

Instructions for Prepping an Orange Cryostat

Pumping Vacuum Jacket

1. Connect a turbo pump to the vacuum valve and pump down to the mid 10^{-5} torr range. If the cryostat has recently been in use and not experienced any problems, you can skip this step.

Purge the Helium Reservoir and Sample Well

If possible, the sample stick should be in the cryostat before this step is begun.

1. Connect the rough pump to the helium exhaust port, start the pump and open the red valve and the warm valve.
2. Turn the blue 3-way valve down. This makes the reservoir and sample well common and allows you to pump both through the helium exhaust port.
3. Pump the volume down to 3-4mbar, then close the valve to the pump and open the valve to the helium gas.
4. Do it three times, ending with 3-5 psi (above the atmospheric pressure) of helium gas in the cryostat.
5. Close the blue 3-way valve (horizontal), the red exhaust valve, and the warm valve. Disconnect the rough pump.

Fill with Cryogens

1. It takes about 20L of Helium to fill a standard (short) 50 or 70 mm cryostat and about 30-35L to fill the larger models (DCS, MACS, HFBS, ICE).
2. Start by filling with liquid helium through the helium fill port. Also make sure the helium exhaust port (red valve) is opened. Open the cold and warm valves slightly.
3. Once the helium is going, fill the nitrogen jacket through any of the three ports.
4. Helium is collecting in the cryostat once a thick white plume is visible at the exhaust port. The helium reservoir is full when this plume suddenly becomes much more intense.
5. After you have put away the transfer line, close the helium fill port and the helium exhaust port on the cryostat.

Cooling Down

1. Connect the sensors to a temperature controller. The cryostat and sample stick sensors are Cernox ones (some old sensors can be Silicon Diode type). The calibration curve for the cryostat and sample stick sensors are written on the top side of the cryostat and on the top flange of the stick, correspondently.
2. To cool down to 4.2 K relatively quickly, use the cold and warm valves. The cold valve should be opened about a half turn, while the warm valve should be opened several turns. Watch how quickly the temperature falls and vary the valve settings to cool as quickly as possible.
3. To cool below 4.2 K, or to cool very quickly, use one of the large roughing pumps (Kashiyama NeoDry 30E is preferred pump). Connect it to the annulus, **close the warm valve**, and either close the cold valve or leave it very slightly open. Then start the pump.