

Federal Aviation Administration
Civil Aviation Security
Dangerous Goods Advisory Bulletin

Information of Concern to Air Carriers

Subject: Liquid Nitrogen in Dewars
Number: DGAB-98-03
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INFORMATION: The Federal Aviation Administration (FAA) is issuing this Advisory Bulletin to alert air carriers to the hazards associated with mishandling authorized packagings utilizing liquid nitrogen as a refrigerant. These packagings are "non-pressurized" flasks and specially designed flasks known as "dry shippers", which are used to transport refrigerated biological specimens. Liquid nitrogen is a regulated material subject to 49 CFR Parts 100 – 180, Hazardous Materials Regulations, (see 173.320(c)) and the International Civil Aviation Organization's Technical Instructions for the Safe Transport of Dangerous Goods by Air (see Packing Instructions 202).

Safe Handling:

The closure of the container is designed to allow venting to the atmosphere, through the fill opening, in order to prevent the build up of pressure within the package. Packages are designed to be transported in an "upright" position at all times. These containers release of liquid nitrogen through the venting system when handled adversely to the orientation markings and package design. Therefore, it is important that personnel that handle, load and unload flasks that contain liquid nitrogen maintain the flask in the upright position at all times. Failure to do so may result in the release of liquid nitrogen and cause injury.

Non-pressurized flasks: (*other than "dry-shippers"*)

These types of containers are authorized for liquid nitrogen (Division 2.2, cryogenic), in the ICAO Technical Instructions (TI), and must meet the packing instructions in 202. Non-pressurized flasks are similar in design and appearance to "dry shippers", except they are filled with liquid nitrogen, and the biological specimens are suspended in it.

Dry Shippers:

Dry shippers, when properly prepared (see the Note at the end of Packing Instructions 202) are not subject to the requirements of the regulations. However, if the dry shippers are offered with free liquid nitrogen present, they would be subject to the regulations when offered for transportation by aircraft (see 49 CFR 173.320) and must be offered in accordance with the ICAO Technical Instructions. These packagings use liquid nitrogen (Division 2.2, cryogenic liquid) as a refrigerant. A dry shipper consists of an outer metal jacket and an inner shell, with the space between filled with insulation and vacuum-sealed. The interior of the packaging contains a cylindrical void, which holds the material requiring refrigeration, surrounded by absorbent material. The absorbent material is saturated with the liquid nitrogen. The FAA has found shipments where the nitrogen is not completely absorbed so when handled adverse to the orientation markings, results in a loss of liquid nitrogen.

FAA Enforcement:

The FAA will actively pursue enforcement actions against all parties who violate the Hazardous Materials Regulations or the ICAO Technical Instructions. Violators are subject to civil penalties of \$27,500 and criminal prosecution with penalties of \$250,000 and up to five years in prison.

/s/

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