CUTTING CONDITIONS

MACHINING WITH A FIXED WORKPIECE

	Materials to be machined		CARBIDE Vc [m/min]		TiALN Vc [m/min]		CUTINOX Vc [m/min]	
P	Unalloyed steel / Low alloyed steel	< 600 N/mm²	**65**	80	**90**	130		
P	Unalloyed steel / Low alloyed steel	600 – 1500 N/mm²			**70**	100		
P	High alloyed steel	700 – 1500 N/mm²			**75**	105	**80**	110
M	Stainless steel	400 – 700 N/mm²	**35**	50	**70**	100		
M	DUPLEX stainless steel	> 800 N/mm²			**55**	80	**60**	85
K	Tool steel and cast iron	> 1500 N/mm² (50 - 65 HRC)	**80**	100	**90**	110		
K	Grey cast iron / Nodular pearlitic iron	< 250 HB	**65**	80	**75**	90		
K	Alloyed cast iron / Nodular pearlitic iron	> 250 HB	**60**	75	**70**	85		
S	Special alloys / Heat resistant stainless steel	Inconel Nimonic Hastelloy			**25**	50	**30**	55
S	Titanium, titanium alloys		**50**	90				
N	Copper alloys - easy to machine (brass - bronze)		**80**	200				
N	Copper alloys - difficult to machine / Aluminium bronze	(CuAlFe) (Ampco)	**70**	150				
N	Gold, silver		**80**	200				

MACHINING ON A SWISS-TURNING MACHINE - Workpiece turns

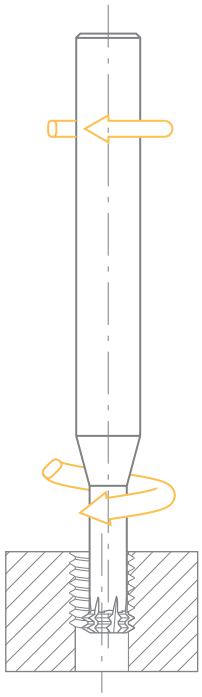
	Materials to be machined	CARBIDE Vc [m/min]	fz [mm] Pitch 0.20 - 0.25	fz [mm] Pitch 0.30 - 0.35	fz [mm] Pitch 0.40 - 0.50	fz [mm] Pitch 0.70 - 1.00
P	Steel	**50** - 100	**0.002** - 0.004	**0.002** - 0.004	**0.003** - 0.006	**0.005** - 0.013
M	Stainless steel	**40** - 80	**0.002** - 0.003	**0.002** - 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

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

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

Feed per tooth **fz [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
0.001 - 0.006	**0.004** - 0.016	**0.010** - 0.026	**0.017** - 0.04	**0.03** - 0.06	**0.04** - 0.10
0.001 - 0.006	**0.004** - 0.015	**0.009** - 0.024	**0.015** - 0.04	**0.02** - 0.06	**0.04** - 0.09
0.001 - 0.005	**0.003** - 0.013	**0.008** - 0.022	**0.014** - 0.03	**0.02** - 0.05	**0.03** - 0.08
0.001 - 0.005	**0.003** - 0.013	**0.008** - 0.022	**0.014** - 0.03	**0.02** - 0.05	**0.03** - 0.08
0.001 - 0.004	**0.003** - 0.011	**0.007** - 0.018	**0.011** - 0.03	**0.02** - 0.04	**0.03** - 0.06
0.002 - 0.011	**0.007** - 0.026	**0.017** - 0.044	**0.028** - 0.07	**0.04** - 0.10	**0.07** - 0.16
0.002 - 0.008	**0.005** - 0.020	**0.013** - 0.033	**0.021** - 0.05	**0.03** - 0.08	**0.05** - 0.12
0.002 - 0.008	**0.005** - 0.020	**0.013** - 0.033	**0.021** - 0.05	**0.03** - 0.08	**0.05** - 0.12
0.001 - 0.003	**0.002** - 0.007	**0.004** - 0.011	**0.007** - 0.02	**0.01** - 0.03	**0.02** - 0.04
0.001 - 0.007	**0.004** - 0.017	**0.011** - 0.028	**0.018** - 0.04	**0.03** - 0.07	**0.04** - 0.10
0.002 - 0.011	**0.007** - 0.026	**0.017** - 0.044	**0.082** - 0.07	**0.04** - 0.10	**0.07** - 0.16
0.001 - 0.007	**0.004** - 0.017	**0.011** - 0.028	**0.018** - 0.04	**0.03** - 0.07	**0.04** - 0.10
0.002 - 0.008	**0.005** - 0.020	**0.013** - 0.033	**0.021** - 0.05	**0.03** - 0.08	**0.05** - 0.12



Example for M2 x 0.40 in titanium, DIXI 1730 Ø D_1 = 1.55

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

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

❷ **Feed Vf mm/min** = n x fz x z

19'000 x 0.004 x 3 = 223 mm/min

❸ **Piece rotation min^{-1}** = $\frac{Vf}{\text{threaded Ø} \times \pi}$

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

When necessary, convert in degrees nb° = min^{-1} x 360° ⇒ 36 min^{-1} x 360° = 12960°