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1.0 PURPOSE AND SCOPE

Conducting research often requires sending refrigerated or frozen samples to labs and off site contributors. Quite often, these types of shipments are done on dry ice, due to its very cold temperature and sublimation properties. However, the U.S. Department of Transportation (DOT) and the International Air Transport Association (IATA) regulate dry ice shipments by ground and by air respectively. This guide document informs Life Lab members of the rules and regulations they must abide by when shipping material on dry ice. This guide does NOT serve as official DOT/IATA training. This document is for informational purposes only. Harvard EHS provides official online trainings for shipping both non-regulated materials and biological materials on dry ice through the Harvard Training Portal.

2.0 OVERVIEW

Dry ice, also known by the shipping name Carbon Dioxide Solid, is considered a hazardous material when transported by air (FedEx Express and International), but not when offered for highway transport (FedEx Ground, UPS). Dry ice must be prepared in accordance with the IATA Dangerous Goods regulations when delivered via FedEx Express or shipped internationally, and in accordance with DOT Hazardous Material Regulations when delivered via UPS or shipped domestically. It is a federal regulation that individuals involved in the shipping of dry ice must, at a minimum, have DOT Hazardous Material and IATA Dangerous Goods training.

FedEx is the Life Lab’s preferred vendor for shipping packages containing dry ice through air transport. Both FedEx and UPS are preferred vendors for shipping packages containing dry ice via highway transport. The following sections discuss how to prepare shipments when using these vendors. Other carriers may have differences in what they require for paperwork, so you may need to contact them directly for instructions.

3.0 PACKAGING

Dry ice is exempt from the UN-Specification packaging standard (IATA Section 6), unless the package also contains another hazardous material (IATA Special Provision A48).

- The package must be strong enough to withstand the normal conditions encountered in transport so that there is no release of hazardous material and the integrity of the package is not compromised. For this reason, you must use a rigid fiberboard box in good condition as the
outermost packaging, and insure the dry ice is well insulated from the box to prevent condensation, which could degrade the fiberboard.

- Styrofoam is not recommended as the outer packaging when shipping dry ice because it may easily be damaged during normal transport conditions.
- Dry ice should not hold the inner content in place; there should be no movement of the inner packaging as the dry ice disappears.
- Dry ice must be allowed to vent and dissipate through the packaging and not create internal pressure that could cause it to rupture. Therefore, DO NOT contain the dry ice in a sealed container such as one with a threaded or friction-type closure.

4.0 MARKING AND LABELING

4.1 Markings

The outer packaging must be marked with the shipping name and identification number (Dry Ice UN 1845), the net weight of dry ice in kilograms, the consignor and consignee’s name and address. Net weight written in pound (lbs) will not be accepted by the shipper. Permanently mark the names and addresses on the packaging even though they may already appear on the air waybill attached to the package. Some hazmat screeners may reject the shipment if this information fails to appear on the box.

![Example of Dry ice label](Figure 1: Example of Dry ice label)
4.2 Hazard label

The hazard label shown in Figure 2 must be affixed to the same face of the box as the markings. The label must be 100 mm x 100 mm, be weather resistant and meet the design specifications of IATA Section 7.3.18 and 49 CFR 172.466.

Oftentimes the label and markings are combined on one decal commonly referred to as “Dry Ice Label” below. (See Figure 3.)

A previous version of the dry ice hazard label, which may still be available, is no longer acceptable to use. Please note the additional horizontal line below the black stripes in Figure 4 below.
5.0 SHIPPING PAPERS

Two categories of shipping papers should accompany a dry ice shipment:

- Dangerous Goods Declaration
- Air Waybill

5.1 Dangerous Goods Declaration

When hazardous materials are offered for shipment via air (FedEx) in a dry ice container, the shipper is required to prepare a Dangerous Goods Declaration to certify the cargo has been prepared in accordance with IATA Dangerous Goods regulations. This is not required when non-hazardous materials are packaged on dry ice. Copies of the Dangerous Goods declaration can be downloaded on IATA’s website as well as FedEx’s.
5.2 Air Waybill

An Air Waybill is a receipt issued by an international airline for goods and evidence of the contract of carriage. It is the most important document issued by a carrier directly or by its authorized agent. By accepting a shipment, an IATA cargo agent is acting on behalf of the carrier whose air waybill is issued. Whether the dry ice shipment contains hazardous waste or not, an air waybill should be completed by the shipper. Instructions to complete the FedEx air waybill can be found online at http://www.fedex.com/ma/shippingguide/intlairwaybill.html.
5.3 Ground Shipping

When non-hazardous material is packed on dry ice and is shipped via highway transport (UPS Ground), a hazardous materials shipping paper (49 CFR 172 Subpart C) is not required, provided alternative documentation is supplied containing the following information:

- Proper shipping name: **Dry Ice, Class 9, UN number 1845**
- The number of packages
- The net quantity in kilograms of dry ice in each package

When hazardous material is packed on dry ice and shipped via highway transport, DOT shipping papers should accompany the shipment in accordance with DOT regulations 49 CFR 172 Subpart C.

6.0 SPECIAL CONSIDERATIONS
When dry ice is shipped via highway transport, the DOT allows special provisions for small quantity shipments as well as materials for diagnostics or treatment purposes. These regulations can be found in the Code of Federal regulations 49CFR 173.217(c)(5) and 173.217(d).

6.1 Small quantities

Dry ice, in quantities not exceeding 2.5 kg or 5.5 lbs per package, and used as a refrigerant for the contents of the package, is exempt from all other requirements of the DOT Hazmat regulations. Shipments are considered compliant if the package is marked “Carbon Dioxide, Solid” or “Dry Ice”, is marked with the name of the contents being cooled, and is marked with the net weight of the dry ice or an indication that the net weight is less than or equal to 2.5 kg or 5.5 lbs. If hazardous material accompanies the shipment, the shipping paper requirement still applies.

6.2 Materials for diagnostic or treatment purposes

Dry ice, when used to refrigerate materials being shipped for diagnostic or treatment purposes (e.g., frozen medical specimens), is exempt from the shipping paper and certification requirements of the DOT Hazmat regulations. Shipments are considered compliant if the package is marked “Carbon Dioxide, Solid” or “Dry Ice”, and is marked with an indication that the material being refrigerated is being transported for diagnostic or treatment purposes.

7.0 HARVARD TRAINING PORTAL

Anyone with an assigned and active Harvard University ID may sign into the training portal to complete these courses. Use your HarvardKey to login to the Harvard Training Portal. Then click on Environmental Health & Safety Training and search for the following courses. Once the course is complete, you must take a quiz and get 100% correct to be issued a completion certificate. Harvard requires individuals that ship materials on dry ice to complete these trainings every 2 years.
7.1 Shipping Non-regulated Materials and Dry Ice (ID: LAB114)

This online course prepares you to legally ship research non-regulated biological based materials with dry ice. This course is mandated by IATA 1.5.

7.2 Shipping Biological Materials and Dry Ice (ID: LAB104)

This online course provides the training required by IATA 1.5 to legally ship biological specimens, with or without dry ice, by air.

8.0 REVISION HISTORY

<table>
<thead>
<tr>
<th>Change</th>
<th>Reason</th>
<th>Effective Date</th>
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<tbody>
<tr>
<td>New Document</td>
<td>New guidance document for residents needing to ship out materials on dry ice.</td>
<td>Dec 2016</td>
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