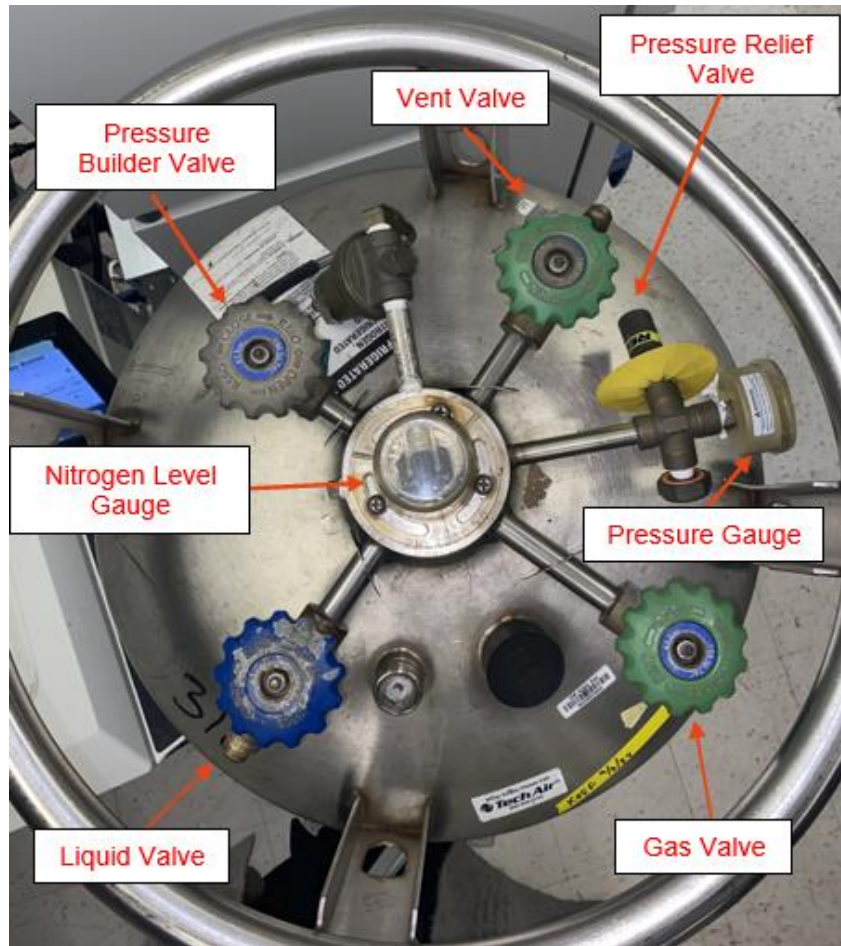


# Liquid Nitrogen Transfer: Technical Guide & Best Practices



Overhead view of liquid nitrogen tank



**Pressure Gauge.** All low-pressure tanks for liquid nitrogen dewar filling are 22 PSI. However, it is acceptable for the tank to be between 15 and 22 PSI for liquid nitrogen withdrawal.



**Nitrogen Level Gauge.** Shows how much nitrogen is left in the tank.



**Liquid Valve.** This is the only valve that should be used during liquid nitrogen transfers into dewars. Each valve is identified with a metal tag (as pictured) or a sticker.

### Other Valves:

**Gas Valve** – Only used in high pressure tanks (230 PSI) to withdraw gaseous nitrogen. **Never** use for liquid nitrogen transfers.

**Pressure Builder Valve** – If pressure gets too low (under 15 PSI), open pressure builder valve for 30 minutes at a time to increase pressure.

**Pressure Relief Valve** – Will open automatically and release pressure if the tank is over 22 PSI.

**Vent Valve** – if the pressure is too high for the pressure relief valve to correct, open the vent valve to vent out some of the gas.

If any of the valves or the pressure gauge is not working, contact Air Gas. **Do not tamper with the valves.**

### Before the Transfer:

- Ensure transfer is done in a well ventilated area, **never** in an enclosed space (e.g., closet)
- Wear proper lab attire (lab coat, long pants, shoes that completely cover feet) and PPE (chemical goggles, face shield, cryogenic gloves)
- Ensure the phase separator (see image below) is attached to the nitrogen hose. It allows for a steady stream, reducing splashing of nitrogen. Without the phase separator, liquid nitrogen will pour out erratically which leaves a higher chance of causing burns.

### Transfer Procedure:

1. First connect the hose to the liquid valve by hand. If aligned properly, there shouldn't be any resistance when hand tightening the nut. If there is resistance, stop and reposition the hose. Forcing the hose can ruin the threads and may result in an improper seal and nitrogen leakage.
2. Then put on your gloves and use an adjustable crescent wrench (other wrenches can damage/dull the ridges on the nut) to fully tighten the nut.
3. Insert the hose into the dewar. Continue to hold the hose as you slowly open the liquid nitrogen valve.
4. Keep an eye on the dewar to make sure you are not filling too much nitrogen.
5. When you are done filling the dewar, close the liquid valve and then slowly lower hose to the ground. **Careful!** Dropping or throwing the hose to the ground can result in breaking the phase separator.
6. Close the dewar.
7. Leave the hose attached to the tank for 30 minutes. After 30 minutes, if the hose is still frosted, leave for another 30 minutes. Once the hose is warmed up to room temp and no longer frosted, use crescent wrench to loosen the nut and remove the hose from the liquid valve.



*Adjustable  
crescent wrench*



*Phase Separator*

For any technical difficulties with the nitrogen tank, contact Airgas at (914) 949-5151



*Cryogenic Liquid – Liquid  
Nitrogen Fact Sheet*