

JOB AID

HAZMAT Transportation Part 3: **Packaging**

HAZMAT Transportation Part 3: Packaging

| Symbols | Hazardous materials descriptions and proper shipping names | Hazard Class or Division | Identification Numbers | PG | Label Codes | Special provisions (§ 172.102) | (8) Packaging | | | (9) Quantity Limitations | | (10) Vessel Storage | |
|---------|--|--------------------------|------------------------|-----|-------------|--------------------------------|---------------|-----------|------|--------------------------|---------------------|---------------------|------------|
| | | | | | | | Exceptions | Non- bulk | Bulk | Passenger aircraft/rail | Cargo aircraft only | Location | Other |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8A) | (8B) | (8C) | (9A) | (9B) | (10A) | (10B) |
| | Argon, refrigerated liquid (<i>cryogenic liquid</i>) | 2.2 | UN1951 | | 2.2 | T75, TP5 | 320 | 316 | 318 | 50kg | 500kg | D | |
| | Arsenic | 6.1 | UN1558 | II | 6.1 | IB8, IP2, IP4, T3, TP33 | 153 | 212 | 242 | 25kg | 100kg | A | |
| | Arsenic acid, liquid | 6.1 | UN1553 | I | 6.1 | T20, TP2, TP7, TP13, W31 | None | 201 | 243 | 1L | 30L | B | 46 |
| | Arsenic acid, solid | 6.1 | UN1554 | II | 6.1 | IB8, IP2, IP4, T3, TP33 | 153 | 212 | 242 | 25kg | 100kg | A | |
| | Arsenic bromide | 6.1 | UN1555 | II | 6.1 | IB8, IP2, IP4, T3, TP33 | 153 | 212 | 242 | 25kg | 100kg | A | 12, 25, 40 |
| | <i>Arsenic chloride, see Arsenic trichloride</i> | | | | | | | | | | | | |

Packaging requirements are listed in Part 173 of the HMR. Columns 8A, 8B and 8C of the Hazardous Materials Table (HMT) identify the applicable packaging exceptions and regulations for each hazardous material.

- **Packaging** refers to the containers or receptacles in which we pack hazardous materials
- A **package** is a filled package or the packaging plus its contents

Responsibilities

Shippers and carriers share the responsibility of ensuring HAZMAT packages comply with these requirements:

- The **shipper** packages and offers hazardous materials to the carrier
- The **carrier** must inspect and accept only those packages that comply with the HMR. The carrier may also repackage and offer hazardous materials for reshipment

Requirements

General package requirements:

- Address package design, construction and content limitations
- Are mostly located in Section 173.24 of the HMR; Section 173.27 contains the package requirements for air transportation

Specific package requirements:

- Provide the criteria (including quantity limitations) for each mode of transportation
- Are found in Column 9 of the HMT for air and rail

Air Shipments

Follow the general requirements for air shipments in Section 173.27 of the HMR. Select UN Standard or DOT-approved packaging that complies with air transportation requirements and is designed and constructed to prevent leakage. Packages with vented closures are forbidden.

Liquid Hazardous Materials

To allow for expansion, leave a vacant space, vapor space or outage (percent by volume) when packaging liquid materials (or solid materials that may become liquid during transport). Mark package to keep inner packaging upright and cushion inner containers to prevent breakage.

Overpacks

Overpacks consolidate multiple HAZMAT packages into one unit for easier handling or better containment. Each package *within* the overpack must meet the HMR packaging requirements. Clearly label with the word "Overpack". Detailed provisions for overpacks can be found in Sections 173.3 and 173.25.

Forbidden Packages and Materials

When selecting packaging for hazardous materials, we must consider:

- The material's form (solid, liquid, gas)
- Its compatibility with the material
- The material's packing group
- The mode of transportation

- Whether we can transport the material

“Forbidden” in Column 3 of the HMT indicates that the material is not permitted to travel by any mode of transportation.

“Forbidden” in Column 9 of the HMT means the material is only banned on passenger aircraft, cargo aircraft and/or passenger railservice.

Section 173.21 of the HMR provides an extensive list of materials and packages forbidden from transportation, such as:

- Electrical devices likely to create sparks or generate a dangerous quantity of heat
- Packages that give off a flammable gas or vapor

Special Packaging

Leaking or Damaged Packages

It's not acceptable to transport leaking or damaged packages without containing the hazardous materials in some way. Package these materials (as well as hazardous waste) in a metal or plastic salvage drum that:

- Has a removable head to allow for packing solids and semi-solid forms of materials
- Is compatible with the hazardous material
- Was made before October 1, 1993, or is a UN1A2, UN1B2, UN1N2 or UN1H2 drum
- Can pass a 20-kilopascal UN leak test and perform at a PG III performance level or higher (for UN drums)

It may be necessary to pack absorbent and/or cushioning materials around the contents to soak up any liquids and prevent the package from moving around during transport. If so, mark the outside of the drum with:

- The proper shipping name of the contents
- The name and address of the person receiving the shipment (consignee)
- “Salvage” or “Salvage Drum”

Label the drum properly and complete the proper shipping papers.

DOD Packaging

The U.S. Department of Defense (DOD) requires that shipments of hazardous materials (sent to or from a DOD installation) are packaged in UN Standard or DOD-certified packaging.

Reusable Packaging

You may reuse certain packaging and receptacles to transport hazardous materials, provided they remain compliant with the HMR through reconditioning and retesting. Provisions for reuse are found in Section 173.28 of the HMR.

When marking the reused package:

- Remove or cover any previous markings
- Mark the package with the letter "L" plus the name or symbol of the leak tester OR the letter "R" with the name or symbol of the reconditioner
- Mark the package with the last two digits of the year tested

Empty Packaging

Treat any empty packaging that hasn't been cleaned or purged as though it still contains hazardous materials:

- Mark, label and describe empty packaging according to the materials it last contained
- Close and secure openings or valves to prevent the release of any residue
- Comply with any other applicable empty packaging requirements in Section 173.29

Exceptions

Packaging exceptions exist for certain materials unless they're transported as hazardous waste.

Special Provisions

Special provisions and packaging exceptions may be listed in Columns 7 and 8A of the HMT. Special provisions are coded according to the type of packaging. For instance, "IB" codes indicate special provisions for intermediate bulk containers or IBCs and "T" codes refer to portable tank packaging requirements.

Limited and Small Quantity Exceptions

Packaging exceptions may apply when shipping limited or small quantities of hazardous materials. For limited quantities, read Subpart B of the packaging exception listed in Column 8A of the HMT. For shipping small quantities of hazardous materials, read Section 173.4 of the HMR. This section details:

- Which hazardous materials qualify for the exception
- The conditions you must meet when packing the material, including quantity limits and marking requirements

Agricultural Products Exception

Agricultural products defined as hazardous materials include **fertilizers, pesticides** and **fuel**. These materials, other than Class 2 gases and hazardous waste, are exempt from HMR packaging requirements.

According to Section 173.5 of the HMR, the exception applies to agricultural products that:

- Are transported over local roads within 150 miles of the farm
- Do not exceed the regulated amount per vehicle
 - 7,300 kg (16,094 lbs) of ammonium nitrate fertilizer in bulk packaging and properly classed as Division 5.1 PG III
 - 1,900 L (502 gal) for liquids or gases
 - 2,300 kg (5,070 lbs) for solids

Farmers may use this exception as long as:

- They are registered as an interstate private motor carrier
- They use the products on their own farm
- The DOT exception meets state laws or regulations

Materials of Trade (MOTs) Exception

MOTs help us:

- Protect our health and safety
- Operate or maintain the motor vehicle
- Support our job or business

To qualify for the MOTs exception:

- Packaging must not exceed the quantity limitations in Section 173.6, Subpart A
- The total gross weight, excluding diluted mixtures of Class 9 materials, must not exceed 200 kg (440 lbs)
- MOTs must be in the manufacturer's original packaging or that of equal or greater strength
- Gasoline must be transported in DOT-authorized metal or plastic cans
- Packaging must be leak-tight for liquids and gases and sift-proof for solids
- Packages must be closed properly, protected against damage and secured against movement

If you prepare MOTs for someone else to transport, you must let the driver know about the MOTs, their reportable quantity and their requirements in Section 173.6

Lab Pack Exception

Class or Division 3, 4.1, 4.2, 4.3, 5.1, 6.1, 8 or 9 hazardous waste materials may be packaged in **lab packs**, EXCEPT for Division

6.1 PG I materials, Division 4.2 PG I materials, chloric acid, and oleum (or fuming sulfuric acid).

However:

- Combination packaging must meet the requirements of Section 173.12
- Waste material can only be transported for disposal or recovery by highway

When packaging waste materials in a lab pack, the requirements are as follows:

- For the outer packaging, select from:
 - UN1A2 or UN1B2 metal drum
 - UN1D plywood drum
 - UN1G fiber drum
 - UN1H2 plastic drum
- Make sure lab packs meet the UN specifications and are marked at a minimum for PG III
- The maximum capacity for each inner packaging must be 4 L (1 gal) for glass containers and 20 L (5.3 gal) for metal and plastic containers
- If the material is a liquid waste, pack the drum with enough compatible absorbent material to soak up all of the liquid contents in the event inner packaging leaks or spills
- The gross weight of the package cannot exceed 205 kg (451 lbs)
- The package can only contain waste materials from one hazard class