

Shipping Dry Ice

Regulations

Dry ice is a hazardous material and is regulated by both the U.S. Department of Transportation (DOT) and the International Air Transport Association (IATA). Specific procedures are required for handling, packaging, and shipping materials refrigerated with dry ice. This document outlines the requirements for shipping **ONLY** non-regulated materials on dry ice according to IATA Packing Instruction (PI) 954.



Training Requirements

To package dry ice shipments or to sign any type of shipping documentation (such as an Air Waybill) for a dry ice shipment, you must complete:

- OH601 Dry Ice Shipping (online)
- OH101 Hazard Communication (online)
- OH102 Site-Specific Hazard Communication

Upon successful completion of these training requirements, EHS will certify you to ship dry ice for a period of 2 years.

★ Shipments must **NOT** contain infectious/pathogenic materials, chemicals (in any amount), tissues, etc. Contact EHS for additional requirements. ★

Hazards

Dry ice is classified by the DOT and IATA as a “miscellaneous” hazard, class 9. Dry ice is considered hazardous for three reasons:

Explosion Hazard: Dry ice releases carbon dioxide gas as it sublimates. If packaged in a container that does not allow for the release of the gas, it may explode, causing personal injury or property damage. See Figure 1.

Suffocation Hazard: Carbon dioxide gas is a simple asphyxiant and in a confined space will displace oxygen, creating an oxygen deficient environment.

Contact Hazard: Dry ice is a cryogenic material that causes severe frostbite upon contact with skin.



Figure 1. This insulated chest containing dry ice was received completely sealed with tape. The build-up of pressure ruptured the side of the chest and allowed for the formation of frost on the outer packaging.

Packaging

1. Venting: Must be in packaging designed and constructed to permit release of carbon dioxide gas and to prevent build-up of pressure. To allow for release of gas, **DO NOT** seal or completely tape a package containing dry ice. Dry ice must never be sealed in a container with an airtight seal (i.e., jar) or a plastic cooler.

2. Package Integrity: A package containing dry ice must be of adequate strength for intended use. It must be strong enough to withstand the loading and unloading normally encountered in transport. It must also be constructed and closed to prevent any loss of contents that might be caused by vibration or by changes in temperature, humidity, or altitude.

3. Package Materials: Do not use plastics/materials that can be rendered brittle or permeable by the temperature of dry ice.

4. Reusing Packaging: Thoroughly inspect the package for damage, structural integrity, and contamination from previous shipments. Damaged and/or contaminated boxes should not be used and may be rejected by the carrier. All irrelevant or old markings and labels **MUST** be removed or covered, e.g., address, old shipping label, barcodes, and hazard labels.

5. Triple Packaging: See Figure 2.

A. Place samples into leak-proof primary containers with positive closures (screw-on, snap-on, or push-on lids/caps). Fragile containers such as glass vials, tubes, etc., should be wrapped in cushioning (bubble wrap) to prevent contact/breakage while in transport. Lids/caps should be secured with tape or parafilm.

B. The primary containers should than be placed into leak-proof secondary packaging with absorbent material in sufficient quantity to absorb the entire contents.

C. Properly pack and secure samples inside the insulated chest in such a way that, under normal transport conditions, they cannot break, be punctured, or leak their contents into the insulated chest or outer packaging.

D. The insulated chest must be packed into a rigid outer package (i.e., cardboard/fibreboard box) of adequate strength.

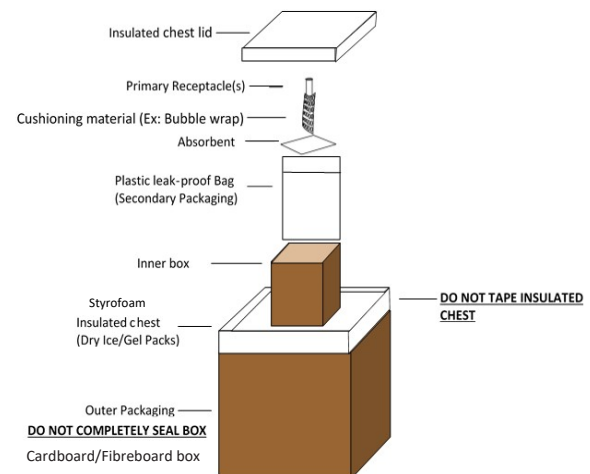
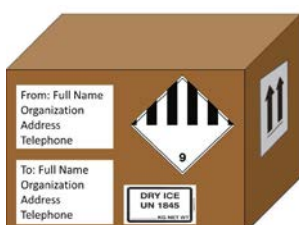


Figure 2. Samples shipped on dry ice should follow the triple packaging method.

NOTE: Dry ice shipping kits meeting required specifications including labels/markings may be purchased. Contact EHS for more information.

Marking/Labeling

- A. Name and address of shipper and consignee
 - B. Class 9 label
 - C. Proper shipping name (dry ice or carbon dioxide, solid) and UN1845
 - D. Net weight of dry ice in kg
 - E. Orientation arrows
- Note: Maximum allowable net quantity of dry ice per package is 200 kg.



Documentation

The Air Waybill must have UN1845, Dry Ice, 9, number of packages X net weight of dry ice in kilograms. If using FedEx, this information is already on the Air Waybill, just check appropriate box and write in amount.

Domestic Air Waybill (FedEx) --- See Special Handling Section 6

“Expanded Service International Air Waybill” (FedEx) --- See Special Handling Section 6a