



# Cutting data for milling

## RAKU<sup>®</sup> TOOL WB-1600



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### 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

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

$$11400 \text{ [mm/min]} = 15000 \text{ [rpm]} \times 0,380 \text{ [mm]} \times 2 \text{ [number]}$$

### 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 $D_c$	<b>0,50 x <math>D_c</math></b>	0,50 x $D_c$
0,10 x $D_c$	<b>1,00 x <math>D_c</math></b>	1,00 x $D_c$
2	<b>2</b>	4

### 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 $D_c$	<b>0,01 x <math>D_c</math></b>	0,05 x $D_c$
0,01 x $D_c$	<b>0,10 x <math>D_c</math></b>	0,20 x $D_c$
2	<b>2</b>	4

### 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	0,380	14.968	11.376	10,00	20,00	86,0	20,0
torus	12,0	2	560	0,360	14.862	10.701	6,00	12,00	55,0	16,0
torus	6,0	2	280	0,330	14.862	9.809	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	0,600	14.968	17.962	0,20	2,00	67,0	17,0
ball	12,0	2	560	0,580	14.862	17.240	0,12	1,20	52,0	10,5
ball	6,0	2	280	0,580	14.862	17.240	0,06	0,60	23,0	10,0

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	

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	

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Our recommendations on the use of the material are based on many years of experience and current scientific and practical knowledge. They are, however, provided without any obligation on our part and do not relieve the buyer of the need for suitability tests. They do not constitute a legal relationship, nor are any protected third party rights what's ever affected thereby.

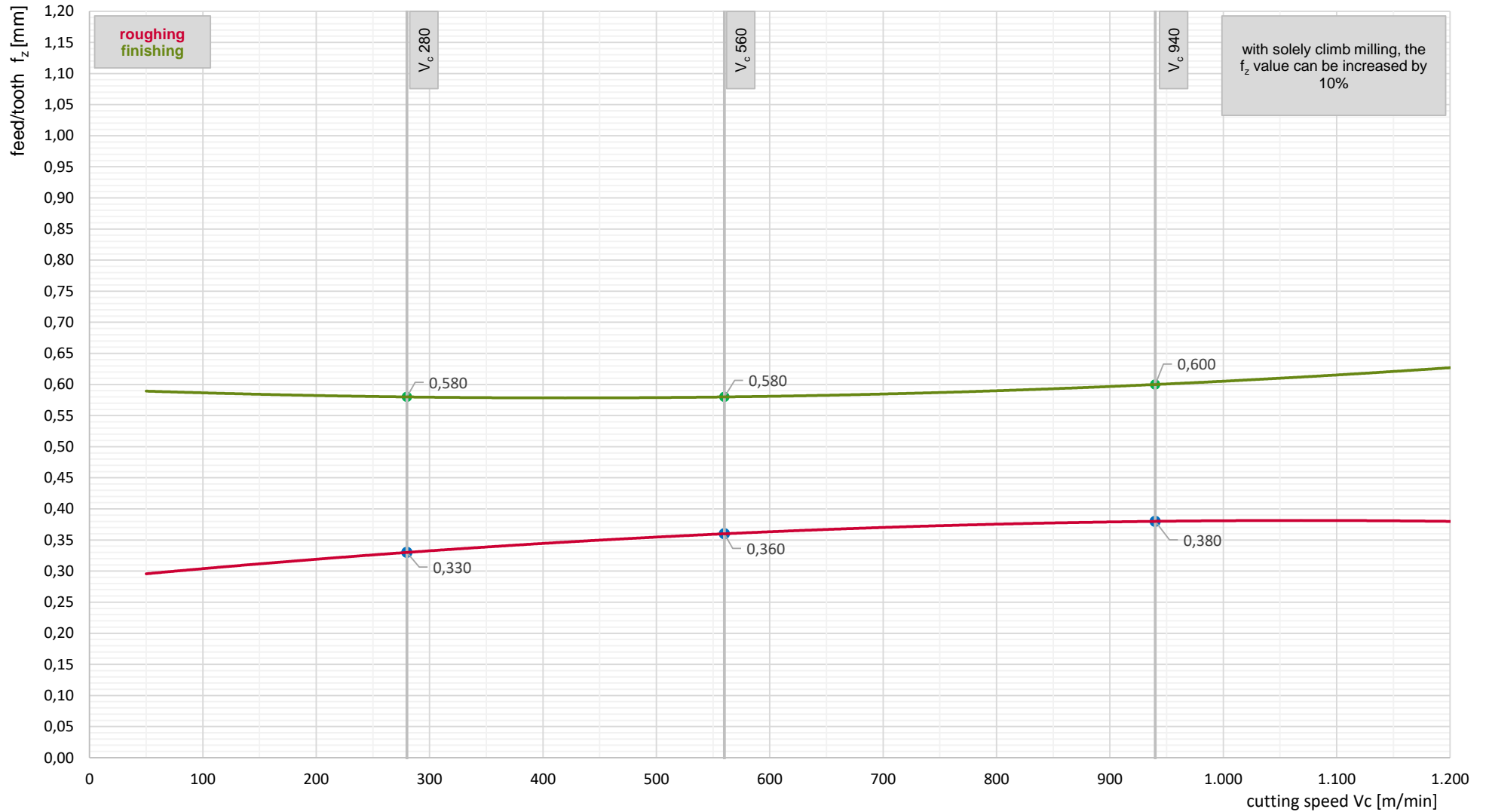
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# Cutting data diagram for milling RAKU<sup>®</sup> TOOL WB-1600



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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	0,33	280
roughing torus D12	vol. roughing following contour	6,00	12,00	0,12	0,36	560
roughing torus D20	vol. roughing following contour	10,00	20,00	2,00	0,38	940
finishing ball D6	zigzag stroke milling	0,06	0,60	0,00	0,58	280
finishing ball D12	zigzag stroke milling	0,12	1,20	0,00	0,58	560
finishing ball D20	zigzag stroke milling	0,20	2,00	0,00	0,60	940

### tools used on the demonstrator

tool manufacturer	tool type	$D_c$	$L_0$	$L_1$	$L_2$	$Z_n$
<a href="http://hufschmied-tools.com/de/">hufschmied-tools.com/de/</a>	PROTO-LINE / Torus	6,0	60,0	23,0	8,0	2
<a href="http://hufschmied-tools.com/de/">hufschmied-tools.com/de/</a>	PROTO-LINE / Torus	12,0	100,0	55,0	16,0	2
<a href="http://hufschmied-tools.com/de/">hufschmied-tools.com/de/</a>	PROTO-LINE / Torus	20,0	104,0	86,0	20,0	2
<a href="http://hufschmied-tools.com/de/">hufschmied-tools.com/de/</a>	PROTO-LINE / Kugel	6,0	60,0	23,0	10,0	2
<a href="http://hufschmied-tools.com/de/">hufschmied-tools.com/de/</a>	PROTO-LINE / Kugel	12,0	83,0	52,0	10,5	2
<a href="http://hufschmied-tools.com/de/">hufschmied-tools.com/de/</a>	PROTO-LINE / Kugel	20,0	104,0	67,0	17,0	2



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