

Z = Number of flutes

d = Cutting edge Ø

n = Revolutions 
$$n = \frac{v_c \cdot 1000}{d \cdot \pi} \text{ (1/min) (RPM)}$$

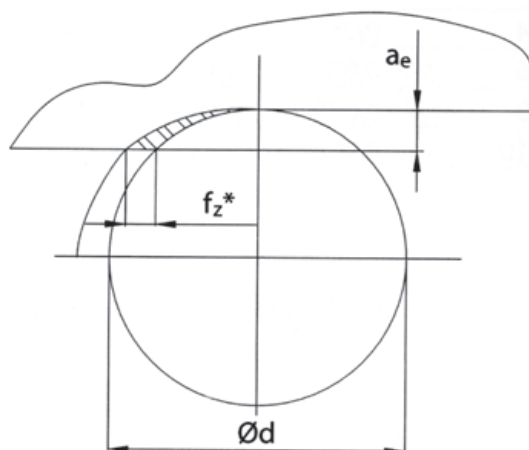
$v_c$  = Cutting speed 
$$v_c = \frac{d \cdot \pi \cdot n}{1000} \text{ (m/min) / .3048 = sfm}$$

$f_z$  = Feed/tooth 
$$f_z = \frac{V_f}{Z \cdot n} \text{ (mm) / 25.4 = inch}$$

$v_f$  = Feed rate 
$$V_f = f_z \cdot Z \cdot n \text{ (mm/min) / 25.4 = inch/min}$$

Q = Material removal rate 
$$Q = \frac{a_e \cdot a_p \cdot V_f}{1000} \text{ (cm}^3\text{/min) * .06102376 = inch}^3\text{/min}$$

$f_z$  = effective for side milling with small  $a_e$  (up to  $0.25 \cdot d$ ) 
$$*f_z = f_z \sqrt{\frac{d}{a_e}} \text{ (mm/tooth) / 25.4 = inch}$$



N

## Cutting data System DA

ISO	Material	Hardness Brinell	Insert size DA31 Feed/tooth $f_z$	Insert size DA32 Feed/tooth $f_z$	Cutting speed $v_c$ (ft/min)
<b>P</b>	unalloyed steel	125	0.001 - 0.012	0.002 - 0.016	850-1250
	unalloyed steel	190	0.001 - 0.012	0.002 - 0.016	790-1150
	low alloyed steel	200	0.001 - 0.012	0.002 - 0.016	660-1050
	low alloyed steel	300	0.001 - 0.012	0.001 - 0.012	460-820
	high alloyed steel	200	0.001 - 0.012	0.001 - 0.012	360-690
<b>M</b>	Stainless steel martenitic	240	0.001 - 0.012	0.001 - 0.012	430-660
	Stainless steel austenitic	180	0.001 - 0.006	0.001 - 0.008	360-620
<b>K</b>	Malleable cast iron ferritic	130	0.001 - 0.012	0.002 - 0.012	490-820
	Malleable cast iron perlitic	230	0.001 - 0.006	0.002 - 0.015	430-750
	Spheroidal graphite cast iron ferritic/perlitic	180	0.001 - 0.006	0.002 - 0.015	390-660
	Spheroidal graphite cast iron perlitic	260	0.001 - 0.006	0.002 - 0.008	330-620
	Grey cast iron	160	0.001 - 0.012	0.002 - 0.016	490-820
<b>S</b>	Super alloy Ni/Co based	350	0.001 - 0.004	0.001 - 0.008	100-230
	Alloy Titanium based alloy	350	0.001 - 0.004	0.001 - 0.008	100-230
<b>N</b>	Al-alloys	90	0.001 - 0.016	0.002 - 0.02	1640-3940

When 45° milling the feed per tooth  $f_z$  could be increased by factor 1.4!

## Ramp angle and plunging with a 90° milling cutter

Ø (mm) Insert size	32 DA32	25 DA32	20 DA32	32 DA31	25 DA31	20 DA31	16 DA31
Diving angle (°)	3.5°	3.5°	3.5°	4.0°	3.5°	3.5°	3.0°
vertical full diving max. (inch)	.039	.024	.016	.067	.031	.024	.016
vertical side diving ae max. (inch)	.181	.181	.181	.122	.122	.122	.122
Predrilling D <sub>b</sub> min. (inch)	.898	.622	.425	1.016	.740	.543	.386

## Ramp angle and plunging with a 45° milling cutter

Ø (mm) Insert size	17 DA32	14.4 DA31	10.5 DA31
Diving angle (°)	11°	7°	10,5°
vertical full diving max. (inch)	.126	.079	.079

## Correction factor for reduced cutting depth in consideration to the corner radius when 45° milling.

Corner radius r <sub>x</sub> (inch)	Correction factor f <sub>ap</sub> (inch)
.000	.0000
.008	.0031
.016	.0067
.031	.0130
.039	.0161

