INERT CRYOGENIC LIQUIDS

Emergency Contact Numbers:

911	***(If using a cell phone, specify UMass/Amherst*)**
545-2682	**Environmental Health and Safety (EH&S)**
577-5000	**University Health Services Urgent Care**
(413) 781-6554	**Air Gas**

Types of Inert Cryogenic Liquids:

Liquid Nitrogen **Liquid Helium** **Liquid Argon**

Hazards:

Asphyxiation – Risk when cryogenic liquids are stored or used in poorly ventilated areas as they displace oxygen in the air.

Cryogenic Burns – Risk when skin contacts liquid nitrogen or surfaces that are/have been in contact with liquid nitrogen. The risk is greater for eyes and other delicate tissue.

Frostbite – Risk where there is a continued exposure of unprotected skin to cold atmospheres.

Hypothermia – Risk from low temperatures arising from the proximity of liquefied gases.

Explosion Hazard – Risk from pressure buildup (due to the large expansion ratio of cryogenic liquids) in containers where ventilation is blocked.

Personal Protective Equipment:

- **Cryogenic gloves** should be loose fitting.
- **Full face shield** over safety goggles compliant to ANSI Z87.1.
- **Lab coat or cryogenic apron at all times.**
- Pants, **NO SHORTS.**
- Sturdy shoes**, NO OPEN TOES.**

Storage and Transport:

- Room must have **6-10 air changes per hour.** Call EH&S at: 545-2682, to check for proper ventilation.
- **Provide oxygen monitor and alarm** if room is not well-ventilated.
- Do not store cryogenic liquids in corridors, stairwells, or enclosed spaces (ie closets).
- **Do not store with corrosive or flammable materials.**
- Transport only in an insulated Dewar approved for the transport of cryogenic liquids.
- Do not store or transport in a container with a screw top lid or airtight cover.
- **Conduct periodic inspection of equipment.** Remove ice and frost blockages from openings, inspect pressure relief valves and gauges, replace old and damaged equipment.
- For elevator transport of large Dewars, use a freight elevator if possible and do not allow any other passengers on the elevator.
- For any location where cryogenic liquids are drawn, maintain emergency number information, appropriate logs, and safety accessories.
- **Sample storage in LN2 containers.** Use extreme caution when preserving samples in LN2. When cryovials are immersed in the liquid phase, LN2 can still enter the closed screw-top cryovials with o-rings during storage. The cryovial could explode when it is removed from storage due to the vaporization and expansion ratio of the LN2.

First Aid:

Inhalation: If experiencing light-headedness, dizziness, or confusion, immediately exit area, and seek fresh air and medical attention.

Skin contact: Remove any clothing that may restrict circulation to the frozen area.
Do not rub frozen parts, as tissue damage may result.
Place the affected area in a lukewarm water bath or under running water not in excess of 105°F. Do not apply heat. Once thawed, cover the area with a sterile, dry dressing, seek medical attention.

Eye contact: Immediately flush with warm water (at least 15 minutes), seek medical attention.