Feeds and Speeds for RAKU® TOOL WB-1700

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formula for calculating speed (spindle)

$$n = \frac{V_c \times 12{,}0001}{D_c \times \pi}$$

15715 [rpm] = $\frac{3084 \text{ [ft/min]} \times 12{,}0001}{¾ \text{ [in]} \times 3{,}14}$

formula for calculating axis feed rate

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

297 [in/min] = 15715 [rpm] x 0,0094 [in] x 2 [number]

validated cutting data for roughing

Type	D_c [in]	z_n [number]	V_c [ft/min]	f_z [in]	n [rpm]	V_f [in/min]	a_e [in]	a_p [in]	L_1 [in]	L_2 [in]
torus	¾	2	3084	0,0094	15.715	297	0,394	0,787	3,386	0,787
torus	½	2	1837	0,0087	14.043	243	0,236	0,472	2,165	0,630
torus	¼	2	919	0,0081	14.043	227	0,118	0,236	0,906	0,315

validated cutting data for finishing

Type	D_c [in]	z_n [number]	V_c [ft/min]	f_z [in]	n [rpm]	V_f [in/min]	a_e [in]	a_p [in]	L_1 [in]	L_2 [in]
ball	¾	2	3084	0,0146	15.715	458	0,008	0,079	2,638	0,669
ball	½	2	1837	0,0146	14.043	409	0,005	0,047	2,047	0,413
ball	¼	2	919	0,0146	14.043	409	0,002	0,024	0,906	0,394

recommended cutting data for roughing

parameter	symbol	unit	roughing recommendation min.	ideal	max.
radial infeed:	a_e	[in]	- x D_c	**0.50 x D_c**	0.80 x D_c
axial infeed:	a_p	[in]	0.10 x D_c	**1.00 x D_c**	2.00 x D_c
number of teeth:	z_n	[number]	1	**2**	4

recommended cutting data for finishing

parameter	symbol	unit	finishing recommendation min.	ideal	max.
radial infeed:	a_e	[in]	- x D_c	**0.01 x D_c**	0.10 x D_c
axial infeed:	a_p	[in]	0,01 x D_c	**0.10 x D_c**	0.50 x D_c
number of teeth:	z_n	[number]	1	**2**	4

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

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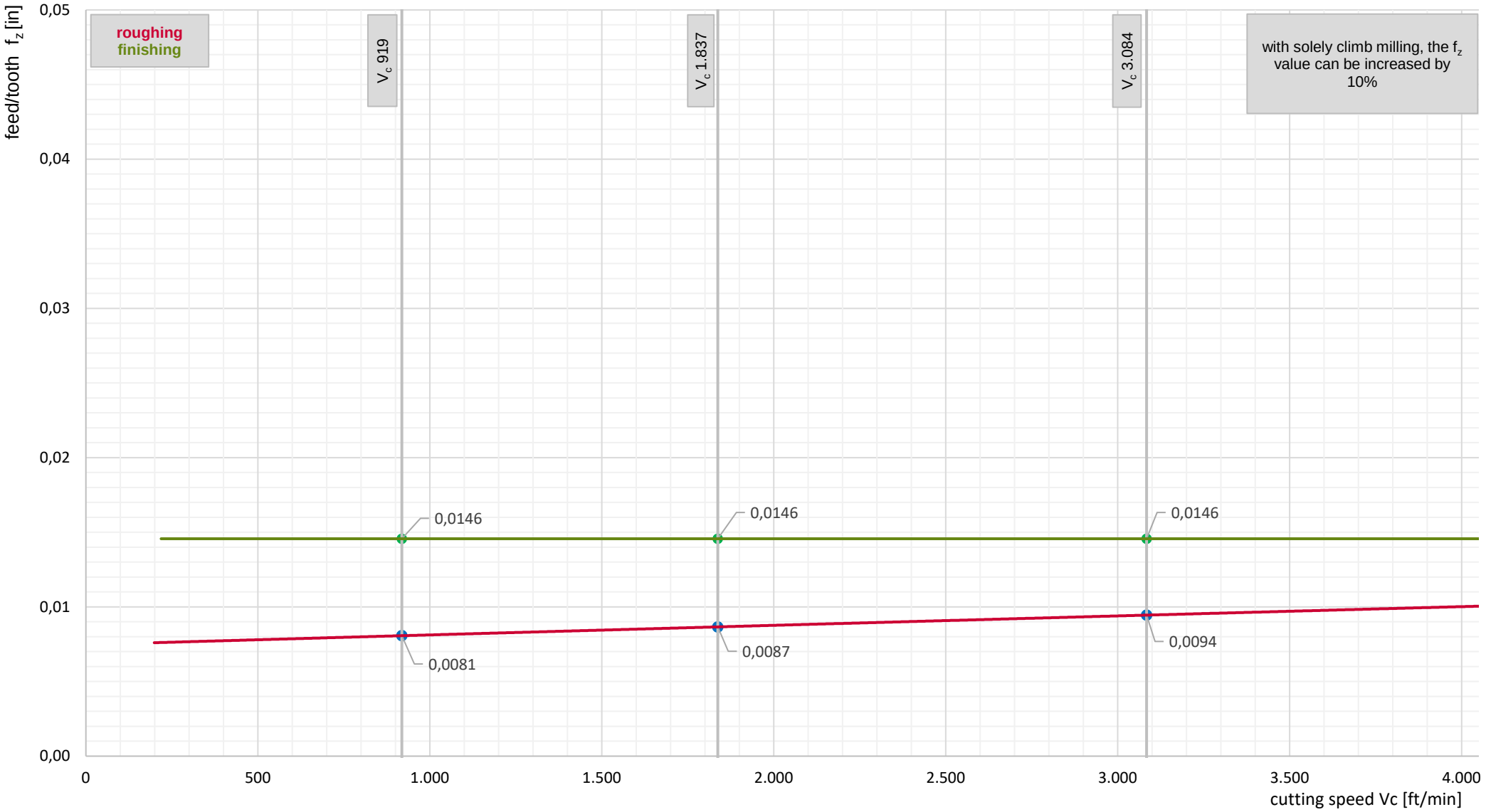

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cutting data used on the demonstrator

sequence of processing	processing strategy	a_e [in]	a_p [in]	offset [in]	f_z [in]	V_c [ft/min]
roughing torus D6	vol. roughing following contour	0,118	0,236	0,024	0,008	919
roughing torus D12	vol. roughing following contour	0,236	0,472	0,005	0,009	1837
roughing torus D20	vol. roughing following contour	0,394	0,787	0,079	0,009	3084
finishing ball D6	zigzag stroke milling	0,002	0,024	0,000	0,015	919
finishing ball D12	zigzag stroke milling	0,005	0,047	0,000	0,015	1837
finishing ball D20	zigzag stroke milling	0,008	0,079	0,000	0,015	3084

tools used on the demonstrator

tool manufacturer	tool type	D_c [in]	L_0 [in]	L_1 [in]	L_2 [in]	z_n [number]
hufschmied-tools.com/de/	PROTO-LINE / torus	¼	2,36	0,91	0,31	2
hufschmied-tools.com/de/	PROTO-LINE / torus	½	3,94	2,17	0,63	2
hufschmied-tools.com/de/	PROTO-LINE / torus	¾	4,09	3,39	0,79	2
hufschmied-tools.com/de/	PROTO-LINE / ball	¼	2,36	0,91	0,39	2
hufschmied-tools.com/de/	PROTO-LINE / ball	½	3,27	2,05	0,41	2
hufschmied-tools.com/de/	PROTO-LINE / ball	¾	4,09	2,64	0,67	2

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