

Tuned Piezo Cutting Tool (TPCT) Manual

1. Mount a section of a clean glass slide on the specimen table. Do not add slurry to this slide.
2. Position the specimen table on its magnetic base beneath the cutting tool, using the positioning pins to hold it in place on the hinged platform.
3. Gently lower the cutting tool onto the glass, using the right or left large knob at the back of the tool.
4. When the cutting tool makes contact with a glass, the dial indicator reading ceases to change, since the tool and the tables are now moving together.
5. Continue lowering the cutting tool onto the glass slide until the horizontal indicator is aligned.
6. Rotate the outer ring of the dial indicator to move the markings on the dial. Align the zero mark with the dial needle (0 μm on the large dial). Note the reading on the reading on the smaller coarse dial to obtain a specific zero reading.
7. Raise the cutting tool.
8. Remove the specimen table.
9. Fill the syringe with water and attach the other end of the hose to the intake pipe protruding from the front of the TPCT.
10. Position the specimen table with specimen on the magnetic base assembly and slide the assembly onto the base of the TPCT. Make sure the magnetic table is properly positioned against the two locating pins on the base of the cutting tool.
11. Apply the cutting grit. Use a spatula to make a small conical pile of cutting grit over the specimen area. Add a few drops of water to make a slurry.
12. When cutting thick specimens ($> 1 \text{ mm}$), slowly suck enough slurry up into the syringe to have a reserve for the cutting cycle.
13. Lower the cutting tool into the slurry until the hinged platform is properly deflected (the horizontal indicator is aligned). When the cutting tool is correctly lowered and the hinged platform is applying the appropriate pressure, the center white line will be just below the level of the two white lines on either side of it. The dial indicator will display the thickness of the specimen + wax.
14. Switch on the power and follow the progress of the cut on the dial indicator. NB: A change in frequency occurs when the tool breaks the bottom of surface of the specimen.
15. Monitor the depth of cut using the horizontal reference indicator. The range of movement of the hinged platform is only $\pm 1 \text{ mm}$. Thus, the cutting tool must be lowered periodically to maintain the platform at the appropriate level. Check the horizontal reference indicator frequently and continue to lower the cutting tool so that the horizontal reference indicator maintains a consistent position just below the white lines.
16. Adjust the cutting rate using the tuning knob. Effective cutting frequencies will emit audible sounds.
17. Raise the cutting tool when the large dial indicator needle just passes through the zero mark.
18. Repeat the cutting process in a new location if needed.
19. When all cuts have been made, switch off the power and remove the specimen table.
20. Wash off the slurry and remove the cut sample of the specimen.
Cut specimens may become trapped in the cutting tool. Flush water through the tool while the power is still on to remove them. If unsuccessful, remove the cutting tool with the special wrench supplied and push out the cut sample with a toothpick.