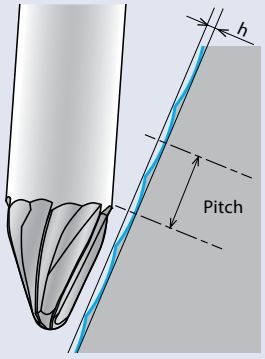
List 3785: EXOCARB VU-TBR: Using Peripheral Edge Radius (R2)

Hardness	< 30 HRC			30 - 45 HRC			45 - 55 HRC		
Work Material	Carbon Steel Alloy Steel			Hardened Steel Prehardened Steel			Hardened Steel Prehardened Steel		
Cutting Speed	360 SFM			300 SFM			230 SFM		
Depth of Cut	Aa = 0.012"			Aa = 0.012"			Aa = 0.012"		
Mill Dia.	Speed RPM	Feed in/min	Pitch	Speed RPM	Feed in/min	Pitch	Speed RPM	Feed in/min	Pitch
6 (R0.5 x R150 x 20°)	10700	133.9	Based on cusp height (See chart below)	8800	98.5	Based on cusp height (See chart below)	6800	63.0	Based on cusp height (See chart below)
8 (R1 x R150 x 20°)	7300	90.6		6000	67.0		4700	43.4	
10 (R1.5 x R300 x 20°)	5600	70.9		4600	51.2		3600	35.5	
12 (R2 x R300 x 20°)	4500	86.7		3700	63.0		2900	39.4	
16 (R2.5 x R500 x 20°)	3400	63.0		2800	47.3		2200	31.5	
16 (R3 x R500 x 20°)	3300	63.0		2700	43.4		2100	31.5	

1. This chart should be used when machining with the Peripheral Edge Radius, R2.
2. Use a rigid and precise machine and holder.
3. Use a coolant with low air-blow or fuming property according to the work material. MQL (oil mist coolant) is recommended for cutting hardened steels.
4. Using Peripheral Edge Radius (R2)" is the guide to use the intermediate position of peripheral edge radius. Please adjust the rotation speed, feed rate and cutting pitch based on the cutting shape, machine rigidity, workpiece and holding conditions.
5. When chattering, vibration or abnormal cutting noise occurs, please adjust the rotation speed, feed rate and cutting pitch.
6. In order to change the rotation speed, both the rotation speed and the feed rate should be changed at the same ratio.

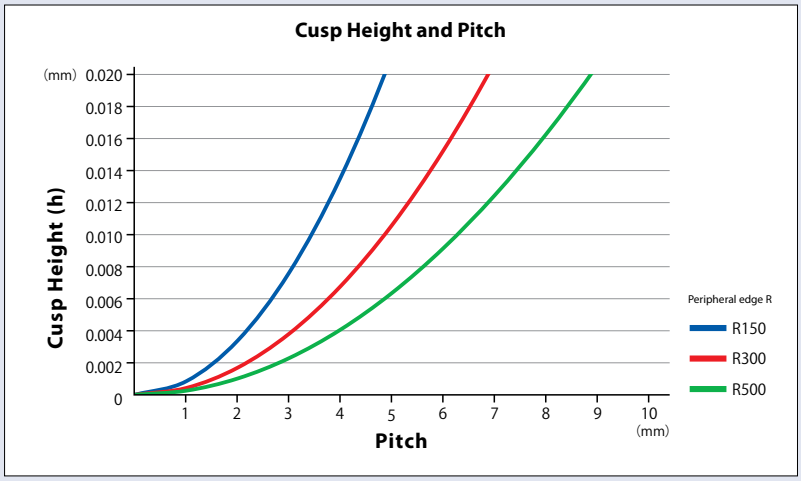
Theoretical Cusp Height

VU-TBR
Taper Barrel Type



$$h = 0.5 \times \left(2 \times R2 - \sqrt{(2 \times R2)^2 - P^2}\right)$$

h: Cusp Height P:Pitch R2: Peripheral Edge R



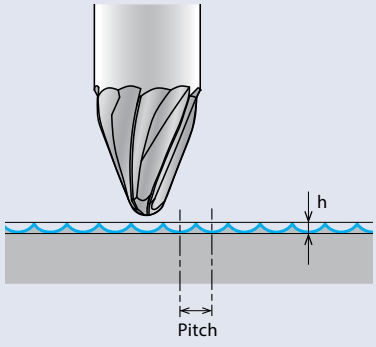
List 3785: EXOCARB VU-TBR: Using Tip Radius (R1)

Hardness	< 30 HRC			30 - 45 HRC			45 - 55 HRC		
Work Material	Carbon Steel Alloy Steel			Hardened Steel Prehardened Steel			Hardened Steel Prehardened Steel		
Cutting Speed	660 SFM			525 SFM			460 SFM		
Depth of Cut	D=6 Aa = 0.004″ D=8 Aa = 0.008″ D=10 Aa = 0.010″ D≥12 Aa = 0.012″			D=6 Aa = 0.004″ D=8 Aa = 0.008″ D=10 Aa = 0.010″ D≥12 Aa = 0.012″			D=6 Aa = 0.004″ D=8 Aa = 0.008″ D=10 Aa = 0.010″ D≥12 Aa = 0.012″		
Mill Dia.	Speed RPM	Feed in/min	Pitch	Speed RPM	Feed in/min	Pitch	Speed RPM	Feed in/min	Pitch
6 (R0.5 x R150 x 20°)	19500	244.1	Based on cusp height (See chart below)	15600	173.3	Based on cusp height (See chart below)	13600	130.0	Based on cusp height (See chart below)
8 (R1 x R150 x 20°)	13300	169.3		10700	118.2		9300	86.7	
10 (R1.5 x R300 x 20°)	10300	130.0		8200	90.6		7200	67.0	
12 (R2 x R300 x 20°)	8300	157.5		6600	110.3		5800	82.7	
16 (R2.5 x R500 x 20°)	6300	118.2		5000	82.7		4400	63.0	
16 (R3 x R500 x 20°)	6000	114.2		4800	78.8		4200	59.1	

1. This chart should be used when machining with the Tip Radius, R1.
2. Use a rigid and precise machine and holder.
3. Use a coolant with low air-blow or fuming property according to the work material. MQL (oil mist coolant) is recommended for cutting hardened steels.
4. Using Tip Radius (R1)" is the guide to use the tip radius. Please adjust the rotation speed, feed rate and cutting pitch based on the cutting shape, machine rigidity, workpiece and holding conditions.
5. When chattering, vibration or abnormal cutting noise occurs, please adjust the rotation speed, feed rate and cutting pitch.
6. In order to change the rotation speed, both the rotation speed and the feed rate should be changed at the same ratio.

Theoretical Cusp Height

VU-TBR
Taper Barrel Type



$$h = 0.5 \times \left(2 \times R1 - \sqrt{(2 \times R1)^2 - P^2}\right)$$

h: Cusp Height P:Pitch R1: Tip R