



Liquid Nitrogen Dry Shippers

Dry shippers are insulated cryogenic flasks or dewars containing a porous material. Dry shippers are cooled with refrigerated liquid nitrogen (LN2) fully absorbed into the porous lining. They are designed for safely shipping biological specimens at cryogenic temperatures (-150°C or colder) without the risk of spilling LN2.

- **Correctly prepared dry shippers do not contain free LN2.**
- Dry shippers must let gaseous nitrogen escape, so you may see vapor coming out of the containers.
- Empty dry shippers must be at room temperature or are subject to International Air Transport Association (IATA) Dangerous Goods Regulations Packing Instruction 202.
- [Cryoport Systems](#) and FedEx collaborate to rent pre-cooled, returnable dry shippers. Setup an account through FedEx.

Shipping Regulations

While liquid nitrogen (class 2.2, UN 1977) is a regulated dangerous goods when shipped, properly prepared dry shippers are exempt from United States Department of Transportation (USDOT) and IATA shipping requirements under these conditions:

- Containers must not allow the buildup of pressure.
- LN2 must not escape from the package regardless of the package's orientation.
- When dry shippers are used to ship **substances not subject to dangerous goods regulations**, the air waybill's substance description must include: "Not restricted, as per Special Provision A152"

Dry shippers typically contain non-regulated or exempt products. You may need special additional packaging and labeling for dewars containing regulated biological materials.

Filling Dry Shippers

Always follow the manufacturer's instructions for filling and preparing dry shippers for shipment.

1. Review the [liquid nitrogen and argon lab safety guideline](#) before handling liquid nitrogen.



Use the right personal protective equipment (PPE):

- Lab coat and/or cryogenic apron
- Closed toed shoes
- Face protection
- Cryogenic gloves

LN2 can cause severe frostbite. Work in well-ventilated areas because high concentrations of nitrogen can cause suffocation.

2. Slowly fill your dry shipper with LN2. When the liquid reaches your dry shipper's neck, stop filling the unit.
3. Replace the cap and set the dry shipper away. Follow the manufacturer's specified charging period so the LN2 saturates the dry shipper's absorbent material.
4. Check the dry shipper and add more LN2 until the liquid level no longer drops down. This could take several hours depending on the dry shipper.
5. Once the LN2 level no longer drops, let the dry shipper cool down for at least 24 hours.

Preparing Dry Shipper Shipments

Remove all free LN2 from the dry shipper before transport.

1. Wear the appropriate PPE and empty the dry shipper by pouring the excess LN2 back into a large LN2 dewar or appropriate receptacle.

Don't pour LN2 down the sink because it could crack pipes or onto the floor as it could splash on your shoes or legs and cause severe burns.

2. Hold the dry shipper upside down until the liquid stops flowing.
3. Stand the dry shipper upright for the time specified by the manufacturer.
4. Repeat steps until you remove all remaining LN2 from the dry shipper.
5. Put the specimens into the dry shipper and replace the cap.
6. Place the dry shipper into the protective case (if applicable).

Markings and Labels

- Correctly prepared dry shippers don't require the class 2 dangerous goods label for LN2.



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- If applicable, shippers must properly mark and label the outside of dry shipper packages containing regulated biological substances.
- When using dry shippers, the presence of regulated biological substances must be appropriately documented on the air waybill.

Shipping Documentation

Special Provision A152 relates to insulated packaging containing refrigerated LN2 fully absorbed in a porous material. When an air waybill is issued, the following statement must be added verbatim: **“Not restricted, as per Special Provision A152”**