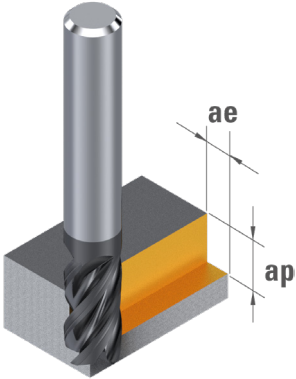


ROUTING

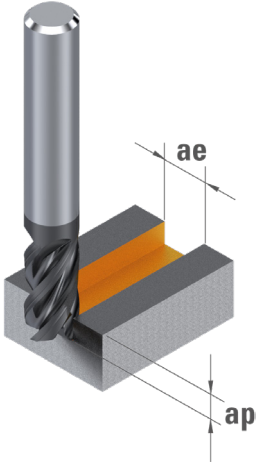
		VDI 3323		CARBIDE Vc [m/min]	TiAIN Vc [m/min]	ae (mm)	ap (mm)
P	Unalloyed steel, leaded steel	1 - 5			100	<0.30×ØD1	<1×L1
	Low alloyed steel < 800 N/mm2	6 - 9			80	<0.20×ØD1	<1×L1
	High-alloy steel > 800 N/mm2, stainless steel ferr.- marten.	10 - 13			55	<0.15×ØD1	<1×L1
M	Austenitic stainless steel < 700 N/mm2	14.1-14.2			80	<0.15×ØD1	<1×L1
	Nickel-free stainless steel / DUPLEX > 700 N/mm2	14.3-14.4			55	<0.10×ØD1	<1×L1
K	Grey cast iron < 250 HB	15 - 16		110	125	<0.40×ØD1	<1×L1
	Ductile, malleable, nodular cast iron > 250 HB	17 - 20		75	100	<0.30×ØD1	<1×L1
N	Wrought aluminium alloy < 12% Si	21 - 22		320		<0.45×ØD1	<1×L1
	Cast aluminium alloy >12% Si	23 - 25		260		<0.35×ØD1	<1×L1
	Copper alloy good machinability with Pb	26		160		<0.40×ØD1	<1×L1
	Copper alloy with difficult machinability	27 - 28		140		<0.40×ØD1	<1×L1
	Plastic, wood	29 - 30		210		<0.45×ØD1	<1×L1
	Gold, silver	-		180		<0.40×ØD1	<1×L1
S	Refractory alloy, Fe, Ni, Co base	31 - 35		15	20	<0.05×ØD1	<1×L1
	Titanium, titanium alloy	36 - 37		60	70	<0.30×ØD1	<1×L1

$$n \text{ [rpm]} = \frac{V_c \text{ [m/min]} \times 1000}{\pi \times D_1 \text{ [mm]}}$$

$$V_f \text{ [mm/min]} = n \text{ [rpm]} \times f_z \text{ [mm]} \times Z$$

Feed per tooth				fz [mm]				
Ø D ₁ 0.10 - 0.30	Ø D ₁ 0.35 - 0.60	Ø D ₁ 0.65 - 1.00	Ø D ₁ 1.05 - 2.00	Ø D ₁ 2.10 - 3.00	Ø D ₁ 3.50 - 6.00	Ø D ₁ 6.50 - 10.00	Ø D ₁ 12.00 - 20.00	
0.0008 - 0.003	0.004 - 0.006	0.007 - 0.010	0.011 - 0.020	0.021 - 0.030	0.036 - 0.060	0.060 - 0.090	0.100 - 0.140	
0.0007 - 0.002	0.003 - 0.005	0.006 - 0.009	0.009 - 0.018	0.019 - 0.027	0.032 - 0.055	0.050 - 0.080	0.090 - 0.130	
0.0006 - 0.002	0.003 - 0.005	0.005 - 0.008	0.008 - 0.016	0.017 - 0.024	0.028 - 0.050	0.050 - 0.070	0.080 - 0.110	
0.0006 - 0.002	0.003 - 0.005	0.005 - 0.008	0.008 - 0.016	0.017 - 0.024	0.028 - 0.050	0.050 - 0.070	0.080 - 0.110	
0.0006 - 0.002	0.002 - 0.004	0.005 - 0.007	0.007 - 0.014	0.015 - 0.021	0.024 - 0.040	0.040 - 0.060	0.070 - 0.100	
0.0010 - 0.003	0.004 - 0.007	0.008 - 0.012	0.013 - 0.024	0.025 - 0.036	0.042 - 0.070	0.070 - 0.110	0.120 - 0.170	
0.0008 - 0.003	0.004 - 0.006	0.007 - 0.010	0.011 - 0.020	0.021 - 0.030	0.036 - 0.060	0.060 - 0.090	0.100 - 0.140	
0.0012 - 0.004	0.005 - 0.009	0.010 - 0.015	0.016 - 0.030	0.032 - 0.045	0.052 - 0.090	0.090 - 0.140	0.140 - 0.210	
0.0010 - 0.004	0.005 - 0.008	0.008 - 0.013	0.014 - 0.026	0.027 - 0.039	0.046 - 0.080	0.080 - 0.120	0.120 - 0.180	
0.0012 - 0.004	0.005 - 0.009	0.010 - 0.015	0.016 - 0.030	0.032 - 0.045	0.052 - 0.090	0.090 - 0.140	0.140 - 0.210	
0.0010 - 0.003	0.004 - 0.007	0.008 - 0.012	0.013 - 0.024	0.025 - 0.036	0.042 - 0.070	0.070 - 0.110	0.120 - 0.170	
0.0012 - 0.004	0.005 - 0.009	0.010 - 0.015	0.016 - 0.030	0.032 - 0.045	0.052 - 0.090	0.090 - 0.140	0.140 - 0.210	
0.0008 - 0.003	0.004 - 0.006	0.007 - 0.010	0.011 - 0.020	0.021 - 0.030	0.036 - 0.060	0.060 - 0.090	0.100 - 0.140	
0.0004 - 0.001	0.002 - 0.003	0.003 - 0.005	0.005 - 0.010	0.011 - 0.015	0.018 - 0.030	0.030 - 0.050	0.050 - 0.070	
0.0008 - 0.003	0.004 - 0.006	0.007 - 0.010	0.011 - 0.020	0.021 - 0.030	0.036 - 0.060	0.060 - 0.090	0.100 - 0.140	

SLOTING

		VDI 3323		CARBIDE Vc [m/min]	TiAIN Vc [m/min]	ae (mm)	ap (mm)
P	Unalloyed steel, leaded steel	1 - 5			70	1×ØD1	<0.50×ØD1
	Low alloyed steel < 800 N/mm2	6 - 9			55	1×ØD1	<0.30×ØD1
	High-alloy steel > 800 N/mm2, stainless steel ferr.- marten.	10 - 13			40	1×ØD1	<0.20×ØD1
M	Austenitic stainless steel < 700 N/mm2	14.1-14.2			55	1×ØD1	<0.20×ØD1
	Nickel-free stainless steel / DUPLEX > 700 N/mm2	14.3-14.4			40	1×ØD1	<0.15×ØD1
K	Grey cast iron < 250 HB	15 - 16		90	100	1×ØD1	<0.50×ØD1
	Ductile, malleable, nodular cast iron > 250 HB	17 - 20		60	70	1×ØD1	<0.35×ØD1
N	Wrought aluminium alloy < 12% Si	21 - 22		230		1×ØD1	<1.00×ØD1
	Cast aluminium alloy >12% Si	23 - 25		190		1×ØD1	<0.80×ØD1
	Copper alloy good machinability with Pb	26		110		1×ØD1	<1.00×ØD1
	Copper alloy with difficult machinability	27 - 28		100		1×ØD1	<0.50×ØD1
	Plastic, wood	29 - 30		150		1×ØD1	<0.70×ØD1
	Gold, silver	-		130		1×ØD1	<0.70×ØD1
S	Refractory alloy, Fe, Ni, Co base	31 - 35		10	15	1×ØD1	<1.00×ØD1
	Titanium, titanium alloy	36 - 37		50	50	1×ØD1	<0.25×ØD1

Feed per tooth				fz [mm]				
Ø D ₁ 0.10 - 0.30	Ø D ₁ 0.35 - 0.60	Ø D ₁ 0.65 - 1.00	Ø D ₁ 1.05 - 2.00	Ø D ₁ 2.10 - 3.00	Ø D ₁ 3.50 - 6.00	Ø D ₁ 6.50 - 10.00	Ø D ₁ 12.00 - 20.00	
0.0006 - 0.002	0.003 - 0.005	0.005 - 0.008	0.008 - 0.015	0.016 - 0.023	0.028 - 0.045	0.050 - 0.070	0.080 - 0.110	
0.0005 - 0.002	0.002 - 0.004	0.005 - 0.007	0.007 - 0.014	0.014 - 0.020	0.024 - 0.040	0.040 - 0.060	0.070 - 0.100	
0.0005 - 0.002	0.002 - 0.004	0.004 - 0.006	0.006 - 0.012	0.013 - 0.018	0.022 - 0.040	0.040 - 0.050	0.060 - 0.080	
0.0005 - 0.002	0.002 - 0.004	0.004 - 0.006	0.006 - 0.012	0.013 - 0.018	0.022 - 0.040	0.040 - 0.050	0.060 - 0.080	
0.0005 - 0.002	0.002 - 0.003	0.004 - 0.005	0.005 - 0.011	0.011 - 0.016	0.018 - 0.030	0.030 - 0.050	0.050 - 0.080	
0.0008 - 0.002	0.003 - 0.005	0.006 - 0.009	0.010 - 0.018	0.019 - 0.027	0.032 - 0.055	0.050 - 0.080	0.090 - 0.130	
0.0006 - 0.002	0.003 - 0.005	0.005 - 0.008	0.008 - 0.015	0.016 - 0.023	0.028 - 0.045	0.050 - 0.070	0.080 - 0.110	
0.0009 - 0.003	0.004 - 0.007	0.008 - 0.011	0.012 - 0.023	0.024 - 0.034	0.040 - 0.070	0.070 - 0.110	0.110 - 0.160	
0.0008 - 0.003	0.004 - 0.006	0.006 - 0.010	0.011 - 0.020	0.020 - 0.029	0.034 - 0.060	0.060 - 0.090	0.090 - 0.140	
0.0009 - 0.003	0.004 - 0.007	0.008 - 0.011	0.012 - 0.023	0.024 - 0.034	0.040 - 0.070	0.070 - 0.110	0.110 - 0.160	
0.0008 - 0.002	0.003 - 0.005	0.006 - 0.009	0.010 - 0.018	0.019 - 0.027	0.032 - 0.055	0.050 - 0.080	0.090 - 0.130	
0.0009 - 0.003	0.004 - 0.007	0.008 - 0.011	0.012 - 0.023	0.024 - 0.034	0.040 - 0.070	0.070 - 0.110	0.110 - 0.160	
0.0006 - 0.002	0.003 - 0.005	0.005 - 0.008	0.008 - 0.015	0.016 - 0.023	0.028 - 0.045	0.050 - 0.070	0.080 - 0.110	
0.0003 - 0.001	0.002 - 0.002	0.002 - 0.004	0.004 - 0.008	0.008 - 0.011	0.014 - 0.025	0.020 - 0.040	0.040 - 0.050	
0.0006 - 0.002	0.003 - 0.005	0.005 - 0.008	0.008 - 0.015	0.016 - 0.023	0.028 - 0.045	0.050 - 0.070	0.080 - 0.110	

Values based on cutting oil use. The cutting parameters are very strongly influenced by external parameters, such as tool and workpiece stability, etc.
The cutting conditions must be adapted to the operating conditions !