

Fischione Model 170 Ultrasonic Disk Cutter Procedure

1. Mount bulk ceramic on Aluminum plate using Type 509 Crystal Bond (T ~ 150 deg. C)
2. Allow assembly to cool.
3. Secure Aluminum plate in circular, magnetically coupled base using thumbscrews.
4. Rotate optical microscope into viewing position. (Note: always swivel microscope clockwise until nearing either the initial or final position, then lock into position using upper / rear knob.)
5. Focus on the surface of the ceramic.
6. Translate the ceramic (x,y) until the target area is chosen.
7. Carefully center this area with respect to the reticle in the eye piece of the optical microscope.
8. Place 600 grit SiC or 30 – 45 um CBN slurry over the target area, depending on hardness of ceramic. The former can be used for Silicon and cross-sections comprised mostly of Silicon. Long handled Qtips can be used. CBN may be required for ceramics with greater hardness.
9. Fill the plastic syringe with water and attach its tubing to the inlet on front of system.
10. Turn the left hand toggle switch to AUTO position, and the right hand toggle switch to the ON position.
11. Slowly lower the Titanium cutting tool until a few millimeters above the ceramic, turning the 2nd / lower knob on the right side of the system counter clockwise.
12. Release a few drops of water from the syringe.
13. Continue advancing the tool until contact is made with the ceramic, then continue to rotate the knob another $\frac{1}{2}$ - $\frac{3}{4}$ turn.
14. Monitor the cutting process by watching the depth indication on the dial micrometer on top of the system.
15. If the process stalls, gently raise the Titanium tool and apply more slurry and water, then continue.
16. Stop when the AUTO LED displays a steady red color, and is no longer either unlit or blinking red.
17. Switch the left hand toggle switch to CONT and raise the Titanium tool.
18. Reheat the Aluminum plate and ceramic.
19. Remove the cut sample.
20. Repeat as required.