

4700 FESEM Operating Procedure

1. Fill funnel on the left side of the SEM with LN₂~ 4 full funnels. On the column console of the SEM, place the “Obj.Apt.” switch in the “Degas” position for 30min, if you are the first user of the scope that day, then place switch in the “Heat” position.
2. Prepare your samples **using gloves to handle** the samples and sample holders. Set the sample and sample holder height with gauge and make sure the sample holder base is in the correct position before inserting into the SEM
3. Log in under S-4700 user name and “hitachi” password, if computer is off, turn on computer using the “Display” and “EO Control” buttons, behind the left front door at the top, and. **DO NOT TURN OFF THE COMPUTER WITH THE COMPUTER ON/OFF BUTTON!**
4. Push the “Chamber” section “Air” button on the front right of the column console. This will allow air into the sample exchange chamber “SEC”, Sample Exchange Chamber.
5. **DO NOT USE THE SAMPLE EXCHANGE ROD AS A DOOR HANDLE.** Screw sample holder to sample exchange rod.
6. Close SEC door and **hold closed**, while pushing “Chamber” section “Evac” button, on the front right of the column console.
7. Wait for “Sample Exchange Chamber” lights in the “Chamber Vacuum” section to show a green light at the top.
8. 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 Ip³ setting.**
9. Turn on the **Chamber Scope**, located to the left of the SEM CRT.
10. Rotate “MV1” (located on the side of the SEC), towards the ceiling, push the end of the rod until it releases, allow the vacuum to insert the sample onto the stage, watch on the **Chamber Scope**. When the it 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 open software and set operating parameters for sample type and SEM examination.
13. **Check Sample Chamber, SC, vacuum, L X 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. Save images in the current month folder on the **D** drive.
18. **Shut Down Procedure, while the HV is still on and in the “high mag mode”, go to File, Operating Conditions, select Shutdown.pm1 and click Load/Set and then Close, then turn off the HV. This will put the system in Default conditions except for the Degas switch and homing the stage.**
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 and contact Clarissa or leave a note. **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.