Speeds and Feeds

						HCSNP2 - Haas Square Negative Positive 2
Material			Grade	Inserts	Recommended Cutting Speed	Recommended Feed Per Tooth
Group	Description	Hardness (HB)				
P Steel	Unalloyed Steel	< 180	HMP20	02-0623	720 - 1150	0.004 - 0.016
	Low-alloyed Steel	180 - 280	HMP20	02-0623	720 - 1050	0.004 - 0.016
	High-Alloyed Steel and Tool Steel	280 - 350	HMP20	02-0623	590 - 980	0.004 - 0.016
M Stainless Steel	Stainless Steel	< 270	HMP20	02-0623	360 - 880	0.004 - 0.012
K Cast Iron	Grey Cast Iron, Ductile Cast Iron, Malleable Cast Iron	180 - 250	HMP20	02-0623	490 - 980	0.004 - 0.016
S High-Temp Alloys	Heat-resistant Alloys	< 400	HMP20	02-0623	200 - 400	0.004 - 0.012

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	