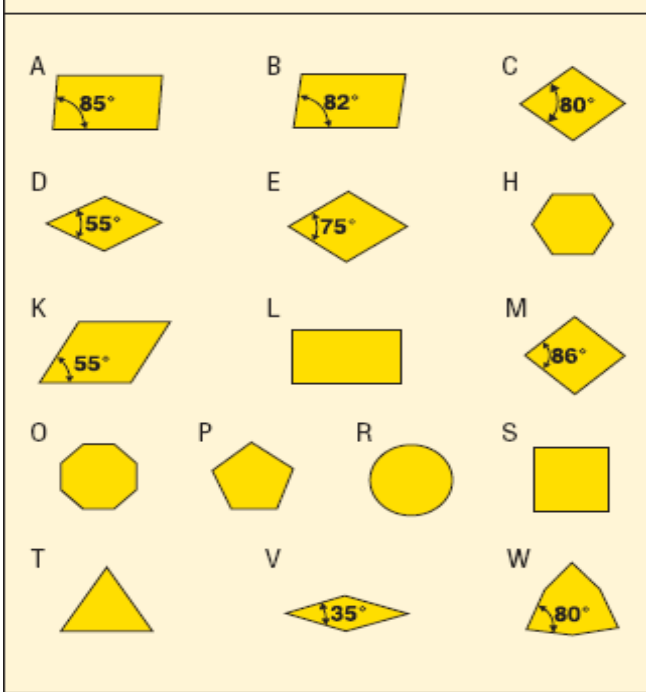


MILLING INSERTS

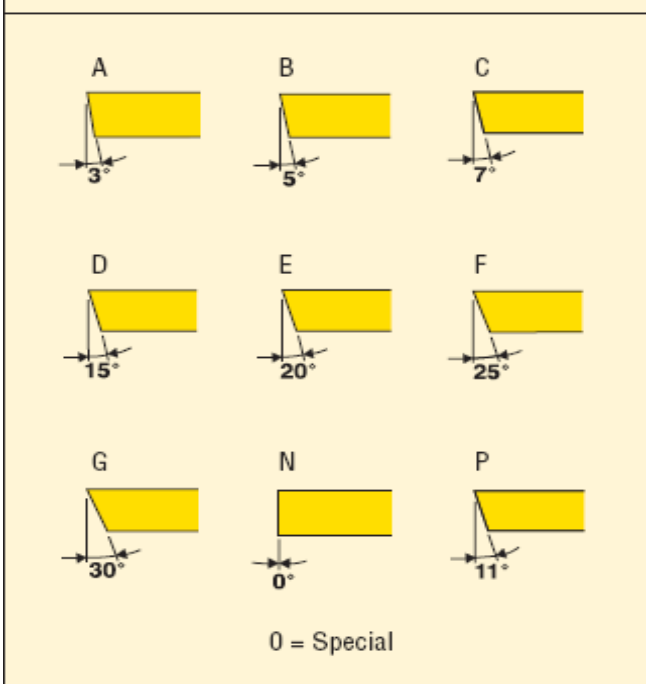
راهنمای انتخاب اینسرتهای فرزکاری

S	E	M	X	12	04	AF	T	N	-	ME12
1	2	3	4	5	6	7	8	9		10

1. Shape



2. Side clearance angle

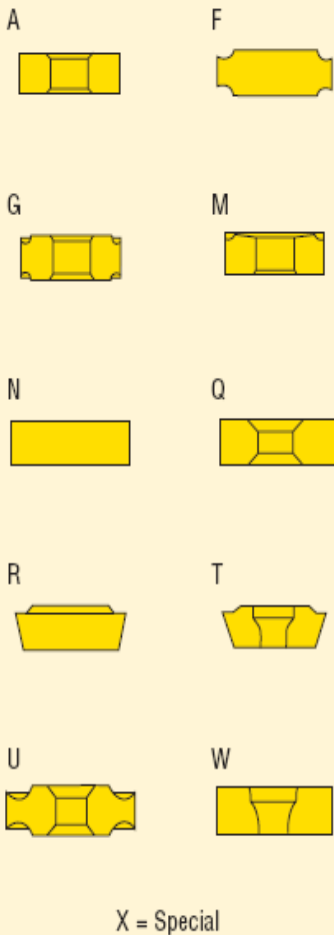


3. Tolerances

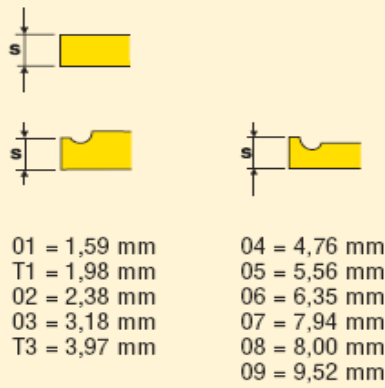
Tol.-class	Tolerance +/- mm			For d, dimension mm									
	m	s	d	3,175*	4,76	6,35	9,525	12,7	15,875	19,05	25,4	31,75	38,1
A	0,005	0,025	0,025	•	•	•	•	•	•	•	•	•	•
E	0,025	0,025	0,025	•	•	•	•	•	•	•	•	•	•
F	0,005	0,025	0,013	•	•	•	•	•	•	•	•	•	•
G	0,025	0,13	0,025	•	•	•	•	•	•	•	•	•	•
H	0,013	0,025	0,013	•	•	•	•	•	•	•	•	•	•
J	0,005	0,025	0,05	•	•	•	•						
	0,005	0,025	0,08					•					
	0,005	0,025	0,10						•	•			
	0,005	0,025	0,13								•		
	0,005	0,025	0,15									•	•
K	0,013	0,025	0,05	•	•	•	•						
	0,013	0,025	0,08					•					
	0,013	0,025	0,10						•	•			
	0,013	0,025	0,13								•		
	0,013	0,025	0,15									•	•
M	0,08	0,13	0,05	•	•	•	•						
	0,13	0,13	0,08					•					
	0,15	0,13	0,10						•	•			
	0,18	0,13	0,13								•		
	0,20	0,13	0,15									•	•
U	0,13	0,13	0,08	•	•	•	•						
	0,20	0,13	0,13					•					
	0,27	0,13	0,18						•	•			
	0,38	0,13	0,25								•	•	•

*not ISO

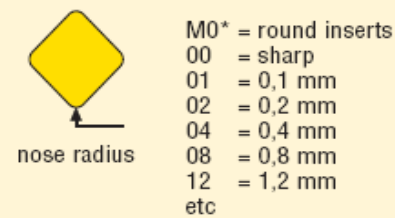
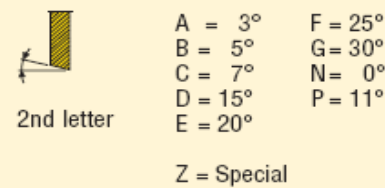
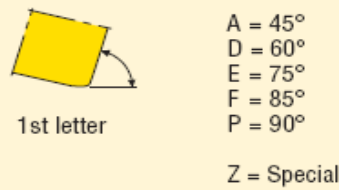
4. Type



6. Thickness



7. Insert with corner chamfers/nose radius



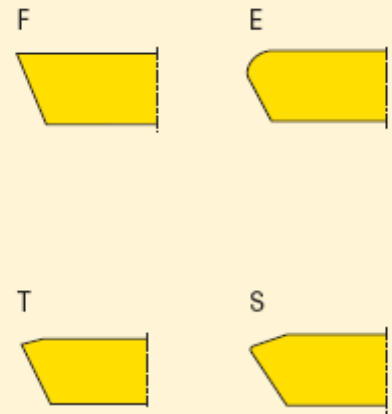
*Metric version

10. Internal designation

Machining conditions

E = Easy
M = Medium
D = Difficult

8. Cutting edge designation

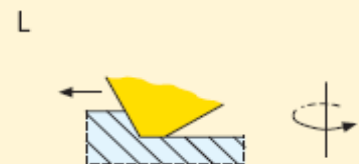


Not mandatory information

9. Direction of cutting



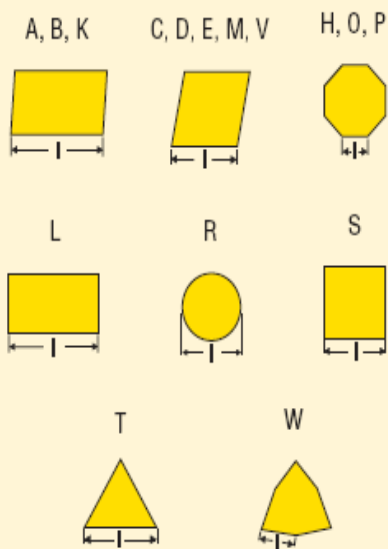
Right-rotated



Left-rotated

N
Neutral
(R- and L-rotated)

5. Cutting edge length

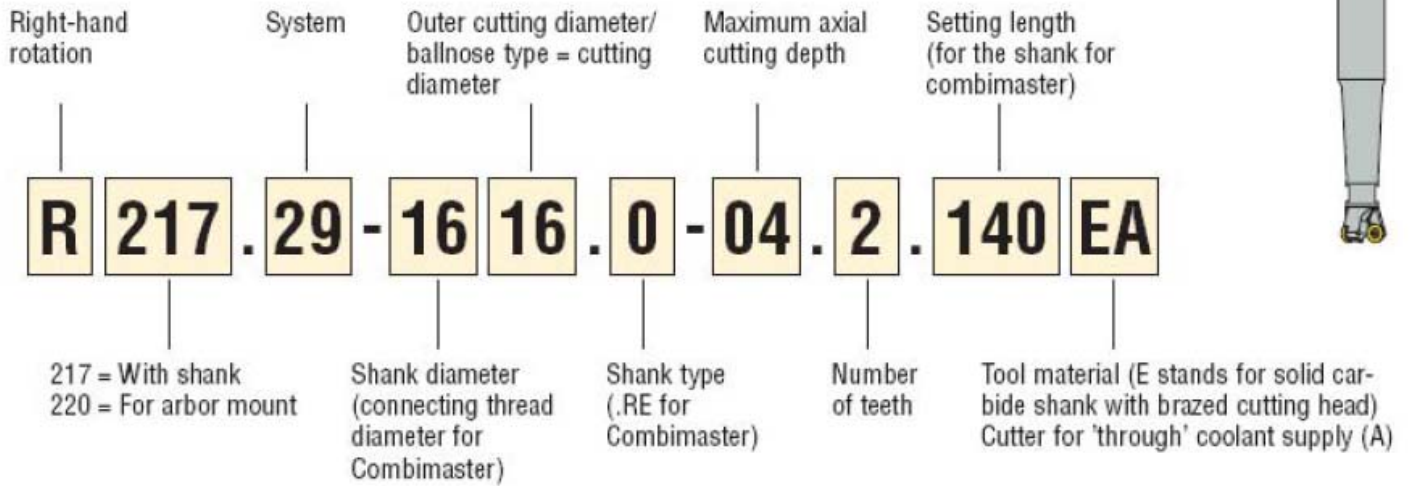


MILLING HOLDERS

1- COPY MILLING

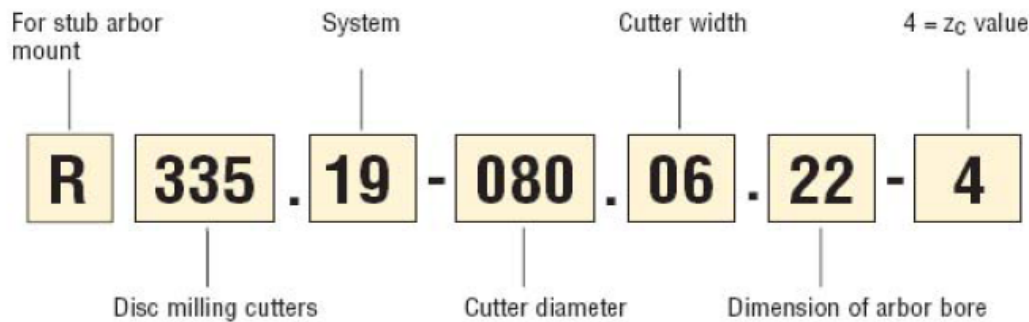
Code key

Note that parts of the code can vary for different cutters.

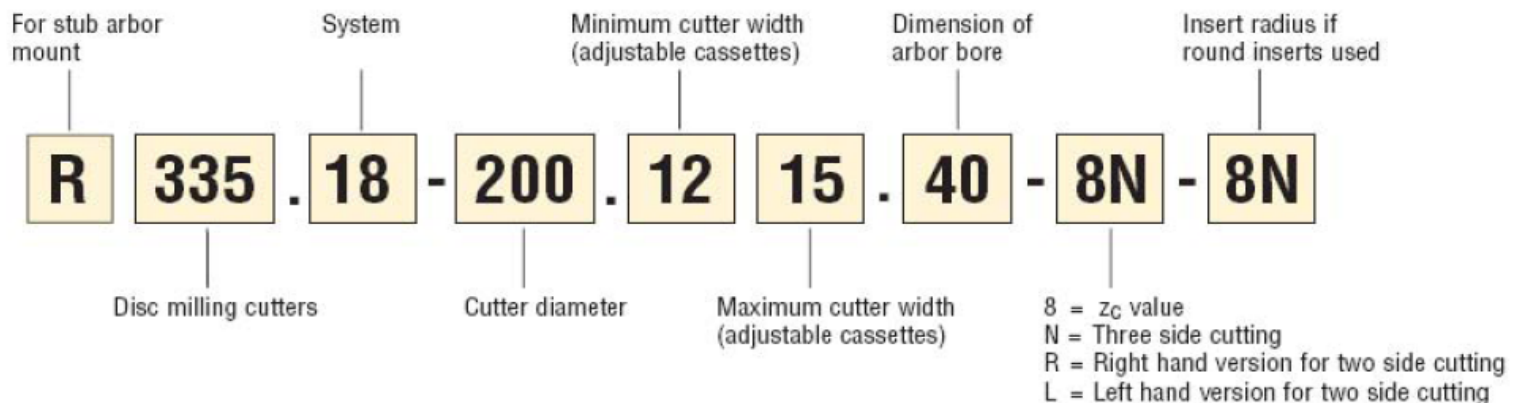


2- DISC MILLING

For fixed pocket disc milling cutter



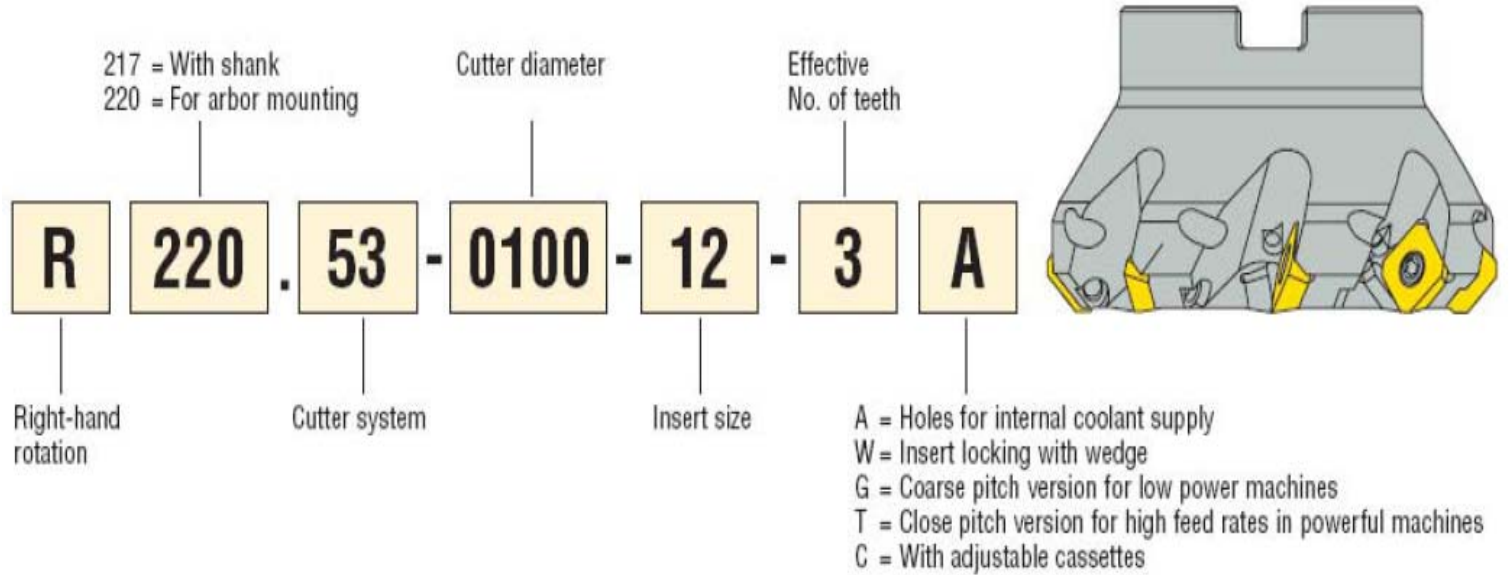
For adjustable disc milling cutter



3- FACE MILLING

Code key

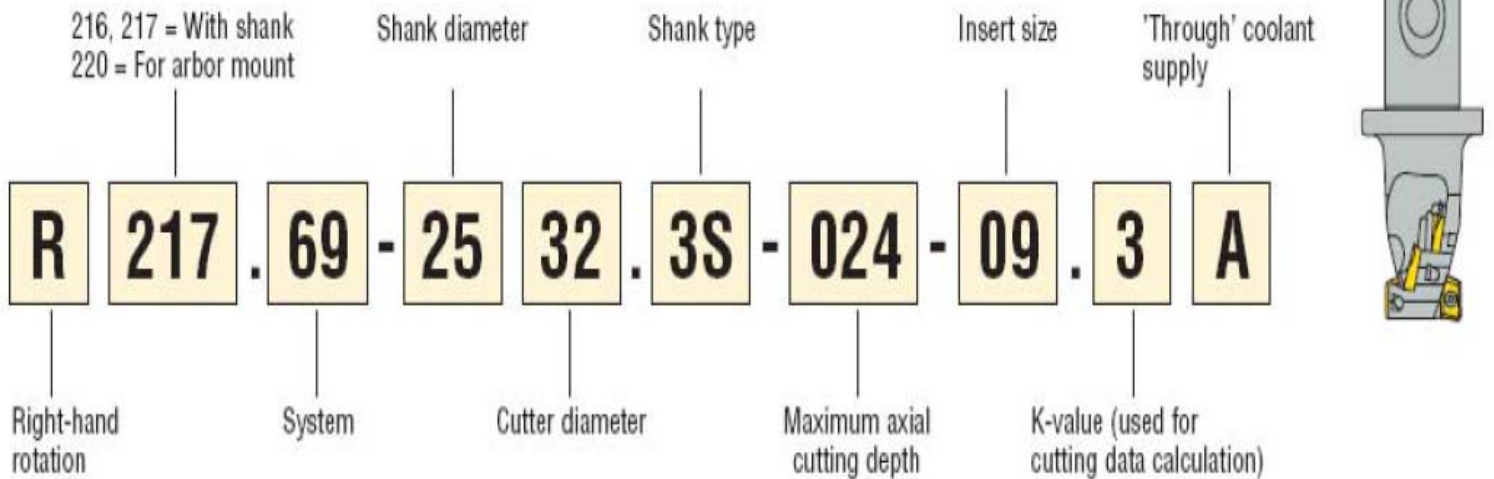
Note that parts of the code can vary for different cutter systems.



3- HELICAL MILLING

Code key

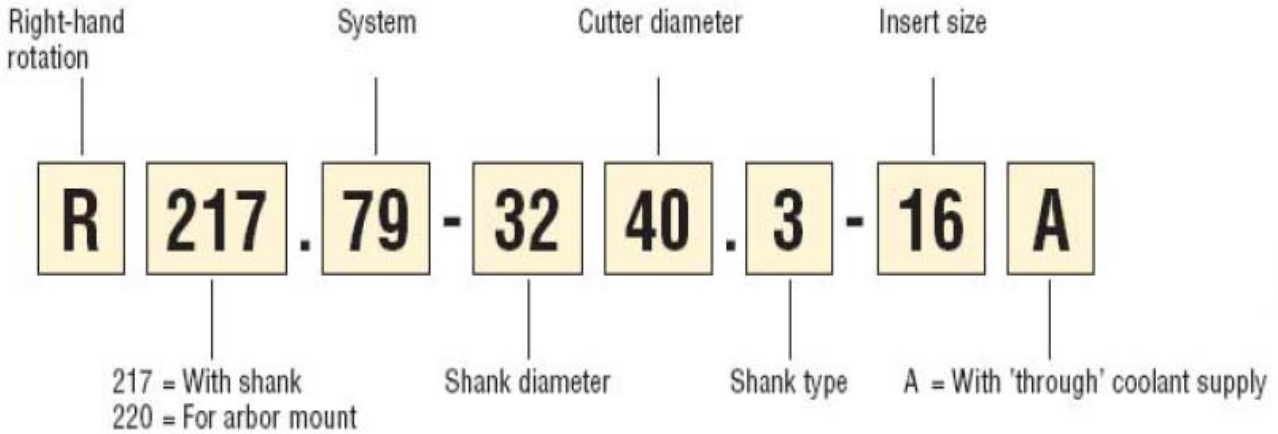
Note that parts of the code can vary for different cutters.



4- PLUNG MILLING

Code key

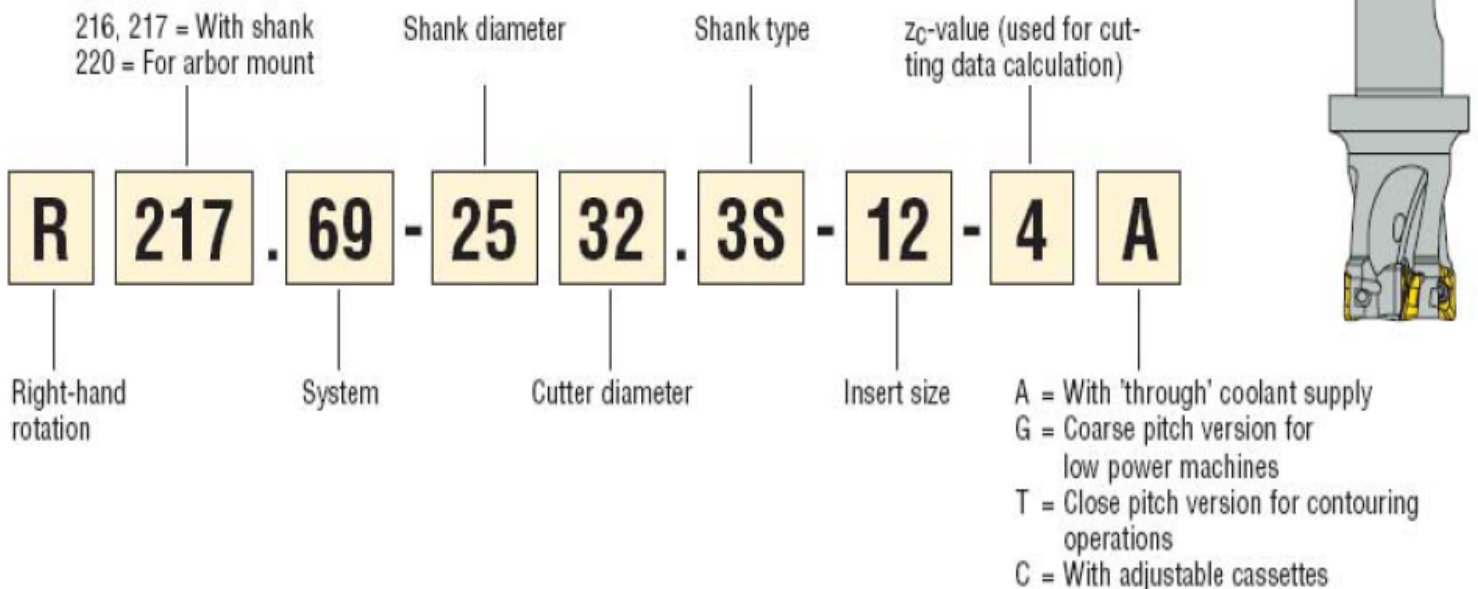
Note that parts of the code can vary for different cutter systems.



5- SQUARE SHOULDER & SLOT MILLING

Code key

Note that parts of the code can vary for different cutters.



MILLING PARAMETERS

راهنمای محاسبه پارامترهای فرزکاری

RPM

$$n = \frac{v_c \cdot 1000}{\pi \cdot D_c} \quad (\text{rev/min})$$

Cutting speed

$$v_c = \frac{n \cdot \pi \cdot D_c}{1000} \quad (\text{m/min})$$

Feed speed

$$v_f = n \cdot z_n \cdot f_z \quad (\text{mm/min})$$

$$v_f = n \cdot z_c \cdot f_z \quad (\text{mm/min})$$

Feed per revolution

$$f = z_n \cdot f_z \quad (\text{mm/rev})$$

$$f = z_c \cdot f_z \quad (\text{mm/rev})$$

Metal removal rate

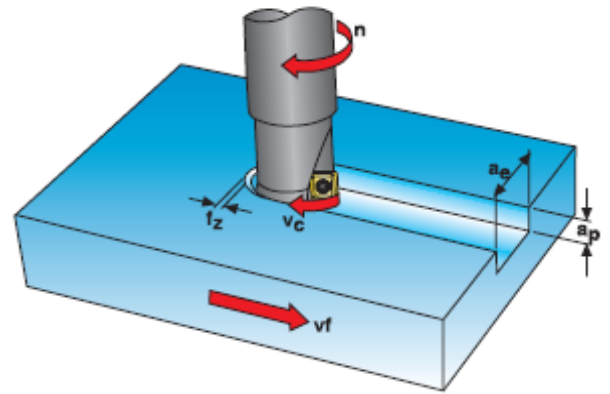
$$Q = \frac{a_e \cdot a_p \cdot v_f}{1000} \quad (\text{cm}^3/\text{min})$$

Cutting speed and RPM for copying

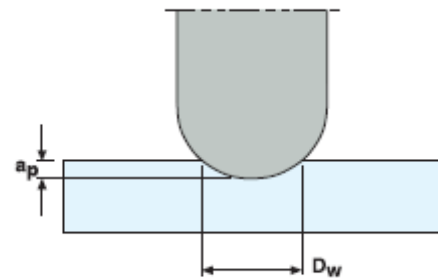
$$v_c = \frac{n \cdot \pi \cdot D_w}{1000} \quad (\text{m/min})$$

$$n = \frac{v_c \cdot 1000}{\pi \cdot D_w} \quad (\text{RPM})$$

$$D_w = 2 \cdot \sqrt{a_p (D_c - a_p)} \quad (\text{mm})$$

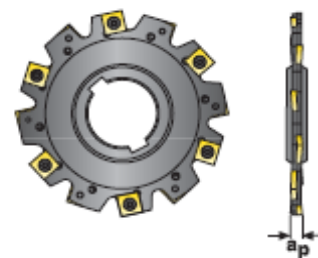


- a_e = Width of cut mm/radial depth of cut (mm)
- a_p = Depth of cut mm/axial depth of cut (mm)
- D_c = Cutter diameter (mm)
- f = Feed per revolution (mm/rev)
- f_z = Feed per tooth (mm/tooth)
- z_c = Effective No. of teeth for calculation of feed speed or feed per rev (see below)
- n = RPM (rev/min)
- Q = Material removal rate (cm³/min)
- v_c = Cutting speed (m/min)
- v_f = Feed speed (mm/min)
- z_n = No of teeth



Effective No. of teeth (z_c)

The effective No. of teeth (z_c) is used to calculate the feed speed (v_f) and the feed per revolution (f). For most of the cutters the effective No. of teeth (z_c) is equal to the No. of teeth in the cutter (z_n), but for some of the cutters z_c is less than z_n .



Example: Disc mill 335.19

Total No. of teeth (z_n) = 12

Effective No. of teeth (z_c) = 6

Explanation: 6 inserts on one side of the cutter and 6 overlapping inserts on the other side are used to get the full width (a_p), which means $z_c = 6$.