



CRYOLIQUIDS: SAFETY RULES

1. Never refill Dewars or transfer cryogenic liquids alone!
2. Make sure that there is good ventilation. Open a door and/or a window!
3. Remove watches, rings and other metal jewelry on hands and wrists
4. Wear required **Personal Protective Equipment (PPE)**. In general the following PPE is the minimum acceptable:

a. Cryogenic gloves.

b. Lab coat with sleeves pulled over cuffs of cryogenic gloves.

c. Full length cuffless pants that extend over shoes tops.

d. Closed-toed shoes that are impervious to liquids, such as leather, or covered with liquid proof shoe covers/spats.

e. Safety Glasses or Chemical Splash Goggles and a Full Face Shield.



5. Use Dewars rated for the cryogen being transferred.
6. Dewars larger than 20 Liters will be lifted and poured by two people.
7. Never use a funnel as during overflow cryogenic liquid may be propelled upward.
8. Ensure the receiving vessel is dry.
9. The receiving vessel must be raised so the delivery tube is immediately above the mouth of the vessel (i.e., the cryogenic liquid should never be allowed to fall through air to reach the receiving vessel). Use a table, cart or other mechanical means to position the vessel in the proper location. Never hold the vessel with unprotected hands while filling.
10. To reduce thermal shock, first cool the receiving vessel by dispensing a small amount of cryogenic fluid then continue the dispensing process. Delivery should be conducted slowly to minimize splashing, spilling and thermal shock to the receiving vessel.



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11. Do not move or bend the fill tube during filling.
12. Stay out of the vapor pathway during dispensing.
13. **Do not leave a filling operation unattended.**
14. Only use approved materials with cryogenes. Unapproved materials (such as plastic, rubber, wrought iron, hollow tubes, and carbon steel) will become brittle and shatter, or in the case of hollow tubes become over pressurized.
15. Periodically inspect equipment and remove ice and frost blockages from openings to prevent over pressurization.
16. **Do not tamper with pressure relief valves. Report any leaks or improperly set relief valves to the manufacturer.**
17. When manually pouring liquid into a smaller Dewar, assure that the secondary container is secured, pour slowly to prevent excess splashing, and do not overfill.
18. **BE SAFE!!!**