

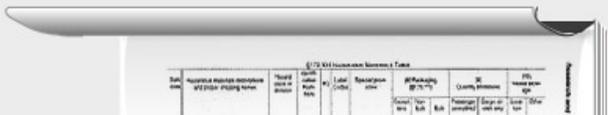
# Hazardous Materials Transportation Training Modules

# VERSION 5.1

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## STUDENT

### The Hazardous Materials Table



§172.101 Hazardous Materials Table

Sym- bols	Hazardous materials descriptions and proper shipping names	Hazard class or division	Identifica- tion Numbers	PG	Label Codes	Special provisions (§172.102)	(8) Packaging (§173.***)			(9) Quantity limitations		(10) Vessel stowage	
							Excep- tions	Non- bulk	Bulk	Passenger aircraft/rail	Cargo air- craft only	Location	Other
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	Acetaldehyde .....	3	UN1089	I	3 .....	A3, B16, T11, TP2, TP7	None ..	201 ..	243 ..	Forbidden	30 L	E	
A	Acetaldehyde ammonia .....	9	UN1841	III	9 .....	IP8, IP6	155 ...	204 ..	240 ..	200 kg	200 kg	A	34
	Acetaldehyde oxime .....	3	UN2332	III	3 .....	B1, IB3, T4, TP1	150 ...	203 ..	242 ..	60 L	220 L	A	



U.S. Department of Transportation  
**Pipeline and Hazardous Materials  
 Safety Administration**

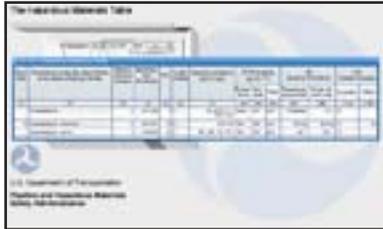
## MODULE 1

# Script

## Visual

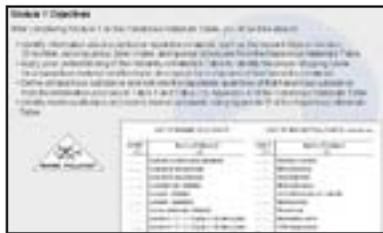
## Narrative

### 1



The Hazardous Materials Table, or HMT, is the backbone of the Hazardous Materials Regulations. Understanding and knowing how to use the Hazardous Materials Table is the first step toward compliance with the Hazardous Materials Regulations. This module will review the information contained within the Hazardous Materials Table.

### 2



After completing Module 1 on the Hazardous Materials Table, you should be able to:

- Identify information about a particular hazardous material, such as the hazard class or division, ID number, packing group, label codes, and other provisions from the Hazardous Materials Table;
- Apply your understanding of the Hazardous Materials Table to identify the proper shipping name for a hazardous material and the basic description for a shipment of that hazardous material;
- Define a hazardous substance and indicate the reportable quantity of that hazardous substance from the information provided in Table 1 and Table 2 to Appendix A of the Hazardous Materials Table.
- Identify marine pollutants and severe marine pollutants using Appendix B of the Hazardous Materials Table.

## 3



The Hazardous Materials Table, also referred to as the Table, or HMT, lists alphabetically, by proper shipping name, those materials that the U.S. Department of Transportation has designated as hazardous materials for the purpose of transportation. The Table provides information used in shipping papers, package marking, and labeling, and prescribes quantity limits on aircraft and railcars, stowage of hazardous materials aboard vessels, and transport vehicle placarding applicable to the shipment and transportation of those hazardous materials. This module assumes that the manufacturer or shipper has already identified the hazardous material.

## 4



The Hazardous Materials Regulations and the Hazardous Materials Table apply to at least three separate groups of people, they include: each person who offers a hazardous material for transportation; each carrier by air, highway, rail, or water who transports a hazardous material; and a person who performs a function related to the provision or proper use of hazmat packaging.

## 5

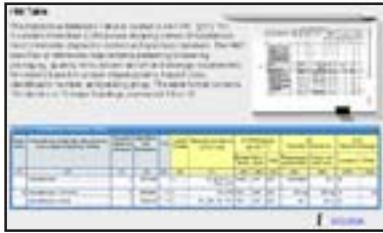
### Professor Fed's Knowledge Check 1

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

The Hazardous Materials Table lists \_\_\_\_\_, by proper shipping name, those materials that the U.S. Department of Transportation has designated as hazardous materials for the purpose of transportation.

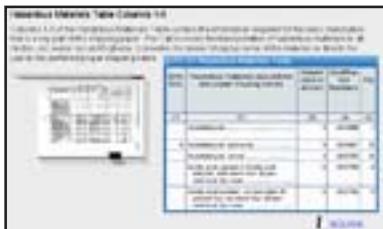
- A. by symbol
- B. numerically
- C. alphabetically
- D. by hazard class

6



The Hazardous Materials Table is located in 49 CFR, §172.101. It contains more than 3,000 proper shipping names of substances most commonly shipped or carried as hazardous materials. The HMT specifies or references requirements pertaining to labeling, packaging, quantity limits aboard aircraft and stowage requirements for vessels based on proper shipping name, hazard class, identification number, and packing group. The table format contains 14 columns in 10 major headings, numbered 1 thru 10. Our discussion of the Table will be divided into two groups. The first group involves Columns 1-5, which provides the information required for the basic description that is a key part of the shipping paper. The second group involves Columns 6-10, which provides specialized information necessary for packaging, marking, labeling, and other mode specific requirements.

7



The first five columns of the Hazardous Materials Table contain the information required for the basic description that is required on the shipping paper document or the hazardous waste manifest, if required. The Table covers the transportation of hazardous materials in all modes air, water, rail and highway. It provides the proper shipping name of the material or directs the user to the preferred proper shipping name. Select the columns labeled 1-5 to learn about the information contained in that column. You will be returned to this screen after learning about each column, until you have completed all of the columns. Completed columns will be indicated in blue.

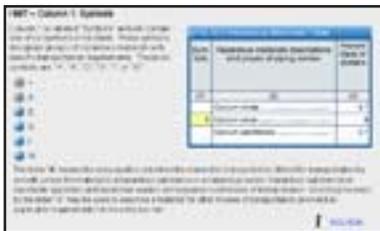
8



Column 1 is labeled “Symbols” and will contain one of six symbols or be blank. These symbols designate groups of hazardous materials with specific transportation requirements. Those six symbols are: “+”, “A”, “D”, “G”, “I”, or “W”. Select each of these buttons to learn more about the use of each of these symbols and to view an example.

**8a**

The plus sign fixes the proper shipping name, hazard class and packing group for that entry, listed in Columns 2, 3, and 5, respectively. The term fixes means that you may not change the proper shipping name, hazard class, or packing group, even if the materials do not meet that hazard class definition. When the plus sign is assigned to a proper shipping name in Column 1 of the HMT, it means that the material is known to pose a risk to humans. Only the Associate Administrator for Hazardous Materials Safety may authorize an appropriate alternate proper shipping name and hazard class.

**8b**

The letter “A” means that the specific material is only regulated if offered or transported by aircraft, unless the material is a hazardous substance or a hazardous waste. Hazardous substances in reportable quantities and hazardous wastes are regulated in all modes of transportation. An entry preceded by the letter “A” may be used to describe a material for other modes of transportation provided all applicable requirements for the entry are met.

**8c**

The letter “D” identifies hazardous materials for the purposes of domestic transportation. A separate entry may identify the same hazardous material when it is shipped internationally, if it is appropriate to ship the material internationally at all. The international entry may or may not have the same proper shipping name as the domestic entry.

**8d**

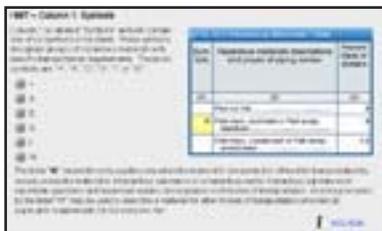
The letter “G” identifies n.o.s. (not otherwise specified) and generic proper shipping names for which one or more technical names of the hazardous material must be entered in parentheses, in association with the basic description.

## 8e



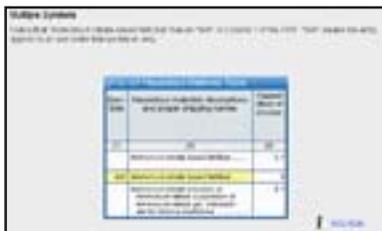
The letter “T” identifies hazardous materials for the purposes of international transportation. An alternate entry may be appropriate for the same hazardous material, when only domestic transportation is involved.

## 8f



The letter “W” identifies a specific material that is regulated only if offered or transported by vessel, unless the material is a hazardous substance or a hazardous waste. Hazardous substances in reportable quantities and hazardous wastes are regulated in all modes of transportation. An entry preceded by the letter “W” may be used to describe a material for other modes of transportation provided all applicable requirements for the entry are met.

## 9



Notice that “Ammonium nitrate based fertilizer” has an “AW” in Column 1 of the HMT. “AW” means the entry applies to air and water transportation only.

## 16

**Professor Fed’s Knowledge Check 2**

Instructions: Complete this Knowledge Check by matching the appropriate Column 1 symbol with the appropriate symbol description. Select the matching pair by first selecting the symbol tile and then selecting the description tile that most closely describes that symbol. You will have two chances to correctly complete this exercise.

+	Identifies shipping names appropriate for domestic transportation	D	I
Identifies shipping names appropriate for international transportation	Fixes the proper shipping name hazard class and packing group	G	Applies to materials offered or intended for transportation by aircraft
W	Identifies n.o.s. and generic shipping names for which technical names must be entered in parentheses with the basic description	A	Applies to materials offered or intended for transportation by vessel

## 11

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### Professor Fed’s Knowledge Check 3

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

The “+” symbol next to the entry for Aniline fixes which of these entries?

- A. Proper shipping name, hazard class, and ID number
- B. Proper shipping name, hazard class, and packing group
- C. Proper shipping name, ID number, and packing group
- D. Hazard class, ID number, and packing group

## 12

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### Professor Fed’s Knowledge Check 4

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

The “DW” symbol in Column 1 of the HMT, next to the entry for Cotton, means this entry is regulated in what two modes or groups of transportation?

- A. transportation by aircraft and vessel
- B. transportation by rail and international transportation
- C. domestic transportation and transportation by vessel, when the cotton is a hazardous substance or a hazardous waste
- D. domestic transportation and transportation by vessel in most cases; in all modes if the cotton is a hazardous substance or a hazardous waste

## 13



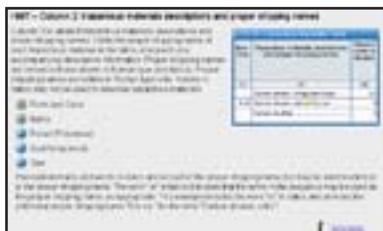
Column 2 is labeled Hazardous materials descriptions and proper shipping names and lists the proper shipping name of each hazardous material in the table, along with any accompanying descriptive information. Proper shipping names are limited to those shown in Roman type, not italics. Proper shipping names are written in Roman type only. Names in italics may not be used to describe hazardous materials. Select each of these buttons to learn more about some additional rules that guide these entries and view an example demonstrating that rule.

## 13a



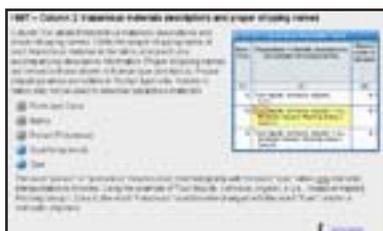
Proper shipping names may be used in the singular or plural form, and in either capital or lower case letters. This example displays the plural form (Aerosols) in both upper and lower case letters, but Aerosol in the singular form, or aerosol in lower case letters, or AEROSOL in all upper case letters would be acceptable.

## 13b



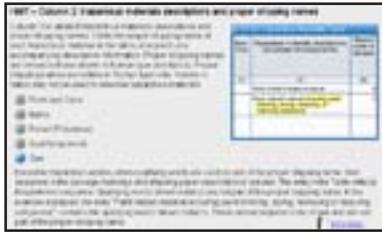
Punctuation marks and words in italics are not part of the proper shipping name, but may be used in addition to the proper shipping name. The word “or” in italics indicates that the terms in the sequence may be used as the proper shipping name, as appropriate. This example includes the word “or” in italics and provides the additional proper shipping name “Dry ice,” for the entry “Carbon dioxide, solid.”

## 13c



The word poison or poisonous may be used interchangeably with the word toxic when only domestic transportation is involved. Using the example of Toxic liquids, corrosive, organic, n.o.s., inhalation hazard, Packing Group I, Zone A, the word poisonous could be interchanged with the word toxic only for a domestic shipment.

## 13d



Except for hazardous wastes, when qualifying words are used as part of the proper shipping name, their sequence in the package markings and shipping paper description is optional. The entry in the Table reflects the preferred sequence.

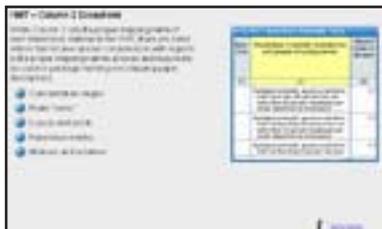
Qualifying words shown in italics are not part of the proper shipping name. In the example displayed, the entry Paint related material including paint thinning, drying, removing or reducing compound, contains the qualifying words shown in italics. These are not required to be shown and are not part of the proper shipping name.

## 13e

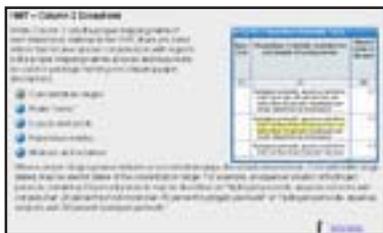


When one entry references another entry by use of the word “see,” and both names are in Roman type, then either name may be used as the proper shipping name. In the example Ethyl alcohol you are directed to look at the entry for Ethanol. You should note that for the entry of Ethyl alcohol none of the other columns contain any entries. All of the HMT data is included with the Ethanol entry, but Ethyl alcohol is still an acceptable proper shipping name.

## 14



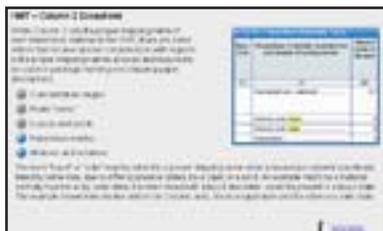
While Column 2 lists the proper shipping name of each hazardous material in the HMT, there are some entries that receive special consideration with regards to the proper shipping names allowed and required to be used on package marking and shipping paper descriptions. Select each of these buttons to learn more about the exceptions that guide these entries and view an example demonstrating that rule.

**14a**

When a proper shipping name includes a concentration range, the actual concentration, if it is within the range stated, may be used in place of the concentration range. For example, an aqueous solution of hydrogen peroxide containing 30 percent peroxide may be described as Hydrogen peroxide, aqueous solution with not less than 20 percent but not more than 40 percent hydrogen peroxide or Hydrogen peroxide, aqueous solution with 30 percent hydrogen peroxide.

**14b**

The use of the prefix “mono” is optional in any shipping name, when appropriate. As an example: Iodine monochloride may be used interchangeably with Iodine chloride; and Glycerol alpha-monochlorohydrin may be used interchangeably with Glycerol alpha-chlorohydrin since the term “mono” is considered a prefix to the term “chlorohydrin” and may be deleted.

**14c**

The word liquid or solid may be added to a proper shipping name when a hazardous material specifically listed by name may, due to differing physical states, be a liquid or a solid. An example might be a material normally found in a dry, solid state, but when mixed with a liquid, like water, would be present in a liquid state. The example shown here are two entries for Crotonic acid, one in a liquid state and the other in a solid state.

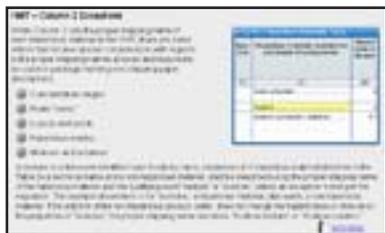
**14d**

If the word waste is not included in the hazardous material description in Column 2 of the Table, the proper shipping name for a hazardous waste shall include the word Waste preceding the proper shipping name of the material. An example would be a container of Acetone that has been contaminated with small quantities of another material. When that container is marked and prepared for disposal, the shipping paper entry would reflect Waste acetone and not simply Acetone. The word “Waste” need not precede a proper shipping name that already includes the word “Waste”.

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**14e**

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A mixture or solution not identified specifically by name, comprised of a hazardous material identified in the Table by a technical name and a non-hazardous material, shall be described using the proper shipping name of the hazardous material and the qualifying word mixture or solution, unless an exception is met per the regulation. The example shown here is for Acetone, a hazardous material, plus water, a non-hazardous material. If the addition of the non-hazardous product, water, does not change the hazard class or division or the chemical properties of Acetone, the proper shipping name becomes Acetone mixture or Acetone solution.

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**15**

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**Professor Fed's Knowledge Check 5**

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

What is the proper shipping name for Isooctane?

- A. Isooctane, because proper shipping names are printed in Italic type.
- B. Octanes, because proper shipping names are printed in Roman type.
- C. Both, because when one entry references another by the use of the word “see” and both names are in Roman type, either entry may be used.
- D. Both, because when one entry references another by the use of the word “see” and both names are in Italic type, either entry may be used.

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**16**

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**Professor Fed’s Knowledge Check 6**

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 answer this exercise correctly. Select the Done button when you are finished to receive feedback.

capital  
italics

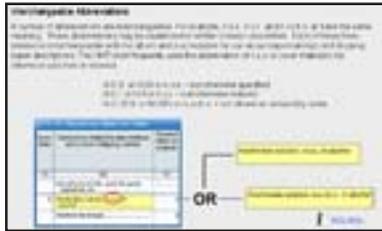
toxic  
qualifying

see  
plural

or  
Roman

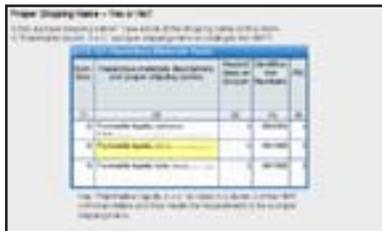
1. Proper shipping names may be used in the singular or \_\_\_\_\_ form, and in either \_\_\_\_\_ or lower case letters.
2. Punctuation marks and words in \_\_\_\_\_ are not part of the proper shipping name, but may be used in addition to the proper shipping name. The word “\_\_\_\_\_” in italics indicates that the terms in the sequence may be used as the proper shipping name, if the name is found in Roman type.
3. The word “poison” or “poisonous” may be used interchangeably with the word “\_\_\_\_\_” when only domestic transportation is involved.
4. Except for hazardous wastes, when \_\_\_\_\_ words are used as part of the proper shipping name, their sequence in the package markings and shipping paper description is optional, but the entry in the Table reflects the preferred sequence.
5. When one entry references another entry by use of the word “\_\_\_\_\_”, and both names are in \_\_\_\_\_ type, then either name may be used as the proper shipping name.

# 17



A number of abbreviations are interchangeable. For example, n.o.s. (not otherwise specified), n.o.i. (not otherwise indexed), and n.o.i.b.n. (not otherwise indexed by name) all have the same meaning. These abbreviations may be capitalized or written in lower case letters. Each of these three phrases is interchangeable with the others and is acceptable for use on package markings and shipping paper descriptions. The HMT most frequently uses the abbreviation of n.o.s. to cover materials not otherwise specified or indexed.

# 18



Is this a proper shipping name? Take a look at the shipping name on this drum.

Is Flammable liquids, n.o.s. a proper shipping name according to the HMT?

Yes, Flammable liquids, n.o.s. is listed in Column 2 of the HMT in Roman letters and thus meets the requirements to be a proper shipping name.

## 19

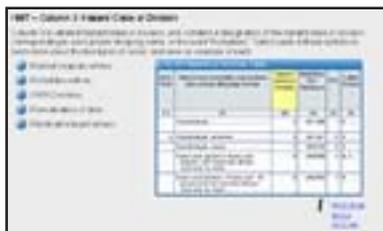
### Professor Fed’s Knowledge Check 7

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 answer this exercise correctly. Select the Done button when you are finished to receive feedback.

concentration      liquid      mixture      mono  
solid      solution      waste

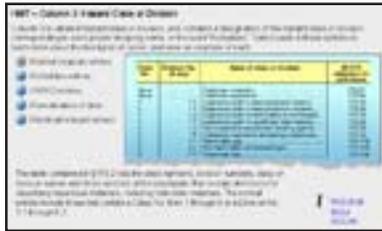
1. When a proper shipping name includes a \_\_\_\_\_ range, the actual value, if it is within the range stated, may be used in place of the stated range.
2. The use of the prefix “\_\_\_\_\_” is optional in any shipping name.
3. The word “\_\_\_\_\_” or “\_\_\_\_\_” may be added to a proper shipping name when a hazardous material is treated differently when it is shipped in different physical states.
4. If the word “\_\_\_\_\_” is not included in the hazardous material description in Column 2 of the Table, the proper shipping name for a hazardous waste shall include that word preceding the proper shipping name of the material.
5. A \_\_\_\_\_ or \_\_\_\_\_ not identified specifically by name, comprised of a hazardous material identified in the Table by a technical name and a non-hazardous material, shall be described using the proper shipping name of the hazardous material and the addition of the qualifying word, unless an exception is met per the regulation.

## 20



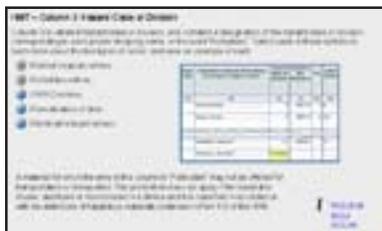
Column 3 is labeled hazard class or division and contains a designation of the hazard class or division corresponding to each proper shipping name, or the word “Forbidden.” Select each of these buttons to learn more about the five types of cases, and view an example of each.

## 20a



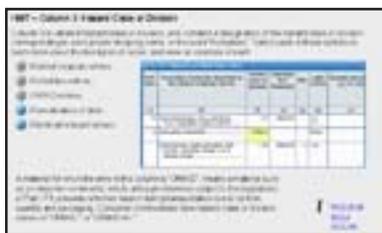
The table contained in §173.2 lists the class numbers, division numbers, class or division names and those sections of the subchapter that contain definitions for classifying hazardous materials, including forbidden materials. The normal entries include those that contain a Class No. from 1 through 9 or a Division No. 1.1 through 6.2.

## 20b



A material for which the entry in this column is forbidden may not be offered for transportation or transported. This prohibition does not apply if the material is diluted, stabilized or incorporated in a device and it is classified in accordance with the definitions of hazardous materials contained in Part 173 of the HMR.

## 20c



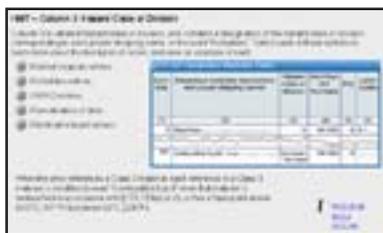
A material for which the entry in this column is “ORM-D”, means a material such as a consumer commodity, which, although otherwise subject to the regulations of Part 173, presents a limited hazard during transportation due to its form, quantity and packaging.

## 20d



When a reevaluation of the test data or new data indicates a need to modify the forbidden designation or the hazard class or packing group specified for a material specifically identified in the Table, this data should be submitted to the Associate Administrator for Hazardous Materials Safety for review and approval.

## 20e



Later, we'll talk about packaging. In some cases, an exception in section 173.150 will allow you to reclassify a Class 3 (flammable) material, as a combustible liquid. A flammable liquid with a flash point at or above 38°C or 100°F that does not meet the definition of any other hazard class may be reclassified as a combustible liquid. Some restrictions apply to vessel and aircraft modes of transportation, and to bulk or non-bulk packaging. Please see §173.150(e) and (f) for additional details.

## 21

### Professor Fed's Knowledge Check 8

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

Which of these materials may not be offered for transportation or transported, unless the material is diluted, stabilized, or incorporated in a device, in addition to being properly classified?

- A. Acetylene, dissolved
- B. Acetylene (*liquefied*)
- C. Acetyl bromide
- D. Acetyl chloride

## 22

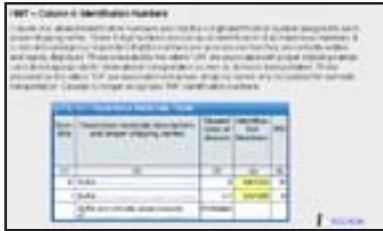
### Professor Fed's Knowledge Check 9

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

Which of these is not identified as “other regulated material”?

- A. Cartridges power devices
- B. Cartridges, small arms
- C. Charges, depth
- D. Consumer commodity

## 23



Column 4 is labeled Identification Numbers and lists the 4-digit identification number assigned to each proper shipping name. These 4digit numbers provide quick identification of all hazardous materials. It is critical to emergency responders that the numbers are accurate and that they are correctly written and legibly displayed. Those preceded by the letters “UN” are associated with proper shipping names considered appropriate for international transportation as well as domestic transportation. Those preceded by the letters “NA” are associated with proper shipping names only recognized for domestic transportation. Notice the “D” and “I” symbols in column 1 of these entries for sulfur. The entry used for international shipping uses a U.N. number, and division 4.1. The entry for domestic shipping uses an NA number and class 9. Different rules apply to international shipments of sulfur and domestic shipments of sulfur, although both are permitted, when the correct provisions of the HMR are met.

## 24



Identification numbers preceded by the letters “UN,” for United Nations, identify materials for domestic and/or international shipments, while identification numbers preceded by the letters “NA,” for North America, may be used for certain materials when transported within the United States only.

**25**

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**Professor Fed’s Knowledge Check 10**

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

Which of the choices below provides the best description of the limitations placed on the entry “Diesel fuel, 3, NA1993”?

- A. This entry prescribes appropriate handling of the material for international transportation.
- B. This entry prescribes appropriate handling of the material for international transportation everywhere except Canada.
- C. This entry prescribes appropriate handling of the material for transportation within the United States only.
- D. This entry prescribes appropriate handling of the material by air only.

**26**

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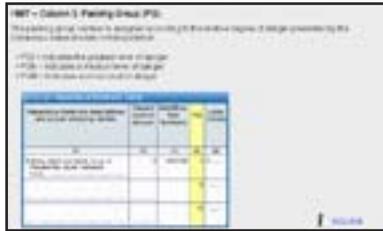
**Professor Fed’s Knowledge Check 11**

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

Which of the choices below provides the best description of the limitations placed on the entry “Kerosene, 3, UN1223”?

- A. This entry prescribes appropriate handling of the material for international transportation as well as domestic transportation.
- B. This entry prescribes appropriate handling of the material for international transportation.
- C. This entry prescribes appropriate handling of the material for domestic transportation only in the lower 48 states.
- D. This entry prescribes appropriate handling of the material for domestic transport only within the United States and/or between Canada and the United States.

## 27



Column 5 is labeled Packing Group and specifies one or more packing groups assigned to a material corresponding to the proper shipping name and hazard class for that hazardous material. The HMT specifies one or more packing groups assigned to most hazardous materials. If a material is assigned to more than one packing group, the shipper must determine the correct packing group for that hazardous material. The packing group of the hazardous material will have an effect on a material's packaging requirements.

## 28

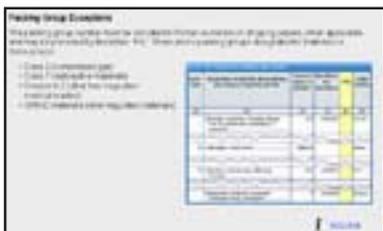
### Professor Fed's Knowledge Check 12

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

Knowing only their packing groups, which of the choices below would you say presents the greatest relative degree of danger?

- A. Amatsols, *see* Explosives, blasting, type B
- B. Amines, flammable, corrosive, n.o.s. *or* Polyamines, flammable, corrosive, n.o.s., PGI
- C. Amines, flammable, corrosive, n.o.s. *or* Polyamines, flammable, corrosive, n.o.s., PGII
- D. Amines, flammable, corrosive, n.o.s. *or* Polyamines, flammable, corrosive, n.o.s., PGIII

## 29



The packing group number must be indicated in Roman numerals on shipping papers, when applicable, and may be preceded by the letters "PG." There are no packing groups designated for materials in these groups: Class 2, Class 7, Division 6.2, and ORM-D materials.

## 30

### Professor Fed’s Knowledge Check 13

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

What Packing Group is assigned to the material – Consumer commodity (see graphic), and why is that appropriate?

- A. PGI; because it is a Class 7, radioactive material
- B. PGII; because it is a Class 1, explosive material
- C. Not assigned a PG, because the hazard class is marked with ORM-D
- D. PGIII; because it is a Division 6.2, infectious substance material

## 31



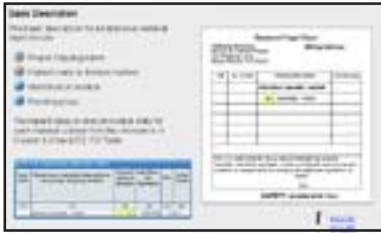
The basic description for a hazardous material must include these items of information, taken from the HMT. Later, we’ll talk more about the basic description, and the order the information goes in. The four items that make up the basic description include the proper shipping name, the hazard class or division number, the identification number, and the packing group. The basic description is important in many function specific tasks, including but not limited to the preparation of shipping papers. Select each of these buttons to learn more about the items that compose the basic description.

### 31a



The proper shipping name entry is taken from the material name prescribed in Column 2 of the Table. The technical name may be entered in parentheses between the proper shipping name and the hazard class or following the basic description for those materials with a ‘G’ in Column 1.

### 31b



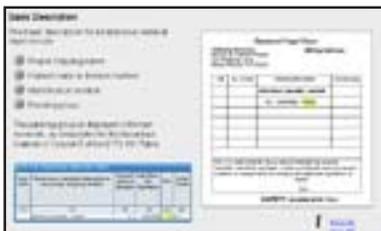
The hazard class or division number entry for each material is taken from the information in Column 3 of the Table. Except for combustible liquids, the subsidiary hazard class or subsidiary division number must be entered in parentheses immediately following the primary hazard class or division number.

### 31c



The identification number is taken from Column 4 of the Table.

### 31d



The packing group is displayed in Roman numerals, as designated for the hazardous material in Column 5 of the Table. The packing group may be preceded by the letters “PG”.

## 32

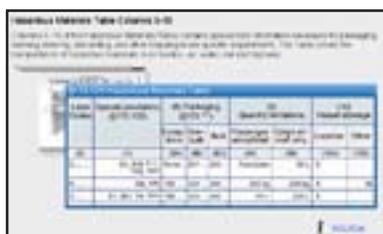
## Professor Fed’s Knowledge Check 14

Instructions: Click and drag each of the possible responses shown here to fill in the blanks below. Select the response that best completes each statement. You may use the HMT to answer these questions. Use the link in the lower right corner to access the HMT. Each response 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.

advanced shipping 2	basic Roman 5	hazard identification 7	italic PG 9	packing UN
---------------------------	---------------------	-------------------------------	-------------------	---------------

1. The \_\_\_\_\_ group number must be indicated in \_\_\_\_\_ numerals on shipping papers and may be preceded by the letters \_\_\_\_\_.
2. There are no packing groups designated for materials in Class \_\_\_\_\_, Class \_\_\_\_\_, Division 6.2, and for ORM-D materials.
3. The four items that make up the \_\_\_\_\_ description include: the proper \_\_\_\_\_ name, the \_\_\_\_\_ class or division, the \_\_\_\_\_ number, and the packing group.

## 33



The last five columns of the Hazardous Materials Table contains specialized information necessary for packaging, marking, labeling, placarding, and other shipping mode specific requirements. While none of the information found in these last five columns is directly placed on the shipping papers, the information contained in these columns is important for determining the required hazard warning labels, applicable special provisions, packaging requirements and restrictions, and limitations on the mode of transportation available to ship a particular hazardous material. Select each of the buttons labeled Column 6-10 to learn about the information contained in that column. You will be returned to this page after learning about each column, until you have completed all the columns. Completed columns will be indicated in blue.

## 34



Column 6, Label Codes, specifies the hazard warning labels that must be applied to each package filled with a material conforming to the associated hazard class and proper shipping name, unless the package is otherwise excepted from labeling. If two label codes are listed, the first represents the primary hazard and the second represents the subsidiary hazard. No label is required for a material classified as a combustible liquid or for a Class 3 material that is reclassified as a combustible liquid. The codes contained in Column 6 are defined according to the Label Substitution Table found in §172.101(g). Additional labeling requirements are found in §172.402.

## 35

### Professor Fed’s Knowledge Check 15

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

What does the Column 6 entry for the material “Diallylamine” indicate to the hazardous materials employee?

- Any of the three label codes (3, 6.1, and 8) can be used to mark a package containing the hazardous material Diallylamine.
- A label code of 6.1 should be used to mark a package containing the hazardous material Diallylamine.
- A label code of 8 should be used to mark a package containing the hazardous material Diallylamine.
- The primary hazard label for a package containing the hazardous material Diallylamine is 3, with 6.1 and 8 representing the subsidiary hazards.

## 36

UN Class	Hazardous materials description	Mode	Code	Label	Special provisions (§ 172.102)
3	Petroleum oil	All	144	None	144

Column 7 is labeled Special provisions and specifies codes for special provisions applicable to hazardous materials. These special provisions are in addition to the standard requirements. When Column 7 refers to a special provision for a hazardous material, the meaning and requirements of that special provision are as set forth in the §172.102 Table.

## 37

UN Class	Hazardous materials description	Mode	Code	Label	Special provisions (§ 172.102)
3	Intermediate bulk containers	All	IB2	None	IB2

Special provisions are coded with numbers and/or letters and numbers. Numeric-only codes are multi-modal in application and may apply to both bulk and non-bulk packaging. Alpha/numeric codes are specific to a particular transportation mode or a particular type of packaging. In the example highlighted here, the code IB2 concerns special provisions involving intermediate bulk containers. The T4 code concerns special provisions involving intermodal portable tanks, and the TP1 code concerns special provisions involving portable tanks. Review §172.102(a) and (b) to learn more about these special provisions.

## 38

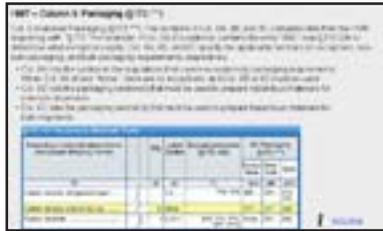
### Professor Fed's Knowledge Check 16

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

What does the special provision code '144' from the Column 7 entry for Petroleum oil indicate?

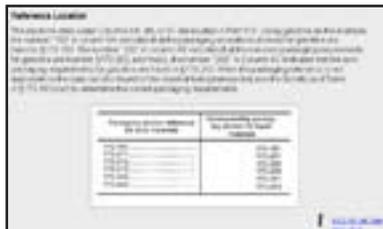
- A. This special provision applies to only the air mode and both bulk and non-bulk packagings.
- B. This special provision applies to only the rail mode and both bulk and non-bulk packagings.
- C. This special provision applies to only the highway mode and both bulk and non-bulk packagings.
- D. This special provision applies to multi-modal and to both bulk and non-bulk packagings.

39



You have identified the material from Columns 2, 3, 4, 5, 6, and 7, now the hazardous material needs to be packaged in accordance with the HMR. Column 8 of the HMT specifies the applicable sections containing the packaging requirements. Notice that Column 8 is divided into three parts - Column 8A, 8B and 8C. In the example shown here for Carbon dioxide, solid, the entry in Column 8A indicates that exceptions to the packaging requirement for this material can be found in §173.217. The entry for Column 8B indicates that packaging requirements for non-bulk shipments is also found in §173.217, while the entry for Column 8C indicates that packaging requirements for bulk shipments is found in §173.240.

40



The sections cited under Columns 8A, 8B, or 8C are located in Part 173. Using gasoline as the example, the number “150” in column 8A indicates that the packaging exceptions allowed for gasoline are found in §173.150. The number “202” in column 8B indicates that the nonbulk packaging requirements for gasoline are found in §173.202, and finally, the number “242” in Column 8C indicates that the bulk packaging requirements for gasoline are found in §173.242. When the packaging reference is not applicable to the solid or liquid state of the material being transported, use the Solid/Liquid Table in §172.101(i)(4) to determine the correct packaging.

**41****Professor Fed’s Knowledge Check 17**

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

What reference contains the packaging exceptions for the domestic transportation of Ammonia, anhydrous?

- A. §173.304
- B. §173.314
- C. §173.315
- D. None, there are no exceptions regarding the domestic transportation of Ammonia, anhydrous.

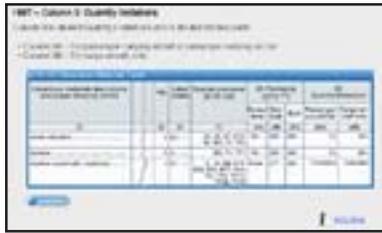
**42****Professor Fed’s Knowledge Check 18**

Instructions: Using the list of hazardous materials presented here and the HMT, properly fill in the empty columns on the chart. Click on the correct response to select it and drag it to the proper location in the chart.

3	UN1415	I	150
4.3	UN1090	II	211
9	NA1365	None	242

Col 2 Proper Shipping Name	Col 3 Hazard Class	Col 4 ID#	Col 5 PG	Col 8A Exceptions	Col 8B Non-bulk	Col 8C Bulk
1. Acetone					202	
2. Cotton			–	None		None
3. Lithium				None		244

## 43



Column 9 is labeled Quantity limitations and is divided into two parts. Column 9A specifies the maximum quantities that may be offered for transportation in one package for a passenger-carrying aircraft or passenger-carrying rail car, while Column 9B specifies the maximum quantities that may be offered for transportation in one package for cargo aircraft only, subject to the limitations stated here. Select the Exceptions button to view the exceptions to these quantity limitations.

## 43a



## 44

### Professor Fed's Knowledge Check 19

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

What is the quantity limitation for Arsenic being transported or offered for transportation on cargo aircraft only?

- A. 25 kg
- B. 50 kg
- C. 100 kg
- D. 500 kg

## 45

The screenshot shows a portion of the HMT table. The title is 'HMT - Column 10: vessel stowage'. Below the title, there are three columns of text: 'Column 10: Vessel stowage', 'Column 10A: Authorized stowage locations for hazardous materials on board cargo and passenger vessels', and 'Column 10B: Stowage requirements for specific hazardous materials'. The table below has several rows. The row for 'Carbon dioxide, solid, or Dry ice' has 'C' in Column 10A and '40' in Column 10B.

Column 10: Vessel stowage	Column 10A: Authorized stowage locations for hazardous materials on board cargo and passenger vessels	Column 10B: Stowage requirements for specific hazardous materials
Carbon dioxide, solid, or Dry ice	C	40

Column 10 is labeled Vessel stowage and is divided into two parts. Column 10A specifies the authorized stowage locations for hazardous materials on board cargo and passenger vessels. Column 10B specifies codes for stowage requirements for specific hazardous materials. In the example shown here for Carbon dioxide, solid, or Dry ice, the entry in Column 10A indicates stowage category “C,” which means that the material must be stowed “on deck only” on a cargo vessel and on a passenger vessel. The entry in Column 10B indicates that stowage provision “40” applies for this material, Carbon dioxide, solid, or Dry ice, which prescribes that this material be stowed “clear of living quarters.”

## 46

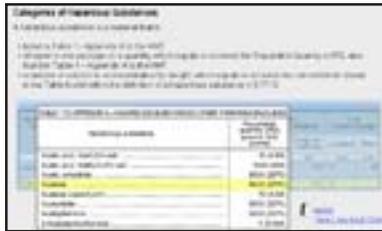
### Professor Fed’s Knowledge Check 20

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

What is the authorized stowage location for Cotton, as indicated in Column 10A of the HMT?

- A. On deck or under deck of a cargo vessel and/or a passenger vessel - stowage category ‘A’
- B. On deck or under deck of a cargo vessel or passenger vessel with a restricted number of passengers – stowage category ‘B’
- C. On deck only for a cargo vessel and/or a passenger vessel – stowage category ‘C’
- D. On deck only of a cargo vessel or passenger vessel with a restricted number of passengers – stowage category ‘D’

47



Hazardous materials often fit more than one category, such as hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the HMT, and other materials as defined in part 173. For example, Acetone, a Class 3 flammable liquid material is listed in Table 1 to Appendix A, and may meet the definition of a hazardous substance. Review §171.8 for more information on the definition for a hazardous substance. The criteria for hazardous substances is shown here.

48

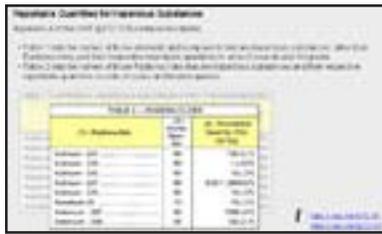


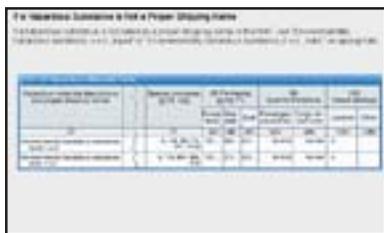
Table 1 to Appendix A of §172.101 lists all hazardous substances other than radionuclides along with the reportable quantities in both pounds and kilograms. Table 2 to Appendix A of §172.101 lists those Radionuclides that are hazardous substances and their respective reportable quantities in units of curies and terabecquerels.

49



To determine if a material is a hazardous substance, you must use Table 1 and Table 2 - Appendix A of the HMT. You may use the reference links to view Table 1 and Table 2 – Appendix A at the end of the HMT. To determine whether a particular package of hazardous material is regulated as a hazardous substance, you must first determine the specific name of the material. Is the material listed as a hazardous substance in either Table 1 or Table 2 to Appendix A? What is the RQ for the material, as listed in Table 1 or 2 of Appendix A? Does the amount of the hazardous substance contained in one package meet or exceed the RQ for that substance? Finally, to determine the proper shipping name of the hazardous substance, you must use the HMT to determine if it is a proper shipping name.

## 50



If a hazardous substance is not listed as a proper shipping name in the HMT, use “Environmentally hazardous substance, n.o.s., liquid” or “Environmentally hazardous substance, n.o.s., solid,” as appropriate

## 51



Now let’s determine if “Ethylene dichloride” is a hazardous substance for the purposes of transportation. Locate the name “Ethylene dichloride” in the lefthand column of Table I - Appendix A. Follow across the page to the far right column, entitled “Reportable Quantity. Reportable quantities are shown in pounds and kilograms. The RQ for Ethylene dichloride is 100 pounds or 45.4 kilograms per package. For this example, let’s assume we have 5,500 pounds of “Ethylene dichloride” in a cargo tank, which is one package. The material is not in a mixture or solution.

Is the “Ethylene dichloride,” as packaged, a hazardous substance for the purpose of transportation?

Is the material listed in Table 1 - Appendix A?

Yes, it is listed.

Does the amount of material equal or exceed the RQ for “Ethylene dichloride?”

Yes, it exceeds the RQ, there are more than 100 pounds in one package.

Therefore, as packaged, Ethylene dichloride is a hazardous substance for the purpose of transportation.

The final step involves checking to see if ethylene dichloride is a proper shipping name and located in column 2 of the HMT.

Yes, ethylene dichloride is located in column 2 of the HMT and is a proper shipping name.

**Professor Fed’s Knowledge Check 21**

Instructions: Use the reference link to both the HMT and to Appendix A, located in the right corner of the screen, to help answer this question. Select the best answer from the four choices provided. You will have two chances to answer this question correctly.

A rail car contains 5,000 gallons of Hydrochloric acid with a net weight of more than 30,000 pounds. Is this rail car carrying a hazardous substance, for the purposes of transportation?

- A. No, Hydrochloric acid is not found in either Table 1 or 2 of Appendix A.
- B. Yes, Hydrochloric acid is found in Table 1 of Appendix A, the RQ is 5,000 pounds, and the rail car is one package that exceeds the stated RQ quantity.
- C. No, while Hydrochloric acid is found in Table 1 of Appendix A, the RQ is 50,000 pounds and the net weight of the one rail car is not exceeded.
- D. No, Hydrochloric acid is not found in Table 2 to Appendix A.

## 53

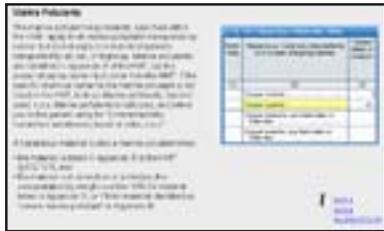
**Professor Fed’s Knowledge Check 22**

Instructions: Using the list of materials presented here and the HMT, properly fill in the empty columns on the chart. Some answers may be used more than once. Click on the correct response to select it and drag it to the proper location in the chart.

Yes          /                               100/(45.5)                      No  
 1/(0.54)                      1000/(454)                      5000/(2270)

Name	Listed in Appendix A Yes or No	Reportable Quantity (RQ) (lbs/kg)	Listed in HMT Yes or No
Acetone			
2-Propenal			
Saccharin and salts			
Sodium nitrate			
Toluene			

## 54



The marine pollutant requirements, specified under the HMR, apply to all marine pollutants transported by vessel; but do not apply to nonbulk shipments transported by air, rail, or highway. Marine pollutants are identified in Appendix B of the HMT. Each shipper must determine if the material is a marine pollutant. Let's try an example. See if Copper cyanide, is a marine pollutant by checking to see if it is listed in Appendix B to §172.101, List of Marine Pollutants. As you can see it is, now check to see if Copper cyanide is a proper shipping name found in the HMT. It is in the HMT, thus Copper cyanide is a marine pollutant, and Copper cyanide is the proper shipping name to be used. For more information on the definition of a marine pollutant, please click on the book icon in the right corner of the screen and select §171.8; or for marine pollutant exceptions, select §171.4.

## 55

### Professor Fed's Knowledge Check 23

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

Which of these four hazardous materials is NOT classified as a Marine Pollutant?

- A. Bromoacetone
- B. Bromoacetyl bromide
- C. Bromobenzene
- D. 3-Bromopropene

## 56



The table located at Appendix B to 172.101, "List of Marine Pollutants", contains two columns. Column 1 is labeled "S.M.P." for Severe Marine Pollutants and Column 2 is labeled "Marine Pollutant". If the material is listed in Column 2 of Appendix B, it is a marine pollutant. If the letters "PP" appear in Column 1, the material listed in Column 2 is a Severe Marine Pollutant (S.M.P.), otherwise it is not.

57

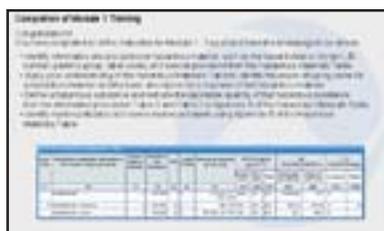
### Professor Fed’s Knowledge Check 24

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

Which of these four hazardous materials is classified as a Severe Marine Pollutant?

- A. Bromoacetone
- B. Bromobenzene
- C. Bromocyanide
- D. Bromophos-ethyl

58



This concludes the instruction and Knowledge Checks for Module 1 – The Hazardous Materials Table. If the word *test* is not underlined in the Express Lane, make sure you have correctly answered each knowledge check, and have viewed all the material covered. You should now be able to:

- Identify relevant information from the HMT
- Identify proper shipping names
- Define hazardous substances and their RQ
- Identify marine pollutants and severe marine pollutants.

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 1. This will be an open reference test. Good luck.

# End of Module Test

---

Now that you have completed reviewing the topic on the Hazardous Materials Table, 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 four learning objectives covering the Hazardous Materials Table. 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

---

Which of these tables are important resources for the hazmat employee to utilize, to be able to successfully complete their packaging, marking, labeling, and shipping of hazardous materials responsibilities?

- A. Hazardous Substances and Reportable Quantities
- B. Hazardous Materials Table
- C. List of Marine Pollutants
- D. All of the above

## Question #2

---

“Dichlone” in a one-pound (net weight) package is regulated as a \_\_\_\_\_.

- A. hazardous substance
- B. marine pollutant
- C. radionuclide
- D. severe marine pollutant

**Question #3**

---

The packaging requirements for the proper shipping name “Flammable solid, inorganic, n.o.s., 4.1, UN3178, PGII” are found in \_\_\_\_\_ of the HMT.

- A. Column 5
- B. Column 6
- C. Column 7
- D. Column 8

**Question #4**

---

When determining the basic description for “Compressed gas, toxic, n.o.s. *Inhalation Hazard Zone A*”, what is the correct hazard class or division that should be included?

- A. 2.1 – (Division 2.1 - Flammable gases)
- B. 2.2 – (Division 2.2 - Non-flammable gases)
- C. 2.3 – (Division 2.3 - Poison gases)
- D. None - No hazard class or division is indicated

**Question #5**

---

The “+” sign in Column 1 of the HMT \_\_\_\_\_.

- A. fixes the proper shipping name, hazard class or division, and packing group.
- B. identifies hazardous substances.
- C. fixes the packaging requirements.
- D. fixes the quantity limitations.

### Question #6

---

Copra is regulated when transported by \_\_\_\_\_.

- A. A (Aircraft)
- B. G (Ground transport)
- C. AW (Aircraft and water vessel)
- D. W (Water vessel)

### Question #7

---

The hazard class or division for “Rags, oily” is \_\_\_\_\_.

- A. 8 (Corrosive substances)
- B. 2.2 (Non-flammable gases)
- C. 9 (Miscellaneous hazardous materials)
- D. 4.2 (Spontaneously combustible materials)

### Question #8

---

What is the packing group for Ethyl chloroacetate?

- A. PGI only
- B. PGII only
- C. PGIII only
- D. PGI, II, or III

**Question #9**

---

The bulk packaging authorization requirements for “Nitrous oxide” is found in \_\_\_\_\_.

- A. Column 8A of the HMT
- B. Column 8C of the HMT
- C. §173.306 of the HMR
- D. Column 8B of the HMT

**Question #10**

---

The proper shipping name for a hazardous material is found in \_\_\_\_\_ of the HMT.

- A. Column 5
- B. Column 4
- C. Column 3
- D. Column 2

**Question #11**

---

A shipment of “Ammonium acetate” with an aggregate gross weight of 7,500 pounds , is regulated as a \_\_\_\_\_.

- A. hazardous substance
- B. marine pollutant
- C. radionuclide
- D. severe marine pollutant

### **Question #12**

---

What is the identification number for Cotton, from the HMT?

- A. UN1365
- B. UN3096
- C. NA1365
- D. UN1364

### **Question #13**

---

The letter “W” in Column 1 of the HMT means the entry regulates the offering for transport or transportation of the material \_\_\_\_\_, unless the material is a hazardous substance or a hazardous waste.

- A. by aircraft
- B. domestically
- C. by vessel
- D. internationally

### **Question #14**

---

The packaging exceptions for the proper shipping name “Ferric nitrate” are found in \_\_\_\_\_ of the HMT.

- A. Column 8A
- B. Column 8B
- C. Column 8C
- D. Column 7

**Question #15**

---

A 110-pound (net weight) package of “Aluminum phosphide” is regulated as \_\_\_\_\_.

- A. a hazardous material
- B. a radionuclide
- C. both a hazardous material and a hazardous substance
- D. a marine pollutant

**Question #16**

---

What is the proper shipping name for “*Sodium hypochlorite, solution*”?

- A. *Sodium hypochlorite, solution* is an acceptable proper shipping name
- B. Flammable, liquid, n.o.s.
- C. Hypochlorite sodium solutions
- D. Hypochlorite solutions

**Question #17**

---

The hazardous material “Boron tribromide, UN2692” is forbidden to be transported in \_\_\_\_\_ mode(s) of transportation.

- A. the passenger and cargo aircraft
- B. the passenger rail car
- C. the vessel
- D. Both A. and B.

### Question #18

---

A ten-pound package of “Fluorine” is regulated as a hazardous substance in \_\_\_\_\_ mode(s) of transportation.

- A. the air
- B. all
- C. the highway
- D. the vessel

### Question #19

---

Which of these proper shipping names is an acceptable alternative for the proper shipping name “Petroleum gases, liquefied”?

- A. Propanethiols
- B. Isoheptanes
- C. Pentane
- D. Liquefied petroleum gas

### Question #20

---

What do the letters “RQ” represent, that are displayed in Table 1 to Appendix A of the HMT?

- A. reportable quantity
- B. restricted quantity
- C. registered quantity
- D. required quantity

**Question #21**

---

The hazard class or division for the proper shipping name “Cartridges, small arms” is \_\_\_\_\_.

- A. Div 1.3G (Explosives with a fire hazard)
- B. Div 1.4G (Explosives with no significant blast hazard)
- C. Div. 6.1 (Toxic substances)
- D. ORM-D (Other regulated materials)

**Question #22**

---

Which of these four marine pollutants is NOT classified as a Severe Marine Pollutant?

- A. Chlorine
- B. Aldrin
- C. Dieldrin
- D. Lindane

**Question #23**

---

If a liquid marine pollutant is not listed by name in the §172.101 Hazardous Materials Table, then it must be offered for transportation on the shipping paper as:

- A. Hazardous waste, liquid, n.o.s., NA3082
- B. Environmentally hazardous substances, liquid, n.o.s., UN3082
- C. Marine pollutant
- D. Environmentally hazardous substances, solid, n.o.s., UN3077

### **Question #24**

---

The substances DDT, EPN, and PCBs all have what in common?

- A. Each is a marine pollutant, but is not classified as a severe marine pollutant (SMP).
- B. Each is a hazardous substance as listed in Table 1 to Appendix A.
- C. Each is a marine pollutant and classified as a severe marine pollutant (SMP).
- D. Each is listed as a proper shipping name in the HMT.

### **Question #25**

---

What is the identification number for the proper shipping name “Nicotine”?

- A. UN1655
- B. UN3144
- C. UN1654
- D. UN1656