

CRYOGENIC SAFETY

Cryogenic liquids are liquefied gases that are kept in their liquid state at very low temperatures (i.e. boiling points below -150°C). Some of the commonly used cryogenics in laboratories include argon, helium and nitrogen.

Hazards and the **safety practices to be adopted:**



Vacuum Insulated Evaporator (VIE)




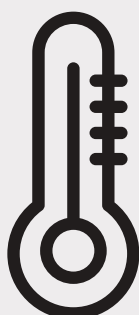



Liquid Gas Cylinder (LGC)

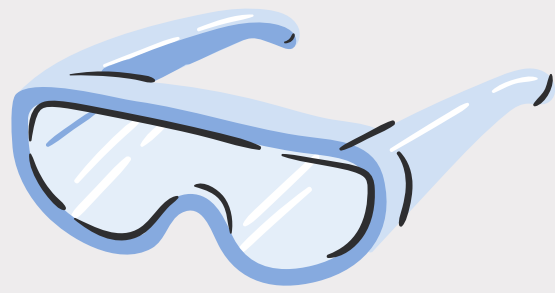


Cryogenic Storage Dewar (LN2 Dewar)

Hazards Associated

- Extreme Cold 
- Asphyxiation 
- Oxygen Enrichment 
- Pressure buildup and Explosion  

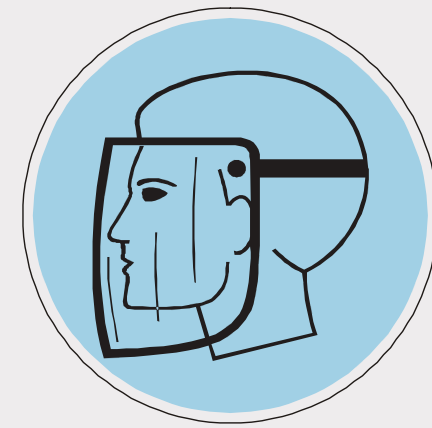
Personal Protective Equipment (PPE) for handling Cryogenic



Goggles

(for small amount)

Safety spectacles do not give adequate protection against splashes.



Full-face Visor

A visor protects the eyes and the face. BS EN 166 grade 3.



Cryogenic Gloves

BS EN 511 (cold protection) Consider possibilities of Liquid Nitrogen being splashed into the glove via cuff area. No cotton gloves are allowed.



Apron

Non-woven fabric; no pockets. Sufficiently long to protect the lower part of the legs.



Covered Shoes

No open-toed shoes and sandals; running shoes with breathing holes not allowed. Wellington boots with protective toe cap preferred.

Long Pants



No ripped jeans with open holes for accident prevention.

SAFE HANDLING PRACTICES

WHAT TO LOOK OUT FOR ?

- ✓ • **Only** store Cryogenic Liquids in containers with pressure-relief mechanisms that are designed for the pressure and temperature to which they may be subjected.
- ✗ • **Never touch** non-insulated vessels containing Cryogenic Liquids. Flesh will stick to **extremely cold** materials and cause **severe consequences**.
- ✗ • **Never** tamper or modify safety devices such as cylinder valve or regulator of the tank.
- ✗ • **Do not** store in a confined space or near ignition source. Store and handle Cryogenics in well ventilated areas.
- ✓ • Fill dewars to not more than **80% capacity** to cater for expansion of gases.
- ✓ • Be **constantly attentive** during dispensing/decanting operation.
- ✓ • Conduct your **Risk Assessment**.
- ✓ • **Check** the Cryogenics **PPE** before use.
- ✗ • **Never** pour Liquids Cryogens from a height above eye level.