



Nanoscale Fabrication & Characterization Facility

Anatech Hummer 10.2 Users Guide



The Anatech Hummer 6.2 is a rough vacuum system, designed to coat samples in preparation for SEM electron beam analysis. The system uses argon gas as a process gas.

Au/Pd Sputter Operation Procedure:

- 1) Log into FOM.
- 2) The system should be off and vented to atmospheric pressure.
- 3) With the power button off open the lid and carefully remove the glass chamber.
- 4) Place your sample/samples on the bottom plate.
- 5) Replace the sputter glass chamber on the lower plate while making certain the seals are clean and aligned properly.
- 6) Gently lower the top plate onto the glass chamber while make sure all hoses and cables are clear.
- 7) Open the gas delivery valve to the argon tank and check that the delivery pressure is set to 5-6 psi.
- 8) Check that the process switch is set to "plate".
- 9) Set the voltage control to 0 volts.
- 10) Turn on the power switch. You should hear a beep and the lights should start to turn on.
- 11) Press the "vacuum" button to start the mechanical pump. You may have to press slightly on the chamber lid to initiate a seal.
- 12) Within a few seconds you should see the pressure begin to drop on the Torr display. At .099 the gas button will light.

- 13) Wait until the pressure reaches a minimum of .030 torr. If it does not reach the set point within 10 minutes contact support staff to trouble shoot the issue.
- 14) Allow the pressure to stabilize below .030 torr for 30 seconds and then press the "gas" button.
- 15) If necessary, adjust the gas control valve to set the desired pressure. .070 torr is ideal but anywhere from .05 to .08 torr is acceptable.
- 16) Using the attached rate chart, determine the amount of time necessary to get the desired thickness that you require.
- 17) Turn on the HV button and slowly adjust the voltage to 2400 volts. The current should be between 10-15 milliamps. If the current is not in that range, slowly adjust the gas pressure to maintain 10-15 milliamps at 2400 volts.
- 18) Once you have reached your desired thickness, turn the voltage to 0 volts.
- 19) Turn off the "HV" and the "Gas" buttons.
- 20) Press the "stop" button.
- 21) Shut off the power button and allow a few seconds for the system to reach atmospheric pressure.
- 22) Open the lid.
- 23) Remove the glass chamber.
- 24) Remove your samples.
- 25) Re-install the glass chamber and slowly close the top lid.
- 26) Log out of FOM.

Carbon Coater Operation Procedure:

- 1) Log into FOM.
- 2) The system should be off and vented to atmospheric pressure.
- 3) With the power button off open the lid and carefully remove the glass chamber.
- 4) Place your sample/samples on the bottom plate.
- 5) Replace the glass chamber (labeled carbon) on the lower plate while making certain the seals are clean and aligned properly.
- 6) Place the carbon top plate on the glass chamber.
- 7) Remove the gas supply hose from the sputter top plate and connect it to the carbon top plate.
- 8) Open the gas delivery valve to the argon tank and check that the delivery pressure is set to 5-6 psi.
- 9) Make certain the current control for the carbon unit is set to zero amps.
- 10) Turn on the power switch for both the carbon and the Hummer unit. You should hear a beep and the lights should start to turn on.
- 11) Press the "vacuum" button on the hummer unit to start the mechanical pump. You may have to press slightly on the chamber lid to initiate a seal.
- 12) Within a few seconds you should see the pressure begin to drop on the Torr display. At .099 the gas button will light.
- 13) Wait until the pressure reaches a minimum of .030 torr. If it does not reach the set point within 10 minutes contact support staff to trouble shoot the issue.

- 14) Allow the pressure to stabilize below .030 torr for 30 seconds and then press the "gas" button.
- 15) If necessary, adjust the gas control valve to set the desired pressure. .100 torr is ideal.
- 16) Using the attached rate chart, determine the amount of time necessary to get the desired thickness that you require.
- 17) Warm up the electrode tip by turning up the current to 5 amps for 10 seconds.
- 18) Turn it back to zero amps for 20 seconds.
- 19) Repeat steps 17-18 three times until the tip glows orange.
- 20) When the tip glows bright orange, increase the power until the tip starts to turn white.
- 21) Reduce the current until the tip is yellow.
- 22) Increase the current again white watching the current meter carefully. You should see the current drop when you are around 40 to 60 amps. When this happens, quickly reduce the current by 10 amps for the deposition.
- 23) When your desired deposition is complete, turn the current control to zero and turn off the main power switch.
- 24) Once the system vents, remove the gas delivery hose and re-attach it to the hummer top plate.
- 25) Remove the carbon top plate, glass chamber and your samples.
- 26) Re-install the sputter glass chamber and slowly close the top lid.

Log out of FOM.