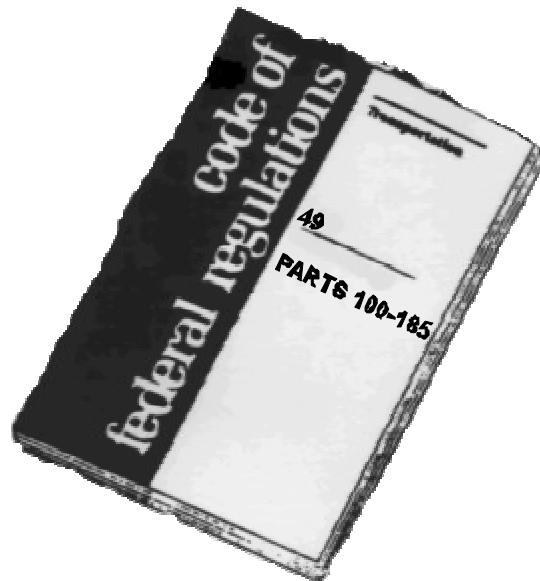




BILINGUAL HAZARDOUS MATERIALS GENERAL AWARENESS TRAINING

Volume I

Understanding and Using The Code of Federal Regulations, Title 49



ENTENDER Y USAR EL CODIGO DE REGLAMENTOS FEDERALES TÍTULO 49

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10/01/98

BASIC OUTLINE

The Code of Federal Regulations follows the same basic outline used for most written material.

Headings follow the descending order shown below:

Title:	Title 49 - Transportation
Subtitle:	Subtitle B - Other Regulations Relating to Transportation
Chapter:	Chapter I - Research and Special Programs Administration, Department of Transportation
Subchapter:	Subchapter C - Hazardous Materials Regulations
Part:	171 - General information, regulations and definitions
Subparts*	172 - Subpart D, Placarding
Section*	172.101
Paragraphs*	172.101(a)
Subparagraphs*	172.101(a)(1)
Sub-subparagraphs	172.101(a)(1)(i)

Suggested Tabbing for Title 49

Part 171 Index

171.8 - Definitions

171.14 - Transition Periods

Part 172 Index

172.101 - HM Table

172.101 - Appendix A Hazardous Substances

172.101 - Appendix B Marine Pollutants

172.102 - Special Provisions

172.200 - Subpart C, Shipping Papers

172.300 - Subpart D, Marking

172.400 - Subpart E, Labeling

172.500 - Subpart F, Placarding

172.600 - Subpart G, Emergency Response Information

172.700 - Subpart H, Training

Part 173 Index

173.24 - General Packaging Requirements

173.29 - Empty Packaging Requirements

173.50 - Subpart C, Class 1 Definition

173.115 - Subpart D, Definitions Other than Class 1 and Class 7

173.158 - Subpart E, Non-bulk Packaging

173.240 - Subpart F, Bulk packaging

173.300 - Subpart G, Gases, Preparation and Packaging

173.401 - Subpart I, Radioactive Materials

Part 174 Index, Carriage by Rail (optional)

Part 175 Index, Carriage by Aircraft (optional)

Part 176 Index, Carriage by Vessel (optional)

Part 177 Index, Carriage by Highway

177.848 - Loading and Segregation Chart

178.500 - Subpart L, Non-bulk Packaging Standards

178.600 - Subpart M, Testing of Non-bulk Packages

Part 173 -- SHIPPERS -- GENERAL REQUIREMENTS
FOR SHIPMENTS AND PACKAGINGS

Subpart A 173.1	General Purpose and Scope
Subpart B 173.21	Preparation of Hazardous Materials for Transportation Forbidden materials and packages
Subpart C 173.50	Definitions, Classification and Packaging for Class 1 Class - Definitions
Subpart D	Definitions, Classification, Packing Group Assignments and Exceptions for Hazardous Material Other than Class 1 and Class 7.
173.115	Class 2, Divisions 2.1, 2.2, and 2.3, - Definitions.
173.120	Class 3 - Definitions.
173.124	Class 4, Divisions 4.1, 4.2, and 4.3, - Definitions.
173.127	Class 5, Division 5.1 - Definition and assignment of packing group.
173.128	Class 5, Division 5.2 - Definitions and types.
173.132	Class 6, Division 6.1 - Definition.
173.134	Class 6, Division 6.2 - Definition.
173.136	Class 8 - Definition.
173.140	Class 9 - Definition.
173.144	Other Regulated Materials (ORM) - Definitions
Subpart E	Non-bulk Packaging for Hazardous Materials Other Than Class 1 and Class 7
Subpart F	Bulk Packaging for Hazardous Materials Other Than Class 1 and Class 7
Subpart G	Gases, Preparation and Packaging
Subpart H	Reserved
Subpart I 173.401	Radioactive Materials Scope
Subpart J - O	Reserved

PART 174 -- CARRIAGE BY RAIL

PART 175 -- CARRIAGE BY AIRCRAFT

PART 176 -- CARRIAGE BY VESSEL

PART 177 -- CARRIAGE BY PUBLIC HIGHWAY

Subpart A 177.800	General Information and Regulations Purpose and scope of this part and responsibility for compliance and training
Subpart B 177.834	Loading and Unloading General Requirements
Subpart C 177.848	Segregation and Separation Chart of Hazardous Materials Segregation of Hazardous Materials
Subpart D	Vehicles and Shipments in Transit, Accidents
Subpart E	Regulations applying to Hazardous Materials on Vehicles Carrying Passengers For Hire

PART 178 -- SPECIFICATIONS FOR PACKAGINGS

PART 180 -- CONTINUING QUALIFICATION AND
MAINTENANCE OF PACKAGINGS



If you transport hazardous materials in the course of a commercial business, you are regulated and must comply with the HMR.

171.2(b)

171.2 ADDITIONAL GENERAL REQUIREMENTS

(f) No person shall, by marking or otherwise, represent that;

(1) A container or package for the transportation of hazardous materials is safe, certified, or in compliance with the requirements of this Title unless it meets the requirements of all applicable regulations issued under the Act, or

(2) A hazardous material is present in a package, container, motor vehicle, rail freight car, aircraft, or vessel, if the hazardous materials is not present

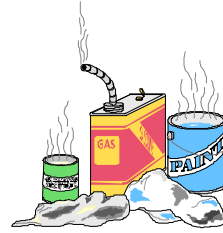
(g) No person shall unlawfully alter, remove, deface, or otherwise tamper with;

(1) Any marking, label, placard, or description on a document required by the Act, or a regulation issued under the Act; or

(2) Any package, container, motor vehicle, rail freight car, aircraft, or vessel used for the transportation of hazardous materials.

HAZARDOUS MATERIALS

W HAZARDOUS SUBSTANCES
W HAZARDOUS WASTES
W MARINE POLLUTANTS
W ELEVATED TEMPERATURE
MATERIAL
W MATERIAL IDENTIFIED IN
172.101
W MATERIALS MEETING THE
DEFINITIONS CONTAINED IN
PART 173



49 CFR 171.8

A hazardous material is a substance or material that meets two criteria:

1. It poses an unreasonable risk when transported in commerce.
2. The Secretary of Transportation has designated it a hazardous material.

171.8

Table of Hazardous Materials and Special Provisions

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

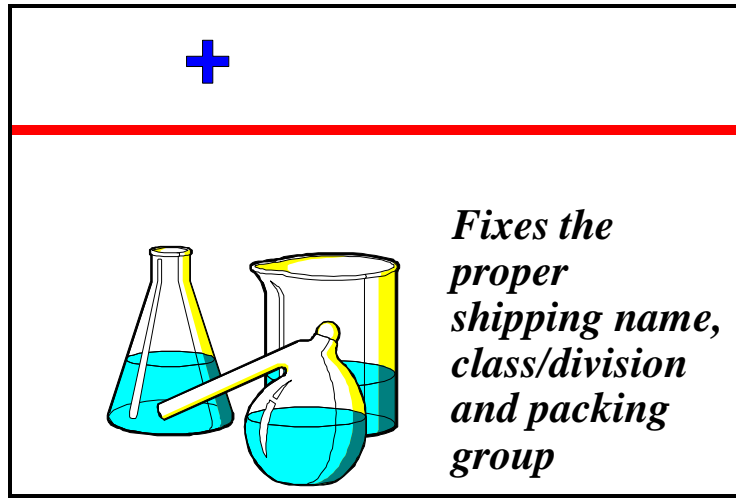
The use and explanation of the table is as follows:

<i>Column 1 HM Table</i>
+
A
D
I
W

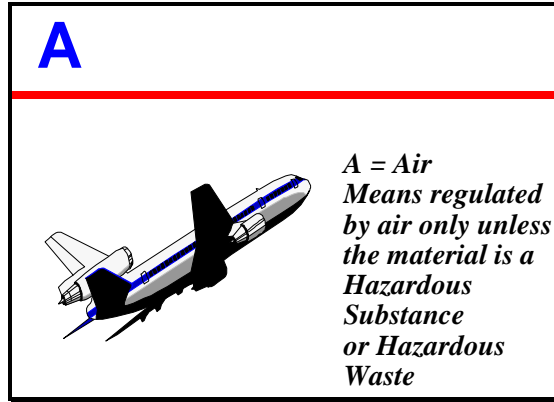
Column 1: Symbols

Column one contains the symbols: +, A, D, I, and W. These symbols indicate which mode of transportation the material is regulated. If there is no symbol in Column 1, the material is regulated in all modes of transportation.

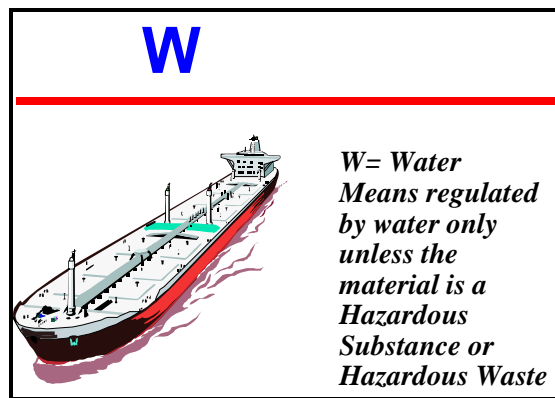
[+] Fixes the proper shipping name, class/division, and packing group without regard to whether the material meets the definition of that class or packaging group or meets any other hazard class definition. If there is no A+@ in column 1, the shipper must determine the proper shipping name and hazard class.



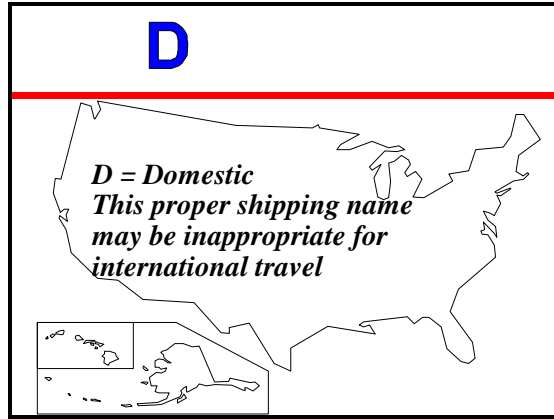
"Fixes" means you can't change the shipping name or hazard class, even if the material does not meet the definition of that hazard class. However, an alternate shipping name and hazard class may be authorized by the Office of Hazardous Materials Transportation of the USDOT.



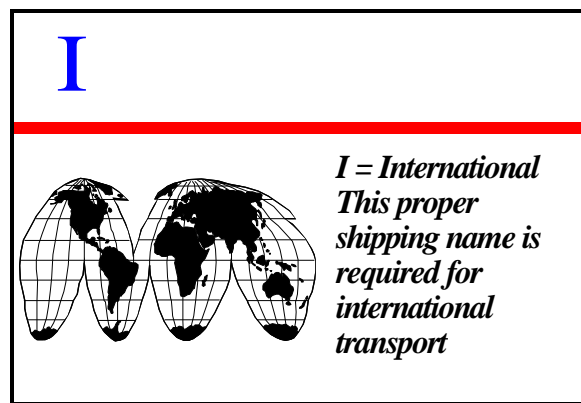
- * A = Only regulated by Air, unless the material is a hazardous waste or hazardous substance.



- * W = Only regulated when transported by vessel, unless the material is a hazardous waste or hazardous substance.



- * [D] Identifies proper shipping names which are appropriate for domestic transportation but may be inappropriate for international shipment.



- * [I] Identifies proper shipping names which are appropriate for international transportation. An alternate proper shipping name may be selected for domestic transportation.

<i>Column 2 HM Table</i>
Ž Shows the Proper Shipping Name
Ž Roman Type Only (Not Italics)

Now look at Column 2 of the HMT. The proper shipping names are in Column 2. Look closely at the two types of letters, Roman and Italic.

Proper shipping names are written in ROMAN type only.

172.101(c)

<i>Column 2 HM Table</i>
Words in <i>italics</i>
are <u>not</u> part of the
Proper Shipping Name

Note: Words in italics are not part of the proper shipping name. The use of those italicized words is discussed in the Shipping Paper Module.

172.101(c)(2)

HM TABLE COLUMN (2)
Proper Shipping Name

Column 2, HM Table

Hazardous materials description and proper shipping name	Hazard Class or Division	Identification number
Flammable liquids, n.o.s. 3		UN1963

Sometimes, a hazardous material doesn't have a specific name listed in the HMT but meets U.S. DOT's definition of a particular hazard class, such as "Flammable Liquid". In this case, the proper shipping name would be the same as the hazard class, such as "Flammable Liquid," plus the generic phrase - "not otherwise specified" or "not otherwise indexed" or "not otherwise indexed by name".

Fortunately, the generic phrases may be abbreviated, CAPITALIZED or in lower case:

- n.o.s. = not otherwise specified;
- n.o.i. = not otherwise indexed;
- n.o.i.b.n. = not otherwise indexed by name.

These phrases are interchangeable. They have similar meanings. You may use any one of these abbreviations. The preferred abbreviation is n.o.s. 172.101(c)(3)

The order of precedence for selecting the proper shipping name is: (1) the specific name, (2) a name that indicates its use such as **A**Compounds cleaning liquid,@(3) a generic proper shipping name. 171.101(c)(12)

<i>HM Table</i>
<p>Qualifying words</p> <ul style="list-style-type: none">• Sequence is optional• Table entry is Preferred!

Qualifying words such as liquid, dry, solid, flake and granular may be placed either before or after the proper shipping name. However, the HMT listing is the preferred sequence.

For example, the qualifying word in "compound, cleaning liquid" could be written "liquid, compound cleaning."

172.101(c)(4)

<i>HM Table</i>
<p>“See” means:</p> <ul style="list-style-type: none">• If both names are in Roman Type, either name may be used

The word "see" after a proper shipping name entry refers to another entry. If both names are in ROMAN type, you may use either name as the proper shipping name.

However, for the hazard class Organic peroxides, the technical name listed in the HMT "shall be used".

172.101(c)(5)

HM Table

Proper Shipping names for Hazardous Waste:

- **Hazardous Waste Liquid, N.O.S.**
- **Hazardous Waste Solid, N.O.S.**
- **Waste Acetone**

When the material is a hazardous waste and the word "waste" is not included in the HMT description, the word "Waste" must be placed before the proper shipping name, for example, Waste Acetone.

The word "waste" need not precede a proper shipping name that includes the word waste, for example, Hazardous waste, liquid, n.o.s., or Hazardous waste, solid, n.o.s.

If a hazardous material has a nonhazardous product added, the material becomes a mixture or solution. In this case, Acetone becomes Acetone mixture or Acetone solution.

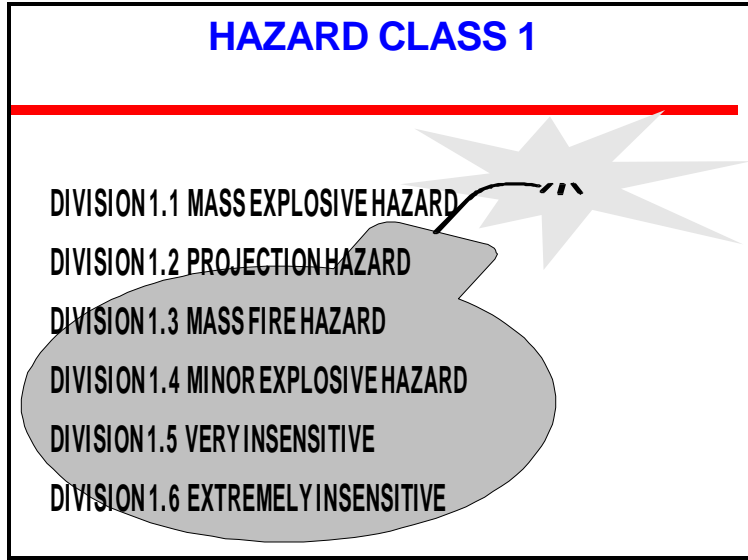
If addition of the nonhazardous product does not change the hazard class nor the general properties of Acetone, the proper shipping name/hazard class is: "Acetone Mixture, Flammable Liquid".

172.101(c)(10)

Column 3, Hazard Class or Division		
Hazardous materials description and proper shipping names	Hazard Class or Division	
Chlorine.....3		
Chlorine azide.....Forbidden		
Chlorine dioxide, hydrate frozen.....5.1		
Chlorine dioxide, (not hydrated).....Forbidden		

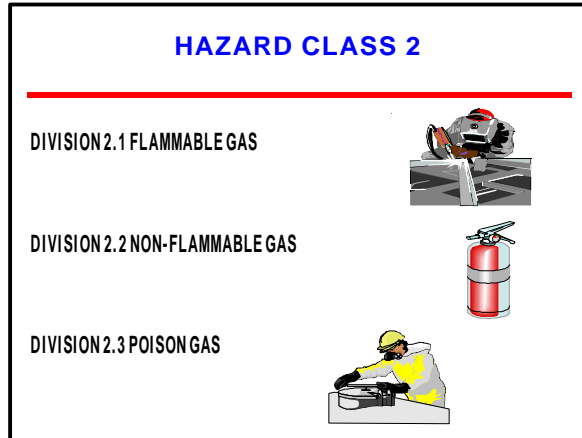
Column 3: Column 3 contains the Hazard Class or Division

- * DOT Hazard Classes are changed to Class or Class/Division.
- * Class/Division and Compatibility Group are listed for all explosives.
- * A Class 3 material may be modified to read "Combustible Liquid" when the material is reclassified in accordance with 173.150(f) of this subchapter. REFER TO 172.101(d)(4).
- * Column 3 also contains the word "Forbidden". This means that the material may not be offered or accepted for transportation unless the material is diluted or stabilized, and it is classed in accordance with the HMR.



CLASS 1 Explosives are separated into six divisions as follows:

- | | |
|--------------|----------------------------------|
| DIVISION 1.1 | MASS EXPLOSIVE HAZARD |
| DIVISION 1.2 | PROJECTION HAZARD |
| DIVISION 1.3 | MASS FIRE HAZARD |
| DIVISION 1.4 | MINOR EXPLOSION HAZARD |
| DIVISION 1.5 | VERY INSENSITIVE EXPLOSIVES |
| DIVISION 1.6 | EXTREMELY INSENSITIVE EXPLOSIVES |

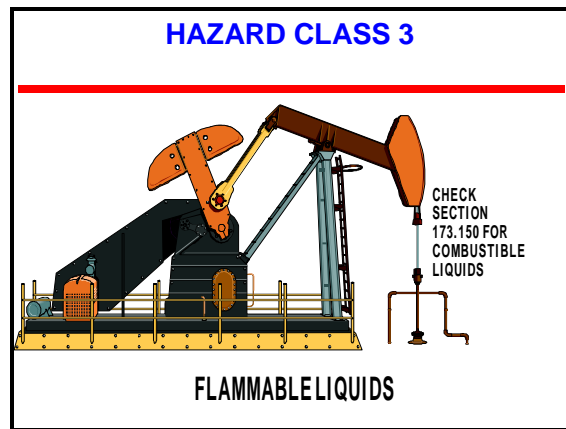


CLASS 2 Gases are divided into the following divisions:

DIVISION 2.1 FLAMMABLE GASES

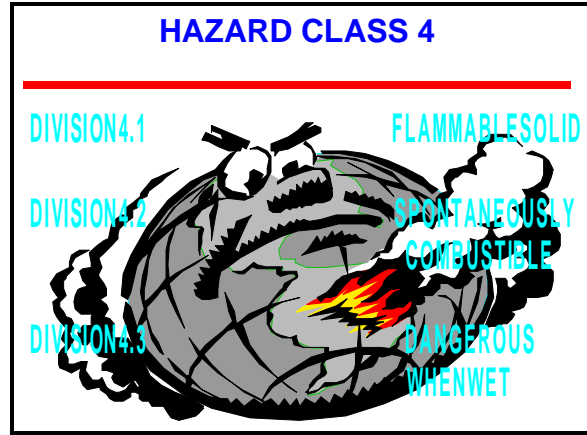
DIVISION 2.2 NON-FLAMMABLE GASES

DIVISION 2.3 POISONOUS OR TOXIC GASES



CLASS 3 FLAMMABLE/COMBUSTIBLE LIQUIDS

While Class 3 is not divided into Divisions, certain materials with a flash point above 100 degrees Fahrenheit can be re-classified as Combustible Liquids when transported domestically.

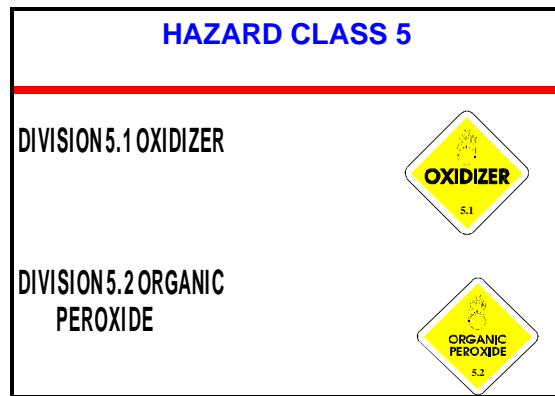


CLASS 4 FLAMMABLE SOLIDS are separated into three divisions as follows:

DIVISION 4.1 FLAMMABLE SOLID

DIVISION 4.2 SPONTANEOUSLY COMBUSTIBLE MATERIAL

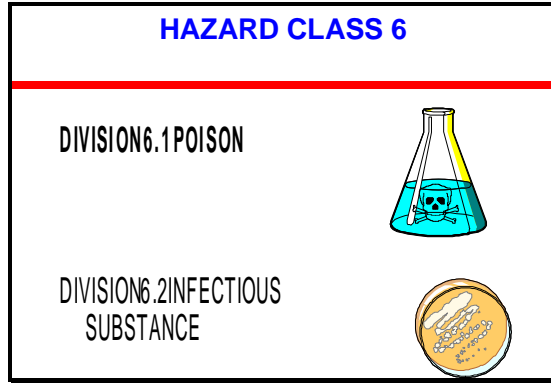
DIVISION 4.3 DANGEROUS WHEN WET



CLASS 5 has two divisions, they are:

DIVISION 5.1 OXIDIZER

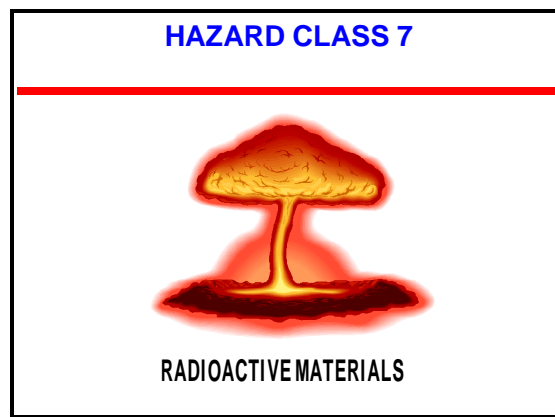
DIVISION 5.2 ORGANIC PEROXIDE



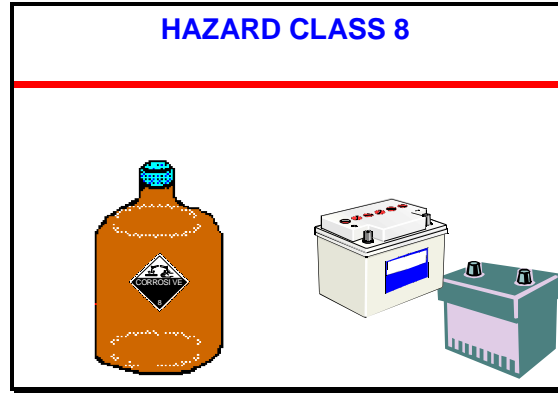
CLASS 6 has the following two divisions:

DIVISION 6.1 POISONOUS (TOXIC MATERIAL) (KEEP AWAY FROM FOOD)

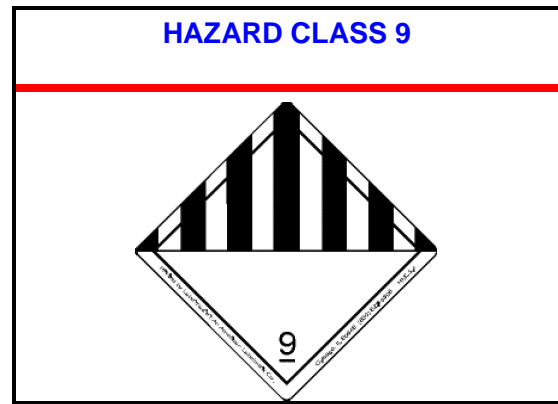
DIVISION 6.2 INFECTIOUS SUBSTANCE



CLASS 7 RADIOACTIVE MATERIALS have no divisions.



CLASS 8 CORROSIVE MATERIAL has no divisions.



CLASS 9 MISCELLANEOUS HAZARDOUS MATERIALS

These materials were previously known as Other Regulated Materials. For domestic transport purposes, the ORM-D designation is retained.

Column 4, Identification numbers

(2)	(3)	Identification numbers
		UN0333

Column 4: Identification Number

- * All hazardous materials have ID numbers including explosives.
- * It is critical to emergency response personnel that these numbers are accurate and properly displayed.

Approximately 14,000 military explosives alone were added to the identification numbering system, although not all were assigned individual numbers.

Column 5, Packing Group			
(2)	(3)	(4)	Pack- ing group
			I
			II
			III

Column 5: Packing Group

- * All packing groups are assigned in this table.
- * Classes 2, 7, and ORM-D materials do not have packing groups assigned.
- * Packing group numbers indicate the degree of danger presented by the material.
- * Some Class 6.1 and 2.3 poison inhalation hazard materials must indicate the Hazard Zone for the material based on the toxicity of the material. Refer to Section 173.133 for the specific requirements.

Packing Group	Degree of Danger
I	Great Danger
II	Medium Danger
III	Minor Danger

Packing Groups

172.101(f)

The packing group designated in the 172.101 Table, column 5, indicates the degree of danger presented by the material. The shipper is responsible for determining the appropriate packing group.

Packing Group	Degree of Danger
I	Great
II	Medium
III	Minor

The packing group is assigned in 172.101 Table. If more than one packing group is indicated for an entry, the packing group for the HM is determined using the criteria in Subpart D of part 173.

Column 6, Label codes

(3)	(4)	(5)	Label codes
			4.1, 4.3 6.1 1.1A

Column 6: Label(s) codes

- * 172.101(g) contains a cross reference list which identifies the label code with the required label.

Column 7, Special Provisions

(5)	(6)	Special Provisions (7)
		1..... 2..... B1, T1..... A7, B2, N34, T8, T26

Column 7: Special Provisions

Special Provision Codes

Numeric Codes apply to all modes of Transportation and to Bulk and Non-bulk Packages

Column 7 of the HMT lists Special Provisions for Hazardous Materials using a system of codes. These codes simplify the process of identifying any special requirements for a particular hazardous material. Some codes consist of a number only, while other codes have a number and a letter. Number only codes apply to all modes of transportation and to bulk and non-bulk packages.

Codes that begin with a letter apply to a particular mode of transportation. The letter codes are as follows:

- A - Transportation by aircraft
- B - Bulk packaging
- H - Transportation by highway
- N - Non-bulk packagings
- R - Transportation by rail
- T - Intermodal portable tanks
- W - Transportation by water

All Special Provisions are in addition to the packages authorized in Column 8 of the HMT.

Column 8, Packaging Authorizations

Packaging (173.***)		
Exceptions (8A)	Non-bulk (8B)	Bulk (8C)
154	213	240
152	213	240
None	213	240

Column 8: Packaging Authorizations

- * Directs you to the applicable packaging sections.
- * Divided into three sub-columns:

[8A] Exceptions

[8B] Non-bulk

[8C] Bulk

After you have met all the Special Provisions you are ready to turn to the packaging section referenced in Column 8. When you locate the proper section you are free to use any packaging type listed in the section.

The packaging sections are arranged as follows:

1. Sub-section (a) spells out in text what type of hazardous material each section applies to.
2. Sub-section (b) provides a list of combination packagings, listing outer packages first, then inner packages.
3. Sub-section (c) lists single packagings, and composite packagings.

IDENTIFICATION CODES FOR PACKAGING

- "1" DRUM
- "2" WOODEN BARREL
- "3" JERRICAN
- "4" BOX
- "5" BAG
- "6" COMPOSITE PACKAGING
- "7" PRESSURE RECEPTACLE

Package Identification Codes

- "A" = Steel
- "B" = Aluminum
- "C" = Natural Wood
- "D" = Plywood
- "F" = Reconstituted Wood
- "G" = Fiberboard

Package Identification Codes

- "H" = Plastic
- "L" = Textile
- "M" = Multiwall
- "N" = Metal (other than steel/aluminum)
- "P" = Glass, Porcelain, or Stoneware

Manufacturer's Marking Requirements	
178.803	
United Nations Symbol	

Performance Oriented Packaging

Manufacturer's Marking Requirement, 178.503

1. the United Nations symbol.

Manufacturer's Marking Requirements		
178.803		
Package Identification Codes	U N	1A1 1B2 6HA 7P

2. Packaging identification code consisting of:

Type of packaging

Material of construction

Category of packaging

Column 9, Quantity Limitations

(9) Quantity Limitations	
Passenger aircraft/rail	Cargo aircraft only
25 kg.....	100 kg.....
5 L.....	60 L.....
15 kg.....	50 kg.....

Column 9: Quantity Limitations

This Column specifies quantity limitations for passenger aircraft and rail transportation.

Quantity limitation is net unless otherwise indicated. Quantity limitations are expressed using SI units of measure.

When articles or devices are specifically listed by name, the net quantity limitation applies to the entire device (less packaging and packaging materials) rather than only to its hazardous component.

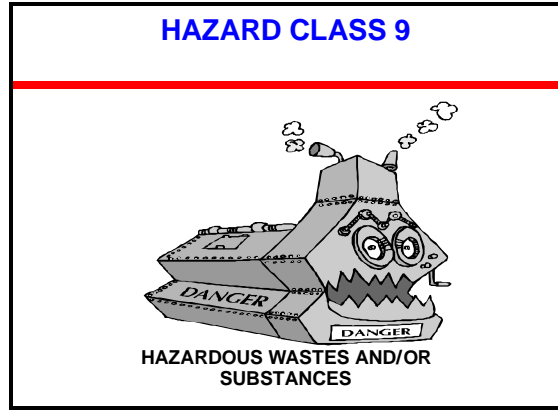
Column 10, Vessel Stowage Requirements

(10) Vessel Stowage	
Location (10A)	Other (10B)
E.....	40
A.....	
D.....	91

Column 10: Vessel Stowage Requirements

Column 10A specifies the authorized stowage location on both passenger and cargo vessel.

Column 10B specifies codes for stowage requirements for specific hazardous materials.



What are Environmentally Hazardous Substances?

Hazardous Materials often fit into more than one category: Hazardous Substance, Hazardous Material, or Marine Pollutant. For example, the material may be classed as a flammable liquid and also meet the definition of a hazardous substance or marine pollutant.

The definition of a hazardous substance is found in section 171.8 and reads:

A hazardous substance is a substance that is:

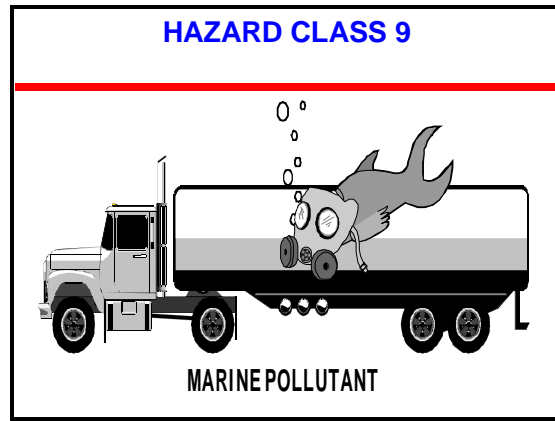
1. Listed in the Appendix A to the hazardous materials table and,
2. Shipped in one package that equals or exceeds the reportable quantity (RQ).

HM Table, Appendix A

Hazardous Substance Other than Radionuclides, Table 1	
Hazardous Substance	Reportable Quantity
Acetone	lbs/kg 5000/454

172.101 Appendix A

MARINE POLLUTANTS



Marine Pollutants

Appendix "B" to the HMT contains the list of Marine Pollutant materials. Marine Pollutants are regulated in Interstate and Intrastate commerce. However, these materials are only subject to regulation when shipped in bulk packages by air, highway, or rail.

171.4

HM Table, Appendix B

Appendix B to §172.101 List of Marine Pollutants	
S.M.P.	Marine Pollutant
(1)	(2)
PP.....	Chlorotulenes Chlorpynphos

Column 1 of Appendix B titled S.M.P., identifies the material as a marine pollutant or a severe marine pollutant. Severe marine pollutants are identified with "PP" in this column.

Column 2 lists the name of the substance or material.