

OSEH Guidance Document for Shipping Materials with Dry Ice

Introduction

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 and this training must be documented.

This guide is intended for dry ice shipments in which **no other hazardous materials, infectious substances or diagnostic specimens are included**. Please contact OSEH at 763-6973 if you need assistance with classifying your shipment.

Training Requirements

Federal regulations mandate training for all personnel handling dry ice shipments or signing any type of shipping documentation (such as a FedEx Airbill). Refresher training must be provided every two years.

Hazard Identification

Dry ice is classified by DOT and IATA 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 release 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 displace oxygen and create an oxygen deficient environment.
3. **Contact hazard:** Dry ice is a cryogenic material that causes severe frostbite upon contact with skin.

Packaging

Packaging dry ice properly minimizes the risk to personnel transporting the material.

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 container with a threaded lid or plastic cooler.

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 in order to prevent any

loss of contents that might be caused by vibration or changes in temperature, humidity or altitude.

Package Materials: Do not use plastics that can be rendered brittle or permeable by the temperature of dry ice. Use commercially available packaging systems intended for dry ice shipments.

Airbill: The airbill must include the statement “Dry ice, 9, UN1845, number of packages X net weight in kilograms. FedEx has a check box on their airbill to satisfy this requirement, see Figure 1. Other carriers use slightly different formats. Check the airbill to ensure this information is included prior to sending shipment.

Labeling: The outermost container must be labeled with a hazard class 9 label, UN 1845, and net weight of dry ice in kilograms. See Figure 2. The maximum allowable net quantity of dry ice allowed per package is 200 kg. See Figure 3 for UPS Blue Dry Ice label. **IMPORTANT NOTE FOR UPS SHIPMENTS. In addition to the UPS Blue Dry Ice label, a hazard class 9 label and the UN 1845 marking must also be on the package.**

Additional Information

- **Do not** write “specimens” or “diagnostic specimens” on the outer box. Diagnostic specimens are subject to specific packaging and training requirements that are not covered in this guidance document. Please contact OSEH at 763-6973 if you have any questions regarding classifying your shipment.
- You may choose to reuse a dry ice shipping box for future shipments. Ensure all markings, labels, addresses, barcodes and carrier labels are defaced. Use caution if reusing a box that had previously been used for shipments of infectious substances or diagnostic specimens. Only reuse a box if you can personally verify it is not contaminated and its integrity is intact.
- Ensure all samples are secured so that they cannot move freely inside the package when the dry ice sublimates. Use cardboard dividers or Styrofoam to separate samples. Fragile containers such as glass tubes or vials must be individually wrapped or separated so as to prevent contact between them.
- Minimize the volume of air to which the dry ice is exposed in order to slow the rate of sublimation. If there is any air space after filling the package, fill it with additional packing materials such as peanuts or crumpled paper.
- Shipments are generally recommended to contain 5-10 pounds (2.27-4.54 kg) of dry ice per 24 hours. Refer to package manufacturer’s recommendations for the correct amount of dry ice to use for your shipment.

- The sender should coordinate logistics of the shipment with the recipient. Take into account local holidays or closings that might delay package receipt.
- Dry ice shipments can be made with many carriers such as FedEx, Airborne Express. Note: UPS and the United States Postal Service (USPS) have extremely restrictive policies regarding shipments of hazardous materials, including dry ice.

Figure 1

FedEx USA Airbill Express FedEx Tracking Number **833163101560**

From (E. No.) **0200** Sender's Copy

1 From Please print and press hard. Sender's FedEx Account Number **123**
 Date **01/01/02**
 Sender's Name **VICTOR PANTUSA** Phone **(713) 677-7953**
 Company **TEXAS A&M Institute of Biosciences & Technology**
 Address **2121 W. HOLCOMBE**
 City **HOUSTON** State **Tx** ZIP **77030**

2 Your Internal Billing Reference OPTIONAL
 First 28 characters will appear on invoice.

3 To
 Recipient's Name **BILL NYE** Phone **(123) 456-7890**
 Company **STATE COLLEGE**
 Address **123 MAIN STREET**
 Address **BIOLOGY DEPT** **299**
 City **ANYTOWN** State **USA** ZIP **71234**

4a Express Package Service
 FedEx Priority Overnight Next business morning
 FedEx Standard Overnight Next business afternoon
 FedEx 2Day Second business day
 FedEx Express Saver Third business day
FedEx Envelope size not available. Minimum charge. One-pound rate.

4b Express Freight Service
 FedEx 1Day Freight* Next business day
 FedEx 2Day Freight Second business day
 FedEx 3Day Freight Third business day
*Call for Confirmation. *Declared value limit \$20K.

5 Packaging
 FedEx Envelope*
 FedEx Pak* Includes FedEx Small Pak FedEx
 Other

6 Special Handling Include FedEx address in Section 3.
 SATURDAY Delivery Available ONLY for FedEx Priority Overnight and FedEx 2Day to select ZIP codes
 HOLD Weekday at FedEx Location NOT Available for FedEx First Overnight
 HOLD Saturday at FedEx Location Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations
 Does this shipment contain dangerous goods? (See box must be checked.)
 No Yes As per attached Shipper's Declaration Yes Shipper's Declaration not required
 Dry Ice Dry Ice, 9, UN 1845 **1** x **2.2** kg
 Cargo Aircraft Only
 Dangerous Goods (including Dry Ice) cannot be shipped in FedEx packaging.

Payment Bill to: Enter FedEx Acct. No. or Credit Card No. below.
 Recipient Third Party Credit Card

Total Packages Total Weight Total Declared Value*
 \$.00
*Our liability is limited to \$100 unless you declare a higher value. See back for details. FedEx Use Only

8 Release Signature Sign to authorize delivery without obtaining signature.
 By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.
 446
 Rev. Date 10/01 • Form #157812 • ©1998-2001 FedEx • PRINTED IN U.S.A. • GBPE 1301

Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak

6 Special Handling Include FedEx address in Section 3.

SATURDAY Delivery Available ONLY for FedEx Priority Overnight and FedEx 2Day to select ZIP codes

HOLD Weekday at FedEx Location NOT Available for FedEx First Overnight

HOLD Saturday at FedEx Location Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

No Yes As per attached Shipper's Declaration Yes Shipper's Declaration not required

Dry Ice Dry Ice, 9, UN 1845 **1** x **2.2** kg

Cargo Aircraft Only

Dangerous Goods (including Dry Ice) cannot be shipped in FedEx packaging.

Figure 2



Figure 3



Acknowledgment of Training – OSEH Guidance Document on Shipping Dry Ice

I have reviewed the reference materials included in this guidance document. I understand that I should call Occupational Safety and Environmental Health (OSEH) at 763-6973 if I have any questions about shipping refrigerated materials with dry ice.

UM ID Number _____

Signature _____

Print Name _____

Date Completed _____

Please fax acknowledgement of training to:

**OSEH Biosafety
(734) 763-1185**