Feeds and Speeds for RAKU® TOOL WB-1258

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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

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

495 [in/min] = 15715 [rpm] x 0,0157 [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	0,0157	15.715	495	0,394	0,787	3,386	0,787
torus	½	2	1837	0,0165	14.043	464	0,236	0,472	2,165	0,630
torus	¼	2	919	0,0173	14.043	487	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	0,0228	15.715	718	0,008	0,079	2,638	0,669
ball	½	2	1837	0,0228	14.043	641	0,005	0,047	2,047	0,413
ball	¼	2	919	0,0228	14.043	641	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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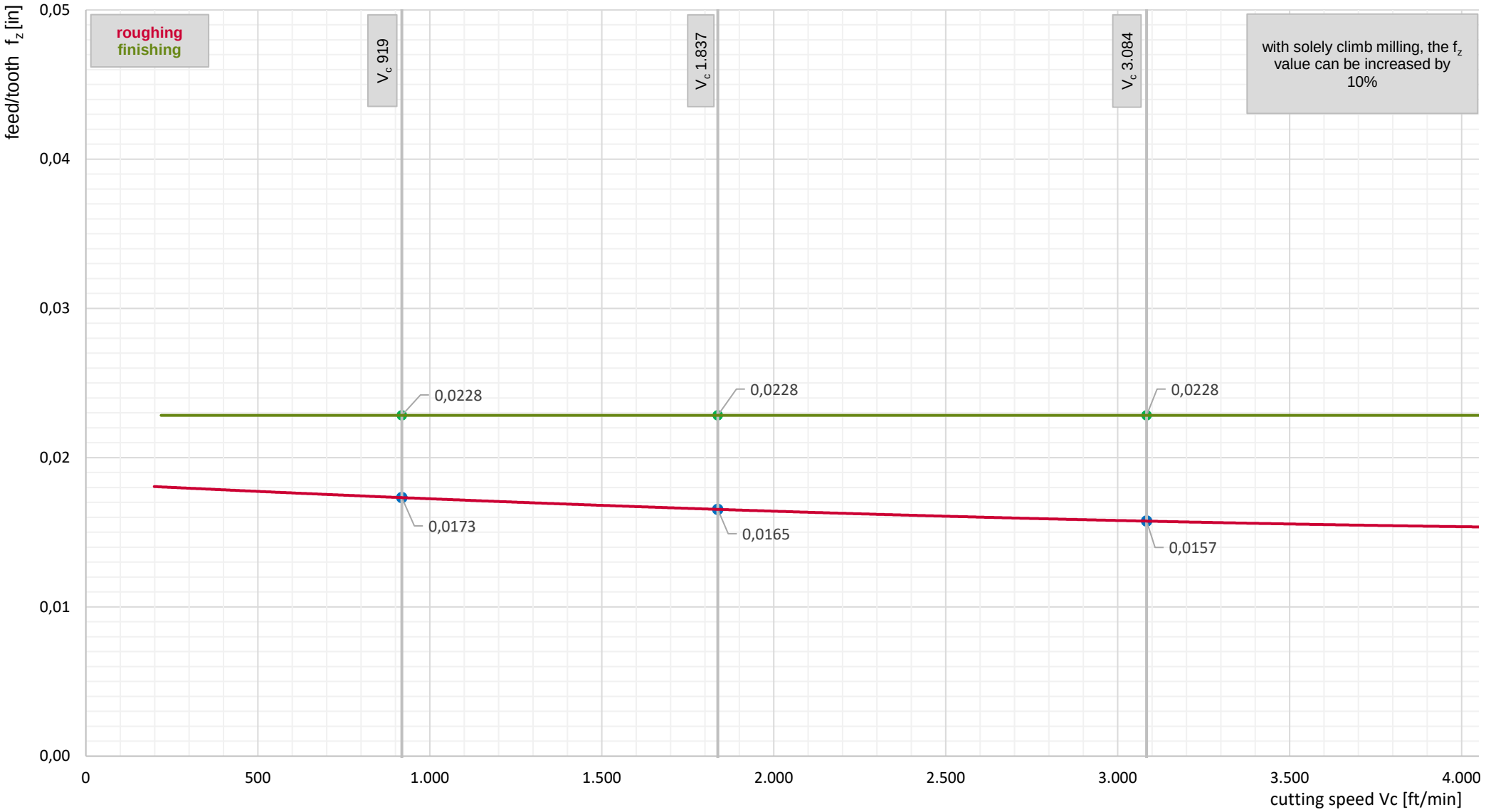

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cutting data used on the demonstrator

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	0,017	919
roughing torus D12	vol. roughing following contour	0,236	0,472	0,005	0,017	1837
roughing torus D20	vol. roughing following contour	0,394	0,787	0,079	0,016	3084
finishing ball D6	zigzag stroke milling	0,002	0,024	0,000	0,023	919
finishing ball D12	zigzag stroke milling	0,005	0,047	0,000	0,023	1837
finishing ball D20	zigzag stroke milling	0,008	0,079	0,000	0,023	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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