

MVE CryoCube™ Operating Instruction Manual

MVE CryoCube is ideally suited for the transportation of biological materials. The liquid nitrogen is retained in an absorbent material and the cold nitrogen vapors maintain the CryoCube storage area at -150°C. The absorbent material retains the liquid nitrogen and prevents accidental spills.

Liquid nitrogen is classified as "Dangerous Goods" by the Department of Transportation (DOT). At least three regulatory agencies publish dangerous goods regulations:

DOT - Department of Transportation
IATA - International Air Transportation Association
ICAO - International Civil Aviation Organization

Liquid nitrogen is classified under the name "Nitrogen, refrigerated liquid" and has a UN 1977 code number. The name classification and UN Code Number must be indicated on the shipping carton in addition to a "Gas nonflammable" label. Packing and labeling requirements can be obtained from the above organizations. Also, contact your carrier for any variances in the rules as they may apply specifically to that company and/or the ultimate destination of the shipment.

Be aware that the regulations undergo periodic revisions. If you need current information prior to the shipping of your cryobiological specimen, please contact your air carrier for the most recent regulations.

GENERAL DESCRIPTION:

The CryoCube is a vacuum insulated aluminum container with a fiberglass neck construction providing the highest efficiency possible in nitrogen vapor storage. The container is for use with inert fluids only. Liquid oxygen is not compatible with this unit and must not be stored.

These high quality vacuum insulated units are constructed of durable material, compatible with the divergent temperature extremes and broad applications of cryobiology. The life expectancy of this product is one (1) year.

Upon receipt of the container, examine both the container and packaging for any evidence of damage during shipping. Contact the shipping agent if any damage is apparent. Watch after the first fill for any signs of vacuum loss, such as frost or sweating on the outside jacket. (Some frost near the top just after filling is normal).



A) SAFETY

To avoid injury by frostbite, use extreme care whenever handling liquid nitrogen, liquid nitrogen storage or transfer vessels or any objects which have come in contact with liquid nitrogen.

- Leave no area of skin exposed.
- Always wear proper safety attire over clothing: face shield, cryogenic gloves, cryogenic apron.
- Never overfill vapor shippers with liquid nitrogen. Overfilling the tank may cause immediate or premature vacuum failure to occur.
- Always keep vapor shippers in upright position.
- Do not tightly seal liquid nitrogen container or prevent nitrogen gas from escaping.
- Use extreme care to prevent spilling and splashing liquid nitrogen during transfer.
- Immediately remove any clothing or safety attire on which liquid nitrogen has spilled.
- Get immediate medical attention for any frostbite injuries due to liquid nitrogen.



WARNING: The venting of nitrogen vapors will deplete oxygen in the air, possibly leading to asphyxiation or even death. Do not store or use container in areas that have poor ventilation.

B) CHARGING / FILLING INSTRUCTIONS

Note: Fill the container with a funnel when possible. Avoid spilling liquid nitrogen on the neck. To ensure maximum performance from your MVE CryoCube simply follow the listed steps just prior to shipping to final destination:

- Weight empty unit and record. The unit should weigh about $5.2 \pm .2$ lbs ($2.4 \pm .1$ kg)
- Using a funnel pour 1 cup (8oz, 250ml) of LN₂
- Wait 5 minutes or until LN₂ is absorbed
- Continue adding 1 cup of LN₂ every few minutes until 3.5 lb (1.6 kg) have been added. This should be ~10 cups.
- Verify internal tank is dry, pour off any standing liquid.
- Insert contents into canister and canister into dewar.
- Insert cork half way into neck and allow to cool for ~1 minute.
- Push cork all the way into neck.
- The container is now ready for validation, labeling and shipping.

C) PREVENTIVE MAINTENANCE

The MVE CryoCube is designed as a limited use product and should be considered a disposable shipper. Generally, no preventive maintenance is required for the CryoCube. However, if the unit performance drops below an acceptable hold time (< 5 day holding time @ >-150C), users should contact Chart Inc. Customer/Technical Service for rework options. The rework options may extend the overall life of the unit.

D) SHIPPING INSTRUCTIONS

Follow charging instructions. Prior to packaging dewar for shipment the entire contents of liquid nitrogen must be removed. This is usually done by pouring out excess liquid nitrogen until no liquid is visible on the bottom of the inner dewar. Place in bio samples, package dewar and ship. If liquid nitrogen is visible in the bottom of the inner it then becomes a liquid shipper and the exception status is void. The liquid inside is now classified as hazardous material.

LETTER EXPLAINING EXCEPTION

This is concerning the applicability of the Federal Hazardous Material Regulations to the shipment of refrigerated samples in the "Dry Shipper" container. A "Dry Shipper" package consists of an outer container that is lined with an absorbent material. The container is charged with nitrogen refrigerated liquid which is absorbed into the container lining. The charged, completed package serves as refrigerated container for the shipment of samples.

In consideration of the above, consultation with the Research and Special Programs Administration of the DOT has determined that the use of nitrogen refrigerated liquid charged "dry shipper" containers for the shipment of samples fall within the regulation exception provided in 49CFR 173.320 paragraph (a) of the section states the

requirements of this subchapter do not apply to atmospheric gases and helium when used in the operation of the process system such as refrigeration system. Paragraph (c) of 173.320 pertains to air transport of same refrigeration system. For exception status of air shipments please refer to IATA-Dangerous Goods Regulations for nitrogen refrigerated liquid. This falls in the class of 2.2 nonflammable gas, packing instructions 202 with special provisions A-800. For answers to questions regarding shipping regulations contact a Chart, AI-Cryobiological Tech Service Representative at 800-482-2473.

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LIMITED WARRANTY STATEMENT

MVE warrants to the original purchaser ("Purchaser") that each new CryoCube (each a "Product"), shall be free from defects in materials and workmanship for a period of ninety (90) days from the date of shipment, except as provided below. MVE warrants all dewar vacuum integrity shall be free from defects in materials and workmanship for a period of ninety (90) days from the date of shipment, except as provided below. MVE warrants all repaired equipment and factory blemished equipment shall be free of defects in materials and workmanship for a period of ninety (90) days from the date of shipment and warrants all dewar vacuum integrity shall be free from defects in materials and workmanship for a period of ninety (90) days from date of shipment.

Purchaser agrees that before this limited warranty shall become effective, Purchaser shall fully inspect each Product within ten (10) days of delivery and before such Product is put to use. Purchaser also agrees to operate the Product in accordance with MVE's operating instructions and that failure to do so shall void this limited warranty. Purchaser further agrees that any claim for breach of warranty must be made in writing within 15 days of discovery of a purported defect. MVE will not be responsible for any alleged breach of warranty, which, as a result of MVE's inspection, MVE determines to have arisen from a cause not covered by this limited warranty.

This limited warranty does not apply to: (A) Misuse, abuse, accident, or repairs made by persons other than MVE or persons not authorized by MVE; (B) Defects caused by the effects of normal wear and tear; (C) Acts of God, or other causes not within the control of MVE.

If purchaser believes that a product does not comply with the limited warranty stated above, Purchaser should contact MVE, describing the problem and providing proof of the date of purchase. If directed by MVE Purchaser shall return Products freight prepaid, properly packaged in a MVE approved shipping container and properly identified by a Return Material Authorization Number issued by MVE. Products returned without a Return Material Authorization Number will be refused and returned at Purchaser's expense.

MVE SHALL HAVE NO FURTHER LIABILITY FOR DAMAGES, LOSSES, COST OR FEES OF ANY KIND OR NATURE, WHETHER FORESEEABLE OR NOT, INCLUDING BUT NOT LIMITED TO ATTORNEY'S FEES AND CONSEQUENTIAL, GENERAL, SPECIAL, EXEMPLARY OR PUNITIVE DAMAGES, ARISING OUT OF OR RELATED TO THE USE OF MVE EQUIPMENT, EVEN IF MVE HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, LOSSES, COST OR FEES.

EXCEPT FOR THIS LIMITED WARRANTY, MVE HAS MADE NO WARRANTIES OR REPRESENTATIONS, EXPRESSED, OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. NO REPRESENTATION OR STATEMENT OF MVE MAY CHANGE OR ALTER THIS LIMITED WARRANTY.

Any claims for breach of this limited warranty shall be governed by Georgia law and must be brought in a state or federal court in Georgia. Some states do not allow limitations on implied warranties or on incidental or consequential damages, so the above limitations may not apply. This limited warranty gives the purchaser specific legal rights. Purchaser may also have other rights, which vary from state to state.