



New Mexico State University

# Environmental Health & Safety

## Guide to Shipping with Dry Ice



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## Purpose

Dry ice is a hazardous material and as such it is regulated for shipment by the United States Department of Transportation (USDOT) and the International Air Transport Association (IATA). Regulations require that specific procedures must be followed when shipping dry ice.

**Individuals have two options when shipping packages containing dry ice.**

1. **In Las Cruces, you can contact Anderson Hall Shipping (575) 646-9911 or email [ipsanch@psl.nmsu.edu](mailto:ipsanch@psl.nmsu.edu) to ship hazardous materials or any shipment with dry ice.**
2. **Become certified to ship dry ice and follow specific labeling and packaging procedures**

This guide outlines the procedure to become certified to ship dry ice. *This is only for a shipment that includes no hazardous materials other than dry ice.* If you are not sure if the material you are shipping is considered hazardous, contact Environmental Health & Safety at (575) 646-3327 or email [ehs@nmsu.edu](mailto:ehs@nmsu.edu). When shipping biological materials, please contact the Biosafety Manager at (575) 646-4463 or email [biosafe@nmsu.edu](mailto:biosafe@nmsu.edu).

Packages refrigerated with dry ice are normally shipped by air in order to reach their destinations rapidly. Therefore, information in this guide pertains to air shipments of dry ice only. If you intend to ship your package by other means such as ground, freight, vessel, etc., contact Anderson Hall Shipping (575) 646-9911 to discuss applicability of shipping regulations.

## Training Requirements

Federal law requires that anyone wishing to ship dry ice (or any other hazardous material) must have appropriate training. If you wish to prepare or offer a package containing dry ice for shipment, you must first follow the training certification requirements outlined here:

1. **Read this guide.** This guide will explain the general provisions relating to the regulations and detailed training in the requirements applicable to dry ice.
2. **Complete the [Intent to Ship Dry Ice Form \(Appendix A\)](#)** and submit it to EH&S.
3. EH&S will review this form and, upon successful completion, will certify you to ship dry ice.
4. Shipping regulations change frequently, so it is necessary to renew your certification every two years.

### I. Hazard Identification

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

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

Following the procedures outlined in this guide will minimize risk for all during transportation. With a package designed to vent gaseous carbon dioxide, the explosion hazard will be eliminated, and by labeling the package properly and declaring the HazMat shipment, the suffocation and contact hazards will be greatly reduced.

## II. Packaging Dry Ice

**A. Requirements** - There are five basic requirements for shipments of dry ice:

1. **Venting of gas:** packages must allow for the release of carbon dioxide gas. Dry ice must never be sealed in a container with an airtight seal.
2. **Package integrity:** a package containing dry ice must be of adequate strength for its intended use. It must be strong enough to withstand the handling 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 by changes in temperature, humidity or altitude.
3. **Package materials:** do not use plastics that can be rendered brittle or permeable by the temperature of dry ice. This problem can be avoided by using commercially available packages intended to contain dry ice, see [Appendix B, Manufacturers of Dry Ice Shipping Containers](#).
4. **Airbill:** the airbill (also referred to as the air waybill) must include the statement “Dry ice, 9, UN1845, *number of packages* X *net weight of dry ice in kilograms*.” FedEx has a check box on their airbill to satisfy this requirement; see Figure 2. This procedure only applies to FedEx shipments. Other couriers have different notations that are not explained here.
5. **Labeling:** the outermost container must be labeled with a hazard class 9 label, the words “UN 1845, Dry Ice”, and the net weight of dry ice in kilograms. See Figure 1. These labels are available through EH&S and a printable version is included in [Appendix C](#). The label must be affixed to a vertical side of the box (not the top or bottom) and oriented as in Figure 1. The maximum allowable net quantity of dry ice allowed per package is 200 kg.

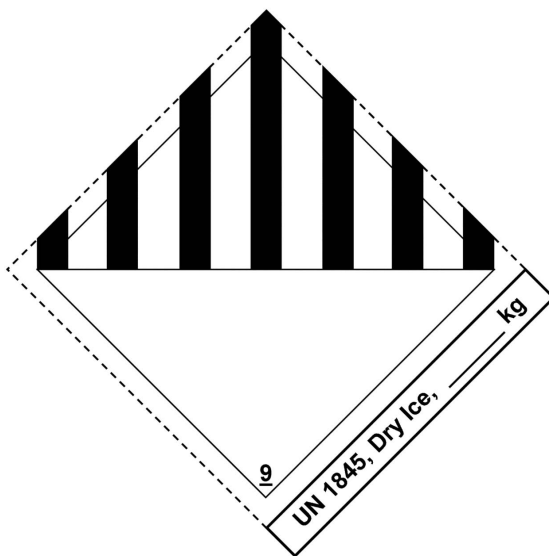


Figure 1. Dry ice label.

NMSU EH&S Guide to Shipping with Dry Ice

**FedEx USA Airbill** FedEx Tracking Number **839360283475** Form 101, No. **0200** Sender's Copy

**1 From** Please print and press hard. Sender's FedEx Account Number  
 Date \_\_\_\_\_  
 Sender's Name \_\_\_\_\_ Phone (\_\_\_\_) \_\_\_\_\_  
 Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ ZIP \_\_\_\_\_

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

**3 To** Recipient's Name \_\_\_\_\_ Phone (\_\_\_\_) \_\_\_\_\_  
 Company \_\_\_\_\_  
 Address \_\_\_\_\_ We cannot deliver to P.O. boxes or P.O. ZIP codes.  
 Address \_\_\_\_\_ Dept./Room/Suite/Floor \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ ZIP \_\_\_\_\_

**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  
**Express Freight Service**  
 Day Freight\* 1st day  
 FedEx 2Day Freight Second business day  
 FedEx 3Day Freight Third business day  
 Packages up to 150 lbs. Delivery commitment may be later in some areas. Earliest next business morning delivery to select locations.  
 Packages over 150 lbs. Delivery commitment may be later in some areas.

**5 Shipper's Declaration**  
 Yes Shipper's Declaration not required  
 Dry Ice Dry Ice, §, UN 1845 1 x 6 kg  
 Cargo Aircraft Only

**6 Special Handling**  
 SATURDAY Delivery Available ONLY for FedEx Priority Overnight and FedEx 2Day to select ZIP codes.  
 HOLD Weekday at FedEx Location  
 HOLD Saturday at FedEx Location  
 Does this shipment contain dangerous goods?  
 No  Yes As per attached Shipper's Declaration  
 Yes Shipper's Declaration not required  
 Dry Ice Dry Ice, §, UN 1845 1 x 6 kg  
 Cargo Aircraft Only

**7 Payment Bill to:** Enter FedEx Acct. No. or Credit Card No. below.  
 Sender Acct. No. in Section 7 will be billed.  Recipient  Third Party  Credit Card  Cash/Check

Total Packages \_\_\_\_\_ Total Weight \_\_\_\_\_ Total Declared Value<sup>1</sup> \$ \_\_\_\_\_

**8 Release Signature** Sign to authorize delivery without obtaining signature. 446

By using this Airbill you agree to the service conditions on the back of this Airbill and in our current Service Guide, including terms that limit our liability.  
 Questions? Visit our Web site at [fedex.com](http://fedex.com) or call 1.800.Go.FedEx® 800.463.3339.

Rev. Date 10/01 \*Part #157612-D-109-2001 FedEx® PRINTED IN U.S.A. WCS 02 \*\*\*\*\*

Figure 2. FedEx Airbill. Highlighted area properly documents 1 box containing 6 kg of dry ice.

## **B. Recommendations**

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

- Do not write “specimens” or “diagnostic specimens” on the box. Diagnostic specimens are subject to specific packaging requirements and there should not be any misunderstanding about your shipment. Diagnostic specimens, in shipping terminology, are materials that may be infectious to humans or animals. If you think your samples might be infectious, please contact Biosafety Manager at (575) 646-4463, [biosafe@nmsu.edu](mailto:biosafe@nmsu.edu).
- Reusing a dry ice shipping box is a good use of resources. If you choose to reuse a box, completely cover or obliterate all unnecessary marking such as hazard labels, addresses, old FedEx (or other courier) labels and/or barcodes. Only reuse a box if you can personally verify it is not contaminated and its integrity is intact. A box should not be reused if it is torn, cut, stained, or if the insulation is cracked or broken.
- Secure your samples in such a way that when the dry ice sublimates, the samples will not move freely inside of the insulated box. This can be accomplished by wedging your samples in place with cardboard or styrofoam. Fragile containers such as glass tubes or vials should be wrapped with cushioning material.
- 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 you fill your package with dry ice, fill it with packing peanuts or other material to reduce the volume of air space.
- Shipments are generally recommended to contain 5-10 pounds (2.27-4.54 kg) of dry ice per 24 hours. Refer to your package manufacturer’s recommendations. Make arrangements with your consignee to make sure your package will be received on its intended delivery date. Take into account local holidays or closings that might delay package receipt.
- Dry ice shipments should be delivered using FedEx. The U.S. Postal Service and UPS have extremely restrictive policies concerning shipments of hazardous materials including dry ice; EH&S recommends that you do not ship dry ice with UPS or the U.S. Postal Service.

**Appendix A. Intent to Ship Dry Ice**

After reading the NMSU Guide to Shipping with Dry Ice, complete the following exam and acknowledgement. EH&S will review the completed form and, upon successful completion, will certify you to ship dry ice. The certification will expire after two years. You may recertify through this same process.

- 1) Why is dry ice considered a hazardous material?
  
- 2) Which of the following labels/markings must appear on a package containing dry ice? Check all that apply.
 

<input type="checkbox"/> Class 9 hazard label	<input type="checkbox"/> Net weight of dry ice
<input type="checkbox"/> Class 8 hazard label	<input type="checkbox"/> "UN1845, Dry ice"
<input type="checkbox"/> "Inner packages comply with prescribed specifications"	<input type="checkbox"/> Biohazard symbol
	<input type="checkbox"/> "Diagnostic specimens"
  
- 3) A class 9 label must be put on a package only when there are other hazardous materials in the box in addition to dry ice.
  - a) True
  - b) False
  
- 4) It is acceptable to put a class 9 label on the top or bottom of the box.
  - a) True
  - b) False
  
- 5) The only consideration when reusing a dry ice shipping box is labeling it with the correct address.
  - a) True
  - b) False
  
- 6) If you are shipping non-hazardous plant tissue samples to a lab for diagnostic analysis, the statement, "Diagnostic specimens enclosed," should be written on the package.
  - a) True
  - b) False

I understand the hazards associated with dry ice and the shipping requirements for dry ice as outlined in this Guide. The labeling and packaging instructions are specific to FedEx and I am only certified to ship using this vendor. My test score must be 100% to be certified by Environmental Health & Safety.

<b>Print Name:</b>		<b>Email:</b>
<b>Signature:</b>		
<b>Department:</b>		<b>MSC:</b>
<b>Date:</b>		<b>Phone:</b>
Please send to EH&S at Mail Service Code (MSC) 3578 or scan and email to <a href="mailto:ehs@nmsu.edu">ehs@nmsu.edu</a>		

**Appendix B. Manufacturers of Dry Ice Shipping Containers**

Air Sea Atlanta  
1234 Logan Circle  
Atlanta, GA 30318  
(880) 351-8600  
<http://www.airseatlanta.com>

CARGOpak Corporation  
3215-A Wellington Court  
Raleigh, NC 27615  
(800) 266-0652  
<http://www.cargopak.com>

DG Supplies, Inc.  
5 Boxal Drive  
Cranbury, NJ 08512  
(800) 347-7879  
<http://www.dgsupplies.com>

HAZMATPAC, Inc.  
5301 Polk St., Bldg. 18  
Houston, TX 77023  
(800) 923-9123  
<http://www.hazmatpac.com>

Inmark, Inc.  
220 Fisk Drive S.W.  
Atlanta, GA 30336-0309  
(800) 646-6275  
<http://www.inmarkinc.com>

Polyfoam Packers  
Corporation  
2320 S. Foster Avenue  
Wheeling, IL 60090  
(888) 765-9362  
<http://www.polyfoam.com>

SAF-T-PAK, Inc.  
10807-182 Street, Edmonton  
Alberta, Canada, T5S 1J5  
(800) 814-7484  
<http://www.saftpak.com>

### Appendix C. Dry Ice Shipping Label

The label below should print with the proper dimensions of a class 9 hazard label (minimum dimensions: 100 mm on a side). Cut around the outside border of the label and affix it a vertical side of the box (not the top or bottom), oriented as shown below. Many printer inks run when exposed to even small amounts of water, such as rain or snow. Therefore, when using this label, cover with clear plastic tape after filling in the weight of dry ice.

