

4700 FESEM Operating Procedure

Use gloved hands to handle the samples and sample holders. Set the sample height with height gauge and make sure the sample holder base is in the **CORRECT POSITION** before inserting into the SEM.

1. If you are the first user for the day, place the “Obj.Apt.” switch in the “Degas” position for 30 min. then switch to the “Heat” position, SEM column console “Obj.Apt” section. **Do not have to wait to insert sample.**
2. Turn on the **Chamber Scope** and monitor, located to the left of the SEM CRT.
3. **INSERT SAMPLE**- Push the “Air” button in the “Chamber” section on the front right of the column console. This will allow air into the sample exchange chamber “SEC” (Sample Exchange Chamber).
4. Open the SEC door, **DO NOT USE THE SAMPLE EXCHANGE ROD AS A DOOR HANDLE.**
5. Push the exchange rod forward to expose the threads, screw sample holder onto sample exchange rod.
6. Pull exchange rod back, until the bottom guide rod is barely visible.
7. Close SEC door and **hold closed**, while pushing “Chamber” section “Evac” button.
8. Wait for “Sample Exchange Chamber” lights in the “Chamber Vacuum” section to show a green light at the top.
9. Log in computer with the S-4700 user name and “hitachi” password. If computer is off please see the AMCL staff. **DO NOT TURN OFF THE COMPUTER WITH THE COMPUTER ON/OFF BUTTON!**
10. Log your appointment in the log book: your name, advisor and MoCode, time started/ended, and the current Ip, (ion pump) readings, located in the “Ion Pump Vacuum” section of the column console by rotating the knob to each Ip setting. **Leave the knob at the Ip³ setting.**
11. Rotate “MVI” (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 to the stage, watch on the **Chamber Scope**. When the sample stops, push it onto the SEM stage with the insertion rod.
12. Unscrew exchange rod and pull straight out. Close MVI by rotating towards the floor, make sure the bottom of the MVI handle touches the door of the SEM stage.
13. Open software and set operating parameters for sample type and SEM examination.
14. Check **Sample Chamber, (SC) vacuum**, it will be $L \times 10^{-3}$ before turning on the HV.
15. Turn on the HV by clicking the “ON” button at the upper right of the SEM operating window.
16. Record in log book the HV readings, **Vacc, Ie** and **Vext** in the correct columns
17. **Note the Vext. reading of the last baseline flash. If it is >1.2 kV than the last baseline, 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 reading in the log book, circle the new baseline Vext.**
18. Proceed with sample examination. Save images in the current month folder on the **D drive**.
19. When finished with the SEM examination, proceed with the **Shut Down Procedure** and place system in the **Default Conditions**, go to **File, Operating Conditions**, select **Shutdown.pm1** and click **Load/Set** and then **Close**. Turn off **HT** and remove sample.
20. **Move images to the AMCL Research volume.**
21. 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 AMCL staff and 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.