

SUNY Cortland - Environmental Health and Safety Office

Shipping Dry Ice

Date of Inception: February 20, 2014
Latest Revision/Review Date: August 7, 2018
Previous Revision/Review Date: June 30, 2017

Shipping Dry Ice

Contents:

- I. Introduction
- II. References
- III. Training and Recordkeeping
- IV. Hazard Identification
- V. Packaging Dry Ice
- VI. Recommendations
- VII. Steps for Shipping

I. Introduction

The U.S. Department of Transportation (DOT) and the International Air Transport Association (IATA) regulate shipments of dry ice because it is a hazardous material. As a result, specific procedures shall be followed when packaging and shipping materials stored on dry ice. The shipper must be trained and records must be retained.

This procedure outlines steps to be taken when non-hazardous materials are shipped with dry ice. If you are uncertain if the material you are sending is considered hazardous, contact the Environmental Health and Safety (EH&S) Office at envirohlth@cortland.edu or extension 2508 for assistance. If hazardous materials accompany a dry ice shipment, the EH&S Office will specify additional controls that are required.

It is important to mention that packages refrigerated with dry ice are normally shipped by air in order to reach their destinations quickly. Therefore, the information in this procedure pertains to air shipments. For non-air shipments, the EH&S Office will assist with implementing appropriate regulatory controls.

II. References

1. FedEx Express Shipping Requirements
http://images.fedex.com/us/services/pdf/Dry_Ice_Job_Aid.pdf
2. Packaging Perishable Shipments
http://images.fedex.com/us/services/pdf/packaging/Perishables_fxcom.pdf
3. Department of Transportation [49 CFR 175.10\(a\)\(10\)](#)

III. Training and Recordkeeping

DOT regulations specify that when dry ice is shipped, the shipment must be prepared by a trained employee. EH&S Office personnel are trained to prepare dry ice shipments; therefore, campus personnel should contact the EH&S Office before shipping materials with dry ice.

Recordkeeping requirements are specified by both IATA and DOT. Whereas, IATA requires that shippers retain all paperwork related to a shipment for at least three months, the U.S. DOT requires shippers to retain a copy or electronic image of shipping papers for two years. Carriers (operators) are to retain shipping papers for one year.

IV. Hazard Identification

DOT and IATA classify dry ice as a “miscellaneous” hazard, class 9. Dry ice is considered hazardous during transportation for the following reasons:

1. Explosion hazard: Dry ice releases a large volume of carbon dioxide gas as it sublimates. If packaged in a container that does not allow for ventilation of the gas, it may explode, causing personal injury or property damage.
2. Suffocation hazard: A large volume of carbon dioxide gas emitted in a confined space may create an oxygen deficient atmosphere.
3. Contact hazard: Dry ice is a cryogenic material that causes severe frostbite upon contact with skin.

V. Packaging Dry Ice

The following must be observed for packaging dry ice:

1. Gas Venting – Packages must allow for release of carbon dioxide gas. Dry ice must never be sealed in a container with an airtight seal such as a jar with a threaded lid or a plastic cooler.
2. Package Integrity – Packaging containing dry ice must be of adequate strength for its intended purpose. It must be strong enough to withstand the loading and unloading normally encountered in transport. It must be constructed and closed in order to prevent any loss of contents that might be caused by vibration or by changes in temperature, humidity, or altitude.
3. Packaging Material – Do not use plastics that can become brittle or permeated by the temperature of dry ice. This is avoided by using commercially available packaging that is intended to contain dry ice.
4. Airbill – The airbill, also referred to as the air way bill, must include: 1) the statement “UN1845, Dry Ice”; and 2) the number of packages times the net quantity in kilograms. FedEx has a check box in Section 6 of their airbill to satisfy the requirement for identifying dangerous goods. A FedEx airbill is pictured on page 3.
5. Labeling – The outermost container must be labeled with a hazard class 9 label, UN 1845, and total weight of dry ice in kilograms. This label should be affixed to a vertical side of the box (not the top or bottom). A hazard class 9 label is pictured on page 3.

FedEx Package US Airbill Tracking Number: 1234 5678 9010

1 From: Please print your name and address. **3/1/15** Shipper's Account Number: 99999-99999-99999
 Sender's Name: Tyler Hanson Phone: 662-555-1812
 Address: 1234 Main Street
 City: Phoenix State: AZ ZIP: 85034

2 Your Internal Billing Reference:
 Recipient's Name: Liam Riley Phone: 405-555-8300
 Recipient's Address: Ridgeview Design
 2020 Vision Street
 Atlanta, GA 30305

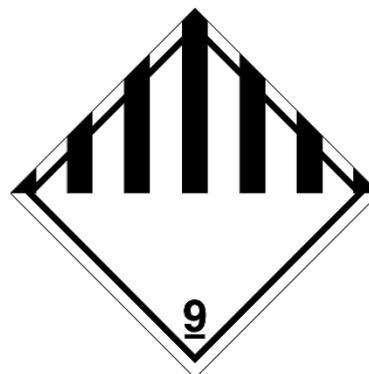
4 Express Package Service: FedEx First Overnight FedEx First Overnight
 FedEx Priority Overnight FedEx Priority Overnight
 FedEx Standard Overnight FedEx Standard Overnight

5 Packaging: FedEx Envelope FedEx Box FedEx Tube Other

6 Special Handling and Delivery Signature Options: Signature Required Signature Required
 Signature Required Signature Required
 No Signature Required No Signature Required
 No Signature Required No Signature Required

7 Payment: Cash Bill Me Bill My Third Party Credit Card Check

Ship It. Track It. Pay for it. All online. fedex.com



VI. Recommendations

Note the following recommendations when packaging and labeling dry ice shipments:

1. Do not write “specimens” or “diagnostic specimens” on the box. Specimens that are potentially infectious to humans or animals are subject to specific packaging requirements and there should not be any misunderstanding about the shipment. Refer to shipping biological materials for those items.
2. Reusing a dry ice box is a good use of resources. If you choose to reuse a box, completely obliterate all unnecessary markings such as hazard labels, addresses, FedEx (or other carrier) labels and barcodes. Use caution if reusing a box that has been used to ship infectious material or diagnostic specimens. Only reuse a box if you can personally verify it is not contaminated and that it maintains its integrity. Do not reuse a box that is cut, torn, stained, or if the insulation is damaged.
3. Ensure that samples are secured such that as the dry ice sublimates, the samples will not move freely in the box. Use cardboard or Styrofoam to secure the samples in place. Wrap fragile items in cushioning material.
4. Minimize the volume of air to which the dry ice is exposed in order to slow the rate of sublimation. Fill any headspace remaining with packing peanuts or crumpled paper.
5. Shipments are generally recommended to contain 5 – 10 pounds (2.27 – 4.45 kg) of dry ice per 24 hours. Refer to your package manufacturer’s recommendations. Ensure that your carrier will deliver the package within the intended delivery time. Take into account weekends, holidays, and/or closings that may delay your package.
6. Dry ice shipments can be made with FedEx and Airborne Express, UPS and the USPS. Please check with the EH&S Office as to the best carrier for your needs.

VII. Steps for Shipping

1. Assign hazard class and packing group. (e.g., Class 9, UN 1845)
2. Select a proper shipping name using the List of Dangerous Goods. (e.g., Dry Ice)
3. Select packaging that meets IATA standards.
4. Check and follow state and operator regulations.
5. Mark the package.
6. Label the package.
7. Prepare shipping papers.