

Liquid Nitrogen Container



Handling Instructions

A little caution and a little common sense are needed for the safe handling of liquid nitrogen in cryobiological storage containers. You should always be aware of two primary facts concerning liquid nitrogen:

- **It is extremely cold. At atmospheric pressure, liquid nitrogen boils at 320 degrees below zero (-196°C).**
- **It produces a large amount of gas. One liter of liquid nitrogen vaporizes into almost 25 cubic feet of nitrogen gas.**

Either of these two properties can produce personal injury or property damage. Do not handle liquid nitrogen until you have read the cautionary notes in this booklet. The MVE CryoBiological System is a versatile, integrated family of A.I. containers whose reliability and safety can best be assured by following the precautions outlined in this booklet.



Transfer Liquid Nitrogen With Care.

The primary hazards of transferring liquid nitrogen from one container to another are spilling and splashing. Special funnels (with the top partially covered) will reduce splashing. For MVE cryobiological storage containers, a self pressurizing discharge device is available that allows controlled LN₂ withdrawal up to two liters per minute. (Specify the container model number when ordering.) Always follow carefully the instructions on containers or accessories when transferring liquid nitrogen. NEVER overfill the containers. Filling above the specified level is likely to produce spillage when the necktube core is replaced.

Use Solid Metal Or Wooden Dipsticks

Because of the extremely low temperature of liquid nitrogen, plastic measuring devices tend to become very brittle or even shatter. NEVER use hollow rods or tubes; the gasification and expansion of the rapidly cooling liquid inside the tube will force liquid to spurt from the top of the tube. Always wear insulated or heavy gloves when measuring.

Nitrogen Gas Is Colorless, Odorless, Tasteless...And Deadly.

It reduces the concentration of oxygen and can cause suffocation. Since it can not be detected by sight, taste or smell, it may be inhaled as if it were air. That is why liquid nitrogen must always be stored and used ONLY in areas that are fully ventilated. As liquid nitrogen evaporates, the resulting nitrogen gas displaces the normal air -- and breathing air that is less than 18% oxygen may cause dizziness, unconsciousness and even death.

Nitrogen Gas Is Extremely Cold.

The eyes can be damaged by exposure to this gas even when the contact is too brief to affect the skin.

Nitrogen Gas Is Invisible.

When liquid nitrogen is exposed to the air, the cloudy vapor that you see is condensed moisture, not nitrogen gas. The gas itself is invisible.



Handle Liquid Nitrogen With Care.

Contact with skin may cause serious frostbite. Because it is extremely cold, it can freeze human flesh almost instantaneously.

Do Not Allow Objects Cooled By Liquid Nitrogen To Touch Your Bare Skin.

Even worse than sticking your tongue against the bottom of an ice-cube tray fresh from the freezer, objects cooled by liquid nitrogen may stick to the skin and tear flesh away when you attempt to remove the object. Use forceps or tongs to remove straws or canes from the storage container.

Protective Clothing Can Reduce The Hazards Of Handling Liquid Nitrogen.

Insulated or heavy leather gloves should always be worn when handling any object that has been in contact with liquid nitrogen. Loose fitting gloves are recommended so that they may be discarded quickly in the event that any liquid nitrogen splashes into them. If you are working with open containers of liquid nitrogen, boots should be worn and trousers should not be tucked into boots, but worn outside.

Special Containers Are Required.

MVE cryo-biological storage containers are specifically designed and constructed to withstand the extreme temperature variances involved in handling liquid nitrogen. These special containers should be filled slowly to avoid the expansion stress that occurs as a result of the rapid cooling. Too much stress can damage the container.

Do Not Seal The Containers Tightly.

MVE cryo-biological storage containers are designed to function with little or no internal pressure. The use of any tight-fitting stopper or plug that prevents the adequate venting of gas builds up pressure that could severely damage or even burst the container. Even icing or accumulated frost can interfere with proper venting and containers should be checked for such obstructions. To assure safe operations, only the original neck-tube core or approved accessories for closing the necktube should be used.

To Lessen The Danger From Nitrogen Gas,

liquid nitrogen should be disposed of ONLY in outdoor areas. The liquid should be poured slowly onto the ground (never on pavement) where it can evaporate into the open air.

FIRST
AID

First Aid.

If anyone working with liquid nitrogen becomes dizzy or loses consciousness, move them to a fully ventilated area at once and call a doctor. If they appear to have difficulty breathing, administer oxygen. Where breathing has stopped, apply artificial respiration immediately and then give oxygen. Keep the person warm and as calm as possible until the doctor arrives.

If a person is exposed to liquid nitrogen or gas, the affected tissue should be restored to normal body temperature (98.6°F) as quickly as possible. Remove or loosen any clothing, belts, collars, etc., that might restrict circulation to the affected area, and bathe or immerse the area in water heated to 108°F.

DO NOT heat water above 112°F. Protect the injured tissue from further damage or infection and call a doctor. DO NOT rub the affected area in an attempt to improve circulation and DO NOT allow the person to smoke or drink any alcoholic beverage.

CONTAINER
STORAGE

Store Containers In Clean, Dry Areas.

Moisture, manure, caustic cleanser, chemicals, or other substances which might cause corrosion should be removed at once.

Wash container with plain water or mild detergent solution and then wipe dry.

Transport Containers With Care.

Closed trucks or vans are not recommended for transporting cryo-biological storage containers; ventilation is required to prevent nitrogen gas from accumulating. In addition, containers should be secured in an upright position to prevent spillage and they should be protected from heavy jolting or colliding with one another.

Handle Containers With Care.

A few simple precautions in the handling of your cryo-biological storage containers can protect you and your investment. Containers should always be stored in an upright position. Tipping the container or letting it lie on its side can result in spillage and may damage the container or the materials stored in it. Dropping the container or subjecting it to severe vibrations may damage the vacuum insulation system. Walking or dragging containers could result in a partial or complete vacuum loss. For containers that cannot be easily and safely carried, the MVE Handler or the MVE Roller Base can provide safe and easy movement of containers.

Container Contents.

The extremely low temperature of the liquid nitrogen or nitrogen gas provides the protection of the materials stored in the MVE cryobiological storage containers. When all the liquid nitrogen has evaporated, the temperature inside the container will rise slowly. The rate of evaporation depends upon the age, condition and use pattern of the container. Just like our kitchen refrigerator, opening and closing the container or moving it about will reduce its cooling efficiency. You should check the liquid nitrogen level in your containers at least weekly; make sure there is enough liquid nitrogen in the container to maintain the required temperature to avoid damage to the ampules, canes, straws or vials stored in the container. If the liquid has evaporated faster than usual or if the container is covered with frost or condensation, the vacuum system may be damaged. In such instances, transfer the contents to another container and remove the damaged one from service at once.

For more detailed information on handling cryogenic liquid send for CGA pamphlet P-12:

COMPRESSED GAS
1725 JEFFERSON DAVIS HWY
ARLINGTON, VA 22202-4102

ACCESSORIES

Contact customer service for appropriate part number(s) to ensure proper fit with your dewar or with questions on any of the safety items below.

ROLLER BASES

The roller base allows convenient movement of containers. It is fabricated from painted cast aluminum. Call your customer service representative for part number to fit your dewar.

CANES AND VIALS

Aluminum canes are designed to hold vials or ampules and feature visual identification for quick retrieval. Standard size canes accommodate vials available from MVE in 11mm, 12mm, 14.5mm, 15mm, 16mm, and 20mm diameter.

SELF PRESSURIZING DISCHARGE DEVICE

The self pressurizing discharge device allows controlled liquid nitrogen withdrawal from MVE cryogenic containers. It allows up to two liters per minute to be extracted. See product operating manual for additional instructions.

PERSONAL PROTECTION EQUIPMENT (PPE)

Cryo-Gloves are available in three sizes (M, L, XL) and three lengths for use with liquid nitrogen vapor phase and ultra-low temperature freezers. See our website for additional safety wear.



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