

Guideline for Liquid Helium Transfer



1. Check for signs of problems with the dewar (e.g. frost or condensation on the top or sides)
2. Check to make sure there is no damage on the threads on the fitting on the Transfer Valve V-1.
3. Verify that the transfer line has been pumped out recently by checking the date on the checklist, which should be posted nearby. Pump-out should be done bi-monthly. Vacuum must be good to ensure efficient transfer.
4. If the transfer line has special fittings to prevent ice from being pulled into transfer line, make sure the fittings are hand-tight.
5. Check that the compression fittings are mounted on the transfer line.



6. Wear safety glasses or goggles along with a face shield, cryogenic gloves, long sleeves (or lab coat) and pants.

Caution: the valves should not be left open any longer than necessary to prevent air ice buildup at the bottom of the dewar or cryostat

7. Make sure the storage dewar is vented by standing to the side and slowly opening the Vent Valve (V-2). Wait until the exhausting Helium gas is no longer noticeable before closing (condensation cloud subsides).
8. Close the Low Pressure Relief Valve V-3.
9. The transfer line may be purged with Helium gas. If so, after purging keep both ends pointed down to prevent Helium being displaced with air.
10. Open the top Transfer Valve V-1 and slowly insert the transfer line into the dewar. If the transfer line does not go in easily, do not force it. There may be a mechanical malfunction of the Transfer Valve, and the dewar should be returned to the vendor.



11. To pressurize the storage dewar either:
 - a. close the Vent Valve V-2 to build pressure or
 - b. If the storage dewar will be pressurized by an outside source (gas bottle) of Helium, purge the source line from the gas bottle, then connect it to the Vent Valve port and open Vent Valve V-2.*



*Note that the use of an outside source should be avoided if possible. Most sub-40 liter transfers can be done without external pressurization if:

- i. The timing of the storage dewar pressurization is right
 - ii. The transfer line pre-cooling is correct.
12. Wait for cold gas, then white-ish gas, then a few drops of liquid to come out of the other end of the transfer line.
 13. On the instrument/cryostat to be filled, open the Helium fill port, ensure the relief valve is open, and insert the transfer line.



14. Tighten the fittings on both connections.
15. If the pressure in the dewar gets too high for the instrument being filled, open the Vent Valve V-2.
16. When transfer is complete,

- a. Close the Vent Valve V-2 and disconnect the outside Helium gas source if used.
 - b. Make sure the area in front of the Vent Valve V-2 is clear, and slowly open it to relieve pressure.
17. Keeping the fittings on the transfer line (to avoid damage to the O-ring), slowly remove the transfer line by pulling it *straight* out of the storage dewar and cryostat. Avoid any bending of the transfer line as this may cause damage.
18. Close the Transfer Valve V-1, and Vent Valve V-2, and open the Low Pressure Relief Valve V-3 for storage.
19. When the transfer line has warmed to room temperature, the fittings can easily be removed, and the assembly may be handled without PPE.