UNIVERSITY OF NEBRASKA MEDICAL CENTER℠
ENVIRONMENTAL HEALTH AND SAFETY

HAZARDOUS MATERIAL FACT SHEET
Liquid Nitrogen Dry Shippers

All personnel planning to use liquid nitrogen dry shippers must have completed the UNMC EHS Shipping Biological Substance and Dry Ice Training. Please contact unmcehs@unmc.edu to obtain training.

Overview

Dry shippers are dewars that contain porous material cooled with liquid nitrogen (LN2) but do not have free liquid nitrogen when prepared correctly. They are designed for the safe shipment of specimens at liquid nitrogen temperatures without the risk of spilling liquid nitrogen.

While liquid nitrogen is a regulated Hazardous Material when shipped, a properly prepared "dry shipper" is not. Dry shippers are exempt from shipping requirements if they meet the following conditions:

- They will not allow the build-up of pressure within the container.
- They will not permit the release of liquid nitrogen, regardless of the dry shipper's orientation.
- The shipping paper describes the dry shipper as "Not restricted, as per Special Provision A152" on the Air Waybill.

Dry shippers typically contain non-regulated or exempt specimens. Additional requirements may apply to dry shippers containing Category A or B Infectious Substances.

This Fact Sheet outlines the process to ensure that dry shippers are prepared and shipped correctly.

Filling the dry shipper – Follow the manufacturer’s instructions.

- Conduct work in well-ventilated areas as high concentrations of nitrogen can cause oxygen deprivation and asphyxiation without warning.
- Wear a face shield and appropriate insulated gloves made for handling LN2.
- Add the LN2 slowly as a significant amount of nitrogen gas will be generated as the cold liquid contacts the shipper's warm surfaces.

- Stop filling when the liquid reaches the neck of the dry shipper. Replace the dewar cap and set the dry shipper aside to allow the LN2 to saturate the absorbent for the manufacturer's specified amount of time.
- Repeat steps until the liquid level no longer drops on standing.

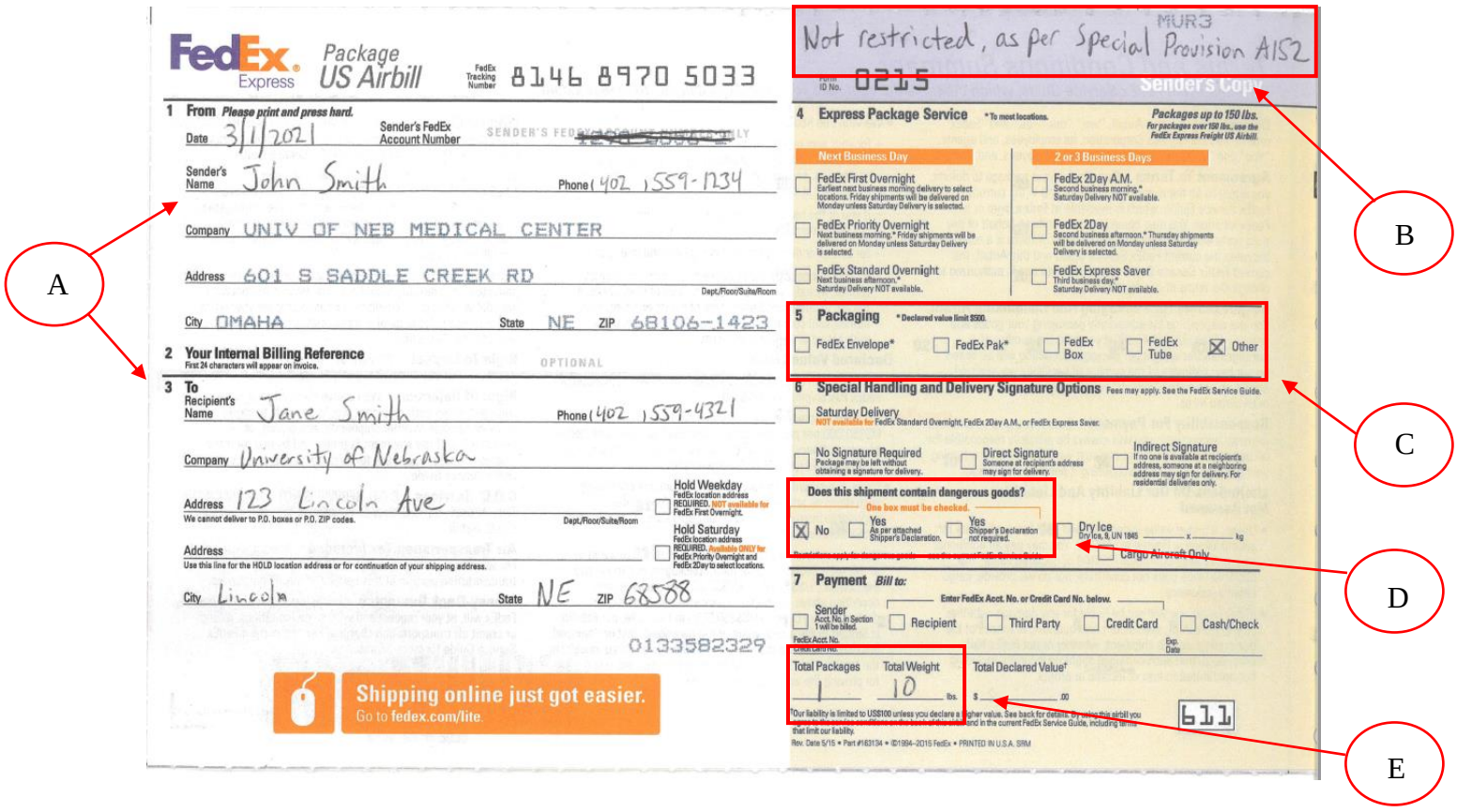
Preparing dry shipper for shipment – Remove all free LN2 from the dry shipper before transport.

- Conduct work in well-ventilated areas as high concentrations of nitrogen can cause oxygen deprivation and asphyxiation without warning.
- Wear insulated gloves, a thermal apron, and a face shield when emptying the dry shipper.
- Empty the dry shipper by pouring the excess LN2 back into a large LN2 dewar or an appropriate receptacle. (Do **NOT** pour LN2 down the sink as it could crack the pipes or onto the floor as it could splash and cause severe burns).
- Hold the dry shipper upside down until the liquid stops flowing.
- Stand the dry shipper upright for the amount of time specified by the manufacturer.
- Repeat steps until all remaining LN2 is removed from the dry shipper.
- Put specimens into the dry shipper and replace the cap.
- Place the dry shipper into the protective case (if applicable).

Preparing paperwork for shipment – Air Waybill documentation.

A. Document the To/From information (shipper & consignee).
B. Document "Not restricted, as per Special Provision A152" on the Air Waybill.
C. Mark "Other" as the type of packaging.
D. Mark "No" for the question "Does this shipment contain dangerous goods?".
E. Document the total number and weight of packages.

Example Air Waybill



Section		Description
A	Ship "From" and "To"	The full name and address of the shipper ("from") and consignee ("to") must be clearly printed on the Air Waybill.
B	Special Provision documentation	"Not restricted, as per Special Provision A152" must be documented on the Air Waybill.
C	Packaging	Document "Other" as the type of packaging.
D	Dangerous Goods	Document "No" for the question "Does this shipment contain dangerous goods?".
E	Total packages and total weight	Document the total number and weight of packages.

Please call 402.559.6356 or
email unmcehs@unmc.edu with any questions