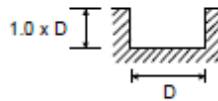




MATERIAL GROUP	HRc		Size (mm)							
			6.0	8.0	10.0	12.0	14.0	16.0	20.0	
<b>P</b>	11 12	< 30	v <sub>c</sub> (m/min)	30	30	30	30	30	30	30
			n	1600	1200	950	800	700	600	480
			f <sub>z</sub>	0.02	0.026	0.33	0.04	0.045	0.056	0.069
			f (mm/min)	95	95	95	95	95	100	100
	13 14	30-40	v <sub>c</sub> (m/min)	25	25	25	25	25	25	25
			n	1300	1000	800	660	570	500	400
			f <sub>z</sub>	0.017	0.022	0.027	0.033	0.038	0.053	0.067
			f (mm/min)	65	65	65	65	65	80	80
<b>K</b>	31 32 33		v <sub>c</sub> (m/min)	40	40	40	40	40	40	40
			n	2100	1600	1300	1000	900	800	640
			f <sub>z</sub>	0.035	0.048	0.062	0.083	0.096	0.113	0.151
			f (mm/min)	220	230	240	250	260	270	290
<b>N</b>	61 62 63		v <sub>c</sub> (m/min)	75	75	75	75	75	75	75
			n	4000	3000	2400	2000	1700	1500	1200
			f <sub>z</sub>	0.026	0.034	0.043	0.052	0.061	0.069	0.086
			f (mm/min)	310	310	310	310	310	310	310
	71 72 73		v <sub>c</sub> (m/min)	100	100	100	100	100	100	100
			n	5300	4000	3200	2600	2300	2000	1600
			f <sub>z</sub>	0.026	0.034	0.043	0.053	0.059	0.068	0.085
			f (mm/min)	410	410	410	410	410	410	410



► The feed rate for long and long reach tools should be reduced by up to 50%

v<sub>c</sub> - cutting speed (m/min)

n - RPM (rev/min)

f<sub>z</sub> - feed rate (mm/tooth)

f - feed rate (mm/rev)

z - No. of teeth

a<sub>p</sub> - axial depth of cut

a<sub>r</sub> - radial depth of cut

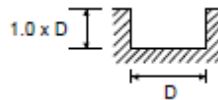
$$\text{To calculate RPM from cutting speed: } n = \frac{v_c \cdot 1000}{\pi \cdot \phi}$$

$$\text{To calculate cutting speed from RPM: } v_c = \frac{n \cdot \pi \cdot \phi}{1000}$$

All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up. The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.



MATERIAL GROUP	HRc		Size (mm)							
			6.0	8.0	10.0	12.0	14.0	16.0	20.0	
<b>P</b>	11 12	< 30	$v_c$ (m/min)	40	40	40	40	40	40	40
			$n$	2240	1680	1330	1120	980	840	670
			$f_z$	0.02	0.027	0.034	0.04	0.046	0.056	0.07
			$f$ (mm/min)	135	135	135	135	135	140	140
	13 14	30-40	$v_c$ (m/min)	35	35	35	35	35	35	35
			$n$	1820	1400	1120	925	800	700	560
			$f_z$	0.016	0.021	0.027	0.032	0.038	0.052	0.065
			$f$ (mm/min)	90	90	90	90	90	110	110
<b>K</b>	31 32 33		$v_c$ (m/min)	55	55	55	55	55	55	55
			$n$	2940	2240	1820	1400	1280	1120	895
			$f_z$	0.035	0.048	0.061	0.083	0.097	0.113	0.151
			$f$ (mm/min)	310	320	335	350	365	380	405
<b>N</b>	61 62 63		$v_c$ (m/min)	105	105	105	105	105	105	105
			$n$	5600	4200	3360	2800	2380	2100	1680
			$f_z$	0.026	0.035	0.043	0.052	0.061	0.069	0.086
			$f$ (mm/min)	435	435	435	435	435	435	435
	71 72 73		$v_c$ (m/min)	140	140	140	140	140	140	140
			$n$	7420	5600	4480	3640	3220	2800	2240
			$f_z$	0.026	0.034	0.043	0.053	0.06	0.068	0.086
			$f$ (mm/min)	140	140	140	140	140	140	140



► The feed rate for long and long reach tools should be reduced by up to 50%

$v_c$  - cutting speed (m/min)

$n$  - RPM (rev/min)

$f_z$  - feed rate (mm/tooth)

$f$  - feed rate (mm/rev)

$z$  - No. of teeth

$a_p$  - axial depth of cut

$a_e$  - radial depth of cut

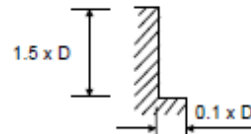
$$\text{To calculate RPM from cutting speed: } n = \frac{v_c \cdot 1000}{\pi \cdot \phi}$$

$$\text{To calculate cutting speed from RPM: } v_c = \frac{n \cdot \pi \cdot \phi}{1000}$$

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MATERIAL GROUP	HRc		Size (mm)							
			6.0	8.0	10.0	12.0	14.0	16.0	20.0	
<b>P</b>	11 12	< 30	$v_c$ (m/min)	30	30	30	30	30	30	30
			$n$	1600	1200	950	800	700	600	480
			$f_z$	0.04	0.053	0.068	0.079	0.09	0.111	0.139
			$f$ (mm/min)	190	190	190	190	190	200	200
	13 14	30-40	$v_c$ (m/min)	25	25	25	25	25	25	25
			$n$	1300	1000	800	660	570	500	400
			$f_z$	0.033	0.043	0.054	0.066	0.076	0.107	0.133
			$f$ (mm/min)	130	130	130	130	130	160	160
<b>K</b>	31 32 33		$v_c$ (m/min)	40	40	40	40	40	40	40
			$n$	2100	1600	1300	1000	900	800	640
			$f_z$	0.07	0.096	0.123	0.167	0.193	0.225	0.302
			$f$ (mm/min)	440	460	480	500	520	540	580
<b>N</b>	61 62 63		$v_c$ (m/min)	75	75	75	75	75	75	75
			$n$	4000	3000	2400	2000	1700	1500	1200
			$f_z$	0.052	0.069	0.086	0.103	0.122	0.138	0.172
			$f$ (mm/min)	620	620	620	620	620	620	620
	71 72 73		$v_c$ (m/min)	100	100	100	100	100	100	100
			$n$	5300	4000	3200	2600	2300	2000	1600
			$f_z$	0.052	0.068	0.085	0.105	0.119	0.137	0.171
			$f$ (mm/min)	820	820	820	820	820	820	820



► The feed rate for long and long reach tools should be reduced by up to 50%

$v_c$  - cutting speed (m/min)

$n$  - RPM (rev/min)

$f_z$  - feed rate (mm/tooth)

$f$  - feed rate (mm/rev)

$z$  - No. of teeth

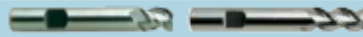
$a_p$  - axial depth of cut

$a_r$  - radial depth of cut

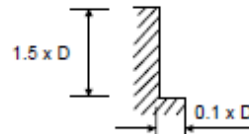
$$\text{To calculate RPM from cutting speed: } n = \frac{v_c \times 1000}{\pi \times \phi}$$

$$\text{To calculate cutting speed from RPM: } v_c = \frac{n \times \pi \times \phi}{1000}$$

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MATERIAL GROUP	HRc		Size (mm)							
			6.0	8.0	10.0	12.0	14.0	16.0	20.0	
<b>P</b>	11 12	< 30	$v_c$ (m/min)	40	40	40	40	40	40	40
			$n$	2240	1680	1330	1120	980	840	670
			$f_z$	0.039	0.053	0.066	0.079	0.09	0.111	0.139
			$f$ (mm/min)	265	265	265	265	265	280	280
	13 14	30-40	$v_c$ (m/min)	35	35	35	35	35	35	35
			$n$	1820	1400	1120	925	800	700	580
			$f_z$	0.033	0.043	0.054	0.065	0.075	0.107	0.134
			$f$ (mm/min)	180	180	180	180	180	225	225
<b>K</b>	31 32 33	$v_c$ (m/min)	55	55	55	55	55	55	55	
		$n$	2940	2240	1820	1400	1260	1120	895	
		$f_z$	0.07	0.096	0.123	0.167	0.193	0.225	0.302	
		$f$ (mm/min)	615	645	670	700	730	755	810	
<b>N</b>	61 62 63	$v_c$ (m/min)	105	105	105	105	105	105	105	
		$n$	5600	4200	3360	2800	2380	2100	1680	
		$f_z$	0.052	0.069	0.086	0.104	0.122	0.138	0.173	
		$f$ (mm/min)	870	870	870	870	870	870	870	
	71 72 73	$v_c$ (m/min)	140	140	140	140	140	140	140	
		$n$	7420	5600	4480	3640	3220	2800	2240	
		$f_z$	0.052	0.068	0.086	0.105	0.119	0.137	0.171	
		$f$ (mm/min)	1150	1150	1150	1150	1150	1150	1150	



► The feed rate for long and long reach tools should be reduced by up to 50%

$v_c$  - cutting speed (m/min)  
 $n$  - RPM (rev/min)  
 $f_z$  - feed rate (mm/tooth)  
 $f$  - feed rate (mm/rev)  
 $z$  - No. of teeth  
 $a_p$  - axial depth of cut  
 $a_e$  - radial depth of cut

$$\text{To calculate RPM from cutting speed: } n = \frac{v_c \times 1000}{\pi \times \phi}$$

$$\text{To calculate cutting speed from RPM: } v_c = \frac{n \times \pi \times \phi}{1000}$$

All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up. The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.