

## 4700 FESEM Operating Procedure

1. Fill funnel on the side of the SEM with LN<sub>2</sub> until you hear a high pitched squeal. On the column console of the SEM, place the “Obj. Apt.” switch in the “Degas” position for 30min. Then place it in the “Heat” position.
2. If computer is off, turn on computer using the “Display” and “EO Control” buttons, behind the left front door at the top, and log in under your user name and password. **DO NOT TURN OFF THE COMPUTER WITH THE COMPUTER ON/OFF BUTTON!**
3. Prepare your samples using gloves to handle the samples and sample holders. Be sure to set the sample and sample holder height with gauge. Make sure the sample holder base is in the correct position before inserting into the SEM.
4. Push the “Chamber” section “Air” button on the front right of the column console. This will allow air into the sample exchange chamber “Sample Exchange Chamber, SEC”
5. Turn on the Chamber Scope, located to the left of the SEM CRT.
6. **Do not use the sample exchange rod as a door handle.** Open SEC door, screw sample holder to sample exchange rod.
7. Close SEC door and hold closed, while pushing “Evac” button on the front right of the column console in the “Chamber” section.
8. Wait for “SEC” lights in the “Chamber Vacuum” section to show a green light at the top.
9. Write in the log book, your name, advisor and MoCode, time started, and the SEM current **Ip**, (ion pump) readings, located in the “Ion Pump Vacuum” section by rotating the knob to each **Ip** setting. Leave the knob at **Ip**<sup>3</sup> setting.
10. Rotate “MV1” (located on the side of the SEC), towards the ceiling, push the end of the rod until it releases and allow the vacuum to insert the sample onto the stage, watch on the Chamber Scope. When the sample stops, push it onto the SEM stage with the insertion rod.
11. Unscrew exchange rod and pull straight out. Close MV1 by rotating towards the floor.
12. Using the mouse and software set operating parameters for sample type and SEM examination.
13. Check Sample Chamber, SC vacuum,  $L \times 10^{-3}$  before turning on the HV, by clicking the “ON” button at the upper right of the SEM operating window.
14. Record in log book the HV readings, Vacc, Ie and Vext in the correct columns
15. Note the Vext. Reading of the last flash. If it is 1.2 kV higher than the last time it was flashed, then turn off the HV and flash. Record the Ie during the flash in the last column of the log book. Turn HV back on and record the new Vext readings in the log book.
16. Proceed with sample examination.
17. Save images in the correct month folder on the **D** drive.
18. When finished with the SEM examination, proceed with the **Shut Down Procedure**, and place restore **Default conditions**.
19. If problems arise with the operation of the 4700, i.e. software locks up, vacuum drops and HV shuts off, note all problems in the log book and leave instrument. Call Clarissa and leave a message. **Do not under any circumstances try to fix the problem!** Failure to operate the 4700 in the manner prescribed will result in your operating status being permanently revoked.

**Note: Sample types that are not for use in the FESEM are, magnetic sample, liquid or oily sample, some epoxy samples if they out gas, or any sample that will degrade the vacuum.**