

PPE: Protection From Cryogenic Liquids

When working with cryogenics such as liquid nitrogen (LN₂) or liquid helium (LH), cryogen-rated personal protective equipment (PPE) is always worn. Common types of cryogenic PPE include:

- Aprons
- Gloves (non-porous shoulder length or elbow length preferred)
- Face shields
- Goggles
- Ear protection

Eye, hand, and body protection are necessary to prevent potential cold burns when handling cryogenics.

Eye protection is required at all times when handling cryogenic fluids. When pouring a cryogen or when working with a wide-mouth dewar (that is, open flow delivery), a full-face shield over safety glasses must be used. A face shield by itself does not provide adequate splash protection; safety glasses or goggles must be worn underneath as well. The only exceptions are for transporting cryogenics in closed dewars or portable tanks and disposing of very small quantities (less than 0.5 liter) by evaporation.

For hand protection, it is best to wear loose insulating non-porous gloves. For tasks requiring a high degree of dexterity that are difficult or impossible to perform while wearing insulating gloves, such as manipulating samples in small vials, a better solution is the use of insulated hand tools.

Never use clean room gloves which are absorbent (cotton) or porous (nylon) for hand protection. Recommended body protection when working with large quantities of cryogenic fluids includes

- Cuff-less trousers extended over work boots
- Leather or nonporous apron

Along with cryogen-rated PPE, pants legs and shirt sleeves should never be cuffed, as a spill may get caught in the cuff resulting in a cryo-burn. Always reduce the amount of exposed skin as much as possible. The following table presents common tasks, hazards, and PPE.

Task	Hazard	Protective Clothing
Filling a LN ₂ or LH tank or dewar	Cryo-burns, frostbite	Cryogen-rated apron, gloves, face shield, and goggles, long-sleeve shirt, long cuff-less pants
Filling a LN ₂ or LH tank or dewar under pressure (can produce intense noise)	Noise, cryo-burns, frostbite	Wear ear plugs or muffs, cryogen-rated apron, gloves, face shield, and goggles, long-sleeve shirt, long cuff-less pants