

Speeds and Feeds



RECOMMENDED CUTTING SPEED AND FEED							
ISO	VDI 3323	Material Description	HB	HRC	Cutting Speed (SFM)	Feed per tooth (inch/tooth)	
					With Coolant Hole	With Coolant Hole	
						ØDCX ≤ .3125	ØDCX > .3125
P	1	Non-alloy steel	125		250-400	.0010-.0020	.0020-.0038
P	2		190	13	250-370	.0008-.0016	.0016-.0034
P	3		250	25	250-360	.0008-.0016	.0016-.0034
P	4		270	28	230-330	.0006-.0014	.0014-.0030
P	5		300	32	230-320	.0006-.0014	.0014-.0030
P	6	Low alloy steel	180	10	250-360	.0008-.0016	.0016-.0034
P	7		275	29	230-330	.0006-.0014	.0014-.0030
P	8		300	32	230-320	.0006-.0014	.0014-.0030
P	9		350	38	200-300	.0006-.0014	.0014-.0030
P	10	High alloyed steel, and tool steel	200	15	230-320	.0008-.0016	.0016-.0034
P	11		325	35	200-300	.0006-.0014	.0014-.0026
M	12	Stainless steel	200	15	200-250	.0006-.0010	.0010-.0022
M	13		240	23	200-250	.0004-.0008	.0008-.0018
M	14		180	10	150-250	.0006-.0010	.0010-.0022
K	15	Grey cast iron	180	10	250-400	.0012-.0020	.0020-.0041
K	16		260	26	250-360	.0008-.0016	.0016-.0034
K	17	Nodular cast iron	160	3	250-400	.0012-.0020	.0020-.0041
K	18		250	25	230-320	.0008-.0016	.0016-.0034
K	19	Malleable cast iron	130		230-320	.0008-.0016	.0016-.0034
K	20		230	21	230-350	.0012-.0020	.0020-.0041
N	21	Aluminum-wrought alloy	60		500-1000	.0024-.0032	.0032-.0049
N	22		100		400-800	.0020-.0028	.0028-.0041
N	23	Aluminum-cast, alloyed	75		350-900	.0012-.0020	.0020-.0034
N	24		90		350-900	.0012-.0020	.0020-.0034
N	25		130		350-800	.0008-.0016	.0016-.0030
N	26	Copper and Copper Alloys (Bronze / Brass)	110		500-800	.0016-.0024	.0024-.0038
N	27		90		350-800	.0016-.0024	.0024-.0038
N	28		100		300-600	.0012-.0020	.0020-.0034
N	29	Non Metallic Materials			350-900	.0012-.0020	.0020-.0034
N	30				350-900	.0012-.0020	.0020-.0034
S	31	Heat Resistant Super Alloys	200	15	100-200	.0004-.0008	.0008-.0014
S	32		280	30	70-180	.0002-.0006	.0006-.0014
S	33		250	25	50-140	.0002-.0006	.0006-.0010
S	34		350	38	50-120	.0002-.0006	.0006-.0010
S	35		320	34	50-140	.0002-.0006	.0006-.0009
S	36	Titanium Alloys	400 Rm		100-250	.0006-.0010	.0010-.0022
S	37		1050 Rm		60-140	.0002-.0006	.0006-.0010

TO CALCULATE SPEED & FEED RATES

Calculate R.P.M of cutter

$$N = \frac{12 \times \text{SFM}}{d \times \pi}$$

Calculate Feed per Revolution

$$F_1 = fz \times Z \times N$$

Finally Calculate Feed at Tool Center Line

$$F_2 = \frac{\text{Internal Thread } F_1 \times (D - d)}{D} \quad \text{External Thread } F_2 = \frac{F_1 \times (Dm + d)}{Dm}$$

N : R.P.M

SFM : Recommended Cutting Speed

d : Diameter of Cutter

fz : Recommended Feed per Tooth

Z : Number of Teeth

F₁ : Feed at Cutting Edge

F₂ : Feed at Center Line of Cutting

D : Major Diameter of Component

Dm : Minor Diameter of Component

