

formula for calculating speed (spindle)

$$n = \frac{V_c \times 1000}{D_c \times \pi}$$

$$14968 \text{ [rpm]} = \frac{940 \text{ [m/min]} \times 1000}{20,0 \text{ [mm]} \times 3,14}$$

formula for calculating axis feed rate

$$V_f = n \times f_z \times z_n$$

$$15300 \text{ [mm/min]} = 15000 \text{ [rpm]} \times 0,510 \text{ [mm]} \times 2 \text{ [number]}$$

validated cutting data for roughing

Type	D _c [mm]	z _n [number]	V _c [m/min]	f _z [mm]	n [rpm]	V _f [mm/min]	a _e [mm]	a _p [mm]	L ₁ [mm]	L ₂ [mm]
torus	20,0	2	940	0,510	14.968	15.268	10,00	20,00	86,0	20,0
torus	12,0	2	560	0,455	14.862	13.524	6,00	12,00	55,0	16,0
torus	6,0	2	280	0,440	14.862	13.079	3,00	6,00	23,0	8,0

validated cutting data for finishing

Type	D _c [mm]	z _n [number]	V _c [m/min]	f _z [mm]	n [rpm]	V _f [mm/min]	a _e [mm]	a _p [mm]	L ₁ [mm]	L ₂ [mm]
ball	20,0	2	940	0,650	14.968	19.459	0,20	2,00	67,0	17,0
ball	12,0	2	560	0,620	14.862	18.429	0,12	1,20	52,0	10,5
ball	6,0	2	280	0,610	14.862	18.132	0,06	0,60	23,0	10,0

recommended cutting data for roughing

parameter	symbol	unit
radial infeed:	a _e	[mm]
axial infeed:	a _p	[mm]
number of teeth:	Z _n	[number]

roughing recommendation		
min.	ideal	max.
- x D _c	0,50 x D_c	0,80 x D _c
0,10 x D _c	1,00 x D_c	2,00 x D _c
1	2	4

parameter	symbol	unit
cutting speed:	V _c	[m/min]
feed/tooth:	f _z	[mm]

user specifications
selection in the diagram
selection in the diagram

speed (spindle):	n	[rpm]
axis feed rate:	V _f	[mm/min]

calculation by user
calculation by user

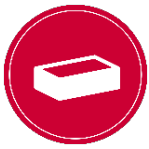
recommended cutting data for finishing

parameter	symbol	unit
radial infeed:	a _e	[mm]
axial infeed:	a _p	[mm]
number of teeth:	Z _n	[number]

finishing recommendation		
min.	ideal	max.
- x D _c	0,01 x D_c	0,10 x D _c
0,01 x D _c	0,10 x D_c	0,50 x D _c
1	2	4

cutting diameter:	D _c	[mm]
tool total length:	L ₀	[mm]
tool unclamping length:	L ₁	[mm]
tool cutting length:	L ₂	[mm]

processing specific
processing specific
processing specific
processing specific

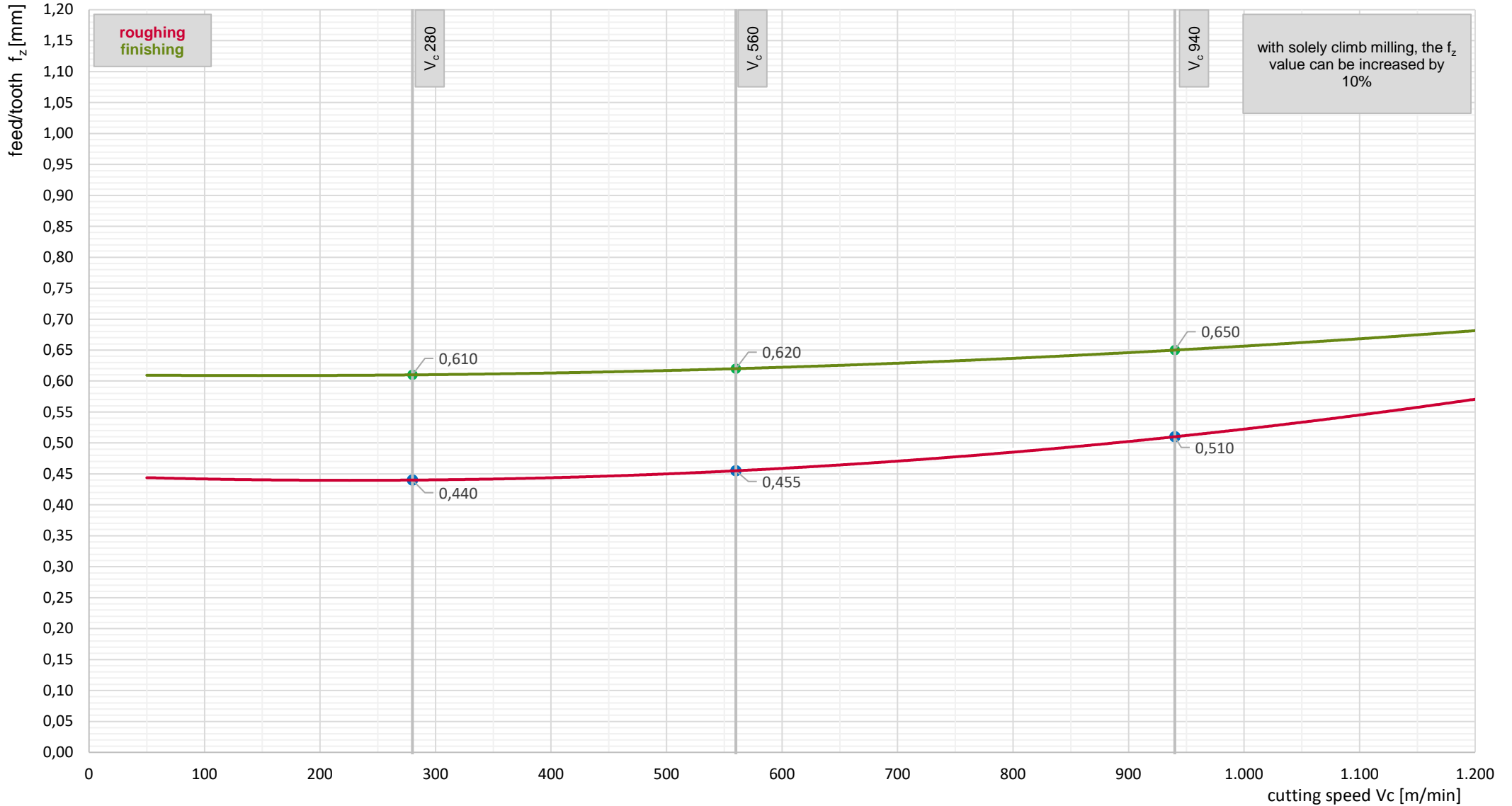


Cutting data diagram for milling

RAKU[®] TOOL MB-0670



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RAMPF Advanced Polymers GmbH & Co. KG

Robert-Bosch-Str. 8 -10 | 72661 Grafenberg | Germany
T +49.7123.9342-0
E advanced.polymers@rampf-group.com

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Practical application of the cutting data

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cutting data used on the demonstrator

sequence of processing	processing strategy	a _e	a _p	offset	f _z	V _c
roughing torus D6	vol. roughing following contour	3,00	6,00	0,60	0,44	280
roughing torus D12	vol. roughing following contour	6,00	12,00	0,12	0,46	560
roughing torus D20	vol. roughing following contour	10,00	20,00	2,00	0,51	940
finishing ball D6	zigzag stroke milling	0,06	0,60	0,00	0,61	280
finishing ball D12	zigzag stroke milling	0,12	1,20	0,00	0,62	560
finishing ball D20	zigzag stroke milling	0,20	2,00	0,00	0,65	940

tools used on the demonstrator

tool manufacturer	tool type	D _c	L ₀	L ₁	L ₂	Z _n
hufschmied-tools.com/de/	PROTO-LINE / Torus	6,0	60,0	23,0	8,0	2
hufschmied-tools.com/de/	PROTO-LINE / Torus	12,0	100,0	55,0	16,0	2
hufschmied-tools.com/de/	PROTO-LINE / Torus	20,0	104,0	86,0	20,0	2
hufschmied-tools.com/de/	PROTO-LINE / Kugel	6,0	60,0	23,0	10,0	2
hufschmied-tools.com/de/	PROTO-LINE / Kugel	12,0	83,0	52,0	10,5	2
hufschmied-tools.com/de/	PROTO-LINE / Kugel	20,0	104,0	67,0	17,0	2



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