

Speeds and Feeds

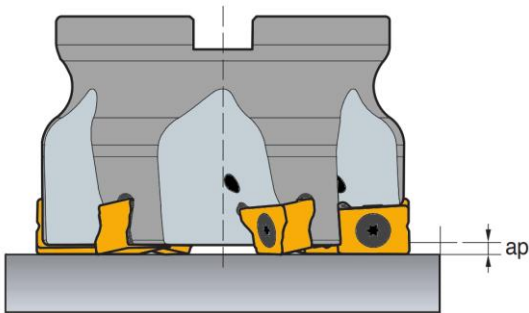


1. Select your material in the ISO colored chart.
2. Start with the recommended RPM, cutting speed, v_c (sfm) and feed rate, f_z (in/tooth). Adjust the cutting speed and/or feed rate based on your cutting conditions.
3. Warning: Calculated RPM may exceed the maximum RPM of the cutter body. Never exceed the maximum RPM rating of the cutter body.

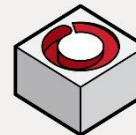
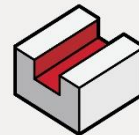
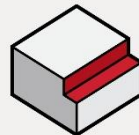
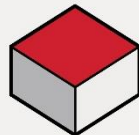
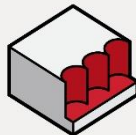
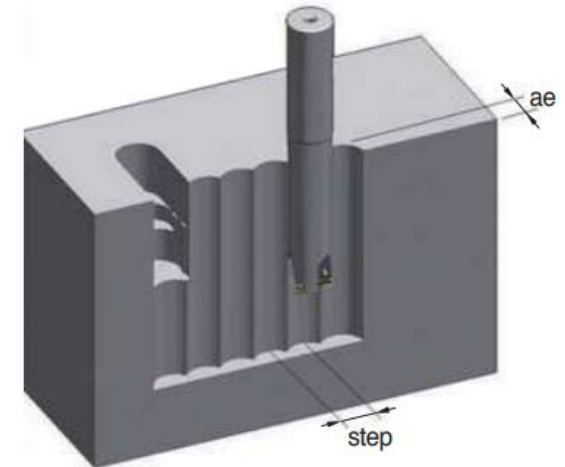
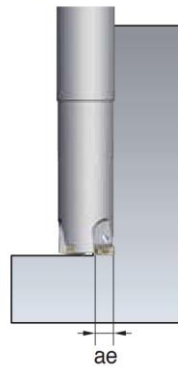
Haas Milling Cutter Series	Haas Insert Geometry	Haas Cutter Bodies
HLNP	LNMX151008-HM	01-0625
		01-0626
		01-0627

Haas Milling Cutter Series	Workpiece Material	Haas Grade	Haas Inserts	v_c (ft/min)	f_z (in/t)	max ae (in)	max ap (in)	max step
HLNP	P Steel	HMP40C	02-0982	490~820	0.0039~0.0118	0.5512	0.0984	<0.7D
	M Stainless steel	HU30	02-0983	390~820	0.0031~0.0118	0.5512	0.0984	<0.7D
	K Cast iron	HMK15	02-0984	330~590	0.002~0.0079	0.5512	0.0984	<0.7D

In horizontal machining, Depth of cut = a_p



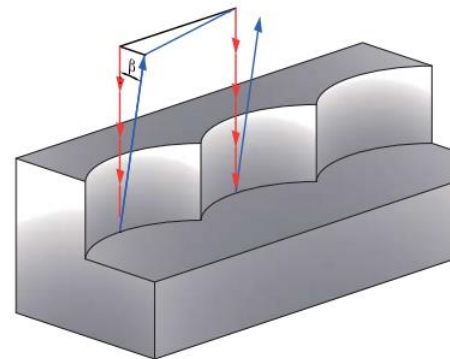
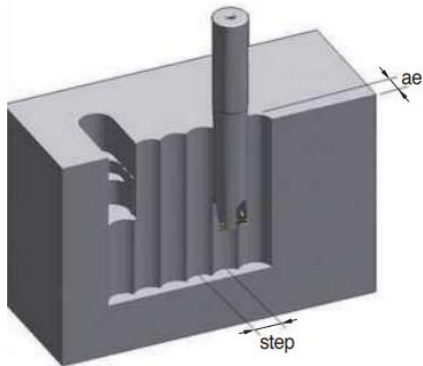
In plunging, Depth of cut = a_e



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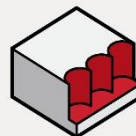


ae (in)	Cutter Diameter (in)						
	1.00	1.25	1.50	2.00	2.50	3.00	4.00
	max step (in)						
0.039	0.386	0.433	0.476	0.555	0.622	0.681	0.787
0.079	0.535	0.606	0.783	0.776	0.870	0.957	1.110
0.118	0.642	0.728	0.807	0.941	1.059	1.165	1.350
0.157	0.724	0.827	0.917	1.075	1.215	1.335	1.555
0.197	0.791	0.909	1.012	1.189	1.346	1.484	1.728
0.236	0.846	0.976	1.091	1.287	1.461	1.614	1.882
0.276	0.890	1.035	1.161	1.378	1.563	1.732	2.024
0.315	0.925	1.083	1.220	1.457	1.657	1.839	2.154
0.354	0.953	1.126	1.272	1.524	1.740	1.933	2.272
0.394	-	-	-	-	1.819	2.024	2.382
0.433	-	-	-	-	1.890	2.106	2.484
0.472	-	-	-	-	0.776	2.185	2.579
0.512	-	-	-	-	2.016	2.256	2.669
0.551	-	-	-	-	2.071	2.323	2.756

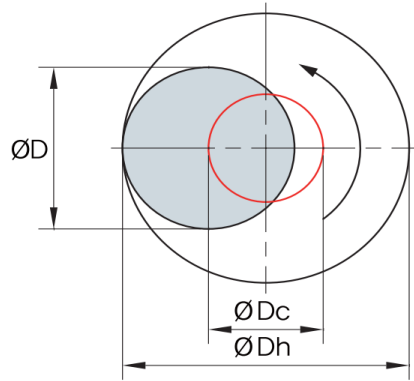


- - - Plunging feed direction
- Tool escape
- β Escape angle ($\beta \geq 1^\circ$)

*When your tool steps back after plunging, please get over 1° more escape angle

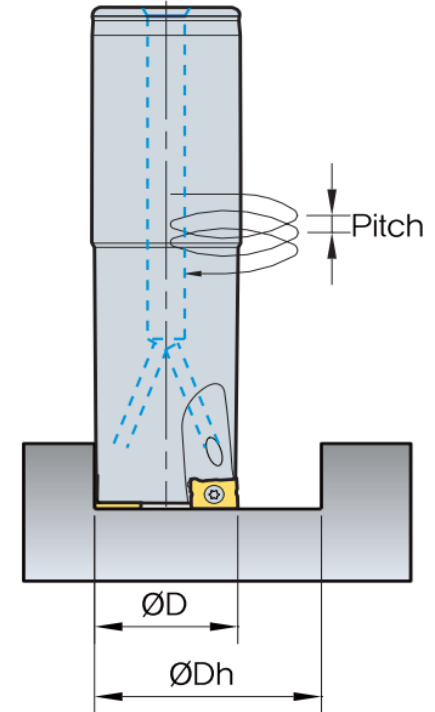


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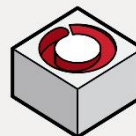


$$\text{ØDc} = \text{ØDh} - \text{ØD}$$

ØDc = Tool center path
 ØDh = Desired hole diameter
 ØD = Tool Dia.



Cutter Diameter ØD (in)	Helical data			
	ØDh min (in)	ØDh max (in)	Min. Pitch (in)	Max. Pitch (in)
1.00	1.213	1.921	0.017	0.075
1.25	1.674	2.421	0.013	0.038
1.50	2.174	2.921	0.011	0.023
2.00	3.174	3.921	0.012	0.021
2.50	3.780	4.921	0.021	0.039
3.00	4.780	5.921	0.019	0.032
4.00	6.780	7.921	0.015	0.021



Speeds and Feeds



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

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

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

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

Cutting Speed (ft/min)
$v_c = \frac{\pi \cdot D_{tool} \cdot n}{12}$

Spindle Speed (rev/min)
$n = \frac{v_c \cdot 12}{\pi \cdot D_{tool}}$

Material Removal Rate (in ³ /min)
$MMR = a_p \cdot a_e \cdot v_f$

Inch

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