

PRECISION ETCHING COATING SYSTEM USER'S GUIDE



Mounting a Sample

1. Place the SEM holder on its stand
2. Load a clean stub/carrier into the recess of the holder
3. Mount the sample using an appropriate mounting paste.

Loading an SEM sample

1. Disconnect the Rotate Motor cable from the end of the sample holder
2. Toggle the Airlock Control switch to OUT
Caution: Do not depress the Vent button until the piston is fully retracted or venting of the complete chamber will occur.
3. Depress the Vent button momentarily.
Grasp the knob at the end of the sample holder and slowly pull it from the whisperlock.
4. Load sample
5. Align the notches on the knob to the mating guide pins on the rock drive.
6. Toggle the Airlock Control switch to the IN position.
7. Reconnect the Rotate Motor cable to the end of the sample holder.

Viewing a Sample

1. Toggle the Illuminator switch toward the front of the unit.
2. Toggle the switch toward the rear of the unit.

Etching SEM Sample

1. The targets must be retracted and the manual Shutter closed over the sample
2. Set Beam Energy and start Timer countdown.
Rotate the Beam Energy control of the panel to the 5 Kev position.
Set the HV Timer for 10 min.
Depress the Start/Stop buton to begin the Timer counting down.
Allow the Etching gun to run at this setting(with current > 100 μ A) fort he 10 min interval.
3. Adjust the Gas Flow control of the Etching gun to obtain a current of approximately 250 μ A
4. Switch on and set the Rock and Rotate controls to the desired setting.
5. Set the Timer for the actual etching time and start the Timer.
6. Open the manual Shutter and begin etching.
7. Close Shutter when desired etching time has elapsed.
8. Transfer the specimen into the Airlock position.
Disconnect the cable from the rotate motor and transfer the sample holder from its working position. By toggling the front panel Airlock Control switch to the OUT position.
9. Depress the Vent buton to vent the Airlock.
Upload the sample.

Coating SEM Samples

1. Targets must be retracted and the manual shutter closed over the sample.
2. Rotate the Beam Energy control on the front panel to the 5 kev position
3. Set the HV Timer for 10 min.
4. Depress the Start/Stop to begin the Timer counting down.
5. Once the voltage is displayed, adjust it to read 6.0 keV.
6. Allow the Coating guns to run at this setting fort he 10 min interval.
7. After the elapsed time, start the timer by depressing the Start/Stop buton.
8. Readjust thevoltage to read 10.0 keV
9. Allow both gun to run at this setting for about 2 min.
10. Adjust the current of each gun to about 425 μ A
11. Allow the guns to run at this setting fort he 10 min interval.
12. Establish that both guns are stable.
13. Switch off the guns using the Start/Stop switch on the HV Timer.
14. Insert the target assembly to working position and select the target.
15. Switch on and set the Rock and Rotate controls to desired setting.
16. Depress the ON/OFF rocker switch at the rear of the Film-Thickness Monitor.
17. Press the RESET button on the Monitor to clear the P FAIL message.
18. Rotate the Front-Entry probe 180° to the sensor position.

19. Adjust the Film thickness and film number on the Monitor.
20. Depress the STAR button.
This will zero the thickness display and prepare the Monitor input for thickness reading.
21. Depress the Start/Stop button for Timer countdown.
22. Open the Shutter over the sample
Rotate the Shutter knob CCW and begin coating.
23. Transfer the sample into the Airlock position.
24. Depress the Vent button to vent the Airlock.
25. Rotate the probe 180° to the Shield position.

Purging the Ion-Guns

All three guns cannot be purged simultaneously.

Note: Do not use Gas-Flow control (needle valves) to shut off gas to the guns. Use the Gas-Valve switches instead.

To purge the Etching gun

High voltage must be turned off when purging the gun and the Gas Selection valve rotated to ARGON position.

1. Toggle the Etching gun gas ON/OFF switch to ON
Adjust the Etching gun Gas- Flow control to obtain a vacuum reading about 1×10^{-4} Torr
2. Purge the gun for about 15 minutes.
Note: The high voltage must be turned off.
Adjust the gas flow in small turn increments and allow the current reading to stabilize between adjustments.
Purging should be continued until a gun current of $< 8 \mu\text{A}$ is obtained for maximum acceleration voltage 10 keV and the gas flow to the gun switched off.

To purge the Coating guns

1. Toggle the Etching gun gas ON/OFF switch to OFF
2. Toggle the Right Coating gun gas ON/OFF switch to OFF.
3. Adjust the Gas-Flow control of the Left Coating gun to obtain a vacuum reading of about 1×10^{-4}
4. Repeat steps 2 and 3 for the Right Coating gun.
Toggle both left and right gas on/off switch to ON and allow the guns to purge for 15-20 minutes.
Purging should be continued until a gun current of $< 8 \mu\text{A}$ is obtained with maximum acceleration voltage and the gas flow to the gun switched off.

Testing Purged Guns

1. Insert the sample holder into the Whisperlock
2. Set the Beam Energ control to 5 keV
3. Set the Timer for 10 minutes, depress the Start/Stop button to begin count down.

4. Read the beam current on the front panel.(manual shutter must be closed)
5. Readjust the beam energy 6.0 keV and allow the guns to run at this 10 minute interval to establish a stable operation temperature.
6. Readjust the Beam Energy 10.0 KeV , adjust the gas flow to maximize the gun current to about 425 μ A and run this setting 10 minute interval.
7. Turn off the Gas-Flow switch and observe the gun current is 3 or 4 μ A.