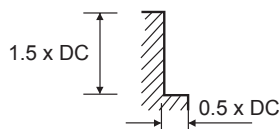


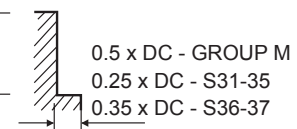
## CUTTING DATA

171329, 176323, 177323, 178323, 179323 (4 Flute VX)												
VDI MATERIAL GROUP	Material	HRc	SIDE CUTTING	Size (mm)								
				3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0
P	1-5 Non-alloy Steel	<25	$v_c$ (m/min)	152	152	152	152	152	168	168	168	168
			$n$	16128	12096	9677	8064	6048	5348	4456	3342	2674
			$f_z$	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.053	0.065
			$f$ (mm/min)	323	387	513	516	653	813	838	709	695
	6-9 Low alloy Steel	25-35	$v_c$ (m/min)	107	107	107	107	107	117	117	117	117
			$n$	11353	8515	6812	5677	4257	3724	3104	2328	1862
			$f_z$	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.053	0.065
			$f$ (mm/min)	227	272	300	363	460	566	583	493	484
	10-11 High alloy Steel, Tool Steel	35-45	$v_c$ (m/min)	64	64	64	64	64	70	70	70	70
			$n$	6791	5093	4074	3395	2546	2228	1857	1393	1114
			$f_z$	0.003	0.006	0.008	0.011	0.019	0.027	0.032	0.037	0.045
			$f$ (mm/min)	81	122	130	149	194	241	238	206	201
M	12 Ferritic/Martensitic Stainless Steel	$v_c$ (m/min)	161	161	161	161	161	161	161	161	161	
		$n$	17083	12812	10250	8541	6406	5125	4270	3203	2562	
		$f_z$	0.004	0.006	0.009	0.013	0.022	0.034	0.040	0.045	0.055	
		$f$ (mm/min)	273	307	369	444	564	697	683	577	564	
	13 Martensitic Stainless Steel	$v_c$ (m/min)	115	115	115	115	115	115	115	115	115	
		$n$	12202	9151	7321	6104	4576	3661	3050	2288	1830	
		$f_z$	0.005	0.008	0.013	0.018	0.028	0.048	0.056	0.063	0.077	
		$f$ (mm/min)	244	293	381	439	512	703	683	577	564	
	14 Austenitic Stainless Steel	$v_c$ (m/min)	104	104	104	104	104	104	104	104	104	
		$n$	11035	8276	6621	5517	4138	3310	2759	2069	1655	
		$f_z$	0.005	0.008	0.013	0.018	0.028	0.048	0.055	0.062	0.077	
		$f$ (mm/min)	221	265	344	397	463	636	607	513	510	
K 15-20 Cast Iron	$v_c$ (m/min)	112	112	112	112	112	123	123	123	123		
	$n$	11884	8913	7130	5942	4456	3915	3263	2447	1958		
	$f_z$	0.006	0.010	0.014	0.020	0.034	0.048	0.058	0.065	0.081		
	$f$ (mm/min)	285	357	399	475	606	752	757	636	634		
S	31-35 HRSA Fe & Ni/Co Based	$v_c$ (m/min)	31	31	31	31	31	31	31	31	31	
		$n$	3289	2467	1974	1645	1233	987	822	617	493	
		$f_z$	0.005	0.007	0.012	0.018	0.031	0.047	0.055	0.064	0.077	
		$f$ (mm/min)	66	69	95	118	153	186	181	158	152	
	36-37 Titanium/Titanium Alloys	$v_c$ (m/min)	81	81	81	81	81	81	81	81	81	
		$n$	8594	6446	5157	4297	3223	2578	2149	1611	1289	
		$f_z$	0.004	0.007	0.011	0.016	0.025	0.043	0.050	0.056	0.069	
		$f$ (mm/min)	138	180	227	275	322	445	430	361	356	

MATERIAL GROUPS P,K



1.5 x DC - GROUP M  
1.0 x DC - S31-35  
1.0 x DC - S36-37



Recommended cutting depths are **maximum** depths, and **speeds and feeds are a starting point** based on these depths.  
All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up.  
**For long series and long necked tools** it may be necessary to reduce feed rate by up to 50%.

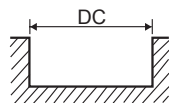
$v_c$  - cutting speed (m/min)  
 $n$  - RPM (rev/min)  
 $f_z$  - feed per tooth (mm)  
 $f$  - feed rate (mm/min)  
 $a_p$  - axial depth of cut  
 $a_e$  - radial depth of cut

## CUTTING DATA

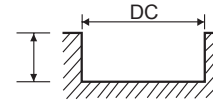
171329, 176323, 177323, 178323, 179323 (4 Flute VX)												
VDI MATERIAL GROUP	HRC	SLOTTING	Size (mm)									
			3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	20.0	
P	1-5 Non-alloy Steel	<25	$v_c$ (m/min)	152	152	152	152	152	168	168	168	168
			$n$	16128	12096	9677	8064	6048	5348	4456	3342	2674
			$f_z$	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.053	0.065
			$f$ (mm/min)	323	387	513	516	653	813	838	709	695
	6-9 Low alloy Steel	25-35	$v_c$ (m/min)	107	107	107	107	107	117	117	117	117
			$n$	11353	8515	6812	5677	4257	3724	3104	2328	1862
			$f_z$	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.053	0.065
			$f$ (mm/min)	227	272	300	363	460	566	583	493	484
	10-11 High alloy Steel, Tool Steel	35-45	$v_c$ (m/min)	64	64	64	64	64	70	70	70	70
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			$f$ (mm/min)	81	122	130	149	194	241	238	206	201
M	12 Ferritic/Martensitic Stainless Steel	$v_c$ (m/min)	161	161	161	161	161	161	161	161	161	
		$n$	17083	12812	10250	8541	6406	5125	4270	3203	2562	
		$f_z$	0.004	0.006	0.009	0.013	0.022	0.034	0.040	0.045	0.055	
		$f$ (mm/min)	273	307	369	444	564	697	683	577	564	
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		$f$ (mm/min)	244	293	381	439	512	703	683	577	564	
	14 Austenitic Stainless Steel	$v_c$ (m/min)	104	104	104	104	104	104	104	104	104	
		$n$	11035	8276	6621	5517	4138	3310	2759	2069	1655	
		$f_z$	0.005	0.008	0.013	0.018	0.028	0.048	0.055	0.062	0.077	
		$f$ (mm/min)	221	265	344	397	463	636	607	513	510	
K 15-20 Cast Iron	$v_c$ (m/min)	112	112	112	112	112	123	123	123	123		
	$n$	11884	8913	7130	5942	4456	3915	3263	2447	1958		
	$f_z$	0.006	0.010	0.014	0.020	0.034	0.048	0.058	0.065	0.081		
	$f$ (mm/min)	285	357	399	475	606	752	757	636	634		
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		$n$	3289	2467	1974	1645	1233	987	822	617	493	
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		$f$ (mm/min)	66	69	95	118	153	186	181	158	152	
	36-37 Titanium/Titanium Alloys	$v_c$ (m/min)	81	81	81	81	81	81	81	81	81	
		$n$	8594	6446	5157	4297	3223	2578	2149	1611	1289	
		$f_z$	0.004	0.007	0.011	0.016	0.025	0.043	0.050	0.056	0.069	
		$f$ (mm/min)	138	180	227	275	322	445	430	361	356	

MATERIAL GROUP P, K

1.0 x DC



1.0 x DC - GROUP M  
0.5 x DC - S31-35  
0.5 x DC - S36-37



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$v_c$  - cutting speed (m/min)  
 $n$  - RPM (rev/min)  
 $f_z$  - feed per tooth (mm)  
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 $a_p$  - axial depth of cut  
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