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## Work Practice Controls When Using Cryogenic Liquids

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- Do not put your head inside a liquid nitrogen freezer or other enclosed space containing a cryogen. Never allow people to travel in an elevator with cryogenic liquids.
- Do not use hollow rods or tubes as dipsticks. (When a warm tube is inserted into a cryogen, liquid will spout from the top of the tube.)
- When retrieving cryopreservation vials that have been stored in liquid nitrogen, raise the vials out of the liquid phase and store them in the gas above the liquid for 24 hours to allow any trapped liquid nitrogen to escape. After this period, the vials may be removed. Retrieving these vials directly from the liquid phase may cause the vials to rupture if liquid nitrogen has become trapped inside. This may expose the employee to flying bits of plastic, biological specimens or cryoprotective agents (such as dimethyl sulfoxide) that were in the vial.
- Check the liquid levels of Dewars regularly. If the liquid evaporates more rapidly than normal, the Dewar may be losing its vacuum.
- Follow the [SOP for asphyxiants](#).

### Personal Protective Equipment (PPE)

- Wear loose fitting cryogenic gloves, safety goggles, face shield, lab coat, long pants and closed toe shoes when handling and transporting cryogenic materials.
- Lab coats should be knee length and have no pockets or cuffs to catch the liquid.
- Pants should not have cuffs and should be long enough to go over the shoe or boot.

### Transportation and Storage

- Never store cryogenic liquids or dry ice in walk-in cold rooms.
- Use and store liquid hydrogen and helium away from flammable materials and ignition sources. (These gases can condense oxygen out of the air, creating a localized oxygen enriched environment.)
- For liquid helium and hydrogen storage systems, check the pressure relief and inspect the system for leaks regularly.
- These gases are cold enough to solidify atmospheric air; leaks in storage systems for these gases may become plugged with solidified air. If the pressure relief device becomes plugged, the container may over-pressurize and fail.
- Use and store liquid oxygen away from open flames. Post a “No Open Flames” sign in liquid oxygen storage areas.
- Store and transport cryogenic materials only in Dewars or cryogenic liquid cylinders designed for that particular cryogen. Inspect Dewars daily to insure that no air or ice plugs exist in the neck openings.
- Cryogens may be transported in elevators only in containers certified to leak at less than or equal to 1 liter of liquid (or 1 kilogram of solid) per day. Never allow passengers to travel in an elevator with cryogenic liquids.

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## **Waste Disposal**

If a cryogen (such as dry ice) has been mixed with a liquid that would normally be disposed of as hazardous waste (such as alcohol, as in a cold trap), follow disposal procedures for that liquid. Cryogens must not be dumped into sinks, as the thermal shock is likely to damage the sink and/or the plumbing.

As the unneeded cryogen is evaporating, good ventilation is essential to prevent hazardous air concentrations of the gas.

Do not put unneeded cryogen in a sealed container, as the build-up of pressure could cause an explosion.