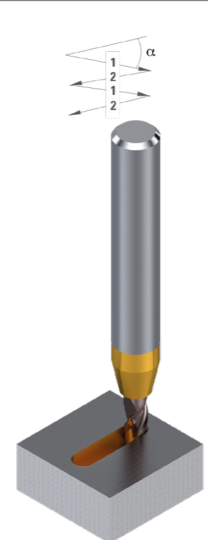


DISCESA IN RAMPA

	VDI 3323		Ø D ₁ 0.30 - 1.50		Ø D ₁ 1.60 - 4.50		Ø D ₁ 4.60 - 10.00	
			MDnudo Vc [m/min]	C-TOP Vc [m/min]	MDnudo Vc [m/min]	C-TOP Vc [m/min]	MDnudo Vc [m/min]	C-TOP Vc [m/min]
P	Acciaio non legato	1 - 5		25 - 50		50 - 125		100 - 190
	Acciaio leggermente legato < 800 N/mm ²	6 - 9		20 - 40		50 - 100		75 - 155
	Acciaio fortemente legato > 800 N/mm ² , acciaio inossidabile ferritico /martensitico	10 - 13		20 - 25		50 - 60		75 - 90
M	Acciaio inossidabile austenitico < 700 N/mm ²	14.1-14.2		20 - 40		50 - 100		85 - 155
	Acciaio inox austenitico senza Ni/DUPLEX >700 N/mm ²	14.3-14.4		15 - 30		40 - 80		65 - 120
K	Ghisa nodulare, ghisa malleabile > 250 HB	17 - 20	15 - 30	25 - 45	35 - 80	50 - 110	50 - 120	95 - 170
	Leghe Cu bronzo ottone con Pb	26	20 - 35	30 - 50	45 - 90	50 - 135	70 - 140	130 - 205
N	Lega di rame difficile da lavorare	27 - 28	15 - 30	30 - 50	35 - 80	50 - 125	50 - 120	110 - 190
	Oro, argento	-	15 - 35	30 - 50	40 - 95	50 - 145	65 - 145	135 - 220
S	Leghe speciali nickel cobalto	31 - 35		15 - 20		30 - 50		50 - 80
	Titanio e relative leghe	36 - 37	10 - 25	25 - 35	30 - 65	50 - 75	45 - 100	100 - 115

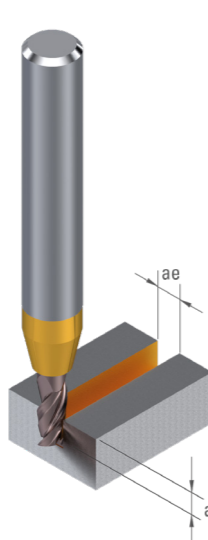
$$n \text{ [g/min]} = \frac{Vc \text{ [m/min]} \times 1000}{\pi \times D_1 \text{ [mm]}}$$

$$Vf \text{ [mm/min]} = n \text{ [g/min]} \times fz \text{ [mm]} \times Z$$

Avanzamento al dente fz [mm]

Ø D ₁ 0.30 - 0.50		Ø D ₁ 0.50 - 0.80		Ø D ₁ 0.80 - 1.60		Ø D ₁ 1.60 - 3.00		Ø D ₁ 3.00 - 5.00		Ø D ₁ *5.00 - 10.00	
fz	α (°)	fz	α (°)	fz	α (°)	fz	α (°)	fz	α (°)	fz	α (°)
0.0017-0.0034	<25°	0.003-0.005	<25°	0.005-0.011	<25°	0.009-0.021	<25°	0.017-0.034	<25°	0.025-0.048	<20°
0.0015-0.0030	<25°	0.003-0.005	<25°	0.004-0.010	<25°	0.008-0.018	<25°	0.015-0.030	<25°	0.023-0.044	<20°
0.0015-0.0030	<25°	0.002-0.005	<25°	0.004-0.009	<25°	0.008-0.017	<25°	0.015-0.030	<25°	0.021-0.040	<20°
0.0015-0.0030	<20°	0.002-0.005	<20°	0.004-0.009	<20°	0.008-0.017	<20°	0.015-0.030	<20°	0.021-0.040	<15°
0.0014-0.0028	<15°	0.002-0.004	<15°	0.004-0.009	<15°	0.007-0.016	<15°	0.014-0.028	<15°	0.020-0.038	<10°
0.0019-0.0038	<25°	0.003-0.006	<25°	0.005-0.012	<25°	0.010-0.023	<25°	0.019-0.038	<25°	0.028-0.052	<20°
0.0026-0.0052	<30°	0.004-0.008	<30°	0.007-0.016	<30°	0.014-0.031	<30°	0.026-0.052	<30°	0.038-0.072	<25°
0.0021-0.0042	<30°	0.003-0.007	<30°	0.005-0.013	<30°	0.011-0.025	<30°	0.021-0.042	<30°	0.030-0.058	<25°
0.0019-0.0038	<30°	0.003-0.006	<30°	0.005-0.012	<30°	0.010-0.023	<30°	0.019-0.038	<30°	0.028-0.052	<25°
0.0009-0.0018	<10°	0.001-0.003	<10°	0.002-0.005	<10°	0.005-0.010	<10°	0.009-0.018	<10°	0.013-0.024	<5°
0.0021-0.0042	<20°	0.003-0.007	<20°	0.005-0.013	<20°	0.011-0.025	<20°	0.021-0.042	<20°	0.030-0.058	<15°

SCALANATURA

	VDI 3323		Ø D ₁ 0.30 - 1.50		Ø D ₁ 1.60 - 4.50		Ø D ₁ 4.60 - 10.00	
			MDnudo Vc [m/min]	C-TOP Vc [m/min]	MDnudo Vc [m/min]	C-TOP Vc [m/min]	MDnudo Vc [m/min]	C-TOP Vc [m/min]
P	Acciaio non legato	1 - 5		25 - 50		50 - 150		100 - 240
	Acciaio leggermente legato < 800 N/mm ²	6 - 9		20 - 50		50 - 125		75 - 195
	Acciaio fortemente legato > 800 N/mm ² , acciaio inossidabile ferritico /martensitico	10 - 13		20 - 30		50 - 70		75 - 110
M	Acciaio inossidabile austenitico < 700 N/mm ²	14.1-14.2		20 - 50		50 - 125		85 - 195
	Acciaio inox austenitico senza Ni/DUPLEX >700 N/mm ²	14.3-14.4		15 - 40		40 - 100		65 - 155
K	Ghisa nodulare, ghisa malleabile > 250 HB	17 - 20	15 - 30	25 - 50	35 - 80	50 - 140	50 - 120	95 - 215
	Leghe Cu bronzo ottone con Pb	26	20 - 35	30 - 50	45 - 90	50 - 150	70 - 140	130 - 255
N	Lega di rame difficile da lavorare	27 - 28	15 - 35	30 - 50	35 - 80	50 - 150	50 - 120	110 - 240
	Oro, argento	-	15 - 30	30 - 50	40 - 95	50 - 150	65 - 145	135 - 270
S	Leghe speciali nickel cobalto	31 - 35		15 - 25		30 - 65		50 - 100
	Titanio e relative leghe	36 - 37	10 - 25	25 - 35	30 - 65	50 - 95	45 - 100	100 - 145

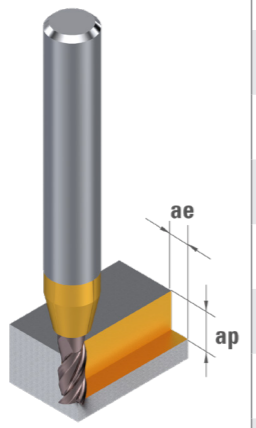
Avanzamento al dente fz [mm]

Ø D ₁ 0.30 - 0.50		Ø D ₁ 0.50 - 0.80		Ø D ₁ 0.80 - 1.60		Ø D ₁ 1.60 - 3.00		Ø D ₁ 3.00 - 5.00		Ø D ₁ *5.00 - 10.00	
fz	ap (mm)	fz	ap (mm)	fz	ap (mm)	fz	ap (mm)	fz	ap (mm)	fz	ap (mm)
0.0015 - 0.0030	< 0.50 × Ø	0.003 - 0.005	< 1.00 × Ø	0.004 - 0.010	< 2.00 × Ø	0.008 - 0.018	< 2.00 × Ø	0.015 - 0.030	< 0.50 × Ø	0.025 - 0.048	< 0.50 × Ø
0.0014 - 0.0028	< 0.50 × Ø	0.002 - 0.004	< 1.00 × Ø	0.004 - 0.009	< 2.00 × Ø	0.007 - 0.017	< 2.00 × Ø	0.014 - 0.028	< 0.50 × Ø	0.023 - 0.044	< 0.50 × Ø
0.0013 - 0.0026	< 0.50 × Ø	0.002 - 0.004	< 1.00 × Ø	0.003 - 0.008	< 2.00 × Ø	0.007 - 0.016	< 2.00 × Ø	0.013 - 0.026	< 0.50 × Ø	0.021 - 0.040	< 0.50 × Ø
0.0013 - 0.0026	< 0.50 × Ø	0.002 - 0.004	< 1.00 × Ø	0.003 - 0.008	< 2.00 × Ø	0.007 - 0.016	< 2.00 × Ø	0.013 - 0.026	< 0.50 × Ø	0.021 - 0.040	< 0.50 × Ø
0.0012 - 0.0024	< 0.50 × Ø	0.002 - 0.004	< 1.00 × Ø	0.003 - 0.008	< 1.50 × Ø	0.007 - 0.015	< 1.00 × Ø	0.012 - 0.024	< 0.50 × Ø	0.020 - 0.038	< 0.50 × Ø
0.0017 - 0.0034	< 0.50 × Ø	0.003 - 0.005	< 1.00 × Ø	0.004 - 0.011	< 2.00 × Ø	0.009 - 0.020	< 2.00 × Ø	0.017 - 0.034	< 0.50 × Ø	0.028 - 0.052	< 0.50 × Ø
0.0023 - 0.0046	< 0.50 × Ø	0.004 - 0.007	< 1.00 × Ø	0.006 - 0.015	< 2.00 × Ø	0.009 - 0.020	< 2.00 × Ø	0.017 - 0.034	< 0.50 × Ø	0.038 - 0.072	< 0.50 × Ø
0.0018 - 0.0036	< 0.50 × Ø	0.003 - 0.006	< 1.00 × Ø	0.005 - 0.012	< 2.00 × Ø	0.004 - 0.009	< 2.00 × Ø	0.008 - 0.016	< 0.50 × Ø	0.030 - 0.058	< 0.50 × Ø
0.0017 - 0.0034	< 0.25 × Ø	0.003 - 0.005	< 1.00 × Ø	0.004 - 0.011	< 2.00 × Ø	0.010 - 0.022	< 2.00 × Ø	0.018 - 0.036	< 0.50 × Ø	0.028 - 0.052	< 0.50 × Ø
0.0008 - 0.0016	< 0.25 × Ø	0.001 - 0.002	< 0.50 × Ø	0.002 - 0.005	< 1.00 × Ø	0.004 - 0.009	< 1.00 × Ø	0.008 - 0.016	< 0.50 × Ø	0.013 - 0.024	< 0.50 × Ø
0.0018 - 0.0036	< 0.50 × Ø	0.003 - 0.006	< 1.00 × Ø	0.005 - 0.012	< 2.00 × Ø	0.010 - 0.022	< 2.00 × Ø	0.018 - 0.036	< 0.50 × Ø	0.030 - 0.058	< 0.50 × Ø

*D1 > 5,00 mm --> Aumentare i parametri di taglio se il mandrino e il supporto del pezzo lo consentono.

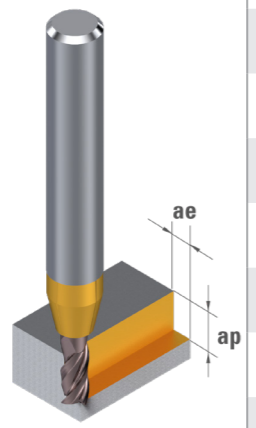
CONTORNATURA / SGROSSATURA

	VDI 3323	Ø D ₁ 0.30 - 1.50		Ø D ₁ 1.60 - 4.50		Ø D ₁ 4.60 - 10.00	
		MDnudo Vc [m/min]	C-TOP Vc [m/min]	MDnudo Vc [m/min]	C-TOP Vc [m/min]	MDnudo Vc [m/min]	C-TOP Vc [m/min]
P Acciaio non legato	1 - 5		30 - 50		50 - 150		120 - 180
P Acciaio leggermente legato < 800 N/mm ²	6 - 9		25 - 50		50 - 150		90 - 230
P Acciaio fortemente legato > 800 N/mm ² , acciaio inossidabile ferritico /martensitico	10 - 13		25 - 35		50 - 85		90 - 130
M Acciaio inossidabile austenitico < 700 N/mm ²	14.1-14.2		25 - 50		50 - 150		100 - 230
M Acciaio inox austenitico senza Ni/DUPLEX > 700 N/mm ²	14.3-14.4		20 - 45		50 - 115		75 - 180
K Ghisa nodulare, ghisa malleabile > 250 HB	17 - 20	15 - 35	30 - 50	40 - 90	50 - 150	60 - 140	110 - 250
N Leghe Cu bronzo ottone con Pb	26	20 - 40	30 - 50	50 - 105	50 - 150	80 - 165	150 - 300
N Lega di rame difficile da lavorare	27 - 28	15 - 35	30 - 50	40 - 90	50 - 150	60 - 140	130 - 280
N Oro, argento	-	20 - 45	30 - 50	50 - 110	50 - 150	75 - 170	160 - 320
S Leghe speciali nickel cobalto	31 - 35		15 - 30		40 - 80		60 - 120
S Titanio e relative leghe	36 - 37	15 - 30	30 - 45	35 - 80	50 - 110	55 - 120	120 - 170



CONTORNATURA / FINITURA

	VDI 3323	Ø D ₁ 0.30 - 1.50		Ø D ₁ 1.60 - 4.50		Ø D ₁ 4.60 - 10.00	
		MDnudo Vc [m/min]	C-TOP Vc [m/min]	MDnudo Vc [m/min]	C-TOP Vc [m/min]	MDnudo Vc [m/min]	C-TOP Vc [m/min]
P Acciaio non legato	1 - 5		30 - 50		50 - 150		150 - 350
P Acciaio leggermente legato < 800 N/mm ²	6 - 9		30 - 50		50 - 150		110 - 290
P Acciaio fortemente legato > 800 N/mm ² , acciaio inossidabile ferritico /martensitico	10 - 13		30 - 40		50 - 105		110 - 160
M Acciaio inossidabile austenitico < 700 N/mm ²	14.1-14.2		30 - 50		50 - 150		130 - 290
M Acciaio inox austenitico senza Ni/DUPLEX > 700 N/mm ²	14.3-14.4		25 - 50		50 - 150		90 - 230
K Ghisa nodulare, ghisa malleabile > 250 HB	17 - 20	20 - 45	30 - 50	50 - 150	50 - 150	80 - 180	140 - 310
N Leghe Cu bronzo ottone con Pb	26	25 - 50	30 - 50	50 - 150	50 - 150	100 - 210	190 - 380
N Lega di rame difficile da lavorare	27 - 28	20 - 45	30 - 50	50 - 150	50 - 150	80 - 180	160 - 350
N Oro, argento	-	25 - 50	30 - 50	50 - 150	50 - 150	90 - 210	200 - 400
S Leghe speciali nickel cobalto	31 - 35		20 - 40		50 - 135		80 - 150
S Titanio e relative leghe	36 - 37	20 - 40	30 - 50	45 - 150	50 - 110	70 - 150	150 - 210



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

$$Vf \text{ [mm/min]} = n \text{ [g/min]} \times fz \text{ [mm]} \times Z$$

Avanzamento al dente fz [mm]

Ø D ₁ 0.30 - 0.50		Ø D ₁ 0.50 - 0.80		Ø D ₁ 0.80 - 1.60		Ø D ₁ 1.60 - 3.00		Ø D ₁ 3.00 - 5.00		Ø D ₁ *5.00 - 10.00	
fz	ae ap (mm)	fz	ae ap (mm)	fz	ae ap (mm)	fz	ae ap (mm)	fz	ae ap (mm)	fz	ae ap (mm)
0.002 - 0.004	< 0.90 × Ø < 2.00 × Ø	0.003 - 0.006	< 0.90 × Ø < 2.00 × Ø	0.005 - 0.012	< 0.90 × Ø < 2.00 × Ø	0.010 - 0.022	< 0.90 × Ø < 2.00 × Ø	0.018 - 0.036	< 0.90 × Ø < 2.00 × Ø	0.025 - 0.060	< 0.30 × Ø < 2.00 × Ø
0.002 - 0.003	< 0.90 × Ø < 2.00 × Ø	0.003 - 0.005	< 0.90 × Ø < 2.00 × Ø	0.004 - 0.010	< 0.90 × Ø < 2.00 × Ø	0.009 - 0.019	< 0.90 × Ø < 2.00 × Ø	0.016 - 0.032	< 0.90 × Ø < 2.00 × Ø	0.023 - 0.054	< 0.25 × Ø < 2.00 × Ø
0.002 - 0.003	< 0.90 × Ø < 2.00 × Ø	0.003 - 0.005	< 0.90 × Ø < 2.00 × Ø	0.004 - 0.010	< 0.90 × Ø < 2.00 × Ø	0.008 - 0.018	< 0.90 × Ø < 2.00 × Ø	0.015 - 0.030	< 0.90 × Ø < 2.00 × Ø	0.021 - 0.052	< 0.25 × Ø < 2.00 × Ø
0.002 - 0.003	< 0.90 × Ø < 2.00 × Ø	0.003 - 0.005	< 0.90 × Ø < 2.00 × Ø	0.004 - 0.010	< 0.90 × Ø < 2.00 × Ø	0.008 - 0.018	< 0.90 × Ø < 2.00 × Ø	0.015 - 0.030	< 0.90 × Ø < 2.00 × Ø	0.021 - 0.052	< 0.25 × Ø < 2.00 × Ø
0.001 - 0.003	< 0.90 × Ø < 2.00 × Ø	0.002 - 0.005	< 0.90 × Ø < 2.00 × Ø	0.004 - 0.009	< 0.90 × Ø < 2.00 × Ø	0.008 - 0.017	< 0.90 × Ø < 2.00 × Ø	0.014 - 0.028	< 0.90 × Ø < 2.00 × Ø	0.020 - 0.048	< 0.20 × Ø < 2.00 × Ø
0.002 - 0.004	< 0.90 × Ø < 2.00 × Ø	0.003 - 0.006	< 0.90 × Ø < 2.00 × Ø	0.005 - 0.013	< 0.90 × Ø < 2.00 × Ø	0.011 - 0.024	< 0.90 × Ø < 2.00 × Ø	0.020 - 0.040	< 0.90 × Ø < 2.00 × Ø	0.028 - 0.066	< 0.30 × Ø < 2.00 × Ø
0.003 - 0.005	< 0.90 × Ø < 2.00 × Ø	0.005 - 0.009	< 0.90 × Ø < 2.00 × Ø	0.007 - 0.017	< 0.90 × Ø < 2.00 × Ø	0.014 - 0.032	< 0.90 × Ø < 2.00 × Ø	0.027 - 0.054	< 0.90 × Ø < 2.00 × Ø	0.038 - 0.090	< 0.30 × Ø < 2.00 × Ø
0.002 - 0.004	< 0.90 × Ø < 2.00 × Ø	0.004 - 0.007	< 0.90 × Ø < 2.00 × Ø	0.006 - 0.014	< 0.90 × Ø < 2.00 × Ø	0.012 - 0.026	< 0.90 × Ø < 2.00 × Ø	0.022 - 0.044	< 0.90 × Ø < 2.00 × Ø	0.030 - 0.072	< 0.30 × Ø < 2.00 × Ø
0.002 - 0.007	< 0.90 × Ø < 2.00 × Ø	0.003 - 0.006	< 0.90 × Ø < 2.00 × Ø	0.005 - 0.013	< 0.90 × Ø < 2.00 × Ø	0.011 - 0.024	< 0.90 × Ø < 2.00 × Ø	0.020 - 0.040	< 0.90 × Ø < 2.00 × Ø	0.028 - 0.066	< 0.30 × Ø < 2.00 × Ø
0.001 - 0.002	< 0.90 × Ø < 2.00 × Ø	0.002 - 0.003	< 0.90 × Ø < 2.00 × Ø	0.002 - 0.006	< 0.90 × Ø < 2.00 × Ø	0.005 - 0.011	< 0.90 × Ø < 2.00 × Ø	0.009 - 0.018	< 0.90 × Ø < 2.00 × Ø	0.013 - 0.030	< 0.15 × Ø < 2.00 × Ø
0.002 - 0.004	< 0.90 × Ø < 2.00 × Ø	0.004 - 0.007	< 0.90 × Ø < 2.00 × Ø	0.006 - 0.014	< 0.90 × Ø < 2.00 × Ø	0.012 - 0.026	< 0.90 × Ø < 2.00 × Ø	0.022 - 0.044	< 0.90 × Ø < 2.00 × Ø	0.030 - 0.072	< 0.30 × Ø < 2.00 × Ø

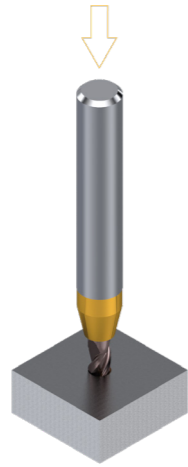
Avanzamento al dente fz [mm]

Ø D ₁ 0.30 - 0.50		Ø D ₁ 0.50 - 0.80		Ø D ₁ 0.80 - 1.60		Ø D ₁ 1.60 - 3.00		Ø D ₁ 3.00 - 5.00		Ø D ₁ *5.00 - 10.00	
fz	ae ap (mm)	fz	ae ap (mm)	fz	ae ap (mm)	fz	ae ap (mm)	fz	ae ap (mm)	fz	ae ap (mm)
0.002 - 0.004	< 0.20 × Ø < 2.00 × Ø	0.003 - 0.006	< 0.20 × Ø < 2.00 × Ø	0.005 - 0.012	< 0.20 × Ø < 2.00 × Ø	0.010 - 0.022	< 0.20 × Ø < 2.00 × Ø	0.018 - 0.036	< 0.20 × Ø < 2.00 × Ø	0.030 - 0.060	< 0.20 × Ø < 2.00 × Ø
0.002 - 0.003	< 0.15 × Ø < 2.00 × Ø	0.003 - 0.005	< 0.15 × Ø < 2.00 × Ø	0.004 - 0.010	< 0.15 × Ø < 2.00 × Ø	0.009 - 0.019	< 0.15 × Ø < 2.00 × Ø	0.016 - 0.032	< 0.15 × Ø < 2.00 × Ø	0.027 - 0.054	< 0.15 × Ø < 2.00 × Ø
0.002 - 0.003	< 0.15 × Ø < 2.00 × Ø	0.003 - 0.005	< 0.15 × Ø < 2.00 × Ø	0.004 - 0.010	< 0.15 × Ø < 2.00 × Ø	0.008 - 0.018	< 0.15 × Ø < 2.00 × Ø	0.015 - 0.030	< 0.15 × Ø < 2.00 × Ø	0.026 - 0.052	< 0.15 × Ø < 2.00 × Ø
0.002 - 0.003	< 0.15 × Ø < 2.00 × Ø	0.003 - 0.005	< 0.15 × Ø < 2.00 × Ø	0.004 - 0.010	< 0.15 × Ø < 2.00 × Ø	0.008 - 0.018	< 0.15 × Ø < 2.00 × Ø	0.015 - 0.030	< 0.15 × Ø < 2.00 × Ø	0.026 - 0.052	< 0.15 × Ø < 2.00 × Ø
0.001 - 0.003	< 0.10 × Ø < 2.00 × Ø	0.002 - 0.005	< 0.10 × Ø < 2.00 × Ø	0.004 - 0.009	< 0.10 × Ø < 2.00 × Ø	0.008 - 0.017	< 0.10 × Ø < 2.00 × Ø	0.014 - 0.028	< 0.10 × Ø < 2.00 × Ø	0.024 - 0.048	< 0.10 × Ø < 2.00 × Ø
0.002 - 0.004	< 0.20 × Ø < 2.00 × Ø	0.003 - 0.006	< 0.20 × Ø < 2.00 × Ø	0.005 - 0.013	< 0.20 × Ø < 2.00 × Ø	0.011 - 0.024	< 0.20 × Ø < 2.00 × Ø	0.020 - 0.040	< 0.20 × Ø < 2.00 × Ø	0.033 - 0.066	< 0.20 × Ø < 2.00 × Ø
0.003 - 0.005	< 0.20 × Ø < 2.00 × Ø	0.005 - 0.009	< 0.20 × Ø < 2.00 × Ø	0.007 - 0.017	< 0.20 × Ø < 2.00 × Ø	0.014 - 0.032	< 0.20 × Ø < 2.00 × Ø	0.027 - 0.054	< 0.20 × Ø < 2.00 × Ø	0.045 - 0.090	< 0.20 × Ø < 2.00 × Ø
0.002 - 0.004	< 0.20 × Ø < 2.00 × Ø	0.004 - 0.007	< 0.20 × Ø < 2.00 × Ø	0.006 - 0.014	< 0.20 × Ø < 2.00 × Ø	0.012 - 0.026	< 0.20 × Ø < 2.00 × Ø	0.022 - 0.044	< 0.20 × Ø < 2.00 × Ø	0.036 - 0.072	< 0.20 × Ø < 2.00 × Ø
0.002 - 0.004	< 0.20 × Ø < 2.00 × Ø	0.003 - 0.006	< 0.20 × Ø < 2.00 × Ø	0.005 - 0.013	< 0.20 × Ø < 2.00 × Ø	0.011 - 0.024	< 0.20 × Ø < 2.00 × Ø	0.020 - 0.040	< 0.20 × Ø < 2.00 × Ø	0.033 - 0.066	< 0.20 × Ø < 2.00 × Ø
0.001 - 0.002	< 0.08 × Ø < 2.00 × Ø	0.002 - 0.003	< 0.08 × Ø < 2.00 × Ø	0.002 - 0.006	< 0.08 × Ø < 2.00 × Ø	0.005 - 0.011	< 0.08 × Ø < 2.00 × Ø	0.009 - 0.018	< 0.08 × Ø < 2.00 × Ø	0.015 - 0.030	< 0.08 × Ø < 2.00 × Ø
0.002 - 0.004	< 0.20 × Ø < 2.00 × Ø	0.004 - 0.007	< 0.20 × Ø < 2.00 × Ø	0.006 - 0.014	< 0.20 × Ø < 2.00 × Ø	0.012 - 0.026	< 0.20 × Ø < 2.00 × Ø	0.022 - 0.044	< 0.20 × Ø < 2.00 × Ø	0.036 - 0.072	< 0.20 × Ø < 2.00 × Ø

*D1 > 5,00 mm --> Aumentare i parametri di taglio se il mandrino e il supporto del pezzo lo consentono.

FORO

	VDI 3323	Ø D ₁ 0.30 - 1.50		Ø D ₁ 1.60 - 4.50		Ø D ₁ 4.60 - 10.00	
		MDnudo Vc [m/min]	C-TOP Vc [m/min]	MDnudo Vc [m/min]	C-TOP Vc [m/min]	MDnudo Vc [m/min]	C-TOP Vc [m/min]
		P	Acciaio non legato	1 - 5	25 - 50	50 - 125	100 - 190
	Acciaio leggermente legato < 800 N/mm ²	6 - 9	20 - 40	50 - 100	75 - 155		
	Acciaio fortemente legato > 800 N/mm ² , acciaio inossidabile ferritico /martensitico	10 - 13	20 - 25	50 - 60	75 - 90		
M	Acciaio inossidabile austenitico < 700 N/mm ²	14.1-14.2	20 - 40	50 - 100	85 - 155		
	Acciaio inox austenitico senza Ni/DUPLEX >700 N/mm ²	14.3-14.4	15 - 30	40 - 80	65 - 120		
K	Ghisa nodulare, ghisa malleabile > 250 HB	17 - 20	15 - 30	25 - 45	35 - 80	50 - 110	50 - 120
	Leghe Cu bronzo ottone con Pb	26	20 - 35	30 - 50	45 - 90	50 - 135	70 - 140
N	Lega di rame difficile da lavorare	27 - 28	15 - 30	30 - 50	35 - 80	50 - 125	50 - 120
	Oro, argento	-	15 - 35	30 - 50	40 - 95	50 - 145	65 - 145
S	Leghe speciali nickel cobalto	31 - 35		15 - 20		30 - 50	
	Titanio e relative leghe	36 - 37	10 - 25	25 - 30	30 - 65	50 - 75	45 - 100



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

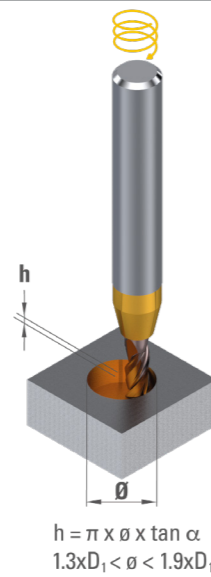
$$Vf \text{ [mm/min]} = n \text{ [g/min]} \times fz \text{ [mm]} \times Z$$

Avanzamento al dente fz [mm]

Ø D ₁ 0.30 - 0.50		Ø D ₁ 0.50 - 0.80		Ø D ₁ 0.80 - 1.60		Ø D ₁ 1.60 - 3.00		Ø D ₁ 3.00 - 5.00		Ø D ₁ *5.00 - 10.00	
fz	ap (mm)	fz	ap (mm)	fz	ap (mm)	fz	ap (mm)	fz	ap (mm)	fz	ap (mm)
0.0008 - 0.0016	<0.75×Ø	0.0014 - 0.0026	<1.00×Ø	0.0022 - 0.0052	<1.25×Ø	0.0035 - 0.008	<1.25×Ø	0.006 - 0.012	<1.25×Ø	0.007 - 0.016	<1.25×Ø
0.0008 - 0.0016	<0.50×Ø	0.0012 - 0.0024	<0.75×Ø	0.0020 - 0.0048	<1.00×Ø	0.0035 - 0.008	<1.00×Ø	0.005 - 0.010	<1.00×Ø	0.005 - 0.014	<1.00×Ø
0.0007 - 0.0014	<0.50×Ø	0.0012 - 0.0022	<0.75×Ø	0.0018 - 0.0044	<1.00×Ø	0.0030 - 0.007	<1.00×Ø	0.005 - 0.010	<1.00×Ø	0.004 - 0.010	<1.00×Ø
0.0005 - 0.0010	<0.25×Ø	0.0008 - 0.0016	<0.50×Ø	0.0014 - 0.0032	<0.75×Ø	0.0025 - 0.005	<0.75×Ø	0.004 - 0.008	<0.75×Ø	0.004 - 0.010	<0.75×Ø
0.0005 - 0.0010	<0.25×Ø	0.0008 - 0.0016	<0.50×Ø	0.0014 - 0.0032	<0.75×Ø	0.0025 - 0.005	<0.75×Ø	0.004 - 0.008	<0.75×Ø	0.004 - 0.010	<0.75×Ø
0.0007 - 0.0014	<0.75×Ø	0.0012 - 0.0022	<1.00×Ø	0.0018 - 0.0044	<1.25×Ø	0.0030 - 0.007	<1.25×Ø	0.005 - 0.010	<1.25×Ø	0.006 - 0.014	<1.25×Ø
0.0009 - 0.0018	<1×Ø	0.0016 - 0.0030	<1.25×Ø	0.0026 - 0.0060	<1.5×Ø	0.0045 - 0.010	<1.5×Ø	0.007 - 0.014	<1.5×Ø	0.008 - 0.018	<1.5×Ø
0.0008 - 0.0016	<0.75×Ø	0.0012 - 0.0024	<1×Ø	0.0020 - 0.0048	<1.25×Ø	0.0035 - 0.008	<1.25×Ø	0.005 - 0.010	<1.25×Ø	0.006 - 0.014	<1.25×Ø
0.0007 - 0.0014	<0.75×Ø	0.0012 - 0.0022	<1×Ø	0.0018 - 0.0044	<1.25×Ø	0.0030 - 0.007	<1.25×Ø	0.005 - 0.010	<1.25×Ø	0.006 - 0.014	<1.25×Ø
0.0003 - 0.006	<0×ØD1	0.0006 - 0.0010	<0.25×Ø	0.0008 - 0.0020	<0.5×Ø	0.0015 - 0.003	<0.5×Ø	0.002 - 0.004	<0.5×Ø	0.003 - 0.006	<0.5×Ø
0.0006 - 0.0012	<0.5×Ø	0.0001 - 0.0020	<0.75×Ø	0.0016 - 0.0040	<1×Ø	0.0030 - 0.006	<1×Ø	0.005 - 0.010	<1×Ø	0.005 - 0.012	<1×Ø

INTERPOLAZIONE ELICOIDALE

	VDI 3323	Ø D ₁ 0.30 - 1.50		Ø D ₁ 1.60 - 4.50		Ø D ₁ 4.60 - 10.00	
		MDnudo Vc [m/min]	C-TOP Vc [m/min]	MDnudo Vc [m/min]	C-TOP Vc [m/min]	MDnudo Vc [m/min]	C-TOP Vc [m/min]
		P	Acciaio non legato	1 - 5	25 - 50	50 - 125	100 - 190
	Acciaio leggermente legato < 800 N/mm ²	6 - 9	20 - 40	50 - 100	75 - 155		
	Acciaio fortemente legato > 800 N/mm ² , acciaio inossidabile ferritico /martensitico	10 - 13	20 - 25	50 - 60	75 - 90		
M	Acciaio inossidabile austenitico < 700 N/mm ²	14.1-14.2	20 - 40	50 - 100	85 - 155		
	Acciaio inox austenitico senza Ni/DUPLEX >700 N/mm ²	14.3-14.4	15 - 30	40 - 80	65 - 120		
K	Ghisa nodulare, ghisa malleabile > 250 HB	17 - 20	15 - 30	25 - 45	35 - 80	50 - 110	50 - 120
	Leghe Cu bronzo ottone con Pb	26	20 - 35	30 - 50	45 - 90	50 - 135	70 - 140
N	Lega di rame difficile da lavorare	27 - 28	15 - 30	30 - 50	35 - 80	50 - 125	50 - 120
	Oro, argento	-	15 - 35	30 - 50	40 - 95	50 - 145	65 - 145
S	Leghe speciali nickel cobalto	31 - 35		15 - 20		30 - 50	
	Titanio e relative leghe	36 - 37	10 - 25	25 - 35	30 - 65	50 - 75	45 - 100



Avanzamento al dente fz [mm]

Ø D ₁ 0.30 - 0.50		Ø D ₁ 0.50 - 0.80		Ø D ₁ 0.80 - 1.60		Ø D ₁ 1.60 - 3.00		Ø D ₁ 3.00 - 5.00		Ø D ₁ *5.00 - 10.00	
fz	α (°)	fz	α (°)	fz	α (°)	fz	α (°)	fz	α (°)	fz	α (°)
0.0017 - 0.0034	<20°	0.003 - 0.005	<25°	0.005 - 0.011	<25°	0.009 - 0.021	<25°	0.017 - 0.034	<25°	0.025 - 0.048	<20°
0.0015 - 0.0030	<20°	0.003 - 0.005	<25°	0.004 - 0.010	<25°	0.008 - 0.018	<25°	0.015 - 0.030	<25°	0.023 - 0.044	<20°
0.0015 - 0.0030	<20°	0.002 - 0.005	<25°	0.004 - 0.009	<25°	0.008 - 0.017	<25°	0.015 - 0.030	<25°	0.021 - 0.040	<20°
0.0015 - 0.0030	<15°	0.002 - 0.005	<20°	0.004 - 0.009	<20°	0.008 - 0.017	<20°	0.015 - 0.030	<20°	0.021 - 0.040	<15°
0.0014 - 0.0028	<10°	0.002 - 0.004	<15°	0.004 - 0.009	<15°	0.007 - 0.016	<15°	0.014 - 0.028	<15°	0.020 - 0.038	<10°
0.0022 - 0.0044	<20°	0.003 - 0.006	<25°	0.005 - 0.012	<25°	0.010 - 0.023	<25°	0.019 - 0.038	<25°	0.028 - 0.052	<20°
0.0026 - 0.0052	<25°	0.004 - 0.008	<30°	0.007 - 0.016	<30°	0.014 - 0.031	<30°	0.026 - 0.052	<30°	0.038 - 0.072	<25°
0.0021 - 0.0042	<25°	0.003 - 0.007	<30°	0.005 - 0.013	<30°	0.011 - 0.025	<30°	0.021 - 0.042	<30°	0.030 - 0.058	<25°
0.0019 - 0.0038	<25°	0.003 - 0.006	<30°	0.005 - 0.012	<30°	0.010 - 0.023	<30°	0.019 - 0.038	<30°	0.028 - 0.052	<25°
0.0009 - 0.0018	<5°	0.001 - 0.003	<10°	0.002 - 0.005	<10°	0.005 - 0.010	<10°	0.009 - 0.018	<10°	0.013 - 0.024	<5°
0.0021 - 0.0042	<15°	0.003 - 0.007	<20°	0.005 - 0.013	<20°	0.011 - 0.025	<20°	0.021 - 0.042	<20°	0.030 - 0.058	<15°

*D1 > 5,00 mm --> Aumentare i parametri di taglio se il mandrino e il supporto del pezzo lo consentono.