



# Safe Operating Procedure

(Revised 5/25)

## SHIPPING ITEMS WITH DRY ICE THAT ARE NOT OTHERWISE DANGEROUS GOODS



**DO NOT** prepare any international shipments before consulting with University of Nebraska-Lincoln Export Control at [exportcontrol@unl.edu](mailto:exportcontrol@unl.edu) or call 402.472.6929.

### Introduction

This Standard Operating Procedure (SOP) describes how to prepare a shipment containing dry ice as the only dangerous good for transport by air with a carrier that subscribes to International Air Transport Authority (IATA) standards. The information in this SOP is based on the most current IATA Dangerous Goods Regulations.

This SOP is a supplement to and not a substitute for the DOT/IATA training provided by EHS. Training is required before engaging in any transport-related function and at least every three (3) years thereafter.

### Scope

Shipments of Dry Ice in combination with any other dangerous good/hazardous material are beyond the scope of this SOP. As applicable, this SOP must be used in tandem with the following EHS SOP's:

- ***Shipping Excepted Quantities of Dangerous Goods***
- ***Shipping Biological Substances and Patient Specimens***
- ***Shipping Infectious Substances With or Without Dry Ice***

Refer to the SOPs listed above for examples of completed packages and shipping documentation when the package contains an excepted quantity of dangerous goods in the presence of a material properly classified as an Exempt Patient Specimen, Biological Substance Category B, and which contains dry ice.



## Safety Information – Dry Ice

Prior to preparing dry ice for shipment, review the Safety Data Sheet. Following is a broad summary of the hazards of small quantities (e.g., 5 pounds or less) of dry ice shipped in commerce.

- Dry ice sublimates. It changes directly from a solid to a gas. Therefore, packages and overpacks must not be tightly sealed. They must allow gases to escape to prevent the build-up of pressure.
- As dry ice sublimates it creates carbon dioxide gas, which is colorless and odorless. If enough dry ice were to sublime in an unventilated space, it could accumulate to a level that exceeds an occupational exposure limit (5000 ppm, expressed as an 8-hour Time-Weighted Average (TWA) or 30,000 ppm as a ceiling limit). Breathing high concentrations of carbon dioxide can lead to labored breathing, increased pulse rate, headache, increased blood pressure, and muscle twitching. At extremely high concentrations, the amount of oxygen available to support life may not be available, leading to asphyxiation.
- Dry ice is extremely cold at -109.3°F (-78.5°C). Touching dry ice unprotected can lead to frostbite. Always handle dry ice with care and wear thermally protective gloves and eyewear. Use a mechanical device (e.g., tongs) to handle.

## IATA 4.2 – List of Dangerous Goods (Dry Ice) Table

<b>IATA Section 4.2 List of Dangerous Goods (Dry Ice)</b>	
Proper shipping name	"Carbon dioxide, solid" or "Dry ice"
UN/ID No.	UN 1845
Class or Division	9
Hazard Label	Miscellaneous
Packing Group	Not Applicable
Packing Instructions	954
Maximum Quantity/Package for Limited Quantity	"E0"- Not permitted as Excepted Quantity
Passenger/Cargo Aircraft	200 kg
Cargo Aircraft Only	200 kg
Special Provisions	A48 (packaging test not considered necessary); A151 (when used as a refrigerant for other than dangerous goods loaded in a unit load device or other type of pallet, the quantity limits per package...do not apply...); A805 (clarifies that dry ice may be placed directly within an overpack that meets the requirements of Packing Instruction 954)



## **Packaging – Dry Ice (Packing Instruction 954)**

Packing Instruction 954 references the general packaging requirements of IATA 5.0.2, meaning that the packaging must be of good quality; compatible with the contents; and sufficient size to accommodate required labeling. Requirements specific to dry ice include the following:

1. Packaging must be designed and constructed to permit the release of carbon dioxide gas. This usually means that the package is not completely sealed at all seams.
2. The package must be of sufficient size to allow for marking and labeling. No labels may fold over from one surface of the container to the next, or overlap.
3. The total net weight of dry ice in the package must be less than the maximum amount specified in the IATA Dangerous Goods Table.

## **Marking & Labeling – Dry Ice**

General marking and labeling requirements must be observed, such as: all markings must be in English; all markings and labels must be durable and in the correct location, and only relevant markings and labels are allowed. The following marking and labeling are required on the outer package.

1. UN1845
2. Proper shipping name: “Carbon dioxide, solid” or “Dry ice.” Either name can be used as a proper shipping name.
3. Full name and address of shipper (from) and consignee (to).
4. Net weight of dry ice in the package, expressed in kilograms (2.2 lbs = 1 Kg).
5. Class 9 label.

## **Documentation – Dry Ice**

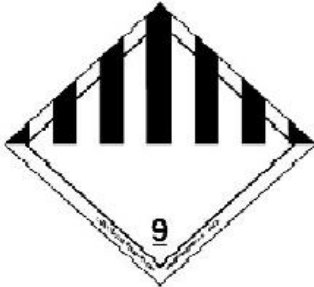
A Dangerous Goods Declaration is not required. However, the appropriate box on the airway bill must be checked to indicate that the shipment contains dangerous goods, and the following information must be provided on the Airway bill:

1. UN1845 (pre-printed on the FedEx Airway bill)
2. Proper Shipping Name, including Hazard Class “9” (pre-printed on the FedEx Airway bill)
3. Number of packages containing dry ice (fill in the blank provided on the Airway bill)
4. Net quantity of dry ice in the package, expressed in kilograms (fill in the blank provided on the Airway bill)



If the person who prepared the package for shipment is different from who is listed as the shipper on the airway bill, record the name of the preparer in Section 2 of the airway bill. A copy of the airway bill must be retained by the shipper for at least 2 years.

### Example Package Label and Air Waybill

Shipper: Ann Smith University of Nebraska – Lincoln, 3630 E. Campus Loop Lincoln, NE 68583-0824	Ship to: Marge Harley MBD Inc. 6075 S. Spencer Las Vegas, NV 89109
UN1845, Carbon Dioxide, Solid, 2 Kg	
	

<b>FedEx Express</b> <span style="float: right;">8531 5774 6190</span>		<b>0200</b> <span style="float: right;">Sender's Copy</span>	
<b>1 From</b> <small>Please print name and address</small> Date: 9-23-2005 <span style="float: right;">Sender's FedEx Account Number: 1234567890</span> Sender's Name: Ann Smith <span style="float: right;">Phone: (402) 472-0000</span> Company: University of Nebraska-Lincoln EHS Address: 3630 E. Campus Loop City: Lincoln State: NE ZIP: 68583-0824		<b>4a Express Package Service</b> <span style="float: right;">Packages up to 100 lbs.</span> <input checked="" type="checkbox"/> FedEx Priority Overnight <input type="checkbox"/> FedEx Standard Overnight <input type="checkbox"/> FedEx 2Day <input type="checkbox"/> FedEx Express Saver <input type="checkbox"/> FedEx 3Day Freight <input type="checkbox"/> FedEx 2Day Freight <input type="checkbox"/> FedEx 3Day Freight	
<b>2 Your Internal Billing Reference</b> <i>Ann Smith</i>		<b>4b Express Freight Service</b> <span style="float: right;">Packages over 100 lbs.</span> <input type="checkbox"/> FedEx 1Day Freight <input type="checkbox"/> FedEx 2Day Freight <input type="checkbox"/> FedEx 3Day Freight	
<b>3 To</b> Recipient's Name: Marge Harley <span style="float: right;">Phone: 000 1 000-0000</span> Company: MBD Inc. Recipient's Address: 6075 S. Spencer City: Las Vegas State: NV ZIP: 89109		<b>5 Packaging</b> <span style="float: right;">This must also be marked</span> <input type="checkbox"/> FedEx Envelope <input type="checkbox"/> FedEx Pak <input type="checkbox"/> FedEx Box <input type="checkbox"/> FedEx Tube <input type="checkbox"/> Other	
Try online shipping at fedex.com <small>By using the FedEx.com website, you agree to the service conditions on the back of this Airbill and our current Service Guide, including terms for limited liability.</small> <b>Questions? Visit our Web site at fedex.com</b> <small>or call 1.800.GoFedEx 1.800.463.3333.</small>		<b>6 Special Handling</b> <span style="float: right;">Includes FedEx address in Section 5</span> <input type="checkbox"/> SATURDAY Delivery <input type="checkbox"/> HOLIDAY Delivery <input type="checkbox"/> HOLIDAY Saturday <input type="checkbox"/> No <input type="checkbox"/> Yes <input checked="" type="checkbox"/> Yes <input type="checkbox"/> Yes <input type="checkbox"/> Yes <input type="checkbox"/> Yes Does this shipment contain dangerous goods? <input type="checkbox"/> No <input type="checkbox"/> Yes <input checked="" type="checkbox"/> Yes <input type="checkbox"/> Yes <input type="checkbox"/> Yes <input type="checkbox"/> Yes <b>7 Payment</b> <b>Bill to:</b> <input type="checkbox"/> FedEx <input type="checkbox"/> Recipient <input type="checkbox"/> Third Party <input type="checkbox"/> Credit Card <input type="checkbox"/> Cash/Check Total Packages: 1 Total Weight: 4 lbs Total Declared Value: \$ 0.00 <b>8 Sign to Authorize Delivery Without a Signature</b> <span style="float: right;">467</span>	



Note: The example Air Waybill provided in this SOP is a hard copy format. In general, University of Nebraska-Lincoln shippers have an account with FedEx and the Air Waybill is completed electronically. The information required for hard copy and electronic Air Waybills is the same.

### **Security Awareness Training Reminder**

Hazmat employees must receive training related to security. Following is a summary of the security awareness information included in the EHS IATA training program. Reduce the possibility of unauthorized access, possession, and use by securing all hazardous materials/dangerous goods. The following general guidelines represent minimum requirements:

- Packages containing hazardous materials/dangerous goods must be kept in a secured area, or under the supervision of a designated shipper, or other authorized employee(s) until picked up by the carrier. Limit access to areas where dangerous goods/hazardous materials packages are prepared for shipment, received, stored, unpacked or used to authorized employees only. Report latches and locks on doors or other security devices that are damaged, sticky, or have been tampered to your supervisor and the Building Maintenance Reporter.
- Make sure the carrier picking up dangerous goods/hazardous materials shipments has identification (e.g., company ID, uses a clearly identified company vehicle, or wears a company uniform).
- Report suspicious individuals, behavior, stolen or missing dangerous goods/hazardous materials, and known or suspected unauthorized entry into secured areas to your supervisor and to the University of Nebraska-Lincoln (UNL) Police Department 402-472-2222. Be aware of your surroundings; look for out-of-place vehicles and abandoned or out-of-place backpacks, bags, or other containers.
- Limit information concerning hazardous materials/dangerous goods shipments to individuals who need to know, such as other authorized employees, carrier personnel, and supervisors. Do not share information on dangerous goods/hazardous materials shipments with casual acquaintances or strangers.
- Be familiar with emergency procedures in place at UNL and know what to do if a package is leaking or damaged.