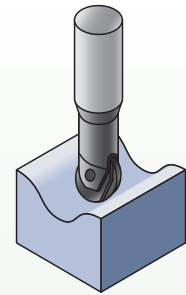


## Selecting the Correct Insert and Cutting Conditions for Your Application

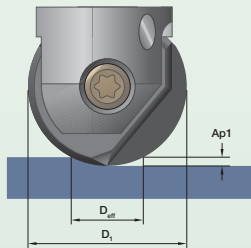
### 1. Insert Style: Considerations for Selecting the Correct Insert

Best Choices for Insert and Grade Selection ● First choice ○ Alternate choice	BR Geometry		BF Geometry
Grade	TN7535	TN2510	TN2505
Roughing Operation	●	○	
Finishing Operation		○	●
Low RPM Machine	●	○	
Flat Areas or Face Milling (≤10° inclination)	●	○	
Hard Machining		○	●
Unstable and/or Long Overhangs	●	○	
HSM or 5-Axis Machining (smaller ap/ae values)	●	○	

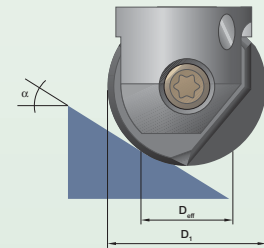


### 2. Calculating effective diameter and resulting surface speed

It is important to consider the effective diameter (Deff) when using light depths of cut in order to properly calculate RPM values. Use the following formula when machining flat surfaces or inclinations of 10° or less to find the Deff value, and then use this for RPM calculations as opposed to using the overall insert diameter (D1).



When machining inclinations between 11° and 55°, further modification of vc is required. Apply factor "k" from the given formula to calculate the correct vc (vceff). This corrected value is then used to calculate the proper RPM for the tool.



$$D_{eff} = \sqrt{D1^2 - (D1 - 2Ap1)^2}$$

$$k = \frac{1}{\sin [\alpha + \arccos (1 - (2 (Ap1/D1)))]}$$

$$v_{c\text{eff}} = v_c \times k$$

### Starting Values for Semi-Finishing in Common Material Types (L/D ratio <3 x D1)

M270 is usually applied for semi-finishing and finishing operations; Ap1/ae conditions depend on the operation. As a general rule: Ap1/ae ≤ 0,05D.

Material	Tool Diameter																	
	Ø10		Ø12		Ø16		Ø20		Ø25		Ø32							
	max rec. (mm)		fz (mm/tooth)		max rec. (mm)		fz (mm/tooth)		max rec. (mm)		fz (mm/tooth)		max rec. (mm)		fz (mm/tooth)			
	Ap1	ae	Ap1	ae	Ap1	ae	Ap1	ae	Ap1	ae	Ap1	ae	Ap1	ae	Ap1	ae		
Soft Steel <250 HB	0,7	0,7	0,2	0,8	0,8	0,2	1,1	1,1	0,27	1,3	1,3	0,27	1,7	1,7	0,3	2,1	2,1	0,3
High-Strength Steel 33-44 HRC	0,5	0,5	0,15	0,6	0,6	0,2	0,8	0,8	0,25	1	1	0,25	1,3	1,3	0,25	1,6	1,6	0,25
Hardened Steel 44-55 HRC	0,3	0,3	0,15	0,4	0,4	0,2	0,5	0,5	0,22	0,7	0,7	0,22	0,8	0,8	0,25	1,1	1,1	0,25
Grey Cast Iron GG25...	1	1	0,2	1,2	1,2	0,25	1,6	1,6	0,25	2	2	0,25	2,5	2,5	0,3	3,2	3,2	0,3
Nodular Cast Iron GGG60...	0,7	0,7	0,2	0,8	0,8	0,25	1,1	1,1	0,25	1,3	1,3	0,25	1,7	1,7	0,3	2,1	2,1	0,3