Liquid Nitrogen (LN2) Safety Guidelines

1. Only trained personnel are allowed to fill 160-L Dewars from the 5700-L stationary tank located in the DBH loading dock. “Trained personnel” refers to faculty, staff, and students who need to fill 160-L Dewars on a weekly basis, have watched the liquid nitrogen safety video, AND have participated in a hands-on demonstration on how to fill a 160-L Dewar using the stationary tank. For training, contact the Chemistry/Biochemistry Department at 657-278-3621, or the Safety Trainer at 657-278-7233.

2. Trained personnel must follow the Standard Operating Procedures (SOPs) when filling 160-L Dewars. SOPs are located in the storage cabinet within the gated area, adjacent to the stationary tank.

3. Only 160-L Dewars may be filled using the 5700-L stationary tank.

4. A minimum of two general-purpose 160-L Dewars (with carts) will be kept in DBH-161A and DBH-143. They are to be used to fill smaller Dewars only. The 160-L Dewars are NOT to leave their respective rooms, except for filling the NMR Dewar and to be refilled. Immediately after filling, the large Dewar cart should be returned to DBH-161A and small Dewar cart to DBH-143.

5. Users/departments wishing to have 160-L Dewars in their labs will have to lease or purchase their own Dewars.

6. Keys to the fixed storage tank must be ordered through the Chemistry/Biochemistry Department. Keys will only be issued to “trained” faculty, staff and students. A key will be issued to one of the trained students as a “research group key”, but available for each to use assuming all of the research students are trained. This student is responsible for returning the key to the department upon leaving the research group; the key will then be issued to a new trained student within the group. The “research group key” should be closely monitored and stored away so that other people walking into the lab do not have ready access to the key.

7. The Chemical Stockroom (DBH-242) is responsible for keeping the general purpose 160-L Dewars filled, monitoring the level and pressure of the stationary tank, and placing orders for the stationary tank to be refilled.

8. Please alert the Chemical Stockroom: if the LN2 level of the stationary tank drops below 25 inches, or if your LN2 usage will increase or decrease significantly. Any questions or problems should be addressed to the Chemical Stockroom, or the Chemistry/Biochemistry Department (MH-580).

9. In case of emergencies, the blue emergency phone outside the DBH loading dock area can be used. To get in touch with the LN2 stationary tank company in case of an emergency, call the SO-CAL phone number located on the fixed storage tank: 213-564-5711.

10. Always use a 4-wheel cylinder cart to move LN2 Dewars.

11. While filling the 160-L Dewars, discourage unauthorized observers.
12. When filling the 160-L Dewars, utilize the “buddy system” if possible, or let someone in your research lab know what you are doing and where you will be.
13. When filling 160-L Dewars, you should wear clothes that minimize skin exposure, thus reducing the likelihood of burns to the skin.
14. Required personal protective equipment (PPE): face shield, safety eyewear underneath face shield, cryo-apron, cryo-gloves (or leather gloves), hearing protection, lab coat, and closed-toe shoes.
15. In the event that the LN2 Dewar tips over, slowly raise to vertical position and immediately open vent valve. Inspect Dewar for damage. If Dewar is damaged, do NOT use.
16. Do not hold the vessel with unprotected hands while filling. Liquid nitrogen can cause terrible "burns." (Death of living tissue caused by the extreme cold.)
17. Do not store container(s) of LN2 in a cold room or any other location where a person could physically enter an anoxic atmosphere. (Cold rooms have no air changes and a person entering a room with elevated nitrogen in the air can quickly pass out and then die within several minutes of entering.
18. Remove metal jewelry/watches on hand and wrists.
19. Asphyxiation -- nitrogen is not poisonous; the air is already about 78% nitrogen (oxygen makes up about 21%, and trace gases the remaining 1%). However, if sufficient liquid nitrogen is vaporized so as to reduce the oxygen percentage to below 19.5%, you are at risk of oxygen deprivation. Rapid venting can cause near-total displacement of normal air, leading to a local concentration of about 100% nitrogen. Simple asphyxiants such as nitrogen do not have good warning properties! (You might not feel "light-headed," you may simply pass out without any warning whatsoever. And then die without regaining consciousness.). Never enter elevators with a full tank of liquid nitrogen.
20. Steel toed shoes/boots are recommended when transporting large Dewars.
21. For transport of large nitrogen Dewars outside -- over pavement, sidewalks, wheelchair curb-cuts... -- a 4-wheel tipcart should be used. The casters welded to the tank, and/or the casters on the trolleys in common use, are not meant for transport over pavement and concrete. While enroute, exercise great care and stay completely clear of sewer grates, large cracks, uneven portions of pavement, and any other hazards which could catch a cart wheel and cause tipping.
22. In case of a large liquid nitrogen leak:
   a. Try to safely shut-off the outlet valve (painted green) on the 5700-L stationary tank. An emergency shut-off valve (also painted green) is located underneath the tank and is labeled “Emergency Shut-Off”
   b. Isolate the area
   c. Get away and deny access
   d. Notify the Chemical Stockroom, Safety Office, or University Police for assistance
23. In case of exposure or burns:
   a. Immediately place exposed area in warm water until you receive medical attention
   b. Notify the Safety Office or University Police immediately
c. Get medical attention

**IMPORTANT CONTACTS**

- Chemical Stockroom (657) 278-3509
- Chemistry/Biochemistry Dept. (657) 278-3621
- Safety Office: (657) 278-7233
- University Police (non-emergency) (657) 278-2515
- University Police (emergency) 911
- SO-CAL Company (213) 564-5711