

Standard Operating Procedure for Filling a Liquid Nitrogen Dewar - (specific for the equipment in Chemistry)

Note: When filling a liquid nitrogen (LN2) Dewar, the **doors must be open at all times** to prevent asphyxiation from the gas displacing the oxygen in the room.

ALARM: IF AT ANY TIME YOU HEAR OR SEE THE OXYGEN SENSOR ALARMS SOUNDING PLEASE LEAVE THE AREA IMMEDIATELY AND CONTACT 911 FOR ASSISTANCE.

PPE Required: *Items listed below are in the PPE bin located on the door*
Gloves:

- blue leather gloves - use for incidental splash contact
- cryogenic gloves - use when direct contact with liquid nitrogen or equipment/items that have been chilled to liquid nitrogen temperature. These are available through Jim Farmer or Mike Dimauro upon request.

Eye Protection: Safety glasses **and** face shield

Additional: Closed toed shoes, long pants, long sleeves or lab coat.

Equipment:

Use only equipment approved for cryogenic liquids. Always ensure that relief valves are not clogged or blocked.

Procedure: **To transfer liquid nitrogen you must:**

- 1. have attended the Keen liquid nitrogen training session***
- 2. be supervised the first time few times you fill a dewar***
- 3. always have two people***
- 4. remove cart from aisle way out to the hallway so that egress is not limited***

Please contact your supervisor or Jim Farmer (2545) or Mike Dimauro (2461) for assistance.

To Connect and Fill Dewar:

1. Ensure all valves on dewar are closed before starting.
2. Reposition the 160 ltr (tall) LN2 Dewar so that Liquid Port (with liquid tab) is facing the main LN2 filling line.

3. Securely attach metal hose to Vent port on the 160 ltr LN2 and then place the opposite end of the hose into the exhaust to vent to the outdoors. If the hose is not attached already attached to the vent port make sure just finger tight. Use wrench to tighten to 1/8" of a turn. (Do not over tighten or you will have trouble disconnecting the line).
4. Take main filler line metal hose and attach to Liquid port on 160 ltr LN2. Make sure just finger tight. Use wrench to tighten to 1/8" of a turn. (Do not over tighten or you will have trouble disconnecting the line).
5. Close yellow handle on the main LN2 filler line (counter clockwise pointing parallel with the external building wall).
6. Open the liquid tap on the 160 ltr LN2 Dewar a few turns.
7. Push the timer button located above the inlet line to start the 10 minute flow timer for the LN2.
8. Turn red handle on the main LN2 filler line to flow position (counter clockwise so that it is parallel to external building wall).
9. Open the vent tap on the 160 ltr LN2 Dewar all the way.

To Disconnect Dewar:

1. When LN2 begins to come out the vent hose into the exhaust, close red handle on LN2 filler line (to point towards external building wall).
2. Push the timer button to stop the 10 minute flow timer for the LN2.
3. Close the vent and liquid taps all the way on the 160 ltr LN2 dewar and **immediately** conduct #3.
4. **Slowly** (to prevent excess LN2 from coming out) open yellow handle on Liquid Nitrogen filler line to release pressure in line.
5. Wait about 1 minute to remove the metal hoses from the Liquid port and from the vent port on the 160 ltr LN2 Dewar.

6. When moving the 160 ltr LN2 Dewar the relief valves are located on the far side of the Dewar to prevent LN2 from pouring out.

Exposure: In the case of cold burns (frost bite):

Eye: Flush eye with cold water for 15 minutes and contact 911 for assistance

Skin: Flush affected area with cold water for 15 minutes and contact 911

Inhalation: Remove victim from area to fresh air if it is safe to do so and contact 911

Spills: In the event of an accidental release the rapid expansion of liquefied gases will displace oxygen, posing an asphyxiation hazard.

Minor spills - (a few drops) Alert others and leave area immediately. Contact your supervisor and the Departmental Chemical Hygiene Officer (Dr. Bulkowski x2467).

Major spills -

1. Alert others
2. Leave room and building immediately
3. Activate the **red emergency stop button** located:
 - inside the fill room or
 - on the wall outside of the fill room on the right side by exterior door
4. Pull the building alarm to evacuate
5. Exit building out the door directly outside the fill room

Emergency/Contact numbers:

Public Safety 911

Department of Occupational Health and Safety x8475

Chemical Hygiene Officer Dr. Bulkowski x2467

Jim Farmer x2545

Mike Dimauro x2461