

# Advanced Materials Characterization Laboratory

## Hitachi S-570 Operation Instructions for use with the LaB<sub>6</sub> Filament

### LOADING SPECIMENS

1. Make sure the WD control is in the **Exchange** (EX, two white boxes lined up) position, the **Tilt** is zero, the **Backscattered Electron Detector** is out, and the **SDD detector** is out.
2. Press the **Air Button** on the microscope column console.
3. When the chamber reaches atmospheric pressure, pull the stage out and place your specimen in the holder or exchange your specimen.
4. Push the stage back in and hold the door closed while pressing the **EVAC** button.
5. When the vacuum pumps start you can stop holding the door closed. If this is not done correctly there will be backstreaming of the pumping oil into the sample chamber and can contaminate your samples.
6. Wait until the **High Vac light** (green) on the gun airlock is illuminated to operate the SEM

### TURNING ON AND SEM OPERATION

1. Check that the **High Vac light** (green) on the gun airlock is illuminated.
2. Open the **Gun Airlock** by turning the black knob to the **Free position** (towards the back wall), pulling out the knob to the right until the second white line is visible on the throat, return the knob to the **Lock** position (towards opposite the wall). The words on the knob should be parallel with the floor.
3. Turn on the **Display power switch** on the bottom front of the microscope column console.
4. Using the **display menu and buttons** on the right console, select the **accelerating voltage** you will be using. Also select the working distance, then press **Enter** twice to return to the image screen
5. Make sure the **Filament control** is fully counter clockwise, off position.
6. Press the **Acc. Voltage On button** when the green light is illuminated.
7. Slowly (**one division every 30 seconds**) increase the filament control to its maximum clockwise position.
8. Check the gun bias meter to make sure the bias is not over **80 $\mu$ A**. Adjust the gun bias with the gun bias knob in the covered panel to the upper right.
9. Turn brightness knob to 12 o'clock, press the **Normal Scanning Mode** button to see an image on the CRT.
10. Adjust the **condenser lenses, aperture, and working distance** as necessary. (Be careful with going to short working distances that you will not hit any of the detectors!!!)
11. The recommended working distance with the **SDD EDS** detector is **20mm**. The detector should be rotated in to approximately **12.0 mm** with the crank on the end of the detector.

### TO TURN INSTRUMENT OFF

1. Slowly (**one division every 30 seconds**) lower the **Filament control** knob to zero (counter clockwise).
2. Press **AC voltage Off Button**
3. Close the Gun Airlock by turning the black knob to the **Free** position (towards the wall), pushing the knob in to the left until only one white line is visible, then returning the knob to the **Lock** position. The words on the knob should be parallel with the floor.
4. Lower working distance to the **Exchange position** and set **tilt** to zero.
5. Retract **Backscatter Electron Detector** and **SDD detector** if necessary.
6. Switch the stage lock switch to **FREE** if on.
7. Make sure the microscope is in the **Standard Conditions**.
8. Turn off the **Display power switch** on the bottom front of the microscope column console.

### UNLOADING AND EXCHANGING SPECIMENS

1. Repeat "Turning Instrument Off" instructions 1-6
2. Press the **Air Button** on the microscope column console.
3. When the chamber reaches atmospheric pressure, pull it out and exchange or remove specimens.
4. Push the stage back in and press the EVAC. The stage door should not be left open, this will cause longer pump down times.
5. Wait until the High Vac Light (green) on the gun airlock is illuminated to operate the SEM.