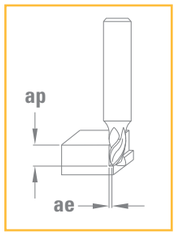
SCHNITTBEDINGUNGEN - UMFANGSBEARBEITUNG



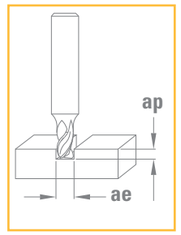
$$n\ [tr/min] = \frac{Vc\ [m/min] \times 1000}{\pi \times D_1\ [mm]}$$

$$Vf\ [mm/min] = n\ [tr/min] \times fz\ [mm] \times Z$$

	Zu bearbeitender Werkstoff		VHM Vc [m/min]		C-TOP Vc [m/min]		ap [mm]	ae [mm]	Vorschub pro Zahn fz [mm] Ø D_1 0.10 - 0.40	Ø D_1 0.40 - 1.00	Ø D_1 1.00 - 1.50	Ø D_1 1.50 - 3.00	Ø D_1 3.00 - 6.00	Ø D_1 6.00 - 12.00
P	Niedrig leg. / unleg. Stahl	< 600 N/mm²			**100**	200	<1.5 x ØD1	<0.40 x ØD1	**0.0013** - 0.0075	**0.005** - 0.019	**0.010** - 0.028	**0.014** - 0.053	**0.026** - 0.105	**0.049** - 0.195
P	Niedrig leg. / unleg. Stahl	600 – 1500 N/mm²			**80**	170	<1.5 x ØD1	<0.30 x ØD1	**0.0011** - 0.0056	**0.004** - 0.017	**0.009** - 0.025	**0.012** - 0.046	**0.023** - 0.092	**0.043** - 0.172
P	Bleilegierter Automatenstahl				**120**	200	<1.5 x ØD1	<0.40 x ØD1	**0.0015** - 0.0075	**0.006** - 0.023	**0.012** - 0.034	**0.017** - 0.063	**0.032** - 0.126	**0.059** - 0.234
P	Hochlegierter Stahl	700 – 1500 N/mm²			**70**	100	<1.5 x ØD1	<0.30 x ØD1	**0.0010** - 0.0070	**0.004** - 0.015	**0.008** - 0.023	**0.011** - 0.042	**0.021** - 0.084	**0.039** - 0.156
M	Rostfreier Stahl	400 – 700 N/mm²			**80**	110	<1.5 x ØD1	<0.30 x ØD1	**0.0010** - 0.0060	**0.004** - 0.015	**0.008** - 0.023	**0.011** - 0.042	**0.021** - 0.084	**0.039** - 0.156
M	DUPLEX rostfreier Stahl	> 800 N/mm²			**50**	80	<1.5 x ØD1	<0.30 x ØD1	**0.0008** - 0.0045	**0.003** - 0.011	**0.006** - 0.017	**0.008** - 0.032	**0.016** - 0.063	**0.029** - 0.117
K	Grauguss / Sphäroguss perlitisch	< 250 HB	**120**	150	**160**	200	<1.5 x ØD1	<0.40 x ØD1	**0.0015** - 0.0075	**0.006** - 0.023	**0.012** - 0.034	**0.017** - 0.063	**0.032** - 0.16	**0.059** - 0.234
K	Leg. Grauguss / Sphäroguss perlitisch	> 250 HB	**100**	130	**130**	170	<1.5 x ØD1	<0.30 x ØD1	**0.0011** - 0.0056	**0.004** - 0.017	**0.009** - 0.025	**0.012** - 0.046	**0.023** - 0.092	**0.043** - 0.172
K	Sphäroguss ferritisch / Temperguss		**80**	110	**110**	150	<1.5 x ØD1	<0.30 x ØD1	**0.0011** - 0.0056	**0.004** - 0.017	**0.009** - 0.025	**0.012** - 0.046	**0.023** - 0.092	**0.043** - 0.172
S	Sonderlegierungen / Warmfester rostfreier Stahl	Inconel Nimonic Hastelloy	**20**	45	**30**	60	<1.5 x ØD1	<0.15 x ØD1	**0.0005** - 0.0030	**0.002** - 0.008	**0.004** - 0.011	**0.006** - 0.021	**0.011** - 0.042	**0.020** - 0.078
S	Titan, Titanlegierung		**45**	75	**50**	80	<1.5 x ØD1	<0.30 x ØD1	**0.0013** - 0.0075	**0.005** - 0.019	**0.010** - 0.028	**0.014** - 0.053	**0.026** - 0.105	**0.049** - 0.195
N	Kupfer-Legierung / gut zerspanbar (Messing – Bronze)		**90**	130	**120**	200	<1.5 x ØD1	<0.40 x ØD1	**0.0020** - 0.0120	**0.008** - 0.030	**0.016** - 0.045	**0.023** - 0.084	**0.042** - 0.168	**0.078** - 0.312
N	Kupfer-Legierung / schwer zerspanbar / Aluminium-Bronze	(CuAlFe) (Ampco)	**70**	120	**80**	140	<1.5 x ØD1	<0.40 x ØD1	**0.0013** - 0.0075	**0.005** - 0.019	**0.010** - 0.028	**0.014** - 0.053	**0.026** - 0.105	**0.049** - 0.195
N	Gold, Silber		**140**	190	**150**	200	<1.5 x ØD1	<0.40 x ØD1	**0.0013** - 0.0075	**0.005** - 0.019	**0.010** - 0.028	**0.014** - 0.053	**0.026** - 0.105	**0.049** - 0.195

$D_1 \leq 0.1$ mm ⇒ (ap & ae) -95 %
$D_1 \leq 0.2$ mm ⇒ (ap & ae) -85 %
$D_1 \leq 0.3$ mm ⇒ (ap & ae) -70 %
$D_1 \leq 0.4$ mm ⇒ (ap & ae) -50 %
$D_1 \leq 0.5$ mm ⇒ (ap & ae) -25 %

SCHNITTBEDINGUNGEN - NUTBEARBEITUNG



$$n\ [tr/min] = \frac{Vc\ [m/min] \times 1000}{\pi \times D_1\ [mm]}$$

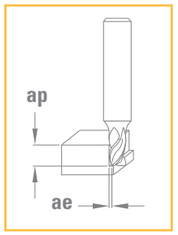
$$Vf\ [mm/min] = n\ [tr/min] \times fz\ [mm] \times Z$$

Vorschub pro Zahn **fz [mm]**

	Zu bearbeitender Werkstoff		VHM Vc [m/min]		C-TOP Vc [m/min]		ap [mm]	ae [mm]	Ø D_1 0.10 - 0.40	Ø D_1 0.40 - 1.00	Ø D_1 1.00 - 1.50	Ø D_1 1.50 - 3.00	Ø D_1 3.00 - 6.00	Ø D_1 6.00 - 12.00
P	Niedrig leg. / unleg. Stahl	< 600 N/mm²			**75**	150	<1.5 x ØD1	<1 x ØD1	**0.0006** - 0.0038	**0.0025** - 0.009	**0.005** - 0.014	**0.007** - 0.026	**0.013** - 0.053	**0.013** - 0.088
P	Niedrig leg. / unleg. Stahl	600 – 1500 N/mm²			**60**	130	<1.2 x ØD1	<1 x ØD1	**0.0006** - 0.0028	**0.0022** - 0.008	**0.004** - 0.012	**0.006** - 0.023	**0.012** - 0.046	**0.011** - 0.077
P	Bleilegierter Automatenstahl				**90**	150	<1.5 x ØD1	<1 x ØD1	**0.0008** - 0.0038	**0.0030** - 0.011	**0.006** - 0.017	**0.008** - 0.032	**0.016** - 0.063	**0.015** - 0.105
P	Hochlegierter Stahl	700 – 1500 N/mm²			**50**	75	<1 x ØD1	<1 x ØD1	**0.0005** - 0.0035	**0.0020** - 0.008	**0.004** - 0.011	**0.006** - 0.021	**0.011** - 0.042	**0.010** - 0.070
M	Rostfreier Stahl	400 – 700 N/mm²			**60**	80	<1 x ØD1	<1 x ØD1	**0.0005** - 0.0030	**0.0020** - 0.008	**0.004** - 0.011	**0.006** - 0.021	**0.011** - 0.042	**0.010** - 0.070
M	DUPLEX rostfreier Stahl	> 800 N/mm²			**40**	60	<0.8 x ØD1	<1 x ØD1	**0.0004** - 0.0023	**0.0015** - 0.006	**0.003** - 0.008	**0.004** - 0.016	**0.008** - 0.032	**0.008** - 0.053
K	Grauguss / Sphäroguss perlitisch	< 250 HB	**90**	160	**120**	200	<1.5 x ØD1	<1 x ØD1	**0.0008** - 0.0038	**0.0030** - 0.011	**0.006** - 0.017	**0.008** - 0.032	**0.016** - 0.063	**0.015** - 0.105
K	Leg. Grauguss / Sphäroguss perlitisch	> 250 HB	**75**	100	**90**	130	<1 x ØD1	<1 x ØD1	**0.0006** - 0.0028	**0.0022** - 0.008	**0.004** - 0.012	**0.006** - 0.023	**0.012** - 0.046	**0.011** - 0.077
K	Sphäroguss ferritisch / Temperguss		**60**	80	**80**	110	<1 x ØD1	<1 x ØD1	**0.0006** - 0.0028	**0.0022** - 0.008	**0.004** - 0.012	**0.006** - 0.023	**0.012** - 0.046	**0.011** - 0.077
S	Sonderlegierungen / Warmfester rostfreier Stahl	Inconel Nimonic Hastelloy	**20**	30	**25**	45	<0.2 x ØD1	<1 x ØD1	**0.0003** - 0.0015	**0.0010** - 0.004	**0.002** - 0.006	**0.003** - 0.011	**0.005** - 0.021	**0.005** - 0.035
S	Titan, Titanlegierung		**35**	60	**35**	60	<1 x ØD1	<1 x ØD1	**0.0006** - 0.0038	**0.0025** - 0.009	**0.005** - 0.014	**0.007** - 0.026	**0.013** - 0.053	**0.013** - 0.088
N	Kupfer-Legierung / gut zerspanbar (Messing – Bronze)		**75**	150	**100**	170	<1.5 x ØD1	<1 x ØD1	**0.0010** - 0.0060	**0.004** - 0.015	**0.008** - 0.023	**0.011** - 0.042	**0.021** - 0.084	**0.020** - 0.140
N	Kupfer-Legierung / schwer zerspanbar / Aluminium-Bronze	(CuAlFe) (Ampco)	**50**	100	**60**	110	<1 x ØD1	<1 x ØD1	**0.0006** - 0.0038	**0.0025** - 0.009	**0.005** - 0.014	**0.007** - 0.026	**0.013** - 0.053	**0.013** - 0.088
N	Gold, Silber		**100**	150	**110**	150	<1 x ØD1	<1 x ØD1	**0.0006** - 0.0038	**0.0025** - 0.009	**0.005** - 0.014	**0.007** - 0.026	**0.013** - 0.053	**0.013** - 0.088

$D_1 \leq 0.1$ mm ⇒ (ap & ae) -95 %
$D_1 \leq 0.2$ mm ⇒ (ap & ae) -85 %
$D_1 \leq 0.3$ mm ⇒ (ap & ae) -70 %
$D_1 \leq 0.4$ mm ⇒ (ap & ae) -50 %
$D_1 \leq 0.5$ mm ⇒ (ap & ae) -25 %

SCHNITTBEDINGUNGEN - UMFANGSBEARBEITUNG



$$n\ [tr/min] = \frac{Vc\ [m/min] \times 1000}{\pi \times D_1\ [mm]}$$

$$Vf\ [mm/min] = n\ [tr/min] \times fz\ [mm] \times Z$$

	Zu bearbeitender Werkstoff		VHM Vc [m/min]		C-TOP Vc [m/min]		ap [mm]	ae [mm]	Vorschub pro Zahn fz [mm] Ø D_1 0.30 - 1.00	Ø D_1 1.00 - 1.50	Ø D_1 1.50 - 3.00	Ø D_1 3.00 - 6.00	Ø D_1 6.00 - 12.00	Ø D_1 12.00 - 16.00
P	Niedrig leg. / unleg. Stahl	< 600 N/mm²		**100**	200		<2 x ØD1	<0.40 x ØD1	**0.0030** - 0.019	**0.010** - 0.028	**0.014** - 0.053	**0.026** - 0.105	**0.049** - 0.195	**0.090** - 0.260
P	Niedrig leg. / unleg. Stahl	600 – 1500 N/mm²		**80**	170		<2 x ØD1	<0.30 x ØD1	**0.0033** - 0.017	**0.009** - 0.025	**0.012** - 0.046	**0.023** - 0.092	**0.043** - 0.172	**0.079** - 0.229
P	Bleilegierter Automatenstahl			**120**	200		<2 x ØD1	<0.40 x ØD1	**0.0045** - 0.023	**0.012**- 0.034	**0.017** - 0.063	**0.032** - 0.126	**0.059** - 0.234	**0.108** - 0.312
P	Hochlegierter Stahl	700 – 1500 N/mm²		**70**	100		<2 x ØD1	<0.30 x ØD1	**0.0030** - 0.015	**0.008** - 0.023	**0.011** - 0.042	**0.021** - 0.084	**0.039** - 0.156	**0.072** - 0.208
M	Rostfreier Stahl	400 – 700 N/mm²		**80**	110		<2 x ØD1	<0.30 x ØD1	**0.0030** - 0.015	**0.008** - 0.023	**0.011** - 0.042	**0.021** - 0.084	**0.039** - 0.156	**0.072** - 0.208
M	DUPLEX rostfreier Stahl	> 800 N/mm²		**50**	80		<2 x ØD1	<0.30 x ØD1	**0.0023** - 0.011	**0.006** - 0.017	**0.008** - 0.032	**0.016** - 0.063	**0.030** - 0.117	**0.048** - 0.156
K	Grauguss / Sphäroguss perlitisch	< 250 HB	**120** 150	**160**	200		<2 x ØD1	<0.40 x ØD1	**0.0045** - 0.023	**0.012** - 0.034	**0.017** - 0.063	**0.032** - 0.126	**0.059** - 0.234	**0.108** - 0.312
K	Leg. Grauguss / Sphäroguss perlitisch	> 250 HB	**100** 130	**130**	170		<2 x ØD1	<0.30 x ØD1	**0.0033** - 0.017	**0.009** - 0.025	**0.012** - 0.046	**0.023** - 0.092	**0.043** - 0.172	**0.079** - 0.229
K	Sphäroguss ferritisch / Temperguss		**80** 110	**110**	150		<2 x ØD1	<0.30 x ØD1	**0.0033** - 0.017	**0.009** - 0.025	**0.012** - 0.046	**0.023** - 0.092	**0.043** - 0.172	**0.079** - 0.229
S	Sonderlegierungen / Warmfester rostfreier Stahl	Inconel Nimonic Hastelloy	**20** 45	**30**	60		<2 x ØD1	<0.15 x ØD1	**0.0015** - 0.008	**0.004** - 0.011	**0.006** - 0.021	**0.011** - 0.042	**0.020** - 0.078	**0.036** - 0.104
S	Titan, Titanlegierung		**45** 75	**50**	80		<2 x ØD1	<0.30 x ØD1	**0.0038** - 0.019	**0.010** - 0.028	**0.014** - 0.053	**0.026** - 0.105	**0.049** - 0.195	**0.090** - 0.260
N	Kupfer-Legierung / gut zerspanbar (Messing – Bronze)		**90** 130	**120**	200		<2 x ØD1	<0.40 x ØD1	**0.0060** - 0.030	**0.016** - 0.045	**0.023** - 0.084	**0.042** - 0.168	**0.078** - 0.312	**0.144** - 0.416
N	Kupfer-Legierung / schwer zerspanbar / Aluminium-Bronze	(CuAlFe) (Ampco)	**70** 120	**80**	140		<2 x ØD1	<0.40 x ØD1	**0.0038** - 0.019	**0.010** - 0.028	**0.014** - 0.053	**0.026** - 0.105	**0.049** - 0.195	**0.090** - 0.260
N	Gold, Silber		**140** 190	**150**	200		<2 x ØD1	<0.40 x ØD1	**0.0038** - 0.019	**0.010** - 0.028	**0.014** - 0.053	**0.026** - 0.105	**0.049** - 0.195	**0.090** - 0.260

$D_1 \leq 0.1$ mm ⇒ (ap & ae) -95 %
$D_1 \leq 0.2$ mm ⇒ (ap & ae) -85 %
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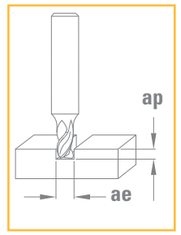
$D_1 \leq 0.4$ mm ⇒ (ap & ae) -50 %
$D_1 \leq 0.5$ mm ⇒ (ap & ae) -25 %

SCHNITTBEDINGUNGEN - NUTBEARBEITUNG



$$n\ [tr/min] = \frac{Vc\ [m/min] \times 1000}{\pi \times D_1\ [mm]}$$

$$Vf\ [mm/min] = n\ [tr/min] \times fz\ [mm] \times Z$$

	Zu bearbeitender Werkstoff		VHM Vc [m/min]		C-TOP Vc [m/min]		ap [mm]	ae [mm]	Vorschub pro Zahn fz [mm] Ø D_1 0.30 - 1.00	Ø D_1 1.00 - 1.50	Ø D_1 1.50 - 3.00	Ø D_1 3.00 - 6.00	Ø D_1 6.00 - 12.00	Ø D_1 12.00 - 16.00
P	Niedrig leg. / unleg. Stahl	< 600 N/mm²			**75**	150	<2 x ØD1	<1 x ØD1	**0.0012** - 0.008	**0.004** - 0.011	**0.006** - 0.021	**0.011** - 0.0426	**0.020** - 0.078	**0.036** - 0.104
P	Niedrig leg. / unleg. Stahl	600 – 1500 N/mm²			**60**	130	<1.5 x ØD1	<1 x ØD1	**0.0013** - 0.007	**0.004** - 0.010	**0.005** - 0.018	**0.009** - 0.037	**0.017** - 0.069	**0.032** - 0.092
P	Bleilegierter Automatenstahl				**90**	150	<2 x ØD1	<1 x ØD1	**0.0018** - 0.009	**0.005** - 0.014	**0.007** - 0.025	**0.013** - 0.050	**0.023** - 0.094	**0.043** - 0.125
P	Hochlegierter Stahl	700 – 1500 N/mm²			**50**	75	<1 x ØD1	<1 x ØD1	**0.0012** - 0.006	**0.003** - 0.009	**0.005** - 0.017	**0.008** - 0.034	**0.016** - 0.062	**0.029** - 0.083
M	Rostfreier Stahl	400 – 700 N/mm²			**60**	80	<1 x ØD1	<1 x ØD1	**0.0012** - 0.006	**0.003** - 0.009	**0.005** - 0.017	**0.008** - 0.034	**0.016** - 0.062	**0.029** - 0.083
M	DUPLEX rostfreier Stahl	> 800 N/mm²			**40**	60	<0.8 x ØD1	<1 x ØD1	**0.0009** - 0.005	**0.002** - 0.007	**0.003** - 0.013	**0.006** - 0.025	**0.012** - 0.47	**0.019** - 0.062
K	Grauguss / Sphäroguss perlitisch	< 250 HB	**90**	160	**120**	200	<2 x ØD1	<1 x ØD1	**0.0018** - 0.009	**0.005** - 0.014	**0.007** - 0.025	**0.013** - 0.050	**0.023** - 0.094	**0.043** - 0.125
K	Leg. Grauguss / Sphäroguss perlitisch	> 250 HB	**75**	100	**90**	130	<1 x ØD1	<1 x ØD1	**0.0013** - 0.007	**0.004** - 0.010	**0.005** - 0.018	**0.009** - 0.037	**0.017** - 0.69	**0.032** - 0.092
K	Sphäroguss ferritisch / Temperguss		**60**	80	**80**	110	<1 x ØD1	<1 x ØD1	**0.0013** - 0.007	**0.004** - 0.010	**0.005** - 0.018	**0.009** - 0.037	**0.017** - 0.69	**0.032** - 0.092
S	Sonderlegierungen / Warmfester rostfreier Stahl	Inconel Nimonic Hastelloy	**20**	30	**25**	45	<0.2 x ØD1	<1 x ØD1	**0.0006** - 0.003	**0.002** - 0.005	**0.002** - 0.008	**0.004** - 0.017	**0.008** - 0.031	**0.014** - 0.042
S	Titan, Titanlegierung		**35**	60	**35**	60	<1 x ØD1	<1 x ØD1	**0.0015** - 0.008	**0.004** - 0.011	**0.006** - 0.021	**0.011** - 0.042	**0.020** - 0.078	**0.036** - 0.104
N	Kupfer-Legierung / gut zerspanbar (Messing – Bronze)		**75**	150	**100**	170	<2 x ØD1	<1 x ØD1	**0.0024** - 0.012	**0.006** - 0.018	**0.009** - 0.034	**0.017** - 0.067	**0.031** - 0.125	**0.058** - 0.166
N	Kupfer-Legierung / schwer zerspanbar / Aluminium-Bronze	(CuAlFe) (Ampco)	**50**	100	**60**	110	<1.5 x ØD1	<1 x ØD1	**0.0015** - 0.008	**0.004** - 0.011	**0.006** - 0.021	**0.011** - 0.042	**0.020** - 0.078	**0.036** - 0.104
N	Gold, Silber		**100**	150	**110**	150	<1 x ØD1	<1 x ØD1	**0.0015** - 0.008	**0.004** - 0.011	**0.006** - 0.021	**0.011** - 0.042	**0.020** - 0.078	**0.036** - 0.104

$D_1 \leq 0.1$ mm ⇒ (ap & ae) -95 %
$D_1 \leq 0.2$ mm ⇒ (ap & ae) -85 %
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$D_1 \leq 0.4$ mm ⇒ (ap & ae) -50 %
$D_1 \leq 0.5$ mm ⇒ (ap & ae) -25 %