	0.004 - 0.01	0.01 - 0.03	0.02 - 0.04	0.03 - 0.05	0.04 - 0.07
0.003 - 0.006	0.004 - 0.01	0.01 - 0.03	0.02 - 0.04	0.03 - 0.05	0.04 - 0.07
0.003 - 0.006	0.004 - 0.01	0.01 - 0.03	0.02 - 0.04	0.03 - 0.05	0.04 - 0.07
0.003 - 0.006	0.004 - 0.01	0.01 - 0.03	0.02 - 0.04	0.03 - 0.05	0.04 - 0.07
0.003 - 0.006	0.004 - 0.01	0.01 - 0.03	0.02 - 0.04	0.03 - 0.05	0.04 - 0.07
0.003 - 0.006	0.004 - 0.01	0.01 - 0.03	0.02 - 0.04	0.03 - 0.05	0.04 - 0.07
0.003 - 0.006	0.004 - 0.01	0.01 - 0.03	0.02 - 0.04	0.03 - 0.05	0.04 - 0.07
0.003 - 0.006	0.004 - 0.01	0.01 - 0.03	0.02 - 0.04	0.03 - 0.05	0.04 - 0.07



MACHINING ON A SWISS-TURNING MACHINE - Workpiece turns

Materials to be machined		CARBIDE				
		Vc [m/min]	fz [m/min] Pitch	fz [m/min] Pitch	fz [m/min] Pitch	fz [m/min] Pitch
P	Steel	50 - 100	0.002 - 0.25	0.002 - 0.004	0.003 - 0.006	0.005 - 0.013
M	Stainless steel	40 - 80	0.002 - 0.003	0.002 - 0.004	0.002 - 0.005	0.004 - 0.01
S	Titanium, titanium alloys	50 - 90	0.002 - 0.003	0.002 - 0.004	0.002 - 0.005	0.004 - 0.01
N	Copper alloys	60 - 150	0.002 - 0.005	0.002 - 0.006	0.003 - 0.007	0.005 - 0.013

Example for M2 x 0.40 in titanium, DIXI 1730 Ø D₁ = 1.55

① Tool rotation $n \text{ (min}^{-1}\text{)} = \frac{1000 \times Vc}{\pi \times \varnothing D_1}$

$$\frac{1000 \times 90}{(\pi \times 1.55)} \Rightarrow 19'000 \text{ min}^{-1}$$

② Feed Vf mm/min = n x fz x z

$$19'000 \times 0.004 \times 3 = 223 \text{ mm/min}$$

③ Piece rotation $\text{min}^{-1} = \frac{Vf}{\text{threaded } \varnothing \times \pi}$

$$\frac{223}{M2 \times \pi} \Rightarrow 36 \text{ min}^{-1}$$

When necessary, convert in degrees $\text{nb}^\circ = \text{min}^{-1} \times 360^\circ \Rightarrow 36 \text{ min}^{-1} \times 360^\circ = 12960^\circ$

