2000 Edition

3

Instructor Manual

Packaging

HAZARDOUS MATERIALS TRANSPORTATION TRAINING MODULES

U.S. Department of Transportation
Research and Special Programs Administration

Script

Visual	Narrative

1

Module 3, Packaging

2

Who is required to comply with the HMR?

According to 171.2(a) of the HMR, anyone who offers or accepts a hazardous material shipment **must** comply with the HMR.

No person, individual or company may offer or accept a hazardous material for transportation **in commerce** unless the shipment complies with the HMR.

171.2(a)

STUDENT RESPONSE NOTE 1-2

The shipper and the carrier share in the responsibility to offer and/or accept **only** hazardous materials that comply with the HMR!

3

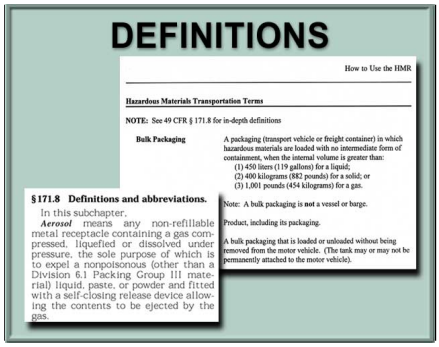
If you transport hazardous materials in the course of a commercial business, you are regulated and must comply with the HMR. The purpose of HMR packaging requirements is to assure that hazardous materials stay in the package during transportation.

171.2(b)

STUDENT RESPONSE NOTE 3

The purpose of HMR packaging requirements is to assure that hazardous materials stay in the package during transportation.

4



The packaging of hazardous materials has its own vocabulary. Common terms take on new meanings when applied to the HMR.

Refer to the glossary in the “How to Use the HMR” booklet, and the HMR definitions in 171.8 when preparing hazardous material for transportation.

171.8

5

The terms “package” and “packaging,” are used extensively throughout the HMR. These terms are frequently misused.

171.8

6

The term “package” or “outside package” means the packaging plus its contents.

171.8

7

The term “packaging” means a receptacle and any other components or materials necessary to perform its containment function in conformance with the minimum packing requirements of the HMR. A package must meet or exceed minimum packaging requirements. Packagings include fiberboard boxes, drums, jerricans, portable tanks, cargo tanks, tank cars, multi-unit tank car tanks and containers other than freight containers and overpacks.

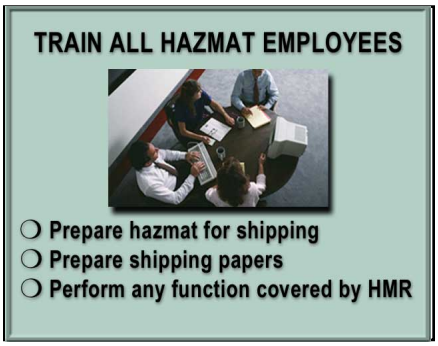
171.8

8

A shipment of hazardous materials that is not prepared in accordance with the HMR may not be offered for transportation by any mode.

173.1(b)

9



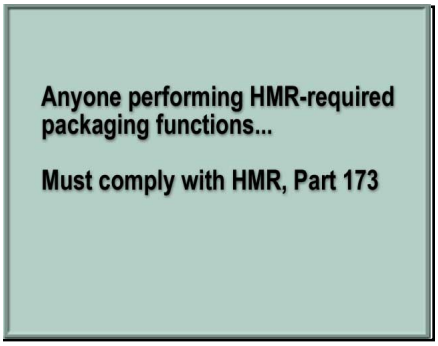
If you offer hazardous materials for transportation, you must train your hazmat employees. Training must be in accordance with the applicable parts of the HMR. Train every officer, agent, and employee who has any responsibility for preparing the hazardous materials for shipment.

173.1(b)

STUDENT RESPONSE NOTE 4-9

Anyone who offers hazardous materials for transportation must train his/her hazmat employees in the applicable requirements of the HMR.

10



Every person (e.g., freight forwarder, agent or broker) who performs a function required by Part 173, must perform that function according to the HMR. That means properly classify, describe and package the hazardous material.

173.1(c);173.22

11

Example: If a carrier repackages a hazardous material for any reason, the carrier is preparing the shipment for transportation.

The material must be repackaged in accordance with all applicable HMR provisions. It makes no difference that the carrier is not the shipper; the carrier is functioning as a shipper.

Sometimes more than one person performs an “offeror” or shipper function. Each person performing an “offeror” function is accountable for HMR packaging responsibilities.

173.1(c)

STUDENT RESPONSE NOTE 10-11

Anyone, shipper or carrier, who performs a packaging function must comply with applicable HMR packaging requirements.

12

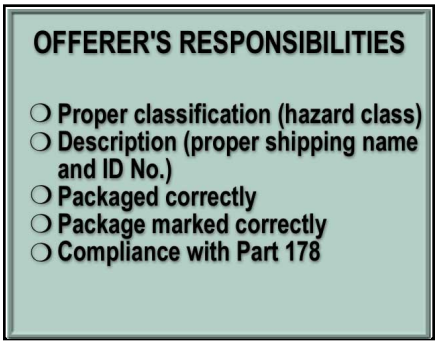
Packaging of hazardous materials for transportation in all modes must be as specified in the HMR. The initial carrier and the DOT are authorized to inspect hazardous materials packages for HMR compliance. They may inspect for methods of manufacture, packing, and storage of hazardous materials that affect safety in transportation.

173.3(a)

STUDENT RESPONSE NOTE 12

The packaging of hazardous materials for all modes of transportation must be as specified in the HMR. Packages of hazardous materials may be inspected for safety by USDOT and the initial carrier.

13



Preparation of hazardous materials for transportation is the responsibility of the person who offers the material for transportation.

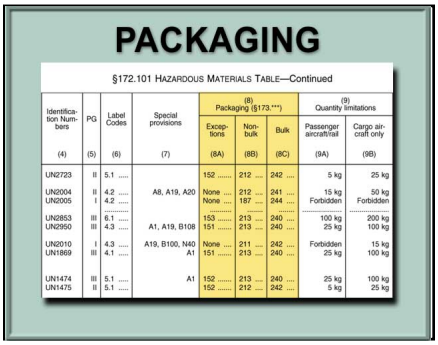
Unless otherwise provided, a hazardous material may be offered for transportation in an approved packaging or container only if the material is

- properly classed,
- properly described,
- in a properly manufactured and tested packaging or container,
- in a packaging marked in accordance with the HMR, and
- the package is in full compliance with Part 178.

173.22(a)(1)-(4)

SPECIFIC REQUIREMENTS

14



Identification Numbers (4)	PG (5)	Label Codes (6)	Special provisions (7)	(8) Packaging (§173.***) Exceptions (8A)	Non-bulk (8B)	Bulk (8C)	(9) Quantity limitations Passenger aircraft/rail (9A)	Cargo aircraft only (9B)
UN2723	II	5.1		152	212	242	5 kg	25 kg
UN2004	II	4.2	A8, A19, A20	None	212	241	15 kg	50 kg
UN2005	I	4.2		None	187	244	Forbidden	Forbidden
UN2853	III	6.1		153	213	240	100 kg	200 kg
UN2950	III	4.3	A1, A19, B108	151	213	240	25 kg	100 kg
UN2010	I	4.3	A19, B100, N40	None	211	242	Forbidden	15 kg
UN1869	III	4.1	A1	151	213	240	25 kg	100 kg
UN1474	III	5.1	A1	152	213	240	25 kg	100 kg
UN1475	II	5.1		152	212	242	5 kg	25 kg

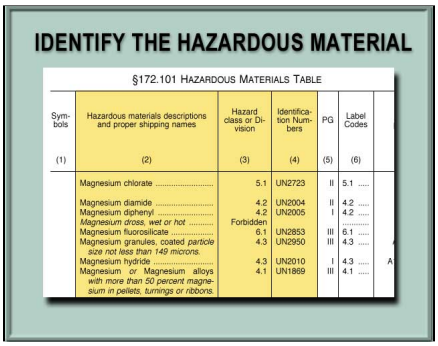
The HMR prescribe packaging authorizations for the transport of hazardous materials. In the HMT, Columns (8A), (8B) and (8C) direct you to specific packaging for each hazardous material. Sometimes the HMR provide exceptions from packaging requirements. Please read 172.101(i).

For this module, we are assuming that the material has been properly classified and assigned a proper shipping name.

The correct packaging is determined by the hazard class/ division of the material, the packing group, and the quantity of the materials being shipped.

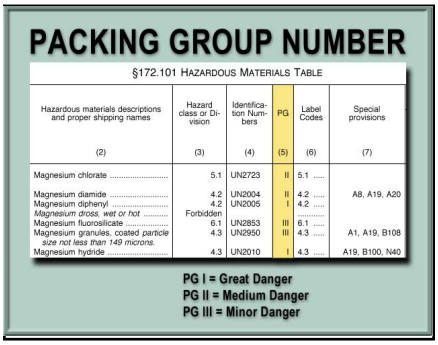
172.101(i)

15



The first step in selecting proper packaging is to turn to the HMT. Identify the material's proper shipping name, hazard class and identification number in columns 2, 3, and 4.

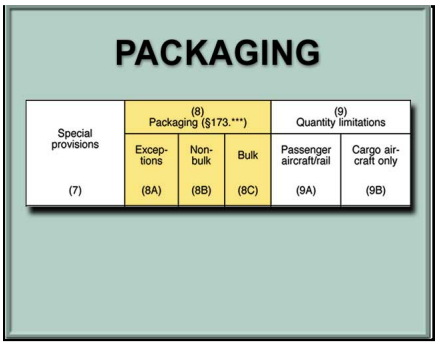
16



Next determine the packing group in Column 5. The packing group is indicated by the Roman numerals I, II, or III. These numbers reflect the degree of danger within certain hazard classes. PG I represents the greatest danger, PG II medium danger, and PG III minor danger.

172.101(f)

17



Now follow across the HMT to Column 8 "Packaging (173.***)." Column (8A) provides exceptions to the packaging requirements if certain conditions are met. Column (8B) provides authorized packaging for non-bulk, and Column (8C) for bulk.

To find the reference section, please replace the *** after 173. in the heading with the references found in Columns (8A), (8B), or (8C).

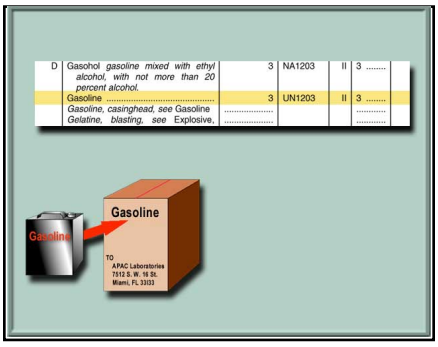
172.101

Remember: Column (8A) lists exceptions, not exemptions.

Exceptions are in the HMR for anyone to use, when applicable. Each exception stands on its own. The exception is permitted only if the section is referenced for the specific hazardous material in the HMT.

Exemptions are issued in writing from the USDOT in Washington, DC. Exemptions are limited to those materials, regulations, conditions and persons or class of persons named in the exemption.

18



Student Activity

Determine the proper packaging authorization for a shipment consisting of 1 liter of gasoline. The gasoline is in a metal can and packaged in a strong outer container.

Gasoline is a Class 3, PG II material. The packaging authorizations in Column 8 of the HMT read as follows:

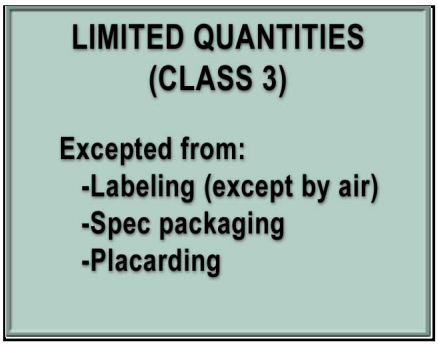
8A	8B	8C
exceptions	non-bulk	bulk
150	202	242

Read 173.150 to see if an exception applies.

This package meets the provisions of 173.150(b). Therefore, the package may be shipped as a "Limited Quantity (Ltd. Qty.)"

173.150

19



When shipped as a Limited Quantity, the hazardous material is excepted from specification packaging and placarding in all modes of transportation. It is also excepted from labeling in all modes, except air.

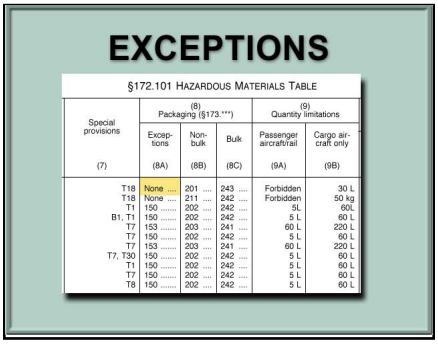
Please stop and read the definition of Limited Quantity in 171.8.

171.8

STUDENT RESPONSE NOTE 13-19

Limited quantities of Class 3 (Flammable liquid) material are excepted from specification packaging and placarding in all modes of transportation.

20



§172.101 HAZARDOUS MATERIALS TABLE

Special provisions	(8) Packaging (§173.***)			(9) Quantity limitations	
	Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only
(7)	(8A)	(8B)	(8C)	(9A)	(9B)
T18	None	201	243	Forbidden	30 L
T18	None	211	242	Forbidden	50 kg
T1	150	202	242	5L	60L
B1, T1	150	202	242	5 L	60 L
T7	153	203	241	60 L	220 L
T7	150	202	242	5 L	60 L
T7	153	203	241	60 L	220 L
T7, T30	150	202	242	5 L	60 L
T1	150	202	242	5 L	60 L
T7	150	202	242	5 L	60 L
T8	150	202	242	5 L	60 L

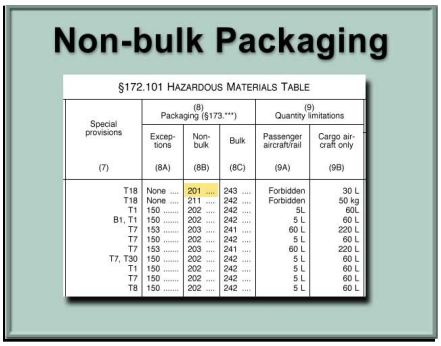
If Col. (8A) had contained the entry “None,” then compliance with the specific packaging sections listed in Cols. (8B) or (8C) is required. Also, compliance with a specific packaging section is required when the package does not meet the requirements of the section referenced in Col. (8A).

172.101(i)

STUDENT RESPONSE NOTE 20

If HMT Col. (8A) says “None” or the exception criteria are not met, compliance with the specific packaging section, referenced in either Col. (8B) or Col. (8C) of the HMT, is required.

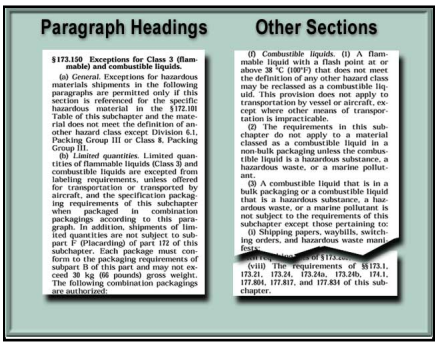
21



Col. (8B) refers you to the HMR section in Part 173 that contains the non-bulk packaging authorizations. A shipper may choose any appropriate packaging listed in the authorization section shown in Col. (8B).

172.101, Col. (8B)

22

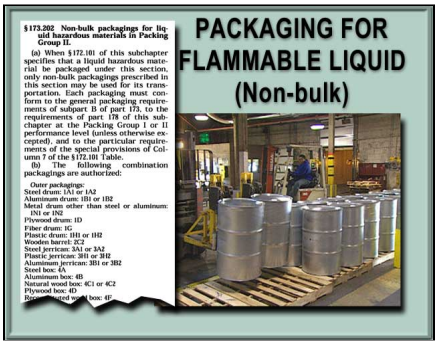


In the packaging section, it is important to read the heading of each paragraph as well as the **entire packaging section**. Also read any other sections mentioned within the section. Some paragraphs might specify packaging for other than the material you are shipping.

Other sections provide exceptions from specific packaging authorizations; that is, in addition to the exceptions listed in Col. (8A).

173.150

23



It is important to become acquainted with the different types of packages in each of the packaging sections. Generic non-bulk packagings for liquids are found in 173.201, 173.202, and 173.203. If a shipper wanted to package the gasoline in 55-gallon metal drums, 173.202 offers a choice of drums made from steel, aluminum or other metals. Please pause the presentation here so you can read 173.202.

173.201; 173.202; 173.203

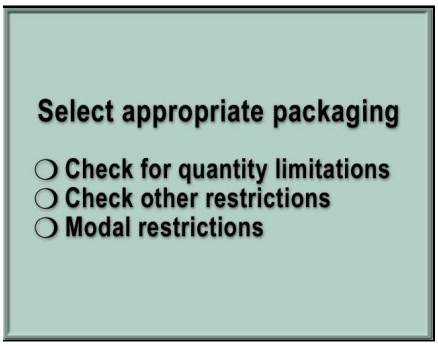
24

If a shipper wanted to ship 8,000 gallons of gasoline in a cargo tank, Col. (8C) contains the reference 242.

This means that 173.242 offers a selection of bulk packaging. That is, a list of rail cars, portable tanks, cargo tanks, and intermediate bulk containers (IBCs) that may be used and the conditions for use.

172.101, Col. (8C); 173.242

25



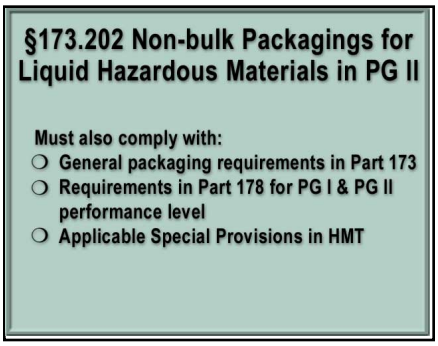
In selecting a packaging, you must also consider quantity and modal limitations that may restrict your choices. For example, in 173.202(c), single packagings are not authorized for transportation of gasoline by passenger aircraft.

173.202(c)

STUDENT RESPONSE NOTE 21-25

Quantity and modal limitations may restrict packaging selection.

26



Notice that 173.202(a) specifies that non-bulk packaging used for a shipment of gasoline must meet

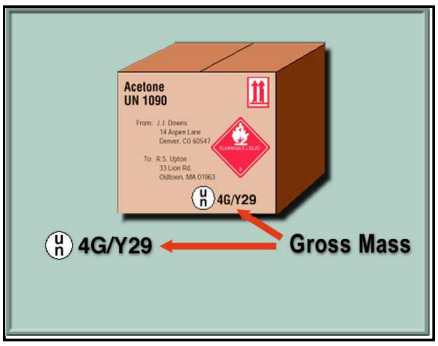
- the general packaging requirements of subpart B of Part 173,
- other requirements for PG I or PG II materials in Part 178, and
- particular requirements of special provisions of Col. 7 of the HMT.

Performance testing requirements for all packaging designs are contained in Part 178. Packagings tested to meet the Part 178 performance requirements are called "UN standard packagings."

Please pause the presentation so you can refer to 173.202(a); and read the definition of "UN standard packaging" in 171.8.

171.8; 173.202(a)

27



Every UN standard packaging must be marked with the appropriate United Nations certification mark which contains the ID code letters and number(s) preceded by the UN symbol, e.g., UN1A1 or UN4G. In addition, the specification packaging must be marked with

- a letter to indicate the packing group performance level, (i.e., X for PG I, II, and III; Y for PG II and III; or Z for PG III), and
- a number designating the specific gravity for liquids or maximum gross mass (in kilograms) for solids of the tested packaging design.

Example: On a packaging for solids, the mark "UN 4G/Y29" indicates a UN specification 4G fiberboard box tested to PG II performance requirements with a maximum gross mass of 29 kilograms.

UN standard packaging can be built and tested to a variety of performance levels and capacities. It is very important that the UN standard you select is authorized for the packing group of the material you want to ship. The package must be tested for the specific gravity or mass for the hazardous material being shipped.

178.3; 178.502; 178.503

28

Detailed explanations of the UN identification codes and package marking requirements are in 178.502 and 178.503. Always make sure that all markings required by the HMR are on the packaging.

UN non-bulk packagings are required to be marked; the mark must include the following:

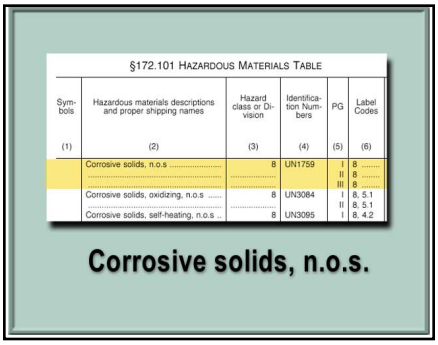
- the hydrostatic test pressure for single and composite packagings intended for liquids, or the letter "S" for packagings intended for solids or inner packagings;
- the last two digits of the year of manufacture;
- the state (country) authorizing allocation of the mark;
- the name and address or registered symbol of the manufacturer or approval agency certifying compliance with Part 178.

178.502; 178.503

STUDENT RESPONSE NOTE 26-28

Unless stated otherwise, packaging for hazardous materials must meet the performance tests in Part 178 and must be marked with the United Nations certification mark.

29



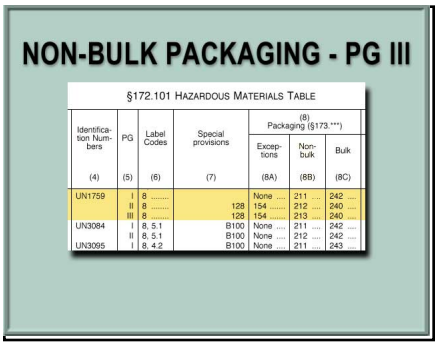
Student Activity

This activity will demonstrate how the packaging requirements may differ, depending on the packing group. In the HMT, look up the proper shipping name, Corrosive solid, n.o.s. Next, look at the non-bulk packaging references for this material in Col. (8B). Notice in cross-referencing Col. 5, that there are three separate packaging references for Corrosive solids, n.o.s. – PG I, PG II, and PG III – depending on the corrosivity of the material.

Please pause the presentation while you look up the packaging references for Corrosive solids, n.o.s. in Col. (8B).

172.101

30



Identification Numbers (4)	PG (5)	Label Codes (6)	Special provisions (7)	(8) Packaging (§173.***) Exceptions (8A)	Non-bulk (8B)	Bulk (8C)
UN1759	I	8		None	211	242 ....
	II	8	128	154	212	240 ....
	III	8	128	154	213	240 ....
UN3084	I	8, 5.1	B100	None	211	242 ....
	II	8, 5.1	B100	None	212	242 ....
UN3095	I	8, 4.2	B100	None	211	243 ....

In Col. (8B) opposite Corrosive solids, n.o.s. are the following packaging references:

PG I	173.211
PG II	173.212
PG III	173.213

Let's assume that you have determined the material is a PG III material. Look up 173.213.

Note that 173.213(a) provides non-bulk packaging authorizations for solid hazardous materials in PG III. It also lists and authorizes the use of packagings tested at PG I, II, III performance levels.

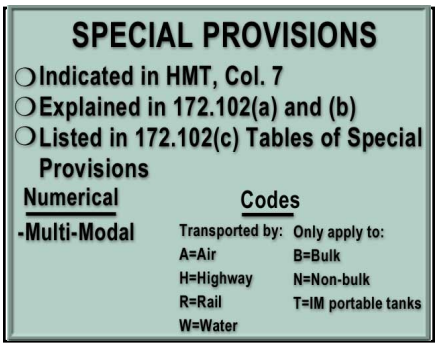
172.101, Col. (8B); 173.213(a)

Student Activity

Please turn to Packaging Selection and Compliance Work Project, Work Project Pack-1, on page 39 in your manual and complete the work project. When you have completed and checked your work for accuracy, either review the work project with the instructor or check the answers on page 53.

GENERAL REQUIREMENTS

31



In addition to the packaging authorizations in Cols. (8A), (8B), and (8C), a hazardous material may be subject to the "Special Provisions" indicated by code letters and /or numbers in Col. 7 of the HMT.

Student Activity

In the HMT, look up "Phosphoric acid." Notice in Col. (8B) is a non-bulk reference to 173.203; in Col. 7 are three references: A7, N34, and T7.

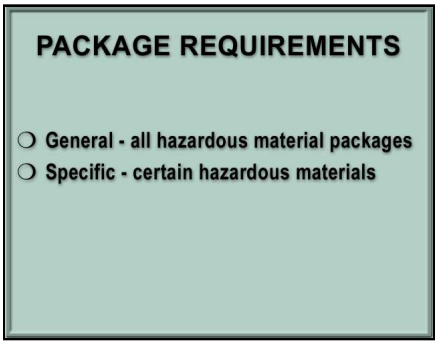
The explanation for Special Provisions is found in 172.102. Please pause the presentation and turn to 172.102 and read the following paragraphs: (a), (b)(2), (b)(5), and (b)(7). The tables of special provisions are in 172.102(c). Please pause the presentation and turn to 172.102(c) and read the following codes: A7, N34, and T7.

172.101(h); 172.102

STUDENT RESPONSE NOTE 29-31

In addition to the packaging authorizations in Col. (8A), (8B), and (8C), the hazardous materials may be subject to a "Special Provision" in Col. 7.

32



As noted previously, the HMR prescribe general packaging requirements for all hazardous materials. Certain hazardous materials must meet additional specific packaging requirements.

173.24

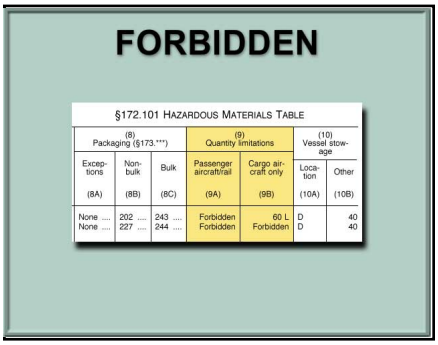
33

General package requirements address package design, construction and content limitations. These general requirements preclude

- significant release of hazardous material,
- substantial reduction in effectiveness of package, and
- mixing of gases or vapors which could reduce package effectiveness.

173.24

34



Col. 9 lists the quantity limitations for hazardous materials that can be transported by passenger railcars, passenger aircraft, or cargo aircraft. When Col. (9A) of the HMT indicates a material is "Forbidden," it may not be offered for transportation aboard passenger aircraft or passenger railcars. The word "Forbidden" in Col. (9B) indicates it may not be offered for transportation on a cargo aircraft.

Student Activity

In the HMT look up "Allyl bromide." The word "Forbidden" in Col. (9A) means it cannot be transported by passenger aircraft or passenger railcar.

Next look up "Allylamine." The word "Forbidden" is in Col. (9A) and (9B), indicating it may not be transported by air or passenger railcars.

172.101(j); 173.27(b)

STUDENT RESPONSE NOTE 32-34

"Forbidden" in Col. (9A) means the hazardous material(s) cannot be transported or offered for transportation by passenger aircraft or passenger railcars.

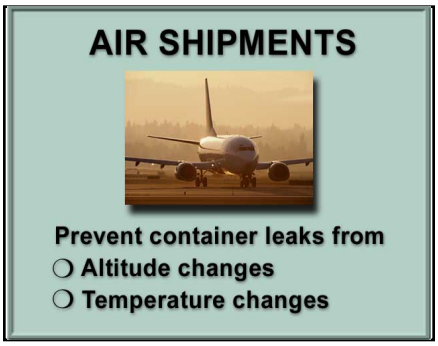
35

Additionally, air shipments of hazardous material must meet

- general packaging requirements,
- specific modal requirements, and
- UN standard packaging requirements.

173.27(a)

36



Hazardous materials packaging for air shipments must be designed and constructed to prevent leakage caused by altitude and temperature changes.

173.27(c)(1)

STUDENT RESPONSE NOTE 35-36

Hazardous material packaging for air shipments must be designed and constructed to prevent leakage caused by altitude and temperature changes.

37

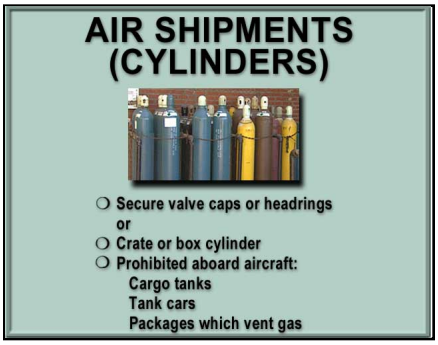
Packaging closures must be held securely in place by positive means to prevent leakage. Combination packaging containing certain hazardous liquids must contain sufficient non-reactive absorbent materials to absorb any leakage. Where absorbent material is required and the outer package is not leak-tight, a leakproof liner, plastic bag, or other means of containment must be used.

173.27(d), (e)

STUDENT RESPONSE NOTE 37

Package closures must be held securely in place to prevent leakage. Some material must be packaged with sufficient non-reactive absorbent material to absorb any leakage.

38



All cylinders transported by air must have protection to prevent operation of or damage to valves. Equip cylinders with

- securely attached valve caps,
- protective headrings, or
- place cylinders in a box or crate.

Vented closures are used to reduce internal pressure and prevent an unintentional release of the product. Cargo tanks, tank cars, or packages with vented closures may not be transported by aircraft.

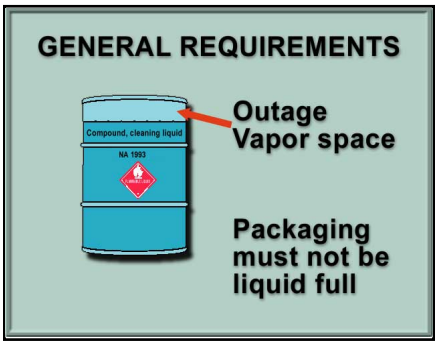
173.24(g); 173.27(g),(h)

STUDENT RESPONSE NOTE 38

Cylinders must be protected from valve operation and damage when shipped by air.

Equip cylinders with valve caps or protective headrings or put cylinders in a box or crate.

39

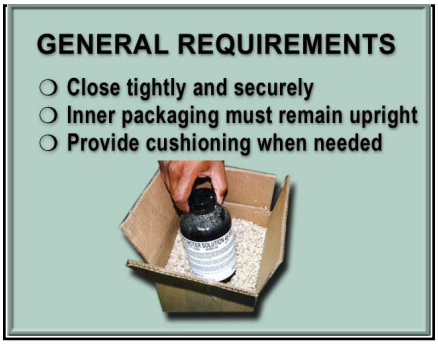


Because of the distinct characteristics of each hazard class, general packaging requirements must be considered for the hazardous material(s) being packaged.

Example: Many liquid hazardous materials expand when heated. For this reason, all containers of liquid hazardous materials must have vacant space or outage. This space is also referred to as vapor space. In other words the packaging must not be liquid full.

173.24(h)

40

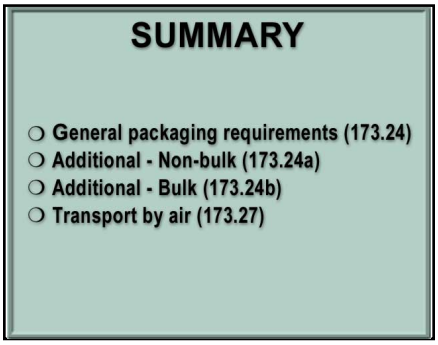


In addition to the requirements for outage (vapor space), containers of liquid hazardous material(s) must be tightly and securely closed.

A combination package containing liquid hazardous materials must be packed so that closure on the inner packages remain upright. They must be packed and cushioned to prevent breakage or leakage. Packagings used for solids which may become liquid during transportation must be capable of containing the material in a liquid state.

173.24a(a)(1), (3); 173.24(e)(5)

41



In summary, general packaging requirements are found in 173.24 and include packaging design criteria and filling limits, based on the physical nature of the material to be packaged.

Additional general packaging requirements are located in

- 173.24a for non-bulk,
- 173.24b for bulk, and
- 173.27 for air transportation.

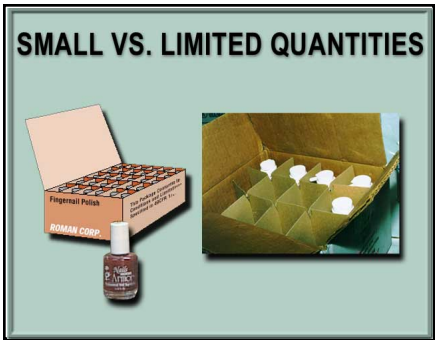
Student Activity

Please complete the General Packaging Requirements Work Project, Work Project Pack-2, on page 41 of your manual. When you have completed and checked your work for accuracy, either review the work project with the instructor or check the answers on page 54.

Please pause the presentation to complete this Student Activity.

EXCEPTIONS

42



Specific exceptions are referenced in Col. (8A) of the HMT. In addition, the HMR provides general exceptions that, if applicable, apply to small quantities of some hazard classes.

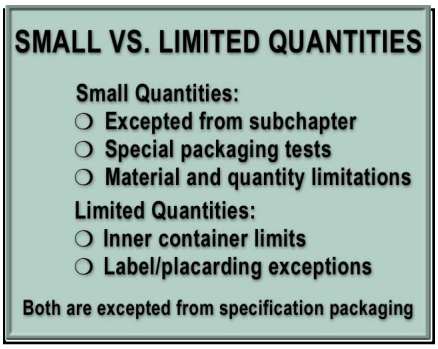
Section 173.4 provides exceptions for small quantities of certain hazardous materials. The term “small quantity” is not synonymous with the term “Limited Quantity.” These two terms have entirely different meanings and uses; both are excepted from specification packaging.

171.8; 173.4

STUDENT RESPONSE NOTE 39-42

General packaging requirements are found in 173.24. Check column (8A) of the HMT for specific exceptions.

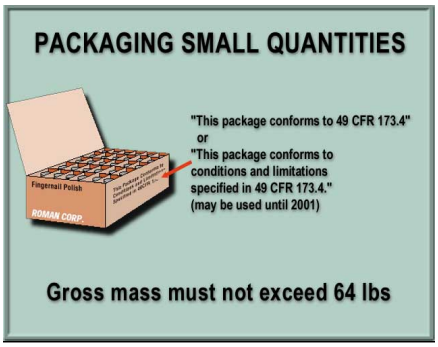
43



The criteria for determining "small quantities" is in 173.4 of the HMR; it is not in the **"Definitions and Abbreviations"** in 171.8. The definition for "Limited Quantity" is in 171.8 of the HMR. Please pause the presentation so you can review the meaning of both terms.

171.8; 173.4

44



Some small quantities are subject only to 173.4 of the HMR. The small quantities exception applies only to

- Class 3,
- Division 4.1,
- Division 4.2 (PG II & III),
- Division 4.3 (PG II & III),
- Division 5.1 and 5.2,
- Division 6.1,
- Class 7,
- Class 8, and
- Class 9 materials that also meet the definition of one or more of the above hazard classes or divisions.

The notation "This package conforms to 49 CFR 173.4" must be marked on the package. The notation "This package conforms to the conditions and limitations specified in 49 CFR 173.4" may be used until 10/1/2001.

173.4

45

Section 173.5 of the HMR contains exceptions for farmers when they transport agricultural products, other than hazardous wastes, between fields of their own farm or to or from their farm. Agricultural products are defined as hazardous materials used to support farming operations, and include but are not limited to fertilizers, pesticides, soil amendments or fuel. Agricultural products are limited to materials in Classes 3, 8, 9, Divisions 2.1, 2.2, 5.1, 6.1 and ORM-Ds.

171.8; 173.5

46

Farmers transporting agricultural products other than gases between fields of the same farm using local roads are excepted from the requirements in the HMR. The farmer must be an intrastate private motor carrier. Class 2 gases such as liquefied petroleum gas or anhydrous ammonia are not within this exception. The agricultural products must be for use on the farmers own farm. Your state must authorize these exceptions by law or regulation and compliance with all state requirements is mandatory.

173.5(a)

47

AGRICULTURAL PRODUCTS

Compliance is required with:

Shipping Papers - Subpart C
Marking - Subpart D
Labeling - Subpart E
Placarding - Subpart F

Farmers transporting agricultural products to or from a farm, within 150 miles of the farm, are excepted from the requirements in Subpart G – Emergency Response Information, Subpart H – Training, and Specification packaging requirements; they must comply with Shipping Papers – Subpart C, Marking – Subpart D, Labeling – Subpart E, and Placarding – Subpart F.

These exceptions apply if:

- the material is transported by a farmer who is an intrastate private motor carrier;
- the total amount of agricultural product transported on a single vehicle does not exceed
  - 7,300 Kg (16,094 lbs) of ammonium nitrate fertilizer classified as Div. 5.1, PG III, in a bulk packaging, or
  - 1,900 L (502 gallons) for liquid or gases, or 2,300 Kg (5,070 lbs) for solids of any other agricultural products;
- the movement and packaging are in conformance to State laws or regulations;
- each person preparing agricultural products for shipment or transporting agricultural products must be instructed in the applicable requirements.

173.5(b)

48

MATERIALS OF TRADE

Definition:
- **Protect health and safety**
- **Support operation/maintenance**
- **Support private motor carrier**

All requirements and exceptions for Materials of Trade transported by motor vehicle are in 173.6 of the HMR.

Materials of Trade are defined as a hazardous material that is carried on a motor vehicle for at least one of the following purposes:

- to protect the health and safety of the motor vehicle operator or passengers;
- to support the operation or maintenance of a motor vehicle or auxiliary equipment;
- to directly support a private motor carrier whose principal business is other than transportation by motor vehicle.

171.8

49

To qualify for the MOTs exception, the materials must be less than the quantity limitations outlined in 173.6(a). Except for a diluted mixture of Class 9 material, the aggregate gross weight of all materials of trade on a motor vehicle may not exceed 200 kg (440 lbs.)

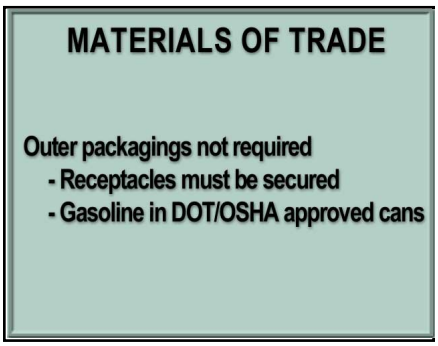
173.6(a),(d)

50

Each material must be packaged in the manufacturer's original packaging, or a packaging of equal or greater strength. The packaging must be leak tight for liquids and gases, sift proof for solids, and securely closed, secured against movement, and protected against damage.

173.6(b)

51



Outer packagings are not required for receptacles that are secured in cages, bins, boxes or compartments. Gasoline must be in DOT authorized or OSHA approved metal or plastic cans. Cylinders and pressure vessels must conform to the HMR except that outer packagings are not required.

173.6(b)

52

MATERIALS OF TRADE

Operator must be informed:
- **Presence of HM**
- **Reportable quantity**
- **Requirements in 173.6**

The operator of a motor vehicle transporting MOTs must be informed about the presence of the hazardous material, including the reportable quantity, and the requirements in 173.6.

173.6(c)(4)

53

LAB PACKS

Combination packaging (173.12)
and
Transported for disposal or recovery
Highway transportation only

Waste materials classed as Hazard Class or Division 3, 4.1, 4.2, 4.3, 5.1, 6.1, 8, or 9 are excepted from HMR specification packaging requirements for combination packages, **if**

- packaged in combination packagings in accordance with 173.12(b),
- transported for disposal or recovery, and
- transported by highway only.

This type of packaging is referred to as "lab packs."

173.12(b)

STUDENT RESPONSE NOTE 43-53

Lab packs of waste material in Hazard Class or Division 3, 4.1, 4.2, 4.3, 5.1, 6.1, 8, or 9 are excepted from specification packaging when:

- properly packaged,
- transported for disposal or recovery, and
- moved via highway only.

54

For lab packs, the outside packaging must be a UN1A2 or UN1B2 metal drum, UN1D plywood drum, UN1G fiber drum, or UN1H2 plastic drum tested and marked at least for PG III materials. Any lab pack drum must be tested and marked as authorized at least for PG III materials. The outside packaging may contain only **one hazard class** and the materials must be chemically compatible. Gross weight may not exceed 205 kilograms (452 pounds).

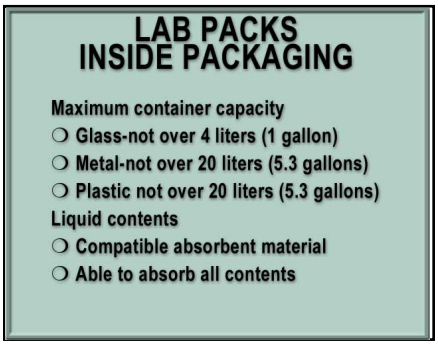
Please pause the presentation so you can read the requirements in 173.12.

173.12(b)(1)-(2)

STUDENT RESPONSE NOTE 54

For a lab pack, use an authorized (UN standard) metal, fiber, or plastic drum for waste material; its gross weight must not exceed 205 kg (452 pounds), and only <u>one</u> hazard class per package is allowed.

55

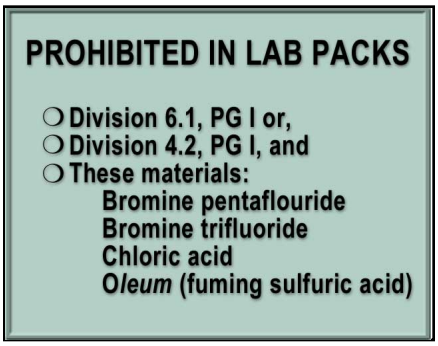


Inside packagings of glass must not be over 4 liters (one gallon) capacity; inside packagings of metal or plastic must not be over 20 liters (5.3 gallons) capacity.

Inside packagings of liquids must be surrounded by enough compatible absorbent material to absorb all of the liquid content.

173.12(b)(2)(ii)-(iv)

56



The following are **not** authorized for lab packs:

- materials meeting the definition of
  - Division 6.1, PG I, or
  - Division 4.2, PG I, and
- the following hazardous materials:
  - Bromine pentafluoride,
  - Bromine trifluoride,
  - Chloric acid, and
  - *Oleum* (fuming sulfuric acid).

173.12(b)(3)

Student Activity

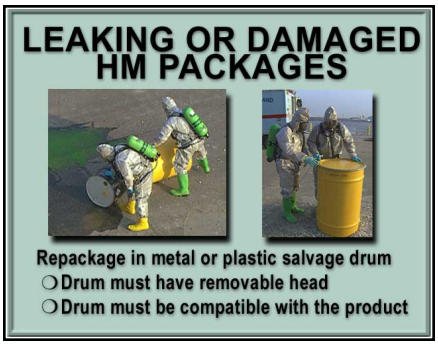
Please pause the presentation while you complete Basic Packaging Requirements Work Project Pack-3 on page 44 in your manual. Follow the instructions and complete the work project.

Check your work for accuracy, either review the work project with the instructor or check the answers on page 55.

STUDENT RESPONSE NOTE 55-56

Materials listed in 173.12(b)(3) may not be shipped under lab pack provisions.

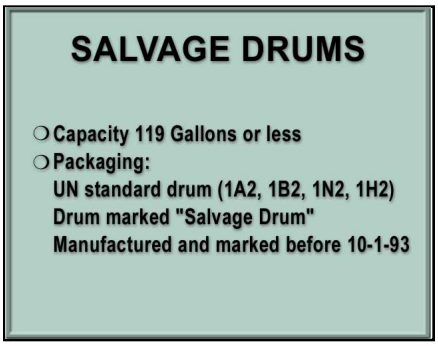
57



Damaged or leaking packages of hazardous materials and spilled or leaked hazardous materials may be placed in a metal or plastic removable head salvage drum. The drum must be compatible with the material and be shipped for repackaging or disposal.

173.3(c)

58



The drum used must be:

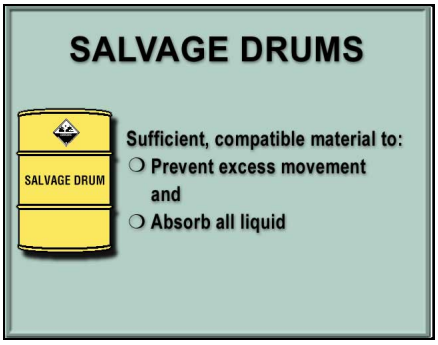
- a UN1A2, UN1B2, UN1N2 or UN1H2 tested and marked for PG III or higher performance standards; or
- a “Salvage Drum” manufactured and marked prior to October 1, 1993. The drum capacity must not exceed 450 liters (119 gallons).

173.3(c)(1)

STUDENT RESPONSE NOTE 57-58

Salvage drums must meet PG III (or higher) performance standards or be a pre-October 1, 1993 “Salvage Drum.” Capacity must not exceed 450 liters (119 gallons) capacity.

59



For each salvage drum, if necessary, provide absorbent and cushioning material that is compatible with the hazardous materials. Provide sufficient material to prevent excessive package movement and absorb all free liquid at the time of closing.

173.3(c)(2)

STUDENT RESPONSE NOTE 59

Salvage drums must have sufficient compatible cushioning and absorbent material.

The material is to prevent excessive package movement and absorb liquid.

60

The salvage drum must be marked with

- the proper shipping name of the hazardous material inside the packaging, the name and address of the consignee, and
- the word(s) “Salvage or “Salvage Drum.”

The drum must be properly labeled for the material it contains. The ID No. marking is not required on salvage drums.

173.3(c)(3)-(4)

STUDENT RESPONSE NOTE 60

Salvage drums must be marked with the proper shipping name, name and address of the consignee, and the word(s) “Salvage or Salvage Drum.” Drums must also be properly labeled.

61

The shipper of a hazardous material in a salvage drum must prepare shipping papers for the material in accordance with the HMR.

173.3(c)(5)

62

When a salvage drum is used to ship a damaged or leaking package, the salvage drum is not subject to HMR overpack requirements.

173.3(c)(6)

STUDENT RESPONSE NOTE 61-62

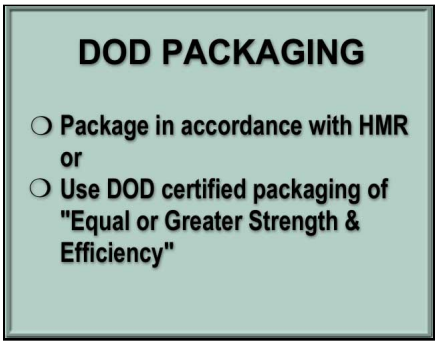
When shipping damaged or leaking packages, the salvage drum is not subject to overpack regulations.

63

Hazardous wastes that are required to be shipped in a closed head drum, may be placed in an equivalent open head drum – provided, the wastes contain solids or semi-solids that would make placement of the wastes in a closed head drum impractical.

173.12(a)

64



Hazardous materials offered for transportation by, for or to the U.S. Department of Defense (DOD) must be packaged

- in accordance with the HMR or
- in DOD-certified packagings of equal or greater strength and efficiency.

This rule includes commercial shipments under government contract.

173.7(a)

65

RESHIPMENT OF DOD PACKAGES:

- ❍ By any shipper
- ❍ To any consignee
  Provided packaging is:
  - -Intact
  - -Unaltered
  - -Undamaged

Hazardous materials offered by DOD under these provisions may be reshipped by any shipper to any consignee as long as the packaging hasn't been altered or damaged.

173.7(a)

STUDENT RESPONSE NOTE 63-65

Hazardous materials offered by, for, or to the DOD must be packaged as required by the HMR or in packaging certified by the DOD. DOD packages may be reshipped by any shipper to any consignee if unaltered and undamaged.

66

HAZARDOUS MATERIALS SOLD BY DOD

Package not marked per HMR requires DOD certification of "Equal or Greater Strength & Efficiency"

Hazardous materials **sold** by DOD in packaging **not marked** in accordance with the HMR may be shipped from DOD installations. But, the DOD must certify in writing that the strength and efficiency of the packaging are equal to or greater than the packaging required by the HMR.

173.7(a)(1)

67

DOD CERTIFICATION

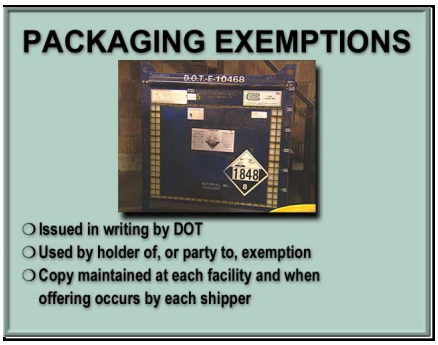
Shipper must:
1. Obtain duplicate certification
2. Provide copy to carrier
3. Keep a copy for 1 year

For each shipment, shippers must obtain the certification, in duplicate, from DOD. Shippers must provide the originating carrier with a copy and retain the other copy for at least one year.

173.7(a)(1)

EXEMPTIONS

68



A person desiring to offer or transport hazardous materials in a manner not authorized in the HMR may request an exemption from specific portions of the regulations. Exemptions are waivers from specific requirements of the HMR, but which provide an equal level of safety and protection to the public. Exemptions are usually specific as to the hazardous material, the hazard class, the regulations affected, and any special safety provisions necessary.

Exemptions that are granted are assigned their own individual number, e.g., DOT-E 8308. **Unless exempt by provisions of the exemption**, the number must be marked on the package and on the shipping paper in association with the shipping description for the material.

Other sections which address the use of exemptions are located in 172.203(a), 172.301(c), 172.302(c), and 173.22a. Please pause the presentation while you read these provisions.

173.22a(a),(b)

STUDENT RESPONSE NOTE 66-68

A hazardous material may be transported in accordance with the procedures specified in a DOT exemption which has been issued by the USDOT headquarters in Washington, DC.

SPECIAL REQUIREMENTS

69

Authorized packages of hazardous materials may be offered for transportation when tightly packed in a strong overpack. Packages may not contain prohibited material and must meet standard packaging requirements.

Overpacks are not packages. Overpacks are used to consolidate packages that could, under normal conditions, be offered and transported individually.

173.25(a), (a)(1)

70

An overpack must be marked with the proper shipping name and ID No. and labeled for each material it contains. If inner package markings and labels are visible, overpack marking and labeling may be omitted.

173.25(a)(2)

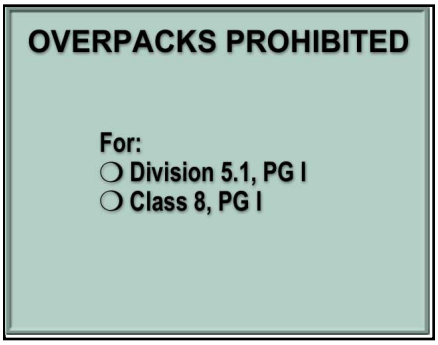
71

If the packages inside the overpack are required to be packed with closures upward, the overpack must be marked with orientation arrows (pointing in the upward direction) on two opposite vertical sides of the overpack.

If specification packagings are required for the inner packages, the overpack must state that the inner packages comply with those requirements. The statement may be omitted if specification markings on the inside packages are visible.

173.25(a)(3)-(4)

72



Packages containing Class 8 (corrosive) materials in PG I or Division 5.1 (oxidizing) materials in PG I may not be overpacked with any other hazardous material.

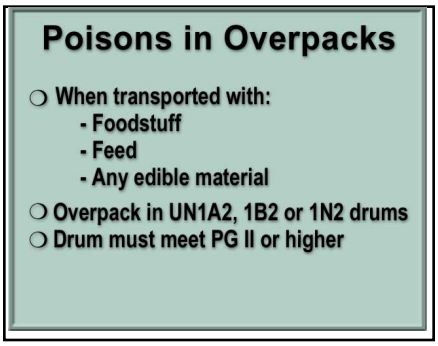
173.25(a)(5)

STUDENT RESPONSE NOTE 69-72

Authorized packages of hazardous materials may be consolidated into overpacks.

Overpacks must be properly marked and labeled for the materials inside.

73



Hazardous materials required to be labeled **"POISON"** or **"TOXIC"** may be transported in the same vehicle with foodstuffs, feed, or any edible material intended for human or animal consumption **if** the hazardous material has been marked, labeled, packaged, and overpacked **in accordance with the HMR.**

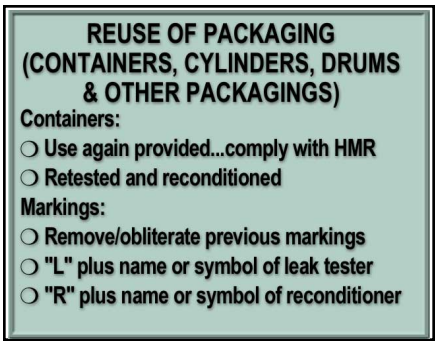
Please pause the presentation so you can read the conditions of this requirement in 173.25(c).

173.25(c)

STUDENT RESPONSE NOTE 73

POISON-labeled or TOXIC-labeled material, properly overpacked, may be transported in the same motor vehicle with foodstuffs and animal feed.

74



When offered in accordance with 173.28, certain containers may be used more than once to transport hazardous material. Some non-bulk packaging used more than once must be retested and/or reconditioned as required by 173.28(b)-(d).

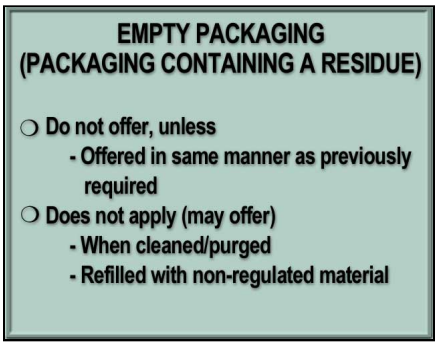
Review the reuse provisions for specific types of packages in 173.28.

173.28(b)-(d)

STUDENT RESPONSE NOTE 74

Containers may be reused provided they comply with the HMR.

75



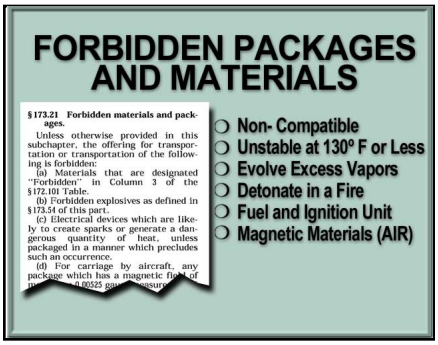
An emptied, but **not cleaned and purged** packaging containing only residue of a hazardous material may not be offered for transportation – unless offered in the **same** manner as before being emptied. This includes proper closure of all openings and valves. The conditions and exceptions associated with this requirement are in 173.29.

173.24; 173.29

STUDENT RESPONSE NOTE 75

To transport emptied – but not cleaned and purged – packagings containing only residue, treat them as though they still contain the hazardous material. The emptied packaging must be described, marked, and labeled as required before being emptied. All packaging conditions must be met.

76



Hazardous materials in certain packages or under certain conditions are prohibited from transportation. Section 173.21 lists those prohibitions.

173.21

77

It is the responsibility of the person offering a hazardous material for transportation to assure that the packagings are compatible with the lading. Plastic packaging must not be permeable to an extent that a hazardous condition occurs during transportation.

Parts 178, 179, and 180 provide standards for the manufacture, testing and certification of packagings.

173.24(d)-(e)

78

This concludes the instruction and practice portion of this module. Now is the time to assess how well the module taught you. This will be an open book test. There are no “trick” questions. Unless instructed otherwise, please complete the **Module 3 Test**. The **Module 3 Test** begins on page 47 of your Instructor Manual.

Instructor Note:
Please check test answers, record scores, and update training records. Review test results with students.

Student Response Note Answers begin on page 50.

Work Project Answers begin on page 53.

Module 3 Test Answers begin on page 56.

Packaging Summary

Selection of proper authorized packaging for a hazardous material is not a difficult task if you follow a set procedure. Remember, it all starts with the HMT.

Selecting the proper packaging:

- Identify what it is you want to ship and check for compliance.
- Check Col. 8 of the HMT and determine if an exception is provided in Col. (8A).
- If an exception is not used, check whether some other provision is used, such as small quantities or an exemption.
- If no exception or exemption is provided or used, check Col. (8B) to determine specific non-bulk packaging and Col. (8C) to determine bulk packaging requirements.
- Check for any general or additional packaging requirements, including quantity limitations and modal restrictions.

Work Projects

Packaging Selection and Compliance Work Project

Work Project Pack-1

Directions to Student(s)

The objective of this work project is to provide a practical exercise in hazardous materials packaging requirements. You are given a list of eight hazardous materials in column 1 of Work Project Pack-1. In the HMT, locate the hazardous materials. In the spaces provided, enter the references for Special Provisions, packaging exceptions (if none, write “none”) and packaging authorizations for non-bulk and bulk packagings.

Self-Evaluation

The work project will evaluate your skill and facility in locating general packaging requirements beyond those indicated in the HMT for materials in different hazard classes and divisions. When you have completed and checked your work for accuracy, either review the work project with the instructor or check the answers on page 53.

General Packaging Requirements Work Project

Work Project Pack-1

Hazardous Materials	Special Provisions	Packaging Authorization		
		Exceptions (If any)	Packaging Authorization Non-Bulk	Packaging Authorization Bulk
Glycidaldehyde UN2622				
Propylene UN1077				
Picric acid, wet NA1344				
Sodium borohydride UN1426				
Copper chlorate UN2721				
Epichlorohydrin UN2023				
Butyl acid phosphate UN1718				
Potassium peroxide UN1491				

Packaging Selection and Compliance Work Project

Work Project Pack-2

Directions to Student(s)

The objective of this work project is to provide a practical exercise in hazardous materials packaging selection and compliance.

Work Project Pack-2 lists six hazardous materials shipments for transportation by motor carrier. The proper shipping name, hazard class and ID No. of each material, as shown in the HMT, is provided along with the selected packaging.

Determine whether or not the given packaging is authorized for the described material. Check “yes” if the packaging is authorized; “no” if it is not. Cite the HMR reference(s) you used to determine your answer. If the packaging is not authorized, identify a packaging that would be authorized.

Self-Evaluation

The work project will evaluate your skill and facility in selecting authorized packaging and in determining whether a packaging is in compliance with the HMR. When you have completed and checked your work for accuracy, either review the work project with the instructor or check the answers on page 54.

Packaging Selection and Compliance Work Project

Work Project Pack-2

1. Ten five gallon UN1A1 steel drums of Acetone, 3, UN 1090, PG II:

   Authorized Packaging section(s)

   Yes _____ _____

   No _____ _____

   If not authorized, what package is authorized?

   _____ (List only one.)

2. Six polyethylene (plastic) receptacles of one gallon each containing 100% Formic acid, 8, UN1779, PG II, inside a UN4G specification fiberboard box weighing 50 pounds:

   Authorized Packaging section(s)

   Yes _____ _____

   No _____ _____

   If not authorized, what package is authorized?

   _____ (List only one.)

3. Four one-liter metal cans of Compound, cleaning liquid, 3, NA 1993, PG III, packed inside a strong fiberboard box:

   Authorized Packaging section(s)

   Yes _____ _____

   No _____ _____

   If not authorized, what package is authorized?

   _____ (List only one.)

4. One UN4C1 wooden box with four 25-pound metal cans of Aldrin, solid, 6.1, NA 2761, PG II packed inside:

   Authorized Packaging section(s)

   Yes_____ _____

   No _____ _____

   If not authorized, what package is authorized?

   _____ (List only one.)

5. Two five-gallon metal cans of Paint, 3, UN 1263, PG III, packed in a strong fiberboard box:

   Authorized Packaging section(s)

   Yes_____ _____

   No _____ _____

   If not authorized, what package is authorized?

   _____ (List only one.)

6. A fifty-five gallon steel drum, UN1A1, of Corrosive, solid, n.o.s., 8, UN 1759, PG I:

   Authorized Packaging section(s)

   Yes_____ _____

   No _____ _____

   If not authorized, what package is authorized?

   _____ (List only one.)

Packaging Selection and Compliance Work Project

Work Project Pack-3

Directions to Student(s)

The objective of this packaging work project is to provide a practical exercise in basic packaging requirements. There are nine (9) questions in Work Project Pack-3. Please select the correct answer and cite the appropriate supporting HMR section reference.

Self-Evaluation

The work project will evaluate your skill and facility in finding and determining basic packaging requirements. When you have completed and checked your work for accuracy, either review the work project with the instructor or check the answers on page 55.

Packaging Selection and Compliance Work Project

Work Project Pack-3

Please select the correct answer and when indicated, provide the supporting HMR section reference.

1. The term package means

   a. an outside package
   b. an outside packaging and required markings
   c. a packaging plus its contents
   d. a packaging plus required labels

   HMR Section _____

2. The term packaging means the assembly of _____ or _____ receptacles and any other components necessary to assure compliance with the minimum packaging requirements.

   HMR Section _____

3. The offeror and the carrier are both responsible to assure that hazardous materials shipments are in proper condition for transportation.

   a. True
   b. False

   HMR Section _____

4. Damaged or leaking packages of hazardous materials may be placed in a(n) _____ .

   a. salvage drum
   b. paper bag
   c. strong outside fiberboard
   d. overpack

   HMR Section _____

5. The term “small quantities” means the same as “Limited Quantity (Ltd. Qty.)”

   a. True
   b. False

   HMR Section _____

6. A shipment of hazardous materials that is not prepared in accordance with the HMR may not be offered for transportation by any mode.

   a. True
   b. False

   HMR Section_____

7. Shipments of hazardous materials made for or to the Department of Defense (DOD) are not subject to the HMR.

   a. True
   b. False

   HMR Section_____

8. Waste materials meeting the definition of Class 3 (Flammable liquid) are excepted from UN standard packaging when packaged in accordance with_____ and transported for disposal or recovery by highway.

   a. 173.23
   b. 173.9
   c. 173.12
   d. 173.24

9. For shipments by air, general packaging requirements are found in section _____ .

   a. 173.4
   b. 173.27
   c. 173.1
   d. 173.3

Module 3 Test

1. A shipment of hazardous materials that is not prepared in accordance with the HMR may not be offered for transportation by any mode.

   a. True
   b. False

2. It is the duty of each person who offers hazardous materials for transportation to instruct each employee that has any responsibility for preparing hazardous materials for shipment in the HMR.

   a. True
   b. False

3. If a carrier repackages a hazardous material for any reason, the packaging must be

   a. approved by the shipper
   b. repackaged in accordance with the HMR
   c. inspected by DOT prior to the offering of the packaging
   d. none of the above

4. Packages of hazardous materials found to be damaged or leaking may be placed in a metal or plastic removable head salvage drum, provided

   a. the drum is compatible with the cargo
   b. the drum is being reshipped for repackaging or disposal
   c. the drum is a UN1A2, UN1B2, UN1N2, or UN1H2 drum
   d. all of the above

5. The shipper of a hazardous material in a salvage drum must prepare shipping papers for the material.

   a. True
   b. False

6. Section 173.4 of the HMR provides exceptions for certain hazardous materials in small quantities.

   a. True
   b. False

7. Shipments of hazardous materials by aircraft must meet certain general packaging requirements in 173.27 in addition to specific modal requirements.

   a. True
   b. False

8. Hazardous materials offered by, for or to the Department of Defense (DOD), including commercial shipments under government contract, are not subject to the HMR.

   a. True
   b. False

9. A waste Class 3 material (Flammable liquid) is not subject to the specification packaging requirements of the HMR if packaged in accordance with

   a. 173.29
   b. 173.9
   c. 173.10
   d. 173.12

10. For waste hazardous materials packaged in a “lab pack,” the inside packagings must be either

    a. glass not exceeding 4 L (one gal.) rated capacity
    b. metal not exceeding 40 L (10 gal.) rated capacity
    c. plastic not exceeding 20 L (five gal.) rated capacity
    d. a and c

11. Col. 8A of the HMT lists the section in the HMR which provides packaging exceptions for that particular proper shipping name.

    a. True
    b. False

12. The standard packaging requirements for all hazardous materials packages are found in

    a. 173.156
    b. 173.154
    c. 173.24
    d. 173.153

13. Overpacks are used for the purpose of consolidating packages of hazardous materials.

    a. True
    b. False

14. When properly overpacked, poison-labeled material may be transported in the same motor vehicle with foodstuffs.

    a. True
    b. False

15. Four one-liter metal cans of Compound, cleaning liquid, a Class 3 (Flammable liquid), may be packed in a strong outside container and offered as a Limited Quantity (Ltd. Qty.) according to

    a. 173.156
    b. 173.154
    c. 173.150
    d. 173.153

16. The same shipment described in question 15 being offered for transportation by aircraft does not require

    a. label(s)
    b. marking
    c. specification packaging
    d. any of the above

17. According to section 173. _____, Acetone, Class 3 (Flammable liquid), with a flash point of -9.4°C (15°F), may be packaged and offered for transportation in a UN1A1 steel drum.

    a. 212
    b. 202
    c. 205
    d. 211

18. Refer to HMT, 172.101, and complete the non-bulk packaging reference for Nitric Acid, less than 70 %.

    Nonbulk 173. _____

19. The general packaging requirements relating to outage for non-bulk packages of hazardous materials are found in Section

a. 173.24(b)
b. 173.24(g)
c. 173.24(h)
d. 173.24b

20. Hazardous materials packagings may be used more than once provided they comply with Section _____ .

a. 173.29
b. 173.28
c. 173.23
d. 173.25

Answer Sheets

Student Response Note Answers

1-2 The shipper and the carrier share in the responsibility to offer and/or accept only hazardous materials that comply with the HMR!

3 The purpose of HMR packaging requirements is to assure that hazardous materials stay in the package during transportation.

4-9 Anyone who offers hazardous materials for transportation must train his/her hazmat employees in the applicable requirements of the HMR.

10-11 Anyone, shipper or carrier, who performs a packaging function must comply with applicable HMR packaging requirements.

12 The packaging of hazardous materials for all modes of transportation must be as specified in the HMR. Packages of hazardous materials may be inspected for safety by USDOT and the initial carrier.

13-19 Limited quantities of Class 3 (Flammable liquid) material are excepted from specification packaging and placarding in all modes of transportation.

20 If HMT Col. (8A) says “none” or the exception criteria are not met, compliance with the specific packaging section, referenced in either Col. (8B) or Col. (8C) of the HMT, is required.

21-25 Quantity and modal limitations may restrict packaging selection.

26-28 Unless stated otherwise, packaging for hazardous materials must meet the performance tests in Part 178 and must be marked with the United Nations certification mark.

29-31 In addition to the packaging authorizations in Col. (8A), (8B), and (8C), the hazardous materials may be subject to a “Special Provision” in Col. 7.

32-34 “Forbidden” in Col. (9A) means the hazardous material(s) cannot be transported or offered for transportation by passenger aircraft or passenger railcars.

35-36 Hazardous material packaging for air shipments must be designed and constructed to prevent leakage caused by altitude and temperature changes.

37 Package closures must be held securely in place to prevent leakage. Some material must be packaged with sufficient non-reactive absorbent material to absorb any leakage.

38 Cylinders must be protected from valve operation and damage when shipped by air. Equip cylinders with valve caps or protective headrings or put cylinders in a box or crate.

39-42 General packaging requirements are found in 173.24. Check column (8A) of the HMT for specific exceptions.

43-53 Lab packs of waste material in Hazard Class or Division 3, 4.1, 4.2, 4.3, 5.1, 6.1, 8, or 9 are excepted from specification packaging when:

- properly packaged,
- transported for disposal or recovery, and
- moved via highway only.

54 For a lab pack, use an authorized (UN standard) metal, fiber, or plastic drum for waste material; its gross weight must not exceed 205 kg (452 pounds), and only one hazard class per package is allowed.

55-56 Materials listed in 173.12(b)(3) may not be shipped under lab pack provisions.

57-58 Salvage drums must meet PG III (or higher) performance standards or be a pre-October 1, 1993 “Salvage Drum.” Capacity must not exceed 450 liters (119 gallons) capacity.

59 Salvage drums must have sufficient compatible cushioning and absorbent material. The material is to prevent excessive package movement and absorb liquid.

60 Salvage drums must be marked with the proper shipping name, name and address of the consignee, and the word(s) “Salvage or Salvage Drum.” Drums must also be properly labeled.

61-62 When shipping damaged or leaking packages, the salvage drum is not subject to overpack regulations.

63-65 Hazardous materials offered by, for, or to the DOD must be packaged as required by the HMR or in packaging certified by the DOD. DOD packages may be reshipped by any shipper to any consignee if unaltered and undamaged.

66-68 A hazardous material may be transported in accordance with the procedures specified in a DOT exemption which has been issued by the USDOT headquarters in Washington, DC.

69-72 Authorized packages of hazardous materials may be consolidated into overpacks. Overpacks must be properly marked and labeled for the materials inside.

73 POISON-labeled or TOXIC-labeled material, properly overpacked, may be transported in the same motor vehicle with foodstuffs and animal feed.

74 Containers may be reused provided they comply with the HMR.

75 To transport emptied – but not cleaned and purged – packagings containing only residue, treat them as though they still contain the hazardous material. The emptied packaging must be described, marked, and labeled as required before being emptied. All packaging conditions must be met.

Packaging Selection and Compliance Work Project Answers

Work Project Pack-1

Hazardous Materials	Special Provisions	Packaging Authorization		
		Exceptions (If any)	Packaging Authorization Non-Bulk	Packaging Authorization Bulk
Glycidaldehyde UN2622	T8	173.150	173.202	173.243
Propylene UN1077	19	173.306	173.304	173.314/ 173.315
Picric acid, wet NA1344	A19, A20, N41	None	173.211	None
Sodium borohydride UN1426	B100, N40	None	173.211	173.242
Copper chlorate UN2721	A1	173.152	173.212	173.242
Epichlorohydrin UN2023	T14	None	173.202	173.243
Butyl acid phosphate UN1718	T7	173.154	173.203	173.241
Potassium peroxide UN1491	A20, N34	None	173.211	None

Packaging Selection and Compliance Work Project Answers

Work Project Pack-2

Question	Answer/Explanation	49 CFR Reference
1.	Authorized – yes;	Packaging section 173.202(c)
2.	Authorized – yes;	Packaging section 173.202(b)
3.	Authorized – yes;	Packaging section 173.150(b)
4.	Authorized – yes;	Packaging section 173.212(b)
5.	Authorized – no;	Packaging section(s) 173.173/173.203 Could be used if outer packaging is UN4G box.
6.	Authorized – yes;	Packaging section 173.211(c)

Packaging Selection and Compliance Work Project Answers

Work Project Pack-3

Question	Answer/Explanation	49 CFR Reference
1.	c. The term means a packaging plus its contents.	171.8
2.	One or more.	171.8
3.	True	171.2
4.	a. Leaking or damaged packages of hazardous materials must be placed in a metal or plastic drum identified as a salvage drum.	173.3(c)
5.	b. Small quantities and Limited Quantities (Ltd. Qty.) have separate meanings and uses. Both are exceptions. Small quantities are subject only to 173.4 and no other part of the regulations unless so stated. Limited quantities (Ltd. Qty.), when applicable to a particular material, with the exception of Division 6.1 materials, are the amount of material for which there are specific labeling and packaging exceptions.	171.8; 173.4
6.	a. 173.1 references the purpose and scope of packaging.	173.1(b)
7.	b. Hazardous materials offered for transportation by, for or to the U.S. Department of Defense, including commercial shipments, are subject to the HMR.	173.7
8.	c. 173.12 provides packaging exceptions for waste material. A, b, and d are not correct. 173.23 references previously authorized packaging. 173.9 references the fumigation of cars, truck bodies or trailers on rail cars. 173.24 references standard requirements for all packages.	173.12
9.	b. 173.3 references packaging and exceptions. 173.4 references small quantities.	

Module 3 Test Answers

Question	Answer/Explanation	49 CFR Reference
1.	a.	173.1(b)
2.	a.	173.1(b)
3.	b. The carrier is now performing a shipper function and must properly package the shipment of hazardous materials. Approval by DOT or the shipper is not required.	173.1(c)
4.	d.	173.3(c)
5.	a.	173.3(c)(5)
6.	a.	173.4(a)
7.	a.	173.27
8.	b.	173.7
9.	d. a, b and c are not correct. None of these references hazardous waste.	173.12
10.	d. b isn't correct because the metal packaging exceeds the five-gallon rated capacity limitation.	173.12(b)
11.	a.	172.101
12.	c. a, b and d are incorrect. 173.156 references exceptions for ORM materials. 173.154 references exceptions for Class 8 materials. 173.153 references exceptions for Division 6.1 materials.	173.24

Question	Answer/Explanation	49 CFR Reference
13.	a.	171.8
14.	a.	173.25(c)
15.	c. a, b, and d are incorrect. 173.156 references exceptions for ORM materials. 173.154 references exceptions for Class 8 (corrosive) materials. 173.153 references exceptions for Division 6.1 (poisonous) materials.	173.150
16.	c. a, b, and d are not correct. The shipment is not excepted from marking and labeling.	173.150(b)
17.	b. a, c, and d are incorrect. None of these provides for packaging for Class 3 (Flammable liquids).	173.202
18.	158	172.101
19.	c. a, b, and d are not correct. None of these refers to outage requirements for non-bulk packages.	173.24(h)
20.	b. a, c, and d are not correct. None of these refers to reuse of hazardous materials packagings.	173.28

Notes