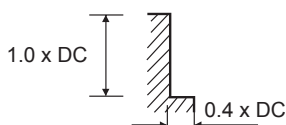


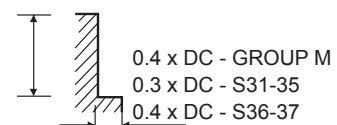
CUTTING DATA

170323 (4 Flute VXD)												
VDI MATERIAL GROUP		HRc	SIDE CUTTING	Size (mm)								
				6.0	8.0	10.0	12.0	14.0	16.0	20.0	25.0	
P	1-5	Non-alloy Steel	<25	v_c (m/min)	160	160	160	160	160	160	160	160
				n	8488	6366	5093	4244	3638	3183	2546	2037
				f_z	0.027	0.035	0.042	0.053	0.058	0.063	0.077	0.084
				f (mm/min)	917	891	856	900	844	802	784	684
	6-9	Low alloy Steel	25-35	v_c (m/min)	150	150	150	150	150	150	150	150
				n	7958	5968	4775	3979	3410	2984	2387	1910
				f_z	0.025	0.035	0.042	0.049	0.056	0.063	0.070	0.084
				f (mm/min)	796	836	802	780	764	752	668	642
	10-11	High alloy Steel, Tool Steel	35-45	v_c (m/min)	150	150	150	150	150	150	150	150
				n	7958	5968	4775	3979	3410	2984	2387	1910
				f_z	0.027	0.035	0.046	0.053	0.060	0.067	0.077	0.084
				f (mm/min)	859	836	879	844	819	800	736	642
M	12	Ferritic/ Martensitic Stainless Steel	v_c (m/min)	155	155	155	155	155	155	155	155	
			n	8223	6167	4934	4112	3524	3084	2467	1974	
			f_z	0.034	0.046	0.057	0.067	0.076	0.086	0.095	0.114	
			f (mm/min)	1125	1125	1125	1094	1071	1055	937	900	
	13	Martensitic Stainless Steel	v_c (m/min)	105	105	105	105	105	105	105	105	
			n	5570	4187	3342	2785	2387	2089	1671	1337	
			f_z	0.025	0.034	0.042	0.048	0.055	0.062	0.071	0.081	
			f (mm/min)	557	568	562	535	525	518	475	433	
	14	Austenitic Stainless Steel	v_c (m/min)	44	44	44	44	44	44	44	44	
			n	2334	1751	1401	1168	1000	875	700	560	
			f_z	0.016	0.021	0.027	0.032	0.036	0.040	0.046	0.052	
			f (mm/min)	151	146	149	151	144	140	128	117	
K	15-20	Cast Iron	v_c (m/min)	175	175	175	175	175	175	175	175	
			n	9284	6963	5570	4642	3979	3482	2785	2228	
			f_z	0.021	0.028	0.035	0.042	0.048	0.053	0.060	0.070	
			f (mm/min)	780	780	780	780	764	738	668	624	
S	31-35	HRSA Fe & Ni/Co Based	v_c (m/min)	32	32	32	32	32	32	32	32	
			n	1698	1273	1019	849	728	637	509	407	
			f_z	0.020	0.026	0.032	0.038	0.044	0.048	0.055	0.065	
			f (mm/min)	136	132	130	129	128	122	112	106	
	36-37	Titanium/ Titanium Alloys	v_c (m/min)	70	70	70	70	70	70	70	70	
			n	3714	2785	2228	1857	1592	1393	1114	891	
			f_z	0.034	0.048	0.057	0.067	0.076	0.086	0.095	0.114	
			f (mm/min)	508	529	508	494	484	476	423	406	

MATERIAL GROUP P, K



1.0 x DC - M12-13
0.6 x DC - M14
0.6 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

170323 (4 Flute VXD)												
VDI MATERIAL GROUP		HRc	SLOTTING	Size (mm)								
				6.0	8.0	10.0	12.0	14.0	16.0	20.0	25.0	
P	1-5	Non-alloy Steel	<25	v_c (m/min)	125	125	125	125	125	125	125	125
				n	6631	4974	3979	3316	2842	2487	1989	1592
				f_z	0.025	0.034	0.042	0.049	0.056	0.063	0.070	0.084
				f (mm/min)	663	676	668	650	637	627	557	535
	6-9	Low alloy Steel	25-35	v_c (m/min)	120	120	120	120	120	120	120	120
				n	6366	4775	3820	3183	2728	2387	1910	1528
				f_z	0.025	0.034	0.042	0.049	0.056	0.063	0.070	0.077
				f (mm/min)	637	649	642	624	611	602	535	471
	10-11	High alloy Steel, Tool Steel	35-45	v_c (m/min)	120	120	120	120	120	120	120	120
				n	6366	4775	3820	3183	2728	238	1910	1528
				f_z	0.027	0.035	0.042	0.053	0.058	0.063	0.077	0.084
				f (mm/min)	688	668	642	675	633	602	588	513
M	12	Ferritic/ Martensitic Stainless Steel	v_c (m/min)	125	125	125	125	125	125	125	125	
			n	6631	4974	3979	3316	2842	2487	1989	1592	
			f_z	0.034	0.046	0.057	0.067	0.074	0.081	0.095	0.105	
			f (mm/min)	907	907	907	882	841	803	756	665	
	13	Martensitic Stainless Steel	v_c (m/min)	85	85	85	85	85	85	85	85	
			n	4509	3382	2706	2255	1933	1691	1353	1082	
			f_z	0.025	0.034	0.042	0.048	0.055	0.062	0.071	0.081	
			f (mm/min)	446	463	452	428	425	418	386	350	
	14	Austenitic Stainless Steel	v_c (m/min)	36	36	36	36	36	36	36	36	
			n	1910	1432	1146	955	819	716	573	458	
			f_z	0.016	0.021	0.027	0.032	0.036	0.040	0.046	0.052	
			f (mm/min)	123	120	122	123	118	114	105	96	
K	15-20	Cast Iron	v_c (m/min)	140	140	140	140	140	140	140	140	
			n	7427	5570	4456	3714	3183	2785	2228	1783	
			f_z	0.021	0.028	0.035	0.042	0.048	0.053	0.060	0.067	
			f (mm/min)	624	624	624	624	611	590	535	478	
S	31-35	HRSA Fe & Ni/Co Based	v_c (m/min)	25	25	25	25	25	25	25	25	
			n	1326	995	796	663	568	497	397	318	
			f_z	0.018	0.024	0.030	0.036	0.040	0.044	0.050	0.055	
			f (mm/min)	95	95	95	95	91	88	80	70	
	36-37	Titanium/ Titanium Alloys	v_c (m/min)	55	55	55	55	55	55	55	55	
			n	2918	2188	1751	1459	1251	1094	875	700	
			f_z	0.034	0.046	0.057	0.067	0.076	0.086	0.095	0.105	
			f (mm/min)	399	399	399	388	380	374	333	293	

MATERIAL GROUP P, K

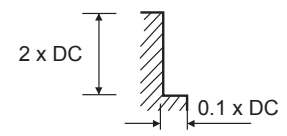
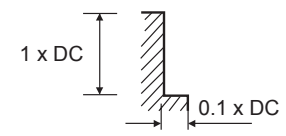
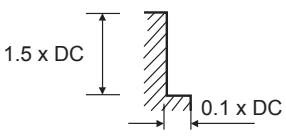
1.0 x DC - M12-13
0.5 x DC - M14
0.4 x DC - S31-35
1.0 x DC - S36-37

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 - DYNAMIC 10% RADIAL DoC

4 Flute VXD, 5 Flute VX5 & VX5H, 6 Flute VX6 & VX6C											
VDI MATERIAL GROUP		HRc		Size (mm)							
				6.0	8.0	10.0	12.0	14.0	16.0	20.0	
P	1-5	Non-alloy Steel	<25	v_c (m/min)	240	240	240	240	240	240	240
				f_z	0.05	0.086	0.107	0.128	0.15	0.167	0.172
	6-9	Low alloy Steel	25-35	v_c (m/min)	160	160	160	160	160	160	160
				f_z	0.037	0.063	0.079	0.095	0.111	0.124	0.129
	10-11	High alloy Steel, Tool Steel	35-45	v_c (m/min)	80	80	80	80	80	80	80
				f_z	0.03	0.053	0.065	0.078	0.091	0.102	0.107
M	12	Ferritic/ Martensitic Stainless Steel	v_c (m/min)	170	170	170	170	170	170	170	
			f_z	0.036	0.062	0.077	0.093	0.108	0.12	0.125	
	13	Martensitic Stainless Steel	v_c (m/min)	120	120	120	120	120	120	120	
			f_z	0.03	0.053	0.065	0.078	0.091	0.102	0.106	
	14	Austenitic Stainless Steel	v_c (m/min)	110	110	110	110	110	110	110	
			f_z	0.03	0.053	0.065	0.078	0.091	0.102	0.106	
K	15-20	Cast Iron	v_c (m/min)	110	110	110	110	110	110	110	
			f_z	0.025	0.028	0.037	0.047	0.051	0.056	0.066	
S	31-35	HRSA Fe & Ni/Co Based	v_c (m/min)	30	30	30	30	30	30	30	
			f_z	0.024	0.041	0.052	0.061	0.072	0.083	0.085	
	36-37	Titanium/ Titanium Alloys	v_c (m/min)	90	90	90	90	90	90	90	
			f_z	0.024	0.041	0.052	0.062	0.072	0.084	0.087	

<p>MATERIAL GROUP P, M, K</p> 	<p>MATERIAL GROUP S31-35</p> 	<p>MATERIAL GROUP S36-37</p> 
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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 - DYNAMIC 5% RADIAL DoC

4 Flute VXD, 5 Flute VX5 & VX5H, 6 FLUTE VX6 & VX6C											
VDI MATERIAL GROUP	Material	HRc		Size (mm)							
				6.0	8.0	10.0	12.0	14.0	16.0	20.0	
P	1-5	Non-alloy Steel	<25	v_c (m/min)	300	300	300	300	300	300	300
				f_z	0.068	0.116	0.144	0.172	0.202	0.225	0.232
	6-9	Low alloy Steel	25-35	v_c (m/min)	200	200	200	200	200	200	200
				f_z	0.05	0.085	0.106	0.128	0.149	0.167	0.174
	10-11	High alloy Steel, Tool Steel	35-45	v_c (m/min)	100	100	100	100	100	100	100
				f_z	0.041	0.071	0.088	0.105	0.123	0.137	0.144
M	12	Ferritic/ Martensitic Stainless Steel	v_c (m/min)	210	210	210	210	210	210	210	
			f_z	0.049	0.084	0.104	0.125	0.146	0.162	0.168	
	13	Martensitic Stainless Steel	v_c (m/min)	150	150	150	150	150	150	150	
			f_z	0.041	0.071	0.088	0.105	0.123	0.137	0.143	
	14	Austenitic Stainless Steel	v_c (m/min)	130	130	130	130	130	130	130	
			f_z	0.041	0.071	0.088	0.105	0.123	0.137	0.142	
K	15-20	Cast Iron	v_c (m/min)	135	135	135	135	135	135	135	
			f_z	0.034	0.038	0.050	0.063	0.069	0.076	0.089	
S	31-35	HRSA Fe & Ni/Co Based	v_c (m/min)	35	35	35	35	35	35	35	
			f_z	0.033	0.055	0.07	0.082	0.097	0.112	0.115	
	36-37	Titanium/ Titanium Alloys	v_c (m/min)	116	116	116	116	116	116	116	
			f_z	0.033	0.055	0.07	0.083	0.097	0.113	0.117	

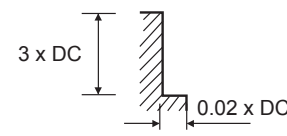
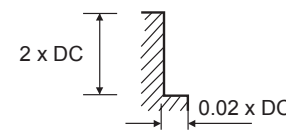
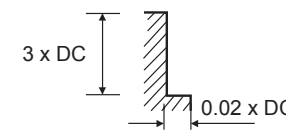
<p>MATERIAL GROUP P, M, K</p>	<p>MATERIAL GROUP S31-35</p>	<p>MATERIAL GROUP S36-37</p>
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Recommended cutting depths are **maximum** depths, and **speeds and feeds are a starting point** based on these depths. All recommendations are based on ideal machining 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 - DYNAMIC 2% RADIAL DoC

4 Flute VXD, 5 Flute VX5 & VX5H, 6 FLUTE VX6 & VX6C											
VDI MATERIAL GROUP	Material	HRc		Size (mm)							
				6.0	8.0	10.0	12.0	14.0	16.0	20.0	
P	1-5	Non-alloy Steel	<25	v_c (m/min)	370	370	370	370	370	370	370
				f_z	0.098	0.167	0.208	0.25	0.292	0.325	0.335
	6-9	Low alloy Steel	25-35	v_c (m/min)	240	240	240	240	240	240	240
				f_z	0.072	0.123	0.153	0.185	0.215	0.241	0.251
	10-11	High alloy Steel, Tool Steel	35-45	v_c (m/min)	120	120	120	120	120	120	120
				f_z	0.059	0.102	0.127	0.152	0.178	0.198	0.208
M	12	Ferritic/ Martensitic Stainless Steel	v_c (m/min)	260	260	260	260	260	260	260	
			f_z	0.071	0.121	0.15	0.18	0.211	0.234	0.242	
	13	Martensitic Stainless Steel	v_c (m/min)	180	180	180	180	180	180	180	
			f_z	0.059	0.102	0.127	0.152	0.178	0.198	0.205	
	14	Austenitic Stainless Steel	v_c (m/min)	160	160	160	160	160	160	160	
			f_z	0.059	0.102	0.127	0.152	0.178	0.198	0.205	
K	15-20	Cast Iron	v_c (m/min)	170	170	170	170	170	170	170	
			f_z	0.049	0.055	0.072	0.091	0.1	0.11	0.128	
S	31-35	HRSA Fe & Ni/Co Based	v_c (m/min)	40	40	40	40	40	40	40	
			f_z	0.048	0.079	0.101	0.118	0.14	0.162	0.166	
	36-37	Titanium/ Titanium Alloys	v_c (m/min)	140	140	140	140	140	140	140	
			f_z	0.048	0.079	0.101	0.120	0.140	0.163	0.169	

<p>MATERIAL GROUP P, M, K</p> 	<p>MATERIAL GROUP S31-35</p> 	<p>MATERIAL GROUP S36-37</p> 
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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