

Fischione Model 1060 SEM Mill Procedure

1. Mount bulk samples on a 25 mm diameter Aluminum SEM pin-type stub using either double – sided carbon tape or Crystal Bond Type 509 ($T \sim 150$ degrees C). If a potted sample is to be ion milled it should be loaded into the dedicated sample holder with cylindrical cup and then the set screw should be tightened. Wafer samples can be clamped into the vise type sample holder using the dedicated loading station and centered. Note: The top surface of the sample must be plumb and level with respect to the particular sample holder for optimal results, and the area of interest must be centered.
2. Vent the load lock.
3. Swivel the load lock cover counter clockwise to reveal the sample stage.
4. Place the washer on the top of the sample stage, then insert the pin type sample holder.
5. Using a metric ruler, confirm that the distance from the sample stage to the top surface of any sample is < 17 mm. If this limit is exceeded the automatic laser targeting system may reject the sample and an error message will be displayed. Click “OK” and modify the sample geometry before continuing.
6. Create an ion milling program / recipe: 1. Step 1: Purge = 10 min., Step 2: Delay = 10 sec, Step 3: Milling = 1 hr or more. Select the number of ion sources, accelerating voltages, milling angles, rotation angle (usually 360 degrees). Select one ion source and ± 70 degrees rocking angle for cross-sections, with the sample loaded such that the interphase interface runs left to right and the substrate is closed to the operator.
7. For optimal ion milling uniformity, fill the dewar in the rear of the unit with liquid nitrogen so that it can act as an anti – contaminator. Note: Use face and hand protection, and pause if boiling occurs while filling.
8. Start the ion milling program.
9. After the ion sources begin to operate, open the sample chamber shutter and view the ion beams on the top surface of the sample. Reduce or increase the vertical offset by a few tenths of μm 's until the intensity and extent of the ion beam ellipses are maximized.
10. After the timer has reached 0, vent and remove the sample. Return the load lock cover to its original position and pump the load lock.