

Start-Up Procedures

- ✓ Turn the cooling water ON (valve on the wall at the rear of the unit)
- ✓ Switch the main power shutoff on the wall behind the unit ON
- ✓ Turn the Vacuum Gauge ON
- ✓ Press the ROUGHING PUMP power switch ON
- ✓ Ensure the HIGH-VACUUM and ROUGHING valves are both closed
- ✓ Open the FORELINE valve completely
 - NOTE: Ensure the foreline pressure (TC 2) drops below 100 millitorr before continuing*
- ✓ Press the DIFFUSION PUMP power switch ON
 - NOTE: The Diffusion pump needs about thirty minutes to fully warm-up before use. During this time do not close the foreline valve as the pump oil will outgas*
- ✓ When the foreline falls below 10 millitorr the liquid-nitrogen cold trap may be filled via the valve at the right-rear of the unit. Stop filling when it overflows from the vent port (this only takes a minute)
- ✓ Open the VENT valve to admit air into the chamber
- ✓ Raise the chamber via the switch on the switch panel
- ✓ Load substrates and evaporant (see notes on this procedure)
- ✓ Turn on the Inficon XTM monitor and ensure the crystal is operating (Ensure XTAL is not lit or blinking)
- ✓ Close the chamber via the LOWER switch on the switch panel

Pump-Down Procedures

- ✓ Close the VENT valve
- ✓ Close the FORELINE valve
- ✓ Open the ROUGHING valve
- ✓ The chamber pressure, indicated on TC 1, will begin to fall. During rough pumping you MUST monitor foreline pressure using TC 2 to ensure it stays below 75 millitorr. If it rises above this level close the ROUGHING valve and open the FORELINE valve to reduce foreline pressure. When the foreline pressure is below 10 millitorr again, close the FORELINE valve and open the ROUGHING valve to continue rough pumping the chamber
- ✓ If the cryotrap has not been filled yet, fill it now (during Rough pumping)
- ✓ Rough pump the chamber to 1 millitorr. This may take a while depending on the cleanliness of the chamber. Be patient, there is no way of rushing this.
- ✓ Close the ROUGHING valve
- ✓ Open the FORELINE valve
 - Opening the HIGH-VACUUM valve must be done slowly as follows to prevent backstreaming which contaminates the chamber, the work, and damages the pump components ...*
- ✓ Slowly open the HIGH-VACUUM valve while watching the foreline pressure (TC 2). At about two turns counter-clockwise the foreline pressure will rise. Open the HIGH-VACUUM valve only enough to keep the foreline pressure below 60 millitorr. If the foreline pressure rises above 60 millitorr, close the valve slightly. In less than one minute the chamber pressure (on TC 1) will fall below measurable limits and the foreline pressure will fall again. Continue to open the HIGH-VACUUM valve until the foreline pressure does not rise again and then open it full counter-clockwise.
- ✓ Turn ON the ion gauge by pressing the FILAMENT ON button for a few seconds until the emission (EM) lamp lights then read the pressure on the LOG scale
- ✓ Pump the chamber to the limits of the system (Below $5 * 10^{-6}$ torr). This usually takes less than 10 minutes
- ✓ Do not run the ion gauge more than a minute at a time. Press FILAMENT OFF to turn the gauge off

Evaporation Procedures

- ✓ Set the filament control (the variac) to ZERO
- ✓ Select a filament (1-4) using the control under the gauges
- ✓ Press the FILAMENT ON switch on the switch panel
- ✓ Regulate current using the filament control (variac). Most filaments require a setting of between '30' and '40' on the control
- ✓ When using a filament which is 'fresh' or has been exposed to atmosphere be sure to close the shutter and outgas it gently first then open the shutter to begin the deposit
- ✓ When complete, close the shutter and shut off the filament
- ✓ Turn the FILAMENT ON switch off and select filament zero (0)

Opening Procedures

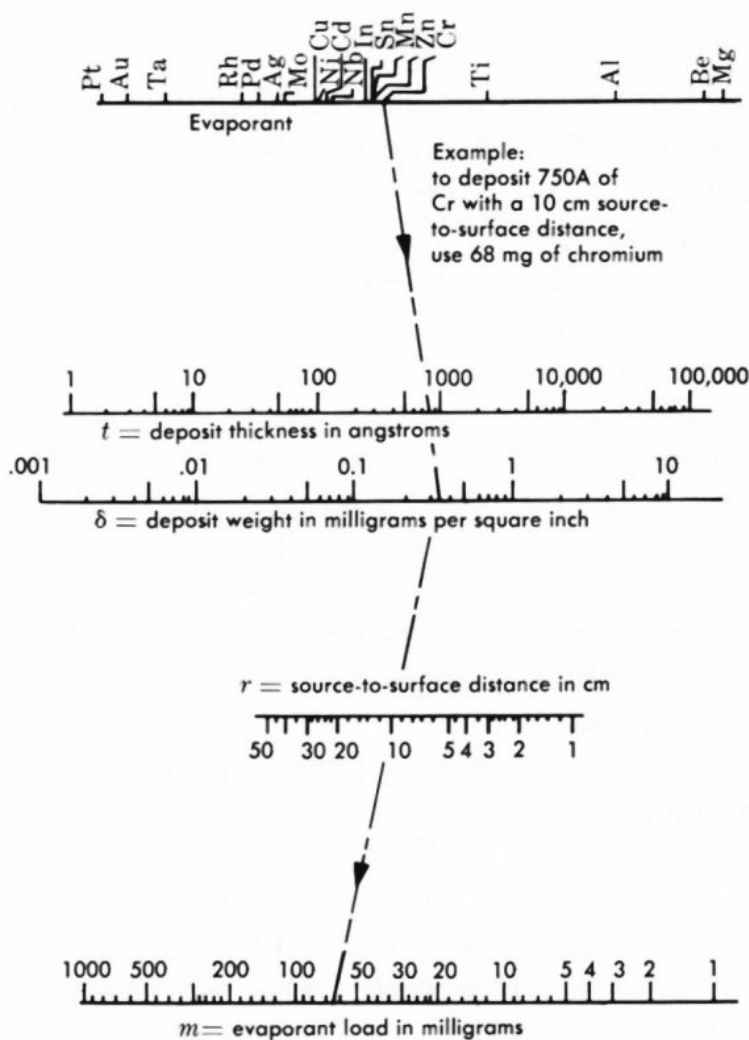
- ✓ Close the HIGH-VACUUM valve. Ensure it is completely closed (it is stiff)
- ✓ Leave the FORELINE valve open
- ✓ Open the VENT valve. Watch TC 2 (Foreline Pressure) to ensure it does not rise – if it does the HIGH-VACUUM valve is not fully closed!
- ✓ Wait until the chamber is back at atmospheric pressure (about two minutes) then raise the chamber

Shutdown Procedures

- ✓ Turn off the DIFFUSION PUMP power switch
- ✓ Leave the FORELINE valve open and the roughing pump ON until the diffusion pump to cools (about 30 minutes)
- ✓ Close the FORELINE valve
- ✓ Open the ROUGHING valve and pump the chamber below 100 millitorr (**Never** leave a chamber at atmospheric pressure for long periods)
- ✓ Close the ROUGHING valve
- ✓ Shut off the roughing pump and turn off the MAIN SUPPLY on the wall behind the unit
- ✓ Turn off the water supply

Filament Loading Procedures

- ✓ Use the nomograph to predict the quantity of evaporant required based on the material, source-to-substrate distance, and desired thickness as per the example.



- ✓ For aluminum, hang horseshoes on the filament as required using tweezers. Each horseshoe weighs exactly 29.9mg. Always add one extra.
- ✓ For Na_3AlF_6 press the powder into the helix until full. Put a cleanroom rag under the filament to catch any excess and change gloves when done: this material is toxic.
- ✓ For MgF_2 fill an Al_2O_3 crucible with about two chunks of the material and place the crucible in the basket filament.