VORTEX TOOLS

MILLING

CUTTING DATA

Solid Carbide Rounding Cutters

CUTTING SPEED & FEED PER TOOTH

ISO P M K N S H

Material		Vc m/min · uncoated	fz FEED PER TOOTH (MM) by tool diameter D (mm)				
			Ø 1-4	Ø 4-8	Ø 8-12	Ø 12-16	Ø 16-20
K CAST IRON	Grey / Malleable	60-100	0.01 – 0.03	0.03 – 0.06	0.06 – 0.08	0.08 – 0.09	0.09 – 0.10
P STEEL	Unalloyed	80-100	0.01 – 0.02	0.02 – 0.03	0.03 – 0.04	0.04 – 0.05	0.05 – 0.06
	Low Alloyed	50-80	0.009 – 0.01	0.01 – 0.02	0.02 – 0.03	0.03 – 0.04	0.04 – 0.05
	High Alloyed	30-50	0.008 – 0.01	0.01 – 0.015	0.015 – 0.02	0.02 – 0.03	0.03 – 0.05
M STAINLESS STEEL / SPECIAL ALLOYS	Ferritic / Martensitic	40-60	0.01 – 0.02	0.02 – 0.04	0.04 – 0.06	0.06 – 0.08	0.08 – 0.10
	Austenitic	30-50	0.01 – 0.02	0.02 – 0.03	0.03 – 0.04	0.04 – 0.05	0.05 – 0.06
	Duplex	20-40	0.01 – 0.02	0.02 – 0.04	0.04 – 0.06	0.06 – 0.08	0.08 – 0.10
N NON-FERROUS / LIGHT ALLOYS	Copper / Brass / Bronze	60-150	0.01 – 0.02	0.02 – 0.04	0.04 – 0.06	0.06 – 0.08	0.08 – 0.10
	Aluminium (Si < 12%)	180-300	0.01 – 0.02	0.02 – 0.05	0.05 – 0.08	0.08 – 0.12	0.12 – 0.15
	Aluminium (Si > 12%)	140-180	0.01 – 0.015	0.015 – 0.04	0.04 – 0.06	0.06 – 0.10	0.10 – 0.12
	Thermoplastic	90-150	0.01 – 0.03	0.03 – 0.05	0.05 – 0.08	0.08 – 0.10	0.10 – 0.12
H HARDENED STEEL	≤ 50 HRC	50-60	0.01 – 0.025	0.025 – 0.03	0.03 – 0.04	0.04 – 0.05	0.05 – 0.06
S TITANIUM / SUPER ALLOYS / HRSA	Ti / Super Alloys / HRSA	20-50	0.01 – 0.03	0.03 – 0.04	0.04 – 0.05	0.05 – 0.06	0.06 – 0.08

ADJUSTMENTS

With TiAlN Coating	Vc +30/50%	fz –40%
Extra Long Series	Vc –20%	fz –60%

FORMULAS

$Vc = (\pi \times D \times N) / 1000$	Cutting speed
$n = (Vc \times 1000) / (\pi \times D)$	Spindle speed
$Vf = fz \times Z \times n$	Table feed
$f = fz \times Z \times n$	Feed rate
$fz = Vf / Z \times n$	Feed per tooth

Vc	fz	D	n / N	Z	Vf
Cutting speed (m/min)	Feed per tooth (mm)	Tool diameter (mm)	Spindle speed (rev/min)	Number of teeth	Feed rate (mm/min)

T 01732 887334 E sales@protool-ltd.co.uk W protool-ltd.co.uk

Recommended starting values. Adjust to suit machine rigidity, workholding, tool overhang and coolant.