



# Shipping & Receiving Dangerous Goods

## Dry Ice Fact Sheet

Solid carbon dioxide or dry ice, is commonly used during transit as a refrigerant to keep materials cold. Shipments containing dry ice pose several hazards during transit, including a risk of explosion, suffocation and tissue damage. Dry ice is therefore regulated as a “dangerous good” by the International Air Transport Authority (IATA) and the Department of Transportation (DOT). To mitigate these hazards, several precautions must be taken when offering packages containing dry ice for shipment.

Hazardous materials shipments may require additional packaging and labeling. Shipments of using dry ice as a refrigerant have:

- identification number **UN 1845**
- proper shipping name of “**Carbon Dioxide, solid B**” or “**Dry Ice**”
- Accordance with Packing Instruction **954** (can be found in [Appendix E](#))

These are the basic requirements for shipments of 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. Pack dry ice loosely in the outer package such as a Styrofoam shipping package. Check the [manufacturer’s list](#) (Appendix A) for prefab packaging.
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 in order to prevent any loss of contents that might be caused by vibration or by changes in temperature, humidity, or altitude. **(See Figure 4)**
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 [manufacturer’s list](#) (Appendix A) (ex.: Saf-T-Pak STP 310 or Source Packaging INF-5000).
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 in kilograms.**” FedEx has a check box on their airbill to satisfy this requirement; see [Appendix C, figure C.1](#). Airborne Express requires a slightly different format; see [Appendix C, figure C.2](#). Check with the courier to obtain or ensure proper completion of their paperwork.
5. **Marking the package.** The shipping container must be marked with the following (Place two labels, one on each opposite side of box):
  - a) “**Carbon dioxide, solid**” or “**Dry Ice**”, **UN1845** in this order and in English;
  - b) The FULL name and address of the shipper and consignee (where/who it is being shipped);
  - c) The net quantity of dry ice within each package in kilograms.
6. **Labeling:** the outermost container must be labeled with a hazard class 9 label, UN 1845, and net weight of dry ice in kilograms. A printable version is included in [Appendix D](#). The label should be affixed to a vertical side of the box (not the top or bottom) and oriented as in [Appendix D](#). The maximum allowable net quantity of dry ice allowed per package is 200 kg. Place one of these labels on two opposing sides of the box.

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, contact the Pace University EH&S Office.
- **Reusing boxes.** If you choose to reuse a box, completely obliterate all unnecessary marking such as hazard labels, addresses, FedEx (or other courier) 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 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 inner package** in such a way that when the dry ice sublimates, it will not move freely inside of the insulated box. You may want to wedge the package in place with cardboard or styrofoam. Fragile containers such as glass tubes or vials should be wrapped with cushioning material.
- 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 can be made with FedEx (Refer to [Fedex How to Pack](#) manual, pages 11-13 on general information on dry ice use in perishable shipments.) and DHL. UPS and the U.S. Postal Service have extremely restrictive policies concerning shipments of hazardous materials; do not ship dry ice with UPS or the U.S. Postal Service.

EH&S Contact Information:

Phone: (914)923-2818

Fax: (914) 330-2795

<http://www.pace.edu/general-services/environmental-health-and-safety>

## Appendix: Manufacturers of Dry Ice Shipping Containers

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

All-Pak, Inc.  
Corporate One West  
1195 Washington Pike  
Bridgeville, PA 15017  
(800) 245-2283  
<http://www.all-pak.com>

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

### Package examples:

SAFT-T-PAK: STP 3100

Source Packaging: INF-5000

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>

Source Packaging of New  
England, Inc.  
405 Kilvert Street  
Warwick, RI 02886  
(800) 200-0366  
<http://www.sourcepak.com>

**Appendix B: Sample image of typical Dry Ice Shipping Container.**

The typical Dry Ice shipping container features an internal foam core with cardboard box exterior. DO NOT tape the Styrofoam top or the box top on tightly. Taping should be secure but NOT air tight.



## Appendix C: Sample Airbill or Air Waybill

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

**FedEx USA Airbill** FedEx Tracking Number: 839360283475 Form ID No: 0200 Sender's Copy

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

**2 Your Internal Billing Reference**  
 First 24 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./Floor/Suite/Rm: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ ZIP: \_\_\_\_\_

**4a Express Package Service** Packages up to 150 lbs.  
 FedEx Priority Overnight Next business morning  
 FedEx Standard Overnight Next business afternoon  
 FedEx First Overnight Earliest next business morning delivery to select locations  
 FedEx 2Day Second business day  
 FedEx Express Saver Third business day  
 FedEx Envelopes are not available. Minimum charge: One special rate.

**Express Freight Service** Packages over 150 lbs.  
 FedEx Freight® First Second business day  
 FedEx 2Day Freight Second business day  
 FedEx 3Day Freight Third business day  
 Delivery commitment may be later in some areas.  
 \* Declared value limit: \$500

**Packaging**  
 FedEx Envelope®  
 FedEx Pak® Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak  
 Other

**6 Special Handling**  
 SATURDAY Delivery Available ONLY for FedEx Priority Overnight and FedEx 2Day in select ZIP codes.  
 HOLD Weekday at FedEx Location  
 HOLD Saturday at FedEx Location  
 Include FedEx address in Section 3.  
 NOT Available for FedEx Priority Overnight and FedEx 2Day to select locations.  
 Does this shipment contain dangerous goods?  
 No  
 Yes Shipper's Declaration not required  
 Dry Ice 1 x 6 kg  
 Cargo Aircraft Only  
 One box must be checked.  
 Dangerous Goods Includes Dry Ice unless otherwise noted.

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

Total Packages: \_\_\_\_\_ Total Weight: \_\_\_\_\_ Total Declared Value? \$ \_\_\_\_\_  
 FedEx Use Only

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

Try online shipping at fedex.com  
 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 or call 1.800.Go.FedEx® 800.463.3338.

Figure C.2. Airborne Express Airbill. Highlighted area shows format required for 1 box containing 5 kg of dry ice.

**Sender Account Number** Preprint Format No. **3 Payment** Origin **Airbill Number** 2959950825  
 Sender will be billed unless marked otherwise  
 Bill to: \_\_\_\_\_ Account No. (Required if 3rd Party)  
 Receiver  3rd Party  
 Amount: \_\_\_\_\_

**4 Service Type** Express (Letter - 150 lbs)  
 One box must be checked. Assumed Express unless noted.  
 Express  
 Next Afternoon over 5 lbs charged at the Express rate.  
 Next Afternoon to Bold Red destinations only.  
 Next Afternoon (Letter - 5 lbs)  
 Second Day (Letter - 150 lbs)

**2 TO (Company) PLEASE PRINT NEATLY**  
 Street Address: \_\_\_\_\_ AIRBORNE CANNOT DELIVER TO P.O. BOX  
 City: \_\_\_\_\_ State: \_\_\_\_\_ ZIP CODE (Required)  
 MUST BE U.S. CITY, STATE, & ZIP CODE  
 Attention: (Name/Dept) Phone (Required)  
 Description: *Dangerous Goods Shippers Declaration not required*  
 DRY ICE, 9, UN 1845, III, 1 X 5 KGS, 904

**Special Instructions**  
 Saturday Delivery Extra charge Express only Not available to all locations  
 Lab Pack Service  
 Hold at Airborne

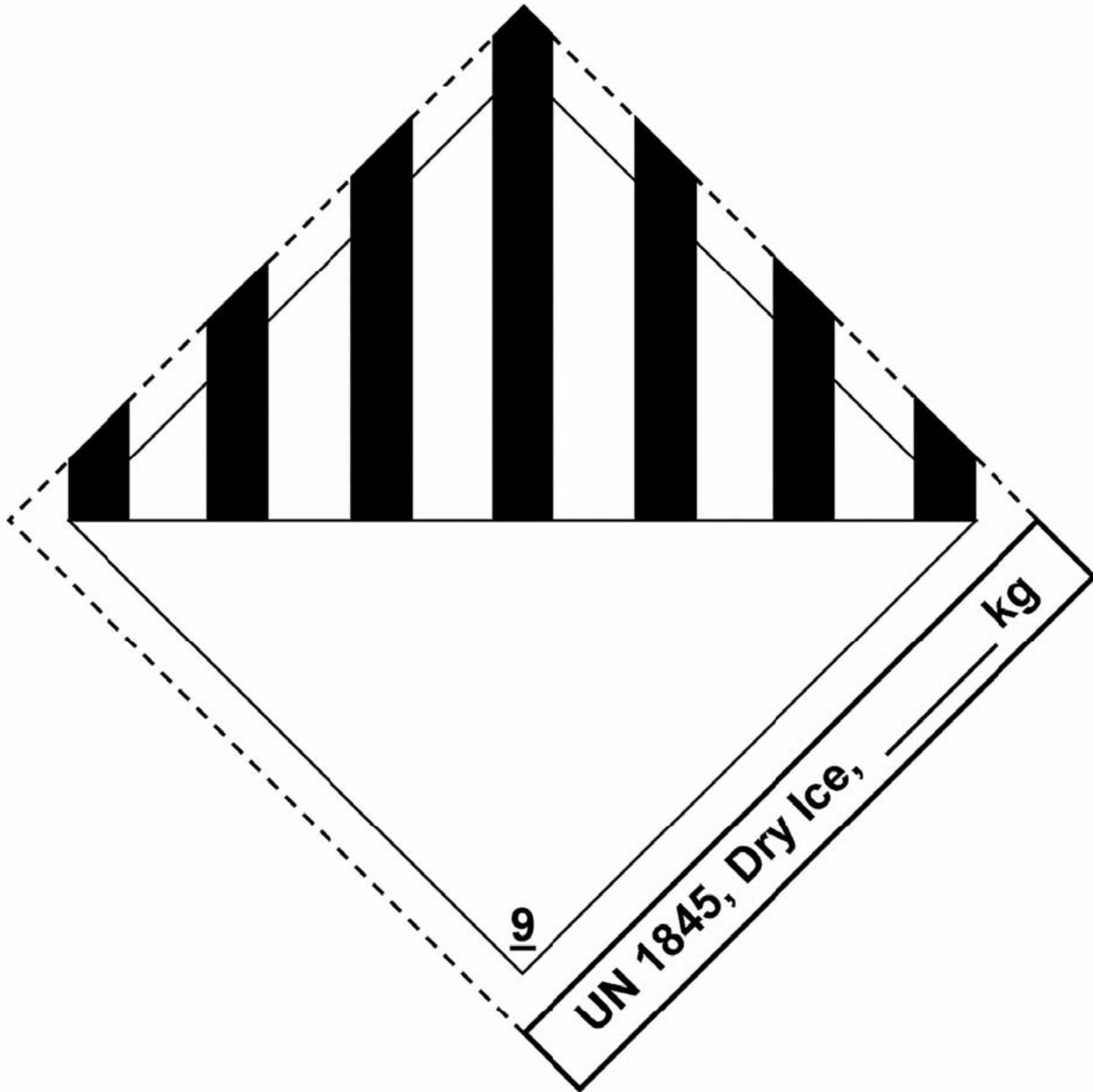
Declared Value: \_\_\_\_\_ Asset Protection: \_\_\_\_\_ Shipment Valuation: \$ \_\_\_\_\_  
 or  \$ \_\_\_\_\_

**Thank You for Shipping with Airborne!**

www.airborne.com **SENDER'S COPY** PO BOX 662, SEATTLE, WA 98111-0662 1-800-247-2676

## Appendix D. 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.



## Appendix E. PACKING INSTRUCTION 954 – Class 9 – Miscellaneous Dangerous Goods

STATE VARIATION: BEG-05 SAG-04 USG-12

OPERATOR VARIATIONS: BD-01 CA-08 CO-09 CS-09 HP-02 IC-08 KE-06 US-02 VN-11

This instruction applies to UN 1845 on passenger and cargo aircraft and CAO. The General Packing Requirements of 5.0.2 must be met.

Carbon dioxide, solid (dry ice) in packages, when offered for transport by air, must be in packaging designed and constructed to permit the release of carbon dioxide gas and to prevent a build-up of pressure that could rupture the packaging.

Arrangements between shipper and operator(s) must be made for each shipment, to ensure ventilation safety procedures are followed.

The Shipper's Declaration requirements of Subsections 8.1 and 10.8.1 are only applicable when the Carbon dioxide, solid (dry ice) is used as a refrigerant for dangerous goods that require a Shipper's Declaration.

When a Shipper's Declaration is not required, the following information, as required by 8.2.3 for the Carbon dioxide, solid (dry ice), should be contained in the "Nature and Quantity of Goods" box on the air waybill:

- UN 1845;
- proper shipping name (Dry ice or Carbon dioxide, solid);
- Class 9;
- the number of packages; and
- the net quantity of dry ice in each package.

The net weight of the Carbon dioxide, solid (dry ice) must be marked on the outside of the package.

Dry ice used as a refrigerant for other than dangerous goods may be shipped in a unit load device or other type of pallet prepared by a single shipper provided that the shipper has made prior arrangements with the operator. In such case, the unit load device, or other type of pallet must allow the venting of the carbon dioxide gas to prevent a dangerous buildup of pressure. The shipper must provide the operator with written documentation stating the total quantity of the dry ice contained in the unit load device or other type of pallet.

### Notes

1. Refer to the relevant airline's loading procedures for Carbon dioxide, solid (dry ice) limitations.
2. For Air Waybill requirements see 8.2.3. For loading instructions see 9.3.12.
3. For cooling purposes, an overpack may contain Carbon dioxide, solid (dry ice), provided that the overpack meets the requirements of Packing Instruction 904.