

SAFE HANDLING OF LIQUID NITROGEN

Adherence to safe work practices by users is necessary to reduce the potential for accidents or injury while transporting, storing, transferring, and using LN₂. At a temperature of approximately -196° C, LN₂ will freeze tissue on contact and cause embrittlement of plastics and rubber. Therefore, only containers specifically designed for use with cryogenic liquids, such as dewar flasks, should be used with LN₂.

When transporting LN₂ tanks, certain personal protective equipment (PPE) and safe work practices should be employed by the person moving the tank. This PPE should include eye protection, leather gloves, and safety shoes. Special carts designed for moving these tanks should be used. Tanks should be loaded on these carts so that the pressure relief vent is directed away from the handler. Get assistance if needed to help prevent back injuries or other physical injuries that may be caused by moving the tanks. The pressure relief vent should also be directed away from personnel at the point of use. Ensure the hook of the cart is fully engaged with the tank prior to tipping

Transfer operations involving open containers should be performed slowly to minimize boiling and splashing of the LN₂. PPE used during this activity should include insulated gloves with long cuffs, face shield and goggles, and a fully fastened lab jacket. As LN₂ evaporates, it expands to a volume nearly 700 times greater than the original volume of the liquid. Therefore, transfer operations should be conducted in well-ventilated areas to prevent the displacement of atmospheric oxygen by nitrogen gas.

Another hazard associated with LN₂ is the potential to concentrate oxygen in or near a cryogenic freezer. Since oxygen boils at a higher temperature than LN₂ (-183° C), the LN₂ can condense oxygen out of the air. The liquefied oxygen can be absorbed into the LN₂ or condensed on a poorly insulated container. This oxygen-enriched environment creates a serious fire hazard. Therefore, prolonged storage of LN₂ must be minimized, and oxidizable materials must be kept away from cryogenic storage containers.

When proper handling procedures and PPE are used, contact with LN₂ is rare. In the unlikely event of contact with LN₂, obtain medical assistance through OHS in Building 426 immediately.

Any comments or questions regarding the safe use and handling of LN₂, or any other cryogenic liquid, should be directed to EHS at x1451.