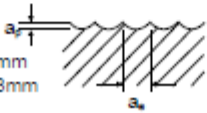


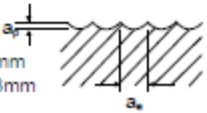
MATERIAL GROUP	HARDNESS HRC	NORMAL SPEED	Size (mm)											
			1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0	
<b>P</b>	13 14	< 30-40	$v_c$ (m/min)	40	65	95	105	115	130	145	160	175	190	205
			$n$	12720	10700	10000	8400	7300	6900	5770	5090	4640	3780	3260
			$f_s$	0.008	0.023	0.023	0.032	0.04	0.06	0.08	0.1	0.12	0.14	0.16
			$f$ (mm/min)	200	490	460	530	580	830	920	1020	1110	1060	1040
<b>H</b>	15 16	45-65	$v_c$ (m/min)	20	30	45	55	60	60	62	65	65	70	70
			$n$	5800	4680	4520	4200	3680	3180	2470	2040	1750	1350	1110
			$f_s$	0.008	0.016	0.017	0.021	0.024	0.03	0.045	0.055	0.07	0.091	0.113
			$f$ (mm/min)	90	150	150	180	180	190	220	225	245	245	250
<b>K</b>	31 32 33 34		$v_c$ (m/min)	50	90	125	130	145	160	180	200	220	240	260
			$n$	15760	14400	13100	10500	9140	8490	7160	6370	5840	4770	4140
			$f_s$	0.008	0.026	0.026	0.035	0.045	0.06	0.09	0.12	0.15	0.18	0.2
			$f$ (mm/min)	250	750	680	740	820	1020	1290	1530	1750	1720	1660

< HRc45



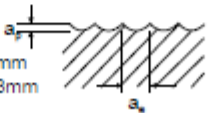
$a_p$ :  $\phi 1.0\text{mm} - 6.0\text{mm} = 0.2\text{mm}$   
 $a_p$ :  $\phi 8.0\text{mm} - 20.0\text{mm} = 0.3\text{mm}$   
 $a_e$ :  $0.2 \times D$

> HRc45



$a_p$ :  $\phi 1.0\text{mm} - 6.0\text{mm} = 0.2\text{mm}$   
 $a_p$ :  $\phi 8.0\text{mm} - 20.0\text{mm} = 0.3\text{mm}$   
 $a_e$ :  $0.1 \times D$

MATERIAL GROUP	HARDNESS HRC	HIGH SPEED	Size (mm)											
			1.0	2.0	3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0	
<b>P</b>	13 14	< 30-40	$v_c$ (m/min)	80	130	200	265	330	395	420	440	460	480	500
			$n$	25000	21000	21000	21000	21000	21000	16700	14000	12200	9550	7960
			$f_s$	0.026	0.035	0.048	0.07	0.086	0.095	0.12	0.139	0.16	0.181	0.2
			$f$ (mm/min)	1300	1480	2000	2940	3600	4000	4000	3900	3900	3450	3180
<b>H</b>	15 16	45-65	$v_c$ (m/min)	80	130	160	170	190	200	210	220	230	240	250
			$n$	25000	21000	17000	13660	12000	10500	8360	7000	6100	4770	3980
			$f_s$	0.016	0.022	0.031	0.042	0.05	0.06	0.075	0.086	0.095	0.105	0.116
			$f$ (mm/min)	800	940	1040	1160	1200	1250	1250	1200	1160	1000	920
<b>K</b>	31 32 33 34		$v_c$ (m/min)	80	130	200	265	330	395	420	440	460	480	500
			$n$	25000	21000	21000	21000	21000	21000	16700	14000	12200	9550	7960
			$f_s$	0.026	0.035	0.048	0.07	0.086	0.095	0.12	0.139	0.16	0.181	0.2
			$f$ (mm/min)	1300	1480	2000	2940	3600	4000	4000	3900	3900	3450	3180



$a_p$ :  $\phi 1.0\text{mm} - 6.0\text{mm} = 0.2\text{mm}$   
 $a_p$ :  $\phi 8.0\text{mm} - 20.0\text{mm} = 0.3\text{mm}$   
 $a_e$ :  $0.05 \times D$