

## LIQUID NITROGEN DRY SHIPPERS

### Preparation and Shipping Requirements



Dry shippers are shipping dewars or insulated containers containing a porous material (foam). These units are designed for the safe shipment of specimens at liquid nitrogen temperatures but without the risk of spilling liquid nitrogen (LN<sub>2</sub>).

When prepared for shipping these units should not contain any free liquid.

**Shipping regulations:** LN<sub>2</sub> is considered a Hazardous Material and regulated by the United States Department of Transportation (USDOT). However, a correctly prepared dry shipper is not.

**Precautions:** Please always be careful while working with LN<sub>2</sub>. Make sure to use the right Personal Protective Equipment (PPE) (closed toed shoes, gloves, face protection and cryo-gloves). Always remember that LN<sub>2</sub> can cause severe frostbite. Please also make sure to work in well ventilated areas as high concentrations of nitrogen can cause suffocation.



### Filling the dry shipper:

1. Slowly fill your dry shipper with liquid nitrogen (LN<sub>2</sub>). When the liquid reaches the neck of the dry shipper, stop filling the unit. Replace the cap and set the dry shipper away. Make sure to follow the charging period specified by the manufacturer. This period will allow the LN<sub>2</sub> to saturate the dry shipper's absorbent material.
2. Check the dry shipper and add more LN<sub>2</sub> until the liquid level no longer drops down. This could take several hours depending on the unit.
3. Once the LN<sub>2</sub> level no longer drops let the dry shipper cool down for at least 24 hours.

### **Shipping instructions:**

4. On the shipping day remove ALL LN2 from the dry shipper.

**Note:** This unit must be shipped without liquid inside.

5. Wearing the appropriate Personal Protective Equipment (PPE), empty the dry shipper content into a designated container or larger dewar.

**Note:** NEVER pour LN2 down the sink as it could crack the pipes in your laboratory. Same applies to the floor. Always remember that LN2 could splash onto your shoes or legs and cause severe burns.

6. Hold the dry shipper upside down until the unit is completely empty of liquid.

- a. Some manufacturers suggest leaving the dry shipper upright for a certain time to allow liquid to come off from the absorbent material. Remove any liquid as needed.

7. Place your samples:

- a. Take your frozen sample puck transport system (already at LN2 temperature) into the dewar.

OR

- a. Take a 50mL falcon tube, punch 3 holes into the tube: 1 in the lid for a string, and 2, ~2 inches from the top of the tube.

**Note:** These holes on the sides will let the interior become saturated with LN2 atmosphere.

1. Place a string through the lid of the tube. Tie the string in place and tape it to the outside of a LN2 dewar to become cold (do not cover past holes). After 5mins, place your cryo grid boxes into the falcon tube.
2. Place this falcon tube into the dewar system and tape to the outside of the shipping dewar.

- b. Secure Dewar with cap and zip ties.

8. Place the dry shipper inside the protective case.

9. Please place your return shipment label on the inside lid of the protective dry shipper covered in a plastic sheet protector or shipping slip.

10. Follow your institutional shipping rules for FedEx. Again, a correctly prepared dry shipper is not considered hazardous materials. We recommend shipping FedEx Priority Overnight during Monday-Thursday. Our dock is closed Saturday and Sunday.

For more questions please email us at: [scheduling@pncc.online](mailto:scheduling@pncc.online)