



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

HAZARDOUS MATERIALS REGULATIONS

STUDENT WORKBOOK



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1.0 - HAZARDOUS MATERIALS TABLE

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Module 1: Hazardous Materials Table

01

Hazardous Materials Table (HMT)

49 CFR Subpart B - Table of Hazardous Materials and Special Provisions (§§172.101-172.102)

Objectives

Objectives

The Hazardous Materials Regulations are issued by the U.S. Department of Transportation and govern the transportation of hazardous materials in commerce. This includes any transportation to, from, or within the United States.

The process of complying or determining compliance with the Hazardous Materials Regulations always centers around the Hazardous Materials Table.

This training module and complimentary workbook will guide you through the information outlined in the Hazardous Materials Table (HMT) and how to use it.

01

HAZARDOUS MATERIALS

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 HMT

02

PROPER SHIPPING NAMES

Apply your understanding of the HMT to identify the proper shipping name for a hazardous material

03

HAZARDOUS SUBSTANCES

Define a hazardous substance and indicate the reportable quantity of that hazardous substance from the information provided in Tables 1 and 2 to Appendix A of the HMT

04

MARINE POLLUTANTS

Identify marine pollutants and severe marine pollutants using Appendix B of the HMT

NARRATION:

The Hazardous Materials Table can be located in 49 CFR Subpart B - Table of Hazardous Materials and Special Provisions (§§172.101-172.102).

The Hazardous Materials Regulations are issued by the U.S. Department of Transportation and govern the transportation of hazardous materials in commerce. This includes any transportation to, from, or within the United States. The process of complying or determining compliance with the Hazardous Materials Regulations always centers around the Hazardous Materials Table. This training workbook will guide you through the information outlined in the Hazardous Materials Table (HMT) and how to use it.

We will review how to properly identify hazardous materials and compile proper shipping names. Also, you will learn how to identify hazardous substances and marine pollutants.

NARRATION:

To ensure compliance with the Hazardous Materials Regulations, it is important to know how to read and navigate the Hazardous Materials Table in order to properly identify and prepare hazardous materials for shipments.

The Hazardous Materials Table in §172.101 identifies hazardous materials for the purpose of transportation of those materials.

- Gives the proper shipping name or directs the user to the preferred proper shipping name
- Identifies the hazard class or specifies that the material is forbidden in transportation
- Specifies or references requirements in this subchapter pertaining to labeling, packaging, quantity limits aboard aircraft and stowage of hazardous materials aboard vessels

In other words, the purpose of the Table is to assign proper shipping names, class and division, and to obtain guidance for packaging and handling requirements for hazardous materials.

§172.101 HAZARDOUS MATERIALS TABLE										
(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class or Division	(4) Identification Numbers	(5) Label	(6) Special provisions	(8) Packaging (173.***)		(7) Quantity limitations (see 173.27 and 175.75)		(10) Vessel stowage
						Non-Passenger	Passenger	Cargo aircraft		
	Accelerene, see p-nitrosodimethylaniline									
	Accumulators, electric, see Batteries, wet, etc.									
	Accumulators, pressurized, pneumatic or hydraulic (containing non-flammable gas) see Articles (pressurized, pneumatic or hydraulic (containing non-flammable gas))									
	Acetal	2UN1058								
	Acetaldehyde	2UN1089								
A	Acetaldehyde ammonia	2UN1841								
	Acetaldehyde oxime	2UN2332								
	Acetic acid, glacial or Acetic acid solution, with more than 80 percent acid, by mass	2UN2789								
	Acetic acid solution, not less than 50 percent but not more than 80 percent acid, by mass	2UN2790	11B	148, A3, A7, A10, B2, B2, T2, T2	154	202	242	1 L	30 LA	
	Acetic acid solution, with more than 10 percent and less than 50 percent acid, by mass	2UN2790	11B	148, B2, T4, T4, T4	154	203	242	5 L	60 LA	
	Acetic anhydride	2UN1715	11B, 3	A3, A7, A10, B2	154	202	243	1 L	30 LA	40

§172.101. Hazardous Materials Table
To ensure compliance with the Hazardous Materials Regulations, it is important to know how to read and navigate the Hazardous Materials Table in order to properly identify and prepare hazardous materials for shipments.

Hazardous Materials Table (HMT)

The purpose of the Table is to assign proper shipping names, class and division, and to obtain guidance for packaging and handling requirements for hazardous materials.

Identifies hazardous materials for the purpose of transportation of those materials

Gives the proper shipping name or directs the user to the preferred proper shipping name

Identifies the hazard class or specifies that the material is forbidden in transportation

Specifies or references requirements in this subchapter pertaining to labeling, packaging, quantity limits aboard aircraft and stowage of hazardous materials aboard vessels

```

graph TD
    HMT[Hazardous Materials Table] --> HM[Hazardous Material]
    HM --> PSN[Proper Shipping Name]
    HM --> HC[Hazard Class]
    PSN --> L[Labeling]
    PSN --> P[Packaging]
    PSN --> QL[Quantity Limits]
    HC --> FTS[Forbidden to Ship]
        
```

Table 49 -- Subtitle B -- Chapter I -- Subchapter C -- Part 172.101 Subpart B--Table of Hazardous Materials and Special Provisions

Hazardous Materials Table (HMT)

§172.101 HAZARDOUS MATERIALS TABLE

Symbols (1)	Hazardous materials descriptions and proper shipping names (2)	Hazard class or Division (3)	Identification Numbers (4)	PG (5)	Label Codes (6)	Special provisions (§172.102) (7)	(8) Packaging (§173.***)			(9) Quantity limitations (see §173.27 and 175.75)		(10) Vessel stowage	
							Exceptions (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)	Location (10A)	Other (10B)
	Oxygen, refrigerated liquid (<i>cryogenic liquid</i>)	2.2	UN1073		2.2, 5.1	175, TP5, TP22	320	316	318	Forbidden	Forbidden	D	
	Paint including paint, lacquer, enamel, stain, shellac solutions, varnish, polish, liquid filler and liquid lacquer base	3	UN1263		I 3	367, T11, TP1, TP8, TP27	150	201	243	1 L	30 L	E	
					II 3	149, 367, 383, B52, B131, IB2, T4, TP1, TP8, TP28	150	173	242	5 L	60 LB		
					III 3	367, B1, B52, B131, IB3, T2, TP1, TP29	150	173	242	60 L	220 LA		
	Paint or Paint related material	8	UN3066		II 8	367, B2, IB2, T7, TP2, TP28	154	173	242	1 L	30 LA		40
					III 8	367, B52, IB3, T4, TP1, TP29	154	173	241	5 L	60 LA		40
	Paint, corrosive, flammable (including paint, lacquer, enamel, stain, shellac, varnish, polish)	8	UN3470		II 8, 3	367, IB2, T7, TP1	154	202	243	1 L	30 LB		40

NARRATION:

Over 3,000 commonly transported hazardous materials are **identified and listed** alphabetically by the proper shipping name in the Hazardous Materials Table.

Hazardous Materials Table (HMT)

§172.101 HAZARDOUS MATERIALS TABLE

Symbols (1)	Hazardous materials descriptions and proper shipping names (2)	Hazard class or Division (3)	Identification Numbers (4)	PG (5)	Label Codes (6)	Special provisions (§172.102) (7)	(8) Packaging (§173.***)			(9) Quantity limitations (see §173.27 and 175.75)		(10) Vessel stowage	
							Exceptions (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)	Location (10A)	Other (10B)
	Accelerene, see p-Nitrosodimethylaniline												
	Accumulators, electric, see Batteries, wet, etc.												
	Accumulators, pressurized, pneumatic or hydraulic (containing non-flammable gas), see Articles pressurized, pneumatic or hydraulic (containing non-flammable gas)												
	Acetal	3	UN1088		II 3	IB2, T4, TP1	150	202	242	5 L	60 L	E	
	Acetaldehyde	3	UN1089		I 3	B16, T11, TP2, TP7	None	201	243	Forbidden	30 L	E	
A	Acetaldehyde ammonia	9	UN1841		III 9	IB8, IP3, IP7, T1, TP33	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 LA		
	Acetic acid, glacial or Acetic acid solution, with more than 80 percent acid, by mass	8	UN2789		II 8, 3	A3, A7, A10, B2, IB2, T7, TP2	154	202	243	1 L	30 LA		

The HMT uses **columns** to reference **requirements** pertaining to labeling, packaging, and quantity limits aboard aircraft, and stowage requirements for vessels.

Hazardous Materials Table (HMT)

§172.101 HAZARDOUS MATERIALS TABLE

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG Codes	Label Codes (§172.102)	Special provisions	(8) Packaging (§173.***)			(9) Quantity limitations (see §§173.27 and 175.75)		(10) Vessel stowage	
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only	Location	Other
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	Accellerene, see p-Nitrosodimethylaniline												
	Accumulators, electric, see Batteries, wet etc												
	Accumulators, pressurized, pneumatic or hydraulic (containing non-flammable gas), see Articles pressurized, pneumatic or hydraulic (containing non-flammable gas)												
	Acetal	3	UN1088	II	3	IB2, T4, TP1	150	202	242	5 L	60 LE		
	Acetaldehyde	3	UN1089	I	3	B16, T11, TP2, TP7	None	201	243	Forbidden	30 LE		
A	Acetaldehyde ammonia	9	UN1841	III	9	IB8, IP3, IP7, T1, TP33	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 LA		
	Acetic acid, glacial or Acetic acid solution, with more than 80 percent acid, by mass	8	UN2789	II	8, 3	A3, A7, A10, B2, IB2, T7, TP2	154	202	243	1 L	30 LA		

NARRATION:

Each row in the HMT contains **information** specific to each hazardous material.

Hazardous Materials Table (HMT)

§172.101 HAZARDOUS MATERIALS TABLE

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG Codes	Label Codes (§172.102)	Special provisions	(8) Packaging (§173.***)			(9) Quantity limitations (see §§173.27 and 175.75)		(10) Vessel stowage	
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only	Location	Other
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	Accellerene, see p-Nitrosodimethylaniline												
	Accumulators, electric, see Batteries, wet etc												
	Accumulators, pressurized, pneumatic or hydraulic (containing non-flammable gas), see Articles pressurized, pneumatic or hydraulic (containing non-flammable gas)												
	Acetal												
	Acetaldehyde												
A	Acetaldehyde ammonia												
	Acetaldehyde oxime												
	Acetic acid, glacial or Acetic acid solution, with more than 80 percent acid, by mass	8	UN2789	II	8, 3	A3, A7, A10, B2, IB2, T7, TP2	154	202	243	1 L	30 LA		
	Acetic acid solution, not less than 50 percent but not more than 80 percent acid, by mass	8	UN2790	III	8	IB8, A3, A7, A10, B2, IB2, T7, TP2	154	202	242	1 L	30 LA		
	Acetic acid solution, with more than 10 percent and less than 50 percent acid, by mass	8	UN2790	III	8	148, IB3, T4, TP1	154	203	242	5 L	60 LA		
	Acetic anhydride	8	UN1715	II	8, 3	A3, A7, A10, B2, IB2, T7, TP2	154	202	243	1 L	30 LA		40
	Acetone	3	UN1090	II	3	IB2, T4, TP1	150	202	242	5 L	60 LB		

A
B
C
D
Z

While the HMT is extensive, it is not an exhaustive list of all hazardous materials. It is always the shippers' responsibility to properly identify their materials using criteria in the Hazardous Materials Regulations.

Let's review the principles of the Hazardous Materials Table organization.

All hazardous materials are listed **alphabetically**. Please note that while the HMT is extensive, it is not an exhaustive list of all hazardous materials.

Hazardous Materials Table (HMT)													
Symbol	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG Codes	Label (172.102)	Special provisions	Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only	Location/Other	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A) (10B)	
	Accellerene, see p-Nitrosodimethylaniline												
	Accumulators, electric, see Batteries, wet, etc.												
	Accumulators, pressurized, pneumatic or hydraulic (containing non-flammable gas), see Articles pressurized, pneumatic or hydraulic (containing non-flammable gas)												
	Acetal	3	UN1088		II	3	IB2, T4, TP1	150	202	242	5 L	60 LE	
	Acetaldehyde	3	UN1089		I	3	B16, T11, TP2, TP7	None	201	243	Forbidden	30 LE	
A	Acetaldehyde ammonia	9	UN1841		III	9	IB6, IP3, IP7, T1, TP33	155	204	240	200 kg	200 kgA	34
	Acetaldehyde oxime	3	UN2332		III	3	B1, IB3, T4, TP33	150	203	242	60 L	220 LA	
	Acetic acid, glacial or Acetic acid solution, with more than 80 percent acid, by mass	8	UN2789		II	8, 3	A3, A7, A10, B2, IB2, T7, TP2	154	202	243	1 L	30 LA	
	Acetic acid solution, not less than 50 percent but not more than 80 percent acid, by mass	8	UN2790		II	8	148, A3, A7, A10, B2, IB2, T7, TP2	154	202	242	1 L	30 LA	
	Acetic acid solution, with more than 10 percent and less than 50 percent acid, by mass	8	UN2790		III	8	148, IB3, T4, TP1	154	203	242	5 L	60 LA	
	Acetic anhydride	8	UN1715		II	8, 3	A3, A7, A10, B2, IB2, T7, TP2	154	202	243	1 L	30 LA	40
	Acetone	3	UN1090		II	3	IB2, T4	150	202	242	5 L	60 LB	

NARRATION:

It is always the shippers' responsibility to properly identify their materials using criteria in the Hazardous Materials Regulations.

Each row contains information specific to each hazardous material.

NARRATION:

Now, we will review all 10 columns of the Hazardous Materials Table. Since the hazardous materials are listed by name in the column #2, let's start reviewing it first.

The second column of the HMT table is labeled "Hazardous materials descriptions and proper shipping names." It lists the proper shipping names and any applicable additional information.

In this segment we will review: a few acceptable ways to write the proper shipping names. Proper shipping names may not be modified except as otherwise stated in the HMR.

Italicized (or slanted) words convey additional information and are not part of the proper shipping name but may be used in addition to the proper shipping name. Also, we will discuss modifications that are authorized or required as part of the proper shipping names.

5172.101 HAZARDOUS MATERIALS TABLE

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG Codes	Label provisions (§172.102)	(8) Packaging (§173.***)			(9) Quantity limitations (see §§173.27 and 175.75)		(10) Vessel stowage		
						Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only	Location	Other	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
	Accelererene, see p-Nitrosodimethylaniline												
	Accumulators, electric, see Batteries, wet, etc.												
	Accumulators, pressurized, pneumatic or hydraulic (containing non-flammable gas), see Articles pressurized, pneumatic or hydraulic (containing non-flammable gas)												
	Acetal	3	UN1088										
	Acetaldehyde	3	UN1089										
A	Acetaldehyde ammonia	9	UN1841										
	Acetaldehyde oxime	3	UN2332										
	Acetic acid, glacial or Acetic acid solution, with more than 80 percent acid, by mass	8	UN2789										
	Acetic acid solution, not less than 50 percent but not more than 80 percent acid, by mass	8	UN2790	II	8	TP2 148, A3, A7, A10, B2, IB2, T7, T4, TP1	154	202	242	1 L	30 LA		
	Acetic acid solution, with more than 10 percent and less than 50 percent acid, by mass	8	UN2790	III	8	148, IB3, T4, TP1	154	203	242	5 L	60 LA		
	Acetic anhydride	8	UN1715	II	8, 3	A3, A7, A10, R2	154	202	243	1 L	30 LA		40

§172.101. Hazardous Materials Table

Hazardous Materials Table Column #2

HAZARDOUS MATERIALS DESCRIPTIONS AND PROPER SHIPPING NAMES

Hazardous materials descriptions and proper shipping names	PROPER SHIPPING NAMES
(2)	
<i>Accelererene, see p-Nitrosodimethylaniline</i>	There are a few acceptable ways to write the proper shipping names. Proper shipping names may not be modified except as otherwise stated in the HMR.
<i>Accumulators, electric, see Batteries, wet, etc.</i>	
<i>Accumulators, pressurized, pneumatic or hydraulic (containing non-flammable gas), see Articles pressurized, pneumatic or hydraulic (containing non-flammable gas)</i>	ITALICIZED WORDS <i>italicized</i> (or slanted) words convey additional information and are not part of the proper shipping name but may be used in addition to the proper shipping name.
Acetal	
Acetaldehyde	MODIFICATIONS Also, we will discuss modifications that are authorized or required as part of the proper shipping names.
Acetaldehyde ammonia	
Acetaldehyde oxime	

Hazardous Materials Table Column #2

PROPER SHIPPING NAMES → NON-ITALICIZED WORDS

Hazardous materials descriptions and proper shipping names
(2)
Acetal
Acetaldehyde
Acetaldehyde ammonia
Acetaldehyde oxime
Acetic acid, <i>glacial or Acetic acid solution, with more than 80 percent acid, by mass</i>
Acetic acid solution, <i>not less than 50 percent but not more than 80 percent acid, by mass</i>

MAY BE USED:

- singular or plural
Paint = Paints
- CAPITAL or lower case
PAINT = Paint
- punctuation marks

NARRATION:

Column 2 includes proper shipping names. Only **non-italicized** words are part of the proper shipping name. Words in italics may be used in addition to the proper shipping name. Please see the highlighted examples in the image.

Proper shipping names may be used in the singular or plural and in either capital or lower case letters. Punctuation marks are not part of the proper shipping name but may be used.

First, let's review the examples of italicized words that are not part of the proper shipping names.

Italicized words convey additional information.

Please see the highlighted example in the image, *in alcohol*.

Hazardous Materials Table Column #2

Hazardous materials descriptions and proper shipping names
(2)
Acetaldehyde ammonia
Acetaldehyde oxime
Acetic acid, <i>glacial or Acetic acid solution, with more than 80 percent acid, by mass</i>
Acetic acid solution, <i>not less than 50 percent but not more than 80 percent acid, by mass</i>
Alcoholates solution, n.o.s., <i>in alcohol</i>

ITALICIZED WORDS

- CONVEY ADDITIONAL INFORMATION

Hazardous Materials Table Column #2

Hazardous materials descriptions and proper shipping names (2)
Acetaldehyde ammonia
Acetaldehyde oxime
Acetic acid, glacial <i>or</i> Acetic acid solution, with more than 80 percent acid, by mass
Acetic acid solution, not less than 50 percent but not more than 80 percent acid, by mass
Alcoholates solution, n.o.s., in alcohol

ITALICIZED WORDS

- CONVEY ADDITIONAL INFORMATION
- SEPARATES PROPER SHIPPING NAMES

or

NARRATION:

The next example contains the italicized word "OR."

This word indicates that both shipping names are acceptable: acetic acid glacial "or" acetic acid solution because they are both written in non-italicized font. In other words, **italicized word "OR"** separates proper shipping name options. In many cases, the italicized word "see" follows the italicized hazardous material, directing you to a different hazardous material that is written in non-italicized font.

Remember, only **non-italicized** names can be used as the proper shipping name; words in **italics** may be used in addition to the proper shipping name. In some instances, one entry references another entry and both names are not italicized. This means that either name can be used as the proper shipping name.

In the example, "Ethyl alcohol," you are directed to the entry for Ethanol. All the other columns are left blank because all information will be provided in the entry to which you were directed.

Hazardous Materials Table Column #2

ONLY NON-ITALICIZED NAMES CAN BE USED AS THE PROPER SHIPPING NAME
words in italics may be used in addition to the proper shipping name

Hazardous materials descriptions and proper shipping names (2)	Hazardous materials descriptions and proper shipping names (2)
Accelerene, <i>see</i> p-Nitrosodimethylaniline	Ethyl alcohol, <i>see</i> Ethanol
Accumulators, electric, <i>see</i> Batteries, wet, etc.	Ethyl aldehyde, <i>see</i> Acetaldehyde
	Ethyl amyl ketone

§172.101 HAZARDOUS MATERIALS TABLE

Symbol	Hazardous materials descriptions and proper shipping names (2)	Hazard class or Division (3)	Identification Numbers (4)	PG Codes (172.102) (5)	Special Label provisions (7)	(8) Packaging (173.***)			(9) Quantity limitations (see §173.27 and 175.75)		(10) Vessel stowage	
						Exceptions (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft (9A)	Cargo aircraft only (9B)	Location (10A)	Other (10B)
	Accelerene, <i>see</i> p-Nitrosodimethylaniline											
	Accumulators, electric, <i>see</i> Batteries, wet, etc.											
	Ethyl alcohol, <i>see</i> Ethanol											
	Ethyl aldehyde, <i>see</i> Acetaldehyde											
	Ethyl amyl ketone		3UN2271	II 3	81, 83, T2, TP1	150	203	242	60 L	220 L	IA	

Hazardous Materials Table Column #2

ONLY NON-ITALICIZED NAMES CAN BE USED AS THE PROPER SHIPPING NAME
words in italics may be used in addition to the proper shipping name

Hazardous materials descriptions and proper shipping names (2)
Accelerene, <i>see</i> p-Nitrosodimethylaniline
Accumulators, electric, <i>see</i> Batteries, wet etc
Accumulators, pressurized, pneumatic or hydraulic (containing non-flammable gas), <i>see</i> Articles pressurized, pneumatic or hydraulic (containing non-flammable gas)
Acetal
Acetaldehyde
Acetaldehyde ammonia
Acetaldehyde oxime

ITALICIZED WORDS

- CONVEY ADDITIONAL INFORMATION
- SEPARATES PROPER SHIPPING NAMES
or
- DIRECTS TO ANOTHER HAZARDOUS MATERIAL THAT MUST BE USED AS THE PROPER SHIPPING NAME
see

NARRATION:

In other words, italicized word "see" directs user to another hazardous material that must be used as the proper shipping name.

Only non-italicized words are part of the proper shipping name. Italicized words may be used in addition to the proper shipping name. When used, the **italicized text** must appear exactly as it is listed in the HMT without modification. Please see the highlighted examples in the image. However, for proper shipping names that include concentration ranges, some modification is authorized. If the actual concentration is within the range stated, the actual concentration may be used in place of the concentration range. For example, an aqueous solution of hydrogen peroxide containing 50 percent peroxide may be described the way it is displayed in the highlighted box, with the concentration range or stating the actual concentration "Hydrogen peroxide, aqueous solution with 50 percent hydrogen peroxide."

Hazardous Materials Table Column #2

PROPER SHIPPING NAMES → NON-ITALICIZED WORDS

Hazardous materials descriptions and proper shipping names (2)
Hydrogen, peroxide, aqueous solutions <i>with more than 40 percent but not more than 60 percent hydrogen peroxide (stabilized as necessary)</i>
Hydrogen peroxide, aqueous solution with 50 percent hydrogen peroxide

ITALICIZED WORDS

MUST APPEAR EXACTLY AS LISTED IN THE HMT WITHOUT MODIFICATION

AUTHORIZED MODIFICATIONS

- CONCENTRATION RANGES
- THE ACTUAL CONCENTRATION

For example, an aqueous solution of hydrogen peroxide containing 50% peroxide

Hazardous Materials Table Column #2

PROPER SHIPPING NAMES

MODIFICATIONS

LIQUID or SOLID

- stating physical states of the hazardous materials MAY NECESSITATE DIFFERENT SHIPPING REQUIREMENTS

Crotonic acid, liquid
Crotonic acid, solid

WASTE

- WASTE HAZMAT MUST INCLUDE THE WORD **WASTE** BEFORE ITS PROPER SHIPPING NAME
- IF IT **DOES NOT** HAVE THE WORD **WASTE** AS PART OF THE PROPER SHIPPING NAME

Waste acetone



MIXTURE or SOLUTION

- ARE NOT LISTED** IN THE HMT BY NAME
- CONTAIN A SINGLE PREDOMINANT HAZARDOUS MATERIAL
- IF THE HAZARD CLASS OR DIVISION **DOES NOT** CHANGE

THE PROPER SHIPPING NAME MUST INCLUDE the proper shipping name of the predominant hazardous material and the word "MIXTURE" or "SOLUTION"

A combination of ACETONE and WATER

Acetone mixture or Acetone solution

NARRATION:

Modifications to proper shipping names include the following:

- Liquid or solid:

It may be necessary to indicate physical states of the hazardous materials if they can be shipped as a liquid or a solid because it may necessitate different shipping requirements.

For example, Crotonic acid, liquid and Crotonic acid, solid.

- Hazardous waste:

Waste hazardous material must include the word "waste" before its proper shipping name, if it does not have the word "waste" as part of the proper shipping name. For example, Waste acetone.

- Mixture or solution:

In situations when mixtures and solutions are not listed in the HMT by name, contain a single predominant hazardous material, and if the hazard class or division does not change, the proper shipping name must include the proper shipping name of the predominant hazardous material and the word "mixture" or "solution." For example, if acetone is combined with water, the proper shipping name will be Acetone mixture or Acetone solution.

Hazardous Materials Table Column #2

PROPER SHIPPING NAMES

ADDITIONAL INFORMATION FOUND IN THE HAZARDOUS MATERIALS TABLE

- INTERCHANGEABLE ABBREVIATIONS

n.o.s. = n.o.i. = n.o.b.n.
NOT OTHERWISE SPECIFIED



- Prefix "MONO" is OPTIONAL

Iodine monochloride = Iodine chloride

WORDS

poison = poisonous = toxic



for domestic transportation ONLY

NARRATION:

And a few **additional items** THAT may be found in the Hazardous Materials Table: **Interchangeable abbreviations-** N.O.S., N.O.I., N.O.B.N.

These abbreviations all have the same meaning as not otherwise specified.

Interchangeable words- POISON, POISONOUS, TOXIC.

The words poison, poisonous, and toxic may be used interchangeably if the hazmat is shipped domestically.

The use of the prefix "mono" is optional. For example, either Iodine monochloride or Iodine chloride may be used.

Let's review.

Column 2 includes hazardous materials descriptions and proper shipping names.

Non-italicized words are used as part of the proper shipping names. Proper shipping names cannot be **modified** except as otherwise stated in section 172.101(c).

Descriptions and additional information are in **italicized font**. If used, italicized words may not be modified.

SUMMARY: HMT Column #2

HAZARDOUS MATERIALS DESCRIPTIONS AND PROPER SHIPPING NAMES

NON-ITALICIZED WORDS

PROPER SHIPPING NAMES

Proper shipping names cannot be modified except as otherwise stated in section 172.101(c).

ITALICIZED WORDS

DESCRIPTION AND ADDITIONAL INFORMATION

If used, italicized words MAY NOT BE MODIFIED. For concentration ranges, if the actual concentration is within the range stated, the actual concentration may be used in place of the concentration range.

MODIFICATIONS (see §172.101(c))

LIQUID OR SOLID
WASTE
SOLUTION OR MIXTURE

see
or

SUMMARY: HMT Column #2

HAZARDOUS MATERIALS DESCRIPTIONS AND PROPER SHIPPING NAMES

NON-ITALICIZED WORDS

Proper shipping names cannot be modified except as otherwise stated in section 172.101(c).

PROPER SHIPPING NAMES

ITALICIZED WORDS

DESCRIPTION AND ADDITIONAL INFORMATION

If used, italicized words MAY NOT BE MODIFIED. For concentration ranges, if the actual concentration is within the range stated, the actual concentration may be used in place of the concentration range.

see

or

MODIFICATIONS (see §172.101(c))

LIQUID OR SOLID

WASTE

SOLUTION OR MIXTURE

NARRATION:

However, for **concentration ranges**, if the actual concentration is within the range stated, the actual concentration may be used in place of the concentration range.

Italicized words:

"see" and "or" direct you to a different entry.

In some cases, **modifications** must be made to the proper shipping name, such as liquid or solid, waste, solution, or mixture.

Hazardous Materials Table Column #1

SYMBOLS

Symbol	Hazardous materials descriptions and proper shipping names
(1)	(2)
A	Acetaldehyde ammonia
	Acetaldehyde oxime
A W	Cotton waste, oily
A I W	Cotton, wet
+ I	Methanol
D	Methanol

" + ", "A", "D", "G", "I" and "W"

The first column of the Hazardous Materials Table may have one or more symbols or left blank.

- **FIXED STRICT REQUIREMENTS: "+"**
- **ADDITIONAL DESCRIPTION REQUIREMENTS: "C"**
- **SPECIFIC TRANSPORTATION REQUIREMENTS: "A", "D", "I", "W"**

Now, we will turn our attention to Column #1: "Symbols" of the Hazardous Materials Table.

The **first column** of the Hazardous Materials Table can be left blank or may have one or more **symbols**:

" + ", "A", "D", "G", "I", and "W"

Hazardous Materials Table Column #1

SYMBOLS

Symbol	Hazardous materials descriptions and proper shipping names
(1)	(2)
A	Acetaldehyde ammonia
	Acetaldehyde oxime
A W	Cotton waste, oily
A I W	Cotton, wet
+ I	Methanol
D	Methanol

" + ", "A", "D", "G", "I" and "W"

The first column of the Hazardous Materials Table may have one or more symbols or left blank.

- **FIXED STRICT REQUIREMENTS: "+"**
- **ADDITIONAL DESCRIPTION REQUIREMENTS: "G"**
- **SPECIFIC TRANSPORTATION REQUIREMENTS: "A", "D", "I", "W"**

NARRATION:

The **plus sign** indicates fixed strict requirements.

Letter **"G"** in the first column of the Hazardous Materials Table indicates that additional description is required based on §172.203 (k).

Letters **"A", "D", "I", and "W"** in the first column of the Hazardous Materials Table indicate specific transportation requirements.

The **plus sign** fixes the proper shipping name, hazard class, and packing group for that entry. Listed in columns 2, 3, and 5. Also, the plus sign means that the material is known to pose a risk to humans.

Please note that for Mixtures and Solutions, an appropriate alternate proper shipping name and hazard class may be authorized by the Associate Administrator if the hazard to humans is significantly different from that of the pure material or where no hazard to humans is posed.

HMT Column #1 SYMBOLS

FIXED STRICT REQUIREMENTS



- **FIXES** the proper shipping name, hazard class, and packing group for that entry listed in columns 2, 3, and 5
- **the material is known to pose a risk to humans**

? For MIXTURES and SOLUTIONS an appropriate alternate proper shipping name and hazard class may be authorized by the Associate Administrator if the hazard to humans is significantly different from that of the pure material or where no hazard to humans is posed.

§172.101 HAZARDOUS MATERIALS TABLE

Symbol (1)	Hazardous materials descriptions and proper shipping names (2)	Hazard class or Division (3)	Identification Numbers (4)	Label Provisions Po Codes (172.102) (5)	Special Provisions (6)			Quantity Limitations (see 173.27 and 175.35) (7)			Vessel Stowage (10)	
					Exceptions (6A)	Non-bulk (6B)	Bulk (6C)	Passenger aircraft (7A)	Cargo aircraft only (7B)	Location/Other (7C)		
												(6D)
+	Nitrodinitrobenzenes, liquid	6.1	UN1577	II 6.1	82, 77, 153, 792		202	243	5 L	603, B	91	
+	Nitrodinitrobenzenes, solid	6.1	UN3441	II 6.1	88, 92, 153, 94, 73, 7935		212	242	25 kg	100 kg A		91

HMT Column #1 SYMBOLS

ADDITIONAL DESCRIPTION REQUIREMENTS

- G** • IDENTIFIES 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.

[See 49 CFR Subpart B, §172.203\(k\) for additional information and exceptions](#)

i Definition

Technical name means a recognized chemical name or microbiological name currently used in scientific and technical handbooks, journals, and texts. Generic descriptions are authorized for use as technical names provided they readily identify the general chemical group, or microbiological group.

Examples of acceptable generic chemical descriptions are organic phosphate compounds, petroleum aliphatic hydrocarbons and tertiary amines. For proficiency testing only, generic microbiological descriptions such as bacteria, mycobacteria, fungus, and viral samples may be used. Except for names which appear in subpart B of part 172 of this subchapter, trade names may not be used as technical names.

NARRATION:

The letter “G” identifies 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. (See §172.203(k).) The definition for “Technical name” in §171.8 is shown in the image.

Specific transportation requirements are identified by the letters “A,” “W,” “D,” “I,” in the first column of the hazardous materials table.

The letter “A” denotes material that is only regulated if offered or intended for transport by aircraft.

The letter “W” denotes material that is only regulated if offered or intended for transport 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.

The letter “D” identifies entries on the HMT that are only recognized for domestic transportation.

HMT Column #1 SYMBOLS

SPECIFIC TRANSPORTATION REQUIREMENTS

HAZARDOUS SUBSTANCES in reportable quantities and HAZARDOUS WASTES are regulated in all modes of transportation.

A • denotes a material is only regulated if offered or intended for TRANSPORT BY AIRCRAFT

W • denotes a material is only regulated if offered or intended for TRANSPORT BY VESSEL

The international entry may or may not have the same proper shipping name, hazard class or packaging instructions as the domestic entry.

D • identifies entries on the HMT that only recognized for DOMESTIC TRANSPORTATION (within the United States only)

These entries MAY BE USED for both international and domestic transportation.

I • identifies entries on the HMT that are recognized for INTERNATIONAL TRANSPORTATION



HMT Column #1 SYMBOLS

SPECIFIC TRANSPORTATION REQUIREMENTS

HAZARDOUS SUBSTANCES in reportable quantities and HAZARDOUS WASTES are regulated in all modes of transportation.

A • denotes a material is only regulated if offered or intended for TRANSPORT BY AIRCRAFT

W • denotes a material is only regulated if offered or intended for TRANSPORT BY VESSEL

The international entry may or may not have the same proper shipping name, hazard class or packaging instructions as the domestic entry.

D • identifies entries on the HMT that only recognized for DOMESTIC TRANSPORTATION (within the United States only)

These entries MAY BE USED for both international and domestic transportation.

I • identifies entries on the HMT that are recognized for INTERNATIONAL TRANSPORTATION



NARRATION:

The international entry may or may not have the same proper shipping name, hazard class or packaging instructions as the domestic entry.

The letter "I" identifies entries on the HMT which are recognized for international transportation. These entries may be used for both international and domestic transportation.

Hazardous Materials Table Column #3

HAZARD CLASS OR DIVISION

Symbol	Hazardous materials descriptions and proper shipping names	Hazard class or Division
(1)	(2)	(3)
	Aluminum bromide, anhydrous	8
	tert-Butyl hydroperoxide, with more than 90 percent with water	Forbidden
	tert-Butyl hypochlorite	6.2
D	Cartridges, small arms	ORM-D
	Cartridges, starter, jet engine, see Cartridges, power device	
	Cases, cartridge, empty with primer	1.4D
D G	Combustible liquid, n.o.s.	3 Comb. liq.
G	Components, explosive train, n.o.s.	1.2B
G	Components, explosive train, n.o.s.	1.4B
G	Components, explosive train, n.o.s.	1.4C

THE HAZARD CLASS OF A HAZARDOUS MATERIAL IS INDICATED BY

- its class number
 - division number
 - its class name
 - the letters "ORM-D"
- Please note that the ORM-D designation ended on December 31, 2020.

[See 49 CFR Subpart A §173.2](#)

Column #3 of the Hazardous Materials Table is labeled Hazard Class or Division and contains the designation of the hazard class or division corresponding to each proper shipping name. In some cases, it contains the word "Forbidden."

The hazard class of a hazardous material is indicated either by its class number, its division number, its class name or the letters "ORM-D." This information can be located in section 173.2 of the Hazardous Materials Regulations.

§173.2 Hazardous materials classes and index to hazard class definitions.

The hazard class of a hazardous material is indicated either by its class (or division) number, its class name, or by the letters "ORM-D". The following table lists class numbers, division numbers, class or division names and those sections of this subchapter which contain definitions for classifying hazardous materials, including forbidden materials.

Class No.	Division No. (if any)	Name of class or division	49 CFR reference for definitions
None		Forbidden materials	173.211
None		Forbidden explosives	173.54
1	1.1	Explosives (with a mass explosion hazard)	173.50
1	1.2	Explosives (with a projection hazard)	173.50
1	1.3	Explosives (with predominately a fire hazard)	173.50
1	1.4	Explosives (with no significant blast hazard)	173.50
1	1.5	Very insensitive explosives: blasting agents	173.50
1	1.6	Extremely insensitive detonating substances	173.50
2	2.1	Flammable gas	173.115
2	2.2	Non-flammable compressed gas	173.115
2	2.3	Poisonous gas	173.115
3		Flammable and combustible liquid	173.120
4	4.1	Flammable solid	173.124
4	4.2	Spontaneously combustible material	173.124
4	4.3	Dangerous when wet material	173.124
5	5.1	Oxidizer	173.127
5	5.2	Organic peroxide	173.128
6	6.1	Poisonous materials	173.132
6	6.2	Infectious substance (Etiologic agent)	173.134
7		Radioactive material	173.403
8		Corrosive material	173.136
9		Miscellaneous hazardous material	173.140
None		Other regulated material: ORM-D	173.144

NARRATION:

Let's take a look.

This **table** lists class numbers, division numbers, and class or division names.

In addition, it lists those sections of the subchapter that contain definitions for classifying hazardous materials, including forbidden materials.

This information will be covered in more detail in the "Placarding" and "Labeling" section of this training module.

Let's review a **few examples** from the Hazardous Materials Table.

- Aluminum bromide, anhydrous: hazardous class 8
- tert-Butyl hypochlorite: Hazard Division 4.2.
- Cartridges, small arms: Hazard class or division - ORM-D

Please note that the ORM-D designation ended on December 31, 2020.

Combustible liquid, n.o.s. "Class 3" in Column 3 of HMT can always be replaced with the phrase, "Combustible Liquid," for domestic transportation of combustible liquids. A material for which the entry in this column is "Forbidden" may not be offered for transportation or transported.

Hazardous Materials Table Column #3

HAZARD CLASS OR DIVISION

Symbol	Hazardous materials descriptions and proper shipping names	Hazard class or Division
(1)	(2)	(3)
	Aluminum bromide, anhydrous	8
	tert-butyl hypochlorite, with more than 10 percent with water	Forbidden
	tert-butyl hypochlorite	4.2
D	Cartridges, small arms	ORM-D
	Cartridges, starter, jet engine use/Cartridges, power device	
	Cases, cartridge, empty with primer	1.4S
D G	Combustible liquid, n.o.s.	Comb 3
G	Components, explosive train, n.o.s.	1.2B
G	Components, explosive train, n.o.s.	1.4B
G	Components, explosive train, n.o.s.	1.4S

COLUMN #3 ENTRIES

- **CLASS NUMBER**
- **MAY NOT be offered for transportation or transported**
- **DIVISION NUMBER**
- **ORM-D** The ORM-D designation ended on December 31, 2020.
- **"Class 3" can always be replaced with the phrase "Combustible liquid" for domestic transportation of combustible liquids**

Hazardous Materials Table Column #5

PACKING GROUPS

Symbol	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG
(1)	(2)	(3)	(4)	(5)
A	Acetaldehyde ammonia		9UN1841	II
	Carbamate pesticides, liquid, toxic		6.13/N/2992	II
	Carbamate pesticides, liquid, toxic, flammable, flash point not less than 23 degrees C		6.13/N/2991	II

If more than one packing group is indicated for an entry, the packing group for the hazardous material must be determined using the criteria found in Subpart D of Part 173 for the specific hazard class.

NARRATION:

Column 5 is labeled Packing Group. It specifies one or more packing groups assigned to a material corresponding to the proper shipping name and hazard class for that hazardous material. If more than one packing group is indicated for an entry, the packing group for the hazardous material must be determined using the criteria found in Subpart D of Part 173 for the specific hazard class.

Packing groups indicate the degree of danger presented by the materials and determine materials' packaging requirements.

- Packing Group one = Great Danger
- Packing Group two = Medium Danger
- Packing Group three = Minor Danger

On shipping papers, the packing group number must be indicated in Roman numerals preceded by the letters "PG," when applicable, as illustrated in the image.

Packing groups are not assigned to all classes of materials. The shipper is responsible for determining the appropriate packing group based on the technical characteristics of the material.

Hazardous Materials Table Column #5

PACKING GROUP

INDICATES THE DEGREE OF DANGER PRESENTED BY THE MATERIAL

AFFECT HAZARDOUS MATERIALS' PACKAGING REQUIREMENTS

PACKING GROUP I → GREAT DANGER
 PACKING GROUP II → MEDIUM DANGER
 PACKING GROUP III → MINOR DANGER

→ PG I
 → PG II
 → PG III

The shipper is responsible for determining the appropriate packing group based on the technical characteristics of the material.

NARRATION:

Remember that the packing group always corresponds to the proper shipping name and hazard class for that hazardous material. Let's look at a few examples.

- Aluminum borohydride or Aluminum borohydride in devices Hazard Division 4.2, Packing Group 1
- Arsenical pesticides, liquid, toxic Hazardous Division 6.1, and three Packing Groups were assigned to this hazmat
- Igniters, Hazard division 1.1G and no packing group was assigned
- Medicine, liquid, flammable, toxic, n.o.s. Hazard Class 3, Packing Group 2 and 3
- Medicine liquid, toxic, n.o.s. Hazard division 6.1 and the packing group 2 and 3

If more than one packing group is indicated for an entry, the packing group for the hazardous material must be determined using the criteria found in Subpart D of Part 173 for the specific hazard class.

Also, there are no packing groups designated for the materials in these groups:

- Class 1. Explosives
- Class 2. Gases
- Class 7. Radioactive materials
- Division 6.2. Infectious substance
- ORM-D materials (The ORM-D designation ended on December 31, 2020.)
- and articles

It is important to remember that the packing group determines the packaging requirements based on the degree of danger a hazardous material represents.

Hazardous Materials Table Column #5

PACKING GROUP

↓

DETERMINES THE PACKAGING REQUIREMENTS BASED ON THE DEGREE OF DANGER A HAZARDOUS MATERIAL REPRESENTS

CORRESPONDS

THE PROPER SHIPPING NAME **AND** HAZARD CLASS OR DIVISION for that hazardous material

IF MORE THAN ONE PACKING GROUP is indicated for an entry

USE THE CRITERIA in SUBPART D of PART 173 FOR THE SPECIFIC HAZARD CLASS

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG
(1)	(2)	(3)	(4)	(5)
	Aluminum borohydride or Aluminum borohydride in devices	4.2	UN2870	I
	Arsenical pesticides, liquid, toxic	6.1	UN2594	I
	Igniters	1.1G	UN0121	I
	Medicine, liquid, flammable, toxic, n.o.s	3	UN3248	II
	Medicine, liquid, toxic, n.o.s	6.1	UN1851	II
	Medicine, solid, toxic, n.o.s	6.1	UN3249	II

NO PACKING GROUPS:

- Class 1. Explosives
- Class 2. Gases
- Class 7. Radioactive materials
- Division 6.2. Infectious substance
- ORM-D materials

The ORM-D designation ended on December 31, 2020.

- articles (e.g., lithium batteries)

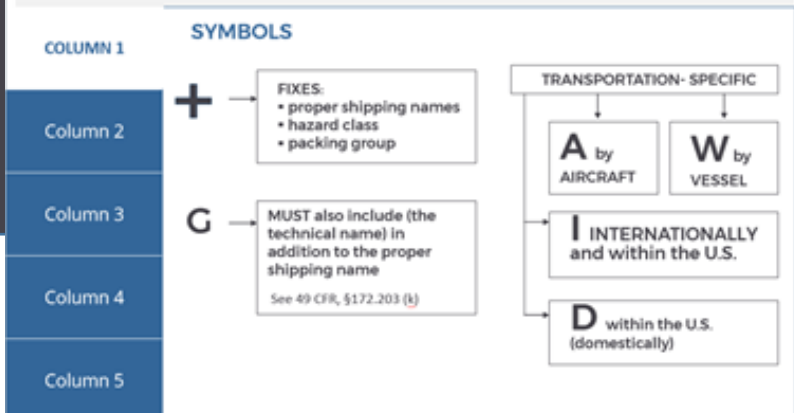
REVIEW

Now, let's review the first five columns of the Hazardous Materials Table.

Column 1	SYMBOLS "+", "A", "D", "G", "I" and "W"
Column 2	PROPER SHIPPING NAMES
Column 3	HAZARD CLASS OR DIVISION
Column 4	IDENTIFICATION NUMBERS
Column 5	PACKING GROUP

REVIEW

Now, let's review the first five columns of the Hazardous Materials Table.



NARRATION:

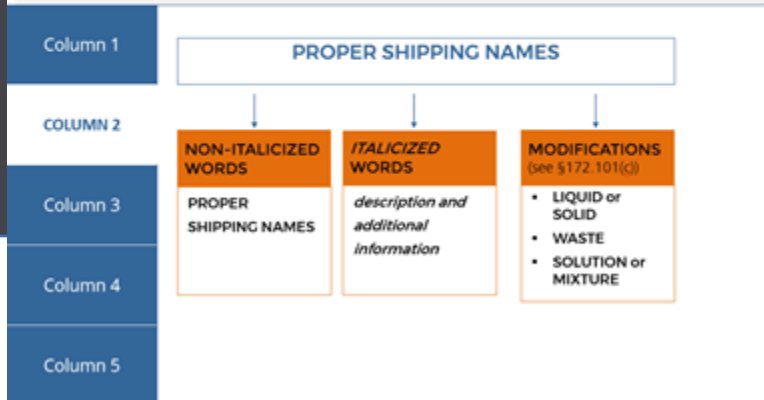
Now, let's **review** the first five columns of the Hazardous Materials Table.

Column #1:

The first column of the Hazardous Materials Table can be left blank or may have one or more symbols. The **plus sign** indicates fixed strict requirements. Letter "**G**" indicates that additional description is required based on the §172.203 (k). And "A," "W," "I," and "D" **symbols** designate groups of hazardous materials with specific transportation requirements.

REVIEW

Now, let's review the first five columns of the Hazardous Materials Table.



NARRATION:

Column #2:

Column #2 includes proper shipping names.

Non-italicized words are used as part of the proper shipping names.

Descriptions and additional information are in **italicized** font.

In some cases, **conditional information** must be added to the proper shipping name, such as liquid or solid, waste, solution, and mixture.

REVIEW

Now, let's review the first five columns of the Hazardous Materials Table.

HAZARD CLASS or DIVISION

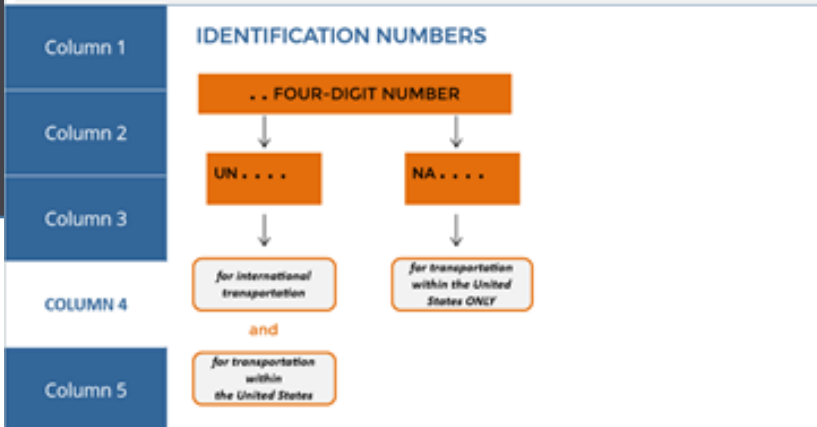
Class No.	Division No. (if any)	Name of class or division	49 CFR reference for definitions
None		Forbidden materials	173.21
None		Forbidden explosives	173.54
1	1.1	Explosives (with a mass explosion hazard)	173.50
1	1.2	Explosives (with a projection hazard)	173.50
1	1.3	Explosives (with a fire hazard)	173.50
1	1.4	Explosives (with no significant blast hazard)	173.50
1	1.5	Very insensitive explosives, blasting agents	173.50
1	1.6	Extremely insensitive detonating substances	173.50
2	2.1	Flammable gas	173.115
2	2.2	Non-flammable compressed gas	173.115
2	2.3	Toxic gas	173.115
3		Flammable and combustible liquid	173.120
4	4.1	Flammable solid	173.124
4	4.2	Spontaneously combustible material	173.124
4	4.3	Corrosive when wet material	173.124
5	5.1	Oxidizer	173.127
5	5.2	Organic peroxide	173.128
6	6.1	Poisonous materials	173.132
6	6.2	Infectious substance (biologic agent)	173.134
7		Radioactive material	173.403
8		Corrosive material	173.136
9		Miscellaneous hazardous material	173.140
None		Other regulated material: ORM-D	173.144

Column #3:

Column #3 of the Hazardous Materials Table is labeled Hazard Class or Division and contains a designation of the hazard class or division corresponding to each proper shipping name. In some cases, it contains the word "Forbidden."

REVIEW

Now, let's review the first five columns of the Hazardous Materials Table.



NARRATION:

Column #4:

Identification numbers are generally preceded by the letters "UN," for United Nations, and identify HMT entries for domestic and/or international shipments. Some identification numbers are preceded by the letters "NA," for North America, may only be used when transported within the United States.

REVIEW

Now, let's review the first five columns of the Hazardous Materials Table.



Column #5:

Column #5 of the HMT specifies one or more packing groups assigned to a material corresponding to the proper shipping name and hazard class for that hazardous material. **Packing groups** indicate the degree of danger presented by the material. Packing group one is assigned to hazardous materials that represent great danger.

Materials Table Column #6

LABEL CODES

HAZARD CLASS LABELS

5172.101 HAZARDOUS MATERIALS TABLE

Symbols (1)	Hazardous materials descriptions and proper shipping names (2)	Hazard class or Division (3)	Identification Numbers (4)	PG (5)	Label Codes (6)	Special provisions (172.102) (7)	Packaging (173.***) (8)			Quantity limitations (see 173.27 and 175.75) (9)		Vessel storage (10)	
							Exceptions (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)	Location (10A)	Other (10B)
	Aluminum borohydride or Aluminum borohydride in devices	4.2	UN2870	I	4.2, 4.3	B11, T21, TP7, TP33	None	181	244	Forbidden	Forbidden	D	13, 148
	Arsenical pesticides, liquid, toxic	6.1	UN2994	I	6.1	T14, TP2, TP13, TP27	None	201	243	1 L	30 L B		40
				II	6.1	IB2, T11, TP2, TP13, TP27	153	202	243	5 L	60 L B		40
				III	6.1	IB3, T7, TP2, TP28	153	203	241	60 L	220 L A		40
	Igniters	1.1G	UN0121		1.1G	None	None	62	None	Forbidden	Forbidden	D3	25
	Medicine, liquid, flammable, toxic, n.o.s	3	UN3248	II	3, 6.1	IB2	150	202	243	1 L	60 L B		40

NARRATION:

Column #6 'Label Codes' of the Hazardous Materials Table specifies the **hazard class labels** that must be applied to each package that contains associated hazardous material.

For example:
Aluminum borohydride or Aluminum borohydride in devices.

Materials Table Column #6

LABEL CODES

HAZARD CLASS LABELS

5172.101 HAZARDOUS MATERIALS TABLE

Symbols (1)	Hazardous materials descriptions and proper shipping names (2)	Hazard class or Division (3)	Identification Numbers (4)	PG (5)	Label Codes (6)
	Aluminum borohydride or Aluminum borohydride in devices	4.2	UN2870	I	4.2, 4.3
	Arsenical pesticides, liquid, toxic	6.1	UN2994	I	6.1
				II	6.1
				III	6.1
	Igniters	1.1G	UN0121		1.1G
	Medicine, liquid, flammable, toxic, n.o.s	3	UN3248	II	3, 6.1

PRIMARY HAZARD CODES

SUBSIDIARY HAZARD CODES

Label Codes 4.2 and 4.3 are listed.

The first code, 4.2, represents the **primary hazard** of the material. Additional label codes represent subsidiary hazards.

Materials Table Column #6

LABEL CODES



HAZARD CLASS LABELS

§172.101(g) Label Substitution Table

Label code	Label name
1	Explosive
1.1 ¹	Explosive 1.1 ¹
1.2 ¹	Explosive 1.2 ¹
1.3 ¹	Explosive 1.3 ¹
1.4 ¹	Explosive 1.4 ¹
1.5 ¹	Explosive 1.5 ¹
1.6 ¹	Explosive 1.6 ¹
2.1	Flammable Gas
2.2	Non-Flammable Gas
2.3	Poison Gas
3	Flammable Liquid
4.1	Flammable Solid
4.2	Spontaneously Combustible
4.3	Dangerous When Wet
5.1	Oxidizer
5.2	Organic Peroxide
6.1 (inhalation hazard, Zone A or B)	Poison Inhalation Hazard
6.1 (other than inhalation hazard, Zone A or B) ²	Poison
6.2	Infectious substance
7	Radioactive
8	Corrosive
9	Class 9

PRIMARY HAZARD CODES

SUBSIDIARY HAZARD CODES

Materials Table Column #6

LABEL CODES



HAZARD CLASS LABELS

§172.101(g) Label Substitution Table

§172.402 Additional labeling requirements

§173.428 Empty Class 7 (radioactive) materials packaging

PRIMARY HAZARD CODES

SUBSIDIARY HAZARD CODES

“EMPTY” LABEL REQUIREMENTS

NARRATION:

4.3 indicates the **subsidiary hazard**.

The codes contained in Column 6 are defined in the table found in section 172.101(g).

In our example, 4.2 identifies that the label must be the “Spontaneously Combustible” label.

4.3 identifies that the label must be the “Dangerous When Wet” label.

Additional labeling requirements and exceptions are specified in section 172.402. For “Empty” label requirements, see §173.428 of the Hazardous Materials Regulations. Labeling will be covered in more depth in the “Labeling” section of this training.

Hazardous Materials Table Column #7

SPECIAL PROVISIONS →

49 CFR, §172.102

Symbols (1)	Hazardous materials descriptions and proper shipping names (2)	Hazard class or Division (3)	Identification Numbers (4)	PG Codes (5)	Label Codes (6)	Special provisions (§172.102) (7)	Packaging (§173.***) (8)		Quantity limitations (see §§173.27 and 175.75) (9)		Vessel stowage (10)		
							Exceptions (8A)	Non-bulk (8B)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)	Location (10A)	Other (10B)	
	Aluminum borohydride or Aluminum borohydride in devices	4.2	UN2870	I	4.2, 4.3	B11, T21, TP7, TP33	None	181	244	Forbidden	Forbidden	D	13, 14B
	Arsenical pesticides, liquid, toxic	6.1	UN2994	I	6.1	T14, TP2, TP13, TP27	None	201	243	1 L	30 L	B	40
				II	6.1	IB2, T11, TP2, TP13, TP27	153	202	243	5 L	60 L	B	40
				III	6.1	IB3, T7, TP2, TP28	153	203	241	60 L	220 L	A	40
	Igniters	1.1	UN0121	I	1.1G	None	None	62	None	Forbidden	Forbidden	O3	25
	Medicine, liquid, flammable, toxic, n.o.s	3	UN3248	II	3, 6.1	IB2150	None	202	243	1 L	60 L	B	40
				III	3, 6.1	IB3150	None	203	242	60 L	220 L	A	40
	Medicine, liquid, toxic, n.o.s	6.1	UN1851	II	6.1	153	None	202	243	5 L	60 L	C	40
				III	6.1	153	None	203	241	60 L	220 L	C	40
	Medicine, solid, toxic, n.o.s	6.1	UN3249	II	6.1	T3, TP33	153	212	242	25 kg	100 kg	C	40
				III	6.1	T3, TP33	153	213	240	100 kg	200 kg	C	40

Hazardous Materials Table Column #7

SPECIAL PROVISIONS →

49 CFR, §172.102

The list of special provisions is extensive. Always check whether any special provisions apply to a hazardous material.

Review section 172.102(a) and (b) to learn more about these special provisions.



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For definitions and descriptions of packaging types see section 171.8.

NARRATION:

Column 7 is labeled Special provisions.

It specifies codes for special provisions applicable to hazardous materials in addition to the standard requirements.

The meaning and requirements of special provisions are as set forth in section 172.102.

The list of special provisions is extensive.

Always check whether any special provisions apply to a hazardous material.

Review section 172.102(a) and (b) to learn more about these special provisions. For definitions and descriptions of packaging types see section 171.8.

Hazardous Materials Table Column #7

SPECIAL PROVISIONS

49 CFR, §172.102

PACKAGING PROVISIONS

PROHIBITIONS

EXCEPTIONS FROM REQUIREMENTS FOR PARTICULAR QUANTITIES OR FORMS OF MATERIALS

REQUIREMENTS OR PROHIBITIONS APPLICABLE TO SPECIFIC MODES OF TRANSPORTATION

DESCRIPTION OF CODES FOR SPECIAL PROVISIONS

ONLY NUMBERS	A	B	IB or IP	N	R	T	TP	W
Transportation Mode								
multi-modal	aircraft				rail			water
Packaging Type								
BULK and NON-BULK		BULK	IBCs and Large Packagings	NON-BULK		UN or IM Specification Portable Tanks	UN or IM Specification Portable Tanks	

NARRATION:

Special provisions contain packaging provisions, prohibitions, and exceptions from requirements for particular quantities or forms of materials and requirements or prohibitions applicable to specific modes of transportation.

Description of codes for special provisions is illustrated in the table in the image.

Column eight of the HMT specifies the applicable sections containing the packaging requirements for a hazardous material.

Columns 8A, 8B, and 8C specify the applicable sections in §173 for exceptions, non-bulk packaging requirements, and bulk packaging requirements.

Let's look at a few examples to see how these columns were established.

Hazardous Materials Table Column #8

PACKAGING AUTHORIZATIONS

49 CFR, §173...

Symbols (1)	Hazardous materials descriptions and proper shipping names (2)	Hazard class or Division (3)	Identification Numbers (4)	PG (5)	Label Codes (6)	Special provisions (§172.102) (7)	Packaging (§173.***) (8)			Quantity limitations (see §§173.27 and 175.75) (9)		Vessel stowage (10)	
							Exceptions (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)	Location (10A)	Other (10B)
	Aluminum borohydride or Aluminum borohydride in devices	4.2	UN2870	1	4.2, 4.3	B11, T21, TP7, TP33	None	181	244	Forbidden	Forbidden	D	13, 148
	Arsenical pesticides, liquid, toxic	6.1	UN2994	1	5.1	T14, TP2, TP13, TP27	None	201	243	1 L	30 LB		40
				II	5.1	IB2, T11, TP2, TP13, TP27	153	202	243	5 L	60 LB		40
				III	5.1	IB3, T7, TP7, TP28	153	203	241	60 L	220 LA		40
	Igniters	1.1G	UN0121		1.1G		None	62	None	Forbidden	Forbidden	D3	25
	Medicine, liquid, flammable, toxic, n.o.s	3	UN3248	II	3, 6.1	IB2	150	202	243	1 L	60 LB		40
				III	3, 6.1	IB3	150	203	242	60 L	220 LA		40
	Medicine, liquid, toxic, n.o.s	6.1	UN1851	II	5.1		153	202	243	5 L	60 LC		40
				III	5.1		153	203	241	60 L	220 LC		40
	Medicine, solid, toxic, n.o.s	6.1	UN3249	II	5.1	T3, TP33	153	212	242	25 kg	100 kg/C		40
				III	5.1	T3, TP33	153	213	240	100 kg	200 kg/C		40

Hazardous Materials Table Column #8

PACKAGING AUTHORIZATIONS

49 CFR, §173...

Symbols (1)	Hazardous materials descriptions and proper shipping names (2)	Hazard class or Division (3)	Identification Numbers (4)	PG Codes (5)	Label Provisions (6)	Special provisions (7)	Packaging (8)			Quantity limitations (9)		Vessel storage (10)	
							Exceptions (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)	Location (10A)	Other (10B)
	Aluminum borohydride or Aluminum borohydride in devices	4.2	UN2870	I	4.2, 4.3	B11, T21, TP7, TP33	None	181	244	Forbidden	Forbidden	D	13, 148
	Arsenical pesticides, liquid, toxic	6.1	UN2994	I	6.1	T14, TP2, TP13, TP27	None	201	243	1 L	30 LB		40
				II	6.1	IB2, T11, TP2, TP13, TP27	153	202	243	5 L	60 LB		40
				III	6.1	IB3, T7, TP2, TP28	153	203	241	60 L	220 LA		40
	Igniters	1.1G	UN0121		1.1G		None	62	None	Forbidden	Forbidden	D3	25
	Medicine, liquid, flammable, toxic, n.o.s		UN3248	II	3, 6.1	IB2	150	202	243	1 L	60 LB		40
				III	3, 6.1	IB3	150	203	242	60 L	220 LA		40
	Medicine, liquid, toxic, n.o.s	6.1	UN1851	II	6.1	153	202	243	5 L	60 LC		40	
				III	6.1	153	203	241	60 L	220 LC		40	
	Medicine, solid, toxic, n.o.s	6.1	UN3249	II	6.1	T3, TP33	153	212	242	25 kg	100 kg	C	40
				III	6.1	T3, TP33	153	213	240	100 kg	200 kg	C	40

NARRATION:

Arsenical Pesticides, liquid, toxic. The entry “none” in column 8A indicates that no packaging exceptions are authorized, except as may be provided by special provisions in Column 7. The meaning and requirements of special provisions are as set forth in section 172.102 of the Hazardous Materials Regulations. The entry “201” in column 8B indicates that non-bulk packaging requirements prescribed in §173.201 are required for non-bulk packagings.

Hazardous Materials Table Column #8

PACKAGING AUTHORIZATIONS

49 CFR, §173...

Symbols (1)	Hazardous materials descriptions and proper shipping names (2)	Hazard class or Division (3)	Identification Numbers (4)	PG Codes (5)	Label Provisions (6)	Special provisions (7)	Packaging (8)			Quantity limitations (9)		Vessel storage (10)	
							Exceptions (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)	Location (10A)	Other (10B)
	Aluminum borohydride or Aluminum borohydride in devices	4.2	UN2870	I	4.2, 4.3	B11, T21, TP7, TP33	None	181	244	Forbidden	Forbidden	D	13, 148
	Arsenical pesticides, liquid, toxic	6.1	UN2994	I	6.1	T14, TP2, TP13, TP27	None	201	243	1 L	30 LB		40
				II	6.1	IB2, T11, TP2, TP13, TP27	153	202	243	5 L	60 LB		40
				III	6.1	IB3, T7, TP2, TP28	153	203	241	60 L	220 LA		40
	Igniters	1.1G	UN0121		1.1G		None	62	None	Forbidden	Forbidden	D3	25
	Medicine, liquid, flammable, toxic, n.o.s		UN3248	II	3, 6.1	IB2	150	202	243	1 L	60 LB		40
				III	3, 6.1	IB3	150	203	242	60 L	220 LA		40
	Medicine, liquid, toxic, n.o.s	6.1	UN1851	II	6.1	153	202	243	5 L	60 LC		40	
				III	6.1	153	203	241	60 L	220 LC		40	
	Medicine, solid, toxic, n.o.s	6.1	UN3249	II	6.1	T3, TP33	153	212	242	25 kg	100 kg	C	40
				III	6.1	T3, TP33	153	213	240	100 kg	200 kg	C	40

The entry “243” in column 8C indicates that bulk packaging requirements prescribed in §173.243 are required for bulk packagings. In other words, if you see a **three-digit number** written in columns 8A, 8B, or 8C, refer to the section that is associated with that number in part 173 of the Hazardous Materials Regulations. It will contain additional packaging requirements or exceptions. For example, look for bulk requirements for the entry with the proper shipping name “Aluminum borohydride or Aluminum borohydride in devices.”

Hazardous Materials Table Column #8

PACKAGING AUTHORIZATIONS

49 CFR, §173...

(1) Symbols	Hazardous materials descriptions and proper shipping names (2)	Hazard class or Division (3)	Identification Numbers (4)	PG Codes (5)	Label provisions (6)	Special provisions (7)	(8) Packaging (173.244)			(9) Quantity limitations (see 173.27 and 175.75)		(10) Vessel stowage	
							Exceptions (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)	Location (10A)	Other (10B)
	Aluminum borohydride or Aluminum borohydride in devices	4.2	UN2870	I	4.2, 4.3	B11, T21, TP7, TP2	None	181	244	Forbidden	Forbidden	D	13, 14B
	Arsenical pesticides, liquid, toxic	6.1	UN2994	I	6.1	T14, TP2, TP13, TP27	None	201	243	1 L	30 L B		40
				II	6.1	IB2, T11, TP2, TP13, TP27	153	202	243	5 L	60 L B		40
				III	6.1	IB3, T7, TP2, TP28	153	203	241	60 L	220 L A		40
	Igniters	1.1G	UN0121		1.1G	None	None	62	None	Forbidden	Forbidden	O3	25
	Medicine, liquid, flammable, toxic, n.o.s	3	UN3248	II	3.6.1	IB2	150	202	243	1 L	60 L B		40
				III	3.6.1	IB3	150	203	242	60 L	220 L A		
	Medicine, liquid, toxic, n.o.s	6.1	UN1851	II	6.1	153	202	243	5 L	60 L C			40
				III	6.1	153	203	241	60 L	220 L C			40
	Medicine, solid, toxic, n.o.s	6.1	UN3249	II	6.1	T3, TP33	153	212	242	25 kg	100 kg C		40
				III	6.1	T3, TP33	153	213	240	100 kg	200 kg C		40

NARRATION:

Bulk packaging requirements are located in §173.244 part of the Hazardous Materials Regulations, but don't forget to also look at special provisions in column 7 applicable to bulk packagings.

Hazardous Materials Table Column #9

QUANTITY LIMITATIONS

the maximum quantities that may be offered for transportation in one package

9A

by PASSENGER-CARRYING



9B

by CARGO



§172.101 HAZARDOUS MATERIALS TABLE


(1) Symbols	Hazardous materials descriptions and proper shipping names (2)	Hazard class or Division (3)	Identification Numbers (4)	PG Codes (5)	Label provisions (6)	Special provisions (7)	(8) Packaging (173.***)			(9) Quantity limitations (see 173.27 and 175.75)		(10) Vessel stowage	
							Exceptions (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)	Location (10A)	Other (10B)
	Benzylisethylamine	8	UN2619	II	8.3	IB2, IB2, T7, TP2	154	202	243	1 L	30 L A		25, 40
	Benzylidene chloride	6.1	UN1886	II	6.1	IB2, T7, TP2	153	202	243	5 L	60 L D		40
G	Beryllium compounds, n.o.s	6.1	UN1566	II	6.1	IB8, TP2, TP4, TP3	153	212	242	25 kg	100 kg A		
D	Consumer commodity	ORM-D			None	222	156, 306	156, 306	None	30 kg gross	Forbidden	A	
	Consumer commodity	9	OR000		9	167	167	167	None	30 kg gross	30 kg gross		
G	Combustibles, water-activated, with desiccant (except for those for nonhazardous use)	1.2L	UN0248		1.2L	None	None	62	None	Forbidden	Forbidden	O3	25, 40

Column 9 of the Hazardous Materials Table is labeled "Quantity limitations." It is divided into two parts: Columns 9A and 9B.

Hazardous Materials Table Column #9

QUANTITY LIMITATIONS

the maximum quantities that may be offered for transportation in one package

9A by PASSENGER-CARRYING 

9B by CARGO 

"NET" weight, except where otherwise specified

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)
Consumer commodity		9DB000	9			167	167	None		30 kg gross	30 kg gross		

"Forbidden" means that the material may not be offered for transportation or transported in the applicable mode of transport

Cord, detonating, flexible	1.1D	UN0065	1.1D	102, 148(6.3)(a)	62	None	Forbidden	Forbidden	04		25		
Cord, detonating, flexible	1.4D	UN0289	1.4D	148	None	62	None	Forbidden	75 kg	02	25		
Cord, detonating or fuse, detonating, metal clad	1.2D	UN0102	1.2D		None	62	None	Forbidden	Forbidden	04	25		
Cord, detonating or fuse, detonating, metal clad	1.1D	UN0290	1.1D		None	62	None	Forbidden	Forbidden	04	25		
Cord, detonating, mild effect or fuse, detonating, mild effect, metal clad	1.4D	UN0104	1.4D		None	62	None	Forbidden	75 kg	02	25		
Cord, igniter	1.4G	UN0066	1.4G		None	62	None	Forbidden	75 kg	02	25		

NARRATION:

Column 9A specifies the maximum quantities that may be offered for transportation in one package by passenger-carrying aircraft or passenger-carrying rail car.

Column 9B specifies the maximum quantities that may be offered for transportation in one package by cargo aircraft only.

The **quantity limitation** is "NET" except where otherwise specified. For example, the entry for 'Consumer Commodity' specifies a '30 kg gross' quantity limitation.

The word "**Forbidden**" means that the material may not be offered for transportation or transported by that mode of transport.

Hazardous Materials Table Column #10

VESSEL STOWAGE REQUIREMENTS

§172.101 HAZARDOUS MATERIALS TABLE

Symbol	Hazardous materials descriptions and proper shipping names (1)	Hazard class or Division (2)	Identification Numbers (3)	PG Codes (4)	Label Provisions (5)	Special provisions (6)	Packaging (§173.***)			Quantity limitations (see §173.27 and 175.25)		Vessel stowage (10)	
							Exceptions (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/trail (9A)	Cargo aircraft only (9B)	Location (10A)	Other (10B)
	Accretion, see p-Azobisisobutyronitrile												
	Accumulators, electric, see Batteries, wet, etc.												
	Accumulators, pressurized, pneumatic or hydraulic (containing non-flammable gas) see Articles, pressurized, pneumatic, or hydraulic (containing non-flammable gas)												
	Acetal		UN1088	II	3	8B, 7A, TP1	150	202	242	5 L	60 L/E		
	Acetaldehyde		UN1089	I	3	816, T11, TP2, TP3	150	201	243	Forbidden	30 L/E		
A	Acetaldehyde ammonia		UN1841	III	9	8B, 8P3, TP33	155	204	240	200 kg	200 kg/A		34
	Acetaldehyde oxime		UN2332	III	3	81, 8B3, 7A, TP1	150	203	242	60 L	220 L/A		
	Acetic acid, glacial or Acetic acid solution, with more than 80 percent acid, by mass		UN2789	II	3	A3, A7, A10, 8B2, 8B2, 7F2	154	202	243	1 L	30 L/A		

NARRATION:

Column 10 is labeled 'Vessel stowage.'

As you can see in the image, the columns "10A" and "10B" can be blank or contain codes.

Column 10A [Vessel stowage] specifies the authorized stowage locations on board cargo and passenger vessels.

The meaning of each code in Column 10A is set forth in §172.101(k) of the Hazardous Materials Regulations and the physical requirements for each authorized stowage location are set forth in §176.63 of the Hazardous Materials Regulations.

Column 10B [Other provisions] specifies codes for stowage and handling requirements for specific hazardous materials. The meaning of each code in Column 10B is set forth in §176.84 of the Hazardous Materials Regulations.

Hazardous Materials Table Column #10

VESSEL STOWAGE REQUIREMENTS

Location (10A)

SPECIFIES THE AUTHORIZED STOWAGE LOCATIONS ON BOARD CARGO AND PASSENGER VESSELS

THE MEANING OF EACH CODE

49 CFR, §172.101(k)

THE PHYSICAL REQUIREMENTS FOR EACH AUTHORIZED STOWAGE LOCATION

49 CFR, §176.63

Other Provisions (10B)

SPECIFIES CODES FOR STOWAGE AND HANDLING REQUIREMENTS FOR SPECIFIC HAZARDOUS MATERIALS

THE MEANING OF EACH CODE

49 CFR, §176.84

NARRATION:

In the example highlighted here, the entry in **Column "10A"** indicates stowage category "C."

Hazardous Materials Table Column #10

Location (10A)

Other Provisions (10B)

49 CFR, §172.101(k)

49 CFR, §176.84

§172.101 HAZARDOUS MATERIALS TABLE

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class or Division	(4) Identification Numbers	(5) PG Codes	(6) Label	(7) Special provisions (§172.102)	(8) Packaging (§173.***)			(9) Quantity limitations (see §§173.27 and 175.75)		(10) Vessel stowage	
							Exceptions (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)	Location (10A)	Other (10B)
A-W	Carbon dioxide, solid or Dry Ice		9UN1845		None	217	217	240	200 kg	200 kg	C	40	
	Carbon disulfide		3UN1131	1	3, 6.1	B16, T14, TP2, TP7, TP13, W31	None	201	243	Forbidden	Forbidden	D	40, 78, 115
D	Consumer commodity	ORM-D			None	222	156, 306	156, 306	None	30 kg gross	Forbidden	A	
	Consumer commodity		9DB000	9			167	167	None	30 kg gross	30 kg gross		
G	Contrivances, water-activated, with burster, expelling charge or propelling charge	1.2L	UN0248		1.2L		None	62	None	Forbidden	Forbidden	D5	25, 14E, 15E, 17E

Hazardous Materials Table Column #10

Location (10A)

Other Provisions (10B)

49 CFR, §172.101(k)

49 CFR, §176.84

(1) Stowage category "A" means the material may be stowed "on deck" or "under deck" on a cargo vessel or on a passenger vessel.

(2) Stowage category "B" means—

(i) The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and

(ii) "On deck only" on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded.

(3) Stowage category "C" means the material must be stowed "on deck only" on a cargo vessel or on a passenger vessel.

(4) Stowage category "D" means the material must be stowed "on deck only" on a cargo vessel or on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers or one passenger per each 3 m of overall vessel length, but the material is prohibited on a passenger vessel in which the limiting number of passengers is exceeded.

(5) Stowage category "E" means the material may be stowed "on deck" or "under deck" on a cargo vessel or on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length, but is prohibited from carriage on a passenger vessel in which the limiting number of passengers is exceeded.

(6) Stowage category "01" means the material may be stowed "on deck" in closed cargo transport units or "under deck" on a cargo vessel (up to 12 passengers) or on a passenger vessel.

(7) Stowage category "02" means the material may be stowed "on deck" in closed cargo transport units or "under deck" on a cargo vessel (up to 12 passengers) or "on deck" in closed cargo transport units or "under deck" in closed cargo transport units on a passenger vessel.

(8) Stowage category "03" means the material may be stowed "on deck" in closed cargo transport units or "under deck" on a cargo vessel (up to 12 passengers) but the material is prohibited on a passenger vessel.

(9) Stowage category "04" means the material may be stowed "on deck" in closed cargo transport units or "under deck" in closed cargo transports on a cargo vessel (up to 12 passengers) but the material is prohibited on a passenger vessel.

(10) Stowage category "05" means the material may be stowed "on deck" in closed cargo transport units or "under deck" on a cargo vessel (up to 12 passengers) but the material is prohibited on a passenger vessel.

And according to §172.101(k), it means that the material must be stowed "on deck only" on a cargo vessel or on a passenger vessel. As you can see, there are multiple stowage categories.

NARRATION

The entry in Column "10B" indicates that stowage provision "40" applies, which, according to CFR, §176.84, prescribes that this material must be stowed "clear of living quarters."

Hazardous Materials Table Column #10

Location (10A)
 49 CFR, §172.101(k)

Other Provisions (10B)
 49 CFR, §176.84

§172.101 HAZARDOUS MATERIALS TABLE

Symbols (1)	Hazardous materials descriptions and proper shipping names (2)	Hazard class or Division (3)	Identification Numbers (4)	PG Codes (5)	Label Codes (6)	Special provisions (§172.102) (7)	Packaging (§173.***) (8)			Quantity limitations (see §173.27 and 175.75) (9)		Vessel stowage (10)	
							Exceptions (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)	Location (10A)	Other (10B)
A W	Carbon dioxide, solid or Dry ice	9	UN1845		None	217	217	240	200 kg	200 kg	C	40	
	Carbon disulfide	3	UN1131	I	3, 6, 1	B16, T14, TP2, TP7, TP13, W31	None	201	243	Forbidden	Forbidden	D	40, 76, 115
D	Consumer commodity	ORM-D			None	222	156, 306	156, 306	None	30 kg gross	Forbidden	A	
	Consumer commodity	9	D8000	9			167	167	None	30 kg gross	30 kg gross		
G	Contrivances, water-activated, with burster, expelling charge or propelling charge	1.2L	UN0248		1.2L		None	62	None	Forbidden	Forbidden	D5	25, 14E, 15E, 17E

Hazardous Materials Table Column #10

Location (10A)
 49 CFR, §172.101(k)

Other Provisions (10B)
 49 CFR, §176.84

§176.84 Other requirements for stowage, cargo handling, and segregation for cargo vessels and passenger vessels.

(a) *General.* When Column 10B of the §172.101 Table refers to a numbered or alpha-numeric stowage provision for water shipments, the meaning and requirements of that provision are set forth in this section. Terms in quotation marks are defined in §176.83. Other terms used in the table in this section such as "acids", "chlorates" and "permanganates" indicate different chemical groups referred to here as segregation groups. Materials falling within a segregation group are considered to have certain similar chemical properties and, although not exhaustive in nature, the materials belonging to each group include those substances identified in section 3.1.4 of the IMDG Code (IBR, see §171.7 of this subchapter) as set forth in §176.83(m).

(b) *Table of provisions:*

Code	Provisions
1	[Reserved]
2	Temperature controlled material.
40	Stow "clear of living quarters".
41	Stow "away from" mercury and its compounds.
42	Stow "away from" nitric acids and perchloric acids not exceeding 50 percent acid by weight.
43	Stow "away from" organic materials.
44	Stow "away from" oxidizers.
45	Stow "away from" permanganates.
46	Stow "away from" powdered metals.
47	Stow "away from" sodium compounds.

Hazardous Materials Table Column #10

Location (10A)

49 CFR, §172.101(k)

Other Provisions (10B)

49 CFR, §176.84

The meaning of each code in Columns 10 A and 10 B is set forth in the Hazardous Materials Regulations.

NARRATION:

The meaning of each code in Columns 10A and 10B is set forth in the Hazardous Materials Regulations.

Hazardous Materials Table Column #10

(1) Stowage category "A" means the material may be stowed "on deck" or "under deck" on a cargo vessel or on a passenger vessel.

49 CFR, §172.101(k)

§172.101 HAZARDOUS MATERIALS TABLE

(1) Symbols	(2) Hazardous materials descriptions and proper shipping names	(3) Hazard class or Division	(4) Identification Numbers	(5) PG Codes	(6) Label Codes	(7) Special provisions (§172.102)	(8) Packaging (§173.***)			(9) Quantity limitations (see §§173.27 and 175.75)		(10) Vessel stowage	
							(8A) Exceptions	(8B) Non-bulk	(8C) Bulk	(9A) Passenger aircraft/rail	(9B) Cargo aircraft only	(10A) Location	(10B) Other
	Dinitrophenol solutions	6.1	UN1599	II	6.1	IB2, T7, TP2	153	202	243	5 L	60 L	A	36
					III	IB3, T4, TP1	153	203	241	60 L	220 L	A	36
	Dinitrophenol, wetted with not less than 15 percent water, by mass	4.1	UN1320	I	4.1, 5.1	23, A8, A19, A20, N41, W31	None	211	None	1 kg	15 kg	E	28, 36
	Dinitrophenolates alkali metals, dry or wetted with less than 15 percent water, by mass	1.3C	UN0077		1.3C, 5.1		None	52	None	Forbidden	Forbidden	04	25, 5E

Let's look at a few examples.

For the entry 'Dinitrophenol solutions,' packing group II (which means medium danger).

Stowage category "A" means the material may be stowed "on deck" or "under deck" on a cargo vessel or on a passenger vessel, according to the Subpart B- Hazardous Materials Table, §172.101(k).

NARRATION:

Stowage provision “36” means the material must be stowed “away from” heavy metals and their compounds, according to §176.84. For the entry, ‘Dinitrophenol, wetted with not less than 15 percent water, by mass.’

Stowage category “E” means the material may be stowed “on deck” or “under deck” on a cargo vessel or on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3m of overall vessel length but is prohibited from carriage on a passenger vessel in which the limiting number of passengers is exceeded, according to the Subpart B-Hazardous Materials Table, §172.101(k).

There are two categories assigned for this entry in the column 10B.

- Stowage provision “28” means the material must be stowed “away from flammable liquids.”
- Stowage provision “36” means the material must be stowed “away from” heavy metals and their compounds, according to §176.84.

Hazardous Materials Table Column #10

(1) Stowage category “A” means the material may be stowed “on deck” or “under deck” on a cargo vessel or on a passenger vessel.

49 CFR, §172.101(k)

Stowage category “36” means the material must be stowed “away from” heavy metals and their compounds.

49 CFR, §176.84

Symbols (1)	Hazardous materials descriptions and proper shipping names (2)	Hazard class or Division (3)	Identification Numbers (4)	PG Codes (5)	Label Codes (6)	Special provisions (§172.102) (7)	Exceptions (8A)	Packaging (§173.***)			Quantity limitations (see §173.27 and 175.75)			Location (10A)	Other (10B)
								Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)	200 L (9C)	220 L (9D)		
	Dinitrophenol solutions	6.1	UN1599	II	6.1	IB2, T7, TP2	153	202	243	5 L	60 L	LA	36		
				III	6.1	IB3, T4, TP1	153	203	241	60 L	220 L	LA	36		
	Dinitrophenol, wetted with not less than 15 percent water, by mass	4.1	UN1320	I	4.1, 6.1	23, A8, A19, A20, N41, W31	None	211	None	1 kg	15 kg	E	28, 36		
	Dinitrophenolates alkali metals, dry or wetted with less than 15 percent water, by mass	1.3C	UN0077		1.3C, 6.1		None	62	None	Forbidden	Forbidden	04	25, 5E		

Hazardous Materials Table Column #10

(5) Stowage category “E” means the material may be stowed “on deck” or “under deck” on a cargo vessel or on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length but is prohibited from carriage on a passenger vessel in which the limiting number of passengers is exceeded.

49 CFR, §172.101(k)

§172.101 HAZARDOUS MATERIALS TABLE

28 Stow “away from” flammable liquids.
36 Stow “away from” heavy metals and their compounds.

49 CFR, §176.84

Symbols (1)	Hazardous materials descriptions and proper shipping names (2)	Hazard class or Division (3)	Identification Numbers (4)	PG Codes (5)	Label Codes (6)	Special provisions (§172.102) (7)	Exceptions (8A)	Packaging (§173.***)			Quantity limitations (see §173.27 and 175.75)			Location (10A)	Other (10B)
								Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)	200 L (9C)	220 L (9D)		
	Dinitrophenol solutions	6.1	UN1599	II	6.1	IB2, T7, TP2	153	202	243	5 L	60 L	LA	36		
				III	6.1	IB3, T4, TP1	153	203	241	60 L	220 L	LA	36		
	Dinitrophenol, wetted with not less than 15 percent water, by mass	4.1	UN1320	I	4.1, 6.1	23, A8, A19, A20, N41, W31	None	211	None	1 kg	15 kg	E	28, 36		
	Dinitrophenolates alkali metals, dry or wetted with less than 15 percent water, by mass	1.3C	UN0077		1.3C, 6.1		None	62	None	Forbidden	Forbidden	04	25, 5E		

REVIEW

Now, let's review columns 6 through 10 of the Hazardous Materials Table.

Column 6	LABEL CODES
Column 7	SPECIAL PROVISIONS
Column 8	PACKAGING AUTHORIZATIONS
Column 9	QUANTITY LIMITATIONS
Column 10	VESSEL STOWAGE REQUIREMENTS

REVIEW

Now, let's review columns 6 through 10 of the Hazardous Materials Table.

COLUMN 6	LABEL CODES → specifies the hazard warning labels that must be applied to each package that contains associated hazardous material
Column 7	PRIMARY HAZARD CODES §172.101(g) Label Substitution Table
Column 8	SUBSIDIARY HAZARD CODES
Column 9	§172.402 Additional labeling requirements
Column 10	"EMPTY" LABEL REQUIREMENTS §173.428 Empty Class 7 (radioactive) materials packaging

NARRATION:

Now, let's review columns 6 through 10 of the Hazardous Materials Table.

Column #6:

Column #6 **Label Codes** specifies the hazard warning labels that must be applied to each package that contains associated hazardous material.

If two or more label codes are listed, the first represents the **primary hazard** and the other(s) represent the **subsidiary hazard(s)**.

The codes contained in Column #6 are defined according to the Label Substitution Table found in section 172.101(g).

Additional labeling requirements are found in section 172.402. For "Empty" label requirements, see §173.428 of the Hazardous Materials Regulations.

REVIEW

Now, let's review columns 6 through 10 of the Hazardous Materials Table.

Column 6

COLUMN 7

Column 8

Column 9

Column 10

SPECIAL PROVISIONS → 49 CFR, §172.102

The list of special provisions is extensive.
Always check whether any special provisions apply to a hazardous material.

REVIEW

Now, let's review columns 6 through 10 of the Hazardous Materials Table.

Column 6

Column 7

COLUMN 8

Column 9

Column 10

PACKAGING AUTHORIZATIONS

49 CFR, §173...

Exceptions (8A)	Packaging (8173.244)				Quantity limitations (see 173.27 and 175.75)		Vessel storage (190)	
	Non-bulk (8B)	Passenger aircraft/mail (8C)	Cargo aircraft only (8D)	Location (19A)	Other (19B)			
None	185	244	Forbidden	Forbidden	D	11, 14B		
None	209	243	1 L	30 L/B		40		
153	200	248	5 L	60 L/B		40		
153	200	241	60 L	229 LA		40		
None	62	None	Forbidden	Forbidden	C3	25		
150	200	248	1 L	60 L/B		40		
150	200	242	60 L	229 LA		40		
153	202	243	5 L	60 LC		40		
153	200	241	60 L	229 LC		40		
143	212	242	25 kg	100 kg/C		40		
153	213	240	100 kg	200 kg/C		40		

NARRATION:

Column #7:

In Column 7, you will find codes for **special provisions** applicable to hazardous materials in addition to the standard requirements.

The meaning and requirements of special provisions are as set forth in section 172.102.

Column #8:

A three-digit number in Columns 8A, 8B, or 8C refers to the segment that is associated with that number in §173 of the Hazardous Materials Regulations.

It will contain additional packaging requirements or exceptions.

REVIEW

Now, let's review columns 6 through 10 of the Hazardous Materials Table.

Column 6

QUANTITY LIMITATIONS

the maximum quantities that may be offered for transportation in one package

Column 7

Column 8

9A	PASSENGER-CARRYING		"NET" weight, except where otherwise specified
9B	CARGO		

COLUMN 9

"Forbidden" means that the material may not be offered for transportation or transported in the applicable mode of transport

Column 10

REVIEW

Now, let's review columns 6 through 10 of the Hazardous Materials Table.

Column 6

VESSEL STOWAGE REQUIREMENTS

Column 7

Location (10A)

Specifies the authorized stowage locations on board cargo and passenger vessels

Column 8

Other Provisions (10B)

Specifies codes for stowage and handling requirements for specific hazardous materials

Column 9

49 CFR, §172.101(k)

49 CFR, §176.84

COLUMN 10

NARRATION:

Column #9: Column #9 Quantity Limitations 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.

Column 9B specifies the maximum quantities that may be offered for transportation in one package for cargo aircraft only. Quantities are a "net" weight/quantity limitation unless a "gross" weight is specified.

The word "Forbidden" indicates that the material may not be offered for transportation or transported by that mode of transport.

Column #10:

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. This information can be found in §172.101(k) of the Hazardous Materials Regulations.

Column 10B specifies codes for stowage requirements for specific hazardous materials. The meaning of each code in Column 10B is set forth in §176.84 of the Hazardous Materials Regulations.



Matching

Information for the Basic Description comes directly from the HMT. Below are two images, Picture 1 is an example of a Basic Description, and Picture 2 is an excerpt from the HMT.

The following information is found in each picture below. Label the following items found in each picture. Use the red boxes to record your answers.

- A. Identification number
- B. Proper shipping name
- C. Hazard class or division
- D. Packing Group (PG)

Picture 1:

No. of Units & Container Type	HM	BASIC DESCRIPTION Identification Number (UN or NA), Proper Shipping Name, Hazard Class, Packing Group, per 172.101, 172.202, 172.203	TOTAL QUANTITY (Weight, Volume, Gallons, etc.)
1 Box		Carriage Bolts	1000 lbs
4 Drums	X	UN1805, Phosphoric acid solution, 8, PGIII	4 gal
1 Drum	X	UN1993, Flammable liquids, n.o.s. (contains methanol), 3, PGIII	18 gal

Picture 2:

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG	Label Codes	Special provisions (§ 172.102)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Phosphine	2.3	UN2199		2.3, 2.1.	1
	Phosphoric acid solution	8	UN1805	III	8	A7, IB3, N34, T4, TP1
	Phosphoric acid, solid	8	UN3453	III	8	IB8, IP3, T1, TP33
	Phosphoric acid triethyleimine, see Tris-(1-aziridyl)phosphine oxide, solution.					

NARRATION:

Now, let's review Appendices A and B to the Hazardous Materials Table.

§172.101 HAZARDOUS MATERIALS TABLE												
(1) Symbols	Hazardous materials descriptions and proper shipping names (2)	Hazard class or Division (3)	Identification Numbers (4)	PG Codes (5)	Special provisions (§172.102) (7)	(8) Packaging (§173.***)			(9) Quantity limitations (see §173.27 and 175.75)		(10) Vessel stowage	
						Exceptions (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)	Location (10A)	Other (10B)
	Accelerene, see p-Nitrosodimethylaniline											
	Accumulators, electric, see Batteries, wet, etc.											
	Accumulators, pressurized, pneumatic or hydraulic (containing non-flammable gas), see Articles pressurized, pneumatic or hydraulic (containing non-flammable gas)											
	Acetal	3	UN1088									
	Acetaldehyde	3	UN1089									
A	Acetaldehyde ammonia	9	UN1841									
	Acetaldehyde oxime	3	UN2332									
	Acetic acid, glacial or Acetic acid solution, with more than 80 percent acid, by mass	8	UN2789									
	Acetic acid solution, not less than 50 percent but not more than 80 percent acid, by mass	8	UN2790	II	8	TP2, 148, A3, A7, A10, B2, B2, T7, TP2	154	202	242	1 L	30 LA	
	Acetic acid solution, with more than 10 percent and less than 50 percent acid, by mass	8	UN2790	III	8	148, B3, T4, TP1	154	203	242	5 L	60 LA	
	Acetic anhydride	8	UN1715	II	8, 3	A3, A7, A10, R2	154	202	243	1 L	30 LA	40



Appendix A to §172.101 - List of Hazardous Substances and Reportable Quantities is divided into two Tables:

- “Table 1-Hazardous Substances Other Than Radionuclides”
- and “Table 2-Radionuclides.”

Appendix A lists materials and their corresponding reportable quantities that are listed or designated as “hazardous substances” under section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. 9601(14).

Appendix A to §172.101

List of Hazardous Substances and Reportable Quantities

Appendix A to §172.101—List of Hazardous Substances and Reportable Quantities is divided into two TABLES:

“TABLE 1—HAZARDOUS SUBSTANCES OTHER THAN RADIONUCLIDES” and “TABLE 2—RADIONUCLIDES.”

Appendix A lists materials and their corresponding reportable quantities (RQs) that are listed or designated as “hazardous substances” under section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §9601(14) (CERCLA, 42 U.S.C. §9601 et seq).

Table 1 Hazardous substances other than radionuclides

↓

Hazardous Substance
→
Reportable Quantity

Table 2 Radionuclides

↓

Hazardous Substance
→
Reportable Quantity

Title 49 → Subtitle B → Chapter I → Subchapter C → Part 172.101
Subpart B—Table of Hazardous Materials and Special Provisions

NARRATION:

Elements and compounds that were designated as **hazardous substances** are listed in Column 1 of Table 1.

A listing of waste streams appear in numerical sequence and are referenced by the appropriate “D,” “F,” or “K” numbers.

Column 2 of Table 1, entitled “**Reportable Quantity (RQ).**”

For each hazardous substance listed in Column 1 of Table 1, it contains the reportable quantity, in pounds and kilograms.

Table 1 in Appendix A to §172.101

Hazardous substances other than radionuclides

↓

Hazardous Substance

TABLE 1 TO APPENDIX A—HAZARDOUS SUBSTANCES OTHER THAN RADIONUCLIDES

Hazardous substance	Reportable quantity (RQ) pounds (kilograms)
A2213	5000 (2270)
Acenaphthene	100 (45.4)
Acenaphthylene	5000 (2270)
D002 Unlisted Hazardous Wastes Characteristic of Corrosivity	100 (45.4)
D001 Unlisted Hazardous Wastes Characteristic of Ignitability	100 (45.4)
D003 Unlisted Hazardous Wastes Characteristic of Reactivity	100 (45.4)
Zirconium tetrachloride	5000 (2270)
F001	10 (4.54)
(a) Tetrachloroethylene	100 (45.4)
(b) Trichloroethylene	100 (45.4)
K178	1000 (454)
K181	1 (0.454)

Table 1 in Appendix A to §172.101

Hazardous substances other than radionuclides

↓

Hazardous Substance + Reportable Quantity

TABLE 1 TO APPENDIX A—HAZARDOUS SUBSTANCES OTHER THAN RADIONUCLIDES

Hazardous substance	Reportable quantity (RQ) pounds (kilograms)
A2213	5000 (2270)
Acenaphthene	100 (45.4)
Acenaphthylene	5000 (2270)
D002 Unlisted Hazardous Wastes Characteristic of Corrosivity	100 (45.4)
D001 Unlisted Hazardous Wastes Characteristic of Ignitability	100 (45.4)
D003 Unlisted Hazardous Wastes Characteristic of Reactivity	100 (45.4)
Zirconium tetrachloride	5000 (2270)
F001	10 (4.54)
(a) Tetrachloroethylene	100 (45.4)
(b) Trichloroethylene	100 (45.4)
K178	1000 (454)
K181	1 (0.454)

Table 1 in Appendix A to §172.101

Hazardous substances other than radionuclides



Hazardous Substance + Reportable Quantity IN POUNDS and (KILOGRAMS)

TABLE 1 TO APPENDIX A—HAZARDOUS SUBSTANCES OTHER THAN RADIONUCLIDES

Hazardous substance	Reportable quantity (RQ) pounds (kilograms)
A2213	5000 (2270)
Acenaphthene	100 (45.4)
Acenaphthylene	5000 (2270)
D002 Unlisted Hazardous Wastes Characteristic of Corrosivity	100 (45.4)
D001 Unlisted Hazardous Wastes Characteristic of Ignitability	100 (45.4)
D003 Unlisted Hazardous Wastes Characteristic of Reactivity	100 (45.4)
Zirconium tetrachloride	5000 (2270)
F001	10 (4.54)
(a) Tetrachloroethylene	100 (45.4)
(b) Trichloroethylene	100 (45.4)
K178	1000 (454)
K181	1 (0.454)

NARRATION:

The first number in the second column lists Reportable Quantity in **pounds**, and the number inside the parentheses is Reportable Quantity in **kilograms**.

For example, for the entry A2213, reportable quantity is 5000 pounds or 2270 kilograms. For the entry Acenaphthene, reportable quantity is 100 pounds or 45.4 kilograms.

Table 2 in Appendix A to §172.101

Radionuclides



Hazardous Substance

TABLE 2 TO APPENDIX A—RADIONUCLIDES

(1)—Radionuclide	(2)—Atomic Number	(3)—Reportable Quantity (RQ) Ci (TBq)
Actinium-224	89	100 (3.7)
Actinium-225	89	1 (.037)
Actinium-226	89	10 (.37)
Actinium-227	89	0.001 (.00037)
Actinium-228	89	10 (.37)
Aluminum-26	13	10 (.37)
Americium-237	95	1000 (37)
Americium-238	95	100 (3.7)
Americium-239	95	100 (3.7)
Americium-240	95	10 (.37)
Americium-241	95	0.01 (.00037)
Americium-242	95	100 (3.7)
Americium-242m	95	0.01 (.00037)
Americium-243	95	0.01 (.00037)
Americium-244	95	10 (.37)
Americium-244m	95	1000 (37)
Americium-245	95	1000 (37)
Americium-246	95	1000 (37)

Table two to Appendix A lists **radionuclides** that are hazardous substances and their corresponding reportable quantities.

NARRATION:

Table 2 in Appendix A to §172.101

Radionuclides



TABLE 2 TO APPENDIX A—RADIONUCLIDES

(1)—Radionuclide	(2)—Atomic Number	(3)—Reportable Quantity (RQ) Ci (TBq)
Actinium-224	89	100 (3.7)
Actinium-225	89	1 (.037)
Actinium-226	89	10 (.37)
Actinium-227	89	0.001 (.000037)
Actinium-228	89	10 (.37)
Aluminum-26	13	10 (.37)
Americium-237	95	1000 (37)
Americium-238	95	100 (3.7)
Americium-239	95	100 (3.7)
Americium-240	95	10 (.37)
Americium-241	95	0.01 (.00037)
Americium-242	95	100 (3.7)
Americium-242m	95	0.01 (.00037)
Americium-243	95	0.01 (.00037)
Americium-244	95	10 (.37)
Americium-244m	95	1000 (37)
Americium-245	95	1000 (37)
Americium-246	95	1000 (37)

Table 2 in Appendix A to §172.101

Radionuclides



TABLE 2 TO APPENDIX A—RADIONUCLIDES

(1)—Radionuclide	(2)—Atomic Number	(3)—Reportable Quantity (RQ) Ci (TBq)
Actinium-224	89	100 (3.7)
Actinium-225	89	1 (.037)
Actinium-226	89	10 (.37)
Actinium-227	89	0.001 (.000037)
Actinium-228	89	10 (.37)
Aluminum-26	13	10 (.37)
Americium-237	95	1000 (37)
Americium-238	95	100 (3.7)
Americium-239	95	100 (3.7)
Americium-240	95	10 (.37)
Americium-241	95	0.01 (.00037)
Americium-242	95	100 (3.7)
Americium-242m	95	0.01 (.00037)
Americium-243	95	0.01 (.00037)
Americium-244	95	10 (.37)
Americium-244m	95	1000 (37)
Americium-245	95	1000 (37)
Americium-246	95	1000 (37)

The reportable quantities for radionuclides are given in the radiological unit of measure of curie, abbreviated “Ci,” followed, in parentheses, by an equivalent unit measured in terabecquerels, abbreviated “TBq.”

Table 2 in Appendix A to §172.101

Radionuclides

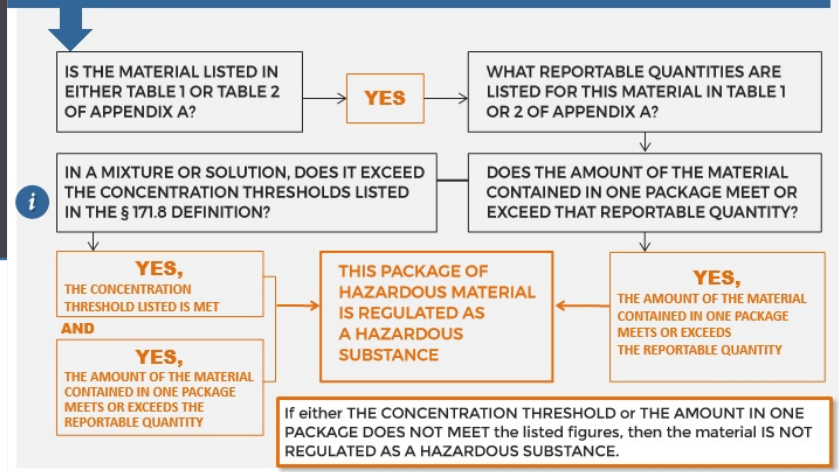


TABLE 2 TO APPENDIX A—RADIONUCLIDES

(1)—Radionuclide	(2)—Atomic Number	(3)—Reportable Quantity (RQ) (Ci) (TBq)
Actinium-224	89	100 (3.7)
Actinium-225	89	1 (0.01)
Actinium-226	89	10 (0.37)
Actinium-227	89	0.001 (0.000037)
Actinium-228	89	10 (0.37)
Aluminum-26	13	10 (0.37)
Americium-237	95	1000 (37)
Americium-238	95	100 (3.7)
Americium-239	95	100 (3.7)
Americium-240	95	10 (0.37)
Americium-241	95	0.01 (0.00037)
Americium-242	95	100 (3.7)
Americium-242m	95	0.01 (0.00037)
Americium-243	95	0.01 (0.00037)
Americium-244	95	10 (0.37)
Americium-244m	95	1000 (37)
Americium-245	95	1000 (37)
Americium-246	95	1000 (37)

For example, reportable quantity for Actinium-224 is 100 Ci or 3.7 TBq.

How to determine whether a particular package of hazardous material is REGULATED AS A HAZARDOUS SUBSTANCE



NARRATION:

For example, reportable quantity for Actinium-224 is 100 curie or 3.7 terabecquerels.

Now, after we reviewed Appendix A to the Hazardous Materials Table, we can see its real-life application as we determine whether a particular package of hazardous material is regulated as a **hazardous substance**.

First, is the material listed in either **table 1** or **table 2** of Appendix A?

If the answer is yes, then look at **reportable quantities** listed in Table 1 or 2.

Then, determine if the amount of the material contained in one package **meets or exceeds** the reportable quantity?

If yes, then this package of hazardous material is regulated as a **hazardous substance**.

Note, that in a mixture or solution, look at the concentration thresholds listed in the §171.8 definition.

NARRATION:

If the **concentration threshold is met** and the amount of the material contained in one package meets or exceeds the reportable quantity, then this package of hazardous material is **regulated** as a hazardous substance. If either the concentration threshold or the amount in one package **does not meet** the listed figures, then the material is **not regulated** as a hazardous substance.

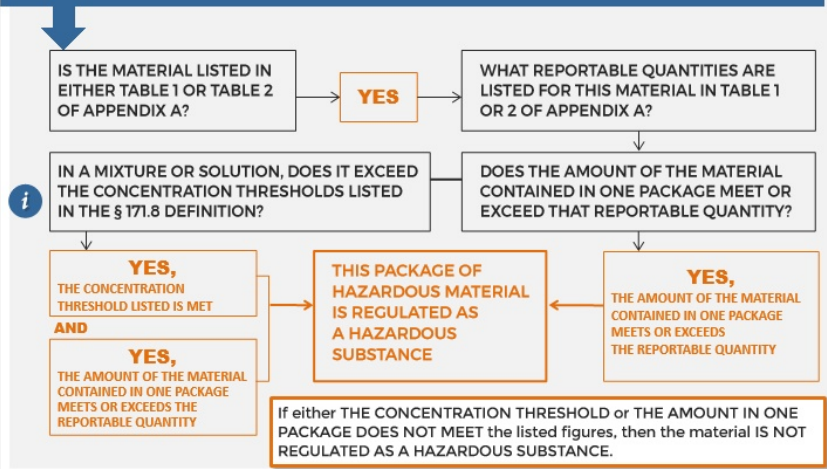
For example, we have 5,500 pounds of pure Ethylene Dichloride (not a mixture or solution).

Let's go through the steps to determine whether this package containing Ethylene Dichloride is regulated as a **hazardous substance**.

The first question to answer is this: Is the material listed in either Table 1 OR Table 2 of Appendix A?

Let's find out.

How to determine whether a particular package of hazardous material is REGULATED AS A HAZARDOUS SUBSTANCE



How to determine whether a particular package of hazardous material is REGULATED AS A HAZARDOUS SUBSTANCE

5,500 pounds of ETHYLENE DICHLORIDE (not a mixture or solution)

IS THE MATERIAL LISTED IN EITHER TABLE 1 OR TABLE 2 OF APPENDIX A?

How to determine whether a particular package of hazardous material is REGULATED AS A HAZARDOUS SUBSTANCE

5,500 pounds of ETHYLENE DICHLORIDE (not a mixture or solution)

IS THE MATERIAL LISTED IN EITHER TABLE 1 OR TABLE 2 OF APPENDIX A?

Ethylenebis(dithiocarbamic acid, salts & esters)
Ethylenediamine
Ethylenediamine-tetraacetic acid (EDTA)
Ethylene dibromide
Ethylene dichloride
Ethylene glycol
Ethylene glycol monoethyl ether
Ethylene oxide
Ethylenethiourea
Ethylenimine
Ethyl ether
Ethylene dichloride
Ethyl methacrylate
Ethyl methanesulfonate
Ethyl methyl ketone [§]
Fampridine
Ferric ammonium citrate
Ferric ammonium oxalate
Ferric chloride
Ferric fluoride
Ferric nitrate
Ferric sulfate
Ferrous ammonium sulfate
Ferrous chloride
Ferrous sulfate
Fluoranthene
Fluorene
Fluorine
Fluoroacetamide
Fluoroacetic acid sodium salt

How to determine whether a particular package of hazardous material is REGULATED AS A HAZARDOUS SUBSTANCE

5,500 pounds of ETHYLENE DICHLORIDE (not a mixture or solution)

IS THE MATERIAL LISTED IN EITHER TABLE 1 OR TABLE 2 OF APPENDIX A?

YES

WHAT REPORTABLE QUANTITIES ARE LISTED FOR THIS MATERIAL IN TABLE 1 OR 2 OF APPENDIX A?

100 pounds (45.4 kilograms)

DOES THE AMOUNT OF THE MATERIAL CONTAINED IN ONE PACKAGE MEET OR EXCEED THAT REPORTABLE QUANTITY?

5,500 pounds

YES

THIS PACKAGE OF 5,500 POUNDS OF ETHYLENE DICHLORIDE IS REGULATED AS A HAZARDOUS SUBSTANCE

NARRATION:

Yes, it's listed.

The next question is: What **reportable quantities** are listed for this material in Table 1 OR 2 of Appendix A?

According to Appendix A, the reportable quantity is 100 pounds or 45.4 kilograms.

And the last question to ask is: Does the amount of the material contained in one package **meet OR exceed** that reportable quantity?

And the answer is yes because the reportable quantity is 100 pounds and our package contains 5,500.

This package of 5,500 pounds of ethylene dichloride is regulated as a hazardous substance.



Think It Through

To determine if a material is regulated you will need to navigate the HMT. Here is an example of how you would apply the principles covered in this module.

Step 1: Identify if “Ethylene dichloride,” as packaged, is a hazardous substance for the purpose of transportation.

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG
(1)	(2)	(3)	(4)	(5)
	<i>Ethylene dibromide and methyl bromide liquid mixtures, see Methyl bromide and ethylene dibromide, liquid mixtures.</i>			
	Ethylene dichloride	3	UN1184	II
	Ethylene glycol diethyl ether	3	UN1153	III
			III

Step 2: Identify the quantity of the hazardous substance for transportation. 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.

Step 3: Locate the name "Ethylene dichloride" in the left-hand column of Table I - Appendix A. Follow across the page to the far right column, titled Reportable Quantity. Reportable quantities are shown in pounds and kilograms. The RQ for Ethylene dichloride is 100 pounds or 45.4 kilograms per package.

TABLE 1 TO APPENDIX A—HAZARDOUS SUBSTANCES OTHER THAN RADIONUCLIDES—Continued

Hazardous substance	Reportable quantity (RQ) pounds (kilograms)
Ethylenebisdithiocarbamic acid, salts & esters	5000 (2270)
Ethylenediamine	5000 (2270)
Ethylenediamine-tetraacetic acid (EDTA)	5000 (2270)
Ethylene dibromide	1 (0.454)
Ethylene dichloride	100 (45.4)
Ethylene glycol	5000 (2270)
Ethylene glycol monoethyl ether	1000 (454)
Ethylene oxide	10 (4.54)

Step 4: Once you determine it is listed in Table 1 to Appendix A, you also need to determine if the amount of material equals or exceeds the RQ for “Ethylene dichloride.”

Answer: In this instance, the amount of 5,500 pounds exceeds the RQ limit of more than 100 pounds in one package; therefore, “Ethylene dichloride” is a hazardous substance regulated for transportation.

NARRATION:

In some instances, the **technical name** of a hazardous substance is not listed as a proper shipping name in the Hazardous Materials Table.

In that case, use an **appropriate proper shipping name** that best describes the material based on its hazard class and packing group, this may be a generic “n.o.s.” HMT entry. If a hazardous substance does not meet the definition of any other hazard class or division then, generally, use the **Class 9 proper shipping names**, “Environmentally hazardous substance, n.o.s., liquid” or “Environmentally hazardous substance, n.o.s., solid,” as appropriate.

Appendix B to §172.101 - List of Marine Pollutants contains two columns. The **first column** identifies whether a material is a **severe marine pollutant**. If the letters “**PP**” appear in this column for a material, the material is a severe marine pollutant, otherwise it is not.

IF THE TECHNICAL NAME OF A HAZARDOUS SUBSTANCE IS NOT LISTED AS A PROPER SHIPPING NAME IN THE HMT

Use an appropriate proper shipping name that best describes the material based on its hazard class and packing group, this may be a generic “n.o.s.” HMT entry.

IF A HAZARDOUS SUBSTANCE DOES NOT MEET THE DEFINITION OF ANY OTHER HAZARD CLASS OR DIVISION

Generally, use the Class 9 proper shipping names “Environmentally hazardous substance, n.o.s., liquid” or “Environmentally hazardous substance, n.o.s., solid,” as appropriate (see §172.101(c)).

Appendix B to §172.101

Marine Pollutants and Severe Marine Pollutants (S.M.P.)

LIST OF MARINE POLLUTANTS

S.M.P. (1)	Marine pollutant (2)
	Acetone cyanohydrin, stabilized
	Acetylene tetrabromide
	Acetylene tetrachloride
	Acraldehyde, inhibited
	Acrolein, stabilized
	Acrolein, inhibited
	Acrolein, stabilized
	Acrylic acid, stabilized
	Acrylic aldehyde, inhibited
	Alcohol C-12 - C-16 poly(1-6) ethoxylate
	Alcohol C-6 - C-17 (secondary)poly(3-6) ethoxylate
	Aldcarb
PP	Aldris
	Alkyl (C12-C14) dimethylamine
	Alkyl (C7-C8) nitrates
	Alkylbenzenesulphonates, branched and straight chain (excluding C11-C13 straight chain or branched chain homologues)
	Alkyl alcohol
	Alkyl bromide
	ortho-Aminoanisole
	Aminobenzene
	Aminocarb

Appendix B to §172.101

List of Marine Pollutants

S.M.P. (1)	Marine pollutant (2)
	Acetone cyanohydrin, stabilized
	Acetylene tetrabromide
	Acetylene tetrachloride
	Acraldehyde, inhibited
	Acroleic acid, stabilized
	Acrolein, inhibited
	Acrolein, stabilized
	Acrylic acid, stabilized
	Acrylic aldehyde, inhibited
	Alcohol C-12 - C-16 poly(1-6) ethoxylate
	Alcohol C-6 - C-17 (secondary)poly(3-6) ethoxylate
	Aldicarb
PP	Aldrin
	Alkyl (C12-C14) dimethylamine
	Alkyl (C7-C9) nitrates
	Alkylbenzenesulphonates, branched and straight chain (excluding C11-C13 straight chain or branched chain homologues)
	Allyl alcohol
	Allyl bromide
	ortho-Aminoanisole
	Aminobenzene
	Aminocarb

Appendix B to §172.101

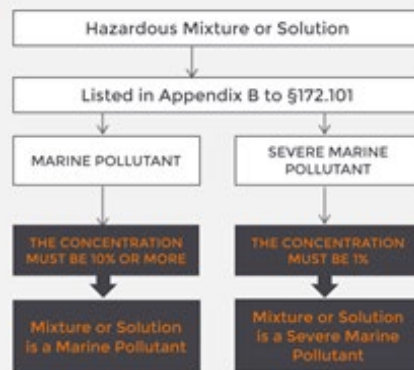
Marine Pollutants and Severe Marine Pollutants (S.M.P.)

Definition

(see §171.8)

Marine pollutant means a material that is listed in Appendix B to §172.101 of the HMR (also see §171.4) and, when in a solution or mixture of one or more marine pollutants, is packaged in a concentration which equals or exceeds:

- (1) Ten percent by weight of the solution or mixture for materials listed in the appendix; or
- (2) One percent by weight of the solution or mixture for materials that are identified as severe marine pollutants in the appendix.



NARRATION:

The **second column** “Marine Pollutant” lists the marine pollutants.

Appendix B lists potential marine pollutants as defined in §171.8 of the Hazardous Materials Regulations.

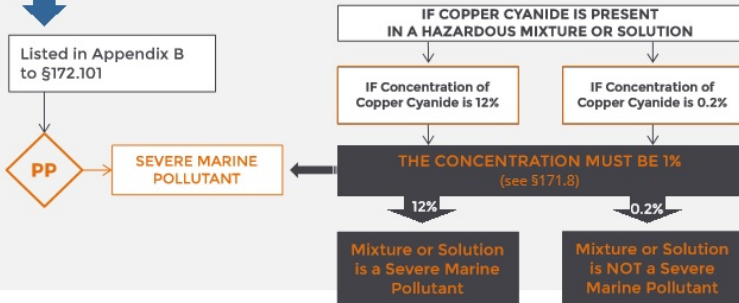
The designation between marine pollutant and severe marine pollutant is significant when the material is in a **mixture or solution**.

For mixtures and solutions, a marine pollutant must be in a concentration of **10% or more** for the mixture or solution to meet the definition of marine pollutant.

For severe marine pollutant, this concentration threshold is **1% concentration**.

How to determine whether a particular hazardous material is a Marine Pollutant or Severe Marine Pollutant

COPPER CYANIDE



S.M.P. (1)	Marine pollutant (2)
PP	Copper chloride solution
PP	Copper cyanide
PP	Copper metal powder

NARRATION:

Let's determine whether Copper Cyanide is a **Marine Pollutant** or **Severe Marine Pollutant**.

It is listed in Appendix B to the Hazardous Materials Table, and the letters “PP” are present in column 1, which means that Copper Cyanide is a severe marine pollutant.

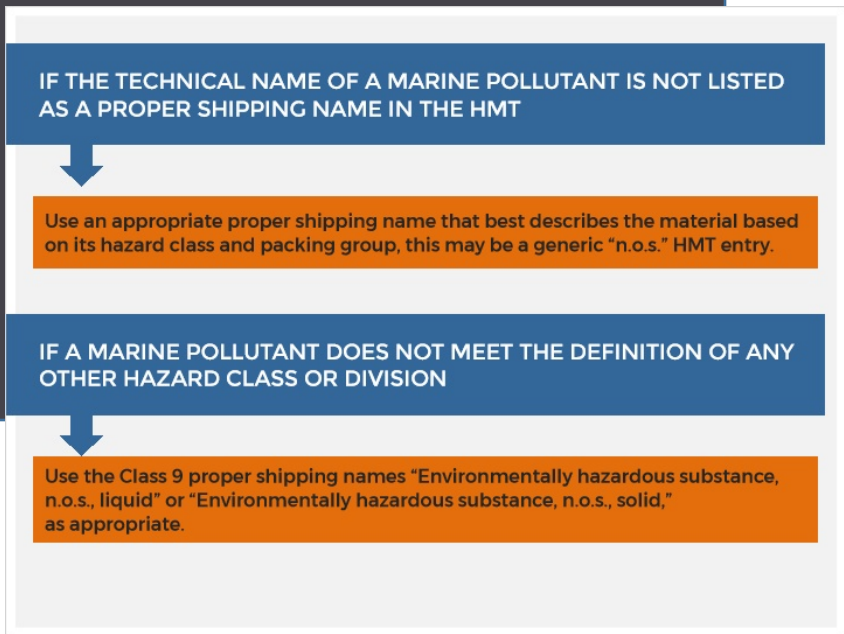
Now, let's review the appropriate **steps** if Copper Cyanide is present in a Hazardous Mixture or Solution.

Depending on whether its concentration in a mixture or solution is **at least 1%**, a mixture or solution will be designated a severe marine pollutant.

For example,

if the concentration of copper cyanide in a mixture or solution is 12%, then the mixture or solution is a severe marine pollutant because it **exceeds** the 1% concentration amount designated in the definition (see §171.8).

If the concentration of copper cyanide in a mixture or solution is 0.2%, then the mixture or solution is not a severe marine pollutant because it **does not exceed or equal** the 1% concentration



NARRATION:

In some instances, the **technical name** of a marine pollutant is not listed as a proper shipping name in the Hazardous Materials Table. In that case, use an **appropriate proper shipping name** that best describes the material based on its hazard class and packing group, this may be a generic "n.o.s." HMT entry.

If a **marine pollutant** does not meet the definition of any other hazard class or division, then use the Class 9 proper shipping names, "Environmentally hazardous substance, n.o.s., liquid" or "Environmentally hazardous substance, n.o.s., solid," as appropriate.