



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

[Environmental Health and Safety](#)

Appendix: Manufacturers of Dry Ice Shipping Containers

Air Sea Atlanta
1234 Logan Circle
Atlanta, GA 30318
(880) 351-8600

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

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>

Package examples:

SAFT-T-PAK: STP 3100

Source Packaging: INF-5000

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 Express USA Airbill Tracking Number: 839360283475 Form ID: 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.

3 To
 Recipient's Name: _____ Phone: () _____
 Company: _____
 Address: _____
 Address: _____
 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 Packages over 150 lbs. Delivery commitment may be later in some areas.

6 Special Handling
☒ **Dry Ice** Dry Ice, 9, UN 1845 1 x 6 kg
☐ Cargo Aircraft Only
☐ Special Handling: SATURDAY Delivery, HOLD Weekday, HOLD Saturday

7 Payment Bill to: ☐ Sender ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check

8 Release Signature Sign to authorize delivery without obtaining signature.

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® 800.463.3339.

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** Sender will be billed unless marked otherwise. **Origin** **Airbill Number** 2959950825

FROM (Company)
 Street Address: _____
 City: _____ State: _____
 Sent by (Name/Dept): _____ Phone (Required): _____

2 TO (Company) PLEASE PRINT NEATLY
 Street Address: _____
 City: _____ State: _____ ZIP CODE (Required): _____
 Attention: (Name/Dept): _____ Phone (Required): _____

Description
 Dangerous Goods Shippers Declaration not required
 DRY ICE, 9, UN 1845, III, 1 X 5 KGS, 904

4 Service Type
 Express (Letter - 150 lbs) ☒
 Next Afternoon (Letter - 5 lbs) ☒
 Second Day (Letter - 150 lbs) ☒

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

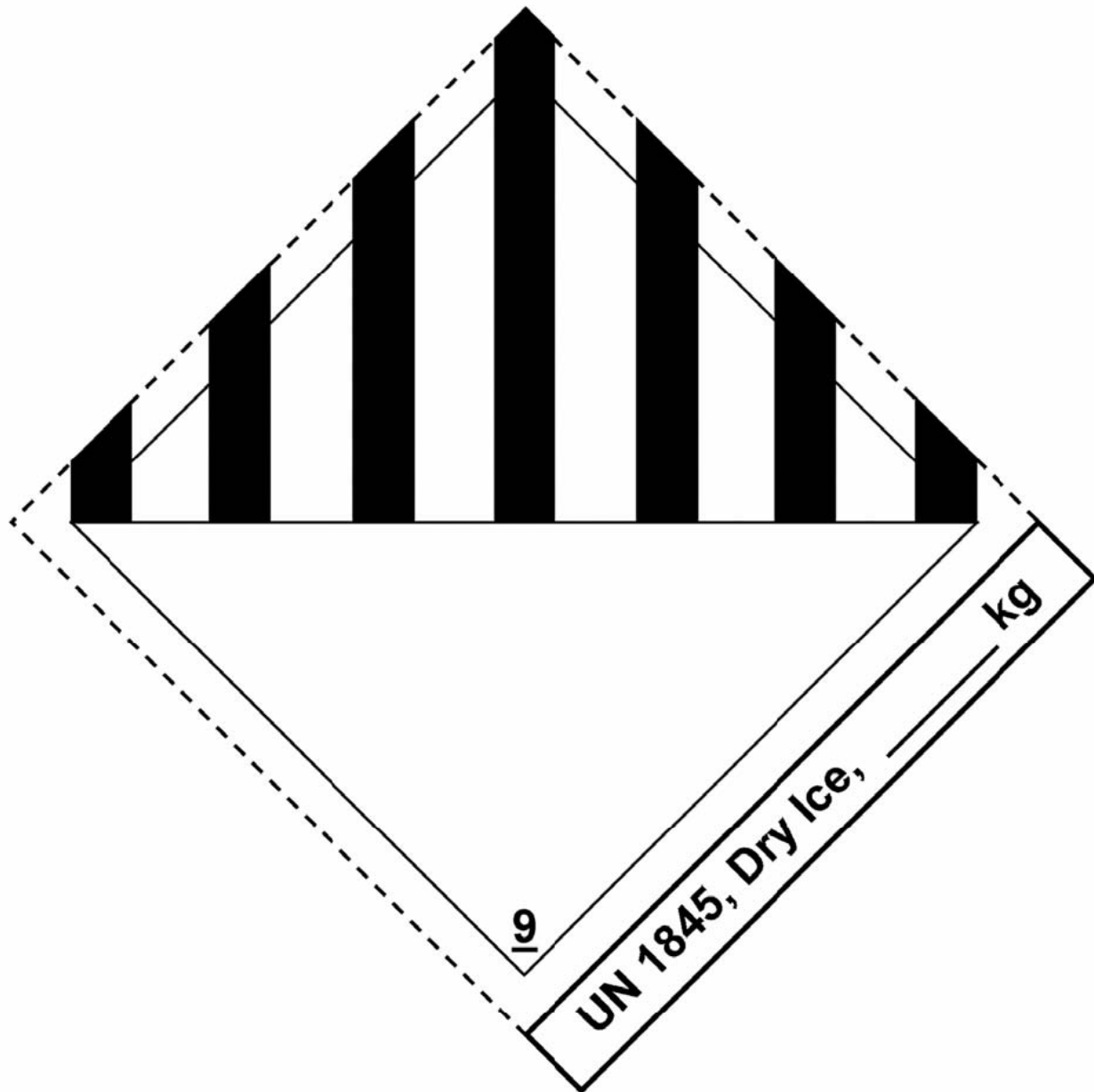
Declared Value Asset Protection Shipment Valuation
☐ or ☐ \$.00

Thank You for Shipping with Airborne!

AIRBORNE EXPRESS
 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.