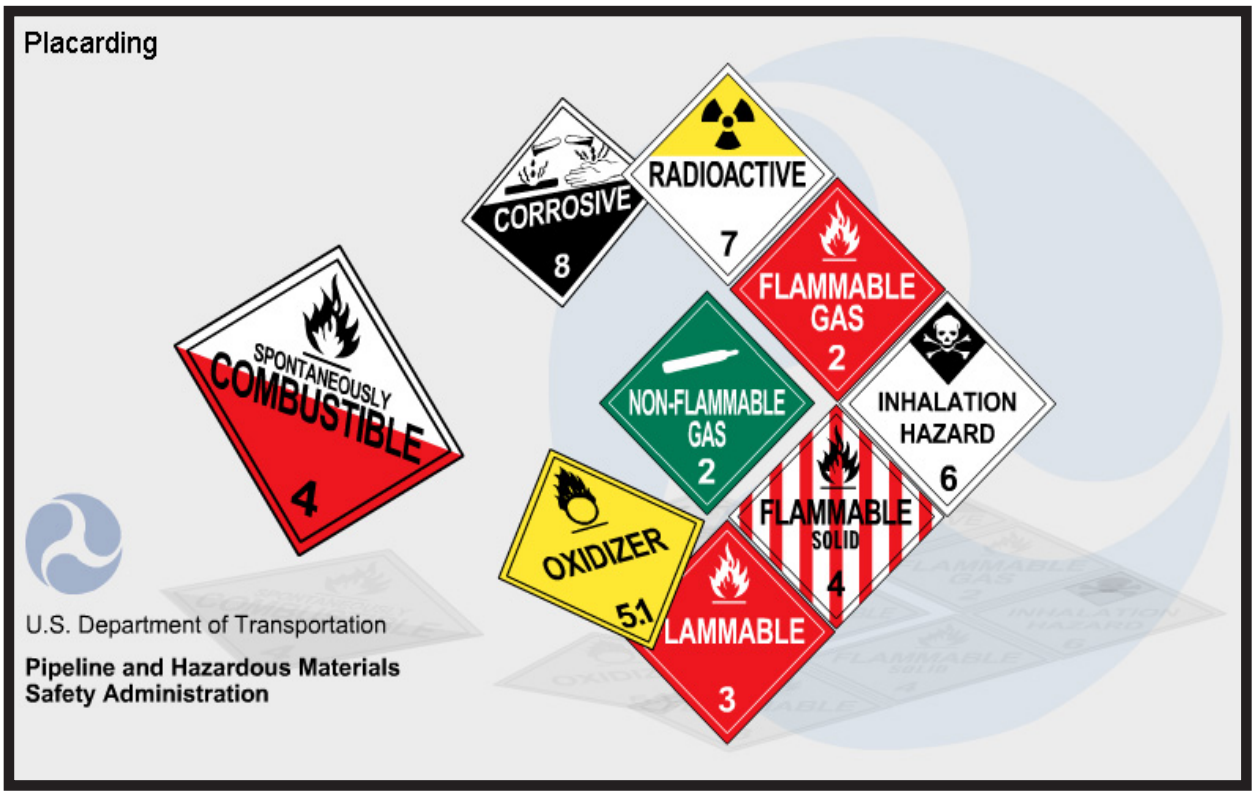
Hazardous Materials Transportation Training Modules

VERSION 5.1

INSTRUCTOR



MODULE 4

Script

Visual

Narrative

1

When an accident causes hazardous materials in transportation to be released, the vehicle operator, emergency response teams, and the surrounding community all face imminent danger. Emergency response teams must accurately identify these materials as quickly as possible. To aid emergency response teams, DOT developed a system of placarding for the rapid identification of hazardous materials. Emergency responders are trained to look for these warning placards. Improperly placarded or unplacarded hazmat shipments place the lives of these individuals and others at risk. This module will review how placards are used to communicate valuable information to these emergency responders, and others who deal with these materials on a daily basis.

2

After completing Module 4 on Placarding, you should be able to:

- Identify the requirements for placarding, and any exceptions or modifications allowed with these requirements.
- Examine the two placarding tables in 172.504(e) to determine placarding requirements.
- Identify the requirements for placard placement, visibility, and design.

3

The general rule to apply when determining the placarding requirements for hazardous materials is simple – if a hazardous material is contained within a transport vehicle, bulk packaging, freight container, unit load device, or rail car, then a placard representing the hazard class for the hazardous material must be displayed on both sides and each end, regardless of quantity. The regulations allow other approaches to placarding under specific circumstances. These are exceptions to this basic rule.

4

If you offer for transportation or transport any hazardous material subject to the HMR, you must comply with the applicable placarding requirements of Part 172 – Subpart F – Placarding. Placards are placed on bulk packagings, freight containers, transport vehicles, and rail cars to alert the public of the potential dangers of the product being transported and to guide emergency responders in the event of an incident or accidental release. One of the exceptions to these placarding requirements provided for in the HMR involves the seven groups of materials listed here:

- Infectious substances;
- Hazardous materials classed as Consumer Commodities;
- Hazardous materials offered for transportation as Limited Quantities when identified as such on the shipping papers with the words “Limited Quantity” or “Ltd Qty” following the basic description;
- Hazardous materials prepared in accordance with §173.13 of the HMR;
- Hazardous materials which are packaged as small quantities under the provisions of §173.4 of the HMR;
- Combustible liquids in non-bulk packagings; and
- Class 9 materials when transported between places in the United States other than through a foreign country.

5

Professor Fed's Knowledge Check 1

Instructions: Select the best answer from the four choices provided. You will have two chances to correctly answer this question.

Placards are not required for infectious substances, hazardous materials authorized to be offered as limited quantities, small quantities of certain hazardous materials, _____ , hazardous materials prepared in accordance with §173.13, and combustible liquids in non-bulk packagings.

A. Hazardous substances
B. Hazardous wastes
C. ORM-D materials
D. Radioactive materials

Correct answer is C. ORM-D materials

6

No person may affix or display on a packaging, freight container, unit load device, motor vehicle or rail car any placard described in the HMR unless:

- the material being offered or transported is a hazardous material;
- the placard represents a hazard of the hazardous material being offered or transported; and
- the placarding conforms to the requirements of the HMR.

Additionally, any sign, advertisement, slogan (such as "Drive Safely"), or device that, by its color, design, shape or content, could be confused with any placard prescribed in the HMR is prohibited.

7

These restrictions do not apply to a bulk packaging, freight container, unit load device, transport vehicle or rail car which is placarded in conformance with the Transportation of Dangerous Goods (TDG) Regulations, the International Maritime Dangerous Goods (IMDG) Code, or the United Nations (UN) Recommendations.

These restrictions also do not apply to the display of a BIOHHAZARD marking, a "HOT" marking, or an identification number on a white square-on-point configuration in accordance with the HMR.

8

For each bulk packaging, freight container, unit load device, transport vehicle or rail car containing any quantity of a hazardous material, you must placard each side and each end with the type of placards specified in Tables 1 and 2 of §172.504 and in accordance with other placarding requirements of the HMR, unless a specific placarding exception is provided for that quantity of material or hazard class or division. Do not confuse these two placarding tables with the Hazardous Materials Table found in §172.101. When determining which placards must be used and what options are available, both placarding tables must be considered. You may placard a hazardous material shipment, even when an exception makes it unnecessary, if the placarding otherwise conforms to the requirements of the HMR for the hazards presented. First, we'll look at the basic placarding requirements set out in Table 1 and Table 2. Then, we'll look at some of the exceptions and options. Select each button to learn more about the placarding requirements associated with Table 1 and Table 2.

9

Table 1 lists hazardous materials by category for which placarding is required for any quantity of material contained in the freight container, unit load device, transport vehicle, or rail car. No material, for which Table 1 applies, is duplicated in Table 2. Each material will be exclusive to only one of the two tables. Placarding requirements for hazard class or division numbers 5.2 and 6.1 are divided between Table 1 and Table 2 based on additional description information. Placarding for hazard class 7 materials is limited to Radioactive Yellow III labels only and exclusive use shipments of low specific activity and surface contaminated objects.

As an example, any quantity of Sulfur dioxide, 2.3, UN1079 being shipped will be placarded based on Table 1.

Since the proper shipping name for this material indicates that it falls under the hazard class or division number 2.3, and Table 1 regulates all hazard class or division 2.3 materials – any quantity of Sulfur dioxide must be placarded with a “POISON GAS” placard.

10

The placarding requirements for Division 5.2, Organic peroxide materials are split between Table 1 and Table 2. All Division 5.2, Type B liquid or solid, temperature controlled organic peroxides are covered by Table 1, while all the other Division 5.2, Organic peroxides are covered by Table 2. Displayed here is a portion of the HMT with some of the Organic peroxide entries. The first two entries are listed as Organic peroxide type B, liquid, temperature controlled and Organic peroxide type B, solid, temperature controlled and are placarded according to Table 1; while the remaining Organic peroxide entries are all placarded according to Table 2.

11

The placarding requirements for Division 6.1 materials are split between Table 1 and Table 2. All Division 6.1, Inhalation hazard, Zone A or B material is covered by Table 1, and placarded with the “POISON INHALATION HAZARD” placard. All other Division 6.1 materials are covered by Table 2, and placarded with the “POISON” placard.

Displayed here is a portion of the HMT with some of the Division 6.1 entries. Each of these materials contains the entry of 6.1 in column 3. If the entry for column 7, Special Provisions, contains the code 1 or 2, it indicates that the material is poisonous by inhalation in Hazard Zone A and Hazard Zone B, respectively.

12

The only difference between the “POISON GAS” and “POISON INHALATION HAZARD” placards is the numeral representing the hazard class. A “2” appears on the “POISON GAS” placard, whereas a “6” appears on the “POISON INHALATION HAZARD” placard. However, there are important differences in the treatment of the different materials.

13

While the placarding requirements for Class 7 Radioactive materials are solely guided by Table 1, not all Class 7 Radioactive materials require placarding. The exception for Class 7 in Table 1 states that placarding is required for “Radioactive Yellow III label only.” The footnote to Table 1, notes that a placard is also required for exclusive use shipments of low specific activity material and surface contaminated objects when shipped in accordance with §173.427. Each motor vehicle used to transport a package of highway route controlled quantity Class 7 (radioactive) material must display a “RADIOACTIVE” placard on a square white background. You don’t have to placard radioactive material labeled WHITE I or YELLOW II.

14

Professor Fed's Knowledge Check 2

Instructions: Select the best answer from the four choices provided. You will have two chances to correctly answer this question.

Which one of these materials does NOT use Table 1 to determine the appropriate placarding requirements?

A. Aluminum carbide
B. Aerosols, flammable, n.o.s.
C. Ethyleneimine, stabilized
D. Organic peroxide type B, solid, temperature controlled

Correct answer is B. Aerosols, flammable, n.o.s.

15

Professor Fed's Knowledge Check 3

Instructions: Select the best answer from the four choices provided. You will have two chances to correctly answer this question.

Which one of these materials does NOT use Table 1 to determine the appropriate placarding requirements?

A. Battery fluid, acid, UN2796
B. Diborane, UN1911
C. Lithium silicon, UN1417
D. Radioactive material, Yellow III label

Correct answer is A. Battery fluid, acid, UN2796

16

The materials in Table 2 may not require placarding in certain cases. Table 2 requires you to placard materials in NON-BULK packages, when the shipment has an AGGREGATE GROSS WEIGHT of 454 kg (1,001 pounds) or more of Table 2 materials, but allows for multiple Table 2 materials to be placarded with a single “DANGEROUS” placard. Transport vehicles and freight containers transporting less than 454 kg aggregate gross weight of Table 2, non-bulk materials may be placarded, but are not required to be. A shipment of 1,000 kg (2,205 pounds) or more of one Table 2 hazardous material, loaded at one loading point, must be placarded according to Table 2 requirements, with placards specific to each category of materials. Remember, the aggregate gross weight applies only to the Table 2 materials in your shipment, not the weight of other materials. Placarding requirements for hazard class or division numbers 5.2 and 6.1 are divided between Table 1 and Table 2 based on additional description information.

17

Except for hazardous materials subject to §172.505 (“Placarding for subsidiary hazards”) a non-bulk packaging that contains only the residue of a Table 2 hazardous material covered by Table 2 need not be considered when determining the Table 2 placarding requirements.

18

When more than one division placard is required for Class 1 materials on a transport vehicle, rail car, freight container or unit load device, only the placard representing the lowest division number must be displayed. The “EXPLOSIVE 1.4” placard is not required for those Division 1.4 Compatibility Group S (1.4S) materials that are not required to be labeled 1.4S. Finally, for shipments of Class 1 (explosive materials) by aircraft or vessel, the applicable compatibility group letter must be displayed on the placards, or labels. When more than one compatibility group placard is required for Class 1 materials, only one placard is required to be displayed, as provided in paragraphs (g)(1) through (g)(4) of §172.504.

19

Additional placarding exceptions exist for these other classes and divisions of hazardous materials placarded under Table 2. Exceptions are provided for materials found under these class or division numbers. Select each button to learn more about each of these exceptions.

19a

19b

19c

19d

19e

20

Professor Fed's Knowledge Check 4

Instructions: Select the best answer from the four choices provided. You will have two chances to correctly answer this question.

Which one of these materials does NOT use Table 2 to determine the appropriate placarding requirements?

A. Hydrocyanic Acid, aqueous solutions, 20%, UN1613
B. Ethylene, refrigerated liquid
C. Fertilizer ammoniating solution
D. Octadecyltrichlorosilane

Correct answer is A. Hydrocyanic acid, aqueous solutions, 20%, UN1613

21

Professor Fed's Knowledge Check 5

Instructions: Select the best answer from the four choices provided. You will have two chances to correctly answer this question.

Which one of these materials does NOT use Table 1 to determine the appropriate placarding requirements?

A. Octonal
B. Consumer commodity
C. Magnesium silicide
D. Nitrosyl chloride

Correct answer is B. Consumer commodity

22

You may use the “DANGEROUS” placard on a freight container, unit load device, transport vehicle, or rail car, if the shipment contains non-bulk packages with two or more categories of hazardous materials that require different placards as specified in Table 2. However, when 1,000 kg (2,205 pounds) aggregate gross weight or more of one category of material is loaded at one loading facility, the placard specified in Table 2 must be applied. For example, a transport vehicle is carrying a combined shipment of 454 kg of a Class 3, flammable liquid; 340 kg of a Class 8, corrosive material, and 113 kg of a Class 2, non-flammable gas material. Instead of displaying the three individual placards for “FLAMMABLE”, “CORROSIVE”, and “NON-FLAMMABLE” materials, as specified in Table 2, the “DANGEROUS” placard may be used instead, on this transport vehicle.

23

Do not use the “DANGEROUS” placard to placard shipments of Table 1 materials. Also, do not use the “DANGEROUS” placard to placard bulk packages like cargo tanks, portable tanks, or tank cars. Instead, affix the placard specified for each hazardous material to the container.

24

Professor Fed's Knowledge Check 6

Instructions: Select the best answer from the four choices provided. You will have two chances to correctly answer this question.

Which of these shipments meets the requirements specified for the use of the "DANGEROUS" placard, in lieu of displaying the individual class or division placards?

A. 227 kg of Cesium and 272 kg of Nitric oxide, compressed
B. Tank car load of Gasoline, 3, UN1203
C. Freight container with 317 kg of a Class 3 flammable liquid; 454 kg of a Class 8 corrosive material; and 136 kg of a Class 2 non-flammable gas.
D. Transport vehicle with 1,043 kg of a Division 5.2 organic peroxide; 227 kg of a Class 8 corrosive material; and 91 kg of an ORM-D material.

Correct answer is C. Freight container with 317 kg of a Class 3 flammable liquid; 454 kg of a Class 8 corrosive material; and 136 kg of a Class 2 non-flammable gas.

25

Some hazardous materials have listed both a primary hazard and a subsidiary hazard in column 6 of the HMT. Under certain circumstances, both a primary hazard placard and a subsidiary hazard placard must be affixed for hazardous materials being shipped in transport vehicles, freight containers, portable tanks, unit load devices, or rail cars. Hazardous materials that possess secondary or subsidiary hazards may display subsidiary placards that correspond to the placards described here, even if not required to be displayed. Select each button to learn more about the special circumstances that require the placarding of subsidiary placards.

25a

INHALATION HAZARD
2
INHALATION HAZARD
6

25b

RADIOACTIVE
7
CORROSIVE
8

25c

DANGEROUS WHEN WET
4

26

Professor Fed's Knowledge Check 7

Instructions: Click and drag each of the words shown here to fill in the blanks below. Select the word that best completes each statement. Each word is used only once. You will have two chances to correctly answer this exercise. Select the Done button when you are finished to receive feedback.

"CORROSIVE"	"EXPLOSIVES"	"FLAMMABLE"
"DANGEROUS WHEN WET"	"TOXIC GAS"	

1. A unit load device contains a quantity of Maneb that requires "SPONTANEOUSLY COMBUSTIBLE" placards and a _____ placard on each side and each end.

2. A freight container contains 908 kg (2,002 pounds) of Radioactive material, uranium hexafluoride. In addition to the "RADIOACTIVE" placard that is required, what other placard should be affixed to this container? _____

3. A transport vehicle load of Hexafluoroacetone requires a _____ placard on each side and each end of the vehicle.

Correct responses are:
1) "DANGEROUS WHEN WET"
2) "CORROSIVE"
3) "TOXIC GAS"

27

The shipper of any hazardous material must offer placards at the time of, or prior to, transportation, unless the transport vehicle is already placarded for the material being offered. Placards already displayed on motor vehicles, transport containers or portable tanks may be used to satisfy this requirement, if the placards are visible. Rail carriers may not accept any rail car for transportation, unless the car is properly placarded. Placarding is the joint responsibility of both the shipper and the carrier. Shipments that comply with the Hazardous Materials Regulations make the transportation of hazardous material safer for everyone. If the required placard is missing or damaged, no matter what the reason, the shipment should not be transported.

28

Special placarding provisions apply for transport involving motor vehicles on the highway and the movement of materials using nurse tanks.

29

Special placarding provisions apply for transport involving the transport of certain hazardous materials by rail car.

30

Each person who offers for transportation, and each person who loads and transports, a hazardous material in a freight container or aircraft unit load device of less than 18 cubic meters shall affix to the freight container or aircraft unit load device the placards specified for the material in accordance with the HMR. An exception is allowed for motor vehicles transporting freight containers and aircraft unit load devices containing less than 454 kg (1,001 pounds) of Table 2 materials. An additional exception is allowed for freight containers and aircraft unit load devices being transported for delivery to a consignee immediately following an air or water shipment. Finally, placarding is not required on a freight container or aircraft unit load device if it is only transported by air and is placarded in accordance with the ICAO Technical Instructions.

31

Each person who offers for transportation, and each person who loads and transports, a hazardous material in a freight container or aircraft unit load device of 18 cubic meters or more shall affix to the freight container or aircraft unit load device the placards specified for the material in accordance with the HMR. An exception is allowed for motor vehicles transporting freight containers and aircraft unit load devices containing less than 454 kg (1,001 pounds) of Table 2 materials. An additional exception is allowed for freight containers and aircraft unit load devices being transported for delivery to a consignee immediately following an air or water shipment. Finally, placarding is not required on a freight container or aircraft unit load device if it is only transported by air and is placarded in accordance with the ICAO Technical Instructions.

32

Each person who offers for transportation a bulk packaging that contains a hazardous material must affix the placards specified for the material in the HMR. Each bulk packaging that is required to be placarded when it contains a hazardous material, must remain placarded when it is emptied, unless it is sufficiently cleaned of residue and purged of vapors to remove any potential hazard to the extent that any residue remaining is no longer hazardous; or it is refilled with a material requiring different placards or no placards at all. In four cases, however, the HMR require placards on only the two opposite sides, or may be labeled instead of placarded. This exception applies to:

- A portable tank having a capacity of less than 3,785 L or 1000 gallons;
- A DOT 106 or 110 multi-unit tank car tank;
- A bulk packaging other than a portable tank, cargo tank, or tank car with a volumetric capacity of less than 18 cubic meters; and
- An intermediate bulk container.

33

Professor Fed's Knowledge Check 8

Instructions: Determine which placard, if any, must be displayed. If no placard needs to be displayed, select No Placard. Click and drag each of the words shown here to fill in the blanks below. Select the placard that best meets the requirements presented in each situation. Each named placard or No Placard may only be used once. You will have two chances to answer this exercise correctly. Select the Done button when you are finished to receive feedback.

"DANGEROUS" "FLAMMABLE" No Placard "GASOLINE"

_____ 1. A rail tank car is returning empty with a residue of Class 3 (Flammable liquid). What is the appropriate placard to affix to the rail tank car?

_____ 2. A shipper offers to a motor carrier: 181 kg of a miscellaneous hazardous material (Class 9); 181 kg of a non-flammable gas in a non-bulk package (Division 2.2); and 363 kg of an oxidizer material in a non-bulk package (Division 5.1). What is the appropriate placard to affix to the motor vehicle?

_____ 3. A rail car is loaded with a van-type trailer loaded with 1700 liters of a flammable liquid in non-bulk packages (Class 3). The trailer is currently placarded with "FLAMMABLE" placards. What is the appropriate placard to affix to the rail car?

_____ 4. A cargo tank is returning empty to the distribution center from a delivery of 22,700 liters of gasoline (Class 3). What is the appropriate placard to affix to the cargo tank?

Correct responses are:
1) "FLAMMABLE"
2) "DANGEROUS"
3) No Placard
4) "GASOLINE"

34

Professor Fed's Knowledge Check 9

Instructions: Select the placard that best meets the requirements presented of each situation by clicking and dragging each of the words shown here to fill in the blanks below. If no placard needs to be displayed, select "No Placard." Each placard may only be used once. You will have two chances to answer this exercise correctly. Select the Done button when you are finished to receive feedback.

"DANGEROUS" "RADIOACTIVE" "POISON" No Placard

_____ 1. A truck is transporting: 204 kg of a Class 7 (radioactive material) labeled YELLOW-III; and 204 kg of Benzene, a Class 3, flammable liquid in a non-bulk package. What is the appropriate placard to affix to this truck?

_____ 2. A motor vehicle is transporting: 340 kg of a Class 8, corrosive material; 14 kg of a Division 2.2, non-flammable gas; and 250kg of a Class 3, flammable liquid in non-bulk packages. What is the appropriate placard to affix to this motor vehicle?

_____ 3. A rail car is transporting: 2500 kg of a Class 3, flammable liquid, packaged and described as limited quantity; and fifty-five (208-liter) empty drums which contain the residue only of a Class 8, corrosive material. What is the appropriate placard to affix to the rail car?

_____ 4. A cargo truck is transporting: 363 kg of an ORM-D material; 136 kg of a Class 3, flammable liquid, packaged as small quantities; and 657 kg of a Division 6.1, PG III, poison material. What is the appropriate placard to affix to the cargo truck?

Correct responses are:
1) "RADIOACTIVE"
2) "DANGEROUS"
3) No Placard
4) "POISON"

35

The square-on-point or diamond shaped hazmat placards are instantly recognizable around the world. Their unique shape, color, and text, as well as the images displayed within the placard borders, are designed to distinguish them from advertisements, logos, and other markings.

They remain distinctive only if they are visible and properly displayed.

Each placard on a motor vehicle or on a rail car must be clearly visible from the direction it faces. A placard on the end of a transport vehicle or rail car is not required to be visible when it is coupled to another motor vehicle or rail car. You may also meet this requirement by placarding the freight containers or portable tanks loaded on a motor vehicle or rail car, but if a portable tank or freight container requiring placarding is inside a closed transport vehicle, the vehicle itself must be placarded.

When the front of a motor vehicle must be placarded, you may placard the front of the truck-tractor instead of, or in addition to, the front of the cargo body.

You must securely attach, affix, or place in a holder each placard on a transport vehicle, bulk packaging, freight container or aircraft unit load device. When you attach or secure a placard to a motor vehicle or rail car, you must not obscure any part of the placard's surface other than the borders. You may use a hinged placard or placard holder, provided the required format, color, and legibility of the placard are maintained.

You must locate each placard clear of appurtenances and devices such as ladders, pipes, doors, and tarpaulins.

You must locate each placard so that dirt or water is not directed toward it from the wheels of the transport vehicle.

You must locate each placard at least 3 inches (76.0 mm) away from any markings or advertising that could substantially reduce its effectiveness.

Each placard must have the words or identification number printed on it displayed horizontally, reading from left to right.

The carrier must maintain each placard so that the format, legibility, color, and visibility of the placard will not be substantially reduced due to damage, deterioration, or obscurement by dirt or other matter.

You must affix each placard to a background of contrasting color, or you must use a placard with a dotted or solid line outer border which contrasts with the background color.

36

The general specifications for hazardous materials placards are described by these four criteria:

- Strength and durability
- Design
- Form identification
- Exceptions

Select each button to learn specifically what the requirements are for hazardous materials placards.

36a

36b

36c

36d

37

Professor Fed's Knowledge Check 10

Instructions: Click and drag each of the words shown here to fill in the blanks below. Select the word that best completes each statement. Each word is used only once. You will have two chances to correctly answer this exercise. Select the Done button when you are finished to receive feedback.

direction	tractor	trailer	attached
doors	horizontally	vertically	

1. Each placard affixed on a motor vehicle or on a rail car must be clearly visible from the _____ it faces.

2. Each placard must have any printed words, numbers, or ID #s displayed _____.

3. Each placard must be securely _____ to the transport vehicle, freight container, or aircraft unit load device.

4. The required placard for the front of the truck-tractor may be placed on the front of the _____ or on the front of the _____ or both.

5. Each placard must be located clear of ladders, pipes, _____, and tarps.

Correct responses are:
1) direction;
2) horizontally;
3) attached;
4) tractor, trailer (interchangeable);
5) doors

38

Now that you understand the general hazardous material placard specifications, let's turn our attention to what each of these hazard class placards look like and any specific requirements that exist for each. Select each hazard class number or symbol to learn more about each of these placards.

39

You can use the "DANGEROUS" placard, instead of multiple placards, for two or more non-bulk, Table 2 materials in the same shipment. If you load 1,000 kg or more of one category of Table 2 hazardous material, at one loading point, you may not use the "DANGEROUS" placard; rather, you must display the required class or division placard for that material. If you have a second Table 2 hazardous material of less than 1,000 kg., you may use either the specific Class or Division placard, or the "DANGEROUS" placard to represent that material.

40

Professor Fed's Knowledge Check 11

Instructions: Select the best answer from the four choices provided. You will have two chances to correctly answer this question.

For which of these possible loads could you use the "DANGEROUS" placard on the outside of the freight container, assuming the enclosed packagings are non-bulk containers?

A. 1,000 kg. of hazard class / division 1.1 material and 227 kg. of hazard class / division 4.3 material
B. 454 kg. of hazard class / division 1.4 material and 340 kg. of hazard class / division 4.1 material
C. 454 kg. of hazard class / division 6.1, Zone A or B material and 998 kg. of hazard class / division 1.6 material
D. 1,360 kg. of hazard class / division 1.5 material and 2,268 kg. of hazard class / division 8 material

Correct answer is B. 454 kg. of hazard class / division 1.4 material and 340 kg. of hazard class / division 4.1 material

41

In addition to the general placarding requirements in §172.519, these specific provisions apply for "EXPLOSIVES" placards. Select each button to view these placards and the specific requirements for each.

41a

41b

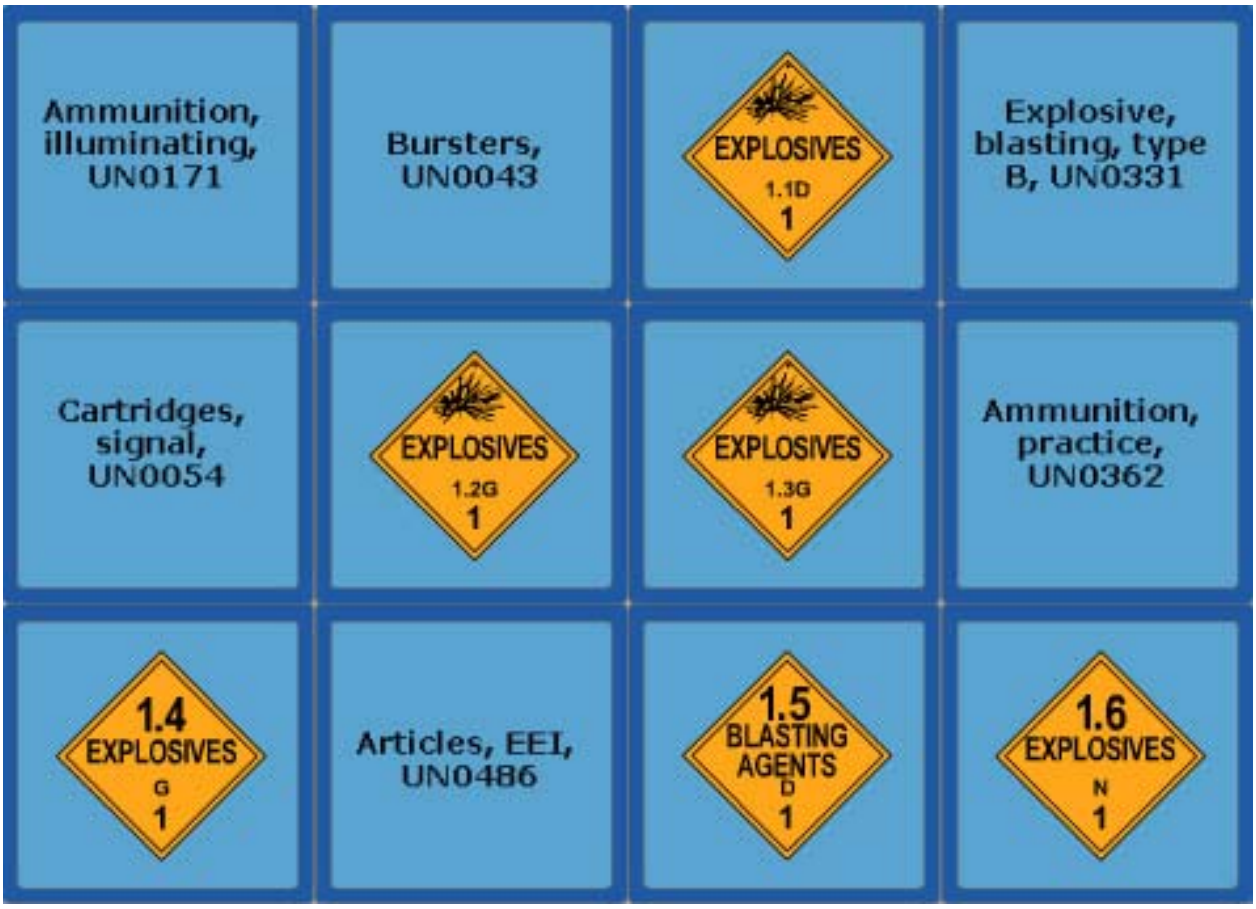
41c

41d

42

Professor Fed's Knowledge Check 12

Instructions: Complete this Knowledge Check by matching the shipping name with the placard that should be affixed to a bulk packaging, freight container, unit load device, transport vehicle, or rail car containing hazardous materials in a quantity requiring a placard. You will have two chances to correctly complete this exercise.



Correct answers are:
Bursters, UN0043 and "EXPLOSIVES 1.1D";
Ammunition, illuminating, UN0171 and "EXPLOSIVES 1.2G";
Cartridges, signal, UN0054 and "EXPLOSIVES 1.3G";
Ammunition, practice, UN0362 and "EXPLOSIVES 1.3G";
Ammunition, practice, UN0362 and "EXPLOSIVES 1.4G";
Explosive, blasting, type B, UN0331 and "EXPLOSIVES 1.5D";
Articles, EEI, UN0486 and "EXPLOSIVES 1.6N".

43

Each bulk packaging, freight container, unit load device, transport vehicle, or rail car containing hazardous materials must be placarded with the hazard class placard specified by the HMT. In addition to the general placarding requirements in §172.519, these specific provisions apply for “GAS” placards. Select each button to view these placards and the specific requirements for each.

43a

43b

44c

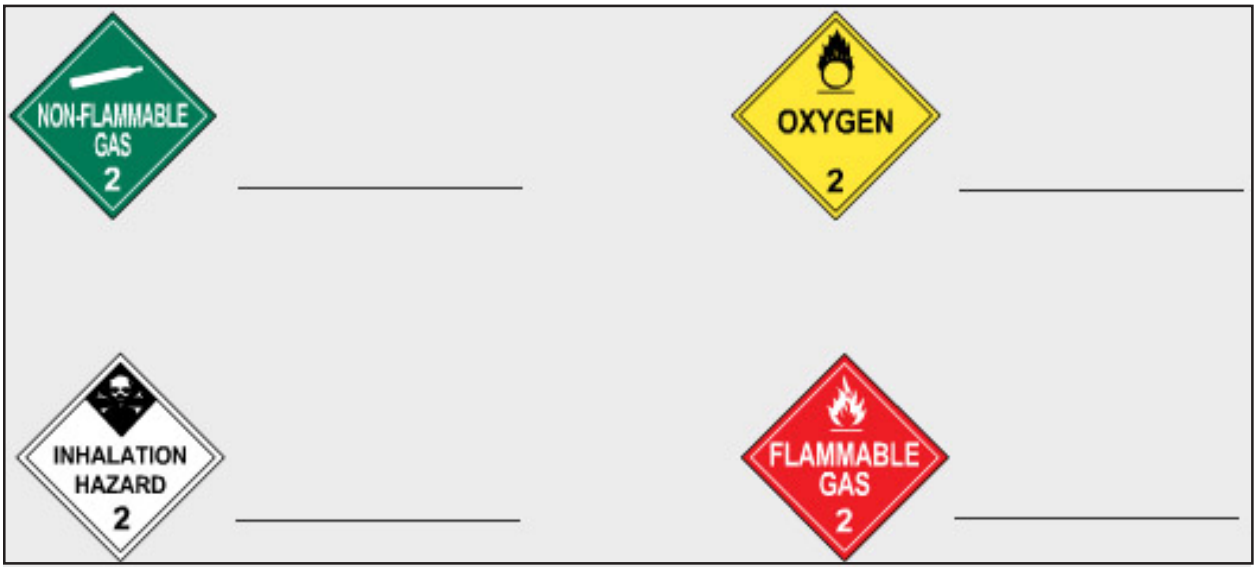
43d

44

Professor Fed's Knowledge Check 13

Instructions: Click and drag each of the shipping names to fill in the blank lines above each hazardous materials placard. Select the placard that must be affixed to a bulk packaging, freight container, unit load device, transport vehicle, or rail car containing hazardous materials in a quantity requiring a placard. Each shipping name is used only once. You will have two chances to answer this exercise correctly. Select the Done button when you are finished to receive feedback.

Arsine Oxygen, compressed UN1072 Butane Argon, compressed



Correct responses are Butane and the placard for "FLAMMABLE GAS"; Argon, compressed and the placard for "NON-FLAMMABLE GAS"; Arsine and the placard for "POISON GAS"; and Oxygen, compressed UN1072 and the placard for "OXYGEN".

45

You must use the “COMBUSTIBLE” placard for all quantities transported in bulk. You may replace the word “COMBUSTIBLE” with the words “FUEL OIL” on a placard that is displayed on a cargo tank or portable tank being used to transport by highway, fuel oil that is not classed as a flammable liquid. The words “FUEL OIL” must be white. On a “COMBUSTIBLE” placard with a white bottom, as prescribed by §172.332(c)(4), the class number must be red or black.

45a

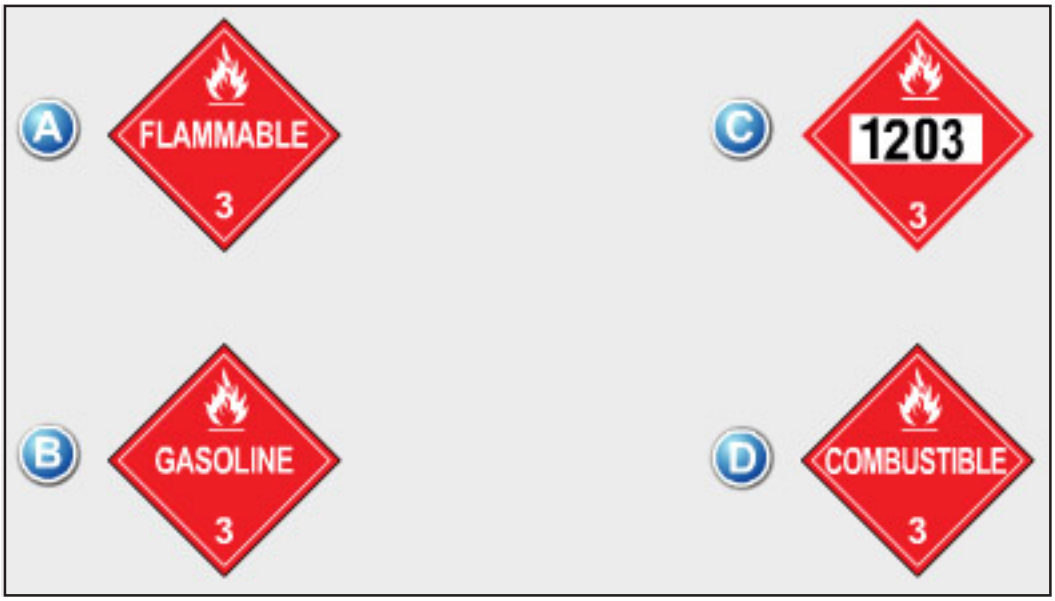
45b

46

Professor Fed's Knowledge Check 14

Instructions: Select the best answer from the four choices provided. You will have two chances to correctly answer this question.

A cargo tank carrying 18,927 liters of gasoline by highway can be placarded with three of these four placards. Which of these placards is NOT appropriate for this highway shipment of 18,927 liters of gasoline?



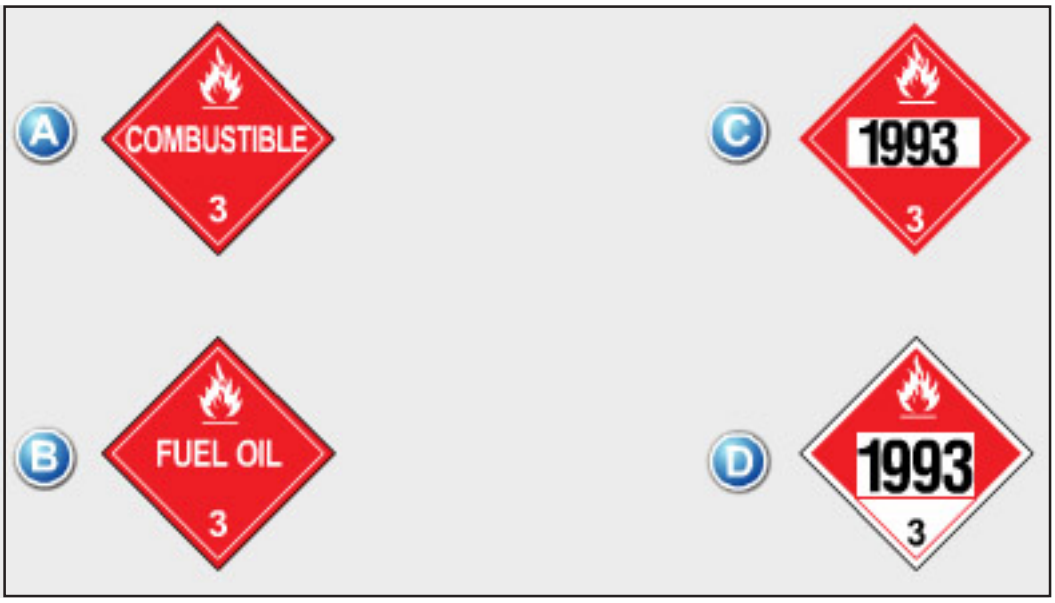
Correct answer is D. Graphic of Combustible, Class 3 placard.

47

Professor Fed's Knowledge Check 15

Instructions: Select the best answer from the four choices provided. You will have two chances to correctly answer this question.

A tank car carrying 30,283 liters of fuel oil by rail, not classed as a flammable liquid, can be placarded with three of these four placards. Which of these placards is NOT appropriate for this rail shipment of 30,283 liters of fuel oil?



Correct answer is C. Graphic of "FLAMMABLE LIQUIDS" - 1993, Class 3 placard.

48

In addition to the general placarding requirements in §172.519, these specific provisions apply for the "FLAMMABLE SOLID," "SPONTANEOUSLY COMBUSTIBLE," and "DANGEROUS WHEN WET" placards. Select each button to view these placards and the specific requirements for each.

48a

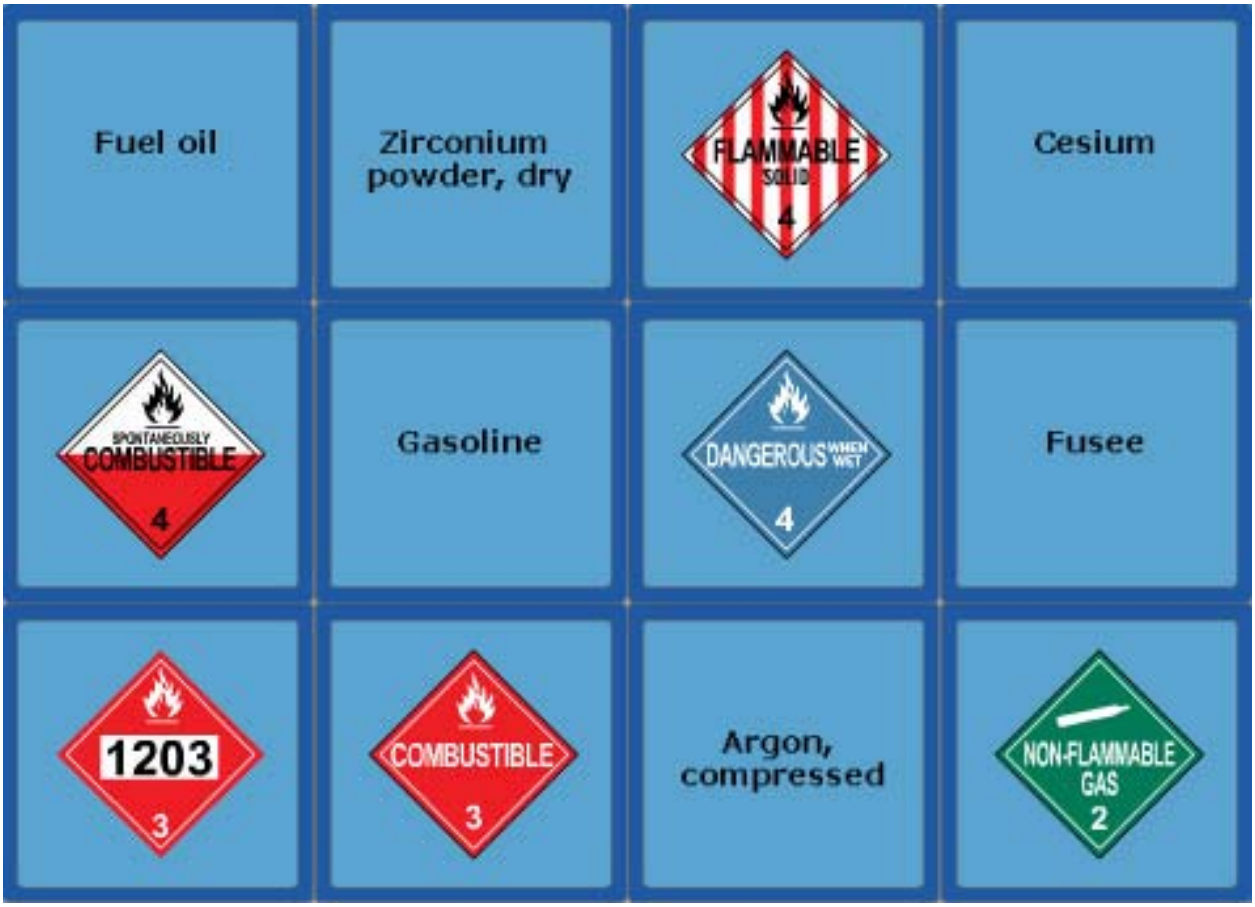
48b

48c

49

Professor Fed's Knowledge Check 16

Instructions: Complete this Knowledge Check by matching the shipping name with the hazardous materials placard that must be affixed to a bulk packaging, freight container, unit load device, transport vehicle, or rail car containing the hazardous material in a quantity requiring a placard. You will have two chances to correctly complete this exercise.



Correct answers are:
Fusee and "FLAMMABLE SOLID" placard;
Zirconium powder, dry and "SPONTANEOUSLY COMBUSTIBLE" placard;
Cesium and "DANGEROUS WHEN WET" placard;
Gasoline and "FLAMMABLE LIQUID" 1203 placard;
Fuel Oil and "COMBUSTIBLE" placard;
Argon, compressed and "NON-FLAMMABLE GAS" placard.

50

In addition to the general placarding requirements in §172.519, these specific provisions apply for “OXIDIZER” and “ORGANIC PEROXIDE” placards. Select each button to view these placards and the specific requirements for each.

50a

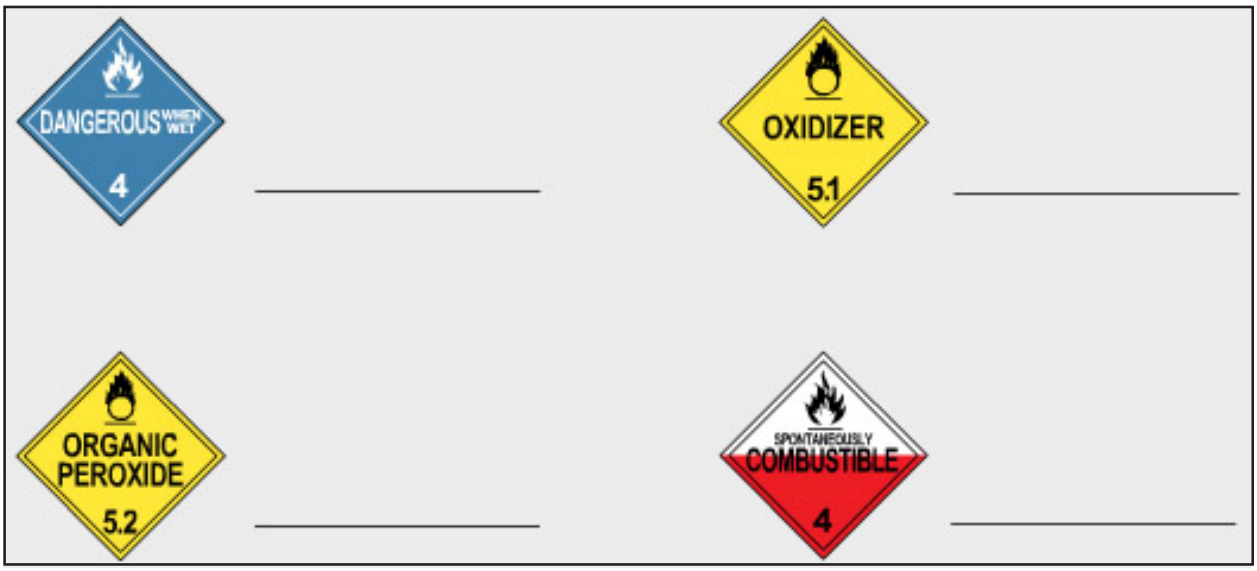
50b

51

Professor Fed's Knowledge Check 17

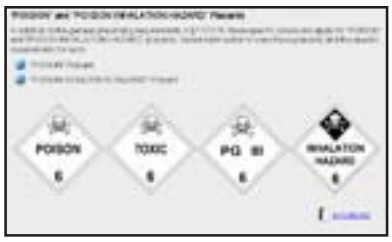
Instructions: Click and drag each of the shipping names to fill in the blank lines above each hazardous materials placard. Select the placard that must be affixed to a bulk packaging, freight container, unit load device, transport vehicle, or rail car containing hazardous materials in a quantity requiring a placard. Each shipping name is used only once. You will have two chances to answer this exercise correctly.

Copper chlorate Organic peroxide type B, liquid Xanthates Strontium phosphide



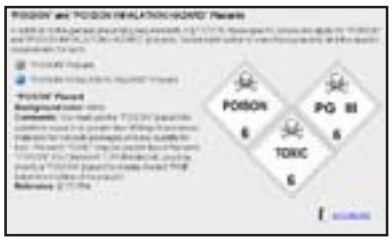
Correct answers are:
Copper chlorate and placard for "OXIDIZER";
Organic peroxide type B, liquid and placard for "ORGANIC PEROXIDE";
Xanthates and placard for "SPONTANEOUSLY COMBUSTIBLE"; and
Strontium phosphide and placard for "DANGEROUS WHEN WET"

52



In addition to the general placarding requirements in §172.519, these specific provisions apply for “POISON” and “POISON INHALATION HAZARD” placards. Select each button to view these placards and the specific requirements for each.

52a



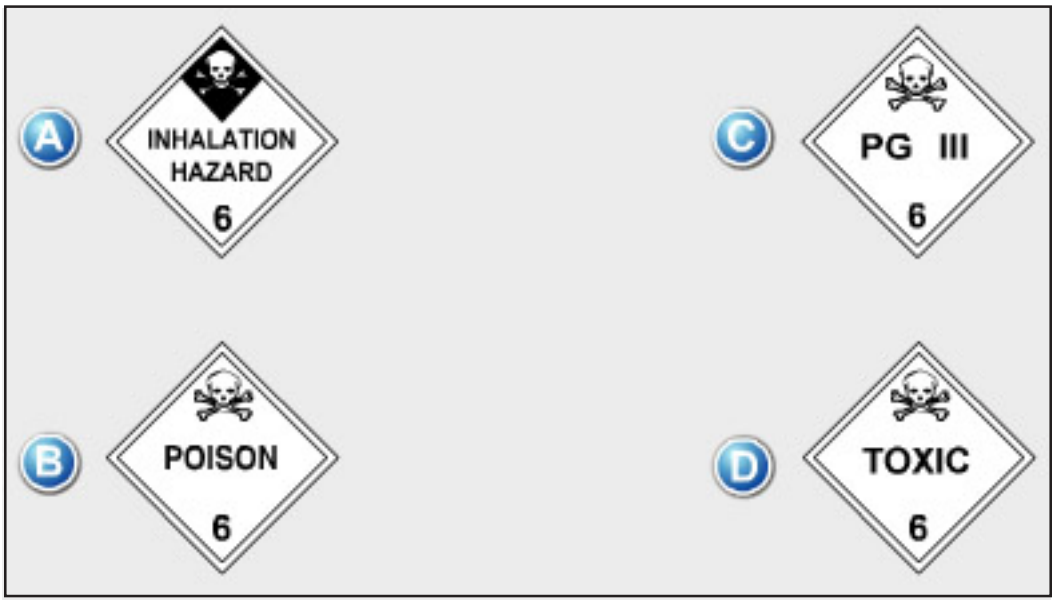
52b

53

Professor Fed's Knowledge Check 18

Instructions: Select the best answer from the four choices provided. You will have two chances to correctly answer this question.

A transport vehicle carrying 500 kg of Lead acetate by highway can be placarded with three of these four placards. Which of these placards is NOT appropriate for this highway shipment of 500 kg of Lead acetate?



Correct answer is A. "POISON INHALATION HAZARD," Class 6 placard

54

You must use the "RADIOACTIVE" placard for any quantity of a shipment containing packages bearing the "RADIOACTIVE -Yellow III" label, and for exclusive use shipments of low specific activity material and surface contaminated objects. The trefoil symbol must meet the appropriate specifications in Appendix B of Part 172.

55

Professor Fed's Knowledge Check 19

Instructions: Select the best answer from the four choices provided. You will have two chances to correctly answer this question.

Which of these loads, containing radioactive material, require the placarding of the transport vehicle with this Class 7 "RADIOACTIVE" placard?

A. A package of radioactive material with a TI of 0.03 and a maximum radiation level of 0.25 mrem/h
B. A package containing a highway route controlled quantity of radioactive material
C. A package of radioactive material with a TI of 0.3 and a maximum radiation level of 25 mrem/h
D. A package of radioactive material with a TI of 0.9 and a maximum radiation level of 50 mrem/h

Correct answer is B. A package containing a highway route controlled quantity of radioactive material

56

You must use the "CORROSIVE" placard for quantities equal to or greater than 454 kg of corrosive material for non-bulk packages, and any quantity for bulk.

57

Professor Fed's Knowledge Check 20

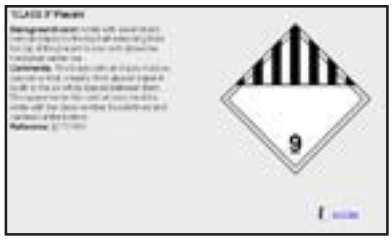
Instructions: Select the best answer from the four choices provided. You will have two chances to correctly answer this question.

Which of these loads, containing a quantity of material requiring the placarding of the transport vehicle, would require the placarding of the transport vehicle with this Class 8 "CORROSIVE" placard?

A. A package of hazardous material marked with the shipping name – Acrolein, stabilized
B. A package of hazardous material marked with the shipping name – Fish meal, stabilized
C. A package of hazardous material marked with the shipping name – Acetyl iodide
D. A package of hazardous material marked with the shipping name – Fluoroacetic acid

Correct answer is C. A package of hazardous material marked with the shipping name – Acetyl iodide

58



Domestic shipments of Class 9 materials in non-bulk packagings do not require placarding. Bulk packaging of Class 9 material must be marked with the appropriate ID number displayed on a "CLASS 9" placard, an orange panel, or a white square-on-point display

59

Professor Fed's Knowledge Check 21

Instructions: Select the best answer from the four choices provided. You will have two chances to correctly answer this question.

Which of these loads, containing a quantity of hazardous material would require the placarding of the transport vehicle with this "CLASS 9" Miscellaneous placard?

A. A domestic shipment in a non-bulk package of White asbestos
B. A domestic shipment in a bulk packaging of Sodium hydride
C. A non-bulk package of Phosgene
D. A shipment destined for Europe in a bulk packaging of Zinc dithionite

Correct answer is D. A shipment destined for Europe in a bulk packaging of Zinc dithionite

60

This concludes the instruction and Knowledge Checks for Module 4 – Placarding. Placarding is the most visible indicator to emergency responders and enforcement officers that hazardous materials are present. Make sure you communicate the correct information by use of these placards; a life may depend on it. You should now be able to:

- Identify the requirements for placarding, and any exceptions or modifications allowed with these requirements
- Examine the two placarding tables in §172.504(e) to determine placarding requirements
- Identify the requirements for placard placement and visibility

It is now time to assess how well you understand the information presented in this module. When you are ready, select Test on the Express Lane, to begin the end of module test for Module 4. This will be an open reference test. Good luck.

End of Module Test

Now that you have completed reviewing the topic on Placarding, let's evaluate how well you have mastered this material. This end of module test contains twenty-five multiple-choice questions to determine your mastery of the three learning objectives covering Placarding. This is an open reference book test and you may use any of the references that you have to assist you in successfully completing this test.

Instructions: Select the best answer from the four choices provided.

Question #1

What placard is required for a 0.45 kg. package of Division 1.1 explosives?

A. "DANGEROUS"
B. "EXPLOSIVES 1.1"
C. "FLAMMABLE SOLID"
D. None required – less than 454 kg.

Correct answer is B

Question #2

A transport vehicle carrying a Class 3 (flammable liquid) material and described on the shipping paper as, "Poison-Inhalation Hazard" must be placarded _____.

A. "DANGEROUS"
B. "FLAMMABLE"
C. "FLAMMABLE" and "POISON-INHALATION HAZARD"
D. "POISON-INHALATION HAZARD"

Correct answer is C

Question #3

A cargo tank used to transport 30,283 liters of gasoline, Class 3 (flammable liquid) material, is returning empty. The cargo tank must be placarded _____.

A. "DANGEROUS"
B. "FLAMMABLE"
C. "CORROSIVE"
D. "RESIDUE"

Correct answer is B

Question #4

You are the shipper. Your shipping paper reflects an entry for 10,000 kg. of Class 3 (flammable liquid) material packaged in case lots noted as "Ltd. Qty." What is the placarding requirement for this shipment?

A. "COMBUSTIBLE"
B. "DANGEROUS"
C. "FLAMMABLE"
D. No placard is required

Correct answer is D

Question #5

A "POISON" placard would not be the appropriate placard for hazardous materials classified as a:

A. Division 2.3
B. Class 3, Poison-Inhalation Hazard
C. Division 6.1
D. Both A and B

Correct answer is D

Question #6

No _____ may accept a rail car containing a hazardous material for transportation unless the placards for the hazardous material are affixed to the rail car in the manner prescribed in the HMR.

A. rail carrier
B. customer
C. consignee
D. intermodal rail carrier; others are regulated under IMDG

Correct answer is A

Question #7

A non-bulk packaging that contains only the residue of a Class 3 (flammable liquid) _____.

A. need not be considered in determining placarding requirements
B. may be transported only after being cleaned and purged
C. must be considered when determining placarding requirements
D. must not be transported

Correct answer is A

Question #8

No person may affix or display on a packaging, freight container, unit load device, motor vehicle or rail car, which of the following?

A. “HOT”
B. “DRIVE SAFELY”
C. “BIOHAZARD”
D. 1203 ID number

Correct answer is B

Question #9

Which of the requirements listed here is not a requirement for the visibility and display of placards?

A. Must be located clear of ladders, pipes, doors, and tarps
B. Must be located at least 3 inches away from other advertisements and markings
C. Affixed to a background of contrasting color or have a dotted / solid color outer border.
D. None – all are requirements for placard visibility and display

Correct answer is D

Question #10

The placarding requirements apply to which of these groups of materials?

A. Infectious substances
B. Hazardous materials offered for transportation as Limited Quantities when identified as such on the shipping papers
C. Flammable gas in bulk packagings
D. Hazardous materials classed as ORM-D

Correct answer is C

Question #11

When affixing a placard to a transport vehicle, bulk packaging, freight container or aircraft unit load device, which of these actions does NOT satisfy the visibility requirement?

A. affixing the placard to a background of contrasting color
B. affixing the placard to a background of a non-contrasting color
C. use of a dotted line outer border which contrasts with the background color
D. use of a solid line outer border which contrasts with the background color

Correct answer is B

Question #12

Which of these placards are properly displayed?

A. "FLAMMABLE SOLIDS" placard displayed right-side up, mid-way along the length of the trailer and away from the splash-up of dirt and water from the wheels.
B. "RADIOACTIVE" placard displayed right-side up and behind the ladder attached to trailer.
C. "NON-FLAMMABLE GAS" placard displayed upside-down, mid-way along the length of the trailer, and high enough up to be away from road grime.
D. "FLAMMABLE GAS" placard displayed on top of a "DRIVE SAFELY" placard.

Correct answer is A

Question #13

Which of these conditions cause a visibility issue that would require the carrier to correct or replace a hazmat placard?

A. placard is no longer affixed to the transport vehicle
B. placard color has become faded and deteriorated
C. writing on the placard is no longer legible
D. All of the above

Correct answer is D

Question #14

Which of these words may be used in place of the word "FLAMMABLE" on a Class 3 placard that is displayed on a cargo tank or a portable tank being used to transport this material by highway?

A. "DIESEL FUEL"
B. "FUEL OIL"
C. "GASOLINE"
D. "KEROSENE"

Correct answer is C

Question #15

A mixed shipment of Class 1 materials comprised of Division 1.1 explosives, Division 1.2 explosives, and Division 1.3 explosives is present on a transport vehicle, rail car, freight container, or unit load device. Which one of the placards must be displayed?

A. "EXPLOSIVES 1.1"
B. "EXPLOSIVES 1.2"
C. "EXPLOSIVES 1.3"
D. "DANGEROUS"

Correct answer is A

Question #16

A Class 3 (flammable liquid) shipment of 1,814 kg. is loaded into a freight container with a total capacity of more than 18 cubic meters. Which of these placards must be affixed to the side of this freight container?

A. "DANGEROUS"
B. "FLAMMABLE"
C. "FLAMMABLE LIQUID"
D. "COMBUSTIBLE"

Correct answer is B

Question #17

For a mixed shipment of a Division 5.1 ("OXIDIZER" -labeled) material with a total weight of 272 kg. and 318 kg. of a Division 6.1 ("POISON"-labeled), PGIII material, the carrier may affix which of the following placard(s)?

A. "OXIDIZER" and "HAZARDOUS"
B. "POISON" and "INHALATION HAZARD"
C. "POISON GAS" and "DANGEROUS"
D. "DANGEROUS"

Correct answer is D

Question #18

A shipment of 4,000 kg. of Class 8 (corrosive) material and a shipment of 3,629 liters of a Class 3 (flammable liquid) material are loaded at one loading facility on a freight container, unit load device, transport vehicle, or rail car. What placard(s) must be displayed on the container, device, vehicle, or car?

A. "CORROSIVE"
B. "CORROSIVE" and "FLAMMABLE"
C. "DANGEROUS"
D. "FLAMMABLE"

Correct answer is B

Question #19

A freight container offered by air, with a capacity of less than 18 cubic meters containing a hazardous material requires no placard(s), but must be labeled _____.

A. on one end
B. on one side
C. on either both ends or both sides; one label on or near the closure
D. None of the above – no labels are required

Correct answer is C

Question #20

A transport vehicle containing packages of a Class 7 (Radioactive) material labeled "RADIOACTIVE-Yellow III" and packages of a Division 1.3 (Explosive) must be placarded with _____.

A. "EXPLOSIVES 1.3" and "RADIOACTIVE"
B. "EXPLOSIVES 1.3"
C. "RADIOACTIVE"
D. "DANGEROUS"

Correct answer is A

Question #21

Which placard may be used in place of a "COMBUSTIBLE" placard on cargo tanks, portable tanks, and compartmented tank cars containing both flammable and combustible liquids?

A. "DANGEROUS"
B. "FLAMMABLE"
C. "FLAMMABLE GAS"
D. "FLAMMABLE LIQUID"

Correct answer is B

Question #22

Table 1 located in §172.504, contains a list of hazardous materials by class / division / category that require the carrier of the transport vehicle or freight container to display placards for _____ of material contained.

A. 2,000 kg. or more
B. 1,000 kg. or more
C. 454 kg. or more
D. any quantity

Correct answer is D

Question #23

Placards required by the HMR are NOT needed if the transport vehicle, packaging or freight container already display placards in accordance with the Canadian Transport of Dangerous Goods Regulations (TDG), _____, or the United Nations Recommendations (UN).

A. the International Civil Aviation Organization (ICAO)
B. the American Trucking Association
C. the International Maritime Dangerous Goods Code (IMDG)
D. the Association of American Railroads (AAR)

Correct answer is C

Question #24

What does this marking represent?

A. Identifies the Elevated temperature liquid, n.o.s., 9, UN3257, PGIII, even though the hazardous material does not require a placard
B. Identifies Fuel oil (No 2), 3, NA1993, PGIII
C. Identifies Chlorine, 2.3, UN1017
D. Identifies Isopropanol, 3, UN1219, PGII

Correct answer is A

Question #25

A placard must be displayed for which of these groups of hazardous materials?

A. Certain Class 3 and Division 4.1, 4.2, 4.3, 5.1, 6.1, and Classes 8 and 9 materials prepared for transportation IAW §173.13
B. Combustible liquids when packaged in non-bulk packagings
C. Class 9 materials when transported between places in the US other than through a foreign country
D. Class 7 radioactive materials with a Radioactive-Yellow III label

Correct answer is D