

## Calculations Drill LBST

n = Rotation Speed in RPM  
 vc = cutting speed in m/min  
 d = Diameter in mm  
 z = number of teeth  
 f = feed in  $\mu\text{m}/\text{rpm}$   
 vf = feed speed (mm/min)



The speed of the cutter is calculated using the following formula:

$$n \text{ [U/min]} = (vc \text{ [m/min]} * 1000) / (3.14 * \text{Ø}d1 \text{ [mm]})$$

Example : Ø 4mm / Softplastic

vc = 100 m/min (selected from table)

d = Ø 4 mm

$$7960 \text{ U/min} = (100 * 1000) / (3.14 * 4)$$

The feed speed can be calculated by following formula:

$$vf = n * f$$

Example softplastic: Drill 4mm

n = 6370 U/min from formula above

f = 0,07 from table

$$307 \text{ mm/min} = 7690 * 0,04$$

### Approximate values for speed an feedrate

1 $\mu\text{m}$ = 0,001mm	vc= m/min	Diameter Drill mm						
		Ø 0,1 - 0,5	Ø 0,6 - 1,0	Ø 1,1 - 3,75	Ø 3,2 - 3,95	Ø 4,0 - 4,85	Ø 4,9 - 6,35	Ø 6,4 - 7,5
		Feedrate f ( $\mu\text{m}/\text{RPM}$ )						
FR4	170	6-32 $\mu\text{m}$	40-70 $\mu\text{m}$	76 $\mu\text{m}$	23 $\mu\text{m}$	20 $\mu\text{m}$	17 $\mu\text{m}$	13 $\mu\text{m}$
Cast-Aluminium > 12% Si	100	2-10 $\mu\text{m}$	12-21 $\mu\text{m}$	23 $\mu\text{m}$	7 $\mu\text{m}$	6 $\mu\text{m}$	5 $\mu\text{m}$	4 $\mu\text{m}$
Aluminium Wrought alloy	150	3-15 $\mu\text{m}$	15-25 $\mu\text{m}$	30 $\mu\text{m}$	10 $\mu\text{m}$	9 $\mu\text{m}$	8 $\mu\text{m}$	7 $\mu\text{m}$
Softplastic	100	12-64 $\mu\text{m}$	80-150 $\mu\text{m}$	160 $\mu\text{m}$	46 $\mu\text{m}$	40 $\mu\text{m}$	30 $\mu\text{m}$	26 $\mu\text{m}$
Hardplastic	130	4-24 $\mu\text{m}$	30-54 $\mu\text{m}$	57 $\mu\text{m}$	17 $\mu\text{m}$	15 $\mu\text{m}$	13 $\mu\text{m}$	10 $\mu\text{m}$
Brass, Copper, Bronze	200	2-10 $\mu\text{m}$	12-21 $\mu\text{m}$	23 $\mu\text{m}$	7 $\mu\text{m}$	6 $\mu\text{m}$	5 $\mu\text{m}$	4 $\mu\text{m}$
Steel	70	1-5 $\mu\text{m}$	6-10 $\mu\text{m}$	12 $\mu\text{m}$	4 $\mu\text{m}$	3 $\mu\text{m}$	2.5 $\mu\text{m}$	2 $\mu\text{m}$

The values given are a rough guide and may differ from the table depending on the machine and peripherals.