

# DOHS Fact Sheet on Cryogen Safety

National Institutes of Health • Office of Research Services (ORS) • Division of Occupational Health and Safety (DOHS) • Technical Assistance Branch (TAB)

**Cryogenic liquids (e.g. nitrogen, helium, carbon dioxide, oxygen and argon) and compressed gases may be used in laboratories and other locations for various applications and work procedures. Due to its low temperature property, working with a cryogen can be hazardous.**

## Guidelines for safe usage of cryogenic liquids:

- Always store cryogenic liquids in well-ventilated rooms. Cryogenic liquids need to release pressure as they boil off over time.
- Only use manufacturer-rated containers which are specifically designed to hold cryogenic liquid. These containers should be insulated, impact resistant, have handles (or secondary tray), and a loose-fitting lid.
- Always wear appropriate PPE when handling cryogenic liquids. This includes: cryogloves, close-toed shoes, long pants, and safety goggles. When dispensing cryogenic liquids into an open container, face shields must be worn in addition to the PPE listed above.
- Never leave the area unattended during the manual filling of cryogenic liquid in dewars.



- Cryogenic liquids should be stored in the upright position. Avoid rolling containers (either vertically or horizontally), as this may cause pressure buildup and explosion. For moving cryogenic liquid cylinders, always use a specifically designed cylinder cart.

- Signage may be posted near cryogenic storage freezers, compressed gas storage areas, and cryogenic liquid dispensing stations to remind users of appropriate PPE and safe work practices. Examples of such signs may be found at this QR code:



- The rapid release and evaporation of cryogenic liquids can create hazardous environments (i.e., oxygen deficiency). The Occupational Safety and Health Administration (OSHA) specifies that a hazardous atmosphere may include one where the oxygen

concentration is below 19.5% or above 23.5%. Please contact the DOHS Oxygen Monitoring Program Manager for information on the requirements of the NIH Oxygen Monitoring Program.



## Safe Handling of Dry Ice:

- Dry ice is to be stored in a well-ventilated location and placed in a Styrofoam container, dry ice storage chest, or a cooler designed for the storage of dry ice.
- Do not store dry ice in a tightly sealed container to avoid explosion due to thermal expansion.
- Do not use or store dry ice in confined areas, walk-in refrigerators, environmental chambers or rooms without ventilation to avoid asphyxiation.

## If a leak is suspected, or there is a spill or rupture of a container:

- Evacuate the area but have someone remain nearby at a safe distance to prevent the entry of others.
- Bethesda: Call the NIH Fire Department (911 from a landline or (301) 496-9911 from a cell phone). All other locations: Call 911.
- Treat any cold burns immediately by flushing with tepid water or placing in a lukewarm water bath. Do not try to warm the skin by rubbing it.
  - a. Seek medical attention.
    - i. Bethesda: Call 911 from a landline or (301) 496-9911 from a cell phone.
    - ii. All other locations: Call 911.
  - b. When safe to do so, notify supervisor and OMS.

For questions regarding this reference document, please contact the Division of Occupational Health and Safety Oxygen Monitoring Program Manager at (301) 496-2960 or consult your IC Safety Specialist.