HOW TO USE

The Hazardous Materials Regulations

CFR 49 Parts 100 To 185

2003

U.S. Department of Transportation
Research and Special Programs Administration

TABLE OF CONTENTS

PREFACE

The Hazardous Materials Regulations (HMR) are issued by the U.S. Department of Transportation (USDOT) and govern the transportation of hazardous materials in interstate, intrastate, and foreign commerce.

The primary goal of the HMR is the safety of the public and those whose occupations involve preparing hazardous materials for transportation or transporting them. To minimize risks, USDOT has issued specific requirements for shipments of hazardous materials in transportation. The HMR are divided into four general areas:

- **hazardous materials identification and classification;**
- **hazard communication;**
  [Shipping papers, markings, labels, and placards are used to communicate hazards of the materials to emergency responders, as well as, to those who handle hazardous materials routinely];
- **packaging requirements; and**
- **operational rules.**

A basic understanding of the HMR is required for compliance with the regulations. The workbook is designed to assist you with the first step -- learning to locate specific parts, subparts and references within the HMR.

If you are not sure if the HMR apply to you and/or your business or occupation, answer the questions on page 15. Check your answers with those found on page 16.

After completing this workbook, it is suggested that you obtain additional in-depth training. Suggested sources of materials and training resources are listed on page 17.

INFORMATION/RECOMMENDATIONS

Information

The USDOT issues most of the "Transportation" regulations in Title 49 – Transportation, Code of Federal Regulations (49 CFR). The Hazardous Materials Regulations (HMR) are in the the volume containing Parts 100-185 and govern the transportation of hazardous materials in all modes of transportation – air, highway, rail and water.

The Code of Federal Regulations (CFR) has the force of the law. The regulations are issued by Federal agencies to carry out the responsibilities imposed on those agencies by Congress.

Objectives

Upon completion of this workbook you should be able to:

- locate parts, subparts, sections, and references within the HMR;
- locate and tab reference sections of the HMR; and
- use the HMR to locate specific information.

Materials Checklist

To complete this workbook, you need:

- a current copy of the HMR in 49 CFR Parts 100 to 185;
- paper and pen or pencil for notes and exercises;
- approximately 40 gummed tabs; and
- a straight edge marker or ruler.

Recommendations

The HMR **must** be used to determine the requirements for shipping hazardous materials and should be treated like a technical or reference book. Read it carefully and always read other sections referenced. When determining compliance **always** use the current HMR and any Federal Register Notices issued since the publish date. It is recommended that you tab your copy of 49 CFR Parts 100 to 185. A recommended tabbing guide is on pages 6-7 of this publication.

STRUCTURE OF CODE OF FEDERAL REGULATIONS

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:	Part 172 – Hazardous materials tables and hazardous materials communications regulations, emergency response information, and training requirements
Subpart*	Subpart D – Marking
Section*	172.301
Paragraph*	172.301(a)
Subparagraph*	172.301(a)(1)
Sub-subparagraph*	172.301(a)(1)(i)

* Listed under Parts, as needed, in descending order.

Turn to page 1 in 49 CFR Parts 100-185. Notice the CFR title at the top of the page:

Title 49 — Transportation

The Parts contained in this volume are noted in parentheses:

(This book contains parts 100 to 185)

The SUBTITLE and CHAPTER are also listed:

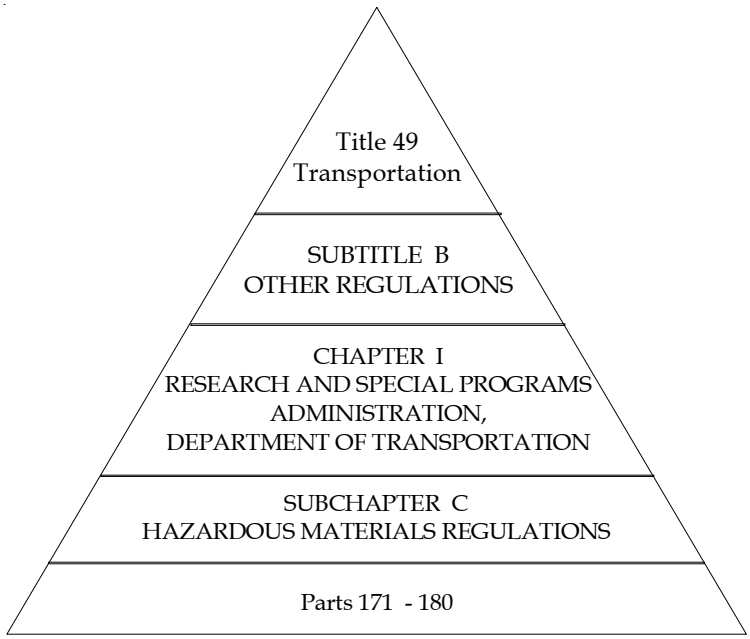
Now locate the CHAPTER I index:

CHAPTER I – RESEARCH AND SPECIAL PROGRAMS ADMINISTRATION DEPARTMENT OF TRANSPORTATION

Notice that SUBCHAPTER C contains the Hazardous Materials Regulations (HMR).

Pyramid Diagram

The pyramid diagram below illustrates the HMR format just discussed and the location of the HMR in 49 CFR.



Rules of Construction, § 171.9

Unless specifically stated otherwise:

- singular words include the plural;
- plural words include the singular;
- masculine words include the feminine;
- "must" means **required**;
- "shall" means r**equired**;
- "should" means **recommended, but not required**;
- "may" means **permitted, but not required**;
- "includes" means **includes, but not limited to**; and
- "no person may " means **no person is required, authorized, or permitted to**...

EXERCISE 1: PARTS

In 49 CFR, Parts 100-185, locate the CHAPTER I index and read the headings under SUBCHAPTERS A, B and C.

Fill in the blanks designating the Part where each subject is addressed in the HMR.

Part (Number)	Heading
_____	Carriage by aircraft
_____	Carriage by rail
_____	Carriage by vessel
_____	Carriage by public highway
_____	General information, regulations and definitions
_____	Hazardous materials tables, special provisions, hazardous materials communications, emergency response information, and training requirements
_____	Shippers – General requirements for shipments and packagings
_____	Specifications for packagings
_____	Specifications for tank cars
_____	Continuing qualification and maintenance of packagings

EXERCISE 2: LOCATING REFERENCE NUMBERS

CFR Reference Numbers. Bold numbers referring to sections are at the top outside corners of each page of the HMR. These reference numbers have the same location and purpose as dictionary locator words at the top of each page in a dictionary. That is, the number on the top left is the CFR reference number that begins that page. The number on the top right of the facing page is the reference number for the last CFR reference number on that page.

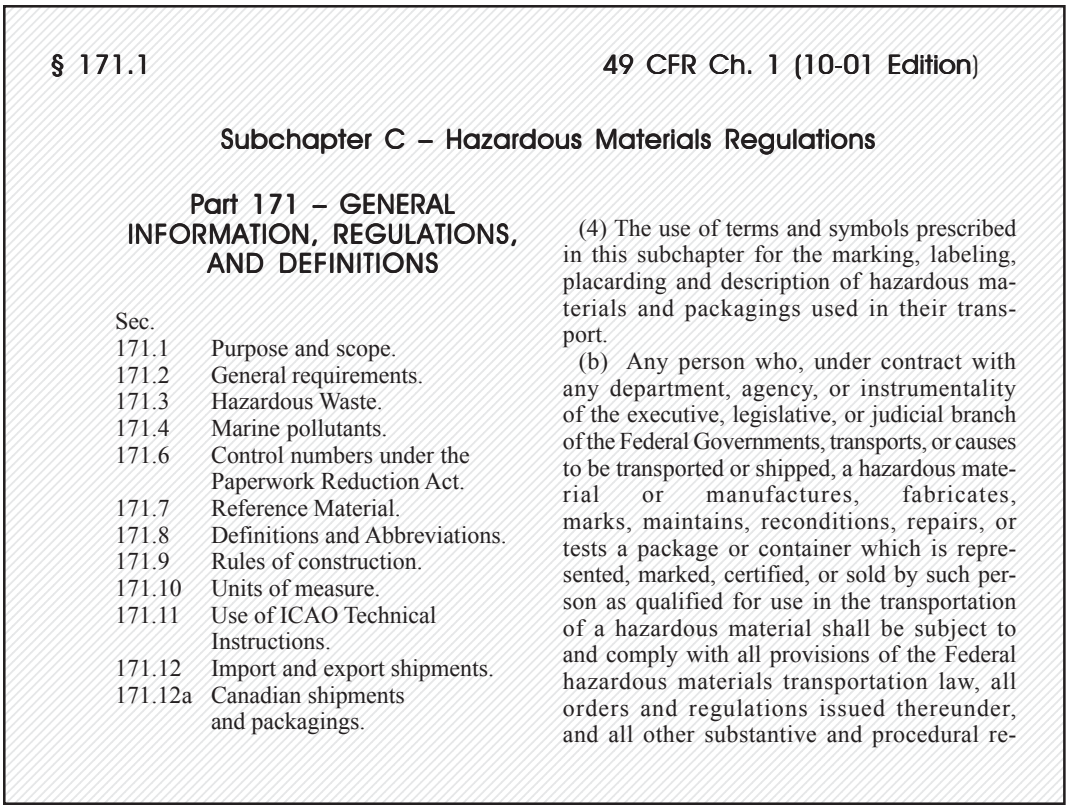
It is important to use these reference numbers rather than page numbers to locate HMR information. The page numbers in 49 CFR are always changing because of revisions, additions, deletions, and the annual reprinting of the CFR.

Turn to Subchapter C, the beginning of the HMR.

Subchapter C – Hazardous Materials Regulations
Part 171 – GENERAL INFORMATION, REGULATIONS, AND DEFINITIONS.

Use the reference numbers at the top of the HMR. Notice that Part 171 begins with a table of contents. The table of contents lists headings within Part 171 by section numbers, not page numbers.

Scan the sections of Part 171. Notice the Part and Section numbers in **bold** at the top of each page; these numbers refer to the section that begins or ends the page.



§ 171.1 49 CFR Ch. 1 (10-01 Edition)

Subchapter C – Hazardous Materials Regulations

Part 171 – GENERAL INFORMATION, REGULATIONS, AND DEFINITIONS

Sec.

(4) The use of terms and symbols prescribed in this subchapter for the marking, labeling, placarding and description of hazardous materials and packagings used in their transport.

(b) Any person who, under contract with any department, agency, or instrumentality of the executive, legislative, or judicial branch of the Federal Governments, transports, or causes to be transported or shipped, a hazardous material or manufactures, fabricates, marks, maintains, reconditions, repairs, or tests a package or container which is represented, marked, certified, or sold by such person as qualified for use in the transportation of a hazardous material shall be subject to and comply with all provisions of the Federal hazardous materials transportation law, all orders and regulations issued thereunder, and all other substantive and procedural re-

EXERCISE 3: SUGGESTED TABBING OF THE HMR

Subject	Reference	Suggested Tab
General		
Exemptions, Preemptions, Registration	Part 107	107
Definitions/Abbreviations	171.8	DEF
Hazardous Materials Table	172.101	HMT
Appendix A (Hazardous Substances)	Appendix A	AP A
Appendix B (Marine Pollutants)	Appendix B	AP B
Special Provisions	172.102	SP PR
Shipping Papers	172.200	SHP PAP
Certification	172.204	CERT
Hazardous Waste Manifest	172.205	MANFST
Marking	172.300	MRK
Labeling	172.400	LBL
Placarding	172.500	PLAC
Emergency Response Information	172.600	ERI
Training	172.700	TRNG
Classes & Definitions	173.2	CLASS
Precedence Table	173.2a	PRE TBL
Waste Packaging Exception	173.12	LAB PK
Packaging-General Requirements	173.24	GEN PKG
Packaging-Add'l Req.-Non-Bulk	173.24a	NB
Packaging-Add'l Req.-Bulk	173.24b	BULK
Packaging-Reuse	173.28	PKG REUSE
Empty packagings	173.29	MT PKG
Specific Packaging		
Packaging-Non-Bulk	Part 173, Subpart E	NB
Packaging Bulk	Part 173, Subpart F	BULK
Hazard Class Definitions/Divisions/Packing Groups		
Class 1 (Explosives)	173.50	CL 1
Class 2 (Gases)	173.115/116	CL 2
Class 3 (Flammable/Combustible Liquids)	173.120/121	CL 3
Class 4 (Flammable Solid, Spontaneously Combustible, Dangerous When Wet)	173.124/125	CL 4
Class 5 (Oxidizers, Organic Peroxides)	173.127/128/129	CL 5
Class 6 (Poisonous Materials/ Infectious Substances)	173.132/133/134	CL 6
Class 7 (Radioactive Materials)	173.403	CL 7
Class 8 (Corrosive Materials)	173.136/137	CL 8
Class 9 (Miscellaneous Hazardous Materials)	173.140/141	CL 9
Other Regulated Materials	173.144/145	ORM

EXERCISE 3: SUGGESTED TABBING OF THE HMR (Continued)

Subject	Reference	Suggested Tab
Exceptions		
Class 2 (Gases)	173.306/307	CL 2 EXC
Class 3 (Flammable/Combustible Liquids)	173.150	CL 3 EXC
Class 4 (Flammable Solids)	173.151	CL 4 EXC
Class 5 (Oxidizers, Organic Peroxides)	173.152	CL 5 EXC
Div. 6.1 (Poisonous Materials)	173.153	DIV 6.1 EXC
Class 8 (Corrosive Materials)	173.154	CL 8 EXC
Class 9 (Miscellaneous Hazardous Materials)	173.155	CL 9 EXC
Other Regulated Materials	173.156	ORM-D EXC
Carrier Requirements		
Rail	PART 174	RAIL
Aircraft	PART 175	AIR
Vessel	PART 176	VES
Highway	PART 177	HWY
Packagings Specs		
Purpose and Scope	178.1	Scope
Applicability & Responsibility	178.2	App
Specs for Inner Receptacles	178.33	Inner
Specs for Cylinders	178.35	Cyl
Specs for Portable Tanks	178.245	PT
Specs for Cargo Tanks		
– MC331	178.337	331
– MC338	178.338	338
– DOT406	178.346	406
– DOT407	178.347	407
– DOT412	178.348	412
Pkgs for Class 7	178.350	RAM
NB Performance Oriented Pkgs.	178.500	POP
Tests – NB Pkgs.	178.600	NBTest
Intermediate Bulk Container Stds.	178.700	IBCs
Testing of IBCs	178.800	IBCTest

EXERCISE 4: FINDING A SPECIFIC SECTION

A. Locate the definition of a hazard class, for example: Class 1 – Explosives.

- Start by looking in §171.8
- § 171.8 refers you to § 173.50
- Use the reference numbers at the top of the HMR pages to locate "§ 173.50 Class 1 – definitions"
- Read the definition

B. Locate a specific reference, such as "§ 172.201(a)(1)(iii)"

- Use the reference numbers at the top of the HMR pages to find the number closest to § 172.201.
- Follow the step-by-step process illustrated below:

§ 172.201

§ 172.201 General Entries

(a) *Contents.* When a description of hazardous material is required to be included on a shipping paper, that description must conform to the following requirements:

(1) When a hazardous material and a material not subject to the requirements of this subchapter are described on the same shipping paper, the hazardous material description entries required by §172.202 and those additional entries that may be required by §172.203:

(i) Must be entered first, or

(ii) Must be entered in a color that clearly contrasts with any description on the shipping paper of a material not subject to the requirements of this subchapter, except that a description on a reproduction of a shipping paper may be highlighted, rather than printed, in a contrasting color (the provisions of this paragraph apply only to the basic description required by § 172.202(a) (1) and (2), and (3), or

(iii) Must be identified by the entry of an "X" placed before the proper shipping name in a column captioned "HM." (The "X" may be replaced by "RQ" if appropriate.)

(2) The required shipping description on a shipping paper and all copies thereof used for transportation purposes, must be legible and printed (manually or mechanically) in English.

1. Look at the top of the pages in 49 CFR for the bold number (§ 172.201). The first three numbers indicate the Part (172).
2. The title of § 172.201 is "General Entries."
3. Paragraph – "(a)" the first paragraph under General Entries pertains to contents of the shipping paper. § 172.201(a)
4. Subparagraph – There are four subparagraphs under paragraph (a). § 172.201(a)(1)-(4)
5. Sub-subparagraph – § 172.201(a)(1) has three sub-subparagraphs: (i)-(iii).
6. Find "§ 172.201(a)(1)(iii)" and complete this sentence: "Must be identified by the entry of an _____ placed before the proper shipping name . . ."
7. "X" is the correct answer.

EXERCISE 5: COMMUNICATING THE HAZARD

The proper shipping name, hazard class or division, packing group, markings, labels, and placards communicate the hazards of a material. To locate the proper shipping name and transportation requirements of a hazardous material, turn to the Hazardous Materials Table (HMT) in Part 172. The Hazardous Materials Table is the backbone of the regulations.

Use the **table of contents** at the beginning of Part 172 to complete the exercise below. **Fill in the blanks.**

Subpart	Heading	Section
A	General	172.1-172.3
B	Hazardous Materials Table*	_____
B	_____	172.102
_____	Shipping Papers	172.200-172.205
D	_____	172.300-172.338
E	Labeling	172.400- _____
F	Placarding	172.500-172.560
G	Emergency _____ Information	172.600-172.604

APPENDICES

Appendix A, Table 1 and 2 to § 172.101– _____

_____

Appendix B to § 172.101– _____

Appendix C to PART 172 – _____

* includes: Appendix A – Hazardous Substances
Appendix B – Marine Pollutants

FREQUENTLY USED REFERENCES

Part 106 **Rulemaking Procedures**

Part 107 **Hazardous Materials Program Procedures**
(Exemptions, Preemption, Designation of Approval and Certification Agencies, Enforcement, and Registration)

Part 171 **General Information, Regulations, and Definitions**

- 171.8 Definitions and abbreviations
- 171.9 Rules of construction
- 171.11 Use of ICAO Technical Instructions
- 171.12 Import and export shipments
- 171.12a Canadian shipments and packagings
- 171.15/16 Hazardous material incidents - notify/report

Part 172 **Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements**

- 172.1 Purpose and scope
- 172.101 Hazardous Materials Table
- 172.102 Special provisions
- 172.200 Shipping papers – Applicability
- 172.300 Marking – Applicability
- 172.400 General labeling requirements
- 172.500 Placarding – Applicability
- 172.600 Emergency response information
- 172.700 Training requirements

Part 173 **Shippers – General Requirements for Shipments and Packagings**

- 173.1 Purpose and scope
- 173.2 Hazardous materials classes and index to definitions
- 173.3 Packaging and exceptions
- 173.4 Small quantity exceptions
- 173.5 Agricultural operations
- 173.6 Materials of trade exceptions
- 173.21 Forbidden materials and packages
- 173.22 Shipper's responsibility
- 173.24 General Requirements for Packagings and Packages
- 173.24a Additional requirements for non-bulk packagings and packages
- 173.24b Additional requirements for bulk packagings
- 173.25 Authorized packages and overpacks
- 173.27 General requirements for transportation by aircraft
- 173.28 Reuse, reconditioning, and remanufacture of packagings
- 173.29 Empty packagings
- 173.30 Loading and unloading of transport vehicles
- 173.301 General requirements for shipments of compressed gases in cylinders and spherical pressure vessels

SPECIFIC HAZARD CLASSES

References

- 173.50 Class 1 (Explosives)
- 173.115 Class 2 (Divisions 2.1, 2.2, & 2.3) (Gases)
- 173.120 Class 3 (Flammable liquids/Combustible liquids)
- 173.124 Class 4 (Divisions 4.1, 4.2, and 4.3)
  - Division 4.1 (Flammable Solid)
  - Division 4.2 (Spontaneously Combustible Material)
  - Division 4.3 (Dangerous When Wet)
- 173.127 Class 5, Division 5.1 (Oxidizers)
- 173.128 Class 5, Division 5.2 (Organic Peroxide)
- 173.132 Class 6, Division 6.1 (Poisonous Materials)
- 173.134 Class 6, Division 6.2 (Infectious Substances)
- 173.403 Class 7 (Radioactive Materials)
- 173.136 Class 8 (Corrosive Materials)
- 173.140 Class 9 (Miscellaneous Hazardous Materials)
- 173.144 Other Regulated Materials (ORM)

Packing groups are designated in Column 5 of the § 172.101 Table and indicate the degree of danger presented by the material. Packing groups are <u>not</u> assigned to all classes of materials. The shipper is responsible for determining the appropriate packing group.

Packing Group I	PG I	Great Danger
Packing Group II	PG II	Medium Danger
Packing Group III	PG III	Minor Danger

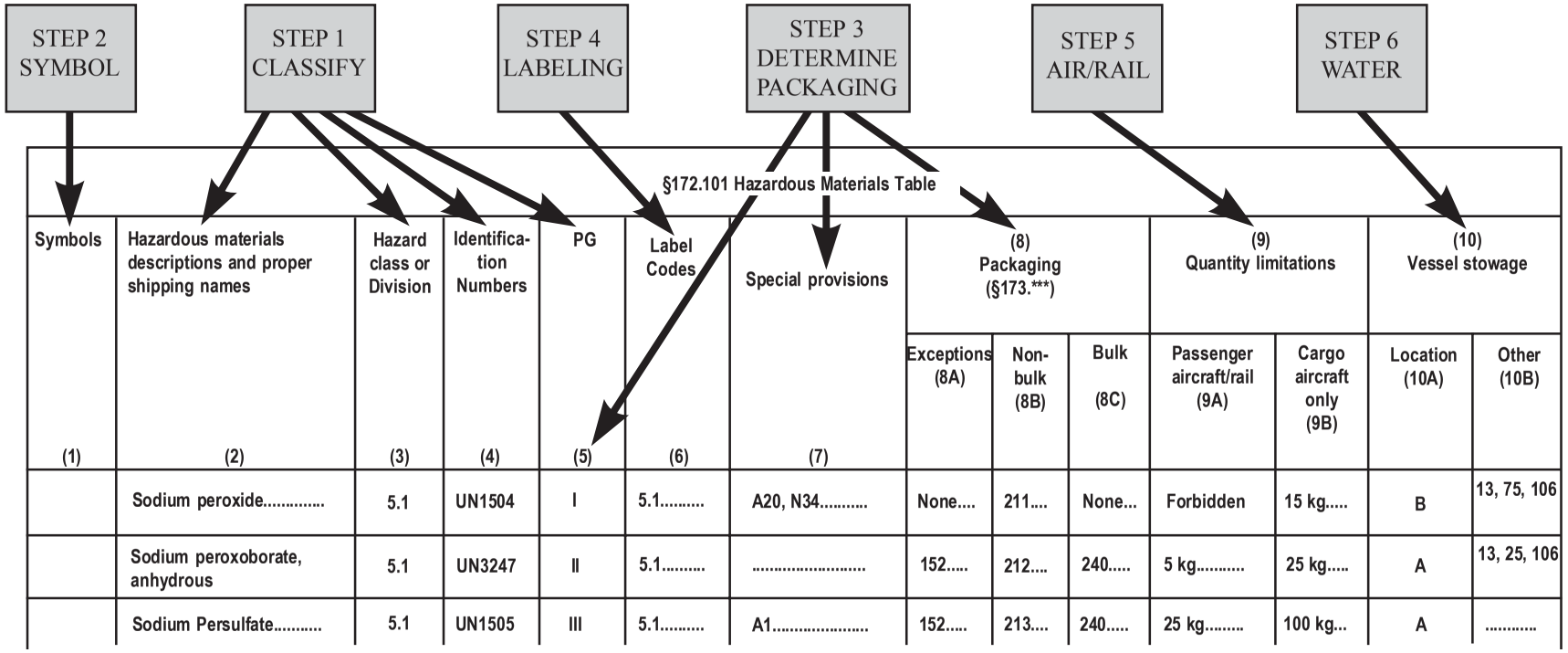
If more than one packing group is indicated for an entry, the packing group for the hazardous material must be determined using the criteria found in Subpart D of Part 173.

For example: Ketones, liquid, n.o.s. is listed in the HMT as a PG I, II, and III material. The shipper must determine the packing group for the material by applying the criteria in **§ 173.121, Class 3 – Assignment of packing group**.

Packing Group	Flash Point	Initial Boiling Point
I		≤35°C (95°F)
II	<23°C (73°F)	>35°C (95°F)
III	≥23°C, ≤60.5°C (141°F)	>35°C (95°F)

< = less than; ≤ = less than, or equal to; > = more than; ≥ = more than, or equal to

Example of HMT, § 172.101



§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 (7)	(8) Packaging (§173.***)			(9) Quantity limitations		(10) Vessel stowage	
							Exceptions (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)	Location (10A)	Other (10B)
	Sodium peroxide.....	5.1	UN1504	I	5.1.....	A20, N34.....	None....	211....	None...	Forbidden	15 kg.....	B	13, 75, 106
	Sodium peroxoborate, anhydrous	5.1	UN3247	II	5.1.....	.....	152.....	212....	240.....	5 kg.....	25 kg.....	A	13, 25, 106
	Sodium Persulfate.....	5.1	UN1505	III	5.1.....	A1.....	152.....	213....	240.....	25 kg.....	100 kg...	A	.....

STEP	TASK	HMT COLUMN
1	Determine proper shipping name* Hazard class or division Identification number Packing group (PG)	2 3 4 5
2	Determine symbol	1
3	Determine Packaging Exceptions Non-Bulk Packaging Bulk Packaging Determine if any special provisions for the material apply	8 8A 8 B 8C 7
4	Determine labels	6
5	Determine air/rail quantity limits	9A & 9B
6	Determine water requirements	10A & 10B

**Note:* Check the Appendices. The material may also be a hazardous substance (Appendix A) or a marine pollutant (Appendix B).

HAZARDOUS MATERIALS TABLE - SUMMARY

The process of complying (or determining compliance) with the HMR, always centers around the § 172.101 Hazardous Materials Table. **Review part 172, Subpart B, § 172.101(a)-(k)**. A very brief description of this process follows:

Step One: **Identify the material by:**

- Proper Shipping Name **(Col. 2)**
- Hazard Class or Division **(Col. 3)**
- Identification Number **(Col. 4)**
- Packing Group, (if appropriate) **(Col. 5)**

REMEMBER, ALWAYS CHECK THE APPENDICES TO THE HMT (172.101)

Appendix A – The hazardous material may also be a **hazardous substance**.
Appendix B – The hazardous material may also be a **marine pollutant**.

Step Two: **Check symbols** and determine if restrictions (+, A, D, G, I or W) apply. **(Col. 1)**

Step Three: **Determine Packaging** – For the material selected, determine the authorized packaging. **(Col. 8A, 8B, 8C)**

Check Special Provisions – For the material selected, determine if any Special Provisions apply. **(Col. 7)**

Step Four: **Label the package(s)** – For the material selected, determine the required hazard warning label(s). **(Col. 6)**

[Note: Marking (§ 172.300) and Placarding (§ 172.500), as required.]

Step Five: **Check Air or Rail Limitations** – For transportation by air and/or rail, determine packaging limits. **(Col. 9A, 9B)**

Step Six: **Check Water Limitations** – For transportation by water, determine vessel shipment requirements. **(Col. 10A, 10B)**

Additional requirements

- 172.204 Shipper's certification
- 172.301/302 Package Marking
- 172.402 Additional Labeling
- 172.504 Placarding
- 172.602/604 Emergency Response Information and Telephone Number

HAZARDOUS MATERIALS TABLE – SUMMARY (Continued)

Appendix A: Hazardous Substances

1. The hazardous material is also a hazardous substance when:

   - the material is listed in Appendix A (HMT § 172.101),
   - concentration limits are exceeded,

     and

   - the amount **in one package**, equals or exceeds the reportable quantity (RQ).

   Note: Petroleum lubricants and fuel products are not considered hazardous substances.

2. Read the footnotes to Appendix A; the footnotes may affect the proper shipping name selection.

Appendix B: Marine Pollutants

1. The hazardous material is also a marine pollutant when:

   - the material is listed in Appendix B (HMT § 172.101),

     and

   - when in solution or mixture, the concentration by weight is:
     - 10% for material listed in Appendix B,

       or

     - 1% for material identified as “severe marine pollutant” in Appendix B.

2. Requirements specific to marine pollutants:

   - apply to all Marine Pollutants transported by vessel

     and

   - do not apply to non-bulk shipments by rail, air, or highway.

TEST YOUR KNOWLEDGE OF THE HMR

A. Are You Subject to the HMR?

		Yes	No
1.	Do you prepare and offer and/or transport any hazardous material(s) by motor vehicle, rail car, aircraft or vessel?	❑	❑
2.	Do you manufacture, repair or recondition containers for the transportation of hazardous materials?	❑	❑

B. Do You Understand the Scope of the HMR?

		T	F
1.	Industry standards have been incorporated into the hazardous materials regulations.	❑	❑
2.	Some words have different meanings when used in conjunction with the HMR.	❑	❑
3.	Air shipments may be transported in accordance with the International Civil Aviation Organization (ICAO) Technical Instructions.	❑	❑
4.	Import shipments require certification prior to acceptance by the initial carrier in the US.	❑	❑
5.	Shipments can move through the United States under Canadian regulations.	❑	❑
6.	Hazardous materials incidents/spills may require immediate and/or written notification to the USDOT.	❑	❑

TEST YOUR KNOWLEDGE OF THE HMR – ANSWERS

A. Are You Subject to the HMR?

If you answered **Yes** to question 1 and/or question 2, the Hazardous Materials Regulations apply to you. You must comply with all aspects of the HMR, including training of hazmat employees (see Subpart H, § 172.700.) You may also be required to register with and pay a fee to the USDOT (see Subpart G, § 107.601.)

Recommendation: Read §§ 171.1 and 171.2 of the HMR to determine how the regulations apply to you.

B. Do You Understand the Scope of the HMR?

1. True

   Industry standards have been incorporated by reference and have the force of the law. See § 171.7.

2. True

   Some words do have different meanings when used in conjunction with the HMR. Become familiar with the definitions in § 171.8 and use the Glossary on page 18 of this document.

3. True

   Air shipments may be transported in accordance with the ICAO Technical Instructions. For more details read § 171.11.

4. True

   Import shipments require certification prior to acceptance by the initial carrier in the US. See § 171.12.

5. True

   Shipments prepared according to Canada's TDG regulations may enter and/or transit the United States. See § 171.12a.

6. True

   Hazardous materials incidents and/or spills meeting the conditions in 171.15 require notification to the USDOT. Please read the details in §§ 171.15 and 171.16.

RESOURCES FOR TRAINING AND ASSISTANCE

THE OFFICE OF HAZARDOUS MATERIALS INITIATIVES AND TRAINING (OHMIT) – The USDOT's Research and Special Programs Administration's (RSPA) OHMIT is responsible for the development and dissemination of hazmat training, technical assistance, and information to enhance compliance, enforcement uniformity and emergency preparedness.

- **HAZMAT SAFETY ASSISTANCE TEAM (HMSAT)** – The HMSAT was established to make industry aware of the regulatory requirements, to help businesses find the resources needed to comply with the HMR, and to provide technical assistance to the emergency response and planning community. Field staff are located in GA, NJ, TX, IL, and CA.

For more information:

http://hazmat.dot.gov

Hazardous Materials
Information Center

(800) 467-4922
(202) 366-4488

U.S. Department of Transportation
Research and Special Programs Administration
Office of Hazardous Materials Initiatives and Training, DHM-50
Washington, DC 20590-0001

E-Mail: Training@rspa.dot.gov
Fax: (202) 366-7342
Phone: (202) 366-2301

TRANSPORTATION SAFETY INSTITUTE (TSI) – The RSPA's Hazardous Materials and Transportation Safety Division, located at the Transportation Safety Institute, is responsible for the training of Federal agencies, industry (shippers, carriers, manufacturers, etc.), state enforcement agencies and emergency response personnel to better understand the complexities of the hazardous materials regulations and to be able to recognize hazardous materials involved in accident or incident situations. For information on training courses:

www.tsi.dot.gov/divisions/hazmat/hazmat.htm

U.S. Department of Transportation
Research and Special Programs Administration
Transportation Safety Institute
Hazardous Materials and Transportation Safety Division, DTI-30
4400 Will Rogers Parkway, Suite 218
Oklahoma City, OK 73108

E-Mail: HAZMAT@TSI.jccbi.gov
Fax: (405) 946-4345
Phone: (405) 949-0036 Ext. 374

GLOSSARY

Acronyms and Common Abbreviations

AAR	Association of American Railroads
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
ATA	American Trucking Associations, Inc.
ATAA	Air Transport Association of America
B of E	Bureau of Explosives (AAR)
Btu	British Thermal Unit
C	Celsius or Centigrade
CAER	Community Awareness and Emergency Response Program (CMA)
CAS No.	Chemical Abstract Service number
CDG	Carriage of Dangerous Goods Subcommittee
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Superfund)
CERT	Council of Energy Resource Tribes
CFR	Code of Federal Regulations
CGA	Compressed Gas Association
CHEMTREC	Chemical Transportation Emergency Center (CMA)
CHLOREP	The Chlorine Emergency Plan
CHRIS	Chemical Hazards Response Information System (USDOT/USCG)
CMA	Chemical Manufacturers Association
COE	Committee of Experts on the Transportation of Dangerous Goods (UN)
CTDG	Canadian Transportation of Dangerous Goods
CVSA	Commercial Vehicle Safety Alliance
DEA	Drug Enforcement Administration (US)
DOC	Department of Commerce (US)
DOD	Department of Defense (US)
DOE	Department of Energy (US)
DOJ	Department of Justice (US)
DOT	Department of Transportation (US)
EPA	Environmental Protection Agency (US)
FAA	Federal Aviation Administration (USDOT)
FEMA	Federal Emergency Management Agency
FHSA	Federal Hazardous Substance Act
FHWA	Federal Highway Administration (USDOT)
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FMCSR	Federal Motor Carrier Safety Regulations (USDOT)
FRA	Federal Railroad Administration (USDOT)
HM	Hazardous Materials
HAZMAT	Hazardous Materials
HMIS	Hazardous Materials Information System (USDOT/RSPA)

Acronyms and Common Abbreviations (Continued)

HMR	Hazardous Materials Regulations
HMT	Hazardous Materials Table
HMTA	Hazardous Materials Transportation Act
HMTUSA	Hazardous Materials Transportation Uniform Safety Act
IAEA	International Atomic Energy Agency
IATA	International Air Transport Association
IATA/DGR	International Air Transport Association, Dangerous Goods Regulations
ICAO	International Civil Aviation Organization
ICAO/TI	International Civil Aviation Organization/Technical Instructions
IFFA	International Federation of Forwarding Agents
ID No.	Identification Number
IM	Intermodal Portable Tank
IME	Institute of Makers of Explosives
IMO	International Maritime Organization
IMO/IMDG	International Maritime Dangerous Goods Code
INTEREC	International Regulations Committee (HMAC)
LEPC	Local Emergency Planning Committee
Ltd. Qty	Limited Quantity
MAWP	Maximum Allowable Working Pressure
MCSAP	Motor Carrier Safety Assistance Program (USDOT/FHWA)
MOU	Memorandum of Understanding
MRHT	Marked Rated Holding Time
MSDS	Material Safety Data Sheet
NA	North America
NAERG	North American Emergency Response Guidebook
NASTTPO	National Association of SARA Title III Program Officers
NCITD	National Council on International Trade Documentation
NCCEM	National Coordination Council of Emergency Management
NCP	National Contingency Plan
NEMA	National Emergency Management Association
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
NIOSH	National Institute of Occupational Safety and Health
NMFC	National Motor Freight Classification
NOAA	National Oceanic and Atmospheric Administration
N.O.I.	Not Otherwise Indexed
N.O.I.B.N.	Not Otherwise Indexed by Name
N.O.S.	Not Otherwise Specified
NPGA	National Propane Gas Association
NRC	National Response Center (USDOT/USCG)
NRT	National Response Team
NSWMA	National Solid Waste Management Association

Acronyms and Common Abbreviations (Continued)

NTTC	National Tank Truck Carriers
NVOCC	Non-Vessel Operating Common Carrier
OHMIT	Office of Hazardous Materials Initiatives and Training (USDOT/RSPA)
OHMS	Office of Hazardous Materials Safety (USDOT/RSPA)
OIC	Officer in Charge
OPA	Oil Pollution Act (1990)
ORANGE BOOK	UN Recommendations on Transport of Dangerous Goods
ORM	Other Regulated Materials
OSHA	Occupational Safety and Health Administration
OWTT	One Way Travel Time
PG	Packing Group
PIH	Poison-Inhalation Hazard
PL	Public Law
POP	Performance-Oriented Packaging
P.s.i.	Pounds per square inch
P.s.i.a.	Pounds per square inch absolute
P.s.i.g.	Pounds per square inch gauge
QT	Quenched and Tempered
RAM	Radioactive Materials
RCRA	Resource Conservation and Recovery Act (1980)
RL	Regulated Limit (Canadian equivalent to RQ)
RQ	Reportable Quantity
RSPA	Research and Special Programs Administration
SARA	Superfund Amendments and Reauthorization Act of 1986
SERC	State Emergency Response Commission
SCF	Standard Cubic Foot
STC	Single Trip Container
TC	Transport Canada
TDG	Transportation of Dangerous Goods (Canada)
TI	Transport Index
TIH	Toxic Inhalation Hazard
Title III	"Emergency Planning and Community Right-to-Know" section of SARA
TOFC	Trailer-On-Flatcar
TSCA	Toxic Substance and Control Act
TSI	Transportation Safety Institute (USDOT/RSPA)
TTMA	Truck Trailer Manufacturers Association
UN	United Nations
UFC	Uniform Freight Classification
UHWM	Uniform Hazardous Waste Manifest
USCG	United States Coast Guard
VNTSC	Volpe National Transportation Systems Center (USDOT/RSPA)

Hazardous Materials Transportation Terms

NOTE: See 49 CFR § 171.8 for in-depth definitions

Bulk Packaging	A packaging (transport vehicle or freight container) in which hazardous materials are loaded with no intermediate form of containment, when the internal volume is greater than: (1) 450 liters (119 gallons) for a liquid; (2) 400 kilograms (882 pounds) net mass for a solid; or (3) 454 kilograms (1,000 pounds) water capacity for a gas. Note: A bulk packaging is **not** a vessel or barge.
Cargo	Product, including its packaging.
Cargo Tank	A bulk packaging that is loaded or unloaded without being removed from the motor vehicle. (The tank may or may not be permanently attached to the motor vehicle).
Chart 11	DOT's Hazardous Materials Marking, Labeling and Placarding Guide.
Compatibility	Relates to possible interactions between a material and (1) its container, or (2) other products that may be loaded or transported together.
Compressed Gas	Material or mixture meeting criteria in § 173.115(b), (absolute pressure of 280 kPa [41 psia]) at 20°C [68° F] or greater).
Compound	Two or more ingredients that are chemically united.
Consist	Sequentially lists the location of each rail car in a train. May serve as the shipping paper if the consist has all the information required by the USDOT.
Dangerous Goods	International term for hazardous materials.
Documentation	Completed forms required to accompany hazardous materials. For example, shipping papers, certificates, emergency response information, or manifests.
Emergency Response Information	Information that can be used in the mitigation of an incident involving hazardous materials.
Etiologic Agent	See Infectious Substance.
Exceptions	Relief from certain HM regulations; applies to everyone.
Exemptions	Specific USDOT-written relief from certain HM Regulations, for shippers, carriers, or manufacturers; 2 year limit but may be renewed. (Part 107, Subpart B of 49 CFR)

Hazardous Materials Transportation Terms (continued)

Flash Point	The minimum temperature at which a substance gives off flammable vapor(s). Substance will ignite when coming in contact with a spark or flame.
Forbidden	A material that is prohibited from being offered or accepted for transportation. This prohibition does not apply if these materials are: • diluted, stabilized, or incorporated into devices **and** • classed in accordance with Part 173. (See § 172.101(d)(1)).
Generator	An EPA term used for a hazardous waste producer and/or shipper.
Grants	Planning and training grants to deal with hazardous materials emergencies.
Gross Weight	Total weight of packaging, including its contents.
Hazard Class	A group of hazardous materials that share dangerous characteristics. The USDOT has identified nine hazard classes based on the dangers posed in transportation.
Hazard Division	A means of sub-dividing similar hazardous materials which require different hazard communications.
Hazardous Material	A substance or material capable of posing an unreasonable risk to health, safety, or property when transported in commerce.
Hazardous Substance	A material listed in Appendix A to § 172.101 **and** the quantity in one package equals or exceeds the reportable quantity (RQ). Material may be in solution or mixture. This definition does not apply to petroleum (lubricants or fuel) products. *Note: For radionuclides, refer to Table 2 of Appendix A to the HMT.*
Hazardous Waste	Any material that is subject to the Hazardous Waste Manifest requirements of the EPA. Refer to 40 CFR Part 262.
Hazardous Waste Manifest	A specific shipping document required by the USDOT and the EPA for hazardous waste shipments. Also referred to as the Uniform Hazardous Waste Manifest (UHWM). If all USDOT requirements [i.e., the basic description (proper shipping name, hazard class/division, ID No., and packing group) are entered on the UHWM, the manifest may be used as a shipping paper. (49 CFR § 172.205)

Hazardous Materials Transportation Terms (continued)

Identification Number (ID No.)	The UN or NA "four-digit number" assigned to hazardous materials, i.e., UN 1203. ID numbers are listed in Col. 4 of the HMT. Used for identification and emergency response.
In-association-with	Refers to the placement of required additional entries on the shipping paper. Usually placed after the complete description for a hazardous material. May be any format, as long as it is clearly part of the entry.
Incident	Unintentional release of hazardous material(s).
Infectious Substance	Living microorganism or its toxin which may cause severe, disabling or fatal disease. Term synonymous with Etiologic Agent. (49 CFR, § 173.134)
Irritating Material	A liquid or solid substance. Upon contact with fire or air, the material gives off dangerous or intensely irritating fumes. **Irritating Material does not include any poisonous material.**
Labels	Hazard class identifiers required on hazardous materials packaging; 100 mm diamond shaped (square-on-point); identify hazard class by symbol, color and sometimes, by name.
Limited Quantity (Ltd. Qty.)	The amount of material for which there is a specific labeling or packaging exception.
Marine Pollutant	Hazardous material which is: • listed in **Appendix B** to § 172.101 and, • when in a solution or mixture of one or more marine pollutants, is packaged in a concentration *(for materials listed in Appendix B)* which equals or exceeds: (1) 10% by weight of the solution or mixture, or (2) 1% by weight of the solution or mixture *for materials that are identified as severe marine pollutants.*
Markings	Information required to be placed on the outside of the shipping container; may include one or more of the following: • proper shipping name; • identification number; • UN standard packaging marks; • instructions/caution.
Mitigate	*To make less severe.* Measures to prevent, or lessen the results of a release of hazardous materials.
Mixture	A material composed of one or more compounds.

Hazardous Materials Transportation Terms (continued)

Motor Vehicle Common Carrier	A motor carrier that transports property for hire.
Motor Vehicle Contract Carrier	A motor carrier that transports only property for those shippers with whom they have a contractual agreement.
Motor Vehicle Private Carrier	A motor carrier that transports property of which it is owner, lessee, or bailee. Such transportation is for the purpose of sale, lease, or rent.
Multiple Hazards	A material meeting the definition of more than one hazard class/division. The material must be classed according to its position on the Precedence of Hazard Table in 49 CFR, § 173.2a.
Net Weight	A measure of weight referring only to the contents of a package. It does not include the weight of any packaging material.
Non-Bulk Packaging	A packaging which has an internal volume equal to or less than: (1) 450 liters (119 gallons) for a liquid; or (2) 400 kilograms (882 pounds) net mass for a solid; or (3) 454 kilograms (1,000 pounds) water capacity for a gas.
Overpack	An enclosure that is used by a single consignor to provide protection or convenience in the handling of a package. It may consolidate two or more packages.
Package	Packaging **plus** its contents.
Packaging	A receptacle and any other components or materials used to provide containment. The packaging must perform its containment function in conformance with the HMR.
Packaging Exception	Provides general relief from certain specification packaging requirements of the HMR.
Packaging Exemption	Specific written administrative relief granted by RSPA from certain requirements of the HMR. Packaging must provide equivalent levels of safety.
Packing Group	Assigned based on the degree of danger presented by the hazardous material: PG I – Great Danger PG II – Medium Danger PG III – Minor Danger
Performance-Oriented Packaging	Container and any other components or materials necessary for the packaging to perform its containment function. Specific testing procedures must be performed and so marked on the packaging.

Hazardous Materials Transportation Terms (continued)

Person	Any of the following: • Individual • Firm • Co-Partner • Corporation • Company • Association • Joint-stock association (including any trustee, receiver, assignee, or similar representative thereof), or • Government or Indian tribe, (agency or instrumentality of any government or Indian Tribe).
Placard	Hazard class identifiers required on transport vehicles or freight containers; placards are 273 mm (10.8 inches) diamond shaped (square-on-point) and hazard class color-coded. May require numbers for identification and emergency response. (Part 172, Subpart F)
Placarding	Process of determining and applying correct placards. (Part 172, Subpart F)
Portable Tank	A bulk packaging designed to be loaded on or temporarily attached to a transport vehicle or vessel.
Preemption	State or local requirements that conflict with the Federal hazardous materials transportation law may be set aside by the Federal Government. (See Subpart C – Preemption, § 107.201.)
Primary Label	Label for primary hazard of the material. Class number in lower part of label is required. (49 CFR § 172.402)
Proper Shipping Name	Name listed in Roman type in the HMT, § 172.101. *Italicized* names are not proper shipping names.
Radioactive Materials	Materials having a specific activity of greater than 0.002 microcuries per gram. (49 CFR § 173.403)
Registration	A person who transports or offers for transportation certain hazardous materials is required to register and pay a fee to the USDOT. (See § 107.601.)
Registration for Cargo Tanks	Procedure for persons who manufacture, assemble, inspect, test, certify or repair a cargo tank or cargo tank motor vehicle. (See § 107.501.)
Reportable Quantity (RQ)	RQ means the quantity specified in Column 2 of Appendix A to § 172.101 for any material identified in Column 1 of the appendix.

Hazardous Materials Transportation Terms (continued)

Residue	The hazardous materials remaining in a packaging, tank car, etc. after unloading.
Shipping Papers	Manifest, bill of lading, shipping order, or document to accompany hazardous materials shipments. Must contain information required by USDOT. (See Part 172, Subpart C.)
Solution	Homogenous liquid mixture of two (2) or more chemical compounds. The mixture will not separate during transportation.
Specification Packaging	Packaging specifically designed for a particular class or classes of hazardous material. Packaging identified by UN standard packaging and/or USDOT specification number.
State Variations	Listed in the ICAO Technical Instructions; governmental options differing from the ICAO Technical Instructions.
Strong Outside Container	Outermost enclosure for protecting inner packages and preventing unintentional release of contents during transportation.
Subsidiary Labels/Placards	Identify the subsidiary or secondary hazard(s). Class number must **not** be shown on the label/placard. (See §§ 172.402, and 172.519(b)(4))
Technical Name	A recognized chemical name currently used in scientific and technical handbooks, journals and texts. Trade names may not be used as technical names, unless they are in the HMT.
Transport Index	The dimensionless number on the label of a radioactive materials package. Designates the degree of control necessary during transportation.
Unit Load Device	Any type of freight container, aircraft container, aircraft pallet with a net, or aircraft pallet with a net over an igloo.

Notes

Notes

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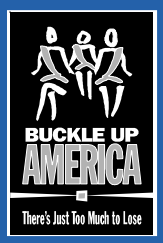

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