Recommendations for thread milling cutters

Material group		Tensile strength MPa (N/mm²)	Hardness HB	Cutting speed v_c (m/min)	Feed per tooth f_z (mm)	Feed for drill per revolution f_b (mm)
	Structural steels	≤ 850	–	80 - 120	0,02 - 0,10	–
	Free-cutting steels	≤ 1000	–	80 - 120	0,02 - 0,10	–
	Unalloyed case hardened steels	≤ 750	–	80 - 120	0,02 - 0,10	–
	Unalloyed heat-treatable steels	≤ 850	–	80 - 120	0,02 - 0,10	–
	Alloyed case hardened steels	≥ 850 ... 1200	–	60 - 80	0,01 - 0,08	–
	Alloyed heat-treatable steels	≥ 850 ... 1200	–	60 - 80	0,01 - 0,08	–
	Alloyed tool steels	≤ 1000	–	60 - 80	0,01 - 0,08	–
	High speed tool steels	≥ 650 ... 1000	–	60 - 80	0,01 - 0,08	–
	Stainless- and acid-resistant steels, sulphured	≤ 850	–	50 - 80	0,02 - 0,10	–
	austenitic	≤ 850	–	50 - 70	0,02 - 0,10	–
	martensitic	≤ 850	–	50 - 70	0,02 - 0,10	–
	Structural steels	≤ 800	–	80 - 100	0,02 - 0,10	–
	Free-cutting steels	≤ 1000	–	80 - 100	0,02 - 0,10	–
	Case hardened steels	≤ 1000	–	80 - 100	0,02 - 0,10	–
	Heat-treatable steels	≤ 1200	–	80 - 100	0,02 - 0,10	–
	Nitriding steels	≤ 1200	–	80 - 100	0,02 - 0,10	–
	Spheroidal graphite iron	–	≤ 240	80 - 120	0,02 - 0,10	0,05 - 0,20
	Aluminium and Al-alloys	≤ 400	–	150 - 300	0,05 - 0,20	0,05 - 0,25
	Al wrought alloys	≤ 400	–	150 - 300	0,05 - 0,20	0,05 - 0,25
	Al cast alloys ≤ 10 % Si	≤ 600	–	150 - 300	0,05 - 0,20	0,05 - 0,40
	> 10 % Si	≤ 600	–	100 - 200	0,05 - 0,20	0,05 - 0,30
	Cast iron	–	≤ 240	100 - 150	0,05 - 0,15	0,05 - 0,25
	Spheroidal graphite iron	–	≤ 240	80 - 120	0,05 - 0,15	0,05 - 0,20
	Malleable cast iron	–	< 300	80 - 120	0,05 - 0,15	0,05 - 0,20
	Brass, short-chipping	≤ 600	–	150 - 250	0,05 - 0,25	0,05 - 0,40
	long-chipping	≤ 600	–	150 - 250	–	0,05 - 0,25
	Plastics	–	–	100 - 200	0,05 - 0,25	0,05 - 0,40
	Magnesium-alloys	≤ 450	–	150 - 300	0,05 - 0,25	0,05 - 0,40
	Titanium and Ti-alloys	≤ 1200	–	40 - 60	0,01 - 0,08	–
	Ni-alloys	≤ 1200	–	40 - 60	0,01 - 0,08	–

The surface of a thread milling cutter does not influence the cutting data, but the suitability for materials:

- ○ easy-to-machine materials
- C steels and Ni-alloys
- A abrasive materials

Formula of calculation

$$v_c = \frac{d \cdot \pi \cdot n}{1000} \quad [m/min]$$

$$n = \frac{v_c \cdot 1000}{d \cdot \pi} \quad [min^{-1}]$$

$$v_f = n \cdot z \cdot f_z \quad [mm/min]$$

$$v_m = \frac{v_f \cdot (D - d)}{D} \quad [mm/min]$$

$$v_b = n \cdot f_b \quad [mm/min]$$

v_c = cutting speed
v_f = contour feed
v_m = centre point path feed
n = revolutions
z = number of teeth
f_z = feed per tooth
f_b = feed for drill per revolution*
v_b = drill feed rate*
D = Ø nom. of thread [mm]
d = milling cutter nom. Ø [mm]
* for drill/thread milling

Guhring Thread Mill
CNC programming made easy

Guhring's Thread Mill software considerably simplifies CNC programming. With the assistance of a clear input mask, the user enters all the required data, i.e. thread mill type, thread type and diameter, machine parameters etc. and with this data produces the relevant CNC program.