

U.S. SOLID

Liquid Nitrogen Dewar



This manual should be made available to all users of this equipment. For best results, and for maximum durability of the equipment, carefully read and follow all instructions. Failure to do so can lead to serious injury or catastrophic damage to the user, machine, supplies, or surrounding areas. All safety suggestions must be followed closely, and extreme precaution must be taken to assure proper use of the equipment by only qualified personnel who have read this guide.

I. Getting Started

Hello new liquid nitrogen dewar user!

Thank you for choosing our liquid nitrogen tank. For smooth and safe operations, please read and understand this manual. The operation and maintenance information listed within has been updated as of its printing.

In light of the ever-changing nature of technology, the company reserves the right to modify specifications or procedures for this product without notice. The company will not assume any responsibility for equipment damage or malfunction that is due to improper operation, incorrect repairs, or use of parts from another company.

The liquid nitrogen dewar has passed through rigorous testing. Like all of our products, it is made with quality materials at an affordable price. This liquid nitrogen tank is sturdy enough for use in your lab, classroom, or home, depending on the circumstance.

The company provides a 12 month warranty from the date of the sale. During this first year, the company is responsible for any replacement parts needed because of manufacturing or material issues. After this 12 month period, the company will only replace parts at their current retail cost.

The warranty will only be in effect if all instructions in the manual are followed fully. The warranty does not cover unforeseeable forces of nature, or 'acts of god,' (fire, earthquakes, floods, etc.).

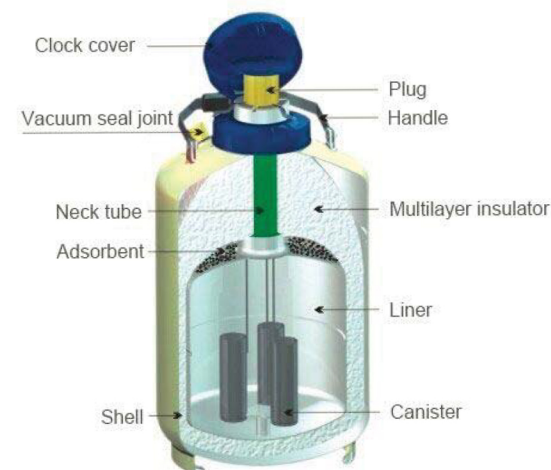
When warranty service is required, inform the company and describe the problem. When doing so, please include the following information: Purchase Date, Order Number, Name, and Delivery Address.

This manual includes basic safety precautions and instructions regarding basic use and maintenance. Therefore, before using the equipment, please read carefully and fully comply with all instructions, and fully understand the listed product requirements.

This manual does not include instructions for all possible uses or functions of this liquid nitrogen tank.



VIII. Diagram of Parts



For questions or concerns, e-mail service@ussolid.com, visit www.ussolid.com, or call (800) 209-4177

V. Measuring Liquid Nitrogen

1. When measuring the amount of liquid nitrogen, always use a wooden or plastic dipstick. Never use a hollow tube to measure liquid nitrogen.
2. Level will be indicated by the frost line on the dipstick. This develops when the dipstick is removed from the dewar.

VI. Maintenance

Preventive Maintenance

1. Follow the steps for filling as usual
2. Check outside of container for signs of major frost or condensation. These are indicators of a weak vacuum, and need to be addressed immediately.
3. In case of weak vacuum, reach out to the manufacturer for more information, or to redeem the warranty in any extreme cases. Do not use a liquid nitrogen container that has a visible leak, as this could create a dangerous situation.

VII. Service and Warranty

At U.S. Solid, we pride ourselves on customer service. Do not hesitate to reach out to us with any comments, questions, or concerns. We stand fully behind each of our products, and as such give a one year warranty. If you are unsatisfied with the product, we will make it right. We are based locally in Cleveland, OH and would love to hear from you. Our customer service number is 800-209-4177, and we are also available by email at service@ussolid.com.

II. Background

- U.S. Solid Liquid Nitrogen Dewars are vacuum insulated containers made of aircraft grade aluminum alloy. They have a fiberglass neck construction and provide the highest efficiency possible in liquid nitrogen storage. The dewar will maintain cryo storage between the temperatures of -320 and -238 Fahrenheit (-196 and -150 C).
- The dewar is designed to be used with inert liquids only! Liquid oxygen is not compatible with fiberglass materials, and must not be stored in these dewars.
- Proper care should always be taken when handling and transporting these vessels. Sharp blows to the exterior of the vessel can damage it or create a leak in the vacuum. Always be careful when moving or using the container, and make sure all handlers have been trained on proper safety procedures. Never stack dewars or put weight on them.
- Upon receipt of your dewar, examine the dewar and all packaging for signs of damage incurred during shipping. If damaged, please reach out to us immediately, and we will rectify the situation.
- There are important indicators that there is a leak or vacuum loss. Specifically, a few hours after filling if you notice frost or sweat on the outside of the vessel, this is an indication of a leak or loss of vacuum. Check for this carefully after filling for the first time. Some frost at the top immediately after filling is to be expected.
- Be sure to note that these dewars are intended as storage dewars. There are two types of liquid nitrogen containers: storage and transportation dewars. Storage dewars are made to hold liquid nitrogen, but are not to be used for the transport of liquid nitrogen. Transportation dewars have vibration and shock support systems that are absent in your storage vessel.

III. Safety

FROSTBITE WARNING!!

- To avoid frostbite, use extreme care when handling liquid nitrogen, liquid nitrogen storage or transfer vessels, and any item that has come in contact with the liquid nitrogen. When handling, use proper gloves and eye wear, making sure no skin is exposed to the potentially damaging effects.
- Wear proper safety attire at all times. This means a face shield, cryogenic gloves (for instance, JFLNT00008 and JFLNT00009, the U.S. Solid brand of liquid nitrogen gloves), and a cryogenic apron. There should be no exposed skin when working with liquid nitrogen.
- Use extreme caution when pouring or transferring liquid nitrogen to avoid splashing. Splashing of liquid nitrogen is dangerous situation, and proper care must be taken to avoid it.
- Immediately remove any clothing or safety attire which has come into direct contact with liquid nitrogen. In the case of liquid nitrogen splashing or otherwise coming in contact with your clothes or safety attire, extricate yourself from the situation immediately, and remove said attire.
- Do not overfill the liquid nitrogen container. This can lead to splashing of liquid. Additionally, it can lead to vacuum failure.

PROPER SHIPPING AND STORAGE WARNING

- Always keep the liquid nitrogen dewar in an upright position. Even during shipping and when empty, vessel must be kept upright. Failure to do so can lead to vacuum failure.
- Do not pressurize or tightly seal the liquid nitrogen container, or otherwise prevent any gas from escaping. This can lead to dangerous pressure buildup.
- Use in a dry environment to prevent the cork from freezing in the neck



III. Safety (Continued)

ASPHYXIATION WARNING!!

- The escape of the liquid nitrogen vapors into the air will deplete oxygen. The depletion of oxygen can lead to asphyxiation and/or death. As such, do not store or use liquid nitrogen dewars in areas that have poor ventilation.

IV. Filling Instructions

- Fill the vessel using a funnel or transfer line whenever possible. Avoid spilling liquid nitrogen over the vacuum cap on the side of the dewar, as this can shrink the vacuum seal and allow air to leak into the vacuum space. This can cause vacuum failure, and permanent damage to the vessel.
- For best performance from your liquid nitrogen dewar, follow the steps below:
 1. Open shipping container with dewar inside and remove cork, cover, and canister assembly by lifting straight up.
 2. Position the pump out valve away from the operator when filling the tank. Slowly pour liquid nitrogen into the empty container with a funnel or transfer hose. Pour slowly to prevent spillage or overfilling.
Note: Follow established safety practices for transfer of liquid nitrogen. Transfer using a cryogenic hose with a phase separator, pouring container with a funnel, or another approved filling device.
 3. Refill the vessel to the desired level after a two hour cool down/settling time.
 4. If filling your dewar from a pressurized source, make sure the source tank is at a low pressure (22 PSI or lower).
 5. If a transfer hose is used for extracting liquid nitrogen from a pressurized source, always use a phase separator on the end of the hose.
 6. As always, make sure proper safety attire is worn and used during the transfer process.
 7. Weigh unit for your records after following steps 1-6.