Mounting the sample

1. Place the platen on a hot plate set to 150 °C. Balance the platen by setting its base in the aluminum ring (Figure 1).

   ![Figure 1. Platen and aluminum ring shown separately (left) and assembled (right).](image)

2. Once the platen reaches the right temperature, melt a small amount of Crystalbond Type 509 adhesive onto its surface (T ~ 150 degrees C).

3. Place the sample on top of the melted adhesive and ensure that it lays flat across the platen by gently pushing down on the sample with a wooden stick or other soft implement.

4. Remove the ring and platen from the hot plate and allow it to cool to room temperature.

5. Remove the platen from the aluminum ring and insert the platen’s small, notched end into the magnetic stage of the Dimpling Grinder (Figure 1). Tighten the set screw on the side of the stage (Figure 2) with the hex ring.

   ![Figure 2. Set screw and moveable (magnetic) portion of stage.](image)

6. Remove the nut from the end of the post and slide the grinding wheel as far as it will go on the post.

7. Replace the nut on the post (Figure 3).
Figure 3. Semiconductor Polishing Wheel (part number 006-0232) positioned on the grinding wheel post and secured in place with the nut. Use bronze for metals, Micarta for ceramics and stainless steel for Silicon. Applications may vary.

8. To center the sample’s area of interest on the stage, place the microscope attachment over the stage and confirm that it is sitting level around the base of the stage (Figure 4).

Figure 4. Microscope attachment shown in correct orientation around the base of the stage.
9. Turn on the microscope flashlight.
10. Look through the eyepiece and turn the knob on the left side of the microscope to focus the image of the sample.
11. Slide the magnetic portion of the stage until the area of interest is centered in the crosshairs of the microscope.
12. Remove the microscope attachment and set it aside.
13. Verify that the protective black plastic guard has been removed from around the micrometer (Figure 5).
14. Clean the metal contacts with isopropanol alcohol.
15. Gently lower the arm of the dimpling grinder until the micrometer head touches the upper metal contact (Figure 5).

![Figure 5. Micrometer head touching the upper metal contact (yellow box).](image)

16. Power on the unit by flipping the on/off switch located on the back panel.

   The LCD panel will display “Initializing” while the grinding wheel stage rises.
17. Press ZERO (Figure 6).

![Figure 6. The ZERO button and the Zero on sample option.](image)
18. Use the ▲▼ keys to select **Zero on sample** on the LCD panel (Figure 6).
   The grinding wheel rises after zeroing to a height of 50 µm above the sample zero point.

19. Press **ZERO**.
   The wheel and stage will both turn as zeroing commences. Once the dimpling grinder is zeroed on the sample, the display will read **Raising wheel**.

**Dimpling the specimen**

These instructions assume a starting sample thickness of 100 µm as measured by a digital micrometer.

When dimpling is in progress, if the desired depth is reached and the process continues for more than 2 minutes without automatically terminating, manually stop the process and proceed to the next step. The piston supporting the dimple grinder head will not let it go beyond the desired depth, so if the metal wheel continues to rotate after the desired depth is reached, it does not result in the removal of any additional material.

**Advancing to -70 µm**

1. Lower the dimpling wheel.
2. Select DEPTH-BASED mode.
3. Select a depth of -70 µm.
4. START the process by pressing the button on the keypad.
5. If the initial depth reading is more than - 2 um when the advance stops, PAUSE and enter a new target that includes this value.
6. Set the GRINDING WHEEL SPEED knob and the SAMPLE ROTATION SPEED knob to your chosen values.
   A value on the extreme left of the scale is no motion and a value on the extreme right of the scale is the fastest motion possible. Positions of 40% of full scale are typical.
7. Add 3 µm diamond paste for ceramics or CBN paste for metals and 2 drops of diluent, water for ceramics and oil for metals. During the grinding process, monitor the platen surface; keep the surface wet, adding diluent as needed.
8. When the process stops and the wheel raises, lift the dimpling wheel from above the sample manually and lock the arm / drive mechanism in its upper position. Sample thickness should be 30 µm after this step.

**Advancing to -85 µm**

1. Add 1 µm diamond paste for ceramics or CBN paste for metals and 2 drops of diluent, water for ceramics and oil for metals. During the grinding process, monitor the platen surface; keep the surface wet, adding diluent as needed.
2. Carefully unlock the arm / drive mechanism and manually lower the dimpling wheel.
3. Select DEPTH-BASED mode.
4. Select a depth of -85 µm.
5. Resume dimple grinding.
6. When the process stops and the wheel raises, lift the arm / drive mechanism and lock it in position. Sample thickness should be 15 µm after this step.
7. Remove any excess polishing paste from the specimen by gently dragging a Kimwipe across the top surface.
8. Soak the sample and platen in acetone for more than 30 min to remove the sample undamaged.

Note: Until the zeroing feature is used again, the dimpling grinder will remember where it left off. Repeated timed steps with analysis in between do not require continuous zeroing.