RECEIPT

DATE 7/23/25 No. 741894

RECEIVED FROM Cummins Distribution Holdco Inc. $350.00

Three hundred fifty and 00/100 DOLLARS

(○) FOR RENT
(○) FOR New DE-HW-0009

ACCOUNT		
PAYMENT		
BAL. DUE		

(○) CASH
(X) CHECK
(○) MONEY ORDER
(○) CREDIT CARD

FROM 221208 TO

BY AC

3-11

RECEIVED

JUL 23 2025

DNREC - WHS

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL
DIVISION OF WASTE AND HAZARDOUS SUBSTANCES
COMPLIANCE AND PERMITTING SECTION

89 KINGS HIGHWAY
DOVER, DELAWARE 19901

TELEPHONE: (302) 739-9403
FAX: (302) 739-5060

HAZARDOUS WASTE TRANSPORTER PERMIT APPLICATION

Instructions: You must complete this application in its entirety and attach all applicable documentation.

(**Note:** For applicants renewing an existing permit, this application requires the submission of updated information and documentation.)

The application must be signed by the company owner or a corporate officer. A check payable to the "**State of Delaware"** must accompany this application.

Delaware Department of Natural Resources and Environmental Control
Compliance and Permitting Section
89 Kings Highway
Dover, DE 19901

1. Type of Permit

☑ New – Submit a check or money order, payable to the "State of Delaware," in the amount of $350.00.

☐ Renewal: Permit # DE-HW- _____ Expiration Date _____

Please indicate the term for which you desire your permit to be issued. Submit a check or money order, payable to the "State of Delaware," for the indicated permit fee.

☐ One Year - $350.00

☐ Two Years - $650.00

☐ Three Years - $950.00

☐ Four Years - $1250.00

☑ Five Years - $1550.00

2. Release to Public:

Do you wish to be included on the list of transporters that is provided to persons requesting a list of Delaware permitted hazardous waste transporters? ☐ Yes ☑ No

3. Company Information:

Company Name: Cummins Distribution Holdco Inc.

Location Address:	Mailing Address:
301 E. Market Street, Indianapolis, IN 46204	435 Bergen Ave. Kearny, NJ 07032

Contact Person: Terry Bartlett Title: Area Operations Vice President

Business Phone: 6467613496 Fax:

E-mail: terry.bartlett@cummins.com 24 hr. Emergency Phone:

EPA Identification Number: NJR000083022

Employer's Federal Tax ID Number: 45-5442408/A84

4. Type of Company: (Check One)

- ☐ Proprietorship
- ☐ Partnership
- ☑ Corporation – City, State and Date of Incorporation: Indianapolis, IN 06/07/2012
- ☐ Municipality
- ☐ Public Institution
- ☐ Other – Explanation:

5. Parent Company Information:

Parent Company Name: Cummins INC
Parent Company Address: 500 Jackson St
Columbus, IN
47201

6. Ownership/Stockholder Information:

For each owner, partner, or corporate officer, list the name, title, home address, and date of birth.

☑ List of owners, partners, or corporate officers: Attachment DE HW APP Cumm

List the name and address of all stockholders owning greater than 5% outstanding shares.

☑ List of stockholders: Attachment
☐ Not Applicable

7. Company Affiliations:

List all other companies owned by the same owners, corporate officers, or parent company that are engaged in the business of solid or hazardous waste transportation, treatment, storage, disposal, recovery, or reclamation.

☑ List of company affiliates: Attachment Cummins INC
☐ No company affiliates

8. Type of Hazardous Waste to be Transported:

Indicate the waste types to be transported. (Note: Characteristic and listed hazardous wastes identified in Delaware's *Regulations Governing Hazardous Waste* (DRGHW) Part 261 are equivalent to RCRA 40 CFR Part 261 wastes.) Check all that apply.

☐ Part 261 characteristic or listed hazardous wastes
☑ Used or waste oils (as defined by Part 279, Used Oil Management Standards)
☐ Spent antifreeze exhibiting a characteristic of hazardous waste
☐ PCB-contaminated hazardous waste
☐ Spent fluorescent lighting tubes and ballasts when managed as non-universal waste

9. Treatment, Storage, and Disposal Facilities:

List all treatment, storage, and disposal facilities that have agreed to accept the hazardous wastes identified above.

☑ List of treatment, storage, and disposal facilities: Attachment DE HW

10. Other Transporter Permits:

List all hazardous waste transporter permits held in other states.

☑ List of transporter permits: Attachment DE HW APP
☐ No hazardous waste transporter permits held in other states

11. Federal DOT and Motor Carrier Numbers:

Indicate your Federal DOT number and Motor Carrier number:

DOT# 98686 MC# _____

12. Proof of Insurance:

The transporter identified in this application must meet or exceed minimum insurance requirements as set forth in DOT Title 49 CFR Part 387. The DNREC Compliance and Permitting Section must be identified as the certificate holder. Also include a current MCS-90 endorsement or affirmation that the endorsement is still in effect.

☑ Certificate of insurance and MCS-90: Attachment DE HW APP COI

13. Spill Control and Safety Equipment:

List all spill control and safety equipment that will be carried on each vehicle.

☑ List of spill control and safety equipment: Attachment DE HW APP Spi

14. Spill Control Plan:

Attach a copy of the Spill Control Plan that describes prevention, containment, and clean up procedures during transportation. The plan must demonstrate compliance with the requirements outlined in DRGHW Sections 263.30, 263.31, and 263.105. **Spill Control Plans must contain the following Delaware Emergency Reporting Telephone Numbers: 1-800-662-8802 and 302-739-9401.**

☑ Spill Control Plan: Attachment DE HW APP S

15. Driver Training:

Attach a copy of your driver training program. All drivers must be trained in current DOT Motor Carrier Safety Regulations and have knowledge of the proper handling procedures for the type of waste transported, the hazardous waste manifest system, and safe vehicle operation as provided in 49 CFR Parts 383, 390 – 399, and DRGHW Section 263.104. All drivers must be familiar with the approved Spill Control Plan.

☑ Driver Training Program: Attachment DE HW APP Tr

16. Controlled Substance Testing:

Do you maintain a controlled substance testing program for drivers in your employment (including contract drivers) in compliance with Federal DOT 49 CFR Part 391?

☑ Yes
☐ No, Explain:

17. Vehicle Identification Information:

List all vehicles to be used for the transportation of hazardous waste into, out of, or through Delaware. You may use the form provided or another printout that contains all required information.

☑ Vehicle Identification Information: Attachment DE HW APP V

18. Environmental Record:

List all criminal citations, arrests or convictions, civil or administrative violations, and civil or administrative enforcement actions, and the disposition(s) thereof for the violation or alleged violation of any environmental statute, regulation, permit, license, approval, or order, regardless of the state in which it occurred. Indicate whether it was a local, state, or federal violation or alleged violation. List all such items for the applicant, and if the applicant is other than an individual, for any employee while employed by the applicant or any partner, officer, or director of the applicant as an individual or for any other former business of such partner, officer, or director. For civil or administrative violations or alleged violations, list all such items for the last five (5) years from the date of application.

☐ Environmental Record: Attachment _____
☑ Not Applicable – No violations within the specified time period

19. Signature:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments, and that upon personal knowledge and information, the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information.

Signature of legal owner or corporate officer

Terry Bartlett
Printed Name

07-07-2025
Date

Area Operation Vice President
Title

Provided below are the names, residential and business addresses, and dates of birth of all officers, directors, and partners of the applicant and of all individuals who hold greater than five percent (5%) equity in (or liability of) Cummins Distribution Holdco Inc.

NAME: DONALD JACKSON

[redacted]

BUSINESS ADDRESS:
301 E. MARKET STREET, INDIANAPOLIS, IN 46204

[redacted]

NAME: JEFFREY WILTROUT

[redacted]

BUSINESS ADDRESS:
301 E. MARKET STREET, INDIANAPOLIS, IN 46204

[redacted]

NAME: ZACH GILLEN

[redacted]

BUSINESS ADDRESS:
301 E. MARKET STREET, INDIANAPOLIS, IN 46204

[redacted]

PRINT NAME: Terry Bartlett TITLE: Area Operation Vice President

SIGNATURE: [signature] DATE: 07/07/2025

Sites aggreging to take used oil:

Bristol, PA CSSNA location

2727 Ford Rd

Bristol, PA

19007

Glen Burnie, MD CSSNA location

1907 Park 100 Dr

Glen Burnie, MD

21061

Used oil is collected by Crystal Clean or Safety-Kleen/Clean Harbors from these two locations

States with Hazardous Waste Transporter Permit held by CDHI:

Massachusetts

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 10/15/2024

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Aon Risk Services Central Inc. 200 E Randolph St. Chicago, IL 60601	**CONTACT NAME:** A. I. King Insurance Agency, Inc. (CMI) **PHONE (A/C, No, Ext):** 317-841-6004 **FAX (A/C, No):** 317-841-6006 **E-MAIL ADDRESS:** cummins@aikinginsurance.com
INSURED Cummins Inc. 500 Jackson Street Columbus IN 47201-6258	**INSURER(S) AFFORDING COVERAGE** — **NAIC #** **INSURER A :** Swiss Re Corporate Solutions Elite Ins — 29700 **INSURER B :** Old Republic Insurance Company — 24147 **INSURER C :** **INSURER D :** **INSURER E :** **INSURER F :**

COVERAGES **CERTIFICATE NUMBER:** 82378235 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	✓ **COMMERCIAL GENERAL LIABILITY** CLAIMS-MADE ✓ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: ✓ POLICY PRO-JECT LOC OTHER:			CGP0000001-02	8/1/2024	8/1/2025	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 5,000,000 $ 5,000,000 $ 10,000 $ 5,000,000 $ 5,000,000 $ 5,000,000
B	**AUTOMOBILE LIABILITY** ✓ ANY AUTO OWNED AUTOS ONLY HIRED AUTOS ONLY SCHEDULED AUTOS NON-OWNED AUTOS ONLY			MWTB 317015 24	8/1/2024	8/1/2025	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) PHYSICAL DAMAGE	$ 2,000,000 $ $ $ $ SELF-INSURED
A	✓ **UMBRELLA LIAB** ✓ OCCUR **EXCESS LIAB** CLAIMS-MADE DED RETENTION $			CGU0000001-02	8/1/2024	8/1/2025	EACH OCCURRENCE AGGREGATE	$ 20,000,000 $ 20,000,000
B	**WORKERS COMPENSATION AND EMPLOYERS' LIABILITY** Y / N ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? N **(Mandatory in NH)** If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		MWC 314311-24	8/1/2024	8/1/2025	✓ PER STATUTE OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 2,000,000 $ 2,000,000 $ 2,000,000
B	Excess Auto Liability			MWZX 317016 24	8/1/2024	8/1/2025	Limit 3,000,000	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

RE: Delaware Hazardous Waste Transportation License

CERTIFICATE HOLDER

Department of Natural Resources and Environmental Control (DNREC)
Attn: Compliance and Permitting Section
Richardson and Robbins Building
80 Kings Highway
Dover, DE 19901

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Al King

USDOT Number: _____ Date Received: _____

Please note, the expiration date as stated on this form relates to the process for renewing the Information Collection Request for this form with the Office of Management and Budget. This requirement to collect information as requested on this form does not expire. For questions, please contact the Office of Registration and Safety Information, Registration, Licensing, and Insurance Division.

A Federal Agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a current
valid OMB Control Number. The OMB Control Number for this information collection is 2126-0008. Public reporting for this collection of information is estimated to be approximately 2 minutes per response, including the time for reviewing instructions, gathering the data needed, and completing and reviewing the collection of information. All responses to this collection of information are mandatory. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to: Information Collection Clearance Officer, Federal Motor Carrier Safety Administration, MC-RRA, Washington, D.C. 20590.

United States Department of Transportation
Federal Motor Carrier Safety Administration

Endorsement for Motor Carrier Policies of Insurance for Public Liability under Sections 29 and 30 of the Motor Carrier Act of 1980

FORM MCS-90

Issued to Cummins Inc. *(Motor Carrier name)* **of** Indiana *(Motor Carrier state)*

Dated at 2:49 PM **on this** 2nd **day of** July , 2024

Amending Policy Number: MWTB 317015 24 **Effective Date:** 08/01/24

Name of Insurance Company: Old Republic Insurance Company

Countersigned by: Lisa Jamiszewski *(authorized company representative)*

The policy to which this endorsement is attached provides primary or excess insurance, as indicated for the limits shown *(check only one)*:

☒ *This insurance is primary and the company shall not be liable for amounts in excess of* $ 2,000,000 *for each accident.*

☐ *This insurance is excess and the company shall not be liable for amounts in excess of* $ _____ *for each accident in excess of the underlying limit of* $ _____ *for each accident.*

Whenever required by the Federal Motor Carrier Safety Administration (FMCSA), the company agrees to furnish the FMCSA a duplicate of said policy and all its endorsements. The company also agrees, upon telephone request by an authorized representative of the FMCSA , to verify that the policy is in force as of a particular date. The telephone number to call is: 877-797-3400.

Cancellation of this endorsement may be effected by the company of the insured by giving (1) thirty-five (35) days notice in writing to the other party (said 35 days notice to commence from the date the notice is mailed, proof of mailing shall be sufficient proof of notice), and (2) if the insured is subject to the FMCSA's registration requirements under 49 U.S.C. 13901, by providing thirty (30) days notice to the FMCSA (said 30 days notice to commence from the date the notice is received by the FMCSA at its office in Washington, DC).

Filings must be transmitted online via the Internet at https://portal.fmcsa.dot.gov/UrsRegistrationWizard/.

(continued on next page)

DEFINITIONS AS USED IN THIS ENDORSEMENT

Accident includes continuous or repeated exposure to conditions or which results in bodily injury, property damage, or environmental damage which the insured neither expected nor intended.

Motor Vehicle means a land vehicle, machine, truck, tractor, trailer, or semitrailer propelled or drawn by mechanical power and used on a highway for transporting property, or any combination thereof.

Bodily Injury means injury to the body, sickness, or disease to any person, including death resulting from any of these.

Property Damage means damage to or loss of use of tangible property.

Environmental Restoration means restitution for the loss, damage, or destruction of natural resources arising out of the accidental discharge, dispersal, release or escape into or upon the land, atmosphere, watercourse, or body of water, of any commodity transported by a motor carrier. This shall include the cost of removal and the cost of necessary measures taken to minimize or mitigate damage to human health, the natural environment, fish, shellfish, and wildlife.

Public Liability means liability for bodily injury, property damage, and environmental restoration.

The insurance policy to which this endorsement is attached provides automobile liability insurance and is amended to assure compliance by the insured, within the limits stated herein, as a motor carrier of property, with Sections 29 and 30 of the Motor Carrier Act of 1980 and the rules and regulations of the Federal Motor Carrier Safety Administration (FMCSA).

In consideration of the premium stated in the policy to which this endorsement is attached, the insurer (the company) agrees to pay, within the limits of liability described herein, any final judgment recovered against the insured for public liability resulting from negligence in the operation, maintenance or use of motor vehicles subject to the financial responsibility requirements of Sections 29 and 30 of the Motor Carrier Act of 1980 regardless of whether or not each motor vehicle is specifically described in the policy and whether or not such negligence occurs on any route or in any territory authorized to be served by the insured or elsewhere. Such insurance as is afforded, for public liability, does not apply to injury to or death of the insured's employees while engaged in the course of their employment, or property transported by the insured, designated as cargo. It is understood and agreed that no condition, provision, stipulation, or limitation contained in the policy, this endorsement, or any other endorsement thereon, or violation thereof, shall relieve the company from liability or from the payment of any final judgment, within the limits of liability herein described, irrespective of the financial condition, insolvency or bankruptcy of the insured. However, all terms, conditions, and limitations in the policy to which the endorsement is attached shall remain in full force and effect as binding between the insured and the company. The insured agrees to reimburse the company for any payment made by the company on account of any accident, claim, or suit involving a breach of the terms of the policy, and for any payment that the company would not have been obligated to make under the provisions of the policy except for the agreement contained in this endorsement.

It is further understood and agreed that, upon failure of the company to pay any final judgment recovered against the insured as provided herein, the judgment creditor may maintain an action in any court of competent jurisdiction against the company to compel such payment.

The limits of the company's liability for the amounts prescribed in this endorsement apply separately to each accident and any payment under the policy because of any one accident shall not operate to reduce the liability of the company for the payment of final judgments resulting from any other accident.

(continued on next page)

SCHEDULE OF LIMITS — PUBLIC LIABILITY

Type of carriage	Commodity transported	January 1, 1985
(1) For-hire (in interstate or foreign commerce, with a gross vehicle weight rating of 10,000 or more pounds).	Property (nonhazardous)	$750,000
(2) For-hire and Private (in interstate, foreign, or intrastate commerce, with a gross vehicle weight rating of 10,000 or more pounds).	Hazardous substances, as defined in 49 CFR 171.8, transported in cargo tanks, portable tanks, or hopper-type vehicles with capacities in excess of 3,500 water gallons; or in bulk Division 1.1, 1.2, and 1.3 materials, Division 2.3, Hazard Zone A, or Division 6.1, Packing Group I, Hazard Zone A material; in bulk Division 2.1 or 2.2; or highway route controlled quantities of a Class 7 material, as defined in 49 CFR 173.403.	$5,000,000
(3) For-hire and Private (in interstate or foreign commerce, in any quantity; or in intrastate commerce, in bulk only; with a gross vehicle weight rating of 10,000 or more pounds).	Oil listed in 49 CFR 172.101; hazardous waste, hazardous materials, and hazardous substances defined in 49 CFR 171.8 and listed in 49 CFR 172.101, but not mentioned in (2) above or (4) below.	$1,000,000
(4) For-hire and Private (In interstate or foreign commerce, with a gross vehicle weight rating of less than 10,000 pounds).	Any quantity of Division 1.1, 1.2, or 1.3 material; any quantity of a Division 2.3, Hazard Zone A, or Division 6.1, Packing Group I, Hazard Zone A material; or highway route controlled quantities of a Class 7 material as defined in 49 CFR 173.403.	$5,000,000

*The schedule of limits shown does not provide coverage. The limits shown in the schedule are for information purposes only.

CUMMINS DISTRIBUTION HOLDCO INC.
USED OIL TRANSPORTER HIGHWAY CONTINGENCY PLAN
DELEWARE

I. EMERGENCY ACTION

In the event of an on the road spill or other emergency the driver will follow these procedures:

A. Remain with the vehicle and if possible, prevent access to the spill (refer to Section G for containment instructions). If there is a major collision that results in a danger to life, then evacuate the area and call **911**.

B. Protect the area by warning all pedestrians and motorists to stay away from the spill area.

C. Call or have someone call the police or fire department (**911**).

D. Upon arrival of the police or fire department, the driver will inform them of what kind of material has been spilled. The police or fire department will block off the area to prevent property damage or any serious injury.

E. Contact the facility contacts (designated person accountable for discharge prevention = Emergency Coordinator) as listed below:

Name	Title	Office Phone	[redacted]
Brian Ford	General Manager		
Jen Wood	HSE Manager		

F. The Emergency Coordinator will gather the information from the driver and provide the following to the National Response Center and all local agencies (Also refer to the Facility SPCC Table G20 for the information needed):

- Name of person reporting the incident.
- Name, address, identification number of the transporter.
- Phone number where person reporting can be reached.
- Date, time, and location of incident.
- The extent of injuries, if any.
- Classification, name, and quantity of waste involved, if available.
- Type of incident and nature of waste involvement and whether a continuing danger exists at the scene.
- Shipping name, hazard class, and identification number of any other material carried.
- For each waste product involved provide:
  - Name and identification of generator.
  - Product shipping, hazardous class, and UN or NA Number.
  - Estimated quantity of material spilled.
  - If possible, estimate the extent of contamination to land, water, or air.

Table 1: Emergency Agency Contact Information

Agency	Toll Free Number	Business Number
National Response Center	(800) 424-8802	(202) 426-2675
Delaware Emergency Reporting	1 (800) 662-8802	(302) 739-9401
US EPA Region 1 – 24 hr Spill Hotline	(888) 372-7341	
Police Department	911	
Fire Department	911	
Heritage Crystal Clean-Response Contractor	(877) 938-7948	
Department of Transportation	Director Office of Hazardous Materials Regulations, Material Transportation Bureau, DOT, Washington DC 20590	

II. ACTIONS TO TAKE AT THE SCENE

A. Containment

The concern is to prevent the escape of any spilled liquid into the ground or a sanitary or storm sewer.

To contain the spill do the following:

- Erect a barrier using absorbents (pads, booms, material, etc...) or anything nearby for example dirt to curb the liquid spill.
- Control the source of the spill or leak (plug drum, turning the drum, overpack drum, etc...).

In the event of a major spill during a collision with another vehicle the area will be evacuated and the driver will call **911**.

B. Cleanup

The cleanup of the spill will be determined based on the quantity and location.

- If the surface is paved and impervious then absorbent material will be used to clean up the liquid spill.
- If the spill has reached the ground (pervious material), the contaminated soil will be removed. The extent of contamination will need to be determined.
- In the event of a small spill less than 5 gallons, then the driver will clean-up the spill with the equipment on the vehicle.
- In the event of a large spill (greater than 5 gallons, then a third-party spill response company will be contacted to clean-up the spill.

The contaminated material will be placed in an appropriate container and disposed of at an approved site.

III. EMERGENCY EQUIPMENT

Each vehicle contains the following equipment stored in a sturdy container or secured inside the vehicle:

Contents	Quantities
Gloves - Nitrile	
Absorbent (booms, pads, material, etc...)	
Emergency Reflective Triangle(s) or Cones	
Goggles	
Disposal Bag	
ABC Fire Extinguisher	

IV. FOLLOW-UP PROCEDURES

A. Decontamination

Trucks or trailers exposed to a spill or leak will be decontaminated in order to prevent any further release to the extent that it can be transported (or move under its own power) to an authorized facility capable of further decontamination if necessary.

B. Notification

In the event of a discharge (release or spill) of used oil during transportation, the transporter, if required will notify the Department of Transportation (DOT) in writing of the incident. Notification for the DOT is within 30 days of the incident. Refer to Table 1 for the submittal information.

V. TRAINING PROGRAM

All drivers transporting and handling used oil will receive spill response training. The trainings consist of a review of the contingency plan, Used Oil Management and Spill Prevention Control and Countermeasure training and the rules of used oil discharge during transport. The training will be completed annually. Training records will be kept at the facility.

VII. CERTIFICATION

I certify that the information listed in this contingency plan is accurate.

Name: Terry Bartlett Title: Area Vice President

Signature: _____ Date: 07/07/2025

DOT: Security for Shipment of Hazardous Materials

According to the US Department of Transportation (DOT), over 800,000 shipments of hazardous materials are transported in the United States every day. The materials shipped include those of chemical, petroleum, radioactive, explosive, and poisonous natures. Of the 800,000 shipments, almost 769,000 are transported by truck on the nation's roads, with the rest divided among rail, pipeline, water, and air. These hazardous materials – or 'hazmats' – are classified by the DOT according to the types of hazard they present and must be transported under the proper regulations set out by the DOT. This course examines the DOT's security requirements relative to the shipment and transportation of hazardous materials. In addition, it explains the hazard classes and provides examples of the placards used when transporting hazardous materials. The course also outlines the basic elements of a security plan, defines the employers who require a plan, and explains the training required for employees of companies with plans in place.

This course was developed with subject matter support provided by EnSafe Inc., a global professional services company focusing on engineering, environment, health and safety, and information technology. Please note, the course materials and content were current with the laws and regulations at the time of the last expert review, however, they may not reflect the most current legal developments. Nothing herein, or in the course materials, shall be construed as professional advice as to any particular situation with respect to compliance with legal statutes or requirements.

Table of Contents

1. Video: DOT: Security for Shipment of Hazardous Materials (sh_ehshsf_d36_enus_01)

No Objectives

[Course title: DOT: Security for Shipment of Hazardous Materials.] Hazardous materials are transported by air, sea, road, and rail throughout the US and the rest of the world on a daily basis. For this reason, the US Department of Transportation, or DOT, sets standards and provides guidelines to ensure the safety and security of hazmat shipments.

In this course, you'll learn about the requirements for transporting hazardous materials, hazard classes, and placards for hazardous materials. You'll also learn about the elements of a security plan, and the involvement of employers and employees in developing and implementing security plans.

2. Video: Transportation of Hazardous Materials (sh_ehshsf_d36_enus_02)

Question 1: Multiple Choice

Identify the three DOT requirements for the transportation of hazardous materials.

Options:

1. Establish and implement a security plan when certain types and quantities of hazardous materials are shipped
2. Train employees to deal with potential security risks
3. Use hazard markings, labels and placards to identify hazardous materials
4. Perform chemical analysis of all materials on board prior to transport

Answer

1. Establish and implement a security plan when certain types and quantities of hazardous materials are shipped
2. Train employees to deal with potential security risks
3. Use hazard markings, labels and placards to identify hazardous materials

Feedback:

Option 1: *This option is correct. The DOT requires that a security plan be established when certain types of hazardous materials are shipped in specified quantities.*

Option 2: *This option is correct. Employers should ensure that all employees are correctly trained in security procedures and how to deal with potential risks.*

Option 3: *This option is correct. Transporters should use placards to identify the hazards of their cargo, to ensure others are aware of what's being transported.*

Option 4: *This option is incorrect. The DOT does not require that chemical analysis be performed on any materials prior to transportation.*

Question 2: Multiple Choice

What are three reasons it's important to secure the transportation of hazardous materials?

Options:

1. A large number of hazardous materials are transported daily
2. Different methods of transportation are used to carry materials, and some may also carry people
3. Hazardous materials are not allowed to be used in US manufacturing
4. Terrorists could steal hazardous materials

Answer

1. A large number of hazardous materials are transported daily
2. Different methods of transportation are used to carry materials, and some may also carry people
4. Terrorists could steal hazardous materials

Feedback:

Option 1: *This option is correct. The volume of hazardous materials in transit poses a risk to the public if an accident or security breach occurs.*

Option 2: *This option is correct. Trains, planes, trucks, and boats are all used to carry dangerous goods, which means that security is important to protect passengers.*

And Division 6.2 defines infectious substances, including medical waste, medical samples, and diagnostic specimens.
Then we move on to Hazard Class 7, which defines all radioactive materials that present a danger of ionizing radiation emissions. This includes electronic tubes, uranium, and medical apparatus.

Next is Hazard Class 8, which defines corrosive materials. It covers all materials that are capable of the severe destruction of human skin and steel upon contact. For example, acids are Class 8 hazardous materials.

And finally, Hazard Class 9 covers miscellaneous hazardous materials that aren't covered by the other classes, such as marine pollutants and materials with noxious or anesthetic properties. Battery-powered equipment, machinery components, asbestos, and dry ice are all Class 9 materials.

In addition to those nine hazard classes, the DOT also defines an unclassified type of hazardous material

Forbidden materials and forbidden explosives are those considered to be too dangerous to transport – for example, a combination of hazardous materials that could react with each other in one package. You must never transport forbidden materials.

These divisions are critical for transporters, so they can treat their cargo appropriately and apply necessary security measures. It's also vital information for first responders and for the public if an incident or spill occurs.

That may seem like a lot to take in, but the information is essential when it comes to the safe transportation of hazardous materials.

Now, let's pause here for some practice questions. We'll pick up here once you're finished.

5. Knowledge Check: Hazard Classes

- *match the hazard classes with their numbers as defined by the Department of Transportation*
- *match the hazard class divisions with their numbers as defined by the Department of Transportation*

Question 1: Matching

Match the hazard class names of the first six hazard classes with their numbers.

Options:

A. Flammable liquids

B. Poisonous material

C. Explosives

D. Oxidizers

E. Flammable solids, spontaneously combustible, and danagerous when wet

F. Gases

Targets:

1. Class 1
2. Class 2
3. Class 3
4. Class 4
5. Class 5
6. Class 6

Answer

1: Option C

2: Option F

3: Option A

4: Option E

Question 3: Matching

Hazard classes 1, 2, 4, 5, and 6 are further classified into divisions.

For hazard classes 1 and 2, match the hazard class division names with the division numbers within the class they represent.

Options:

A. Nonflammable gases

B. Explosives with a mass explosion hazard

C. Explosives with a projection hazard

D. Detonating substances

E. Flammable gas

F. Explosives that are a fire hazard

Targets:

1. 1.1
2. 2.2
3. 1.3
4. 2.1
5. 1.6
6. 1.2

Answer

1: Option B

2: Option A

3: Option F

4: Option E

5: Option D

6: Option C

Feedback:

Target 1: *Division 1.1 indicates that the material is an explosive with a mass explosion hazard. An example of a 1.1 explosive is dynamite.*

Target 2: *Division 2.2 indicates that the material is a non-flammable compressed gas, such as oxygen or carbon monoxide.*

Target 3: *Division 1.3 is an explosive with a fire hazard, such as a shipment of large fireworks.*

Target 4: *Division 2.1 is a flammable gas, such as propane or butane.*

Target 5: *Division 1.6 indicates detonating substances and general highly insensitive explosives with a relatively low hazard risk.*

Target 6: *Division 1.2 defines a material as an explosive with a projection hazard.*

Question 4: Matching

- *match the transportation placards to the hazardous materials they represent*
- *identify which placards should be used for transporting hazardous materials in a given scenario*

[Topic title: Placards for Hazardous Materials.] Images are a great way to relay important messages quickly and effectively. The Department of Transportation, or DOT, makes use of images on placards to display classifications on certain types and quantities of hazardous materials when they're being shipped.

The DOT requires that these placards be displayed on the hazardous materials' packaging, the modes of transport carrying the materials, or both. Placards are usually 9.84 inches by 9.84 inches and made of metal or vinyl.

Each type of hazard has its own placard, with a distinctive color and symbol. The nature of the hazard is printed on the placard along with the class or division number.

Some basic placards use the same color and symbol but are modified according to the hazard type and class. For instance, explosives placards are orange with a black image of an item fragmented by a blast, as well as an asterisk. The first three divisions of the explosives hazard class placard show a symbol of an explosion, along with the hazard class of the division and the label "Explosives." However, Divisions 1.4, 1.5, and 1.6 show the division number at the top of the placard and the hazard class at the bottom of the placard. Additionally, on Division 1.5 placards, the "Explosives" label is replaced with "Blasting Agents", and the asterisk is replaced with a compatibility letter when necessary.

Most flammable materials use a red placard with a flame symbol, and include the hazard class number and the name to specify the material. The flammable solid placard is an exception – it's red and white striped.

The poison placard, which is white with a black skull and crossbones, can be used for all types of poisonous materials. The item is usually specified with the name – toxic, or poison – and the hazard class number. Poisonous gas uses the inhalation hazard placard.

Then there's the oxidizer placard and the oxygen peroxide placard. This yellow placard uses a symbol of a black O on fire to indicate that the hazardous material contains oxygen or yields to oxygen. The specific content is shown on the placard.

Other placards specify only one type of hazard. For instance, the nonflammable compressed gas placard is green and white and depicts a cylinder. This placard is only used for compressed gases that are neither flammable nor poisonous, but that are packaged so the pressure is at least 3.8 pounds per square inch absolute, or psia. This placard can be used to transport things like household aerosols.

The spontaneously combustible material placard is similar to the flammable placard, except that the top half is white and the bottom half is red. Additionally, it depicts a black flame.

The Dangerous When Wet placard is blue and uses the flammable symbol in white.

There are a few other types of placards, such as the radioactive placard, which is used only for radioactive materials. The trefoil design is universally recognized as a symbol meaning radiation.

Then there's the corrosive placard, which is used only for corrosive items. It uses a distinctive and well-known symbol that displays damage to live and inanimate objects.

And finally, the miscellaneous placard notifies transporters, handlers, and the general public of a low-to-moderate-risk hazmat shipment.

Sometimes hazardous materials require more than one placard, depending on the hazard, quantity, and packaging.

On the other hand, some items may not require specific placards if they're under a certain quantity – for example, a shipment of less than 1,000 pounds of flammable gas in non-bulk packaging.

However, certain hazardous cargo must always carry a specific placard regardless of quantity, including Class 1 explosives in divisions 1.1, 1.2, and 1.3, as well as Class 2 gases in division 2.3, poisonous.

One of the DOT's requirements is that when certain types and quantities of hazardous materials are shipped, the vehicles transporting them have placards to identify the nature of the content.

Consider a fleet of vehicles transporting cargo items including aerosol products, butane, carbon monoxide, and lead nitrate to various destinations.

Aerosol products are compressed gases, so the vehicle transporting them must have a class 2 gases placard unless certain exceptions apply.

Butane is flammable gas that could ignite if mixed with air, so there should be a class 2 gases, division 2.1 flammable placard or label attached to the cargo and the vehicle.

Carbon monoxide is poisonous, so it needs a class 2 gases, division 2.3 poisonous placard for the transport vehicle.

And lead nitrate yields to oxygen and could cause the combustion of other materials. In this case, the class 5 oxidizers placard must be attached to the transport vehicle.

Question 2: Interactive

Question

Here are some examples of hazardous cargo. As you did in the previous activity, match each type of hazardous cargo with the placard that should be used to label it for transport.

Drag each type of hazardous cargo to the placard that should be used.

Options:

A. Phosphorus
B. Hydrogen
C. Tear gas
D. Kerosene

Targets:

Answer

Phosphorus is a Class 4 solid and should be transported using the Class 4 placard for spontaneously combustible cargo.

Hydrogen is a division 2.1 flammable Class 2 gas that should be transported using a Class 2.1 placard.

Tear gas is classified as a poison, and should be transported using a Class 6 Poison placard.

Kerosene is a Class 3 Flammable liquid, so it should be transported with a Class 3, Flammable placard that displays the flame at the top.

Correct answer(s):

Option A = Target 1
Option B = Target 2
Option C = Target 3
Option D = Target 4

Question 3: Interactive

Question

Assume you need to transport the materials described in the targets. Determine which placard should be used to represent each type of cargo.

Drag each placard to the material it represents according to the material's class or division.

Options:

A. Class 8: Corrosive
B. Class 4: Flammable Materials
C. Class 7: Radioactive
D. Class 5: Oxidizer

Targets:

1. Nitric Acid
2. Magnesium
3. Plutonium
4. Chlorates

Answer

Nitric acid is a Class 8 corrosive material. The Corrosive placard would be used if you were transporting large quantities of nitric acid.

Magnesium is a material that is dangerous when wet. It's classified as a Class 4, division 4.3 material which requires the Dangerous When Wet placard when transported in any quantity.

In the second step, gaining knowledge of operations, you detect potential security risks. It's important to know the quantities of materials transported and any security procedures already in place. You should also consider shipment security, existing guidelines, threats received to date, and whether any trends are present during this stage. For instance, you could note that the quantities of materials the company ships are large, infrequent, and not well secured, although hazard placards are used. You could also note that previous incidents have involved stolen vehicles and spills due to the nature of the cargo, which is dangerous and expensive. In addition, you would note when there are sparse security procedures in place.

Once all the information is collated, you begin the assessment step. During assessment, it's important to identify security risks, assess procedures in place, and note control points or elements that should be addressed, such as personnel, hazmat control, communications, and emergency response. In the case of the hauling company, you may decide that shipments must be smaller and more frequent and that there must be regular communication between the drivers and the main office. You may also decide that the cargo should be more safely secured, and that there should be procedures in place to help drivers prevent theft in their absence.

Developing a strategy is the next step. This is where you rank security risks according to their risk levels, set goals to reduce risks, and define preventative measures. This is also the stage when you write the security plan. For the hauling company, you may decide that there's a medium risk of terrorist attack due to the cargo's nature and a high risk of hijacking due to the type of vehicles used. With this in mind, you could create a security document with all procedures and risk levels outlined, and set goals to reduce thefts and spills and ensure safer delivery.

The action stage, which is the fifth step, is where you implement the written security plan and notify employees of the new procedures. For instance, you could distribute copies to the hauling company's hazmat transporters.

The next step is verification. At this stage, you monitor the security plan to ensure that it's used correctly. One way to do this for the hauling company would be to ask drivers to check in with you on a weekly basis to verify that the plan is working and that all procedures in place are being followed correctly.

The final step is evaluation, which helps you determine whether the set goals are being met, and whether the security plan is successful. In the case of the hauling company, you could compare your findings to those of a similar company that also delivers hazardous chemicals.

It's essential to adhere to the requirements of a security plan to ensure everyone's safety when shipping or transporting hazardous materials.

Now let's take a short break so you can answer some practice questions. We'll pick up here when you're finished.

9. Knowledge Check: Elements of a Security Plan

- *identify the requirements of a security plan*
- *recognize examples of the steps taken to develop a security plan*

Question 1: Multiple Choice

What are three requirements for how a security plan should be maintained?

Options:

1. It should be in writing
2. It must be reviewed annually and updated as necessary
3. It should be retained while in effect
4. It should be kept electronically for at least 50 years

Answer

1. It should be in writing
2. It must be reviewed annually and updated as necessary
3. It should be retained while in effect

Feedback:

Option 1: *This option is correct. The plan should be in writing and available to those employees with responsibility for implementing or developing the plan.*

Option 2: *This option is correct. The security plan must be reviewed annually and updated as necessary to cover any changes to regulations or security measures.*

Option 3: *This option is correct. The plan should be retained while in effect and not destroyed at any point.*

1: Option A

2: Option B

3: Option C

Feedback:

Target 1: *The first step, scoping, involves noting where risks are present and characterizing the firm's hazardous operations.*

Target 2: *The second stage, knowledge of operations, involves collecting information about operations and problems that have occurred. Shipment security, existing guidelines, threats received to date, and any existing trends should also be considered during this stage.*

Target 3: *The third stage, conducting an assessment is done to determine what the plan should include.*

Question 4: Matching

Match the last four steps in the development of a security plan with their associated actions or activities.

Options:

A. Strategy

B. Action

C. Verification

D. Evaluation

Targets:

1. This stage involves ranking security risks according to risk levels, setting goals for reducing risks, defining preventive measures, and writing the security plan
2. This stage determines whether the goals set are being met, and whether the security plan is successful
3. This stage is where the written plan is implemented and employees are notified of the new procedures.
4. This stage involves monitoring the security plan to ensure that it is being used correctly

Answer

1: Option A

2: Option D

3: Option B

4: Option C

Feedback:

Target 1: *The fourth step, devising a strategy for her security plan, involves determining risk levels of operations, making decisions, and setting goals.*

Target 2: *The seventh and final step of security plan development – evaluation – involves evaluating the security plan to ensure that it's a success.*

Target 3: *The fifth step – action – involves implementing the plan by giving it to everyone who should use it and be aware of it.*

Target 4: *The verification stage, which is the sixth step in the plan's development, involves monitoring the plan's effectiveness and verifying its success.*

10. Video: Employers, Employees, and Security Plans (sh_ehshsf_d36_enus_06)

3. A company transports 6 quarts of industrial chemicals that are poisonous if inhaled
4. A company transports large bulk quantities of organic peroxides

Answer

2. A company transports 900 gallons of a Division 2.1 flammable gas per shipment
3. A company transports 6 quarts of industrial chemicals that are poisonous if inhaled
4. A company transports large bulk quantities of organic peroxides

Feedback:

Option 1: *This option is incorrect. If the quantity of uranium hexafluoride that is being transported does not require hazard placards, it is unlikely that this company requires a security plan.*

Option 2: *This option is correct. This company should have a security plan because it's transporting large bulk shipments of a Division 2.1 flammable gas with a capacity greater than 792 gallons.*

Option 3: *This option is correct. This company should have a security plan because it transports a material that's poisonous by inhalation.*

Option 4: *This option is correct. This company should have a security plan in place because they transport any quantity of organic peroxide.*

Question 2: Matching

Match the type of training with the employee who should receive it. Each training type may match to more than one employee.

Options:

A. In-depth security training

B. Security awareness training

Targets:

1. Tammy deals with the administration and stock checks of hazmat shipments but there is no DOT security plan required
2. Vicki delivers hazmat shipments to companies across the US and is required to implement a security plan
3. Duane's gas station doesn't implement a security plan, but the shippers who deliver the gasoline do
4. Harold is responsible for protecting hazmat shipments from unauthorized access and follows security plan guidelines

Answer

1: Option B

2: Option A

3: Option B

4: Option A

Feedback:

Target 1: *Tammy is not responsible for transporting materials and is not exposed to the same security risks, but she still requires security awareness training to ensure she understands the risks involved in hazmat handling.*

Target 2: *Vicki delivers hazmat supplies and must implement a security plan. Therefore, she must receive in-depth security training.*

Target 3: *Duane is not responsible for his own security plan but should receive awareness training so that he understands the security risks and hazards of the deliveries made by the shippers.*

Target 4:

explosives	Products that are made for the sole purpose of creating explosions.
FAA	Abbreviation for Federal Aviation Administration.
flammable	Easily ignited and capable of burning with great rapidity. Flammable liquids have a flash point that is below 100°F.
flammable liquids	Liquids that have a flash point of not more than 141°F.
flammable solids	Materials that are easily ignited, are spontaneously combustible, or react with water to emit flammable gases.
FMCSA	Abbreviation for Federal Motor Carrier Safety Administration.
gas	A fluid (as air) that has neither independent shape nor volume but tends to expand indefinitely.
hazardous material	Abbreviated as HAZMAT, a substance or material that the Secretary of Transportation has determined capable of posing unreasonable risk to health, safety and property when transported in commerce and has designated as hazardous under Section 5103 of the Federal hazardous materials transportation law. The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials as defined in 49 CFR 171.8, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101) and materials that meet the defining criteria for hazard classes and divisions in Part 173 of the HMR.
Hazardous Material Regulations	Abbreviated as HMR. Identifies hazard characteristics that may make the substance or material a "hazardous material."
hazardous substance	A material, including its mixtures and solutions, that is listed in Appendix A to 49 CFR 172.101 (Hazardous Materials Table), and is in a quantity, in one package, which equals or exceeds the reportable quantity (RQ) shown in the Appendix. For radionuclides, the substance conforms to paragraph 6 or 7 of Appendix A to 49 CFR 172.101. The term does not include petroleum or natural gas.
hazardous waste	Means any material that is subject to the Hazardous Waste Manifest Requirements of the U.S. Environmental Protection Agency specified in 40 CFR part 262.
HAZMAT	See hazardous material.
HAZMAT table	A key element and primary guide to offerors, carriers, and enforcement personnel in determining compliance with the regulations. For each entry, the table specifies the proper shipping name, hazard class or division, identification number, packing group, required hazard warning labels, packaging authorization references, per-package quantity limitations for passenger and cargo aircraft, special provisions, and vessel stowage references.
HMR	See Hazardous Material Regulations.
Miscellaneous hazardous materials (Class 9)	These are products that do not fall into any other hazard class but meet the DOT definition of hazardous waste, hazardous substance, marine pollutant, or elevated temperature material, or which have an anesthetic, noxious, or other similar property which could cause extreme annoyance or discomfort to a flight crew member.
non-bulk packages	Packaging with a maximum capacity of 119 gallons or less (for liquids), a maximum net mass of 882 pounds or less (for solids), a maximum capacity of 119 gallons or less as a receptacle (for solids), and a water capacity of 1,000 pounds or less (for gas).
organic peroxides	Materials that are highly unstable. They are especially dangerous because they contain both oxygen and combustible material.
oxidizers	Materials that give off oxygen, promoting the combustion of flammable materials.
polyethylene	A polymerized ethylene resin used for packaging and molding for a wide variety of containers.
radioactive materials	Means any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values specified in the table in §173.436 or values derived according to the instructions in §173.433.
reactive substances	Substances (chemicals or materials) that tend to react with other chemicals or materials. Some reactive substances will react with even water or air (sodium metal, lithium).
segregation	The act of separating or isolating one item from another.
synthetic	Non-natural material (nylon, polyester, or polypropylene).
toxic/poison materials	Substances which are poisonous or infectious to humans and/or animals.
transportation	The movement of property and loading, unloading, or storage incidental to that movement.

- *recognize training requirements for HAZMAT employees*

[Topic title: Training Requirements.] If your job requires identifying, preparing, or transporting hazardous material – also called HAZMAT – safety is nonnegotiable. In fact, the US Department of Transportation's Hazardous Materials Regulations, or HMR, prescribe HAZMAT training for every HAZMAT employee. It's the law.

To help you do your job safely, these training requirements are outlined in the HMR.

Consider this scenario. A shipper offers two separate corrosive materials from Packing Group II and III as undeclared HAZMAT. *[A sample hazardous material table displays. The information in this table is organized into ten columns. The columns are labeled as (1) Symbol, (2) Hazardous materials descriptions and proper shipping names, (3) Hazard class or division, (4) Identification numbers, (5) PG, (6) Label codes, (7) Special provisions (§172.102), (8) Packaging (§173.***), (9) Quantity limitations (see §§173.27 and 175.75), and (10) Vessel stowage. The column labeled Packaging is further divided into three sub columns labeled as (8A) Exceptions, (8B) Non-bulk, and (8C) Bulk. The column labeled Quantity limitations is further divided into two sub columns labeled as (9A) Passenger aircraft/rail and (9B) Cargo aircraft only. The column labeled Vessel stowage is further divided into two sub columns labeled as (10A) Location and (10B) Other.]* They place the materials in a combination packaging without marking or labeling the outer packaging or preparing shipping papers. They've also overlooked general awareness and function-specific employee training and have no records for testing training materials.

The result? They're assessed a civil penalty of $10,500 for acts committed with willful disregard and endangerment of the public and the environment.

Companies that commit HMR violations can incur penalties of up to $500,000 and five years' imprisonment. Civil penalties for each violation range from $582 to $96,624. If violations cause death, serious illness, or severe injury to someone – or if a substantial property damage incurs – the maximum civil penalty is $225,455. For continuing violations, each day constitutes a separate offense.

Employers can avoid penalties by fulfilling HMR training requirements for HAZMAT employees. Training, however, only applies to employees involved in functions covered by the HMR.

So, if you prepare HAZMAT for transportation, including preparing the shipping papers; load, unload, or handle materials; or are responsible for safely transporting materials, then you qualify.

Training also applies if you manufacture, test, recondition, repair, modify, mark, or otherwise represent containers, drums, or packaging that is qualified for use in transporting HAZMAT.

The HMR requires that companies repeat training and testing every three years. Some common training requirements include general awareness or familiarization, which this course covers.

If your company meets the criteria in Section 172.800 of the HMR, in-depth security training is required. This training includes information about company security objectives, specific security procedures, and employee responsibilities.

You'll also assess your organizational security structure and required actions, should a security breach occur.

Another training requirement is safety training.

If you operate a vehicle that transports HAZMAT, you are required to take driver training, which applies regardless of vehicle type or HAZMAT quantity. Driver training meets the training requirement of performing function-specific tasks specific to HAZMAT transportation.

A final requirement is security awareness training. Since 9/11, the United States has increased its security awareness to address the potential risk of terrorists targeting HAZMAT in transit. So, within 90 days of employment, employees are required to receive security awareness training that focuses on security risk awareness specific to HAZMAT transportation and methods designed to enhance transportation security. This training must also cover recognizing and responding to possible security threats.

Finally, all employees involved in transporting HAZMAT should have the latest copy of Title 49 of the Code of Federal Regulations, or 49 CFR, Parts 100 through 185.

Ensuring public safety and protecting the company's reputation and bottom line is in everyone's best interest. That's why employees who transport hazardous materials must meet the latest HMR training requirements for HAZMAT handling and shipping.

3. Knowledge Check: Training Requirements

- *recognize training requirements for HAZMAT employees*

To start, let's explore hazardous material, commonly known as HAZMAT. The Secretary of Transportation determines if a substance or material qualifies as HAZMAT based on whether the substance or material poses unreasonable health, safety, and property risk when transported commercially.

The HMR defines transportation as the movement of property, and loading, unloading, or storage incidental to that movement. Two examples are pipelines and vehicles that routinely transport cargo.

For something to be classified as HAZMAT under the HMR, the material must meet the defining criteria for hazard classes and divisions in 49 CFR Part 173.
This includes elevated temperature materials as defined in 49 CFR 171.8 and hazardous substances, hazardous waste, as well as marine pollutants.

A hazardous substance is defined as a material that's listed in Appendix A to 49 CFR 172.101, which includes its mixtures and solutions and is in a quantity, in one package, which equals or exceeds the reportable quantity, or RQ, listed in the Appendix. Radioactive substances called "radionuclides" should conform, specifically, to Paragraph 7 of Appendix A.

However, some substances are specifically not listed or designated as hazardous in Appendix A. One example is petroleum, which includes crude oil or any fraction thereof. Also excluded are natural gas, natural gas liquids, liquefied natural gas, synthetic gas usable for fuel, or mixtures of natural gas and synthetic gas.

Then there's hazardous waste, which is defined as any material subject to the Hazardous Waste Manifest Requirements of the Environmental Protection Agency, or EPA, as specified in 40 CFR Part 262.

Becoming familiar with HMR terms – what they mean and what they don't mean – will enable you to interpret the regulations with accuracy.
Next, practice what you've learned so far by answering a question.

5. Knowledge Check: Definitions

- *identify terms associated with hazardous materials transportation*

Question 1: Matching

Match each definition to the appropriate term.

Options:

A. A material listed in Appendix A to 49 CFR 172.101, including its mixtures and solutions

B. Any material subject to Hazardous Waste Manifest Requirements

C. A substance or material capable of posing an unreasonable risk to health, safety, and property when transported commercially

D. The movement of property and loading, unloading, or storage incidental to that movement

Targets:

1. Hazardous material
2. Hazardous substance
3. Hazardous waste
4. Transportation

Answer

1: Option C

2: Option A

3: Option B

4: Option D

Feedback:

Target 1: A hazardous material (HAZMAT) is a material transported in commerce that is capable of posing an unreasonable risk to health, safety, and property.

Next is Class 3, Flammable and Combustible Liquids, the definitions of which relate to flash points. A flash point is the lowest temperature at which a liquid emits enough vapors to form an ignitable mixture with air near its surface. Flammable liquids are defined as having a flash point of no more than 140°F, or 60°C, while combustible liquids are liquids that don't meet the definition of any other hazard class specified in 49 CFR and have a flash point between 140 and 200°F, or 60 and 93°C.

Class 4 has three divisions: Flammable Solids, Spontaneously Combustible, and Dangerous When Wet.

Division 4.1 – Flammable Solids – includes flammable solids that ignite easily and burn vigorously or persistently without the presence of oxygen or air. One example is naphthalene. Flammable solids come in three forms: desensitized explosives, self-reactive materials, and readily combustible solids.

If your company transports pyrophoric or self-heating materials, such as white or yellow phosphorus, Division 4.2 – spontaneously combustible materials – applies to you. These materials may ignite without a source of ignition.

Then there's Division 4.3 – dangerous when wet. These materials react by becoming spontaneously flammable when they come into contact with water. They also give off flammable or toxic gases. Examples are potassium, sodium, and lithium metal alloys.

Class 5 hazards – Oxidizers and Organic Peroxides – are highly unstable and especially dangerous to transport. They fall into two divisions.

Division 5.1 includes oxidizers that emit oxygen, which can cause or enhance the combustion of other materials – for example, sodium chlorite.

Division 5.2 includes organic peroxides that are highly unstable. Consider them a derivative of hydrogen peroxide, where one or more organic radicals – for example, dibenzoyl peroxide – have replaced the hydrogen atoms.

If your company ships nicotine or regulated medical waste, Class 6 applies. This class refers to poisons and infectious substances, which affect humans and animals. Class 6 comprises two divisions.

Division 6.1 covers poisons or toxins, other than gases, which are poisonous through skin absorption, ingestion, or inhalation. An example of this is nicotine.

By comparison, Division 6.2 refers to infectious substances, such as regulated medical waste, that cause disease in humans and animals through viruses, fungi, bacteria, and other organisms.

Radioactive materials form Class 7 hazards. These materials occur naturally or are produced artificially as solids, liquids, or gases and spontaneously emit ionizing radiation. A common example is uranium.

Class 8 includes corrosives, whether in liquid or solid form. These hazards can destroy human skin on contact and cause severe corrosion to steel or aluminum.

If you can't classify a hazard according to any of classes 1 through 8, but the DOT defines it as a hazardous waste, hazardous substance, marine pollutant, or elevated temperature material, then Class 9 – Miscellaneous – would apply. It also applies if the hazard has an anesthetic, noxious, or other similar property.

Class 9 requires you to identify and classify whether the material is a hazardous substance – which we'll cover later in the course – or a marine pollutant. For marine pollutants, check Appendix B of 49 CFR 172.101. Note that marine pollutants identified by the letters "PP" in column 1 of the marine pollutant table are considered severe marine pollutants.

If your company transports chemicals or mixtures defined as marine pollutants either by vessel or bulk containers, they'll be regulated as marine pollutants. These regulations stipulate that the packaging of the material be marked with the marine pollutant marking unless the exceptions in 49 CFR 172.322(d) apply.

You can, however, forego marking the package if the substance, material, or article is in a single or combination packaging containing inner packaging with liquid contents of 1.3 gallons – 5 liters – or 11 pounds – 5 kilograms – or less for solids.

[A table titled "CARRIER INFORMATION" displays. The information in this table is organized into three columns and four rows. The columns are labeled as HM (X), Commodity description, and NMFC.] You should always ensure that the shipping description for a marine pollutant on a shipping paper includes the words "Marine Pollutant" after the basic description. And you should also include the name of the marine pollutant in the shipping description if it's not already listed with the proper shipping name.

The numerous types of HAZMAT can be overwhelming. But having a clear grasp of the nine hazard classes enables you to pinpoint safety precautions that apply to the HAZMAT you're transporting.

Next, practice what you've learned by answering some questions.

7. Knowledge Check: Hazard Classes

- *recognize hazards according to the DOT's nine hazard classes*

Question 1: Multiple Choice

Class 1 explosions contains six hazard divisions. Division 1.2 explosives are projection hazards, which could send pieces everywhere in an explosion.

Target 3: *Class 2 gases consist of three divisions. Division 2.1 includes flammable gases that are likely to combust when in contact with air.*

Question 3: Multiple Choice

Which hazard class consists of products that are cooled, compressed, or dissolved to make their transportation and handling easier?

Options:

1. Class 1 – Explosives
2. Class 2 – Gases
3. Class 5 – Oxidizers and Organic Peroxides
4. Class 4 – Flammable Solids, Spontaneously Combustible, Dangerous When Wet

Answer

2. Class 2 – Gases

Feedback:

Option 1: *This option is incorrect. According to the HMR, it's Class 2. not Class 1, that comprises gases that are cooled, compressed, or dissolved to make their transportation and handling easier.*

Option 2: *This is the correct option. Per the HMR, Class 2 is designated for gases, some of which can be cooled, compressed, or dissolved to facilitate handling.*

Option 3: *This option is incorrect. Class 2 gases are defined by the HMR as gases that are cooled, compressed, or dissolved for greater efficiency in transporting them.*

Option 4: *This option is incorrect. Class 2 gases, as defined by the HMR, are typically cooled, compressed, or dissolved to make transporting them more efficient.*

Question 4: Matching

Match the definition to the hazard class it describes.

Options:

A. Highly unstable and dangerous, containing both oxygen and combustible materials

B. Easily ignited, spontaneously combustible, and water reactive

C. Liquids with a flash point not more than 140°F (60°C)

D. Made for the sole purpose of creating explosions

E. Destroy skin and corrode steel or aluminum

F. Solids, liquids, or gases that spontaneously emit ionizing radiation

Targets:

1. Class 1 – Explosives
2. Class 3 – Flammable Liquids

Each entry in the HMT cites the substance's proper shipping name, hazard class or division, identification number, packing group, required hazard warning labels, special provisions, packaging authorizations, per-package quantity limitations for passenger and cargo aircraft, and vessel stowage.

The HMT spans 10 columns, which are read from left to right. While only the first 8 columns apply to highway shipments, each row's information can derive details from column 2, which covers HAZMAT descriptions and proper shipping names. In this topic, we'll focus on columns 1 and 2. We'll cover the rest of the columns later in the course.

So, let's discuss column 1 – Symbols.

For each item, this column may contain one or more of six symbols: a plus sign and capital letters "A," "D," "I," "G," or "W."

The plus sign fixes the proper shipping name, hazard class or division, and packing group, or PG, listed in columns 2, 3, and 5 of the HMT. "Fixes" means that you cannot change the proper shipping name, hazard class, division, or packing group – even if the material doesn't meet the definition of that hazard class – because the material is a known risk to humans.

Only the DOT can grant authority to make any changes.

A capital letter "A" means the material is only regulated if offered for or transported by air – or both. The exception is if it's a hazardous substance or hazardous waste, which is regulated in all modes of transport.

If you encounter a capital letter "D," it identifies proper shipping names that are appropriate for describing materials for domestic transportation. But these descriptions are unacceptable for international transportation.

In contrast, an uppercase "I" identifies proper shipping names deemed appropriate for describing materials transported internationally. You may select an alternate shipping name when only domestic transportation is involved.

A capital letter "G" identifies proper shipping names for which you must enter one or more technical names of the HAZMAT in parentheses, in association with the basic description.

Finally, a capital letter "W" means the material is regulated only if offered for – or transported by – water, or both. Again, the exception is if the material is a hazardous substance or hazardous waste, as these are regulated in all modes of transport.

The next column, Column 2, covers proper shipping names.

Two types of fonts are used in this column. Roman type is used only for proper shipping names to describe HAZMAT being transported, such as on the shipping paper or a marking on the package.

Italics are used for words that are not part of the proper shipping name but are used in addition to the proper shipping name.

Remember, it's critical to format the proper shipping name correctly. The appropriate response to HAZMAT incidents depends on accurate identification.

Proper shipping names may include some other components. For example, the word "see" after a shipping name entry refers to another entry. If the names of both entries are in Roman type, you may choose either name as the proper shipping name.

You can write the proper shipping name in the singular or plural, and both upper and lowercase letters are acceptable. You should place qualifying words such as "liquid," "dry," "solid," "flake," or "granular" either before or after the proper shipping, though it's preferable to use the sequence displayed in the HMT.
Also, the words "poison" or "poisonous" are interchangeable with the word "toxic," but only for domestic transport.

Say a nonhazardous product called "X" is added to acetone, which is a HAZMAT. How does this mixture or solution affect the proper shipping name? If the nonhazardous product doesn't change the hazard class or division, nor the general properties of "acetone," the name becomes "acetone mixture" or "acetone solution."

In some cases, Section 172.101 of the HMT specifically classifies materials as too hazardous, so they're "forbidden" and may not be transported.

Some substances even require special review and approval. Other material names are described as "not otherwise specified," or "n.o.s." Whenever possible, a single proper shipping name should be used to describe hazardous materials.

Understanding the information cited in columns 1 and 2 of the HMT is crucial to interpreting the rest of the HMT.

Let's pause here so you can practice what you've learned by answering some questions.

9. Knowledge Check: HAZMAT Columns 1 and 2

- *identify information found in the HAZMAT Table columns 1 and 2*

Question 1: Multiple Choice

What information is found in column 2 of the HMT?

Options:

Feedback:

Target 1: *The "A" symbol indicates a material that is regulated if transported by air. This doesn't apply to hazardous substances or waste.*

Target 2: *The "W" symbol indicates a material that is regulated if transported by water. This doesn't apply to hazardous substances or waste.*

Target 3: *The "D" symbol is used for proper shipping names used in domestic transportation.*

Target 4: *The "+" symbol fixes the proper shipping name, hazard class, division, or packing group.*

Target 5: *The "G" symbol identifies proper shipping names for which one or more technical names of the HAZMAT must be entered in parentheses.*

Target 6: *The "I" symbol identifies proper shipping names that are appropriate for describing materials for international transport.*

10. Video: HAZMAT Columns 3 to 7 (sh_ehshsf_d32_enus_06)

- *identify information found in the HAZMAT Table columns 3 to 5*
- *identify information found in the HAZMAT Table columns 6 and 7*

[Topic title: HAZMAT Columns 3 to 7.] To ensure the safe transportation of HAZMAT, the DOT established the Hazardous Materials Regulations, or HMR. A key part of the HMR is the Hazardous Materials Table, or HMT, which contains information regarding appropriate safety precautions.

When preparing material for delivery, you must use the HMT to confirm whether the material you'll be transporting is hazardous.

*[A sample hazardous material table displays. The information in this table is organized into ten columns. The columns are labeled as (1) Symbol, (2) Hazardous materials descriptions and proper shipping names, (3) Hazard class or division, (4) Identification numbers, (5) PG, (6) Label codes, (7) Special provisions (§172.102), (8) Packaging (§173.***), (9) Quantity limitations (see §§173.27 and 175.75), and (10) Vessel stowage. The column labeled Packaging is further divided into three sub columns labeled as (8A) Exceptions, (8B) Non-bulk, and (8C) Bulk. The column labeled Quantity limitations is further divided into two sub columns labeled as (9A) Passenger aircraft/rail and (9B) Cargo aircraft only. The column labeled Vessel stowage is further divided into two sub columns labeled as (10A) Location and (10B) Other.]* The HMT comprises 10 columns that are read from left to right, of which only the first 8 concern highway shipments.

For this topic, we'll focus on columns 3 through 7.

Column 3 lists the hazard class or division of the material, or the word "Forbidden."

"Forbidden" indicates that material may not be transported without special permission from the DOT unless it's diluted, stabilized, or incorporated into a device, and is classed according to the HMR.

If "Forbidden" displays in column 3, the name in column 2 is in italics to indicate it's not a proper shipping name.

If the material is listed as "Forbidden," it cannot be shipped without approval from the DOT.

Next, column 4 lists the 4-digit DOT identification number assigned to the hazardous material, to allow for quick HAZMAT identification.

If "UN" – United Nations – precedes an ID number, it describes materials for domestic or international shipments. If the ID starts with "NA" – North America – it may be used to describe certain materials when transported within the United States or between the United States and Canada.

Always ensure that numbers on shipping materials are accurate and legible. This information is critical to emergency responders.

Next is column 5, which specifies the packing group – or PG – assigned to a material.

Each PG represents a material's relative degree of danger in decreasing order of severity. PG I means great danger and PG II represents medium danger, while for PG III, the danger is minor. The danger level determines the packaging requirements of a material. On shipping papers, the PG number is indicated with Roman numerals when applicable, preceded by the letters "PG."

But what if a HAZMAT is assigned more than one packing group? In that case, you'd determine the correct PG by referring to subpart D of section 173 of the HMR, which specifies the criteria for assigning packing groups.

Target 3: *Column 3 lists the hazard class or division of the material or the word "Forbidden," which means the material may only be offered or accepted for transportation under certain circumstances.*

Question 2: Multiple Choice

What information does column 6 of the HMT tell you about how to package hazardous materials?

Options:

1. It specifies label codes that indicate which hazard warning labels to apply
2. It indicates when a hazardous material is forbidden to be transported in its natural state
3. It provides the proper packing group for the hazardous material
4. It identifies the DOT identification number for the hazardous material

Answer

1. It specifies label codes that indicate which hazard warning labels to apply

Feedback:

Option 1: *This is the correct option. Column 6 of the HMT specifies label codes which represent the hazard warning labels that must be applied to each package of HAZMAT, unless excepted.*

Option 2: *This option is incorrect. It's Column 3 of the HMT, not Column 6, that lists the hazard class or division of the material or the word "Forbidden."*

Option 3: *This option is incorrect. Column 5 of the HMT specifies which packing group has been assigned to the material, not Column 6.*

Option 4: *This option is incorrect. It's Column 4 of the HMT that lists the 4-digit DOT identification number assigned to the hazardous material.*

Question 3: Multiple Choice

Column 7 of the HMT also contains information that applies to the packaging of hazardous materials.

What type of information is it?

Options:

1. Special provisions
2. Label codes
3. Packing group
4. DOT ID number

Answer

1. Special provisions

Feedback:

Option 1: *This is the correct option. Column 7 specifies codes for special provisions that apply to HAZMAT packaging, packaging requirements, certification, marking, or labeling.*

Option 2: *This option is incorrect. Column 6, not Column 7, provides label codes which represent the hazard warning labels that have to be applied to each HAZMAT package, unless excepted.*

Columns 8A, 8B, and 8C may refer you to information in Part 173 of the Code of Federal Regulations, or CFR. For example, a value of "154" in column 8A for the substance "aluminum chloride solution" indicates that specific exceptions from CFR 173.154 apply.

Similarly, "203" in column 8B refers you to specific nonbulk packaging requirements in CFR 173.203. And for 8C, the specific bulk packaging requirements for CFR 173.241 may be indicated by the value of "241."

If the packaging reference does not apply to the form – solid or liquid – being transported, use the Solid/Liquid Table in Section 172.101(i)(4) to determine the correct packaging.

Next, Column 9 addresses special concerns for air and rail shipments. It limits the quantity of material per package or forbids transporting HAZMAT by aircraft or railway cars that carry passengers.

Column 9 comprises two subcolumns: 9A – passenger-carrying aircraft and passenger-carrying rail cars; and 9B – cargo aircraft – aircraft with no passengers. Note that nearly every air carrier must ensure their HAZMAT packages comply with special air regulations.

Column 10 of the HMT specifies requirements for the transportation of hazardous material by cargo and passenger-carrying vessels. Special water regulations generally apply when preparing HAZMAT packages for water shipment.

Column 10 has two subcolumns: 10A, Location; and 10B, Other.

If you're uncertain if a particular material is a hazardous substance, you should refer to Appendix A, which is used to determine HAZMAT. It falls under CFR section 172.101: List of hazardous substances and reportable quantities. *[The appendix lists materials and their corresponding reportable quantities (RQs) that are listed or designated as "hazardous substance" under section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act. T2 U.S.C]*

Appendix A lists hazardous substances across two tables. Table 1 lists hazardous substances other than radionuclides – which are radioactive materials – and table 2 lists radionuclides.

To check if a particular package is regulated as a hazardous substance, you first use the HMT to confirm the proper shipping name of the material, such as "ethylene dichloride."

Second, check the reportable quantity, or RQ, for the material listed in Appendix A if the material is listed as a hazardous substance. And third, clarify the amount in one package.

If a material fits various categories – such as hazardous substance, marine pollutant, and hazardous waste – remember a hazardous substance is classified according to two main factors: first, it's listed in Appendix A; and second, it's shipped in one package in a quantity that equals or exceeds the RQ.

Knowing what information is available in the HMR and HMT places your company one step closer to delivering a HAZMAT shipment safely.

Now practice what you've learned by answering some questions.

13. Knowledge Check: HAZMAT Columns 8 to 10 and Appendix A

- *identify information found in the HAZMAT Table columns 8 through 10 and Appendix A*

Question 1: Multiple Choice

Which three pieces of information can you find in columns 8, 9, and 10 of the HMT?

Options:

1. Requirements for transporting HAZMAT by cargo and passenger-carrying vessels
2. Special concerns for air and rail shipments
3. Determines if a material is a hazardous substance
4. Exceptions to packaging requirements

Answer

1. Requirements for transporting HAZMAT by cargo and passenger-carrying vessels
2. Special concerns for air and rail shipments
4. Exceptions to packaging requirements

Feedback:

Option 1:

	materials designated as hazardous in the Hazardous Materials table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions in Part 173 of the HMR.
Hazardous Materials Regulations	Abbreviated as HMR. Identifies hazard characteristics that may make the substance or material a hazardous material.
Hazardous Materials Table	Abbreviated as HMT, a key element and primary guide to offerors, carriers, and enforcement personnel in determining compliance with the regulations. For each entry, the table specifies the proper shipping name, hazard class or division, identification number, packing group, required hazard warning labels, packaging authorizations, per package quantity limitations for passenger and cargo aircraft, and special provisions.
hazardous substance	A material, including its mixtures and solutions, that is listed in Appendix A to 49 CFR 172.101 (Hazardous Materials Table), and is in a quantity, in one package, which equals or exceeds the reportable quantity (RQ) shown in the Appendix. For radionuclides, the substance conforms to paragraph 7 of Appendix A to 49 CFR 171.101. The term does not include petroleum or natural gas.
hazardous waste	Any material that is subject to the Hazardous Waste Manifest Requirements of the EPA specified in 40 CFR Part 262.
HAZMAT	See hazardous material.
HMR	See Hazardous Materials Regulations.
HMT	See Hazardous Materials Table.
miscellaneous hazardous materials	Products that do not fall into any other hazard class but meet the DOT's definition of hazardous waste, hazardous substance, marine pollutant, or elevated temperature material, or which have an anesthetic, noxious, or other similar property.
nonbulk packages	Packaging that has a maximum capacity less than 119 gallons for liquids, a maximum net mass less than 882 pounds for solids, a maximum capacity of 119 gallons or less as a receptacle for solids, and a water capacity less than 1,000 pounds for gas.
nonflammable nonpoisonous gas	Any material or mixture that exerts in the packaging a gauge pressure of 29.0 psig or 43.8 psia (200 kPa) or greater at 68°F (20°C), is a liquefied gas, or is a cryogenic liquid, and doesn't meet the definition of Division 2.1 or 2.3.
organic peroxide	Any organic compound containing oxygen in the bivalent O-O structure and which may be considered a derivative of hydrogen peroxide, where one or more of the hydrogen atoms have been replaced by organic radicals.
oxidizers	Materials that may, generally by yielding oxygen, cause or enhance the combustion of other materials.
radioactive materials	Materials containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values specified in the table in §173.436 or values derived according to the instructions in §173.433.
radionuclide	An isotope of artificial or natural origin that exhibits radioactivity. Radionuclides serve as agents in nuclear medicine and genetic engineering, play a role in computer imaging for diagnosis and experiment, and account for a percentage of background radiation to which humans are exposed.
reportable quantity	Abbreviated as RQ, the quantity specified in Column 2 of Appendix A of the Hazardous Materials Table for any material identified in Column 1 of Appendix A of §172.101. Any release of a listed hazardous substance that equals or exceeds the RQ must be reported to the U.S. Interagency National Response Center (NRC). Reportable quantities are based on the substance's acute lethal toxicity.
RQ	See reportable quantity.
toxic or poisonous materials	Substances that are poisonous or infectious to humans or animals.
transportation	The movement of property and loading, unloading, or storage incidental to that movement.

[Topic title: Packaging.] Any hazardous materials – or HAZMAT – being transported require safe conditions to reduce the risks associated with transportation. Proper packaging is integral to achieving this. To ensure your hazardous materials are suitably secured, the US Department of Transportation, or DOT, has issued the Hazardous Materials Regulations, or HMR, with instructions and procedures for packaging.

Safe packaging must meet two criteria for any consignment: it must ensure no contents are released under normal conditions, and it must remain effective even if temperature or humidity changes occur, or if any shocks, loadings, or vibrations happen during transportation.

To meet these criteria, the HMR provides various performance levels for packaging HAZMAT – basically, indicators of HAZMAT safety levels under certain conditions. They're based on the nature and level of hazards posed by the material you intend to package, and they're the basis of the HMR's Hazardous Material Table, or HMT, which is used to establish the correct packaging for HAZMAT.

Let's take a moment to differentiate between "packaging" and "package."

"Packaging" is a receptacle and any other components or materials that can contain HAZMAT. It includes fiberboard boxes, drums, jerricans, portable tanks, cargo tanks, tank cars, multi-unit tank car tanks, and containers other than freight containers and overpacks.

Section 171.8 of the HMR defines an "overpack" as an enclosure used to protect or accommodate the handling of a package or consolidate two or more packages. Examples include one or more packages secured to a pallet by strapping or shrink wrap or placed in an outer box or crate.

The term "package," on the other hand, refers to the packaging plus its hazardous contents. So, if a box or drum contains HAZMAT, it becomes a package.
As a shipper or carrier responsible for HAZMAT packaging, you need to know the proper shipping name of the material, its packing group, and the quantity of materials being shipped to determine the applicable HMR packaging requirements.

Now let's review the packaging procedure. *[A table titled "Hazardous Materials Table" displays. It is organized into several columns and rows. The column headers include (1) Symbols, (2) Hazardous Materials Descriptions and Proper Shipping Names, (3) Hazard Class or Division, (4) Identification Numbers, (5) PG, (6) Label Codes, and (7) Special provisions (§172.102).]* You always start with the HMT, which comprises a series of columns that you work through from left to right. First, identify the proper shipping name for each type of HAZMAT using column 2, the hazard class using column 3, and the ID number using column 4. *[The column headers titled "Hazardous Materials Descriptions and Proper Shipping Names", "Hazard Class or Division", and "Identification Numbers" and the entries under them are highlighted.]*

Next, identify the degree of danger, or packing group, using column 5. *[The column header PG and the entries under it are highlighted.]* Roman numerals are used to indicate the packing group – also known as the PG. PG I indicates the greatest danger; PG II means medium danger; and PG III means minor danger.

If you have a specific shipping description – for example "Acetone" – the packing group is already selected for you. *[The entry under the column headers Hazardous Materials Descriptions and Proper Shipping Names, Hazard Class or Division, Identification Numbers, and PG is Acetone, 3, UN1090, and II respectively. The entries are highlighted.]* If you have a generic shipping description like "Flammable Liquids, n.o.s." – n.o.s. meaning "not otherwise specified" – you would need to determine the packing group based on the material's chemical and physical properties and packing group criteria in the HMR.

[The column headers titled "Label Codes" and "Special provisions (§172.102)" and the entries under both the column headers are highlighted.] Next, skip across column 6 and 7 – we'll go back to them later in the course – to Column 8 – Packaging. *[Two new columns titled "(8) Packaging (§173.***)" and "(9) Quantity Limitations (see §§173.27 and 175.75)" are added to the table. The column header Packaging and the entries under it are highlighted.]* This is split into Columns 8A, 8B, and 8C. Each column provides a reference to where to find information on the proper packaging to use. Notice that Column 8's heading includes "173." followed by three asterisks. To find the HMR reference section, replace the asterisks with references found in Column 8A, 8B, or 8C. *[The entries under the columns 8A, 8B, and 8C are highlighted.]*

In this section, start with Column 8A, which lists exceptions to the packaging requirements if certain conditions are met. *[Column 8A and the entries under it are highlighted.]* Here, a reference number indicates that an exception applies; if the HMR's corresponding narrative definition of the exception matches your shipment, the exception applies to you.

For example, an exception applies to reclassify flammable liquids as combustible liquids and shipped as a non-regulated materials if they do not meet the definition of any other hazard class, have a flash point above 100 degrees Fahrenheit, and packaged in non-bulk form.

In another example, HAZMAT that meets the limited quantities exception is excepted from specification packaging and placarding for all transport modes. The exception also applies to hazard warning labeling, but excludes air transportation.

Remember, each exception stands on its own. We'll cover exceptions and Special Permits in more detail later on.

If the entry in Column 8A says "none," check Column 7 for any additional requirements. *[Column header 7 and the entries under it are highlighted.]* Column 7 lists special provisions indicated by code letters and numbers defined in HMR Section 172.102. For example, packaging restrictions could be a special provision. If Column 7 has no special provisions, you must comply with the specific packaging sections listed in Column 8B or 8C. *[Column headers 8B and 8C and the entries under both the columns are highlighted.]*

Column 8B lists packaging authorizations for non-bulk containers. It refers you to generic non-bulk packagings for liquids and solids in HMR Sections 173.201, 173.202, and 173.203. Each section authorizes single and combination packaging for a particular packing group.

Let's take a moment to define single and combination packaging. Single packaging includes plastic, metal, aluminum, or fiber drums containing HAZMAT – either liquids or solids – with no inner containers. Combination packaging includes the same types of containers, but with inner packagings or containers of HAZMAT. These containers provide packaging for liquids with a capacity of up to 119 gallons, or 450 liters; for solids with a capacity of up to 882 pounds, or 400 kilograms, per package and up to 119-gallon, or 450-liters, capacity; or for gases with up to 1,000-pound, or 454-kilogram, water capacity.

Back to the HMT. *[Column 8B and the entries under it are highlighted.]* If the reference in Column 8B applies to your shipment, then choose the appropriate packaging from the relevant section. For example, say you want to ship gasoline in 55-gallon metal drums.

This option is incorrect. Determining the correct packaging does require the proper shipping name, but the label and hazard class apply to the HMT packaging procedure.

Question 2: Multiple Choice

Which packing group indicates minor danger?

Options:

1. PG I
2. PG II
3. PG III

Answer

3. PG III

Feedback:

Option 1: *This option is incorrect. Packing group I indicates the greatest degree of danger.*

Option 2: *This option is incorrect. Packing group II represents medium danger.*

Option 3: *This is the correct option. Packing group, or PG, III represents minor danger.*

Case Study: Question 1 of 3

For your convenience the case study is repeated with each question.

A shipment consists of one liter of gasoline.

The gasoline is in a metal can and packaged in a strong outer container.

Question: Multiple Choice

What is the hazard class for gasoline?

Use the learning aid Hazardous Materials Table (HMT) for Gasoline to help you answer this question.

Options:

1. Class 3
2. Class 7
3. Class 10

Answer

For your convenience the case study is repeated with each question.

A shipment consists of one liter of gasoline.

The gasoline is in a metal can and packaged in a strong outer container.

Question: Multiple Choice

Gasoline is classified as a PG II, Class 3 hazard.

Can this package be shipped as a limited quantity? Use the learning aid Part 173.150 to help you answer this question.

Options:

1. Yes
2. No

Answer

1. Yes

Feedback:

Option 1: *This is the correct option. This package meets the provisions of 173.150 (b), so it may be shipped as a limited quantity.*

Option 2: *This option is incorrect. According to the provisions of 173.150 (b), Class 3 hazards that are categorized as PG II apply to the limited quantity exception. Therefore, this package may be shipped as a limited quantity.*

Question 4: Multiple Choice

What two types of information can you use the HMT to find?

Options:

1. The proper shipping name for hazardous material
2. The ID number for each type of hazardous material
3. Whether a hazardous material meets the limited quantities exception
4. Who is exempted from labeling requirements

Answer

1. The proper shipping name for hazardous material
2. The ID number for each type of hazardous material

Feedback:

Option 1: *This option is correct. Column 2 of the HMT provides information on the proper shipping name.*

Answer

1: Option B

2: Option A

3: Option D

4: Option C

Feedback:

Target 1: *Column 8A lists exceptions, such as limited quantity exceptions, that may apply to certain consignments of HAZMAT.*

Target 2: *Column 7's special provisions refer to additional requirements, such as packaging restrictions.*

Target 3: *Column 8C references bulk packaging options in Section 173.242 of the HMR.*

Target 4: *Column 8B references generic non-bulk packaging options for liquids and solids in Sections 173.201, 173.202, and 173.203 of the HMR.*

4. Video: Labeling (sh_ehshsf_d33_enus_03)

- *identify appropriate labeling requirements for the safe transportation of hazardous materials*

[Topic title: Labeling.] Using the correct labeling is essential for transporting HAZMAT safely. Fortunately, the Hazardous Materials Regulations, or HMR, provide detailed instructions on labeling requirements, exceptions, and authorized modifications to help you choose the right labeling for your shipments.

Labeling is specifically required if your company is transporting HAZMAT in a non-bulk package. In the HMR, the term "label" refers to a prescribed hazard warning notice. Labels identify the primary and subsidiary hazards specific to materials, and communicate information about handling precautions and prohibitions.

Labels should be applied to the outside of HAZMAT shipping container, and must be placed on the same side of the package and near the proper shipping name. They should be diamond-shaped and measure at least 3.9 inches, or 100 millimeters, along each side, unless otherwise specified.

In the HMR, the Hazardous Materials Table, or HMT, is integral to determining labeling requirements. For each HAZMAT, it lists label codes associated with the proper shipping name and hazard class. *[A table titled "Hazardous Materials Table" displays. It is organized into several columns and rows. The column headers include (1) Symbols, (2) Hazardous Materials Descriptions and Proper Shipping Names, (3) Hazard Class or Division, (4) Identification Numbers, (5) PG, (6) Label Codes, (7) Special provisions (§172.102), and (8) Packaging (§173.***).]* So as an initial step, check Column 6 of the HMT for any required labels. *[The column header "Label Codes" and the entries under it are highlighted.]*

Note that the HMT features two different labels for Division 6.1 – Poisons. One applies if the material is a poison inhalation hazard, and other if it's not.

Also, under Class 7 – Radioactive material – the label "Fissile" displays for packages that contain fissile material. In that case, you should complete the label with the criticality safety index, or CSI, to assist the shipper in controlling how many fissile packages are grouped together for shipment.

The HMR provides some exceptions for labeling requirements. *[The column titled "(8) Packaging (§173.***)" is further divided into three subcolumns (8A) Exceptions, (8B) Non-bulk, and (8C) Bulk. The subcolumn header "Exceptions" and the entries under it are highlighted.]* When an exception or exemption applies, package labeling doesn't need to comply with the HMR. In all other cases, anyone offering to transport a package, overpack, or freight container of HAZMAT must label it in accordance with the HMR. If a package fails to meet labeling requirements, it must not be transported.

Labeling must represent the hazard of the material in the package properly and accurately. Ensure the appropriate hazard class or division number is displayed in the lower corner of the primary hazard label and any subsidiary labels. In addition, no person may offer a package of HAZMAT for transport that displays markings that could be in conflict with the labels prescribed by the HMR. If your package contains HAZMAT that meets the definition of more than one hazard class, then label it with all applicable classes.

For international shipments, you can often use labels normally used for domestic shipments. However, several international organizations prescribe labeling requirements in addition to, or in place, of domestic labels.

No person may offer a package of HAZMAT for transport that displays markings that could be in conflict with the labels prescribed by the HMR

2. The labels required by the HMR that are normally used for domestic shipments may be used for international shipments in most cases
3. DOT Hazard warning labels must be placed on the same side of the package and near the proper shipping name.
4. DOT hazard warning label is required even if the material is not regulated by DOT as a hazardous material

Answer

1. No person may offer a package of HAZMAT for transport that displays markings that could be in conflict with the labels prescribed by the HMR
2. The labels required by the HMR that are normally used for domestic shipments may be used for international shipments in most cases
3. DOT Hazard warning labels must be placed on the same side of the package and near the proper shipping name.

Feedback:

Option 1: *This option is correct. The HMR instructs that no one may offer, and no carrier may transport, HAZMAT packages that display markings or labels that could be confused or in conflict with the required labels.*

Option 2: *This option is correct. The HMR's normal label requirements for domestic shipments may be used for international shipments in most cases.*

Option 3: *This option is correct. The HMR offers certain labeling exceptions, but it's still acceptable to affix labels to packages, provided they accurately represent the hazards of the HAZMAT in the package.*

Option 4: *This option is incorrect. The HMR includes certain sections that provide labeling exceptions and exemptions, which override the need to comply with labeling requirements.*

Question 3: Multiple Choice

Under which three circumstances can a hazard warning label be printed on or affixed to a tag instead of the surface of the package?

Options:

1. The package contains radioactive material
2. The label is larger than the package
3. The package surface prevents a label being attached
4. The package is a cylinder

Answer

2. The label is larger than the package
3. The package surface prevents a label being attached
4. The package is a cylinder

Feedback:

Option 1: *This option is incorrect. If a package contains radioactive material, the label cannot be printed or affixed to a tag instead of the package.*

Option 2: *This option is correct. According to the HMR, a label may be printed on or affixed to a tag instead of the surface of the package if the label is larger than the package.*

Option 3: *This option is correct. The HMR allows a company to print a label or affix it to a tag instead of the surface of the package when the package surface prevents a label from being affixed.*

Option 4:

Similar to ID numbers, packages with a capacity less than 1,000 gallons, or 3785 liters, are marked on two opposite sides or two ends other than the bottom, while packages with a capacity over or equal to 1,000 gallons, or 3785 liters, are marked on both sides and ends.

The same capacity rule applies when marking bulk packages with marine pollutants.

Other bulk packaging markings concern elevated temperature materials, which should be marked on two opposite sides with the word "HOT" in black or white gothic lettering on a contrasting background. If the ID number is displayed, then position the word "HOT" in the upper corner of the same white diamond-shaped display configuration in black letters. However, mark bulk packaging that contains molten aluminum or molten sulfur "MOLTEN ALUMINUM" or "MOLTEN SULFUR," respectively.

If your bulk packaging contains poison inhalation hazards, check if "Inhalation Hazard" appears on the labels or placards. If not, ensure the words "Inhalation Hazard" display on two opposite sides of the package. Similarly, any package containing material that meets the criteria of a poison inhalation hazard or toxic inhalation hazard requires an "Inhalation Hazard" marking – which is usually preprinted on the label.

Portable tanks and cargo tanks are bulk packages that also require additional marking guidelines. For portable tanks, mark the proper shipping name and the name of the owner on two opposite sides. Cargo tanks transporting Class 2 gases require the proper shipping name or an appropriate common name for the HAZMAT on both sides and ends.

Certain markings apply to both bulk and non-bulk packages. ID number markings positioned on the exterior of transport vehicles or freight containers indicate that bulk packages of HAZMAT are being carried. Similarly, they indicate that large quantities of a single type of HAZMAT are being carried in non-bulk packages. They also specify quantities of HAZMAT that are poisonous by inhalation in Zone A or B in non-bulk packages.

Using the correct markings communicates critical information about your HAZMAT packages and helps them reach their destinations safely.
Next, you can practice what you've learned by answering some questions.

7. Knowledge Check: Marking

- *identify the proper marking requirements for hazardous materials to include both bulk and non-bulk materials*

Question 1: Multiple Choice

What are three requirements for outer package markings?

Options:

1. They must be durable
2. They must be in English
3. They must be the same color as the container
4. They must be printed on or affixed to the package surface

Answer

1. They must be durable
2. They must be in English
4. They must be printed on or affixed to the package surface

Feedback:

Option 1: *This option is correct. According to the HMR, markings must adhere to certain design requirements, including durable.*

Option 2: *This option is correct. One HMR requirement for markings is that they're in English.*

Option 3: *This option is incorrect. The HMR requires marking designs to communicate effectively. This involves placing them on a background of a sharply contrasting color with no obscuring labels or other matter.*

Option 4: *This option is correct. HMR requirements for markings include that they're printed on or affixed to the package surface. Markings can also be printed on or affixed to a label, tag, or sign.*

Question 4: Multiple Choice

Which two statements about the marking of non-bulk materials are correct?

Options:

1. With two exceptions, every non-bulk package of hazardous material offered for transport must be marked with the name and address of the consignee or consignor
2. Arrows may be used to indicate the proper orientation of the package
3. A limited quantity package must have the words "Limited Quantity" marked on the package

Answer

1. With two exceptions, every non-bulk package of hazardous material offered for transport must be marked with the name and address of the consignee or consignor
2. Arrows may be used to indicate the proper orientation of the package

Feedback:

Option 1: *This option is correct. According to the HMR, every non-bulk package of HAZMAT offered for transport must have the name and address of the shipper or receiver, except packages transported by highway only that won't be transferred from one motor carrier to another, and packages that are part of a carload lot, truckload lot, or freight container load, where the entire contents of the railcar, truck, or freight container are shipped from one consignor to one consignee.*

Option 2: *This option is correct. The HMR allows orientation arrow markings to indicate the proper orientation of a package. Generally, they mark outer packages containing inner packagings with liquids to indicate the proper orientation of the package; however, exceptions do apply.*

Option 3: *This option is not correct. A limited quanitiy package must be marked with the Limited Quantity black and white square-on-point marking in accordance with the Code of Federal Regulations, Title 49, Section 173.156.*

Question 5: Multiple Choice

All bulk packages must display the ID number of the HAZMAT in the package, based on capacity.

If the capacity exceeds or equals 1,000 gallons – or 3,785 liters – how is the ID number displayed?

Options:

1. On one side only
2. On each side and each end
3. On two opposite sides
4. On an orange panel on any two sides

Answer

2. On each side and each end

Feedback:

Option 1: *This option is incorrect. The HMR prescribes that bulk packages with a capacity greater than or equal to 1,000 gallons (3,785 liters) should display the ID number marking on either side and end.*

Option 2: *This option is correct. The package capacity determines where the ID number should be placed. If the capacity equals or is greater than 1,000 gallons (3,785 liters) display the ID number on each side and each end.*

Option 3:

Consider a situation in which a vehicle transporting HAZMAT is involved in a collision. The placard fulfils a crucial purpose because it clearly communicates the hazard of the material being transported. To achieve this, ensure the required placards have no visual competition on the transport vehicle, portable tank, or freight container. Don't use any signs or devices with colors, shapes, contents, or designs that someone may confuse with a placard. Section 172.516(c) of the HMR elaborates further.

Placarding requirements have exceptions that apply to small or limited quantities; infectious substances; combustible liquids in non-bulk packaging; and materials prepared according to Section 173.13.

Certain conditions also apply to using placards. You may only place or display placards on a transport vehicle, portable tank, or freight container if the transported material is a HAZMAT, the placard represents the hazard of the material, and the placarding conforms to the regulations.

So, how do you determine which placards you need to use? *[A sample table titled "Table 1" displays. It is divided into several columns and rows. The column headers include Category of Material (Hazard class or division number and additional description, as appropriate), Placard name, and Placard design section reference (§).]* The HMR provides two placarding tables in Section 172.504(e) of the HMR – not to be confused with the Hazardous Materials Table in Section 172.101. *[The table titled "Hazardous Materials Table" displays again.]* HAZMAT classifications or divisions are assigned to either Table 1 or Table 2. You need to check each table to ensure you select the correct placard for the hazardous material you're shipping. We'll discuss each placarding table in more detail, starting with Table 1.

[The table titled "Table 1" displays again.] Placarding Table 1 is straightforward. Any quantity of any HAZMAT listed in Table 1 requires placarding. Materials in Table 1 for non-bulk packages are always placarded unless excepted from placarding by the HMR.

You'll notice that Table 1 indicates certain limitations in parentheses for Divisions 5.2 and 6.1 and Class 7. *[The entries 5.2 (Organic peroxide, Type B, Liquid or solid, temperature controlled), 6.1 (Material poisonous by inhalation (see § 171.8 of this subchapter)), and 7 (Radioactive Yellow III label only) under the column header Category of Material (Hazard class or division number and additional description, as appropriate) are highlighted.]* For example, the exception for Class 7 states "Radioactive Yellow III label only." Also, the footnote states that a placard is also required for exclusive-use shipments of low specific activity material and surface contaminated objects when shipped in accordance with Section 173.427.

Placarding Table 2 lists the remainder of the HAZMAT classes that require placards. Table 2 materials, with some exceptions, require placarding when in a bulk package, or when the total gross weight for HAZMAT in a non-bulk package on the transport vehicle or freight container is 1,001 pounds – or 454 kilograms – or more.

Let's say you have two or more hazard classes or divisions of Table 2 materials in the same load. This means you're allowed to use the "DANGEROUS" placard. Position it on both sides and ends of the transport vehicle, freight container, rail car, or unit load device. However, the "DANGEROUS" placard cannot be used when a total gross weight of 2,205 pounds – or 1,000 kilograms – or more of one category of material from Table 2 is loaded at a single facility. In that case, a separate placard must be used to represent that hazard. You also cannot use the "DANGEROUS" placard to substitute for any Table 1 materials.

Table 2 materials in non-bulk packages under 1,001 pounds – or 454 kilograms – gross weight are exempted from placarding if transported by highway or rail.
For HAZMAT in both tables, display placards on both sides and ends of the bulk package. Primary and subsidiary hazard placards must also be displayed on both sides and ends of a bulk package when it carries either a poison inhalation hazard or a dangerous when wet hazard. This also applies when the package carries a corrosive, but only with a radioactive primary hazard.

For bulk packages, placard and mark as required according to the hazard class or division number and additional description, as appropriate. For example, bulk packages carrying HAZMAT classified as Explosives 1.6 would use Table 2 and placard and mark as required. Unless the package placards are clearly visible from the exterior, transport vehicles, freight containers, rail cars, and unit load devices are always placarded.

In addition, each bulk packaging that needs to be placarded when it contains HAZMAT must remain placarded when it's empty if it hasn't been cleaned and purged or reloaded with either a nonregulated material or a HAZMAT requiring a different placard. This also applies to cargo tanks and portable tanks. A truly empty package contains no trace of HAZMAT, and all placards and ID numbers are removed, covered, or obliterated.

Some materials, such as those in Class 9, don't require placarding when transported in the US. Other materials may have specific placarding requirements. So, check the placarding requirements for subsidiary hazards – for example, "poison inhalation hazard," "dangerous when wet," or "corrosive" hazards.

Placarding is the joint responsibility of the shipper and carrier. Those who offer, load, and transport hazardous materials must comply with the placarding regulations. If a required placard is missing or damaged, no matter the reason, the shipment must not be transported.

Your responsibility as a shipper or carrier is to make sure the correct placards are offered or affixed before the shipment is transported. Since placarding is complex and crucial, you shouldn't rely solely on the information in this course. Use the HMR and refer to placarding Tables 1 and 2, as well as the exceptions in 172.504(f).

If you're a shipper, make sure you offer the required placards for the material before you ship hazardous materials. If you're a carrier, know what you're accepting for transportation. If the placards aren't correct, don't accept the shipment.

Remember, shipments that comply with the HMR make transportation of HAZMAT safer for everyone. And using placards correctly is paramount to achieving that safety.

Next, you can try some questions to practice what you've learned.

9. Knowledge Check: Placarding

- *identify the appropriate placarding requirements for the transport of hazardous materials*

Question 3: Multiple Choice

Table 2 materials packaged in non-bulk form require placarding when the total gross weight of all HAZMAT in the transport vehicle or freight container meets or exceeds what amount?

Options:

1. 101 lbs (46 kg) or more
2. 500 lbs (227 kg) or more
3. 1,001 lbs (454 kg) or more
4. Weight is not a factor

Answer

3. 1,001 lbs (454 kg) or more

Feedback:

Option 1: *This option is incorrect. Placarding isn't required for transport vehicles and freight containers transporting less than 1,001 pounds (454 kg) total gross weight of Table 2 non-bulk HAZMAT.*

Option 2: *This option is incorrect. According to the HMR, placarding isn't necessary for transport vehicles and freight containers transporting less than 1,001 pounds (454 kg) total gross weight of Table 2 non-bulk HAZMAT.*

Option 3: *This is the correct option. Table 2 materials require placarding only when the total gross weight of all HAZMAT on the transport vehicle or in the freight container is 1,001 lbs (454 kg) or more.*

Option 4: *This option is incorrect. Table 2 materials do require placarding when the total gross weight of HAZMAT in a transport vehicle or freight container is 1,001 lbs (454 kg) or more.*

Question 4: Multiple Choice

When can placarding be removed from a bulk container or transportation vehicle?

Options:

1. When the vehicle or container has been cleaned and purged, or reloaded with another HAZMAT or non-regulated material
2. After the HAZMAT has been removed
3. When a different HAZMAT is transported in the vehicle or container
4. Never

Answer

1. When the vehicle or container has been cleaned and purged, or reloaded with another HAZMAT or non-regulated material

Feedback:

Option 1: *This is the correct option. Placarding can be removed only when the container or vehicle has been cleaned or reloaded with either a non-regulated material or a hazardous material requiring a different placard. This also applies to cargo tanks and portable tanks.*

Option 2: *This option is incorrect. A company can remove placarding only if the container or vehicle has been cleaned or reloaded with either a non-regulated material or a HAZMAT requiring a different placard.*

Option 3: *This option is incorrect. The container or vehicle needs to be cleaned and purged or reloaded with either a non-regulated material or a hazardous material requiring a different placard before the placards can be removed..*

Option 4: *This option is incorrect. A company is allowed to remove placarding once the container or vehicle has been cleaned or reloaded with either a non-regulated material or a HAZMAT requiring a different placard.*

Hazardous Materials Regulations	Abbreviated as HMT, a key element and primary guide to offerors, carriers, and enforcement personnel in determining compliance with the regulations. For each entry, the table specifies the proper shipping name, hazard class or division, identification number, packing group, required hazard warning labels, packaging authorizations, per-package quantity limitations for passenger and cargo aircraft, and special provisions.
hazardous substance	A material which is listed in an Appendix to 49 CFR 172.101 and is in a quantity, in one package, which equals or exceeds the listed reportable quantity shown in the appendix.
hazardous waste	Any material that is subject to the Hazardous Waste Manifest Requirements of the Environmental Protection Agency (EPA) specified in 40 CFR Part 262.
HAZMAT	See hazardous material.
HMR	See Hazardous Materials Regulations.
HMT	See Hazardous Materials Table.
label	Prescribed hazard warning notice. Labels identify primary and subsidiary hazards specific to materials and may give information about handling precautions and prohibitions.
limited quantity	A special exception in the HMR that allows a non-specification packaging option.
marking	Provides required information on an outer package containing hazardous materials. Includes proper shipping name, identification number, shipper or receiver name and address, instructions, and cautions.
non-bulk packaging	Packaging with a maximum capacity less than 119 gallons (for liquids), a maximum net mass less than 882 pounds (solid) and a maximum capacity of 119 gallons or less as a receptacle for solids, and a water capacity less than 1,000 pounds (gas).
package	The packaging plus its hazardous content.
packaging	A receptacle and any other components or materials necessary to provide containment. 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. If the packaging contains HAZMAT, it becomes a package. A package contains hazardous contents; packagings do not.
packing group	The degree of danger within certain hazard classes. PG I presents the greatest danger, PG II presents medium danger, and PG III presents minor danger.
single packaging	Stand-alone packaging without the components, such as a single drum.

*[Topic title: HAZMAT Basic Description]*Shipping hazardous material – or HAZMAT – safely is no easy task. Even a minor incident involving HAZMAT being transported can have serious consequences for people and the environment. That's why the Hazardous Material Regulations, or HMR, set strict requirements for shipments of these materials to minimize the risks during transportation.

One important step in safely transporting HAZMAT is to ensure that properly prepared shipping papers accompany each shipment – unless the material qualifies for an exception. The HMR address the requirement for the shipment of HAZMAT in accordance with the Code of Federal Regulations, or CFR, title 49, Chapter I, Subchapter C with shipping papers specifically covered in Part 172, Subpart C – Shipping Papers.

But what exactly is a shipping paper? It's a document that provides critical hazard communication information that describes the HAZMAT being shipped, the hazards present, the quantity in the containers, and how to obtain more information, if necessary.

The regulations don't specify a special form to prepare for shipping HAZMAT. So, you can use any form or design that's appropriate to your organization as long as the shipping paper includes the minimum HMR required information, including shipping information is indicated accurately, presented in the correct sequence , and all shipping paper entries are legible and printed in English.

The information on the shipping paper is essential for emergency personnel to determine the type of hazardous cargo, and to prevent further damage or an environmental catastrophe in the event of an incident, like a spill or an accident. So, it's crucial that shipping papers are filled out accurately.

Shipping papers are subject to the requirements of 49 CFR, Parts 172, Subpart C and Part 177, Subpart A – unless otherwise indicated. And according to 49 CFR 177.817, the first carrier of a HAZMAT shipment may not accept the materials if there's no properly completed shipping certification included with the shipping papers. This certification is a statement used to declare that the material being offered for transportation complies with the relevant shipping regulations. An example of a certification must read: "This is to certify that the herein-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation."

Several requirements and exemptions are stipulated in 49 CFR 172.203 that apply to the shipping papers for all shipments via rail and air only. For example, when a motor carrier offers a freight container or transport vehicle to a rail carrier, the shipping paper must include the reporting mark and number when displayed on the rail car, freight container, transport vehicle, or portable tank.

However, there are also some situations where shipper certification isn't required. For instance, it's not required for the return of an empty rail tank that previously contained a hazardous material that has not yet been cleaned or purged. But note that shipping papers are still required.
A shipper's certification is also not required for hazardous materials offered for transportation by motor vehicle and transported in a cargo tank supplied by the carrier, or by the shipper as a private carrier, except for a hazardous material that is to be reshipped or transferred from one carrier to another. This does not apply to the transportation of hazardous waste, which always requires a shipping certification.

Now, as already mentioned, it's essential that you fill the shipping paper out accurately and completely. When filling out a shipping paper, you always start with providing a proper basic description of the HAZMAT, which is the core element of the shipping paper for the hazardous material to be shipped.

All the information you need to do this is in the Hazardous Materials Table, or HMT, which lists the materials considered hazardous for the purpose of transportation. You can find this table in 49 CFR 172.101 and use it to find the entry that most closely describes the material you're shipping.

Every shipping paper that accompanies a HAZMAT shipment must include four components: the identification number, the shipping name, the hazard class or division, and the packing group (if assigned). And it's vital that they are in this specific order. The mnemonic "ISHP" is helpful to remember the sequence of the items.

Let's examine each component of the basic description, in order, starting with the identification number. You'll find this listed in column 4 of the HMT. The identification number must be preceded by the letters "UN" – short for United Nations – or "NA" – short for North America. For example, UN1263 is the number used to identify the proper shipping name "Paint."

The second component is the proper shipping name, which you'll find in column 2. For example, "Paint" is the proper shipping name indicated in column 2, and is followed by the words lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler, and liquid lacquer base in italics. These additional words in italics can be used to further define the shipping description but they are not required to be marked on your shipping paper.

Next, as the third component, add the hazard classes or divisions, including any subsidiaries. You can find this information in column 3. The hazard class for paint, for instance, is 3. Except for combustible liquids, the relevant subsidiary hazard class or division number must be entered in parentheses immediately following the primary hazard class or division number. If a material has one or more subsidiary hazards, column 6 will show this. No other information may be placed between the hazard class or division number.

Once you've entered the identification number, shipping name, and hazard class or division, you're ready to add the fourth component: the packing group. If a packing group is assigned, you'll see it in column 5, designated in Roman numerals. So, for example, the Roman numeral I represents a value of one. You may use the prefix "PG," but this is not a requirement.

Not all hazardous materials are required to have a packing group entry on their shipping papers. Examples are Class 1 (explosive) materials; self-reactive substances; batteries, division 5.2 materials; and entries that aren't assigned a packing group – like Class 7. So, when you prepare the papers for these, their basic description will only have the first three components.

Sometimes the shipping paper's basic description requires additional information to be added, which is designated in columns 1 and 7 of the HMT. For example, if you see the letter "G" in column 1, this symbol means the proper shipping name must be further identified to describe the primary components or technical names of the material. And if column 7 indicates special provisions by alphanumeric codes for a hazardous material, you should review their meaning and determine if additional requirements or exceptions apply to what you're shipping. The specific requirements or definitions of the special provision codes are defined in 49 CFR 172.102.

Question

Every shipping paper that accompanies a HAZMAT shipment must include a basic shipping description that is comprised of four components in a specific order.

Drag each component of the basic description in the order in which it should appear on the shipping paper.

Options:

A. Identification number
B. Proper shipping name
C. Hazard classes or divisions
D. Packing group

Targets:

Answer

The first component on the shipping paper is the identification number as designated in column 4 of the HMT. It must be preceded by the letters "UN" or "NA."

The second component is the proper shipping name as indicated in column 2 of the HMT.

The third component is a list of the hazard classes or divisions, including any subsidiaries, which are indicated in column 3 of the HMT.

The fourth component is the packing group as designated in column 5 of the HMT.

Question 2: Interactive

Question

It's crucial that the shipping papers for a HAZMAT shipment identify and describe the materials correctly.

Select the statement that describes the purpose of the HAZMAT Precedence Table.

Options:

1. To determine the primary hazard class group for a material meeting more than one hazard class or division
2. To alphabetically order the chemical components of different types of HAZMAT
3. To determine if a material poses a toxic inhalation hazard

Answer

This is the correct option. You use the HAZMAT Precedence Table from section 173.2a of the Hazardous Materials Regulations, or HMR, to determine the primary hazard class for a material that meets the defining criteria of more than one hazard class or division.

This is an incorrect option. The hazards are listed in descending order of primary hazard class and packing group in the HAZMAT Precedence Table.

This is an incorrect option. Although it's important to know if a material poses a toxic inhalation hazard, the HAZMAT Precedence Table designates the primary hazard class and packing group for a material rather than its toxicity.

Correct answer(s):

Option 1

Question 3: Interactive

Question

hazards that gases and liquids that are poisonous by inhalation can be assigned to – immediately after the shipping description.

One more description is the word "HOT" when a liquid material in a package meets the definition for an elevated temperature material, and it's not disclosed by the words "Molten" or "Elevated temperature." You'll need to enter the word "HOT" immediately in front of the proper shipping name of the material on the shipping paper.

When shipping a Division 4.1 (self-reactive) material or a Division 5.2 (organic peroxide) material, additional description requirements may apply. First, if notification or competent authority approval is required, the shipping paper must contain a statement of approval of the classification and conditions of transport. Second, if the material requires temperature control during transport, the control and emergency temperatures must be included on the shipping paper. Third, the word "SAMPLE" must be included in association with the basic description when samples of Division 4.1 or Division 5.2 materials are offered for transportation.

The description for a shipment of a Class 7 (radioactive) material is quite involved, due to the precautions required to safeguard against the unique hazards of these types of materials. The description must include additional descriptive entries, which you can find in the HMR, as appropriate for the specific radioactive material.

Now, while a hazardous material and a nonhazardous material may be described on the same shipping paper, hazardous materials must stand out from nonhazardous materials.

Let's now examine the methods used for marking the shipping paper containing a mixed shipment. Three methods can be used to do this. One method is to enter the description of the hazardous materials first on the shipping paper. A second method to ensure that it's easily recognizable, is to enter the hazardous material in a contrasting color. A third approach is to identify the hazardous material by putting an "X" or the letters "RQ" before the proper shipping name in the column with the header "HM".

In addition to the basic description, the shipping paper must also show the total quantity of the hazardous material being transported, except if transported by air. You may enter the quantity either by mass or volume, or by activity for Class 7 materials. Something else that must be included is a unit of measurement – for example, kilograms, pounds, liters, gallons, or becquerels and curies as relevant.

For Class 1, explosive materials, the quantity must be the net explosive mass. For an explosive that's an article, such as cartridges or small arms, the net explosive mass may be expressed in terms of the net mass of either the article or the explosive materials contained therein.

There are some exceptions, though. You don't need to specify the total quantity by mass or volume for bulk packages, provided that some indication of the total quantity is shown – for example, indicating the number and type of package like "1 cargo tank" or "2 intermediate bulk containers." Cylinders are also exempt, as long as some indication of the total quantity has been given – for example, it can just indicate "10 cylinders." A third exception is for packages containing only residue of hazardous material.

Describing HAZMAT shipments on the shipping paper correctly is essential to preparing them for safe transportation.

6. Knowledge Check: Shipping Paper Descriptions

- *recognize the additional descriptions that are required on a shipping paper in a given scenario*
- *identify methods used for marking shipping papers containing a mixed shipment*

Question 1: Interactive

Question

Depending on the material being transported, you may be required to provide additional information and descriptions on a shipping paper as part of the HAZMAT's basic description.

Select the additional information that must be added to the basic description for a shipment made under a special permit.

Options:

1. DOT-SP
2. Poison-Inhalation or Toxic-Inhalation Hazard
3. Reportable Quantity
4. Limited Quantity
5. Residue: Last Contained
6. HOT

Answer

This option is correct. If a shipment is made under a special permit, it must bear the notation "DOT-SP," followed by the special permit number assigned.

This option is incorrect. Material shipped under a special permit must be designated as DOT-SP. You add "Poison-Inhalation Hazard" or "Toxic-Inhalation Hazard" to the basic information if it meets the poisonous or toxic-by-inhalation criteria.

This option is incorrect. For hazardous waste shipments, "RQ" – which stands for Reportable Quantity – must be entered on the shipping paper. It can be entered before or after the basic description, but it is not used to designate material shipped under a

- *recognize requirements for providing emergency response information*

[Topic title: Emergency Response] In the event of an emergency involving hazardous material, time is of the essence. It's essential that responders have access to important information to help them respond appropriately to the scene, which can make the difference between life and death. That's why the Hazardous Material Regulations, or HMR, has requirements for providing emergency response information.

The first requirement is that an emergency response phone number must be provided so that, if any type of accident or HAZMAT incident occurs, responders know who to call.

The emergency phone number is also an essential source of information on the HAZMAT being transported. So, a second requirement is that the emergency number must be monitored at all times while the HAZMAT is in transport, including during temporary storage.

Additionally, the contact person must be able to provide emergency response and incident mitigation information immediately upon request. If the person answering the call is not knowledgeable about the hazardous material being shipped, they must have immediate access to someone who is. A voicemail box does not meet these requirements.

The emergency response number must be entered on the shipping paper after the shipping description of the hazardous material, or in a clearly visible place that's easily identified – for example, "EMERGENCY CONTACT," followed by the number.

The number can be placed in one location on the shipping paper if it applies to all the hazardous materials described. But if different emergency numbers are needed for individual descriptions, the correct emergency response number must be entered on the paper after each hazardous material description.

The emergency response telephone number can be of the person offering the shipment, as long as that person monitors it as required. It may also be the contact details of an outside agency or organization. In that case, the person offering the shipment must ensure the agency has the most current information on the material and accepts responsibility for providing this information in an emergency. Many agencies provide this service for a fee.

The HMR also requires that shipments of hazardous material contain emergency response information. Emergency response personnel can use this information on the necessary immediate precautions and actions to take in the event of a spill or a leak, for example.

This information must be available for use, in English, and must be separate from the package of hazardous material. It can be provided on the shipping paper; in a safety data sheet, or SDS, along with the shipping paper; or it can be in a separate document, like an Emergency Response Guidebook.

Easy access to emergency response information is vital for the quick identification of HAZMAT and is essential so early responders can protect themselves and the public when handling any HAZMAT incidents.

8. Video: Uniform Hazardous Waste Manifest (sh_ehshsf_f60_enus_08)

- *determine when a uniform hazardous waste manifest is required*
- *identify the information required to be marked on the uniform hazardous waste manifest*

[Topic title: Uniform Hazardous Waste Manifest] Most shipments of hazardous waste require a specific shipping paper called the Uniform Hazardous Waste Manifest to accompany shipments of hazardous waste that are shipped off-site. This shipping paper is intended to meet both U.S. Environmental Protection Agency, or EPA, and Department of Transportation, or DOT, requirements for shipping hazardous waste. The transporter of the waste is required to maintain this shipping paper during the course of transportation and deliver it, with the waste, to the designated receiving facility.

A uniform hazardous waste manifest is necessary when hazardous wastes are shipped from a generating facility to a treatment, storage, or disposal facility. Both EPA-defined small and large quantity generators of hazardous waste are required to use a uniform hazardous waste manifest (EPA Form 8700-22, and if necessary, EPA Form 8700-22A) as the shipping paper when hazardous wastes are shipped from the generating facility. Note, that some states may also require very small quantity generators to use a uniform hazardous waste manifest.

Question

In the case of an emergency involving hazardous material, a quick, efficient response is vital.

Select the three requirements that apply to emergency response information that will enable a quick response.

Options:

1. An emergency response phone number is required on the shipping papers for all HAZMAT shipments
2. The emergency number must be monitored at all times while the HAZMAT is in transportation
3. The contact person must be capable of providing emergency response and incident mitigation information immediately upon request
4. For mixed hazardous material shipments that require multiple emergency numbers, all the numbers should be listed at the top of the shipping papers
5. An answering service, answering machine, or beeper can be used after hours

Answer

This option is correct. For HAZMAT shipments, emergency response information and an emergency response phone number are required. The emergency response number must be entered on the shipping paper after the shipping description of the hazardous material, or in a clearly visible place that's easily identified.

This option is correct. The emergency number must be monitored at all times while the HAZMAT is in transport, including during storage incidental to transportation. The person offering the shipment can do the monitoring or it can be done by an outside agency or organization.

The person monitoring the emergency number needs to be knowledgeable and have up-to date- information so they can provide emergency response and incident mitigation information immediately upon request. If an outside agency is used, the person offering the shipment must ensure the agency has the most current information on the material and that it accepts responsibility.

This is an incorrect option. All the numbers should be not listed at the top of the shipping papers. If different emergency numbers are needed for individual descriptions, the correct emergency response numbers must be entered immediately after the corresponding shipping descriptions.

This is an incorrect option. An answering service, answering machine, or beeper cannot be used for the emergency response. Even if it is after hours, a knowledgeable person must be available to answer the phone.

Correct answer(s):

Option 1
Option 2
Option 3

Question 2: Interactive

Question

Most shipments of hazardous waste require a specific shipping paper, called the Uniform Hazardous Waste Manifest.

Select the statement that best describes when a Uniform Hazardous Waste Manifest is required.

Options:

1. When hazardous wastes are shipped from a generating facility
2. When requesting to obtain an EPA identification number
3. When the number and types of waste containers are unknown

Answer

This is the correct option. A Uniform Hazardous Waste Manifest is necessary when hazardous wastes are shipped from a generating facility to a treatment, storage, or disposal facility. Both EPA-defined small and large quantity generators of hazardous waste are required to use a Uniform Hazardous Waste Manifest (EPA Form 8700-22, and if necessary, EPA Form 8700-22A) as the shipping paper.

This is option is incorrect. A Uniform Hazardous Waste Manifest is used when hazardous wastes are shipped from a generating facility to a treatment, storage, or disposal facility. Information is entered on the manifest about the generator, transporter(s), and

Question 4: Interactive

Question

Most shipments of hazardous waste require a uniform hazardous waste manifest to accompany the shipments.

Select three of the types of information that must be marked on the uniform hazardous waste manifest.

Options:

1. Special handling instructions and additional information
2. Signatures of the authorized person from the generator, transporter(s), and designated receiving facility
3. Discrepancies between waste described and waste received, if relevant
4. A copy of the carrier's Commercial Driver's License
5. E-mail address of the person receiving hazardous waste

Answer

This option is correct. Special instructions necessary for the proper management or tracking of the materials under the generator's or other handler's business processes, such as waste profile numbers, container codes, bar codes, or response guide numbers can be added. Additional descriptive information about shipped materials, like chemical names, and constituent percentages can also be included.

This option is correct. The signatures of the authorized person from the generator, transporter(s), and the designated receiving facility must be added to the manifest. The generator must read, sign, and date the waste minimization certification statement. The Generator's Certification also contains the required attestation that the shipment has been properly prepared and is in proper condition for transportation (the shipper's certification). When a party other than the generator prepares the shipment for transportation, this party may also sign the shipper's certification statement as the offeror of the shipment.

This option is correct. Any discrepancies between the waste described on the manifest and the waste actually received at the facility should be noted. Manifest discrepancies include significant differences between the quantity or type of hazardous waste described and the quantity and type of hazardous waste a facility actually receives. Also included are rejected wastes, which may be a full or partial shipment of hazardous waste that the facility cannot accept. Discrepancies also include container residues, which are residues that exceed the quantity limits for "empty" containers.

This option is incorrect. A copy of the carrier's Commercial Driver's License is not required to be added to the uniform hazardous waste manifest. The manifest does require information about the transporters of the waste, including their EPA identification numbers.

This option is incorrect. The e-mail address of the person receiving hazardous waste is not required to be added to the uniform hazardous waste manifest. The manifest does include information about the designated receiving facility and the signature of the authorized person receiving the waste.

Correct answer(s):

Option 1
Option 2
Option 3

Course HTML Resources

- Glossary: DOT 3: Shipping Papers

Term	Explanation
basic description	Identification number, proper shipping name, hazard class or division, and packing group of hazardous materials that must appear in a particular order in shipping papers.
Department of Transportation	Abbreviated as DOT, the federal authority in the United States responsible for providing the public with a safe, efficient, and accessible transportation system.
DOT	See Department of Transportation.
emergency response information	Information about hazardous materials and the necessary immediate precautions and actions to take in the event of a spill or leak.
hazardous material	See HAZMAT.
Hazardous Materials	See HMR.

DOT 4: Loading and Storage

This course introduces the requirements of the Department of Transportation's Hazardous Materials Regulations, including the interpretation of the segregation table, general guidelines for shipping papers and loading and unloading HAZMAT, and incident reporting requirements. The proper identification, preparation, and transportation of hazardous materials affect everyone's safety. This training course may be used to meet the requirements for general awareness or familiarization training. Your employer will provide additional function-specific training.

This course was developed with subject matter support provided by EnSafe Inc., a global professional services company focusing on engineering, environment, health and safety, and information technology. Please note, the course materials and content were current with the laws and regulations at the time of the last expert review, however, they may not reflect the most current legal developments. Nothing herein, or in the course materials, shall be construed as professional advice as to any particular situation with respect to compliance with legal statutes or requirements.

Table of Contents

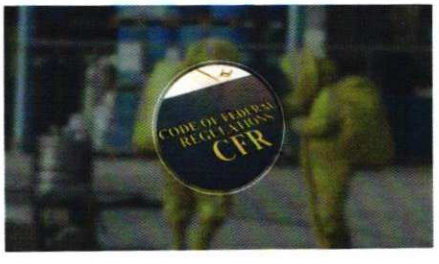
1. Video: DOT 4: Loading and Storage (sh_ehshsf_d34_enus_01)

No Objectives

[Course title: DOT 4: Loading and Storage.] Each year, more than 2.7 billion tons of hazardous materials valued at $3.1 trillion are transported by air, land, and water. Although these materials and the amount of activity involved in shipping them pose significant risks, safe delivery occurs 99.9994% of the time. This significant rate of safe delivery is made possible by the strict safety regulations put in place by the Department of Transportation's Pipeline and Hazardous Materials Safety Administration, or PHMSA, to which shipping operations must adhere. The safe shipping of hazardous materials, or HAZMAT, is mandated by PHMSA and adds about three cents per ton of material shipped.

In this course, you'll learn about segregating HAZMAT according to the segregation table, guidelines for shipping papers, and requirements for loading and unloading HAZMAT and toxic materials. You'll also learn about emergency response actions and requirements pertaining to incident reporting.

2. Video: Segregation Table (sh_ehshsf_d34_enus_02)



This option is incorrect. You can find the segregation table in 49 CFR 177.848(d). It applies to all hazard classes and divisions, and indicates which HAZMAT may be loaded and stored together for carriage by road.

Question 2: Multiple Choice

The segregation table contains a series of Xs and Os.

What does an X in the cell where a row and a column intersect mean?

Options:

1. The two materials may not be loaded, transported on the same vehicle, or stored together
2. The two materials are permitted to be loaded and transported on the same vehicle, or stored together
3. The two materials may be loaded, transported on the same vehicle, or stored together as long as a separation is maintained
4. The two materials may not be stored together, but they can be transported on the same vehicle

Answer

1. The two materials may not be loaded, transported on the same vehicle, or stored together

Feedback:

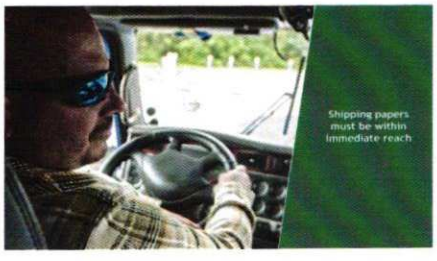
Option 1: *This option is correct. An X in the cell where a row and a column intersect means the two materials may not be loaded, transported on the same vehicle, or stored together.*

Option 2: *This option is incorrect. Wherever a row and a column intersect at a blank cell, no restrictions apply; which means the relevant materials may be loaded, transported, or stored together.*

Option 3: *This option is incorrect. An O in the segregation table represents two materials that may be loaded, transported on the same vehicle, or stored together as long as a separation is maintained.*

Option 4: *This option is incorrect. An X in the cell where a row and a column intersect means the two materials may not be loaded, transported, or stored together.*

4. Video: Shipping Papers (sh_ehshsf_d34_enus_03)



- *identify guidelines for shipping papers*

[Topic title: Shipping Papers.] Shipping hazardous materials, or HAZMAT, requires some paperwork to be filled out – known as shipping papers.

Shipping papers must be kept readily available and stored in the driver's door pouch in case of an incident or inspection by enforcement personnel.

If you're driving, shipping papers must be within your immediate reach whenever you're at the vehicle's controls. And if you're not in the driver's seat, they need to be readily visible to any person entering the driver's compartment.

Shipping papers are subject to the requirements of the Code of Federal Regulations, CFR, title 49 – section 177 – unless otherwise indicated. According to subchapter 817 of this section, 49 CFR 177.817, the first carrier of a HAZMAT shipment may not accept the materials without a properly completed shipper's certification included with the shipping papers.

This certification is a statement used to declare that the material being offered for transportation complies with the relevant shipping regulations. An example of a certification could read: "This is to certify that the herein-named materials are properly classified, described,

Which two statements about storing shipping papers are true?

Options:

1. When the driver is not at the motor vehicle controls, the shipping papers should be on the driver's seat or in a holder mounted on the inside of the driver's door
2. When the driver is at the motor vehicle's controls, the shipping papers must be stored in the compartment with the hazardous materials
3. The shipping papers must be readily visible to a person entering the driver's compartment

Answer

1. When the driver is not at the motor vehicle controls, the shipping papers should be on the driver's seat or in a holder mounted on the inside of the driver's door
3. The shipping papers must be readily visible to a person entering the driver's compartment

Feedback:

Option 1: *This option is correct. If an incident occurs, enforcement personnel will first check the driver's seat or a holder mounted on the inside of the driver's door.*

Option 2: *This option is incorrect. When the driver is at the motor vehicle's controls, the shipping papers should be within the driver's immediate reach.*

Option 3: *This option is correct. Shipping papers must be kept readily available in case of an incident or inspection.*

Question 2: Multiple Choice

Which three statements about loading and unloading packages labeled "Toxic," "Poison," or "Poison Inhalation Hazard" are true?

Options:

1. They aren't permitted in the driver's compartment or sleeper berth
2. They may be transported in the same vehicle as foodstuffs if overpacked in a metal drum
3. Special controls must be in place before the HAZMAT may be transported in the same vehicle as edible material
4. They may be transported in the same vehicle as foodstuffs if one or the other is in a closed unit load device

Answer

1. They aren't permitted in the driver's compartment or sleeper berth
2. They may be transported in the same vehicle as foodstuffs if overpacked in a metal drum
3. Special controls must be in place before the HAZMAT may be transported in the same vehicle as edible material

Feedback:

Option 1: *This option is correct. Packages labeled "Toxic," "Poison," or "Poison Inhalation Hazard" aren't permitted in the driver's compartment or sleeper berth.*

Option 2: *This option is correct. Packages labeled "Toxic," "Poison," or "Poison Inhalation Hazard" may be transported in the same vehicle as foodstuffs if overpacked in a metal drum, as per the regulations.*

Option 3: *This option is correct. There need to be special controls in place before packages labeled "Toxic," "Poison," or "Poison Inhalation Hazard" may be transported in the same vehicle as edible materials.*

Option 4: *This option is incorrect. Packages labeled "Toxic," "Poison," or "Poison Inhalation Hazard" may only be transported in the same vehicle as foodstuffs if both are in separate closed unit load devices.*

Yellow-bordered pages provide an indexed list of dangerous goods in numerical order of identification number. *[Page 26 and Page 27 of the ERG display. Page 27 is divided into two parts. Each part consists of three columns. The column headers are ID No., Guide No., and Name of Material.]* These pages help to identify the guide to be consulted based on the identification number of the material involved. The list displays the four-digit identification number of the material, *[In Page 27, the entry Identification number 1001 under the column header ID No. is highlighted.]* followed by its assigned emergency response guide and material name. *[In Page 27, the entry Guide number 116 under the column header Guide No. is highlighted.]*

Blue-bordered pages provide an indexed list of dangerous goods in alphabetical order of material name. *[Page 92 and Page 93 of the ERG display. Page 93 is divided into two parts. Each part consists of three columns. The column headers are Name of Material, ID No., and Guide No.]* This section outlines the guide to be consulted based on the name of the material involved. The name of each material is listed, *[In Page 93, Acetal under the column header Name of Material is highlighted.]* followed by its assigned emergency response guide and four-digit identification number. *[In Page 93, the entry Guide number 127 under the column header Guide No. and the entry Identification number 1088 under the column header ID No. are highlighted.]*

A section of pages with orange borders contains safety recommendations in 62 individual guides, *[Page 159 and Page 160 of the ERG display.]* with safety-related information on the left page and details on the emergency response, fire, spills, and first aid on the right. *[Page 161 of the ERG displays.]* Each guide is intended to cover a group of materials with similar chemical and toxicological characteristics. *[The page header, MIXED LOAD/UNIDENTIFIED CARGO of Page 160 is highlighted.]*

Finally, a section consisting of green-bordered pages cites three tables. *[Page 294 and Page 296 of the ERG display. Page 296 shows TABLE 1 titled "INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES". The table consists of several rows and columns.]* Table 1 lists, in order of identification number, the chemicals that are toxic by inhalation. This includes chemical warfare agents and chemicals that produce toxic gases when brought in contact with water. *[The column header First ISOLATE in all Directions is highlighted.]* The table also outlines initial isolation distances in all directions and downwind protection distances for small (55 gallons or less) and large spills.

[Page 347 of the ERG displays. It shows TABLE 2 titled "WATER-REACTIVE MATERIALS WHICH PRODUCE TOXIC GASES". The information in this table is organized into four columns. The column headers are ID No., Guide No., Name of Material, and TIH Gas(es) Produced.] Table 2, in order of identification number, lists materials that produce large amounts of toxic inhalation gases when spilled in water.

[Page 356 of the ERG displays. It shows TABLE 3 titled "INITIAL ISOLATION AND PROTECTIVE ACTION DISTANCES FOR LARGE SPILLS FOR DIFFERENT QUANTITIES OF SIX COMMON TIH PIH in the US GASES". The table consists of several rows and columns. The column header First ISOLATE in all Directions and the enteries under it corresponding to the row headers Rail tank car, Highway tank truck or trailer, and Multiple small cylinders or single ton cylinder are highlighted. Later, the table title is also highlighted.] And table 3 lists initial isolation and protective action distances for toxic inhalation hazard materials that may commonly be encountered. These materials include anhydrous ammonia, chlorine, ethylene oxide, hydrogen chloride and hydrogen chloride refrigerated liquid, hydrogen fluoride, and sulfur dioxide.

If you're transporting hazardous materials and the vehicle becomes disabled, everything possible must be done to guard and protect the load. So in the event of a vehicle breakdown, the first priority is to move the vehicle to a place where the hazardous materials are protected.

If a container or package starts leaking during transport, you should repair it only if it's possible to do so according to the best safety practices. If repair isn't feasible, the package should be placed in a salvage drum for further transportation.

If a leaking cargo tank makes further transportation unsafe, you should pull off the road, away from the flow of traffic, and contain the material as viably as possible, including making sure to eliminate all sources of ignition. This all is done to ensure streams and sewers don't get contaminated.

Knowing how to respond in an emergency is crucial when transporting hazardous material.

Now, let's pause here to answer a practice question.

8. Knowledge Check: Emergency Response

- *identify actions to take during an emergency response*

Question 1: Multiple Choice

Which three actions describe what you should do in response to emergencies?

Options:

1. If a truck carrying hazardous materials breaks down, move it to a location where the load is protected
2. If a container starts to leak during transport, making the load unsafe to travel with, move the truck off the road and contain the leak, if you can do so according to best and safest practices
3. If a leaking cargo tank makes further transportation unsafe, pull off the road away from traffic and contain the material to eliminate sources of ignition
4.

reported.

Immediate notification also applies if the flight pattern or routine of an aircraft is altered, if the general public is evacuated for one or more hours, or one or more major transportation arteries or facilities are closed or shut down for one or more hours.

Immediate notification is also required when specific reportable incidents occur. For instance, if you're transporting HAZMAT by aircraft, you must notify the NRC immediately if a fire, violent rupture, explosion, or dangerous evolution of heat occurs as a direct result of a battery or battery-powered device. A dangerous evolution of heat is an amount of heat sufficient to be dangerous to packaging or personal safety to include charring of packaging, melting of packaging, scorching of packaging, or other evidence.

This also applies if a fire, breakage, spillage, or suspected radioactive contamination involving either a radioactive material or an infectious substance other than a regulated medical waste occurs.

More examples include the release of a marine pollutant in excess of 119 gallons, or 450 liters, for a liquid, or 882 pounds, or 400 kg, for a solid, or any situation judged by the possessor of a hazardous material as one that should be reported to the NRC – for example, if a continuing danger to life exists at the scene.

Bear in mind that for incidents requiring immediate reporting, each person – including shippers and carriers – in physical possession of a hazardous material at the time of the incident must submit a hazardous materials incident report on DOT Form F 5800.1 within 30 days of the discovery of the incident. *[A report titled "Hazardous Materials Incident Report" displays.]*

A copy of the report must be retained for two years at the person's place of business.

Other situations that require written incident reports also exist. For an incident involving transportation by aircraft, a report must be submitted electronically in writing to the Federal Aviation Administration, or FAA, Security Field Office nearest to the location of the incident.

Under certain circumstances, the report must be updated within one year of the date of the incident. An example of this is if a death results from injury caused by a hazardous material or if there was a misidentification of the hazardous material or package information on a prior incident report.

Another condition is if damage, loss, or a related cost that was unknown when the initial incident report was filed becomes known, or in cases where damage, loss, or a related cost changes by $25,000 or more, or 10% of the prior total estimate – whichever is greater.

Reporting requirements are subject to specific exceptions. Incident reporting requirements do not apply to releases of a minimal amount – a pint or less – of material in certain cases. Another condition for exemption is if one or more transportation arteries or facilities are closed or shut down for 30 minutes or less.

Another case would be if releases of materials from vents are authorized, provided these releases do not result in property damage or trigger any of the CFR 171.15 telephonic notification requirements.

Other examples of exceptions include releases resulting from routine operation of a seal, pump, compressor, or valve, and releases from the connection or disconnection of loading or unloading lines – provided the release doesn't result in property damage.

Unless a telephone report is required under 49 CFR 171.15, you're not required to report a release of a hazardous material if the shipment is not offered for transportation or transported by air, nor if it's not considered hazardous waste.

This exception also applies if the material is properly classed as a Limited Quantity Materials packaged under authorized exceptions in the Hazmat table (excluding Class 7), or if it's of a class or division 3, 4, 5, 6.1, 8, or 9 in Packing Group III.

Another exception is if the material is released from a package which has a capacity of less than 5.2 gallons, or 20 liters, for liquids, or less than 66 pounds, or 30 kilograms, for solids. And if the total amount of material released is less than 5.2 gallons (20 liters) for liquids or 66 pounds (30 kilograms) for solids, the same exception applies.

For this exception to apply, the material must not be a hazardous waste or meet the definition of an undeclared hazardous material under CFR 171.8.

It's essential to know which incidents involving hazardous material require immediate notification and how to go about reporting them.

Now pause here to answer a few practice questions.

10. Knowledge Check: Incident Reporting

- *identify situations which do and do not require immediate notification*

Question 1: Multiple Choice

Which three incidents require immediate notification, including an incident report?

Options:

1. When the release is the result of materials for which venting is authorized
2.

- Glossary: DOT 4: Loading and Storage

Term	Explanation
bulk packaging	A form of packaging that has no intermediate form of containment. A vessel or barge is not a bulk packaging, but a transport vehicle or freight container is. Bulk packaging has (1) a maximum capacity greater than 119 gallons (450 liters) as a receptacle for a liquid; (2) a maximum net mass greater than 882 pounds (400 kg) and a maximum capacity greater than 119 gallons (450 liters) as a receptacle for a solid; or (3) a water capacity greater than 1,000 pounds (454 kg) as a receptacle for a gas as defined in §173.115.
compatibility table	A reference table in 49 CFR 177.848 used to determine compatibility of one Class of material and another Class of material.
exception	A statement in the HMR allowing relief from some or all of the requirements in the HMR.
hazardous material	See HAZMAT.
Hazardous Materials Regulations	See HMR.
hazardous substance	A material listed in Appendix A to 49 CFR 172.101 in a quantity, in one package, which equals or exceeds the listed reportable quantity shown in the appendix.
hazardous waste	Any material subject to the Hazardous Waste Manifest Requirements of the Environmental Protection Agency (EPA) specified in 40 CFR Part 262.
HAZMAT	Abbreviation for hazardous material, a substance or material that has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce. The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials as defined in 49 CFR 171.8, materials designated as hazardous under the provisions of 49 CFR 172.101, and materials that meet the defining criteria for hazard classes and divisions in part 173 of the HMR.
HAZMAT table	See HMT.
HMR	Abbreviation for Hazardous Materials Regulations, regulations that identify hazard characteristics that may make the substance or material a hazardous material.
HMT	Abbreviation for HAZMAT table, a key element and primary guide to offerors, carriers, and enforcement personnel in determining compliance with the regulations. For each entry, the table specifies the proper shipping name, hazard class or division, identification number, packing group, required hazard warning labels, packaging authorizations, per-package quantity limitations for passenger and cargo aircraft, and special provisions.
label	A prescribed hazard warning notice. Labels identify primary and subsidiary hazards specific to materials and may give information about handling precautions and prohibitions.
limited quantity	A special exception in the HMR that permits relief from some shipping requirements.
marking	Information on an outer package containing hazardous materials, including proper shipping name, identification number, shipper and receiver name and address, instructions, and cautions if applicable.
nonbulk packaging	A packaging with a maximum capacity less than 119 gallons for liquids, a maximum net mass less than 882 pounds and a maximum capacity of 119 gallons or less as a receptacle for solids, and a water capacity less than 1,000 pounds for gas.
package	The packaging plus its hazardous content.
packaging	A receptacle and any other components or materials necessary to provide containment. Packaging includes fiberboard boxes, drums, jerricans, portable tanks, cargo tanks, tank cars, multi-unit tank car tanks, and containers other than freight containers and overpacks. If the box, drum, or other means of containment contains HAZMAT, it becomes a package. A package contains hazardous contents, while packaging does not.
packing group	A set of numbers that reflects the degree of danger within certain hazard classes. PG I indicates the greatest danger, PG II is medium danger, and PG III is minor danger.
special permit	A document that authorizes a person to perform a function not otherwise authorized under the HMR.

For HAZMAT transported by aircraft, if a fire, violent rupture, explosion, or dangerous evolution of heat occurs as a direct result of a battery or battery-powered device

3. Any situation judged by the possessor of a hazardous material as posing a continuing danger to life
4. If a fire, breakage, spillage, or suspected radioactive contamination occurs involving an infectious substance other than regulated medical waste

Answer

2. For HAZMAT transported by aircraft, if a fire, violent rupture, explosion, or dangerous evolution of heat occurs as a direct result of a battery or battery-powered device
3. Any situation judged by the possessor of a hazardous material as posing a continuing danger to life
4. If a fire, breakage, spillage, or suspected radioactive contamination occurs involving an infectious substance other than regulated medical waste

Feedback:

Option 1: *This option is incorrect. Immediate notification isn't required when the release is the result of materials for which venting is authorized.*

Option 2: *This option is correct. When transporting HAZMAT by aircraft, you must notify the NRC immediately if a fire, violent rupture, explosion, or dangerous evolution of heat occurs as a direct result of a battery or battery-powered device.*

Option 3: *This option is correct. You should immediately report any situation, such as a continuing danger to life at the scene, to the NRC if it's judged by the possessor of a hazardous material as one that should be reported.*

Option 4: *This option is correct. You're required to submit an immediate notification and incident report if a fire, breakage, spillage, or suspected radioactive contamination involves an infectious substance other than a regulated medical waste.*

Question 2: Multiple Choice

For which incident is immediate notification, including an incident report, not required?

Options:

1. A person is killed or suffers injuries requiring hospitalization
2. The flight pattern or routine of an aircraft is altered
3. The general public is evacuated for one or more hours
4. One or more transportation arteries or facilities are closed or shut down for 30 minutes or less

Answer

4. One or more transportation arteries or facilities are closed or shut down for 30 minutes or less

Feedback:

Option 1: *This option is incorrect. An immediate notification is required if a person is killed or suffers injuries requiring hospitalization.*

Option 2: *This option is incorrect. An immediate notification is required if the flight pattern or routine of an aircraft is altered.*

Option 3: *This option is incorrect. An immediate notification is required if the general public is evacuated for one or more hours.*

Option 4: *This is the correct option. An immediate notification is not required if one or more transportation arteries or facilities are closed or shut down for 30 minutes or less.*

Course HTML Resources

If a vehicle transporting a hazardous material breaks down, get as far from the highway as you can and call enforcement personnel to guard the vehicle and load

Answer

1. If a truck carrying hazardous materials breaks down, move it to a location where the load is protected
2. If a container starts to leak during transport, making the load unsafe to travel with, move the truck off the road and contain the leak, if you can do so according to best and safest practices
3. If a leaking cargo tank makes further transportation unsafe, pull off the road away from traffic and contain the material to eliminate sources of ignition

Feedback:

Option 1: *This option is correct. If you're driving a truck carrying hazardous materials and the truck breaks down, you must move it to a location where the load is protected.*

Option 2: *This option is correct. If the container you're transporting starts to leak, you must move the truck off the road and contain the leak. Repair it only if you can do so according to best and safest practices.*

Option 3: *This option is correct. If a leaking cargo tank makes further transportation unsafe, you should pull off the road away from the flow of traffic, and contain the material as viably as possible, while eliminating all sources of ignition.*

Option 4: *This option is incorrect. If a vehicle transporting a hazardous material breaks down, you should move it to a location where the load is protected.*

9. Video: Incident Reporting (sh_ehshsf_d34_enus_06)

- *identify situations which do and do not require immediate notification*

[Topic title: Incident Reporting.] If you're ever involved in a vehicle incident, you need to report it. The same rule applies to incidents involving the transportation of hazardous material.

US law 49 CFR 171.15(b) stipulates the types of incidents that are immediately reportable when transporting hazardous materials. According to this regulation, each person in physical possession of a hazardous material must call the National Response Center, or NRC, in the event of an incident. They can reach the NRC toll free at 800-424-8802 or contact them online at www.nrc.uscg.mil. This must happen as soon as is practical, but no later than 12 hours after the occurrence.

For incidents that require immediate notification, CFR 171.15 states each person in possession of the hazardous material must provide notice to the NRC.

Some incidents may be reported over the phone. However, other incidents require written notification to the Department of Transportation, or DOT, in accordance with CFR 171.16.

Each person in physical possession of a hazardous material at the time of an incident while transporting goods - including loading, unloading, and temporary storage - must submit a hazardous materials incident report. *[A report titled "Hazardous Materials Incident Report" displays.]* This is DOT Form F 5800.1.

Written reports are required for all immediate notice incidents, as well as certain specific incidents. For instance, if a hazardous material is released unintentionally or any quantity of hazardous waste is discharged, a written report is required.

Reports are also required if a specification cargo tank with a capacity of 1,000 gallons or greater containing any hazardous material suffers structural damage to the lading retention system. When there's damage that requires repair to a system intended to protect the lading retention system, even without a release of a hazardous material, a written report is mandatory.

Further instances where written reports are required include if an undeclared hazardous material is discovered, or if a fire, violent rupture, explosion or dangerous evolution of heat occurs as a direct result of a battery or battery-powered device. In this instance, a dangerous evolution of heat refers to an amount of heat sufficient to be dangerous to packaging or personal safety causing charring, melting, scorching of packaging, or other evidence.

Immediate notification is required when specific situations occur as a direct result of a reportable incident involving hazardous material. Specifically, if a person is killed or if a person's injuries require hospitalization as a result of a HAZMAT incident, it must be immediately

Question 3: Multiple Choice

Which hazard classes have specific loading and unloading requirements?

Options:

1. 1 through 4 only
2. 1 through 6 only
3. 1 through 8
4. All hazard classes

Answer

3. 1 through 8

Feedback:

Option 1: *This option is incorrect. Hazard classes 1 through 4 are not the only classes that have specific loading and unloading requirements. According to 49 CFR 177.835 to 842, classes 5, 6, 7, and 8 also include specific loading and unloading requirements.*

Option 2: *This option is incorrect. Hazard classes 1 through 6 aren't the only classes with specific loading and unloading requirements. Classes 7 and 8 also include specific requirements.*

Option 3: *This is the correct option. Specific loading and unloading requirements for hazard classes 1 through 8 are specified in 49 CFR 177.835 to 842.*

Option 4: *This option is incorrect. Not all hazard classes have specific loading and unloading requirements. However, specific loading requirements for hazard classes 1 through 8 are specified in 49 CFR 177.835 to 842.*

7. Video: Emergency Response (sh_ehshsf_d34_enus_05)

- *identify actions to take during an emergency response*

[Topic title: Emergency Response.] In an emergency, you dial 911 and wait for help to arrive. But what about an emergency while transporting hazardous materials?

As someone who transports hazardous materials, you should be familiar with the basic safety information about the materials you're carrying.

Emergency response information must be accessible in the shipment vehicle, and it must also be available at all transportation facilities and for use away from the package of hazardous material. It must be printed in English and included on the shipping paper. And the information should also be available in a document such as a safety data sheet, or SDS, along with the shipping paper. Additionally, emergency response information may also be kept in a separate document that cross-references the description of the hazardous materials on the shipping paper.

The Emergency Response Guidebook, or ERG, was developed jointly by the US Department of Transportation – DOT – along with Transport Canada and the Secretariat of Communications and Transportation of Mexico for use by firefighters, police, and other emergency services personnel who may be the first to arrive at the scene of a transportation incident involving a hazardous material.

The ERG is updated every three to four years by the DOT to accommodate new products and technology. It provides emergency response information for transportable HAZMAT using shipping names, United Nations – UN – codes, or North American identification numbers.

The North American ERG works on a color code system. *[The cover page of the EMERGENCY RESPONSE GUIDEBOOK or ERG of 2016 displays.]*

packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation."

Section 172 of the regulations, subchapter 204 – or 49 CFR 172.204 – stipulates several requirements and exemptions that apply to the shipper's certification on shipping papers shipping papers for shipments via rail and air only.

When a motor carrier offers a freight container or transport vehicle to a rail carrier, the shipping paper must be noted with the reporting mark and number when displayed on the rail car, freight container, transport vehicle, or portable tank.

No certification statement is required for the return of an empty rail tank that previously contained a hazardous material and has not yet been cleaned or purged. But the shipping papers are still required.

A shipper's certification is also not required for hazardous materials offered for transportation by motor vehicle and transported in a cargo tank supplied by the carrier, or by the shipper as a private carrier, except for a hazardous material that is to be reshipped or transferred from one carrier to another. This does not apply to the transportation of hazardous waste, which always requires a shipping certification.

Shipping paper guidelines and requirements for the shipper's certification must be followed to ensure the safe transportation of hazardous materials.

Let's pause here to answer a practice question.

5. Video: Loading and Unloading HAZMAT and Toxic Materials (sh_ehshsf_d34_enus_04)

- *identify requirements for loading and unloading HAZMAT and transporting packages labeled "Toxic," "Poison," or "Poison Inhalation Hazard"*

[Topic title: Loading and Unloading HAZMAT and Toxic Materials.] Under US law, 49 CFR 177.834 stipulates the general requirements for the loading and unloading of hazardous materials. Additionally, 49 CFR 177.835 through 842 cite the specific loading and unloading requirements for hazard classes 1 through 8.

Several safeguards apply when loading and unloading Class 1 explosives. For instance, you need to turn off the vehicle engine during loading and unloading and ensure the cargo area interior is free of objects – such as bolts, screws, or nails – that could damage a package or container. You should also close the tailgates to keep cargo within the body of the vehicle.

Another guideline applies to the loading, blocking, bracing, and unloading of all HAZMAT: it must be done in accordance with the prescribed safeguards. This is mandatory in all cases; no substitutes are permitted.

Also, the requirements stipulate you should never transport cyanides and acids on the same vehicle, nor put them in the same storage area or loading dock.

Packages labeled "Toxic," "Poison," or "Poison Inhalation Hazard" are not permitted in the driver's compartment or sleeper berth.

Special controls must be in place before hazardous materials may be transported in the same vehicle as edible materials. These packages may be transported in the same vehicle as foodstuffs only if overpacked in a metal drum, as specified in the regulation, or loaded in separate closed unit load devices.

Always refer to the appropriate regulations to ensure the requirements for loading, unloading, and transporting HAZMAT and packages labeled "Toxic," "Poison," or "Poison Inhalation Hazard" are met.

Now, take a short break to answer some practice questions.

6. Knowledge Check: Loading and Unloading HAZMAT and Toxic Materials

- *identify guidelines for shipping papers*
- *identify requirements for loading and unloading HAZMAT and transporting packages labeled "Toxic," "Poison," or "Poison Inhalation Hazard"*

Question 1: Multiple Choice

- *identify characteristics of the segregation table*
- *identify what the entries in a segregation table for hazardous materials represent*

[Topic title: Segregation Table.] While some materials are safe to handle and use, others are potentially hazardous and need to be segregated for everyone's safety.

In fact, certain hazardous materials must be kept separate to ensure the safety of those handling them. Title 49 of the Federal Code of Regulations, section 177, Subpart C includes a table as part of subchapter 848(d) with information on which types of hazardous materials, or HAZMAT, can be loaded, stored, and transported together. When preparing to transport hazardous goods, you should refer to the segregation table in 49 CFR 177.848(d). The table also identifies which HAZMAT can be loaded and stored – but not transported – together.

[A table titled "SEGREGATION TABLE FOR HAZARDOUS MATERIALS" displays. The information in this table is organized into several columns and rows. The column headers are Class or division, Notes, 1.1/1.2, 1.3, 1.4, 1.5, 1.6, 2.1, and 2.2. The column header Class or divison is highlighted.] The segregation table outlines the segregation requirements for both hazard classes and divisions. *[A part of column headers 1.6 and 2.2 is highlighted. There is no value in the highlighted part.]* Where a hazard class or division is not shown, that particular class or division is unrestricted. *[One column and one row are highlighted.]* Wherever a row and a column intersect at a blank cell, no restrictions apply – meaning the relevant materials may be loaded, transported, or stored together.

Some of the table cells contain either an X or an O. *[The table cells containing "X" are highlighted.]* An X in the cell where a row and a column intersect identifies two materials that may not be loaded or transported together on the same vehicle and may not be stored together.

[The table cells containing "O" are highlighted.] An O in a cell where a row and column intersect means the materials may be loaded, transported, and stored together, provided certain conditions are met. *[The row where the division is 5.1 under the Class or division column header is highlighted.]*

If, for example, an O displays in the cell where the row for Flammable gases 2.1 intersects with column 1.4 – for Class 1.4 Explosives – this indicates these materials may be loaded, transported, or stored together, as long as they're separated in a manner to ensure the materials can't mix if there is a leak.

In the segregation table, any cells containing explosive materials in columns 1.1 through 1.6 are highlighted with an asterisk. This indicates the segregation among different Class 1 explosive materials, which is governed by the Explosive Material Compatibility Table – found in 49 CFR 177.848(f).

For your safety and the safety of the general public, it's essential to know which hazardous materials may and may not be transported together.

Let's take a short break for some practice questions.

3. Knowledge Check: Segregation Table

- *identify characteristics of the segregation table*
- *identify what the entries in a segregation table for hazardous materials represent*

Question 1: Multiple Choice

Which two statements are true about the hazardous material segregation table?

Options:

1. The segregation table shows the segregation requirements for hazard classes and divisions
2. The segregation table is used to determine which HAZMAT can be loaded and stored together
3. The segregation table applies to carriage by marine vessel

Answer

1. The segregation table shows the segregation requirements for hazard classes and divisions
2. The segregation table is used to determine which HAZMAT can be loaded and stored together

Feedback:

Option 1: *This option is correct. The hazardous material segregation table in 49 CFR 177.848(d) applies to all hazard classes and divisions.*

Option 2: *This option is correct. The hazardous material segregation table in 49 CFR 177.848(d) indicates HAZMAT that may be loaded and stored together for carriage by highway.*

Option 3:

Regulations	
HAZMAT	Acronym for hazardous material, a substance or material that the Secretary of Transportation has determined capable of posing unreasonable risk to health, safety, and property when transported in commerce, and which has been designated as hazardous under Section 5103 of the Federal Hazardous Materials Transportation law. The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials as defined in 49 CFR 171.8, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions in Part 173 of the HMR.
HAZMAT Precedence Table	A table used when material meets the definition of more than one hazard class or division.
HAZMAT Table	See HMT.
HMR	Abbreviation for Hazardous Materials Regulations, the HMR identify hazard characteristics that may make the substance or material a "hazardous material."
HMT	Abbreviation for HAZMAT Table, a key element and primary guide to offerers, carriers, and enforcement personnel in determining compliance with the regulations. For each entry, the table specifies the proper shipping name, hazard class or division, identification number, packing group, required hazard warning labels, packaging authorizations, per-package quantity limitations for passenger and cargo aircraft, and special provisions.
shipping paper	A document that provides critical information describing the material being shipped, the hazards present, the quantity in the containers, and how to obtain more information if necessary.
Uniform Hazardous Waste Manifest	A specific shipping document for hazardous waste shipments.

the designated facility – including the generator's EPA identification numbers. Both small and large quantity generators are required to have a 12-digit EPA identification number from their authorized state agency or the EPA.

This option is incorrect. The number of containers for each waste must be included as well as the appropriate abbreviation on the Uniform Waste Manifest. For example, the abbreviation for cylinders is CY, the appropriate abbreviation for tank cars is TC, and the abbreviation for metal boxes, cartons, and cases is CM.

Correct answer(s):

Option 1

Question 3: Interactive

Question

While the uniform hazardous waste manifest is similar to a bill of lading, there are some additional requirements that must be met when completing the manifest.

Select four types of information that must be marked on the uniform hazardous waste manifest.

Options:

1. Generator's EPA identification number
2. Emergency response phone number
3. Manifest tracking number
4. DOT shipping description (including the basic shipping description, number of containers, total quantity, units of measure, and waste codes)
5. Social security number of the receiving facility's owner
6. Required personal protective equipment to deal with emergencies

Answer

This option is correct. The generator's assigned EPA identification number (if applicable) must be marked on the uniform hazardous waste manifest. Small and large quantity generators need to get a 12-digit EPA identification number from their authorized state agency or the EPA. Some states require even very small quantity generators to obtain this number for their site.

This option is correct. A 24-hour emergency response phone number must be included on the uniform hazardous waste manifest. This is the number where someone can be reached to provide emergency information for the shipment in the event of an incident during transportation.

This option is correct. The manifest tracking number should be preprinted on the form by the form provider. This number is a unique identification number, consisting of a three-letter suffix preceded by nine numerical digits.

This option is correct. Because a hazardous waste is also a DOT-regulated material, the uniform hazardous waste manifest contains the DOT shipping basic description, which is the proper shipping name, hazard class or division, identification number, and packing group. The number of containers for each waste must also be included using the appropriate abbreviation for each container type. The total quantity of waste by weight or volume, with partial units rounded to the nearest whole unit, must also be entered using the correct abbreviations for the units of measure. Waste codes, which are assigned by federal or state agencies, should be included to describe each waste stream.

This option is incorrect. The receiving facility's owner's social security number is not required on the uniform hazardous waste manifest. However, the name of the designated receiving facility and its EPA identification number are needed.

This option is incorrect. The personal protective equipment needed to deal with emergencies is not a required element of the uniform hazardous waste manifest. However, a 24-hour emergency response phone number must be included, where someone can be reached to provide emergency information and mitigation instructions for the shipment in the event of an incident during transportation.

Correct answer(s):

Option 1
Option 2
Option 3
Option 4

In most instances, the vendor contracted by the generating facility to transport the waste will prepare this document and give it to the generating facility at the time of shipment. While the manifest is similar to a bill of lading, there are some additional requirements that must be met when completing the manifest.

The uniform hazardous waste manifest has 20 sections, let's review some of these now, including the information required to be marked. Section 1 is where the generator's assigned EPA identification number (if applicable) is marked. Both small and large quantity generators need to get a 12-digit EPA identification from their authorized state agency or from the EPA. Some states even require very small quantity generators to obtain this number for their site.

In section 2 the total number of pages used to complete the manifest will be specified.

Section 3 is for a 24-hour emergency response phone number. This is the number where someone can be reached to provide emergency information for the shipment in the event of an incident during transportation.

Section 4 is where the manifest tracking number should be preprinted on the form by the form provider. This number is a unique identification number, consisting of a three-letter suffix preceded by nine numerical digits.

The following information should also be added in sections 5 through 8: the generator's name, mailing address, phone number, and site address; the company name and EPA identification number of the first and second transporter of the waste; and the name, site address, EPA identification number, and phone number of the facility designated to receive the waste.

Now, let's take a look at the information that should be added in sections 9 through section 13, where the DOT shipping description, the number of containers, the total quantity, the units of measure, and the waste codes go, respectively. Because a hazardous waste is also a DOT-regulated material, you'll find the DOT shipping description, which includes the identification number, the shipping name, the hazard class or division, and the packing group. Since the manifest can also be used to ship nonhazardous wastes, the hazardous materials should be identified with an X. The number of containers for each waste will be included as well as the appropriate abbreviation for the type of container. For example, the abbreviation for cylinders is CY, for tank cars it's TC, and the abbreviation for metal boxes, cartons, and cases is CM. The total quantity of waste, by weight or volume, must also be added using the appropriate abbreviation for the units of measure, such as L for liters, N for cubic meters, or T for tons – with partial units rounded to the nearest whole unit. Something else that must be included are the waste codes assigned to each waste stream, if applicable.

Next, section 14 is where generators can enter special handling instructions and additional information. For example, special instructions necessary for the proper management or tracking of the materials under the generator's or other handler's business processes, such as waste profile numbers, container codes, bar codes, or response guide numbers, can be added. Additional descriptive information about shipped materials, like chemical names and constituent percentages, can also be added.

Section 15 is the Generator's or Offeror's Certifications. This is where the signatures of the authorized persons from the generator, transporter(s), and designated facility go. The generator must read, sign, and date the waste minimization certification statement. This section also contains the shipper's certification – the required attestation that the shipment has been properly prepared and is in proper condition for transportation. When a party other than the generator prepares the shipment for transportation, this party may also sign the shipper's certification statement as the offeror of the shipment on behalf of and the approval of the generator.

Information should also be added in sections 16 and 17 to cover international shipments and the transporter's acknowledgement of receipt of the materials.

Sections 1 through 17 must be completed at the time of shipment from the generator's facility. The remaining sections on the manifest, sections 18 through 20 must be completed by the owners and operators of receiving facilities.

The authorized representative of the designated (or alternate) facility's owner or operator should use section 18 to note any discrepancies between the waste described on the manifest and the waste actually received at the facility, if relevant. Manifest discrepancies include significant differences between the quantity or type of hazardous waste described and the quantity and type of hazardous waste a facility actually receives. Discrepancies may also include rejected wastes, which may be a full or partial shipment of hazardous waste that the facility cannot accept. Also included are container residues, which are residues that exceed the quantity limits for "empty" containers. If a shipment arrives at the designated facility and must be rejected, Sections 18b and 18c must be completed.

Section 19 is where the receiving facility should enter the appropriate Hazardous Waste Report Management Method codes for each waste listed on the manifest. And in section 20, the designated facility owner or operator who receives the waste must print, sign, and date the manifest.

Once the receiving facility has signed section 20, they are required to submit the signed copy back to the generator. A large quantity generator of hazardous waste must receive the signed copy back from the receiving facility, in either electronic or hard copy, within 45 days of when the waste was accepted by the initial transporter. A small quantity generator of hazardous waste must receive the signed copy back from the receiving facility within 60 days. Copies of uniform hazardous waste manifests must be maintained at the generating facility for three years.

Knowing the requirements for the uniform hazardous waste manifest is an essential step towards managing and transporting hazardous waste safely from generation to disposal.

9. Knowledge Check: Emergency and Manifest Information

- *recognize requirements for providing emergency response information*
- *determine when a uniform hazardous waste manifest is required*
- *identify the information required to be marked on the uniform hazardous waste manifest*

Question 1: Interactive

special permit.

This option is incorrect. You do not use the designation Limited quantity to indicate material shipped under a special permit. You add the words "Limited Quantity" – or "Ltd Qty" – immediately after the basic description of the material when a shipment is small enough to qualify for a limited quantity exception.

This option is incorrect. The "Residue: Last Contained" label does not indicate material shipped under a special permit. It is used as part of the additional description on the shipping paper – for example, for an empty packaging containing the residue of a hazardous material in a rail tank car, it would say "Residue: Last Contained***" followed by the basic description of the hazardous material residue.

This option is incorrect. The HOT designation does not apply to materials shipped under a special permit. If a liquid material in a package meets the definition for an elevated temperature material, the words "Molten" or "Elevated temperature" should be part of the proper shipping name. If it's not disclosed as a part of the proper shipping name, the word "HOT" must immediately precede the proper shipping name of the material on the shipping paper.

Correct answer(s):

Option 1

Question 2: Interactive

Question

While a hazardous material and a nonhazardous material may be placed on the same shipping paper, hazardous materials must be distinguished from nonhazardous materials.

Select the three methods used for marking the shipping paper containing a mixed shipment.

Options:

1. Entering the hazardous material first
2. Entering the shipping descriptions in contrasting colors
3. Putting an "X" in the HM column, or "RQ" if it's also a hazardous substance
4. Entering the words "Mixed Shipment" in the Packing Group column
5. Putting the words "'Safe"' in parentheses is after the shipping name of the nonhazardous material.

Answer

This option is correct. One method that can be used for marking the shipping paper containing a mixed shipment is to enter the hazardous materials first on the shipping paper.

This option is correct. One way to distinguish hazardous materials from nonhazardous materials is to enter the hazardous material description in a contrasting color.

This option is correct. Hazardous material can be distinguished from nonhazardous materials by identifying the hazardous material by putting an "X" before the proper shipping name in the column captioned "HM." Instead using an "X," the letters "RQ" may be entered in the HM column if it relates to a hazardous substance.

This option is incorrect. The packing group column should only contain the packing group number. There are multiple methods for marking a mixed shipment, but simply labeling it "Mixed Shipment" isn't one of them.

This option is incorrect. This is not a method to use when marking shipping papers containing mixed shipments. Instead of marking the nonhazardous materials as safe, you could identify the hazardous material by putting an "X" or the letters "RQ" before the proper shipping name.

Correct answer(s):

Option 1
Option 2
Option 3

7. Video: Emergency Response (sh_ehshsf_f60_enus_07)

Now use the job aid HAZMAT Precedence Tableto help you determine the primary hazard for a drum containing a liquid mixture of 50% acetone and 50% acetic acid (50-80% concentration). Acetone is Class 3, Packing Group II and acetic acid (50-80% concentration) is Class 8, Packing Group II.

Select the primary hazard class.

Options:

1. 3
2. 4.2
3. 6.1

Answer

This is the correct option. The hazard class that should be used in this case is Class 3. To determine this, you find the entry at the intersection of the row for Class 3 PG II and the column for Class 8 PG II.

This option is incorrect. To find the correct class you find the entry at the intersection of row 3 II and column 8 II, which is 3. So, the primary hazard class that should be used in this case is Class 3 not 4.2.

This option is incorrect. This option is incorrect. To arrive at an answer of 6.1, you have used either the wrong row or the wrong column. To find the correct class, locate the intersection of row 3 II with column 8 II, where the entry is 3. Class 3 should be used in this case.

Correct answer(s):

Option 1

5. Video: Additional Shipping Paper Descriptions (sh_ehshsf_f60_enus_05)

- *recognize the additional descriptions that are required on a shipping paper in a given scenario*
- *identify methods used for marking shipping papers containing a mixed shipment*

*[Topic title: Additional Shipping Paper Descriptions]*The Hazardous Materials Regulations specify various requirements for describing hazardous materials correctly. And depending on the material being transported, you may be required to provide additional information and descriptions on a shipping paper as part of the HAZMAT's basic description. For example, additional information may be required to clarify the unique characteristics or environmental hazards of the material.

Let's explore the additional basic descriptions that are required on the shipping paper by looking at some scenarios you may come across. First, if a shipment is made under a DOT special permit, unless any exceptions apply, you must enter the notation "DOT-SP", followed by the special permit number. The placement of the notations must be clearly associated with the special permit description.

Next, the words "Limited Quantity" – or its abbreviation "Ltd Qty" – must be entered on the shipping paper – if used – immediately after the basic description of the material when the shipment qualifies for a limited quantity exception. The limited quantity exception enables a shipper to be excepted from certain labeling, packaging, and shipping paper requirements when shipping qualifying small quantities of selected hazardous materials via highway.

If a proper shipping name doesn't identify the hazardous substance by name, and you've consulted Appendix A to the Hazardous Materials Table, or HMT, to check if the name of the material is listed there, the name of the hazardous substance must be entered in parentheses in association with the basic description. For example, "UN1760, Corrosive liquid, n.o.s., (Octanoyl chloride), 8, II." And if the material contains two or more hazardous substances, at least two of the hazardous substances – the two with the lowest reportable quantities (RQs) – must be identified. For a hazardous waste, the waste code – for example D001 – if appropriate, may be used to identify the hazardous substance. Then you must enter the letters "RQ" for "Reportable Quantity" on the shipping paper before or after the basic description and mark the name of each hazardous substance if it's not already marked in the basic description.

The next description is "Residue: Last Contained" if the shipment contains packages that hold only the residue of hazardous material. For example, the shipping paper description for any empty packaging containing the residue of a hazardous material in a rail tank car must include the words "Residue: Last Contained***" before the basic description of the hazardous material residue. For packages other than tank cars containing HAZMAT residue, the phrase "Residue: Last Contained***" may appear on the shipping paper, but it's not required.

Then, if a material meets the criteria of being poisonous or toxic by inhalation, it must be identified on the shipping paper. Enter the words "Poison-Inhalation Hazard" or "Toxic-Inhalation Hazard" and the appropriate hazard zone – which refers to the four levels of

You also need to check appendices A and B of the HMT to determine whether further information is required on the shipping paper. Appendix A consists of two tables – a list of hazardous substances and reportable quantities, or RQ. If the material being shipped is listed in Appendix A, you must verify if it meets the definition of the hazardous substance prescribed in 49 CFR 171.8. If it does, and the quantity per package meets or exceeds the amount listed, you must take the additional step of identifying it as an RQ on the shipping paper.

Appendix B is a list of marine pollutants. If a hazardous material meets the definition of a marine pollutant and it's being shipped by water or shipped in bulk packaging, you have to identify it as such.

When additional information is required for a HAZMAT shipment, it must be listed after the basic description unless the HMR states otherwise.

There are two exceptions for placing additional information after the basic description. First, the technical name may be placed in parentheses after either the proper shipping name or after the basic description. And second, the letters "RQ" can be entered either before or after the basic description.

Some hazardous materials require much more specific information than what's been covered here. Always refer to Subpart C of the HMR for specific details and to verify which regulations apply to a shipment.

Remember, identifying a hazard description's basic components and placing them in the correct order on shipping papers is a key step in shipping HAZMAT safely.

3. Video: The HAZMAT Precedence Table (sh_ehshsf_f60_enus_03)

- *describe the purpose of the HAZMAT Precedence Table*

[Topic title: The HAZMAT Precedence Table] It's crucial that the shipping papers for a HAZMAT shipment identify and describe the materials correctly. In some cases, a HAZMAT shipment may present a single hazard. In other cases, the materials may present several hazards, for example, acetic anhydride is both corrosive and flammable.

If you're shipping material with more than one hazard class or division, you must describe the material according to the hazard which represents the most serious threat in transportation. You should refer to the HAZMAT Precedence Table in Section 173.2a of the Hazardous Materials Regulations, or HMR, to determine the primary hazard class or division of a material when it meets the definition of more than one hazard class or division.

Let's explore the hazardous material classes and divisions included in the HAZMAT Precedence Table so you can learn to identify a material's primary hazard class with confidence. Class 3 is included, which covers flammable liquids, such as gasoline, paint, and methanol. There's also Class 8, corrosive materials, which includes, for example, sulfuric acid.

Apart from these two classes, five divisions are included. Division 4.1, which includes substances that are flammable solids, like magnesium. Division 4.2 covers spontaneously combustible substances, such as sodium hydrosulfite, while the substances in division 4.3 are dangerous when wet – for example, sodium. Two more divisions included are divisions 5.1, which are oxidizers, like potassium chlorate; and division 6.1, which includes poisonous liquids or solids other than Packing Group I, poisonous-by-inhalation.

So how does the table work? All you do is follow the names of the hazard classes and divisions to the point where the columns and rows intersect to determine the primary classification into which a material falls.

Let's illustrate this with an example. Suppose you want to determine the primary hazard class or division for a drum containing a liquid mixture that meets the criteria for Class 3, Packing Group II, as well as those for Class 8, Packing Group II. So, find row 3, II at the left-hand side and find column 8, II on the top of the table side. The point at which the column and the row intersect is 3. This means the primary hazard in this case for the shipping description is 3. In this case, the shipping description would be UN2924, Flammable liquids, corrosive, n.o.s., 3 (8), II.

You should become familiar with the HAZMAT Precedence Table because identifying and describing materials is an important step in ensuring a safe shipment.

4. Knowledge Check: Basic Description and HAZMAT Table

- *identify the four components of a hazardous material basic description and their order on shipping papers*
- *describe the purpose of the HAZMAT Precedence Table*

Question 1: Interactive

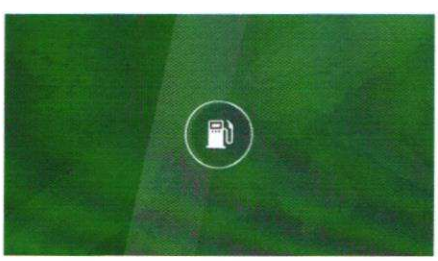
DOT 3: Shipping Papers

This course will introduce the requirements of the Department of Transportation's Hazardous Materials Regulations, including the components of the basic description of hazardous material, general information required on the shipping paper, use of the HAZMAT Precedence Table and Uniform Hazardous Waste Manifest, and general emergency response information. The proper identification, preparation, and transportation of hazardous materials affect everyone's safety. This training course may be used to meet the requirements for general awareness and familiarization training. Additional function-specific training will be provided by your employer.

This course was developed with subject matter support provided by EnSafe Inc., a global professional services company focusing on engineering, environment, health and safety, and information technology. Please note, the course materials and content were current with the laws and regulations at the time of the last expert review, however, they may not reflect the most current legal developments. Nothing herein, or in the course materials, shall be construed as professional advice as to any particular situation with respect to compliance with legal statutes or requirements.

Table of Contents

1. Video: DOT 3: Shipping Papers (sh_ehshsf_f60_enus_01)



No Objectives

[Topic title: Dot 3: Shipping Papers - Course Overview] Billions of tons of hazardous materials, or HAZMAT, are transported annually in the United States. A significant portion of these, including gasoline, poisonous materials, and radioactive materials, are transported by highway. While the transportation of goods is always risky, the risks are much greater when HAZMAT is involved. To ensure these types of shipments reach their destination safely, the Department of Transportation's, or DOT's, Hazardous Materials Regulations must be followed strictly. One of the key elements of these regulations is to have the proper shipping papers.

In this course, you'll learn about the components of a hazardous material basic description and the sequence in which these components must appear on shipping papers. You'll also be introduced to the HAZMAT Precedence Table, additional shipping paper descriptions, and how to mark shipping papers containing a mixed shipment. You'll also learn about the requirements for emergency response information. Finally, you'll learn when a uniform hazardous waste manifest is required and what information must be marked on the manifest.

2. Video: HAZMAT Basic Description (sh_ehshsf_f60_enus_02)

- *identify the four components of a hazardous material basic description and their order on shipping papers*

Question 5: Multiple Choice

Which three statements are correct in relation to placarding?

Options:

1. Placarding is the joint responsibility of shipper and carrier
2. If a required placard is missing or damaged, the shipment must not be transported
3. You should use the HMR and refer to placarding Table 3
4. You must ensure the correct placards are offered or affixed before a shipment is transported

Answer

1. Placarding is the joint responsibility of shipper and carrier
2. If a required placard is missing or damaged, the shipment must not be transported
4. You must ensure the correct placards are offered or affixed before a shipment is transported

Feedback:

Option 1: *This option is correct. The responsibility of the shipper and carrier is to ensure the correct placards are offered or affixed before the shipment is transported. The shipper must ensure the required placards are offered for the material before it's shipped, and the carrier must know what they're accepting for transportation.*

Option 2: *This option is correct. If the required placards are missing, damaged, or incorrect, then the package shouldn't be accepted for shipment.*

Option 3: *This option is incorrect. Selecting the correct placards requires consulting placarding Tables 1 and 2, as well as the HMR.*

Option 4: *This option is correct. If the required placards are not correct, the shipment should not be accepted for transportation.*

Course HTML Resources

- Glossary: DOT 2: Packaging, Labeling, Marking, and Placarding

Term	Explanation
bulk packaging	Packaging with no intermediate form of containment. A vessel or barge is not bulk packaging, but a transport vehicle or freight container is.
combination packaging	Packaging in which the inner receptacle and the outer packaging become a permanent and integral part of the package (single closure).
exception	A statement in the HMR allowing relief from some or all of the requirements in the HMR
exemption	A document issued by the associate administrator of Research and Special Programs Administration (RSPA) that authorizes a person to perform a function not otherwise authorized under the HMR.
fissile	A substance capable of undergoing nuclear fission.
fissile material	Refers to PU-238, 239, or 241, or U-233 or 235, or any combination of these radionuclides.
hazardous material	Also known as HAZMAT, a substance or material that the Secretary of Transportation has determined capable of posing unreasonable risk to health, safety and property when transported in commerce and has designated as hazardous under Section 5103 of the Federal hazardous materials transportation law. The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials as defined in 49 CFR 171.8, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions in Part 173 of the HMR.
Hazardous Materials Regulations	Also known as HAZMAT, a substance or material that the Secretary of Transportation has determined capable of posing unreasonable risk to health, safety and property when transported in commerce and has designated as hazardous under Section 5103 of the Federal hazardous materials transportation law. The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials as defined in 49 CFR 171.8, materials designated as hazardous in the Hazardous Materials Table (49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions in Part 173 of the HMR.

- *identify the appropriate placarding requirements for transport of hazardous materials in bulk packaging*

Question 1: Multiple Choice

What is the purpose of placards?

Options:

1. To clearly communicate the hazard of the material being transported
2. To list the ingredients of the chemical being transported
3. To list the manufacturer of the material being transported
4. To clearly communicate the spill control and cleanup procedures for the chemical being transported

Answer

1. To clearly communicate the hazard of the material being transported

Feedback:

Option 1: *This is the correct option. The HMR prescribes the use of placards to clearly communicate hazards of materials being transported.*

Option 2: *This option is incorrect. The HMR prescribes certain devices and provisions for communicating hazardous chemicals being transported. However, the purpose of placards is to communicate the hazards of materials being transported.*

Option 3: *This option is incorrect. According to the HMR, the role of placards is to clearly communicate the hazard of HAZMAT being transported.*

Option 4: *This option is incorrect. Per the HMR, the information on a placard clearly communicates the hazard of the material being transported.*

Question 2: Multiple Choice

Which two statements about the placarding tables are correct?

Options:

1. When determining which placards must be used and what options are available, both placarding tables must be considered
2. Only hazardous materials in bulk packaging or of a certain weight listed in Table 2 require placarding
3. Only certain quantities of hazardous materials listed in Table 1 require placarding

Answer

1. When determining which placards must be used and what options are available, both placarding tables must be considered
2. Only hazardous materials in bulk packaging or of a certain weight listed in Table 2 require placarding

Feedback:

Option 1: *This option is correct. Selecting the correct placard for the hazardous material being shipped requires consulting both placarding tables.*

Option 2: *This option is correct. In Table 2, placarding applies when the material is in a bulk package or when the total gross weight of all HAZMAT in non-bulk packages on the transport vehicle or in the freight container is 1,001 pounds (454 kg) or more.*

Option 3: *This option is incorrect. Any quantity of any HAZMAT listed in Table 1 requires placarding.*

This option is incorrect. According to the HMR, display the ID number marking on both sides and ends for bulk packages with a capacity greater than or equal to 1,000 gallons (3,785 liters).

Option 4: *This option is incorrect. You should display the ID number based on package capacity. If the capacity is greater than or equal to 1,000 gallons (3,785 liters) display the ID number on both sides and ends.*

Question 6: Multiple Choice

What are marine pollutant bulk package markings based on?

Options:

1. pH of the material
2. Capacity of the bulk package
3. Corrosivity of the material
4. Acidity of the bulk package contents

Answer

2. Capacity of the bulk package

Feedback:

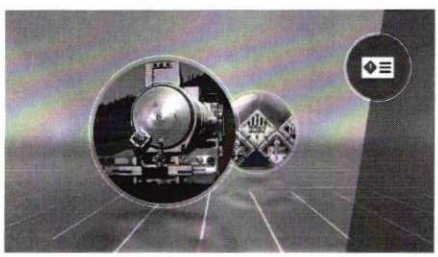
Option 1: *This option is incorrect. Marine pollutant bulk package markings are based on capacity, not pH.*

Option 2: *This is the correct option. Marine pollutant bulk packages display markings based on their capacity. Packages greater than or equal to 1,000 gallons (3,785 liters) capacity are marked on each side and each end; packages less than 1,000 gallons are marked on two opposite sides.*

Option 3: *This option is incorrect. Capacity determines the markings for marine pollutant in bulk packaging, not the material's corrosivity.*

Option 4: *This option is incorrect. Markings on marine pollutant are displayed according to package capacity, not acidity.*

8. Video: Placarding (sh_ehshsf_d33_enus_05)



- *identify the appropriate placarding requirements for the transport of hazardous materials*
- *identify the appropriate placarding requirements for transport of hazardous materials in bulk packaging*

[Topic title: Placarding.] Anyone who approaches or handles a consignment of HAZMAT during transport must be aware of the associated dangers. In order to caution people about the dangers, regulations require that you use placards on packages to provide detailed hazard information.

Regulatory requirements for placarding are defined in the Hazardous Materials Regulations, or HMR. Each person who offers or transports a regulated HAZMAT must comply with the requirements laid out in 49 CFR Part 172 Subpart F.

[A table titled "Hazardous Materials Table" displays. It is organized into several columns and rows. The column headers include (1) Symbols, (2) Hazardous Materials Descriptions and Proper Shipping Names, (3) Hazard Class or Division, (4) Identification Numbers, (5) PG, (6) Label Codes, and (7) Special provisions (§172.102).] Based on these requirements, placards must be displayed on bulk packagings, freight containers, unit load devices, transport vehicles, or rail cars containing any quantity of HAZMAT on each end and each side, unless the HMR says otherwise. Placards are larger than labels but similar in shape, color, and design. They're generally used in place of labels when you transport HAZMAT in bulk packaging. In some cases, the HMR allows you to use both.

Question 2: Multiple Choice

Large quantities of a single HAZMAT in non-bulk packages with the same shipping name and ID number, loaded at one facility, have special requirements.

What is a large quantity?

Options:

1. 1,000 kg or more
2. 2,000 kg or more
3. 4,000 kg or more

Answer

3. 4,000 kg or more

Feedback:

Option 1: *This option is incorrect. A large quantity is defined as 8,820 pounds (4,000 kilograms) or more.*

Option 2: *This option is incorrect. The large quantities these special requirements apply to are consignments of 8,820 pounds (4,000 kilograms) or more.*

Option 3: *This option is correct. A shipment totaling 8,820 pounds (4,000 kilograms) or more of the same HAZMAT in non-bulk packages which have the same shipping name and ID number, and that are loaded at one loading facility, must mark the ID number on each side and each end of the transport vehicle or freight container.*

Question 3: Multiple Choice

When a HAZMAT shipping description requires technical names and the package contains two or more hazardous materials, how many technical names must be displayed on the package?

Options:

1. None, use the letter "G"
2. One
3. At least two
4. All components making up the mixture or solution

Answer

3. At least two

Feedback:

Option 1: *This option is incorrect. The letter "G" applies when packages containing HAZMAT with proper shipping names have the letter "G" in Column 1 of the HMT. This means the package marking must have the proper shipping name and the technical name – or names – of the material constituent.*

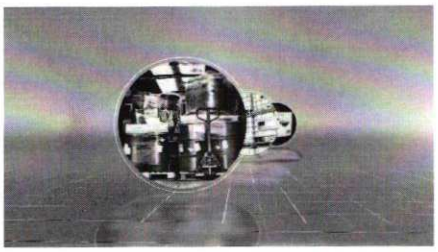
Option 2: *This option is incorrect. In the event that a package contains only one hazardous material, the HMR requirement is that the marking displays one technical name. However, in this case, the package contains more than one material.*

Option 3: *This is the correct option. The HMR instructs that each hazardous material that falls under the shipping description requires a technical name. In the case of two or more materials, there should be at least two names, or as many as there are hazardous materials that fall under the shipping description.*

Option 4: *This option is incorrect. The HMR instructs that each hazardous material that falls under the shipping description requires a technical name, which in this means there should be at least two.*

This option is correct. When a package is a cylinder, the HMR allows the label to be printed or affixed to a tag instead of placed on the surface of the package.

6. Video: Marking (sh_ehshsf_d33_enus_04)



- *identify the proper marking requirements for hazardous materials to include both bulk and non-bulk materials*

[Topic title: Marking.] Shipments of HAZMAT may be handled numerous times and by different people during transport. If your shipment lacks accurate content information or handling instructions, it presents a serious risk during transportation. To avoid this danger, the Hazardous Materials Regulations, or HMR, prescribe certain marking requirements for HAZMAT packages.

Markings have a distinct purpose compared to labels. A "label" only refers to the hazard warning label that communicates the hazard class or division. But a "marking" is information marked on the outer packaging of HAZMAT, including the proper shipping name, ID number, and shipper and receiver names and addresses. Note that both the names and addresses are required when shipping by air.

Proper marking design and positioning is crucial. Markings must be durable, in English, and either printed on or affixed to the surface of the package or on a label, tag, or sign. They must stand out, so you should place them on a sharply contrasting background, unobscured by labels or other matter. Also, position the required markings away from other markings, like advertising, which could reduce their effectiveness.

Certain marking requirements only apply to shipments with specific criteria. For example, if your shipment is 8,820 pounds, or 4,000 kilograms, or more of a single HAZMAT in non-bulk packages with the same shipping name and ID number, and it's loaded at one loading facility, then you must mark the transport vehicle or freight container with the ID number on both sides and ends. This only applies if no other hazardous or nonhazardous material is carried in the freight container or transport vehicle.

[A table titled "Hazardous Materials Table" displays. It is organized into several columns and rows. The column headers include (1) Symbols, (2) Hazardous Materials Descriptions and Proper Shipping Names, (3) Hazard Class or Division, (4) Identification Numbers, (5) PG, (6) Label Codes, and (7) Special provisions (§172.102).] In the HMR, the Hazardous Materials Table, or HMT, also prescribes certain requirements. *[The column headers "Hazardous Materials Descriptions and Proper Shipping Names" and "Symbols" and the entries under both the column headers are highlighted.]* Packages containing HAZMAT with proper shipping names that have the letter "G" in Column 1 of the HMT must be marked with the proper shipping name and the technical name – or names – of the material constituents. The technical name must be displayed in parentheses in association with the proper shipping name.

The HMR may require you to mark the technical names on the package when the HAZMAT is a mixture or solution of two or more materials. In this case, identify the technical names of at least two components most predominant to the hazards. Place the technical names in parentheses, immediately after the proper shipping name they're associated with.

As with labeling, marking requirements have some exceptions. In two instances, non-bulk packages of HAZMAT offered for transportation don't require the shipper's or receiver's name and address. The first is packages that are transported by highway only and won't be transferred from one motor carrier to another. And the second is packages that are part of a carload lot, truckload lot, or freight container load, where all contents of the railcar, truck, or freight container are shipped from one consignor to one consignee.

An exception also applies to orientation arrow markings, which generally mark outer packages that contain inner packagings with liquids – such as a bottle in a box – to indicate the proper package orientation. However, this doesn't apply to liquids contained in manufactured articles – for example, alcohol or mercury in thermometers – which are leak-tight regardless of their orientation. Additionally, it doesn't apply to HAZMAT packages shipped by air, provided the inner packaging contains no more than 4 fluid ounces, or 120 milliliters, with sufficient absorption material packed between the inner and outer packagings to completely absorb the liquid.

Non-bulk and bulk packages require some additional markings for instructions and cautions. Let's start with non-bulk packages.

Each non-bulk package that's a reportable quantity of a hazardous substance should be marked with the letters "RQ." Indicating the amount of RQ in the package is not required. Simply place the "RQ" with the proper shipping name – for example, RQ, UN3077, Environmentally hazardous substances, solid, n.o.s., (cupric acetate), 9, III.

Several additional markings apply to bulk packages. Most importantly, all bulk packages must display the United Nations, or UN, or North American – NA – ID number of the particular HAZMAT in the package. The display requirements for the ID number are based on package capacity. If the capacity is less than 1,000 gallons, or 3,785 liters, display the ID number on two opposite sides; if it exceeds or equals 1,000 gallons, or 3,785 liters, display the ID number on both sides and ends. When regulations apply, display the ID number on a placard, orange panel, or white diamond-shaped configuration. Ensure it's the same size and shape as a placard, but plain white with ID numbers only.

Bulk packaging for infectious substances also requires additional marking. Specifically, you must mark regulated medical waste with a BIOHAZARD marking that's at least 6 inches, or 152.4 mm, on each side and visible from the direction it faces, with an orange background and black symbols and letters.

The HMR authorizes three label modifications.The first is that text indicating a hazard isn't required on certain primary or subsidiary hazard labels. For example, for Class 3, the text FLAMMABLE LIQUID is not required on the label.

The second modification involves packages containing "oxygen, compressed" or "oxygen, refrigerated liquid." Here, the oxidizer label may be modified to display the word "oxygen" instead of "oxidizer" and use class number 2 instead of Division 5.1. It replaces the "nonflammable gas" and "oxidizer" labels.
The third modification concerns poisonous materials. You may modify the poison label to read "TOXIC" instead of "POISON." If your package contains a Division 6.1 Packing Group III material, the label may be modified to "PG III" instead of "POISON" or "TOXIC."

In all cases, the required labels must be printed on or affixed to the same surface of the package near the marked proper shipping name, provided the package dimensions are adequate. Alternately, you may print your label or affix it to a tag if your package either contains no radioactive material, the label is larger than the package, you're unable to affix a label to the package surface, or your package is a cylinder.

The HMR is clear on the requirements you should follow to transport your package safely, so ensure accurate labeling is prioritized for all HAZMAT packaging.
Next, you can practice what you've learned by answering some questions.

5. Knowledge Check: Labeling

- *identify appropriate labeling requirements for the safe transportation of hazardous materials*

Question 1: Multiple Choice

Which three statements regarding hazardous material labeling are true?

Options:

1. The term "label" means a prescribed hazard warning notice
2. Labels identify the primary and subsidiary hazards specific to materials
3. Labels must be at least 3.9 inches (100 mm) on each side
4. The hazard warning label may be placed anywhere on the package

Answer

1. The term "label" means a prescribed hazard warning notice
2. Labels identify the primary and subsidiary hazards specific to materials
3. Labels must be at least 3.9 inches (100 mm) on each side

Feedback:

Option 1: *This option is correct. The HMR defines the term "label" as a hazard warning notice. Labels contain information about necessary precautions and prohibitions.*

Option 2: *This option is correct. Based on the HMR, labels are defined as prescribed warning notices, which means they identify materials' primary and subsidiary hazards.*

Option 3: *This option is correct. According to the HMR, one of the requirements is that labels measure at least 3.9 inches, or 100 mm, along each side. They should also be diamond shaped.*

Option 4: *This option is incorrect. The HMR instructs that labels may also provide information about handling precautions and prohibitions.*

Question 2: Multiple Choice

Select the three statements that correctly describe labeling requirements for the safe transportation of hazardous materials.

Options:

1.

Option 2: *This option is correct. Column 4 of the HMT provides information on the ID number for each type of HAZMAT.*

Option 3: *This option is incorrect. The HMT does not tell you whether the material meets the limited quantities exception; it only gives you a CFR reference where you can read about the limited quantity exception.*

Option 4: *This option is incorrect. Exemptions are issued in writing by the DOT and authorize a company to perform a function that's not normally allowed under the HMR.*

Question 5: Multiple Choice

What is the authorization to manufacture or use a nonspecification, nonstandard packaging under special circumstances called?

Options:

1. Special Permit packaging
2. Nonstandard packaging
3. Modification packaging
4. Specialized container packaging

Answer

1. Special Permit packaging

Feedback:

Option 1: *This is the correct option. A Special Permit issued by the DOT exempts a company from certain packaging requirements under special circumstances.*

Option 2: *This option is incorrect. A company can be permitted to use nonstandard packaging provided they've been issued a Special Permit, which allows for packaging outside HMR limitations.*

Option 3: *This option is incorrect. Packages modified in ways not normally allowed by the HMR are acceptable, provided the company has been issued a Special Permit.*

Option 4: *This option is incorrect. Companies can use specialized container packaging, which the HMR normally doesn't permit, only on the basis of having a Special Permit issued by the DOT.*

Question 6: Matching

Match the HMT columns to the specific information they provide.

Options:

A. Column 7

B. Column 8A

C. Column 8B

D. Column 8C

Targets:

1. Lists exceptions to packaging requirements if certain conditions are met
2. Determines special provisions indicated by code letters and numbers
3. Lists packaging authorizations for bulk containers
4. Lists packaging authorizations for non-bulk containers

1. Class 3

Feedback:

Option 1: *This is the correct option. In the HMT, which is read from left to right, "gasoline" in column 2 - Description, Shipping Name – corresponds with "3" in column 3 - Hazard Class.*

Option 2: *This option is incorrect. The HMT is read from left to right and the information in column 3, Hazard Class, has to correspond to the information in column 2 – Description, Shipping Name. Class 7 doesn't apply.*

Option 3: *This option is incorrect. The information in the Description, Shipping Name column – gasoline – has to correspond with the information in column 3 - Hazard Class. In the case of gasoline, the hazard class is 3.*

Case Study: Question 2 of 3

For your convenience the case study is repeated with each question.

A shipment consists of one liter of gasoline.

The gasoline is in a metal can and packaged in a strong outer container.

Question: Multiple Choice

What is the packing group for gasoline?

Use the learning aid Hazardous Materials Table (HMT) for Gasoline to help you answer this question.

Options:

1. PG I
2. PG II
3. PG III

Answer

2. PG II

Feedback:

Option 1: *This option is incorrect. In the HMT, the information in column 5, Packing Group, must correspond to the information in column 2. PG I is not applicable in this case.*

Option 2: *This is the correct option. Column 5 in the HMT identifies the packing group or danger level, which for gasoline is PG II (medium danger).*

Option 3: *This option is incorrect. The HMT is reviewed from left to right, so the proper HAZMAT description and shipping name in column 2, which is "gasoline," leads to packing group II in column 5.*

Case Study: Question 3 of 3

Gasoline fits Packing Group II criteria, so you can choose from any of the metal drums in Section 173.202.

While Column 8B concerns non-bulk packagings, Column 8C lists packaging authorizations for bulk containers. Basically, bulk packagings have capacities greater than non-bulk. So, if you want to ship 8,000 gallons of gasoline in a cargo tank, for example, Column 8C will refer you to Section 173.242, *[Column 8C and the entries under it are highlighted.]* which offers various bulk packaging options – including rail cars, portable tanks, cargo tanks, and intermediate bulk containers – and the conditions for their use.

The last column in the HMT – Column 9 – identifies certain quantity and modal limitations. *[The column titled "(9) Quantity Limitations (see §§173.27 and 175.75)" is divided into two subcolumns namely, "(9A) Passenger aircraft/rail" and "(9B) Cargo aircraft only". The column header Quantity Limitations and the entries under it are highlighted.]* Always check if Column 9 restricts your packaging choices in any way. For example, in Section 173.202(c), single packagings are not authorized for transporting gasoline by passenger aircraft.

As mentioned already, an important part of correct HAZMAT packaging involves exceptions and Special Permits.

Quantity exceptions – such as small quantities, excepted quantities, and de minimis quantities – are outlined in Sections 173.4, 173.4a, and 173.4b. Should they apply to your package, some or all HMR packaging requirements will be lifted. However, certain requirements and restrictions also apply – for example, any person offering or transporting small, excepted, or de minimis quantities of HAZMAT must know the applicable section's requirements. This means additional training is required in order to ship HAZMAT under quantity exceptions. Also, these exceptions don't apply to Class 1 explosives, Division 2.1 flammable gases, and Division 6.2 infectious substances.

Suppose your company – which doesn't transport HAZMAT as a service – wants to transport a small amount of HAZMAT in a private motor vehicle. Is this allowed? According to the HMR's materials of trade exceptions, it is allowed, but only for certain quantities and types of HAZMAT. Sections 171.8 and 173.6 of the HMR elaborate further.

In comparison, a Special Permit is issued in writing by the DOT. It authorizes your company to perform a function that's not normally allowed under the HMR, *[The Hazardous Materials Table displays again.]* limited to the materials, regulations, conditions, and persons or class of persons named in the Special Permit. A Special Permit exempts your company from certain packaging requirements under special circumstances. It's important to always follow your company's guidelines, and to mark all packagings used for Special Permit shipments with "DOT-SP," followed by the Special Permit number, unless the Special Permit specifies otherwise.

The HMT is fundamental to ensuring your HAZMAT is packaged correctly. You should work through it diligently for each shipment to get your packages to their destinations safely.

Next, you can practice what you've learned so far by answering some questions.

3. Knowledge Check: Packaging

- *identify packaging requirements and practices to ensure safe transport*
- *identify specific information found on the HMT*
- *recognize what information on the HMT means or is used for*

Question 1: Multiple Choice

How is the correct packaging determined?

Options:

1. Proper shipping name, ID number, and label
2. Hazard class or division, packing group, and proper shipping name
3. Proper shipping name, packing group, and quantity of materials being shipped
4. Label, proper shipping name, and hazard class

Answer

3. Proper shipping name, packing group, and quantity of materials being shipped

Feedback:

Option 1: *This option is incorrect. Determining the correct packaging does require the proper shipping name, but the ID number and label apply to the HMT packaging procedure.*

Option 2: *This option is incorrect. Determining the correct packaging does require the packing group and proper shipping name, but the hazard class or division of material applies to the HMT packaging procedure.*

Option 3: *This is the correct option. HMR packaging requirements are determined by the proper shipping name, the packing group, and the quantity of materials being shipped.*

Option 4:

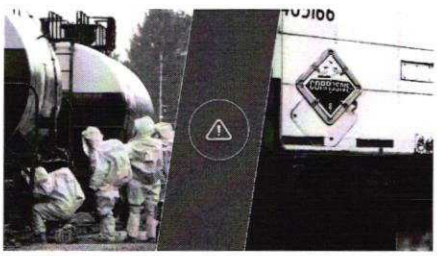
DOT 2: Packaging, Labeling, Marking, and Placarding

This training course will introduce the requirements of the Department of Transportation's Hazardous Materials Regulations, including packaging, labeling, marking, and placarding. The proper identification, preparation, and transportation of hazardous materials has the potential to impact everyone's safety. This training course may be used to meet the requirements for general awareness and familiarization training. Additional function-specific training will be provided by your employer.

This course was developed with subject matter support provided by EnSafe Inc., a global professional services company focusing on engineering, environment, health and safety, and information technology. Please note, the course materials and content were current with the laws and regulations at the time of the last expert review, however, they may not reflect the most current legal developments. Nothing herein, or in the course materials, shall be construed as professional advice as to any particular situation with respect to compliance with legal statutes or requirements.

Table of Contents

1. Video: DOT 2: Packaging, Labeling, Marking, and Placarding (sh_ehshsf_d33_enus_01)

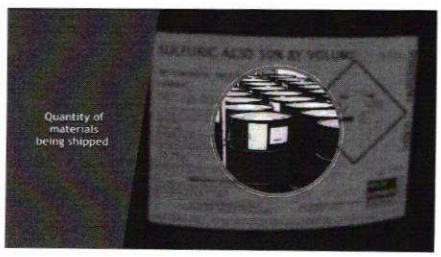


No Objectives

[Course title: DOT 2: Packaging, Labeling, Marking, and Placarding.] Over three billion tons of hazardous material are transported in the United States annually – about 800,000 shipments daily. When accidents occur, they can harm people, the environment, and property. The first line of defense in ensuring hazardous material is secure during transportation is adequate packaging, which requires adhering to the instructions prescribed in the Hazardous Materials Regulations.

In this course, you'll learn to determine packaging, labeling, marking, and placarding requirements and practices for transporting both bulk and non-bulk hazardous material. *[A table titled "Hazardous Materials Table" displays. It is organized into several columns and rows. The column headers include (1) Symbols, (2) Hazardous Materials Descriptions and Proper Shipping Names, (3) Hazard Class or Division, (4) Identification Numbers, (5) PG, (6) Label Codes, and (7) Special provisions (§172.102).]* You'll also learn about information in the Hazardous Materials Table and how to apply it.

2. Video: Packaging (sh_ehshsf_d33_enus_02)



- *identify packaging requirements and practices to ensure safe transport*
- *identify specific information found on the HMT*
- *recognize what information on the HMT means or is used for*

This option is correct. Column 10 of the HMT comprises two columns which specify requirements for transporting HAZMAT by cargo and passenger-carrying vessels.

Option 2: *This option is correct. Column 9 of the HMT consists of two columns which address special concerns for air and rail shipments.*

Option 3: *This option is incorrect. Appendix A of Section 172.101 is used to determine if a material is a hazardous substance.*

Option 4: *This option is correct. Column 8 consists of three subcolumns which provide information on exceptions and how to prepare nonbulk and bulk hazardous material shipments.*

Question 2: Multiple Choice

Which two pieces of information can be found in Appendix A?

Options:

1. Reportable quantities for hazardous substances
2. Lists of hazardous substances
3. Proper shipping names and requirements for transporting hazardous materials by cargo vessel

Answer

1. Reportable quantities for hazardous substances
2. Lists of hazardous substances

Feedback:

Option 1: *This option is correct. Appendix A helps determine if a substance is considered hazardous. Its two tables list all hazardous substances and the quantity of each that equals or exceeds the reportable quantity.*

Option 2: *This option is correct. Appendix A is used to determine if a material is a hazardous substance. It lists hazardous substances across two tables: hazardous substances other than radionuclides, and radionuclides.*

Option 3: *This option is incorrect. Proper shipping names and requirements for transporting hazardous materials by cargo vessel are listed in columns 2 and 10 of the HMT, respectively.*

Course HTML Resources

- Glossary: DOT 1: Introduction, Classification, and the Hazardous Materials Table

Term	Explanation
bulk packaging	A type of packaging that has no intermediate form of containment, such as a transport vehicle or freight container.
corrosives	Liquids or solids that cause destruction to human skin at the site of contact, or that have a severe corrosion rate on steel or aluminum.
Department of Transportation	Abbreviated as DOT, a department of the United States government, established on October 15, 1966. The mission of the DOT is to "Serve the United States by ensuring a fast, safe, efficient, accessible and convenient transportation system that meets our vital national interests and enhances the quality of life of the American people, today and into the future."
DOT	See Department of Transportation.
explosives	Products that are made for the sole purpose of creating explosions.
flammable liquids	Liquids that have a flash point of not more than 140°F.
flammable solids	Materials that are easily ignited, are spontaneously combustible, or react with water to emit flammable gases.
gases	Any material which is a gas at 68°F (20°C) or less and 14.7 psia (101.3 kPa) of pressure; a material which has a boiling point of 68°F (20°C) or less at 14.7 psia (101.3 kPa), which is ignitable at 14.7 psia (101.3 kPa) when in a mixture of 13% or less by volume with air; or a material that has a flammable range at 14.7 psia (101.3 kPa) with air of at least 12% regardless of the lower limit.
hazardous material	Abbreviated as HAZMAT, a substance or material that the Secretary of Transportation has determined capable of posing unreasonable risk to health, safety, and property when transported in commerce and has designated as hazardous under Section 5103 of the Federal Hazardous Materials Transportation law. The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials as defined in 49 CFR 171.8,

Option 3: *This option is incorrect. Column 5 contains the packing group assigned to the material, not Column 7.*

Option 4: *This option is incorrect. It's Column 4, not Column 7, that lists the 4-digit DOT identification number assigned to each HAZMAT.*

Question 4: Multiple Choice

Packing groups are listed in column 5 of the HMT and indicate the degree of danger presented by the material.

Which packing group means great danger?

Options:

1. PG I
2. PG II
3. PG III

Answer

1. PG I

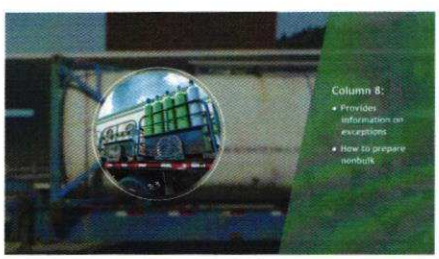
Feedback:

Option 1: *This is the correct option. PG I is the packing group that indicates great danger.*

Option 2: *This option is incorrect. PG II is used for materials that present medium danger. It's PG I that's assigned to the most dangerous materials.*

Option 3: *This option is incorrect. PG III represents minor danger. The PG that indicates great danger is PG I.*

12. Video: HAZMAT Columns 8 to 10 and Appendix A (sh_ehshsf_d32_enus_07)



- *identify information found in the HAZMAT Table columns 8 through 10 and Appendix A*

*[Topic title: HAZMAT Columns 8 to 10 and Appendix A.]*The DOT mandates that each transported HAZMAT meet appropriate safety requirements. Following the Hazardous Materials Table, or HMT, helps you determine what these requirements are and clarifies safety precautions for your shipment.

*[A sample hazardous material table displays. The information in this table is organized into ten columns. The columns are labeled as (1) Symbol, (2) Hazardous materials descriptions and proper shipping names, (3) Hazard class or division, (4) Identification numbers, (5) PG, (6) Label codes, (7) Special provisions (§172.102), (8) Packaging (§173.***), (9) Quantity limitations (see §§173.27 and 175.75), and (10) Vessel stowage. The column labeled Packaging is further divided into three sub columns labeled as (8A) Exceptions, (8B) Non-bulk, and (8C) Bulk. The column labeled Quantity limitations is further divided into two sub columns labeled as (9A) Passenger aircraft/rail and (9B) Cargo aircraft only. The column labeled Vessel stowage is further divided into two sub columns labeled as (10A) Location and (10B) Other.]*Each of the HMT's 10 columns provides specific information on the listed HAZMAT. For this topic, we'll focus on Column 8 to 10 and Appendix A.

Columns 8 to 10 detail HAZMAT packaging requirements according to the HMR. In the HMT, column 8 provides information on exceptions and how to prepare nonbulk and bulk hazardous material shipments. This column consists of three subcolumns.

Column 8A refers to the HMR section that covers exceptions to packaging requirements. If column 8A displays "None," then no exceptions apply. You then move on to column 8B or 8C.

Column 8B lists the packaging sections applicable to prepare hazardous material for nonbulk shipment, while column 8C cites the packaging sections applicable to prepare HAZMAT for bulk shipment.

However, some HAZMAT are not assigned to PG. The materials exempt from packing groups are in Class 2 and Class 7; Division 6.2 – other than regulated medical waste and some Class 9

When preparing the papers that should accompany a shipment, you must follow an exact sequence for compiling the HAZMAT description. First, indicate the ID number, followed by the proper shipping name, hazard class or division, and packing group. These four items – in this precise order – constitute a hazardous material's basic description.

Next in the HMT is Column 6. This column specifies label codes, which represent the hazard warning labels personnel are required to apply to each package of hazardous materials unless an exemption applies. Section 172.402 of the HMR details additional labeling requirements. If you encounter two or more label codes listed, the first represents the primary hazard, while the rest are subsidiary hazards.

Column 7 cites codes for special provisions that are applicable to packaging, packaging requirements, certification, marking, or labeling of hazardous material. These special provisions are additional to the standard packaging requirements, so you must conform to the provisions' limitations or additional regulations.

Special provisions are coded with numbers or a combination of numbers and letters. "Numbers only" codes apply to all HAZMAT shipments.
Let's run through the different codes.

A applies when a material is to be transported by aircraft.

B applies to bulk packaging, while N applies to nonbulk packaging.

T applies to materials offered in UN portable tanks, and last but not least, W applies when the material is to be transported by water.

The HMT is your guide to finding safety requirements for any HAZMAT consignment. It's imperative that you're clear on what information each column provides.
Now take a break to practice what you've learned by answering some questions.

11. Knowledge Check: HAZMAT Columns 3 to 7

- *identify information found in the HAZMAT Table columns 3 to 5*
- *identify information found in the HAZMAT Table columns 6 and 7*

Question 1: Matching

Match the HMT columns to the information they contain.

Options:

A. Column 3

B. Column 4

C. Column 5

Targets:

1. Lists the 4-digit DOT identification number assigned to the hazardous material
2. Specifies the packing group assigned to the material
3. Lists the hazard class or division of the material or the word "Forbidden"

Answer

1: Option B

2: Option C

3: Option A

Feedback:

Target 1: *Column 4 of the HMT lists the 4-digit DOT identification number assigned to the hazardous material. These numbers provide quick HAZMAT identification.*

Target 2: *Column 5 of the HMT specifies the packing group assigned to the material. Each packing group indicates the relative degree of danger that a HAZMAT presents.*

1. Proper shipping names of the materials
2. Symbols that tell you about the proper shipping name
3. Regulations for packing and transporting hazardous materials
4. Rules for enforcing HAZMAT regulations

Answer

1. Proper shipping names of the materials

Feedback:

Option 1: *This is the correct option. Column 2 of the HMT shows proper shipping names for describing hazardous material. The names have to subscribe to certain formatting and naming conventions.*

Option 2: *This option is incorrect. The HMT provides a system for packaging and transporting hazardous material, of which column 2 is used to identify proper shipping names.*

Option 3: *This option is incorrect. Column 2 of the HMT contains information about proper shipping names.*

Option 4: *This option is incorrect. The function of column 2 is to identify proper shipping names.*

Question 2: Matching

Match the symbols used in column 1 to their descriptions.

Options:

A. "D"

B. "+"

C. "A"

D. "W"

E. "I"

F. "G"

Targets:

1. Identifies material only regulated if transported by air, unless hazardous substance or waste
2. Identifies material only regulated if transported by water, unless hazardous substance or waste
3. Identifies proper shipping names for domestic transportation
4. Fixes proper shipping name, hazard class and division, or packing group
5. Identifies proper shipping names where HAZMAT technical names are associated with basic description
6. Identifies proper shipping names for international transport

Answer

1: Option C

2: Option D

3: Option A

4: Option B

5: Option F

6: Option E

3. Class 4 – Flammable Solids
4. Class 5 – Oxidizers
5. Class 8 – Corrosives
6. Class 7 – Radioactive Materials

Answer

1: Option D

2: Option C

3: Option B

4: Option A

5: Option E

6: Option F

Feedback:

Target 1: *Explosives are substances intended to combust. This classification includes six divisions: explosives with mass explosion hazard, minor explosion hazard, those with projection and fire hazard, insensitive explosives, and extremely insensitive articles.*

Target 2: *Flammable liquids have a flash point not more than 140°F (60°C). At this temperature, liquids in Class 3 give off enough vapors to form an ignitable mixture with air near the surface of the liquid.*

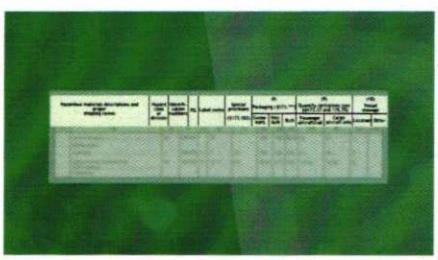
Target 3: *Class 4 contains three divisions. Division 4.1 includes materials that easily ignite and burn without oxygen, Division 4.2 includes solids that may spontaneously combust, and Division 4.3 includes solids that react with water.*

Target 4: *Class 5 oxidizers are highly unstable and dangerous. Division 5.1 materials give off oxygen, which can cause or enhance combustion in other materials, while Division 5.2 contains highly unstable organic peroxides.*

Target 5: *Corrosives in Class 8 are liquids that can destroy whatever they come in contact with, including skin, steel, or aluminum.*

Target 6: *Radioactive materials in Class 7 are substances that spontaneously emit ionizing radiation. They can be solids, liquids, or gases.*

8. Video: HAZMAT Columns 1 and 2 (sh_ehshsf_d32_enus_05)



- *identify information found in the HAZMAT Table columns 1 and 2*

*[Topic title: HAZMAT Columns 1 and 2.]*When transporting HAZMAT, safety is crucial. To reduce the risks, the Department of Transportation, or DOT, provides regulatory oversight of the safe handling and transport over HAZMAT through the Hazardous Materials Regulations, or HMR.

All HAZMAT personnel should consult the Hazardous Materials Table – the HMT – to ensure regulatory compliance when preparing shipments for transport.

When preparing a shipment, you should first consult the HMT to confirm if a load is hazardous. *[A sample hazardous material table displays. The information in this table is organized into ten columns. The columns are labeled as (1) Symbol, (2) Hazardous materials descriptions and proper shipping names, (3) Hazard class or division, (4) Identification numbers, (5) PG, (6) Label codes, (7) Special provisions (§172.102), (8) Packaging (§173.***), (9) Quantity limitations (see §§173.27 and 175.75), and (10) Vessel stowage. The column labeled Packaging is further divided into three sub columns labeled as (8A) Exceptions, (8B) Non-bulk, and (8C) Bulk. The column labeled Quantity limitations is further divided into two sub columns labeled as (9A) Passenger aircraft/rail and (9B) Cargo aircraft only. The column labeled Vessel stowage is further divided into two sub columns labeled as (10A) Location and (10B) Other.]*The HMT alphabetically lists the names of thousands of the most commonly transported HAZMAT.

Which hazard class consists of products that are easily ignited or spontaneously combustible or that react with water to emit flammable gases?

Options:

1. Class 6 - Poisons and Infectious Substance
2. Class 8 - Corrosives
3. Class 9 – Miscellaneous
4. Class 4 – Flammable Solids, Spontaneously Combustible, Dangerous When Wet

Answer

4. Class 4 – Flammable Solids, Spontaneously Combustible, Dangerous When Wet

Feedback:

Option 1: *This option is incorrect. Class 4 – Flammable Solids, Spontaneously Combustible, and Dangerous When Wet – consists of easily ignitable products that are spontaneously combustible, or that may react with water to emit flammable gases.*

Option 2: *This option is incorrect. According to the HMR, materials in Class 4 may become spontaneously flammable when coming in contact with water, or give off flammable or toxic gases.*

Option 3: *This option is incorrect. It's Class 4, not Class 9, that covers products that can easily ignite, spontaneously combust, or react with water to emit flammable gases.*

Option 4: *This is the correct option. The HMR distinguishes Class 4 – Flammable Solids, Spontaneously Combustible, Dangerous When Wet – as materials that may become spontaneously flammable when coming in contact with water, or give off flammable or toxic gases.*

Question 2: Matching

Match each hazard class to a property associated with it.

Options:

A. Class 2 - Gases

B. Class 3 – Flammable Liquids

C. Class 1 - Explosions

Targets:

1. Has a maximum flash point of 140°F (60°C)
2. Has a projection hazard which scatters pieces everywhere
3. Has flammable properties that can become explosive when combined with air

Answer

1: Option B

2: Option C

3: Option A

Feedback:

Target 1: *A Class 3 flammable liquid can reach 140°F (60°C) and give off enough vapors to form an ignitable mixture with the air near the surface of the liquid.*

Target 2:

Target 2: *A material classified as a hazardous substance equals or exceeds the listed reportable quantity in each single package, according to Appendix A to 49 CFR 172.101.*

Target 3: *Hazardous waste is any material subject to the Hazardous Waste Manifest Requirements of the Environmental Protection Agency (EPA), as specified in 40 CFR Part 262.*

Target 4: *According to the HMR, transportation is defined as the movement of property, and loading, unloading, or storage incidental to that movement.*

6. Video: Hazard Classes (sh_ehshsf_d32_enus_04)

- *recognize hazards according to the DOT's nine hazard classes*

[Topic title: Hazard Classes.] Every type of HAZMAT has unique properties and risks. Consequently, your company must adhere to safety measures appropriate to the transport of HAZMAT.

To determine applicable safety precautions, the US Department of Transportation, or DOT, has established nine hazard classes, each with distinct hazard characteristics. Knowing these hazard classes is essential to determining the proper safety requirements for your HAZMAT.

The DOT's Hazardous Materials Regulations, or HMR, is the definitive guide to transporting HAZMAT safely. Title 49 of the Code of Federal Regulations, or CFR, defines criteria for hazard classes and divisions in Part 173 of the HMR.

Let's start with Class 1.

Products that are purpose-built to combust are considered Class 1 hazards – Explosives. Class 1 is composed of six hazard divisions. Division 1.1 explosives have a mass explosion hazard, which means almost the entire load would be affected instantaneously during transportation.

Division 1.2 are explosives with a projection hazard – meaning they don't just explode, but also send projectile fragments everywhere.

Division 1.3 explosives have a fire hazard and either a minor blast hazard, a minor projection hazard, or both.

Explosives with a minor explosion hazard fall within Division 1.4. The effects of these explosives are largely confined to the package, so projectile fragments of significant size or range aren't expected. Also, the contents are not susceptible to an explosion from an external fire.

Division 1.5 explosives are very insensitive yet include a mass explosion hazard. In fact, they're so insensitive that, under normal transport conditions, there's little chance of them detonating.

Finally, Division 1.6 hazards are extremely insensitive and pose no mass explosion hazard. They contain substances that are extremely insensitive to detonation, meaning the odds of them accidentally starting or spreading an explosion are practically zero.

Next are Class 2 hazards, which include gases that are cooled, compressed, or dissolved to make their transportation and handling easier. When you transport gases in containers, they're often in liquid form. But, if the liquid escapes and vaporizes, it forms a gas.

Class 2 gases are split across three divisions.

Division 2.1 includes flammable gases that can become explosive when mixed with air. The DOT defines a flammable gas as any material that meets certain criteria outlined in Section 173.115 of the HMR.

Note that where other definitions of flammable gas use standard atmosphere, or atm 1, as the unit of mean atmospheric pressure, this equals the same atmospheric pressure as 14.7 pounds per square inch absolute, or 14.7 psia, and 101.3 kilopascals of pressure. So, the HMR explains that a flammable gas is a gas at 68°F (or 20°C) or less and 14.7 psia of pressure, with a boiling point of 68°F (or 20°C) or less at 14.7 psia, subject to one of two criteria. First, it's ignitable at 14.7 psia when in a mixture of 13% or less by volume with air. And second, it has a flammable range at 14.7 psia with air of at least 12%, regardless of the lower limit.

Division 2.2 deals with compressed gases that are nonflammable and nonpoisonous but become hazardous through pressurization. A material or mixture in this division must meet two criteria. First, it's a liquefied gas or cryogenic liquid that in the packaging exerts a pressure of 29 pounds per square inch gauge, or psig – or 43.8 psia per 200 kilopascals – or greater at 68°F, which is 20°C. Second, it doesn't meet the definition of Division 2.1 or Division 2.3 gases.

By definition, Division 2.3 describes poisonous gases that cause serious illness or death due to inhalation or exposure. Such a substance is a gas at 68°F – or 20°C – or less and 14.7 psia, or 101.3 kilopascals. It's also known or presumed to be so toxic to humans as to pose a health hazard during transportation.

Question 1: Multiple Choice

The US Department of Transportation's Hazardous Materials Regulations (HMR) hold specific training requirements for all HAZMAT employees.

Which training types are required for HAZMAT employees?

Options:

1. Company security training
2. Safety training
3. Security awareness training
4. Function-specific task training
5. General awareness training
6. Soft skills development training

Answer

1. Company security training
2. Safety training
3. Security awareness training
4. Function-specific task training
5. General awareness training

Feedback:

Option 1: *This option is correct. In-depth security training is required and can include company security objectives, specific security procedures, employee responsibilities, organizational security structure, and required actions.*

Option 2: *This option is correct. Safety training is a requirement of the HMR.*

Option 3: *This option is correct. Security awareness training is required within the employees' first 90 days of employment and teaches them how to recognize and respond to security threats.*

Option 4: *This option is correct. Employees must receive training specific to the function of their position as a HAZMAT employee.*

Option 5: *This option is correct. General awareness training is required and important for all HAZMAT employees to familiarize with the key aspect of their role.*

Option 6: *This option is incorrect. While soft skills training is important, it is not a requirement under the HMR.*

4. Video: Definitions (sh_ehshsf_d32_enus_03)

- *identify terms associated with hazardous materials transportation*

[Topic title: Definitions.] The Department of Transportation's Hazardous Materials Regulations, or HMR, is the authority on transporting hazardous materials safely. But, following the HMR accurately requires understanding key terms as defined in Title 49 of the Code of Federal Regulations, or 49 CFR, parts 100 through 185.

DOT 1: Introduction, Classification, and the Hazardous Materials Table

This training course will introduce the requirements of the Department of Transportation's Hazardous Materials Regulations, including definitions, the nine hazard classes, and the HAZMAT Table. The proper identification, preparation, and transportation of hazardous materials impact everyone's safety. This course may be used to meet the requirements for general awareness or familiarization training. Your employer will provide additional general awareness, function-specific safety awareness, and security awareness training. The learning objectives of the course are to define terms associated with hazardous materials transportation, classify hazards according to DOT's nine hazard classes, and recall and interpret information found in the HAZMAT Table.

This course was developed with subject matter support provided by EnSafe Inc., a global professional services company focusing on engineering, environment, health and safety, and information technology. Please note, the course materials and content were current with the laws and regulations at the time of the last expert review, however, they may not reflect the most current legal developments. Nothing herein, or in the course materials, shall be construed as professional advice as to any particular situation with respect to compliance with legal statutes or requirements.

Table of Contents

1. Video: DOT 1: Introduction, Classification, and the Hazardous Materials Table (sh_ehshsf_d32_enus_01)

No Objectives

[Course title: DOT 1: Introduction, Classification, and the Hazardous Materials Table.] Hazardous material – or HAZMAT – accounts for more than three billion tons of cargo annually in the United States. That's over 800,000 daily shipments by land, sea, and air. To reduce the risks associated with transporting HAZMAT, the Department of Transportation, or DOT, Hazardous Materials Regulations – HMR – provide comprehensive guidance to prepare, package, and handle HAZMAT correctly.

In this course, you'll learn about the training requirements for anyone handling HAZMAT, as well as important HAZMAT terminology. *[A sample hazardous material table displays. The information in this table is organized into ten columns. The columns are labeled as (1) Symbol, (2) Hazardous materials descriptions and proper shipping names, (3) Hazard class or division, (4) Identification numbers, (5) PG, (6) Label codes, (7) Special provisions (§172.102), (8) Packaging (§173.***), (9) Quantity limitations (see §§173.27 and 175.75), and (10) Vessel stowage. The column labeled Packaging is further divided into three sub columns labeled as (8A) Exceptions, (8B) Non-bulk, and (8C) Bulk. The column labeled Quantity limitations is further divided into two sub columns labeled as (9A) Passenger aircraft/rail and (9B) Cargo aircraft only. The column labeled Vessel stowage is further divided into two sub columns labeled as (10A) Location and (10B) Other.]* You'll also learn to recognize the DOT's nine hazard classes and how to get information from the ten columns and Appendix A of the Hazardous Materials Table, or HMT.

2. Video: Training Requirements (sh_ehshsf_d32_enus_02)

Harold should receive in-depth security training because he's responsible for implementing a vital element of a security plan.

Question 3: Multiple Choice

Identify four training requirements for employees who should receive in-depth training.

Options:

1. Company security objectives
2. Actions to be taken in the event of a security breach
3. Organizational security structure
4. Specific security procedures
5. Packaging requirements for explosive materials

Answer

1. Company security objectives
2. Actions to be taken in the event of a security breach
3. Organizational security structure
4. Specific security procedures

Feedback:

Option 1: *This option is correct. In-depth training should cover company security objectives that arise from risk assessments.*

Option 2: *This option is correct. A hazmat employee should receive training on the specific actions to take in the event of a security breach, as well as the best methods of prevention.*

Option 3: *This option is correct. A hazmat employee receiving in-depth training should understand the organizational security structure.*

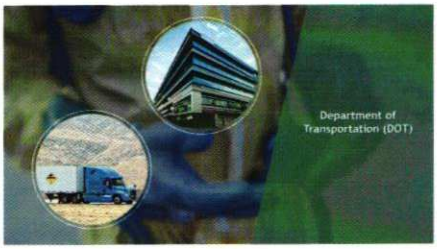
Option 4: *This option is correct. An employee receiving in-depth training should know the security procedure specific to him and his role in the company, based on the security plan.*

Option 5: *This option is incorrect. This training is focused on materials rather than the security plan. In-depth training focuses specifically on the methods and procedures relating to the employer's security plan.*

Course HTML Resources

- Glossary: DOT: Security for Shipment of Hazardous Materials

Term	Explanation
acetylene	A colorless and highly flammable or explosive gas commonly used in welding.
bulk packaging	A packaging, other than a vessel or a barge, including a transport vehicle or freight container, in which hazardous materials are loaded with no intermediate form of containment.
capacity	The ability to receive, hold, or absorb.
caustic	A substance that strongly irritates, burns, or corrodes living tissue.
characterization	The act of describing the qualities of a particular substance using visual and chemical analysis.
combustible	Capable of igniting and burning. Combustible liquids have a flash point that is at or above 140°F.
compatibility	Capable of existing or performing in agreeable combination with another or others as in the case of chemical mixing.
compressed gas	Gas under greater than atmospheric pressure.
corrosives	Liquids or solids that cause destruction to human skin at the site of contact, or that have a severe corrosion rate on steel or aluminum.
decompose	To decay or break down. Some materials will decompose into different compounds or materials.
DOT	Abbreviation for Department of Transportation.



- *recognize examples of employers required by the DOT to implement a security plan*
- *match the type of training required by the DOT to examples of employees involved in hazardous material transportation*
- *identify the in-depth and awareness training requirements for employees responsible for implementing a security plan*

[Topic title: Employers, Employees, and Security Plans.] Having a back-up plan is always a good idea, whether you need one or not. In the same way, if your company is involved in the transportation of hazardous materials, then having a security plan in place – even when it's not obligatory – is a good idea.

But when is it obligatory for employers to have a security plan in place? According to the Department of Transportation, or DOT, organizations that require security plans are those transporting or offering to transport one or more hazardous material of a type and quantity listed in the Hazardous Material Regulations under Title 49 of the Code of Federal Regulations, or CFR, Part 172.800(b). Examples would include division 1.1, 1.2, or 1.3 materials, organic peroxides, and materials poisonous by inhalation.

Security plans may also be required when the quantity of a material being transported or offered for transport requires placarding under the DOT Hazardous Materials Regulations. Examples include materials such as division 1.4, 1.5, or 1.6, and uranium hexafluoride.

Additionally, security plans are required for the transportation of large or bulk quantities of hazardous material. The DOT defines large bulk quantities as materials in quantities greater than 6,614 pounds, or 3,000 kilograms, for solids or 792 gallons – 3,000 liters – for liquids and gases in a single packaging. Specifically, security plans are required for large bulk quantities of materials, such as division 2.1 and 6.1; and for Class 3 materials meeting the criteria for Packing Group I or II.

The DOT also stipulates training requirements for employees. There are two types of employees who require training: those who are required to implement a security plan, and those who aren't required to implement a plan but are involved with hazmat handling or transportation.

If you're a hazmat employee of a company that has a DOT security plan in place, then you should receive in-depth security training. This training must cover company security objectives and employee responsibilities, as well as actions to be taken in the event of a security breach. You should also be informed about the organizational security structure and specific security procedures.

Then, if your company doesn't have a DOT security plan, but you're required to work with hazmat, you should be given security awareness training. This training is more generalized and aims to supply a basic knowledge of hazmat security risks and procedures. It should provide an awareness of the security risks associated with hazmat transportation, methods to enhance transportation security, and the skill of recognition and response to possible security threats.
Consider two employees who are both involved with hazmat deliveries but who require different training.

Ellen is a laboratory assistant who receives and signs for deliveries of chemicals and hazardous substances. She requires security awareness training because, although she's not responsible for transporting or securing the goods, she should understand the nature and risk of what she is handling.
Earl delivers chemicals and hazardous substances to Ellen's laboratory. Earl's employer implements a security plan, so he should receive in-depth security training to ensure he knows exactly what he's responsible for, the security procedures in place, and the risks to account for.

With these security requirements and training specifications in mind, let's take a short break to answer a few practice questions.t.

11. Knowledge Check: Employers, Employees, and Security Plans

- *recognize examples of employers required by the DOT to implement a security plan*
- *match the type of training required by the DOT to examples of employees involved in hazardous material transportation*
- *identify the in-depth and awareness training requirements for employees responsible for implementing a security plan*

Question 1: Multiple Choice

Which three employers require a security plan as defined by the DOT?

Access the job aid Security Plan – Frequently Asked Questions to help you answer the question, if needed.

Options:

1. A company transports shipments of uranium hexafluoride that do not require hazard placards
2. A company transports 900 gallons of a Division 2.1 flammable gas per shipment

Option 4: *This option is incorrect. It is not currently a requirement that the security plan be kept electronically for any length of time.*

Question 2: Multiple Choice

What are three required components of a security plan, as defined by the DOT?

Options:

1. Personnel security
2. En route security
3. Unauthorized access
4. Penalties for noncompliance

Answer

1. Personnel security
2. En route security
3. Unauthorized access

Feedback:

Option 1: *This option is correct. A security plan should outline procedures for preventing potential security risks from personnel. The plan should advise checking new employee details and increasing awareness of suspicious colleagues.*

Option 2: *This option is correct. En route security measures should be outlined in a security plan. Carrier details, communication systems, alternative routes, and emergency contacts should all be included.*

Option 3: *This option is correct. A security plan should provide methods to prevent unauthorized access to hazmat shipments, including a sign-out system for keys, verification checks, and security spot checks.*

Option 4: *This option is incorrect. Penalties for noncompliance are not required in the security plan. The plan should provide procedures and assistance for the safe transportation of hazardous materials.*

Question 3: Matching

Match the first three steps of developing a security plan with the activities or actions performed during the step.

Options:

A. Scoping

B. Knowledge of operations

C. Assessment

Targets:

1. Determining and characterizing the company's operations that need risk management, identifying those involved, and determining where vulnerabilities lie
2. Detecting potential security risks, including confirming quantities of materials transported and any security procedures already in place
3. Identifying security risks, assessing procedures in place, and noting control points – elements that should be addressed, such as personnel, hazmat control, communications, and emergency response

Answer

Plutonium is a Class 7 radioactive material that requires the Class 7 placard when certain quantities of material are being transported. The Class 7 placard with its trefoil symbol is easy to recognize and universally known to symbolize radiation or radioactivity.

Chlorates are Class 5 oxidizers that are identified during transport with the use of the Class 5 Oxidizer placard. The yellow placard is illustrated with an image of a burning O and carries the division name, and the hazard class and division.

Correct answer(s):

Option A = Target 1
Option B = Target 2
Option C = Target 3
Option D = Target 4

8. Video: Elements of a Security Plan (sh_ehshsf_d36_enus_05)

- *identify the requirements of a security plan*
- *recognize examples of the steps taken to develop a security plan*

[Topic title: Elements of a Security Plan.] When dealing with anything dangerous, forewarned is forearmed. That means that it's always best to have a plan in place – not just to prevent mishaps, but to manage incidents should they occur. That's why organizations that handle and transport hazardous materials may be required to implement security plans.
A security plan outlines the potential risks of hazmat shipments, prompts risk assessment, and provides guidance in the event of a security breach.

The Department of Transportation, or DOT, has specific regulations regarding which organizations are required to have a security plan in place, which you'll learn about in the next topic. If your company is a hazmat transporter that's required to have a plan and the DOT chooses to conduct a compliance review, you could get a visit from a representative at any time. Therefore, you should have your security plan prepared, up to date, and readily available.

At a minimum, a security plan must include an assessment of transportation security risks for shipments of hazardous materials and include three main components, the first of which is personnel security.

Personnel security takes into account new employees who could pose a security risk. So the security plan should provide measures to verify employee information. The plan should also include procedures to increase employee awareness concerning suspicious colleagues or incidents.

The second security plan component is unauthorized access, which involves the prevention of unauthorized handling of hazmat shipments. A plan should include security spot checks, paperwork verification during deliveries, designation of employees for sensitive handling, and sign-out systems for keys.

Finally, the en route security component involves the security of hazmat shipments during their journeys. There should be systems in place to make sure materials are safe and secure and that alternate routes are available. En route security includes making sure there are emergency contacts in case of incidents and that there are established communications systems between employers and transporters.

The security plan must identify, by job title of the senior management official responsible for overall development and implementation of the security plan. The plan must also identify security duties for each position or department that is responsible for implementing the plan, and a plan for training hazardous material employees on the objectives and procedures of the plan. The actual security plan must be in writing and retained for as long as it's in effect. The plan must be reviewed annually and revised as necessary to reflect any changes in circumstances.

A security plan is important for everyone's safety and security, from the shippers, transporters, and to the general public. As such, employees must understand the security plan and abide by it at all times. There should be copies available upon request, and someone should be available to answer any questions employees may have concerning the plan.

There is no standard security plan – each plan must be specific to a particular company. Say, for example, that you're responsible for creating a security plan for a small haulage company that transports chemicals to laboratories throughout the US. There are several important steps you need to take in order to develop a security plan according to the company's specific needs.

The first step is scoping. During this step, you determine and characterize the operations in the company that need risk management. You also identify those involved – such as shippers and police – and determine where vulnerabilities lie. For the haulage company, vulnerabilities include the materials being hazardous even in small quantities, and that the truck drivers are separated from their cargo at some points during shipping, during stops for gas or breaks.

Next, let's consider a docking bay containing vehicles that are about to transport hazardous materials.

A tanker is ready to transport 5,000 gallons of gasoline to several gas stations in the state. Gasoline is a highly flammable liquid that should be identified in case of an accident on the highway, so there should be a class 3 flammable placard with the hazard warning "Gasoline."

On another vehicle, 2,000 pounds of hydrochloric acid is due for delivery to a laboratory. The acid is corrosive and hazardous even in small quantities, so a class 8 corrosive placard must be attached to the transport vehicle.

There's also a cargo of flares ready to be shipped to the Coast Guard. Flares fall under class 1 explosives, division 1.4 explosives with no major blast hazard, so the vehicles must have an explosives placard.

A quantity of arsenic is to be transported to a bronzing company. A class 6 poisons, division 6.1 nongaseous poisonous materials placard should be attached because arsenic is poisonous but not infectious.

Another truck holds a large quantity of matches that are tightly packaged. Because matches could ignite if exposed to friction, the truck should have a class 4 materials, division 4.1 flammable solids placard.

Class 9 placarding is not required for domestic shipments. You may ship a hazardous material, for example, a bulk shipment of asbestos removed as part of an abatement project and use placards, but placards are not required.

Using placards is an effective way to communicate which hazardous materials are in transit.

Let's take a short break for some practice questions. After you've finished, we'll pick up here.

7. Knowledge Check: Placards for Hazardous Materials

- *match the transportation placards to the hazardous materials they represent*
- *identify which placards should be used for transporting hazardous materials in a given scenario*

Question 1: Interactive

Question

Use the learning aid which was made available on the previous page, to determine which hazard class and division each example of hazardous cargo belongs to, so you can identify the placard that should be used to label it for transport.

Drag each example to the placard that should be used when transporting it.

Options:

A. Asbestos
B. Dynamite
C. Helium
D. Fertilizer

Targets:

Answer

Asbestos is considered a Class 9, Miscellaneous material. This class applies to any material that doesn't require a specific placard but that carries a low risk of hazard. The placard for this category is black and white striped.

Dynamite is a Class 1 Explosive, in division 1.1 due to its high risk of mass explosion. This placard shows the class at the bottom, the division number above that, and a letter designating the compatability group after the division number.

Helium is a nonflammable, nonpoisonous Class 2 Compressed Gas in division 2.2. It requires a Class 2 Compressed Gas placard when transported.

Fertilizer is classified as a Class 5 Oxidizer. It should be transported with a Class 5 division 5.1 Oxidizer placard.

Correct answer(s):

Option A = Target 1
Option B = Target 2
Option C = Target 3
Option D = Target 4

Now match each hazard class division name for substances in hazard classes 4, 5, and 6 with the division number within the class it represents.

Options:

A. Infectious substances

B. Organic peroxide

C. Oxidizer

D. Spontaneously combustible material

E. Nongaseous poisonous materials

F. Flammable solid

Targets:

1. 4.2
2. 5.1
3. 5.2
4. 6.2
5. 6.1
6. 4.1

Answer

1: Option D

2: Option C

3: Option B

4: Option A

5: Option E

6: Option F

Feedback:

Target 1: *Division 4.2 defines a material as spontaneously combustible. Materials in this category can be pyrophoric or self-heating.*

Target 2: *Division 5.1 defines a material as an oxidizer – a solid or liquid that yields oxygen.*

Target 3: *Division 5.2 is an organic peroxide, which is a compound consisting of two joined oxygen atoms.*

Target 4: *Division 6.2 indicates that a material is an infectious substance. Examples include medical waste and samples.*

Target 5: *Division 6.1 indicates that a material is a nongaseous poisonous material, examples of which include chlorinated solvents and pesticides.*

Target 6: *Division 4.1 is a flammable solid. Within this category are three types: desensitized explosives, self-reactive materials, and readily combustible materials.*

6. Video: Placards for Hazardous Materials (sh_ehshsf_d36_enus_04)

5: Option D

6: Option B

Feedback:

Target 1: Explosives are defined by Hazard Class 1, which includes any substance or article which is designed to function by explosion, or which, by chemical reaction within itself, is able to function in a similar manner.

Target 2: Gases are covered by Hazard Class 2, which includes nonflammable, flammable, and poisonous gases.

Target 3: Flammable and combustible liquids are hazard Class 3, which includes gasoline, kerosene, and certain medicines.

Target 4: Hazard Class 4 is flammable solids, spontaneously combustible, and dangerous when wet materials.

Target 5: Oxidizers are covered by Hazard Class 5, which also includes organic peroxides.

Target 6: Poisonous materials are defined by Hazard Class 6, which also includes infectious substances.

Question 2: Matching

Now match the remaining hazard classes with their hazard class numbers or categories.

Options:

A. Miscellaneous material

B. Corrosive material

C. Forbidden materials and Forbidden explosives

D. Radioactive material

Targets:

1. Class 7
2. Class 8
3. Class 9
4. Unclassified (No number)

Answer

1: Option D

2: Option B

3: Option A

4: Option C

Feedback:

Target 1: Radioactive materials are defined under Class 7, which includes materials that have a risk of ionizing radiation emission.

Target 2: Corrosive materials are covered by Class 8, which include materials that can destroy human skin and surfaces.

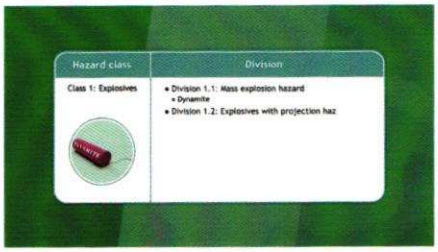
Target 3: Miscellaneous materials are labeled Class 9 and include marine pollutants and materials with noxious or anesthetic properties.

Target 4: Forbidden materials and forbidden explosives are those considered to be too dangerous to transport.

Option 3: *This option is incorrect. Certain hazardous materials are vital to the US economy and need to reach their delivery points safely to ensure the continued functioning of things like gas stations, hospitals, and factories.*

Option 4: *This option is correct. Stolen hazardous materials could be misused for terrorist purposes.*

4. Video: Hazard Classes (sh_ehshsf_d36_enus_03)



- *match the hazard classes with their numbers as defined by the Department of Transportation*
- *match the hazard class divisions with their numbers as defined by the Department of Transportation*

[Topic title: Hazard Classes.] When you're faced with communicating lots of important data, it's best to organize the information in a way that makes sense.

In the case of hazardous materials, the Department of Transportation, or DOT, determines the nature of the materials using a classification system made up of hazard classes defined by the Secretary of Transportation. Five of the classes are broken down into divisions; this breakdown allows transporters and shippers to be more specific when classifying their shipments.

Let's begin with Hazard Class 1, explosives. Explosives are defined as any substance or article, including a device, with the primary function of explosion, or which could explode following a chemical reaction.

Division 1.1 defines a hazardous material with a mass explosion hazard, such as dynamite. Division 1.2 is explosives with a projection hazard, such as grenades, and Division 1.3 defines explosives that are mainly fire hazards and have a risk of minor blast or projection hazard. An example of a division 1.3 hazard would be large fireworks for organized displays.

Then there's Division 1.4, which defines explosives that have no major blast hazard but could cause small explosions – things like small arms ammunition and small fireworks. Division 1.5 is assigned to explosives that are insensitive and unlikely to explode, things like blasting agents. And finally, Division 1.6 defines detonating substances with a very low risk of explosion, such as flares.

Next is Hazard Class 2, which defines three types of gases.

Division 2.1 applies to flammable gas, which is ignitable or flammable when mixed with air under certain conditions. Examples include butane and propane.
Division 2.2 covers nonflammable compressed gas. These gases – which include things like household aerosol products and refrigerants – are neither flammable nor toxic.

Last but not least, Division 2.3 defines poisonous gases – those toxic enough to pose a threat to human health during transportation or handling. Carbon monoxide, ammonia, and chlorine are poisonous gases.

Then there's Hazard Class 3, which defines flammable and combustible liquids. Class 3 liquids include gasoline, diesel oil, kerosene, crude oil, paint, adhesives, and certain medicines.

Next up is Hazard Class 4, materials, which has three divisions.

Division 4.1 includes all flammable solids, which are categorized into three main types: desensitized explosives; self-reactive materials – such as those that are thermally unstable; and readily combustible materials that could react with friction, such as matches.

Next is Division 4.2, which defines spontaneously combustible materials. These are solids that are either pyrophoric – meaning they can ignite upon contact with air – or self-heating, meaning they heat up upon contact with air. An example of 4.2 material is "Titanium Powder, Dry.

Division 4.3 defines materials that are dangerous when wet, meaning any material that can become toxic or catch fire following contact with water. This includes raw elements such as lithium, barium, and calcium.

Then we have Class 5. Hazard Class 5 covers oxidizers and organic peroxides. This class is more specific and covers a smaller range of materials.

Division 5.1 covers oxidizers. Oxidizers are liquids or solids that yield oxygen and may cause the combustion of other materials as a result. A common oxidizer is ammonium nitrate which is used in lawn fertilizers. Division 5.2 covers organic peroxides, which are carbon-containing compounds with two oxygen atoms joined together. Organic peroxides are toxic and explosive in certain conditions. Additionally, they contain their own oxygen, which greatly enhances their fire potential.

Next is Class 6, which covers both poisons and infectious substances.

Division 6.1 covers nongaseous poisonous materials that could cause danger to human health during transportation. Arsenic and pesticides are poisonous materials.

- *identify the DOT requirements for the transportation of hazardous materials*
- *identify the importance of the secure transportation of hazardous materials*

[Topic title: Transportation of Hazardous Materials.] You're probably familiar with the saying, "better safe than sorry." It means that it's better to be cautious than to be careless or complacent. So whether you deal with hazardous materials indirectly, or are involved in the transportation of hazardous materials, you should be aware of the Department of Transportation's, or DOT's, requirements.

The DOT defines hazardous materials as any substances or materials deemed capable of posing an unreasonable risk to health, safety, and property when transported in commerce.

This can include explosives, gases, flammable liquids, flammable solids, combustibles, oxidizers, poisons, corrosives, and radioactive materials.
According to the DOT, there are certain requirements that employers must adhere to when employees are involved in the transportation of hazardous materials.

To start, employers must establish and implement a security plan when certain types and quantities of hazardous materials are being shipped. They should also have a plan in place to enforce company security rules and regulations for the transportation of hazmat shipments and provide guidelines for dealing with incidents if they occur.

In addition, employers must also train all employees involved with hazardous materials to be aware of all security procedures and how to deal with potential risks. This includes employees who are involved in the receipt of hazardous shipments, as well as the transporters themselves.

Lastly, employers must display the appropriate hazard classes and placards when transporting materials. The DOT defines hazard classes for dangerous materials and requires that placards be placed on cargo and vehicles carrying those materials. These placards serve as a warning to others of the cargo's hazard.

Within the DOT, there is a Pipeline and Hazardous Materials Safety Administration, or PHMSA, which is responsible for overseeing the transportation of hazardous materials. Certain hazardous materials – such as those needed for fuel, medicine, farming, and manufacturing – are vital to the US economy, which is why transporters must comply with established regulations to ensure these materials are transported safely.

Cryogens, for instance, are hazardous liquefied gases which can be used for rocket fuel or various types of preservation. And oxygen is a hazardous compressed gas used in hospitals.

Pesticides, which are used in farming, are hazardous materials including some classed as poisons. Another poison is arsenic, which is sometimes used in weed killers and some alloys.

Then there are flammables such as gasoline, which is used for fuel, and butane, which is used for heaters and cigarette lighters.

Large volumes of hazardous materials like petroleum are transported every day using different methods of transportation. As such, proper security must be ensured to prevent incidents that could endanger lives.

Consider Bob, a driver for a haulage firm that transports hazardous materials across the US. He drives a container that holds 5,000 gallons of petroleum for delivery to gas stations. Secure and safe delivery is vital because he's traveling on public roads with a large quantity of a highly flammable material that is important to the functioning of the US transportation system.

And incidents aren't the only factors to take into account. Some hazardous materials can be stolen and misused.

Consider Delia, who's a driver's assistant and is involved in the loading and safe transportation of large quantities of highly infectious organisms. These organisms are needed by science labs for testing, but could prove deadly if they're transported unsecured – they could be used in biological warfare or infect those involved in their handling.

Because these materials could be stolen and misused, it's essential that they're monitored and controlled, especially when moving through the public arena. To this end, security teams are tasked with identifying and dealing with any potential security risks.

With the importance of safe transportation of hazardous materials in mind, let's take a short break for some practice questions. After you've finished, we'll pick up here.

3. Knowledge Check: Transportation of Hazardous Materials

- *identify the DOT requirements for the transportation of hazardous materials*
- *identify the importance of the secure transportation of hazardous materials*

VIN	Make Name	VIN Model	Model Year	Model Name	Lic Plate	Lic State/Prov
1GCZGUCG6E1115786	CHEVROLET	EXPRESS	2014	CG33705 EXPRESS 3500	3FD2957	MD
3C7WRMBL4GG348035	RAM	5500 CHASSIS	2016	5500	9ED0958	MD
3C7WRMAL4GG348036	RAM	5500 CHASSIS	2016	5500	7DP6237	MD
1FTYR1ZM9GKB07423	FORD	TRANSIT VAN	2016	R1Z TRANSIT-250	6DN7749	MD
3C7WRKAL4HG625712	RAM	4500 CHASSIS	2017	4500	2EJ4499	MD
1N6AF0LY2JN800028	NISSAN	NV2500HD	2018	62918 NV CARGO NV3	2DJ1661	MD
3C7WRNBLXJG248115	RAM	5500 CHASSIS	2018	5500	3EL3118	MD
3C7WRNBL1JG248116	RAM	5500 CHASSIS	2018	5500	3EL3119	MD
3C7WRNBL3JG248117	RAM	5500 CHASSIS	2018	5500	3EL3117	MD
3C7WRKAL9JG280084	RAM	4500 CHASSIS	2018	4500	4FR0318	MD
3C7WRKAL3JG284955	RAM	4500 CHASSIS	2018	DP4L63 4500 CHASSIS	1GD5587	MD
3C63RPAL9JG294443	RAM	3500	2018	D23L62 3500	5DJ1228	MD
3C6TRVAG5JE155543	RAM	PROMASTER 1500	2018	VF1L12 PROMASTER 15	5DJ1357	MD
1N6AF0LY7KN805310	NISSAN	NV2500HD	2019	62519 NV CARGO NV3	9DR3048	MD
3C7WRLBL7LG138744	RAM	4500 CHASSIS	2020	DP9L64 4500 CHASSIS	7GK3898	MD
1N6BF0KY9LN806353	NISSAN	NV2500HD	2020	61310 NV CARGO NV2	7EF6656	MD
1N6BF0KY0LN806337	NISSAN	NV2500HD	2020	61310 NV CARGO NV2	7EF6653	MD
1N6BF0KY2LN806355	NISSAN	NV2500HD	2020	61310 NV CARGO NV2	7EF6655	MD
3C7WRNBL5MG612655	RAM	5500 CHASSIS	2021	DP0L64 5500 CHASSIS	3EW5449	MD
1FTBF4UG7NKA21719	FORD	TRANSIT VAN	2022	F4U TRANSIT-350	8FB7338	MD
3C7WRTAL0NG364905	RAM	3500 CHASSIS	2022	DD8L63 3500 CHASSIS	7FR7619	MD
3C6MRVWGXPE591696	RAM	PROMASTER 3500	2023	VF3L12 PROMASTER 35	1FR9140	MD
3C6MRVWG8PE586724	RAM	PROMASTER 3500	2023	VF3L12 PROMASTER 35	5FM4814	MD
3C6MRVWGXPE591701	RAM	PROMASTER 3500	2023	VF3L12 PROMASTER 35	1FR9137	MD
3C6MRVWG1PE591702	RAM	PROMASTER 3500	2023	VF3L12 PROMASTER 35	1FR9138	MD
3C6MRVWG3PE591703	RAM	PROMASTER 3500	2023	VF3L12 PROMASTER 35	1FR9147	MD
3C6MRVWG5PE591704	RAM	PROMASTER 3500	2023	VF3L12 PROMASTER 35	3GA3535	MD
3C6MRVWG7PE591705	RAM	PROMASTER 3500	2023	VF3L12 PROMASTER 35	1FR9145	MD
3C6MRVWG9PE591706	RAM	PROMASTER 3500	2023	VF3L12 PROMASTER 35	1FR9139	MD
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3C7WRLEL7RG368627	RAM	4500 CHASSIS	2024	DP9L93 4500 CHASSIS		
2NP2HN7X2BM121029	PETERBILT	337	2011	337 337	2590109	IN
3D6WA7EL3BG507664	DODGE	RAM TRUCK	2011	DP5L63 RAM 5500 HD	7AA6760	MD
3D6WA7EL9BG507667	DODGE	RAM TRUCK	2011	DP5L63 RAM 5500 HD	7AA6761	MD
1FTSE3EL2CDA77920	FORD	ECONOLINE	2012	E3E E-350 SUPER	5AR3460	MD
1FTSE3ELXDDB15413	FORD	ECONOLINE	2013	E3E E-350 SUPER	5FM4800	

VIN	Make Name	VIN Model	Model Year	Model Name		Lic Plate	Lic State/Prov
1FTSE3EL1EDA49898	FORD	ECONOLINE	2014	E3E	E-350 SUPER	6DN7797	MD
3C7WRTAL9EG279481	RAM	3500 CHASSIS	2014	3500		6DN7743	MD
3C7WRMAL4GG150766	RAM	5500 CHASSIS	2016	5500		6DN7791	MD
3C7WRNAL2GG150741	RAM	5500 CHASSIS	2016	5500		6DN7747	MD
3C7WRMBL9GG162846	RAM	5500 CHASSIS	2016	5500		6DN7798	MD

VIN	Make Name	Model Ye	Model Name	Lic Plate	Lic State/Prov
3C7WRKAL8KG531579	RAM	2019	DP4L63 4500 CHASSIS	ZNN7263	PA
3C6MR5AJ4KG615751	RAM	2019	2500	ZWT0640	PA
3C7WRMBL0HG604334	RAM	2017	5500	ZPD4973	PA
3C7WRMBL2HG604335	RAM	2017	5500	ZPD4974	PA
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3C7WRMBL8JG248446	RAM	2018	5500	ZTE1170	PA
3C6TR5CT5JG287541	RAM	2018	DJ7L91 2500	ZXA6316	PA
1FTBF4XM7KKA80301	FORD	2019	F4X TRANSIT-350	ZVB1671	PA
1FTBF4XM4KKA82779	FORD	2019	F4X TRANSIT-350	ZNK4994	PA
1FTBF4XM7KKA85773	FORD	2019	F4X TRANSIT-350	ZTM8644	PA
1C6RR6GT3KS532678	RAM	2019	DS1H41 1500 CLASSIC	ZXA6307	PA
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1FDBF2A68LED11619	FORD	2020	F2A F-250	ZRR9925	PA
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3C7WR5AJXMG605040	RAM	2021	DJ7L62 2500	ZTK8485	PA
3C7WRNBL9NG186373	RAM	2022	DP0L64 5500 CHASSIS	ZVK5638	PA
1FTBF4UG2NKA62047	FORD	2022	F4U TRANSIT-350	ZVR6748	PA
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3C7WRNBL6NG328596		2022		ZVM6619	PA
1FTBW3XK2NKA67601	FORD	2022	W3X E-TRANSIT-35	ZVZ5136	PA
3C7WRNBL5NG171580	RAM	2022	DP0L64 5500 CHASSIS	ZTT5000	PA
1FTBF4UG0PKA09737	FORD	2023	F4U TRANSIT-350	ZVR8819	PA
1FTBF4UG5PKA09684	FORD	2023	F4U TRANSIT-350	ZRW5386	PA
1FTBF4UG2PKA09903	FORD	2023	F4U TRANSIT-350	ZVY9036	PA
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3C7WRNBL9RG182071	RAM	2024	DP0L64 5500 CHASSIS	ZXZ7447	PA
3C7WRLAL9HG713824	RAM	2017	4500	ZTX5398	PA
3C7WRLAL4HG708157	RAM	2017	4500	ZXX4315	PA

Davis, DaQuan (DNREC)

From: Kirk D Flamm <kirk.flamm@cummins.com>
Sent: Tuesday, September 9, 2025 4:20 PM
To: WHStransporters
Cc: Terry Bartlett
Subject: RE: Incomplete Delaware Hazardous Waste transporter Permit Application (Cummins Inc)
Attachments: Officer Certificate - CDHI- Terry Bartlett09.09.25_signed.pdf

Good afternoon,

Please see attached copy of signature authorization

Kirk Flamm
CSSNA Environmental Compliance Advisor

Cell (623) 236-6413
salesandservice.cummins.com
kirk.flamm@cummins.com

From: Davis, DaQuan (DNREC) <daquan.davis@delaware.gov> **On Behalf Of** WHStransporters
Sent: Friday, August 29, 2025 9:47 AM
To: Kirk D Flamm <kirk.flamm@cummins.com>
Subject: RE: Incomplete Delaware Hazardous Waste transporter Permit Application (Cummins Inc)

The sizing of the letter can be found in the link provided. The lettering should be standard.

I need authorization for Terry Barlett's signature from a corporate officer of Cummins Distribution Holdco Inc., instead of from Nicole Y. Lamb Hale at Cummins Inc.

DaQuan L. Davis

Environmental Scientist
Division of Waste and Hazardous Substances
302-739-9403
WHStransporters@delaware.gov
89 Kings Hwy SW, Dover, DE 19901
dnrec.delaware.gov

From: Kirk D Flamm <kirk.flamm@cummins.com>
Sent: Thursday, August 28, 2025 3:27 PM
To: WHStransporters <WHStransporters@delaware.gov>
Cc: Terry Bartlett <terry.bartlett@cummins.com>
Subject: RE: Incomplete Delaware Hazardous Waste transporter Permit Application (Cummins Inc)

Good afternoon,

Can I ask for the specific sizes needed for the lettering?

I would like to clarify that Cummins Distribution Holdco Inc. is a subsidiary of Cummins Inc. it is a separate company with its own corporate structure. Nicole Y. Lamb-Hale, with Cummins Inc., is the executive authorizing Terry Bartlett to sign for CDHI actions.

Kirk Flamm
CSSNA Environmental Compliance Advisor

Cell (623) 236-6413
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kirk.flamm@cummins.com

of the intended recipient(s). If you are not an intended recipient, please do not read, distribute or take action in reliance upon this message. If you have received this in error, please notify the sender immediately by return e-mail and promptly delete this message and its attachments from your computer system.

From: Davis, DaQuan (DNREC) <daquan.davis@delaware.gov> **On Behalf Of** WHStransporters
Sent: Tuesday, August 26, 2025 11:22 AM
To: Kirk D Flamm <kirk.flamm@cummins.com>
Cc: Terry Bartlett <terry.bartlett@cummins.com>
Subject: RE: Incomplete Delaware Hazardous Waste transporter Permit Application (Cummins Inc)

I'm asking for the name or label on the sides of the trucks, not the ownership details. For instance, if one of our Environmental Crimes Unit officers drives by one of your company trucks, what business name will they see on each truck?

Additionally, the request for an additional corporate list was made because a corporate officer from the subsidiary, Cummins Distribution Holdco Inc. (for which Mr. Barlett provided this list), did not sign the application. Instead, we received a secretary's certificate from the parent company, Cummins Inc., but no corporate list was provided to validate the permission for the signature. We used the corporate list information to verify identity, and we do not approve any application without it unless you go through the FOIA request process https://regulations.delaware.gov/AdminCode/title8/900.shtml#TopOfPage.

Please let me know if you have any further questions.

Thank you,

DaQuan L. Davis
Environmental Scientist
Division of Waste and Hazardous Substances
302-739-9403
WHStransporters@delaware.gov
89 Kings Hwy SW, Dover, DE 19901
dnrec.delaware.gov

From: Kirk D Flamm <kirk.flamm@cummins.com>
Sent: Tuesday, August 26, 2025 10:01 AM
To: WHStransporters <WHStransporters@delaware.gov>
Cc: Terry Bartlett <terry.bartlett@cummins.com>
Subject: RE: Incomplete Delaware Hazardous Waste transporter Permit Application (Cummins Inc)

DaQuan,

I am requesting clarification to your questions.

When you ask, "Does your section 3 response confirm that the trucks transporting hazardous waste in Delaware are under the name Cummins Distribution Holdco Inc.?" Are you asking for owner of the vehicles or operator of the vehicles?

And for the request of further officer information, I would need to validate this question internally. Can I ask for the specific section of the NH Administrative code, Rule, and Policy that is requiring this information?

Kirk Flamm
CSSNA Environmental Compliance Advisor

Cell (623) 236-6413
salesandservice.cummins.com
kirk.flamm@cummins.com

From: Davis, DaQuan (DNREC) <daquan.davis@delaware.gov> **On Behalf Of** WHStransporters
Sent: Tuesday, August 26, 2025 9:49 AM
To: Kirk D Flamm <kirk.flamm@cummins.com>
Cc: Terry Bartlett <terry.bartlett@cummins.com>
Subject: RE: Incomplete Delaware Hazardous Waste transporter Permit Application (Cummins Inc)

EXTERNAL SENDER: This email originated outside of Cummins. Do not click links or open attachments unless you verify the sender and know the content is safe.

Good morning,

Based on the information I received, I'll need the following:

- Does your section 3 response confirm that the trucks transporting hazardous waste in Delaware are under the name Cummins Distribution Holdco Inc.?
- I require a list of corporate officers and owners of Cummins Inc., including Nicole Y. Lamb-Hale, to validate the signature of the application. Please ensure that the list contains their names, titles, preferred mailing addresses, and dates of birth.

Thank you,

DaQuan L. Davis
Environmental Scientist
Division of Waste and Hazardous Substances
302-739-9403
WHStransporters@delaware.gov
89 Kings Hwy SW. Dover. DE 19901
dnrec.delaware.gov

From: Kirk D Flamm <kirk.flamm@cummins.com>
Sent: Monday, August 25, 2025 4:31 PM
To: WHStransporters <WHStransporters@delaware.gov>

Cc: Terry Bartlett <terry.bartlett@cummins.com>
Subject: RE: Incomplete Delaware Hazardous Waste transporter Permit Application (Cummins Inc)

Good afternoon,

Section 3 – Cummins Distribution Holdco Inc is a subsidiary of Cummins

Section 6- Donald Jackson, Treasurer
Jefferey Wiltrout, Vice President
Zach Gillen, President

Section 10 – Massachusetts Hazardous Waste permit has not been issued. Attached is a list of used oil transport permits.

Section 19 – Attached is authorization to sign by Terry Bartlett

Kirk Flamm
CSSNA Environmental Compliance Advisor

Cell (623) 236-6413
salesandservice.cummins.com
kirk.flamm@cummins.com

From: Terry Bartlett <terry.bartlett@cummins.com>
Sent: Monday, August 25, 2025 3:42 PM
To: Kirk D Flamm <kirk.flamm@cummins.com>
Subject: FW: Incomplete Delaware Hazardous Waste transporter Permit Application (Cummins Inc)

Hi Kirk,

I am reaching out to request your guidance on the email below that we recently received from DaQuan Davis regarding our Delaware hazardous waste transporter permit application. I had a conversation with DaQuan today, and he is expecting our response by this morning.

Could you please review the details provided in the email and offer your insights on how we should proceed with addressing the missing or updated information they have requested?

Terry Bartlett
Area Operation Vice President

Cummins Sales and Service
Mobile: 646-761-3496

E Mail:terry.bartlett@cummins.com

From: Davis, DaQuan (DNREC) **On Behalf Of** WHStransporters
Sent: Thursday, July 24, 2025 3:13 PM
To: terry.bartlett@cummins.com
Subject: Incomplete Delaware Hazardous Waste transporter Permit Application (Cummins Inc)

Hello,

Thank you for submitting your application to obtain your Delaware hazardous waste transporter permit. Upon review, I have found that some information is missing or needs to be updated. Please address the items listed below:

- **Section 3-** I noticed that the DOT legal name is Cummins Inc. DBA Cummins Sales and Service. The transporter name must be the same as what is on the trucks. What is the current name on the trucks?
- **Section 6-** Could you please provide the specific titles of the three individuals who hold officer positions in the company?
- **Section 10-** Can you please provide the permit number for Cummins Inc.'s Massachusetts hazardous waste permit? Is the Massachusetts permit Cummins Inc.'s only other state hazardous waste/used oil transporter permit?
- **Section 19-** Please have the company officers sign and date the application.

Please provide the information requested above via e-mail within ten (10) days.

Thank you,

DaQuan L. Davis
Environmental Scientist
Division of Waste and Hazardous Substances
302-739-9403
WHStransporters@delaware.gov
89 Kings Hwy SW, Dover, DE 19901
dnrec.delaware.gov

CUMMINS DISTRIBUTION HOLDCO INC.
Officer's Certificate

I, Zach Gillen, do hereby certify that:

1. I am the duly elected, qualified and acting President of Cummins Distribution Holdco Inc., an Indiana corporation ("CDHI").

2. Terry Bartlett, Area Vice President of Operations of Cummins Inc., has been granted the authority to approve and sign applications for license agreements on behalf of CDHI in accordance with and as limited by the authority granted to him under the Delegation of Financial Authority Policy (CCP-0024), specifically those related to Hazardous Waste Transporter License Applications in various states.

IN WITNESS WHEREOF, I have hereunto signed my name as of the 9th day of September, 2025.

Zach Gillen

Zach Gillen, President
Cummins Distribution Holdco Inc.