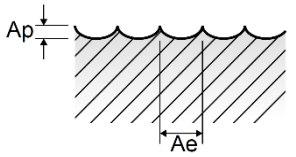


Speeds and Feeds



- 1) Select your material in the ISO colored chart with respect to material description and hardness (HRC).
- 2) Start with a middle/average value for spindle speed, n (RPM) and feed rate, V_f (mm/min). Adjust the spindle speed and/or feed rate based on your cutting conditions.

Insert Grade – **HTM2**

Material				Recommended Cutting Values								
Group		Description	Width of Cut, a_e	Depth of Cut, a_p	Parameter	Tool Diameter (mm)						
ISO	VDI 3323					8 Ø	10, 11 Ø	12, 13 Ø	16, 17 Ø	20, 21 Ø	25, 26 Ø	30, 32, 33 Ø
M	12-14	Stainless Steel	 <p>a_e Roughing: 0.1XD Finishing: ≤ 13 Ø : 0.254mm ≤ 21 Ø : 0.305mm > 21 Ø : 0.406mm</p> <p>a_p Roughing: ≤ 17 Ø : 0.025XD > 17 Ø : 0.05XD Finishing: 0.102mm</p>	Number of Flutes	2	2	2	2	2	2	2	
				V_c	90 - 130	90 - 130	90 - 130	90 - 130	90 - 130	90 - 130	90 - 130	90 - 130
				f_z	0.10 - 0.12	0.13 - 0.15	0.15 - 0.20	0.15 - 0.20	0.15 - 0.20	0.20 - 0.25	0.20 - 0.25	0.20 - 0.25
				n	3580 - 5170	2860 - 4140	2390 - 3450	1790 - 2590	1430 - 2070	1150 - 1660	950 - 1380	950 - 1380
				V_f	720 - 1290	720 - 1240	720 - 1380	540 - 1030	430 - 830	460 - 830	380 - 690	380 - 690

NOTE: It is recommended to use a carbide shank holder when the length of overhang exceeds 4XD.
 It is recommended to reduce feed rates by 70% to 85% of the values in the chart when the length to diameter ratio exceeds 3 to 1.



Speeds and Feeds



Feed Rate, Per Revolution (mm/min)
$v_f = f_n \cdot n$

Feed Rate, Per Tooth (mm/min)
$v_f = f_z \cdot n \cdot Z$

Feed Per Revolution (mm/rev)
$f_n = \frac{v_f}{n}$

Feed Per Tooth (mm)
$f_z = \frac{v_f}{n \cdot Z}$

Cutting Speed (m/min)
$v_c = \frac{\pi \cdot D_{tool} \cdot n}{1000}$

Spindle Speed (rev/min)
$n = \frac{v_c \cdot 1000}{\pi \cdot D_{tool}}$

Material Removal Rate (mm ³ /min)
$MMR = \frac{a_p \cdot a_e \cdot v_f}{1000}$

Metric

Symbol	Definition	Unit
v_f	Feed rate	mm/min
f_n	Feed per revolution	mm/rev
f_z	Feed per tooth	mm
v_c	Cutting speed	m/min (SMM)
n	Spindle speed	rev/min (RPM)
D_{tool}	Tool cutting diameter	mm
MMR	Material removal rate	(mm ³ /min)
a_e	Radial depth of cut	mm
a_p	Axial depth of cut	mm
Z	Number of teeth/flutes	