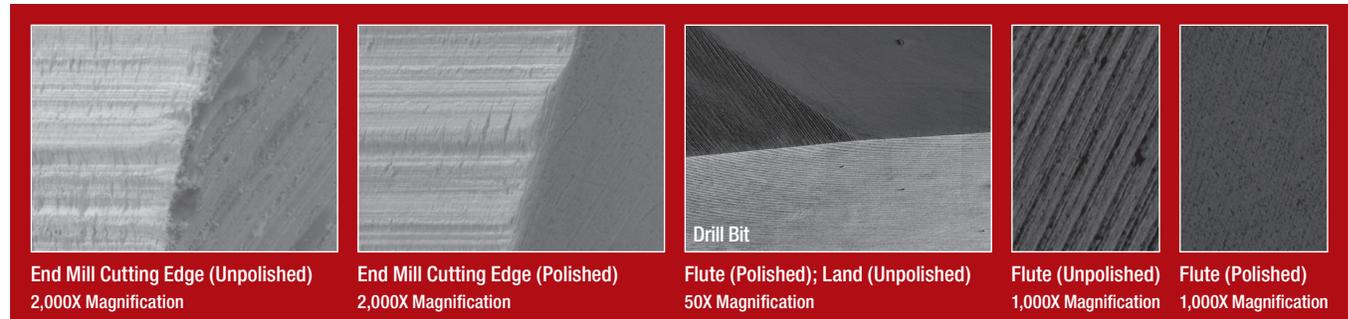


Carbide Cutting Tools — Setup and Instructions for Use

3M™ Trizact™ Diamond Polishing Wheel 685DC



The Scanning Electron Microscope (SEM) images illustrate surface refinement with 3M™ Trizact™ Diamond Polishing Wheel 685DC. The unpolished surface has a Ra surface roughness of 10 µinch Ra. The polished surface has a Ra surface roughness of 1 µinch Ra.



End Mill Cutting Edge (Unpolished)
2,000X Magnification

End Mill Cutting Edge (Polished)
2,000X Magnification

Flute (Polished); Land (Unpolished)
50X Magnification

Flute (Unpolished)
1,000X Magnification

Flute (Polished)
1,000X Magnification

Computer Numeric Control (CNC) Machine Setup

Shape	Shape the wheel to match the fluting wheel shape. Make adjustments to the shape as necessary to maximize polished area coverage.
Angle of Approach	Start with the same angle of approach used during fluting. Make adjustments to the angle of approach to maximize the polished area coverage.
Wheel Speed	4,000 SFPM* (20m/sec.)
In Feed Rate	3"—4"/min. (70mm–100mm/min.)
Depth of Cut	0.0002"—0.0005" (5µm–12µm) The wheel's diameter will increase when spun at 4,000 SFPM* (20m/sec.) due to the centrifugal force. After touching off on the polishing wheel, the operator must factor in for some wheel expansion. Due to wheel expansion, we recommend a small initial depth of cut of 0.0002" (5µm) as a starting point.
Work Sequence	Grind Flute → Polish Flute → Grind Cutting Edge and Reliefs
Coolant	Straight Oil, Soluble, Synthetic and Water

*Surface feet per minute



Polishing Coverage of the Flute

3M™ Trizact™ Diamond Polishing Wheel 685DC can compress during flute polishing resulting in partial polishing of the flute. Incremental changes to shape the radius or angle of the polishing wheel can improve the amount of flute area polished.

Cutting Edge Honing

If the cutting edges are being honed, the operator may need to offset the angle of approach. Please remember to use the following work sequence: fluting with the fluting wheel, polish with Trizact Diamond Polishing Wheel 685DC, then perform reliefs with the cup wheel.

Truing Wheel Guidelines (profiling/shaping the wheel)

Truing and conditioning is required:

- Before a new wheel can be used to remove high spots
- After the wheel has lost its profile/shape from polishing
- When the surface of the wheel has become glazed, loaded or burned

Truing Wheel Grade and Mineral:

The choice for truing wheels can be 60, 80 or 120 grit Silicon Carbide or Aluminum Oxide.

Appearance:

After truing and dressing, the surface of Trizact Diamond Polishing Wheel 685DC will take on a fuzzy appearance which is normal. Once polishing has commenced, the surface will turn gray/black which is normal.

Wheel Conditioning Guidelines

Wheel conditioning is another way to clear loaded, burned or glazed material from the surface of Trizact Diamond Polishing Wheel 685DC and expose new diamond. Sticking is performed by using a 120–220 grit Aluminum Oxide dressing stick with hardness G, H or I (Silicon Carbide will work as well).



Abrasive Systems Division
3M Center, Building 21-1W-10
St. Paul, MN 55144-1000
1-866-279-1235
www.3M.com/superabrasives

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