Cutting data for milling
RAKU® TOOL SB-0240

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formula for calculating speed (spindle)

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

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

formula for calculating axis feed rate

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

28500 [mm/min] = 15000 [rpm] x 0,950 [mm] x 2 [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	685	0,950	10.908	20.725	10,00	20,00	86,0	20,0
torus	12,0	2	425	0,925	11.279	20.867	6,00	12,00	55,0	16,0
torus	6,0	2	218	0,900	11.571	20.828	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	650	1,000	10.350	20.701	2,00	10,00	67,0	17,0
ball	12,0	2	390	1,000	10.350	20.701	1,20	6,00	52,0	10,5
ball	6,0	2	195	1,000	10.350	20.701	0,60	3,00	23,0	10,0

recommended cutting data for roughing

parameter	symbol	unit	roughing recommendation min.	roughing recommendation ideal	roughing recommendation max.
radial infeed:	a_e	[mm]	- x D_c	**0,50 x D_c**	0,80 x D_c
axial infeed:	a_p	[mm]	0,10 x D_c	**1,00 x D_c**	5,00 x D_c
number of teeth:	z_n	[number]	1	**1**	2

recommended cutting data for finishing

parameter	symbol	unit	finishing recommendation min.	finishing recommendation ideal	finishing recommendation max.
radial infeed:	a_e	[mm]	- x D_c	**0,10 x D_c**	0,80 x D_c
axial infeed:	a_p	[mm]	- x D_c	**0,50 x D_c**	1,00 x D_c
number of teeth:	z_n	[number]	1	**1**	2

parameter	symbol	unit	user specifications
cutting speed:	V_c	[m/min]	selection in the diagram
feed/tooth:	f_z	[mm]	selection in the diagram
speed (spindle):	n	[rpm]	calculation by user
axial feed rate:	V_f	[mm/min]	calculation by user
cutting diameter:	D_c	[mm]	processing specific
tool total length:	L_0	[mm]	processing specific
tool unclamping length:	L_1	[mm]	processing specific
tool cutting length:	L_2	[mm]	processing specific

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Cutting data diagram for milling
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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	0,90	218
roughing torus D12	vol. roughing following contour	6,00	12,00	1,20	0,25	425
roughing torus D20	vol. roughing following contour	10,00	20,00	2,00	0,95	685
finishing ball D6	zigzag stroke milling	0,60	3,00	0,00	1,00	195
finishing ball D12	zigzag stroke milling	1,20	6,00	0,00	1,00	390
finishing ball D20	zigzag stroke milling	2,00	10,00	0,00	1,00	650

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	68,0	17,0	2

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