3-Gun Sputter System

You may use the sputter system after receiving training. Reserve the system in Coral and check with the facility staff to make sure the proper targets are in place each time you wish to do a deposition. Fill out a log sheet and enable/disable in Coral each time you perform a deposition. When you finish, the system should be left in the fully pumped state.

To load substrates and pump down:

1) If necessary, turn the ion gauge off (see full step-by-step attached to unit).
2) Close the gate valve by flipping the appropriate toggle on the control panel down.
3) Open the vent valve (manual valve with black knob) and winch the lid to slight tension.
4) When venting is complete, close the vent valve and winch the lid fully open.
5) Verify that the desired targets are in place and the magnet board is correct. For listed tooling factors to be valid, position the guns at the proper heights, with the etched mark 4.75" above the knurled collar (4.25" above the locking collar if one is in use). Any gun not in use should be covered with a blank target.
6) Change the quartz crystal if necessary (can fail above 10% - press XTAL on Inficon QCM controller to check).
7) Place your substrate(s) on the appropriate stage.
8) Move the stage shutter into the closed position (i.e. over the stage).
9) Close the lid in the proper orientation and make sure it is seated properly.
10) To pump out the chamber:
    a. Flip up the control panel toggles to turn on the rough pump and then open the roughing valve.
    b. Wait for the pressure to reach 2 torr (as read on the CG1 line; this takes about 1 1/2 minutes).
    c. Close the roughing valve and turn off the roughing pump by flipping the two toggles down.
    d. Open the gate valve by flipping the appropriate toggle on the control panel up.
11) Pump for an appropriate time before sputtering ($P < 10^{-5}$ torr as indicated by turning ion gauge on).
12) If necessary, turn on stage heater and/or rotation (see back side for specific procedures).

To sputter:

1) Connect appropriate power supplies to gun(s) to be used.
2) ***Make sure water is flowing to the guns***; if necessary, open the cooling water master valve to begin flow.
3) Turn off the ion gauge.
4) Reduce the aperture of the gate throttle array by flipping the "Pump Array" switch to ACTIVE.
5) On the mass flow controller, flip Argon (Channel 2) toggle to the middle position (set point operation). With the far right knob set the channel 2, flow will be indicated on the display (reading = flow in sccm). Activate other gas channels (nitrogen on channel 1, oxygen via separate input assembly) as needed for reactive processes.
6) If necessary, adjust the throttle array micrometer to set the desired sputter pressure (as read on the CG1 line; apply gas corrections as necessary as indicated by the table attached to the gauge).
7) Program the film density, z-ratio, and tooling factor into the Inficon QCM controller. (See notes on back.)
8) Program and activate the appropriate power supply (specific instructions on back) to begin sputtering, and pre-sputter the target as necessary.

   NOTE – In order to prevent the viewport from becoming coated, do not leave the viewport shutter open for more than a few seconds at a time while sputtering is active.

9) When pre-sputtering is complete, open the shutter and zero the total thickness reading on the monitor by pressing ZERO (not the numeral 0).
10) When desired film thickness is obtained, deactivate the power supply.
11) If multiple film layers are required, close the stage shutter and repeat steps 7-10 for each subsequent film.
12) Turn off sputter gas flow and open the gate throttle to return to base pressure. Turn on ion gauge if desired.
13) If applicable, turn off the heated or rotating stage and wait for the stage to cool.

To remove substrate(s), vent by repeating steps 1-4 above, and then pump down by repeating 10-11.