

HMPT: IDENTIFICATION OF HAZARDOUS MATERIALS

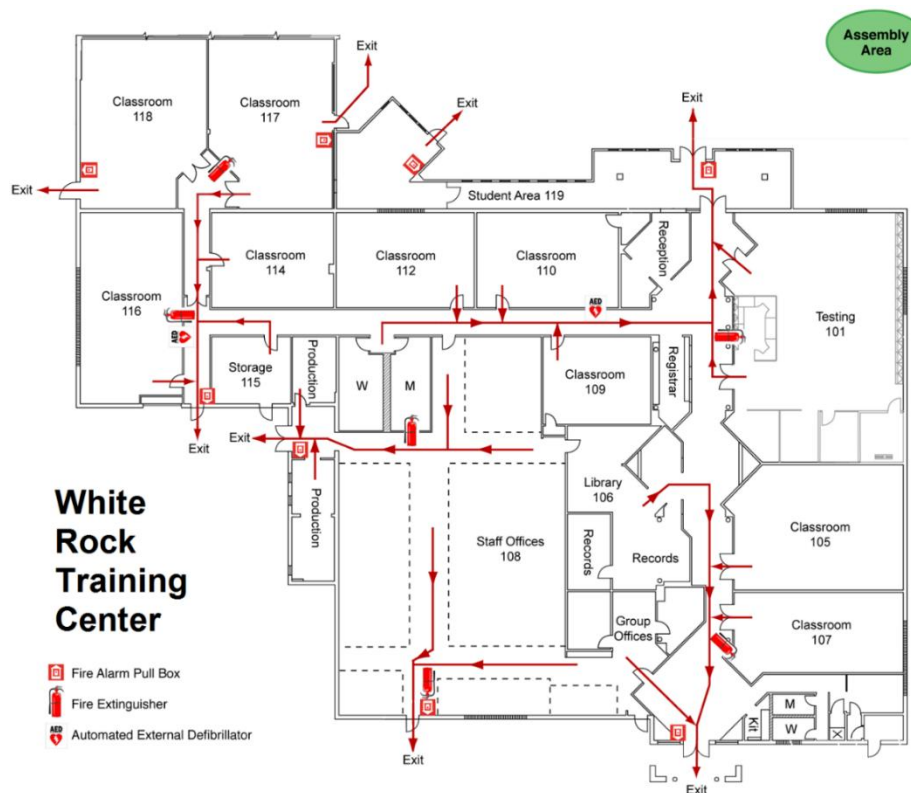
#27918

STUDENT MANUAL

JULY 2026

 EXPLOSIVES 1 Orange Explosive Materials	 FLAMMABLE 3 Red Flammable	 NON-FLAMMABLE GAS 2 Green Non-Flammable	 OXYGEN 2 Yellow Oxidizers	 INHALATION HAZARD 6 White Poisonous and Bio-hazards	 DANGEROUS WHEN WET 4 Blue Flammable when exposed to water
 SPONTANEOUSLY COMBUSTIBLE 4 Half Red and White Flammable when exposed to air	 FLAMMABLE SOLID 4 Red and White Stripes Flammable Solids	 ORGANIC PEROXIDE 5.2 Red and Yellow Flammable Organic Peroxide	 RADIOACTIVE 7 Yellow and White Radioactive	 CORROSIVE 8 Half White and Black Corrosive	 White and Black Stripes various nonclassified dangerous goods

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Course Information

HMPT: Identification of Hazardous Materials (#27918)

Identification of Hazardous Materials is the second course in the Hazardous Materials Packaging and Transportation (HMPT) Los Alamos National Laboratory (LANL) Lab-wide training.

Course Overview

HMPT: Identification of Hazardous Materials (#27918) addresses the function-specific training requirements of the Department of Transportation (DOT). The course (27918) and associated test (27919) is required initially and then every 36 months.

Title 49 of the Code of Federal Regulations (49 CFR) Part 172.700 (Subpart H) defines the training required by the DOT for all employees who handle, package, and/or transport hazardous materials. Course 27918 addresses part of the function-specific training required of HAZMAT handlers, packagers, and shippers.

The training requirements established in 49 CFR 172.700 mandate that all employees who are responsible for preparing or transporting a hazardous material receive specific levels of training. This course partially fulfills the DOT function-specific training required for HAZMAT packers and shippers.

Unless otherwise specified, this training pertains only to *non-bulk packages* of hazardous material by highway. Non-bulk packaging have a maximum capacity of less than or equal to 119 gallons for a liquid, a maximum net mass of less than or equal to 882 pounds for a solid, or a water capacity of 1000 pounds or less as a receptacle for a gas as defined in 49 CFR 173.115.

Note: *Additional requirements for the transportation of hazardous materials, radioactive materials, explosives, and hazardous wastes are addressed in other courses and may be required for specific jobs.*

Course Purpose

This course is intended to help hazardous material (HAZMAT) employees understand DOT regulations in Title 49 Code of Federal Regulations (CFR), *Hazardous Materials Regulations (HMR)*, so that they can make decisions on how these regulations apply when working with the packaging and transportation of hazardous materials.

Course Objectives

When you have completed this course, you will be able to do the following:

- *Classify hazardous materials in accordance with DOT hazard classes, divisions, and proper shipping names;*
- *Apply the Hazardous Materials Table (HMT) to determine regulatory requirements, including hazard communication, packing groups, special provisions, and packaging requirements; and,*
- *Identify and interpret key regulatory requirements related to hazard classification, labeling, and handling of hazardous materials, including poison-inhalation hazards and mixed hazard materials.*

Target Audience

This HMPT training is required for each HAZMAT employee who

- *characterizes Hazardous Materials for packaging operations,*
- *prepares hazardous material for shipment, and*
- *is responsible for the safety of transporting hazardous materials.*

Training Requirements

This course and its accompanying test are required every 36 months:

- *HMPT: Identification of Hazardous Materials (#27918)*
- *HMPT: Identification of Hazardous Materials Test (#27919); Test is given at the end of the course or at a proxied terminal and must be passed with a score of 80% or better.*

If you are . . .	you must take . . .	which contains the . . .
any HAZMAT employee,	<i>HMPT: Introduction (Live Course 27916, Test 27917),</i>	General Awareness/Familiarization, Security Awareness, and Safety Training.
an employee who is responsible for packaging hazardous materials,	<i>HMPT: Introduction (Live Course 27916, Test 27917),</i>	General Awareness/Familiarization, Security Awareness, and Safety Training.
	<i>HMPT: Identification of Hazardous Materials (Live Course 27918, Test 27919),</i>	Identification of Hazardous Materials Function-Specific Training.
	<i>HMPT: Preparing Shipments (Live Course 27920, Test 27921),</i>	Packaging Operations, Marking of Packages, Labeling of Packages, and Shipping Papers Function-Specific Training.
an employee who is responsible for preparing the shipping papers and/or for transporting the materials,	<i>HMPT: Introduction (Live Course 27916, Test 27917),</i>	General Awareness/Familiarization, Security Awareness, and Safety Training.
	<i>HMPT: Identification of Hazardous Materials (Live Course 27918, Test 27919),</i>	Identification of Hazardous Materials Function-Specific Training.
	<i>HMPT: Preparing Shipments (Live Course 27920, Test 27921),</i>	Packaging Operations, Marking of Packages, Labeling of Packages, and Shipping Papers Function-Specific Training.
	<i>HMPT: Movement by Highway (Live Course 27922, Test 27923),</i>	Placarding, Segregation and Separation for Highway Transportation, and Special and Unique Moves Function-Specific Training.
driver	<i>HMPT: Introduction (Live Course 27916, Test 27917),</i>	General Awareness/Familiarization, Security Awareness, and Safety Training.
	<i>HMPT: Movement by Highway (Live Course 27922, Test 27923),</i>	Placarding, Segregation and Separation for Highway Transportation, and Special and Unique Moves Function-Specific Training.
	<i>HMPT: Driver Training (Live Course 27930, Test 27931)</i>	Function-Specific Training

Prerequisites for this course:

- *HMPT: Introduction Live (#27916) / HMPT: Introduction Test (#27917)*
- *Recurrent (every 36 months) - HMPT: Introduction Live (27916)*
- *Required (initial and every 36 months): HMPT: Introduction-Test (27917)*

Course Limitations

Unless otherwise specified, this training pertains only to the transportation of *non-bulk packages* of hazardous waste material by highway. Non-bulk packaging has a maximum capacity of less than or equal to 119 gallons for a liquid or a maximum net mass of less than or equal to 882 pounds for a solid; or a water capacity of 1000 pounds or less as a receptacle for a gas.

Note: *Additional requirements for the transportation of hazardous materials, radioactive materials, and explosives are addressed in other courses and may be required for specific jobs.*

The HAZMAT employer is responsible for ensuring that each designated HAZMAT employee receives the required training to perform his or her function. HAZMAT employees are responsible for keeping their supervisors or managers informed of their current training status.

Registration and Attendance

Attendance is crucial in order to receive credit for this course. All participants must complete registration prior to the beginning of the course, sign the attendance roster for each day of the course, and attend and actively participate in the course. (No credit will be given for participants that miss 15 minutes or more of class time.)

Delivery Methods

Course delivery consists of lecture, group discussions, and participant activities.

Evaluation Strategy

Formative Assessment: The instructor will use oral questioning during the presentation of each module to assess participants' mastery of the material. Problem areas identified during questioning will be reviewed in further detail. Participants will be evaluated with classroom discussion and a participant activity.

Summative assessment: There is an accompanying quiz on which students must achieve a score of 80% or better.

Administrative Details

Details will be given about facility safety features and any additional resources or equipment available. Participants must adhere to all safety requirements during training sessions and notify instructor of any questions or concerns about safety .

Acronyms

CFR	Code of Federal Regulations
DOE	Department of Energy
DOT	Department of Transportation
ERG	Emergency Response Guidebook
HAZMAT	hazardous material
HMPT	hazardous materials packaging and transportation
HMR	Hazardous Materials Regulations
HMT	hazardous materials table
IATA/ICAO	International Air Transport Association/ International Civil Aviation Organization
IM	intermodal
IMDG	International Maritime Dangerous Goods
IPAC	identification, packaging, administrative controls, and communication
LANL	Los Alamos National Laboratory
SDS (MSDS)	Safety Data Sheet (material safety data sheet)
n.o.s.	not otherwise specified (also seen as N.O.S.)
NA	North America
ORM-D	Other Regulated Materials-Domestic
PG	Packing Group
PIH	poison-inhalation hazard
PSN	proper shipping name
RQ	reportable quantity
UN	United Nations

Glossary

Term	Definition (as found in 49 Code of Federal Regulations [CFR] 171.8)
Carrier	A person who transports passengers or property in commerce by railcar, aircraft, motor vehicle, or vessel.
Function-Specific Training	Training conducted to prepare a HAZMAT employee to perform specific HAZMAT functions. Reference: 49 CFR 172.704(a)(2).
General-Awareness Training	Training conducted to give HAZMAT employees a general understanding of DOT regulations and requirements. Reference: 49 CFR 172.704(a)(1).
Hazard Class	The category of hazard assigned to a hazardous material under the definitional criteria of part 173 of 49 CFR subchapter C and the provisions of the Part 172.101 [Hazardous Materials] Table. A material may meet the defining criteria for more than one hazard class but is assigned to only one hazard class. See Hazard Class Definitions 2-9 in 49 CFR 173.115 to 141 in Subpart D.
Hazardous Material	A substance or material, which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated. The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, as defined in 49 CFR 171.8, materials designated as hazardous under the provisions of Parts 172.101 and 172.102 of 49 CFR subchapter C, and materials that meet the defining criteria for hazard classes/divisions in part 173 of subchapter C.
Hazardous Substance	A material, including its mixtures and solutions, that is listed in Appendix A to Part 172.101 [the <i>Hazardous Materials Table</i>], is in a quantity, in one package, which equals or exceeds the reportable quantity (RQ) listed in Appendix A to Part 172.101 Table 1 [the <i>Hazardous Materials Table</i>]; and when in a mixture or solution of radionuclides conforms to paragraph 7 of Appendix A to Part 172.101 Table 2 [the <i>Hazardous Materials Table</i>].
HAZMAT Employee <i>Note: At LANL, the term "HAZMAT employee" includes Department of Energy (DOE) employees and employees of contractors and subcontractors.</i>	A person who is employed by a HAZMAT employer and who in the course of employment directly affects hazardous materials transportation safety. This term includes an owner-operator of a motor vehicle that transports hazardous materials in commerce. This term includes an individual, including a self-employed individual, employed by a HAZMAT employer who, during employment: loads, unloads, or handles hazardous materials; or designs, manufactures, fabricates, inspects, marks, maintains, reconditions, repairs, or tests a package, container, or packaging for use in transporting hazardous materials; or prepares hazardous materials for transportation; or is responsible for safety of transporting hazardous materials; or operates a vehicle used to transport hazardous materials.

HAZMAT Employer	A person who uses one or more of its employees in connection with transporting hazardous materials in commerce; causing hazardous materials to be transported or shipped in commerce; or representing, marking, certifying, selling, offering, manufacturing, reconditioning, testing, repairing, or modifying containers, drums, or packaging as qualified for use in the transportation of hazardous materials. This term includes an owner-operator of a motor vehicle that transports hazardous materials in commerce. This term also includes any department, agency, or instrumentality of the United States, a state, a political subdivision of a state, or an Indian tribe engaged in an activity described in the first sentence of this definition.
Non-bulk Packaging	A packaging that has (1) a maximum capacity of ≤450 L (≤119 gal.) for a liquid or (2) a maximum net mass of ≤400 kg (≤882 lb.) for a solid or (3) a water capacity of 454 Kg (1000 lbs.) as a receptacle for a gas as defined in 49 CFR 173.115.
Recurring Training	Refresher training that must be conducted at specific time intervals (every three years). Reference: 49 CFR 172.704(c)(2). <i>Note: The International Air Transport Association/International Civil Air Organization (IATA/ICAO) requires retraining every two years.</i>
Safety Training	Training conducted to ensure HAZMAT employees recognize emergency response information in accordance with 49 CFR 172.602, recognize hazards associated with hazardous materials and measures to protect HAZMAT employees, and recognize methods and procedures for avoiding accidents. Reference: 49 CFR 172.704(a)(3).
Security Awareness Training	Training conducted to provide an awareness of security risks associated with hazardous materials transportation and methods designed to enhance transportation security, and training to recognize and respond to possible security threats is also covered. Reference: 49 CFR 172.704(a)(4).
Security In-Depth Training	Training given to persons required to have a security plan in accordance with 49 CFR 172.800 who handle, perform a regulated function, or are responsible for implementing the security plan. This training must include LANS security objectives and specific security procedures and responsibilities and actions to be taken by each employee in the event of a security breach. Reference: 49 CFR 172.704(a)(5).
Technical Name	A recognized chemical 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.

Note: At the Laboratory, the term “HAZMAT employee” includes DOE employees, Triad, LLC (LANL) employees, and employees of contractors and subcontractors.

Module

1



Module 1: Understanding Hazard Classes and Divisions

Module Objectives

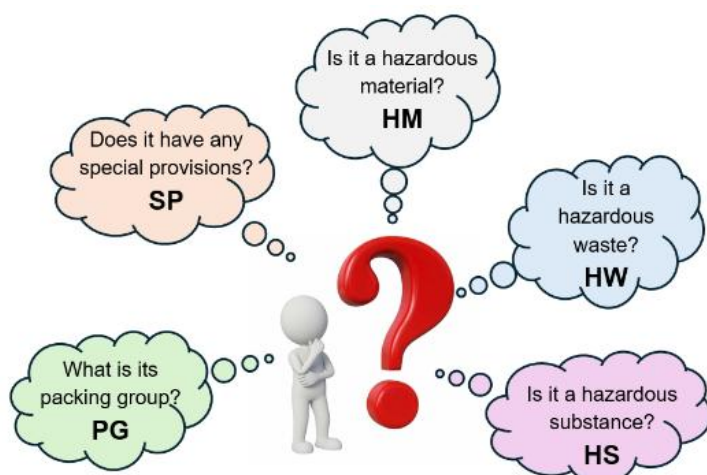
After completing this module, you will be able to do the following:

- *Identify the nine DOT hazard classes and the corresponding divisions that make up certain classes*

Understanding Hazard Classes and Divisions

Each year, LANL prepares more than 12,000 packages that contain hazardous materials. Proper identification and classification of hazardous materials reduce the possibility of mixing incompatible materials, incorrectly packaging hazardous materials, and incorrectly marking and labeling packages that contain hazardous materials. This module presents DOT classes and divisions of chemicals.

Preparing a HAZMAT Shipment



The shipper's acronym IPAC (identification, packaging, administrative controls, and communication) will assist in identifying the process to follow through DOT regulations when preparing a shipment of hazardous materials. This acronym should be used as a tool to ensure that all DOT elements are reviewed when preparing a HAZMAT shipment.

SYMBOL	STEP	ACTION
I	IDENTIFICATION	Identify the material. A shipper must ask the following five questions they classify any material: 1. Is it a hazardous material? 2. Is it a hazardous waste? 3. Is it a hazardous substance? 4. What is its PG? 5. Does it have any special provisions?
P	PACKAGING	Determine the authorized packaging for the identified material.
A	ADMINISTRATIVE CONTROLS	Determine and implement administrative controls such as emergency reporting to the DOT in case of an incident or spill.
C	COMMUNICATION (PLESM)	Communicate the hazards involved: • Placarding attached to vehicle • Labels attached to package • Emergency information provided on/with shipping paper • Shipping paper entries applied • Marking the package

Hazard Classes and Divisions

DOT regulations list **nine** main hazard classes and **one additional** hazard class for domestic shipments. The table below lists the hazard classes. It is the responsibility of each shipper to use [49 CFR 173.2](#) to determine the hazard class/division of the material they will transport. Title [49 CFR 173.50](#) to 173.477 offers classification test, description and details for determining the below hazard classes. Some of these hazard classes are further separated into divisions.

Hazard Class	Hazard Division #	Name of Class or Division	49 CFR Reference for Definitions
1	1.1	Explosives (with a mass explosion hazard)	173.50
	1.2	Explosives (with a projection hazard)	
	1.3	Explosives (with predominately a fire hazard)	
	1.4	Explosives (with no significant blast hazard)	
	1.5	Very insensitive explosives; blasting agents	
	1.6	Extremely insensitive detonating substances	
2	2.1	Flammable gas	173.115
	2.2	Nonflammable compressed gas	
	2.3	Poisonous gas	
3	3	Flammable and combustible liquid	173.120
4	4.1	Flammable solid	173.124
	4.2	Spontaneously combustible material	
	4.3	Dangerous when wet material	
5	5.1	Oxidizer	173.127
	5.2	Organic peroxide	173.128
6	6.1	Poisonous materials	173.132
	6.2	Infectious substance (etiologic agent)	173.134
7	7	Radioactive material	173.403
8	8	Corrosive material	173.136
9	9	Miscellaneous hazardous material	173.140

ORM-D (Other Regulated Materials-Domestic)	Hazard Division #	Name of Class or Division
	None	Includes consumer commodities that present a limited hazard during transportation because of their form, quantity, and/or packaging. The use of ORM-D expired 12-31-2020.

Source: 49 CFR 173.2

Module 2

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG	Label Codes	Special provisions	(9) Quantity limitations (see §§ 173.27 and 175.75)	(10) Vessel stowage
						Exceptions	Non-bulk	Passenger aircraft/rail
						Exceptions	Cargo aircraft only	Location
						Location	Only	Other

Module 2: Using the Hazardous Materials Table

Module Objectives:

After completing this module, you will be able to do the following:

- *Demonstrate familiarity with and use the first eight columns in the Hazardous Materials Table (HMT)*
 - *Identify proper shipping names (PSNs) accepted by DOT regulations*
 - *Recognize the three Packing Groups and their associated dangers*
 - *Apply the special provisions listed in Column 7*
 - *Identify those materials listed in the Hazardous Materials Table that meet the definition for poison inhalation hazard (PIH) (HMT, col. 7)*
- *List the order used for selecting DOT PSNs*

The Hazardous Materials Table

The DOT requires that the contents of a HAZMAT package always be identified by the proper shipping name (PSN). PSNs are listed in the *Hazardous Materials Table* in [49 CFR 172.101](#). In addition to listing PSNs, the *Hazardous Materials Table* identifies most of the other information shippers need to correctly prepare HAZMAT shipments. The DOT considers the *Hazardous Materials Table* to be the backbone of their HMPT regulations. It is the best place to begin the work of interpreting these regulations.

The *Hazardous Materials Table* consists of 10 columns; each column lists specific information that pertains to HAZMAT transportation. Only the first eight columns are applicable to shipments by highway. Column 9 refers to shipments by air and rail. Column 10 refers to shipments by water.

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG	Label Codes	Special provisions (§ 172.102)	(8)			(9)		(10) Vessel stowage	
							Packaging (§ 173.***)			Quantity limitations (see §§ 173.27 and 175.75)		Location	Other
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)

Column 1—Definitions of Symbols

Column 1 of the table contains six different symbols: **+**, **A**, **D**, **G**, **I**, **W**. The presence of a symbol at the beginning of an entry will affect the interpretation of all subsequent information displayed in that entry [[172.101\(b\)](#)].

Symbol	Action
+	Sets the PSN, hazard class, and PG for that specific entry in the table, regardless of whether the material meets the definitions of that class or PG or meets any other hazard-class definition.
A	Restricts the application of transportation requirements to those materials to be transported by aircraft. The exception does not apply to hazardous substances or hazardous wastes.
D	Identifies the PSNs that are appropriate for describing materials that will be transported domestically but that are inappropriate for international transportation.
G	Identifies PSNs that require one or more technical names in parentheses in association with the basic description.
I	Identifies PSNs that are appropriate for describing materials that will be shipped internationally.
W	Restricts the application of the requirements to those materials that will be transported by a water-going vessel. The exception does not apply to hazardous substances or hazardous wastes.

Symbol	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG	Label Codes	Special provisions (§ 172.102)	(8)			(9)		(10) Vessel stowage	
							Packaging (§ 173.***)			Quantity limitations (see §§ 173.27 and 175.75)		Location	Other
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)

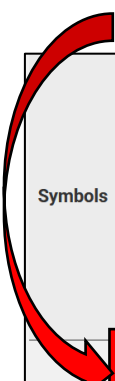
Column 2 - Proper Shipping Names

Column 2 of the *Hazardous Materials Table* lists the DOT PSNs that identify the contents of a HAZMAT package. Reference: [49 CFR 172.101\(c\)](#).

- Names shown in **Bold/Roman type** are PSNs.
- Names shown in *italics print* are not acceptable as PSNs.
- Both singular and plural versions of the PSN may be used.
- Upper- or lower-case letters may be used.
- Punctuation, as it appears in column 2, is optional.
- The word “or” in *italics* indicates that any one of the words in the sequence may be used, if appropriate.
- The word “poison” or “poisonous” may be used interchangeably with the word “toxic” (for domestic transportation only).
- When one PSN references another PSN entry by use of the word “see” and both PSNs are in Roman type, then either PSN may be used for that material.

It is very important to select the correct PSN for the hazardous material when referencing specific columns in the table. If the wrong shipping name is selected, it can mean that the rest of the information across the row in the table will not pertain to the subject material.

(See example of ACETONE below.)



Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG	Label Codes	Special provisions (§ 172.102)	(8)			(9)		(10) Vessel stowage	
							Packaging (§ 173.***)			Quantity limitations (see §§ 173.27 and 175.75)		Location	Other
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only		
	Acetone	3	UN1090	II	3	IB2, T4, TP1	150	202	242	5 L	60 L	B	

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG	Label Codes	Special provisions (§ 172.102)	(8)			(9)		(10) Vessel stowage	
							Packaging (§ 173.***)			Quantity limitations (see §§ 173.27 and 175.75)		Location	Other
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)

Column 3 - Hazard Classes/Divisions

Column 3 contains either a **number** or the word “**forbidden**.” If a number is in column 3, it is the hazard class/division for the material. Reference: 49 CFR 172.101(d). If the word “forbidden” is in column 3, the material may not be transported—unless approved by the DOT on a case-by-case basis. (See example of ACETONE on pg. 14.)

The shipper must be able to class the constituents of the material, he or she must determine the material’s hazard class. This is done in two steps.

Step one: The material’s properties are defined. Helpful tools used to determine a material’s properties are:

- *safety data sheets (SDSs, formerly MSDSs),*
- *vendor information,*
- *chemical dictionaries,*
- *generator knowledge, and*
- *sample and analysis results.*

Step two: The properties are compared with the hazard class/division definitions in the regulations. Title 49 CFR Part 173.2 has a table of hazard classes/divisions that directs the shipper to the hazard class/division definitions starting in 173.115 for Hazard Classes 2-9, excluding 1 and 7.

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG	Label Codes	Special provisions (§ 172.102)	(8)			(9)		(10) Vessel stowage	
							Packaging (§ 173.***)			Quantity limitations (see §§ 173.27 and 175.75)		Location	Other
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)

Column 4 - United Nations or North American Identification Numbers

Column 4 lists the DOT identification number assigned to each PSN. Reference: 49 CFR 172.101(e).

- Numbers preceded by the letters UN—United Nations—are associated with PSNs considered appropriate for international transportation as well as for domestic transportation. (See example of ACETONE on pg. 14.)
- Numbers preceded by the letters NA—North American (specifically the United States)—are associated with PSNs that are recognized only for domestic (US) transportation. However, materials identified by NA prefixes may be transported to and from Canada (Using Transport of Dangerous Goods-TDG) and Mexico.

- **Emergency responders** use this identification number to assist them in identifying the hazardous material in the *Emergency Response Guidebook (ERG)*.
- The identification number will help them locate the proper guide that lists the suggested actions the responder must take.

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG	Label Codes	Special provisions (§ 172.102)	(8)			(9)		(10) Vessel stowage	
							Packaging (§ 173.***)			Quantity limitations (see §§ 173.27 and 175.75)		Location	Other
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)

Column 5 - Packing Groups

Column 5 specifies one or more PGs—packing groups—assigned to a material that corresponds to the PSN and hazard class for that material. Reference: 49 CFR 172.101(f). PG levels are based on the degree of danger of the hazard present in the material. (See example of ACETONE on pg. 14.)

Packing Group (PG):	Type of Potential Danger:	Permitted Packaging Use:
I	great potential danger	A container that is rated “X” is used for PG I material and can be used for PG II and PG III material.
II	medium potential danger	A container that is rated “Y” is used for PG II material and can be used for PG III material.
III	minor potential danger	A container that is rated “Z” can only be used for PG III material.

The following hazard classes/divisions do not have associated PGs:

- Class 2, Gases
- Class 7, Radioactive materials
- Division 6.2 (other than “Regulated Medical Waste,” which is PG II)
- ORM-D
- Combustible liquids
- Self-Reactive 4.1 (See 173.224 for packing method)
- Organic Peroxides 5.2 (See 173.225 for packing method)
- Explosives which have Packing Instructions (PI) (See 173.62)

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PSN	Label Codes	Special provisions (§ 172.102)	(8)			(9)		(10) Vessel stowage	
							Packaging (§ 173.***)			Quantity limitations (see §§ 173.27 and 175.75)		Location	Other
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)

Column 6 - Hazard Labels

Column 6 specifies the hazard warning label(s) required for a package filled with a material that conforms to the corresponding hazard class and PSN of the material. Reference: 49 CFR 172.101(g). (See example of ACETONE on pg. 14.)

- *More than one label entry may be used for a PSN and hazard class.*
- *The first label listed is the primary-hazard label for the specific material. All other labels are considered subsidiary-hazard labels.*
- *Label names are given in 49 CFR 172.101(g).*

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG	Label Codes	Special provisions (§ 172.102)	(8)			(9)		(10) Vessel stowage	
							Packaging (§ 173.***)			Quantity limitations (see §§ 173.27 and 175.75)		Location	Other
							Exceptions	Non-bulk	Bulk	Passenger aircraft/rail	Cargo aircraft only		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)

Column 7 - Special Provisions

Column 7 specifies codes for special provisions applicable to hazardous materials. Reference: [49 CFR 172.101\(h\)](#). When column 7 refers to a special provision for the hazardous material, 49 CFR 172.102 will list the information for the specific provision. Special provisions, each of which lists special handling or packaging requirements, are coded according to the following table.

Code	Application
Numbers Only	Applies to all modes of transportation; bulk and non-bulk packagings
A	Applies only to transportation by aircraft.
B	Applies only to bulk packaging.
IB or IP	Applies only to intermediate bulk container (IBCs).
N	Applies only to non-bulk packaging.
R	Applies only to transportation by rail.
T	Applies only to transportation in UN or IM Specification portable tanks.
TP	Applies only to transportation by UN or IM Specification portable tanks.
W	Applies only to transportation by water.

NOTE: Items in **Bold** are related to Highway Transportation Mode.

Not all PSNs will have a special provision, and some PSNs have more than one provision listed. The special provisions must always be reviewed for each material being packaged for transportation.

Poison-Inhalation Hazards

Column 7 also identifies materials that are PIHs—poison-inhalation hazards. PIH materials affect the classification, packaging, and communication of the material. These materials are identified by numbers 1 - 6 and 13. If the material is a poison inhalation hazard (PIH), there will always be a number first (1 - 6 or 13). Other special provisions, denoted by number or letter, may follow.

Symbols (1)	Hazard materials Descriptions and Proper Shipping Names (2)	Special Provisions (7)
D	Ammonia, anhydrous	13, T50
D	Gas identification set	6
	Methyl bromide	3, B14, N86, T50
	Phosphorus pentafluoride	2, B9, B14
---	Sulfur chlorides	5, A3, A7, A10, B10, B77, N34, T20, TP2
D	Carbon monoxide, refrigerated liquid	4, T75, TP5
+	Bromine	1, B9, B85, N34, T22, TP2, TP10, TP13

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG	Label Codes	Special provisions (§ 172.102)	(8)			(9)		(10) Vessel stowage	
							Packaging (§ 173.***)			Quantity limitations (see §§ 173.27 and 175.75)		Location	Other
							Exceptions	Non-bulk	Bulk	Passenger aircraft/ rail	Cargo aircraft only		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)

Column 8 - Packaging Authorizations

Column 8 lists the applicable packaging authorization reference in 49 CFR 173 for the PSN and PG for a specific material. Reference: [49 CFR 172.101\(i\)](#). The reference in [49 CFR 173.3](#) lists the specific packaging and exceptions that can be used to package the given material. Column 8 is divided into three sub-columns: Exceptions 8(A) for packaging exceptions such as limited quantity and other exceptions, Non-Bulk (8B), and Bulk (8C). All references are prefaced with “173,” which is the section in 49 CFR that lists the authorized packaging.

Symbols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identification Numbers	PG	Label Codes	Special provisions (§ 172.102)	(8)			(9)		(10) Vessel stowage	
							Packaging (§ 173.***)			Quantity limitations (see §§ 173.27 and 175.75)		Location	Other
							Exceptions	Non-bulk	Bulk	Passenger aircraft/ rail	Cargo aircraft only		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)	(9A)	(9B)	(10A)	(10B)

Columns 9 and 10 - Shipments by Air & Water Transportation

Columns 9 and 10 refer to shipments made by air and water transportation; therefore, they will not be discussed in this class. References: 49 CFR 172.101(j) and 49 CFR 172.101(k). The information in column 9 is taught in an International Air Transport Association/International Civil Aviation Organization (IATA/ICAO) class that is applicable to shipments by aircraft. The information in column 10 is taught in an International Maritime Dangerous Goods (IMDG) class that is applicable to shipments by water-going vessels.

Class Activity 1:
Columns of the Hazardous Materials Table (HMT)
See handout packet.



Selecting PSNs

It is the responsibility of the shipper to determine the PSN. The DOT has established an order by which a material's PSN can be accurately selected. Reference: 49 CFR 172.101(c)(12). The order is based on determining the identity of the material by its **CHEMICAL NAME, GENERAL DESCRIPTION, GENERIC NAME OR HAZARD-CLASS NAME**.

Note: Only generic PSNs and hazard-class PSNs end with **n.o.s.** (not otherwise specified).

CHEMICAL NAME: The chemical name is the most descriptive way to identify what is in a package. Consequently, this is the first choice in selecting a shipping name for pure chemicals per 172.101(c)(10)(i)(B). For example, **Acetone or Benzene**

GENERAL DESCRIPTION: If the material is not identified by chemical name (pure chemical) in the *Hazardous Materials Table*, as the next step in the selection process, it must be determined if it appears by general description. A material that does not appear by chemical name in the *Hazardous Materials Table* may still be regulated by DOT based on the material's characteristics. If the table clearly describes the material, then the name linked with this general description must be used as the PSN per 172.101(c)(10)(i)(F). For example, **Coating solution or Paint**

GENERIC NAME (n.o.s.): If a general-description name does not apply, the shipper then must go to the next selection category, which is the generic name. A generic name describes the material in that family of chemicals as n.o.s., which means that the PSN *does not* specifically identify the chemicals or family of chemicals that make up the hazardous material per 172.101(c)(10)(iii).

Common 5.2 and 4.1 self-reactive materials are in this group because they are a family of materials as shown in this excerpt of from 49 CFR 173.224:

TABLE 1 TO PARAGRAPH (b)—SELF-REACTIVE MATERIALS TABLE			
Self-reactive substance	Identification No.	Concentration — (%)	Packing method
(1)	(2)	(3)	(4)
Acetone-pyrogallol copolymer 2-diazo-1-naphthol-5-sulphonate	3228	100	OP8
Azodicarbonamide formulation type B, temperature controlled	3232	<100	OP5
Azodicarbonamide formulation type C	3224	<100	OP6
Azodicarbonamide formulation type C, temperature controlled	3234	<100	OP6

Adapted from Table 1 to Paragraph (b) – Self-Reactive Materials Table 49 CFR 173.224

For Generic name examples, **Alcohol, n.o.s. or Aldehydes, n.o.s. or Ethers, n.o.s. or Petroleum distillates n.o.s.**

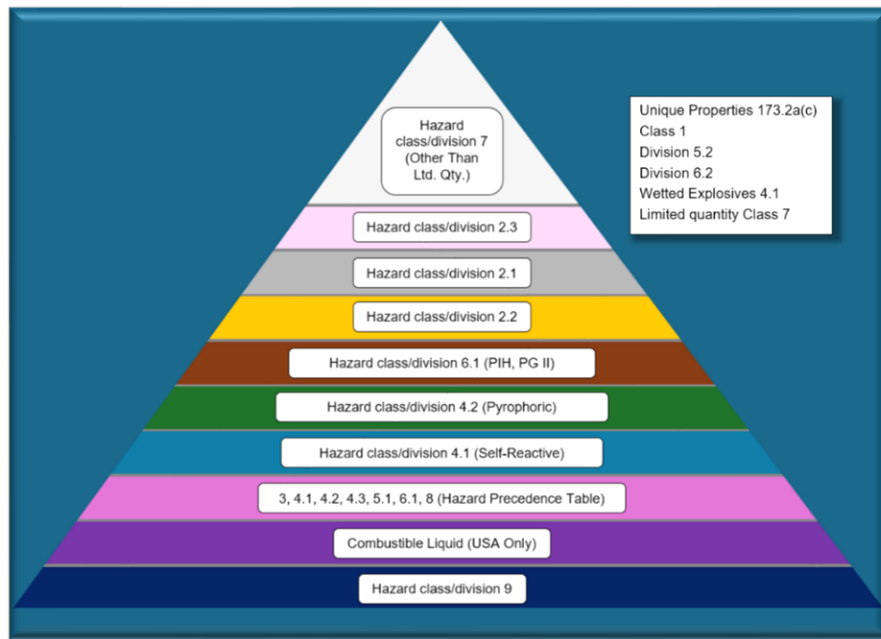
HAZARD-CLASS NAME (n.o.s.): The *Hazardous Materials Table* also contains a few more generic names and is used more widely than other PSNs. These generic names usually describe hazard classes. Most mixtures will drop to this final determination, which is a hazard- class shipping name that is described in 173.2 and labelled according to 172.400. The hazard-class shipping name must be determined by the primary hazard for the specific material, and in mixtures with the subsidiary hazard determined in the precedence table section 173.2a and the designation must end in n.o.s. per 172.101(c)(10)(iii) and (12)(ii). Note: Non-Flammable Gas, n.o.s is the only Hazard Class Name that is best described by Generic Name in HMT by Compressed gases, n.o.s. Also, 6.1 is described in Hazard-Class by the name Toxic (Not poison), 4.2 is described in hazard class by the name pyrophoric or self-heating and not spontaneous combustible and 4.3 is described in Hazard-class by the name water-reactive and not dangerous when wet material. For example Hazard-Class PSNs , **Flammable liquid, n.o.s. or Flammable solid, corrosive, inorganic, n.o.s. or Self-heating solid, toxic, inorganic, n.o.s.**

Class Activity 2:
Proper Shipping Name (PSN) Selection
See handout packet.



Module

3



Module 3: Requirements for Multiple and Mixed Hazardous Materials

Module Objectives:

After completing this module, you will be able to do the following:

- *Identify primary hazard classes/divisions for multiple or mixed hazardous materials*
- *Demonstrate the use of the Precedence Table*

Multiple and Mixed Hazardous Materials

The examples presented so far have been limited to single hazard classes/divisions. When the shipment involves mixtures of materials with different classes/divisions, the primary hazard class must be identified. The DOT has established a specific precedence listing to guide in determining the primary hazard class for mixtures. This precedence can be determined by referencing 49 CFR 173.2a, “Classification of a material having more than one hazard”.

The following materials as stated in [49 CFR 173.2a\(c\)](#) are not subject to 49 CFR 173.2a(a):

1. *Class 1 (explosive materials), new explosive*
2. *Division 5.2 (organic peroxide) 49 CFR 173.225(c) table*
3. *Division 6.2 (infectious substances), other than Class 7*
4. *Wetted explosives 4.1*
5. *Limited quantity of Class 7 (radioactive) that meets definition for more than one hazard class or division. Reference: 49 CFR 173.423.*

The primary hazard class/division, the PG, and the physical state of the material (whether liquid or solid) must be considered when determining the hazard precedence and PSN for material mixtures. When considering the primary hazard class/division, the highest applicable hazard class of those materials in the mixture must be used. Reference 49 CFR 173.2a(a). The hazard classes are listed in descending order of hazard below:

1. *Class 7 (radioactive materials other than limited quantities).*
2. *Division 2.3 (poisonous gases).*
3. *Division 2.1 (flammable gases).*
4. *Division 2.2 (nonflammable gases).*
5. *Division 6.1 (poisonous liquids), PG I, poisonous-by-inhalation only.*
6. *A material that meets the definition of a pyrophoric material in 49 CFR 173.124(b)(1) (Division 4.2). (Defined as liquid or solid that ignites within 5 minutes of contact with air.)*
7. *A material that meets the definition of a self-reactive material in 49 CFR 173.124(a)(2) (Division 4.1). (Defined as thermally unstable and can undergo an exothermic reaction without oxygen.)*
8. *Precedence table in 49 CFR 173.2a(b) for Class 3 (flammable liquids), Class 8 (corrosive materials), Division 4.1 (flammable solids), Division 4.2 (spontaneously combustible materials), Division 4.3 (dangerous-when-wet materials), Division 5.1 (oxidizers), or Division 6.1 (poisonous liquids or solids other than PG I, poisonous-by-inhalation).*
9. *Combustible liquids, and Class 9 (miscellaneous hazardous materials).*

PRECEDENCE OF HAZARD TABLE [HAZARD CLASS OR DIVISION AND PACKING GROUP]															
	4.2	4.3	5.1 I 1	5.1 II 1	5.1 III 1	6.1, I dermal	6.1, I oral	6.1 II	6.1 III	8, I liquid	8, I solid	8, II liquid	8, II solid	8, III liquid	8, III solid
3 I ²		4.3				3	3	3	3	3	(³)	3	(³)	3	(³)
3 II ²		4.3				3	3	3	3	8	(³)	3	(³)	3	(³)
3 III ²		4.3				6.1	6.1	6.1	3 ⁴	8	(³)	8	(³)	3	(³)
4.1 II ²	4.2	4.3	5.1	4.1	4.1	6.1	6.1	4.1	4.1	(³)	8	(³)	4.1	(³)	4.1
4.1 III ²	4.2	4.3	5.1	4.1	4.1	6.1	6.1	6.1	4.1	(³)	8	(³)	8	(³)	4.1
4.2 II		4.3	5.1	4.2	4.2	6.1	6.1	4.2	4.2	8	8	4.2	4.2	4.2	4.2

The Precedence of Hazard Table [49 CFR 173.2a(b)]

The Precedence of Hazard Table is presented in 49 CFR 173.2a(b). The following **three things** can be noted when using this table:

1. The actual Precedence of Hazard Table includes only hazard classes/divisions 3, 4.1, 4.2, 4.3, 5.1, 6.1, and 8 (Reference: 49 CFR 173.2a(b)).
2. Seven hazard classes/divisions take precedence over the information listed in the table. Three of these hazard classes require the application of PG markings or some other unique criteria such as PIH, pyrophoric, and/or self-reactive. Reference: 49 CFR 173.2a(a).
3. Some materials, such as Class 1 (explosives), are always identified regardless of other associated hazards. Reference: 49 CFR 173.2a(c).

To use the Precedence of Hazard Table with two materials: Locate one material on the row heading and one on the column heading. The point at which the row and column intersect has the hazard class/division that takes precedence.

For example, if there is a Class 3 packing group I material and a Class 6.1 packing group II material, the following steps should be taken:

- 1 Find the Class 3 packing group I material in the row heading along the left side of the table.
- 2 Find the Class 6.1 packing group II material in the column heading along the top of the table.
- 3 Note the hazard class/division listed where the row and column intersect.

PRECEDENCE OF HAZARD TABLE [HAZARD CLASS OR DIVISION AND PACKING GROUP]														
	4.2	4.3	5.1 I 1	5.1 II 1	5.1 III 1	6.1, I dermal	6.1, I oral	6.1 II	6.1 III	8, I liquid	8, I solid	8, II liquid		
3 I ²		4.3				3	3	3	3	3	(³)	3		
3 II ²		4.3				3	3	3	3	8	(³)	3		
3 III ²		4.3				6.1	6.1	6.1	3 ⁴	8	(³)	8		
4.1 II ²	4.2	4.3	5.1	4.1	4.1	6.1	6.1	4.1	4.1	(³)	8	(³)		

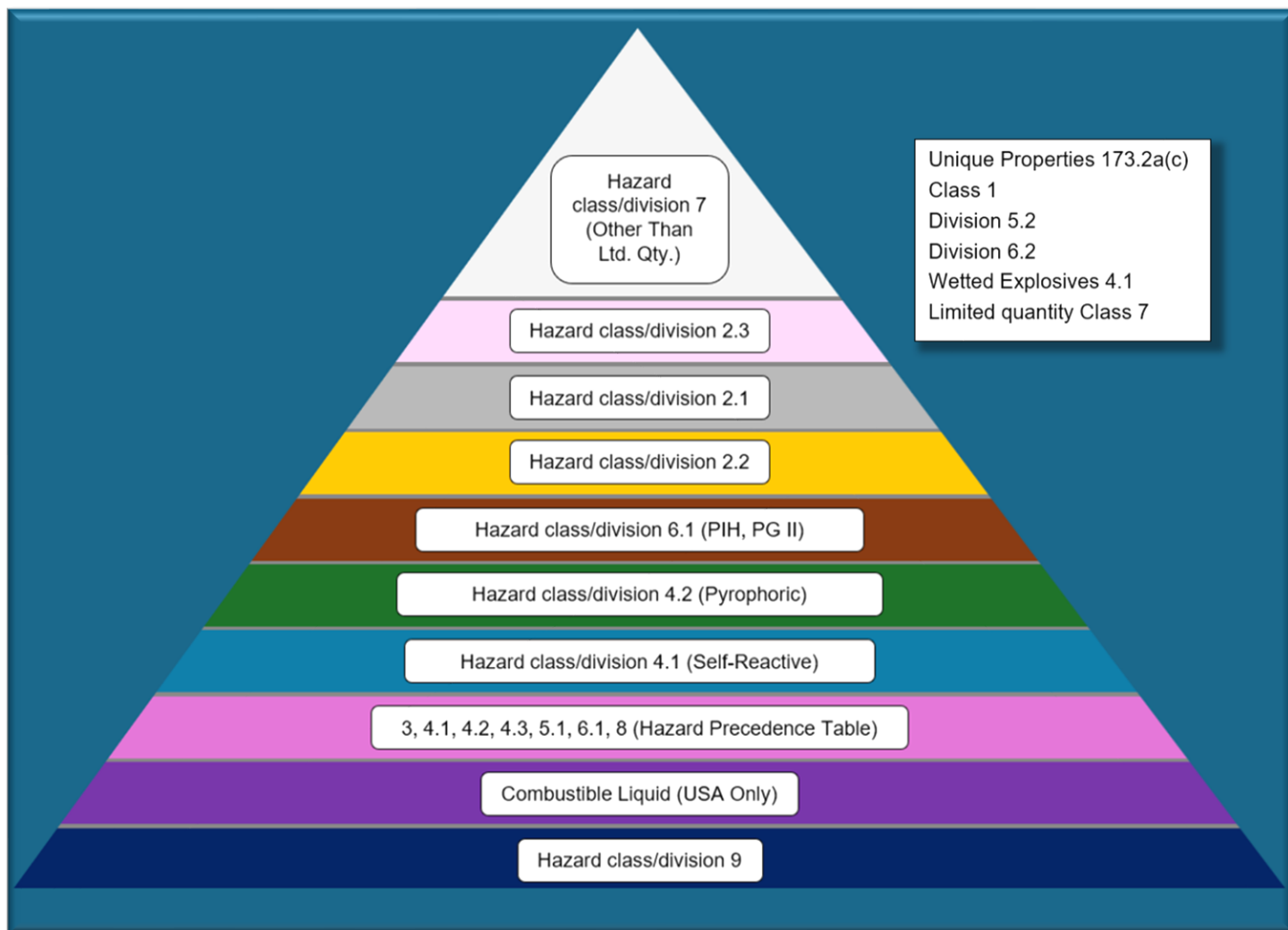
The Class 3 packing group I material takes precedence in this example.

To use the *Precedence of Hazard Table* with more than two materials: Follow these steps.

1. Pick any two materials and determine which one takes precedence as described in the example above,
2. pair the material having precedence (selected in step 1) with another material and determine which one takes precedence, and
3. continue until a single material has been identified as having hazard precedence.

The pyramid below shows the order of precedence, with the highest hazard being at the top of the pyramid. The box in the upper right corner of the graphic shows those materials that must be mentioned no matter what other hazards are present.

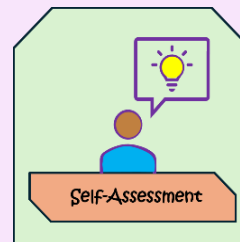
Note: The highest PG for any material must be maintained in the mixture.



Class Activity 3:
Determining Precedence for Multiple
& Mixed Hazardous Materials
See handout packet.



Self-Assessment
See handout packet.



Summary

Now that you have completed this course, you should be able to do the following:

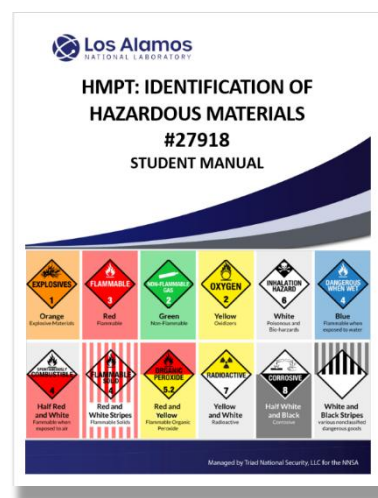
- *Classify hazardous materials in accordance with DOT hazard classes, divisions, and proper shipping names*
- *Apply the Hazardous Materials Table (HMT) to determine regulatory requirements, including hazard communication, packing groups, special provisions, and packaging requirements*
- *Identify and interpret key regulatory requirements related to hazard classification, labeling, and handling of hazardous materials, including poison-inhalation hazards and mixed hazard materials*

Next Steps

Take the proctored test, HMPT: Identification Test, #27919. Test will be proctored at either WRTC (Room 118) or ask instructor for other options. Once you complete the test with a score of 80% or better you will receive credit for the course.

The test is open book so you may refer to the Student Manual, the CFR and any links in manual as resources as you take the test.

For more information or concerns with this course, contact your instructor.



Appendix

A

Appendix A: Answers to Activities

Activity 1: Columns of the Hazardous Materials Table (HMT)

A. Table Completion: Fill in the missing information in the table below using the HMT, 172.101.

Symbols	Hazardous material descriptions and proper shipping names	Hazard Class or Division	Identification numbers	PG	Label codes	Special provisions	(8) Packaging (173.***)		
							Exceptions	Non bulk	Bulk
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8A)	(8B)	(8C)
—	Acetone	3	UN1090	II	3	IB2, T4, TP1	150	202	242
D	Aluminum, molten	9	NA9260	III	9	IB3, T1, TP3	NONE	NONE	247

B. Completion: Fill in the blanks below by referencing the HMT 172.101.

1. Find the PSN for Asbestos . List the applicable symbol (column 1) and indicate what it means.			
Symbol: D		Meaning: Domestic Transportation	
2. Find the PSN for Butylene . List the PSNs that are acceptable to ship this material by highway (column 2).			
PSNs:	Butylene	Petroleum gases, liquefied	Liquefied petroleum gas
3. Find the PSN for Methyl bromide . List the hazard class/division for this material (column 3).			
Hazard Class/Division No.: 2.3		Hazard Class/Division Name: Poisonous gas (173.2)	
4. Find the PSN for Nitrates, inorganic, n.o.s. List the identification number for this material (column 4).			
Identification number:		UN1477	
5. Find the PSN for Pyridine . list the packing group (PG) and its meaning for this material (column 5).			
Packing group: II		Packing group meaning: medium potential danger (172.101[f])	
6. Find the PSN for Methyl mercaptan . List the hazard labels (column 6).			
Primary hazard label: 2.3		Subsidiary hazard label: 2.1	
7. Find the PSN for Alcoholic beverages . List the special provision(s) that apply for PG II (column 7).			
Special provision(s): 24, 149, B1, IB2, T4, TP1			
8. Find the PSN for Allyl alcohol . List the special provision that identifies this material as a poison-inhalation hazard (column 7).			
PIH special provision: 2			
9. Find the PSN for Acetone . List the packaging authorization that allows excepted packaging for this material (column 8A).			
Packaging exception: 173.150			

Activity 2: Proper Shipping Name (PSN) Selection

Instructions: Determine the proper shipping name for the materials given in each question on a cup and pass cups around for each question. Remember that the order of preference for selecting a PSN is the chemical name, the general description, the generic name, and finally, the hazard class name.

Cup No.	Material	PSN
1	alcohol-based cleaning solution	Alcohol, n.o.s., 3, PG II
2	chemical name Xylene	Xylenes, 3, PG II
3	semi-gloss enamel paint	Paint, 3, PG II
4	corrosive liquid pH2	Corrosive liquids, n.o.s., 8, PG II
5	Aldrin solid	Organochlorine pesticides, solid, toxic 6.1, PG II
6	Acetone	Acetone, 3, PG III
7	Nitrates solid	Nitrates, inorganic, n.o.s., 5.1, PG II
8	Muriatic acid (Hydrochloric acid)	Hydrochloric acid, 8, PG II
9	Cyanide salts	Cyanide, inorganic, solid, n.o.s., 6.1, PG I
10	Bromine	Bromine, 8 (6.1), Poison Inhalation Hazard Zone A PG I

Activity 3: Determining Precedence for Multiple and Mixed Materials

Instructions: Determine the appropriate hazard class/division for the given materials or mixtures. Use section 173.2a.



1. A mixture of materials with a hazard class of 2.3 (poisonous gas) and 5.1 (oxidizer) is placed in a package for transport. What primary hazard class will be selected for this mixture to determine the proper shipping name?

Primary hazard class/division: **2.3**

? **Per 173.2a(a)**

2. A mixture of materials with a hazard class of 8 (corrosive material), PG II in liquid form, and a 6.1 (poisonous material) PG III is to be transported. Which takes precedence and why?

Primary hazard class/division: **8**

Why? **Per 173.2a(b)**

3. Select the PSN and PG from the Hazardous Materials Table 172.101 that describes the mixture from problem 2 above.

PSN: UN2922, Corrosive Liquid, Toxic, n.o.s., PG II

4. From Exercise 2 take 2 cups and mix them together to find a new PSN. This will be discussed with instructor as many of these can have different PSN as answers. **(Answers are determined with instructor in class.)**

PSN/PG: **Instructor-led, based on mixture**

Why? _____

Appendix

B

Appendix B: Answers to Self-Assessment

Self-Assessment - Answers

1) List the DOT hazard classes/divisions and their corresponding DOT hazard-class titles. (49 CFR 173.2)

- 1.1: Explosives (with a mass explosion hazard)
- 1.2: Explosives (with a projection hazard)
- 1.3: Explosives (with predominately a fire hazard)
- 1.4: Explosives (with no significant blast hazard)
- 1.5: Very insensitive explosives; blasting agents
- 1.6: Extremely insensitive detonating substances
- 2.1: Flammable gas
- 2.2: Nonflammable compressed gas
- 2.3: Poisonous gas
- 3 Flammable and combustible liquid
- 4.1: Flammable solid
- 4.2: Spontaneously combustible material
- 4.3: Dangerous-when-wet material
- 5.1: Oxidizer
- 5.2: Organic peroxide
- 6.1: Poisonous materials
- 6.2: Infectious substance (Etiologic agent)
- 7 Radioactive material
- 8 Corrosive material
- 9 Miscellaneous hazardous material

2) Identify the number and subject title of each column in the *Hazardous Materials Table* (49 CFR 172.101).

- Column 1: symbols
- Column 2: hazardous materials descriptions and PSNs
- Column 3: hazard class or division
- Column 4: identification numbers
- Column 5: PGs
- Column 6: label codes
- Column 7: special provisions
- Column 8: packaging authorization
- Column 8a: exceptions
- Column 8b: nonbulk packaging
- Column 8c: bulk packaging
- Column 9: quantity limitations
- Column 9a: passenger aircraft/rail
- Column 9b: cargo aircraft only
- Column 10: vessel stowage
- Column 10a: locations
- Column 10b: other

- 3) List the *Hazardous Materials Table* columns that are applicable to transportation by highway.
(Manual page 13)
Columns 1 - 8
- 4) List, in order of determination, the four categories of DOT PSNs.
1. chemical names
2. general description names
3. generic names
4. hazard class names
- 5) How are acceptable DOT PSNs identified in the *Hazardous Materials Table*?
Printed in bold print (Roman Type)
- 6) Of the four PSN-determination selection categories:
a. Identify the two categories in which PSNs end with n.o.s.
1. generic names
2. hazard class names

b. Why would a PSN that ends with n.o.s. be used?
Because a more descriptive (non-n.o.s.) PSN cannot be used, and the technical/chemical name is not in Hazardous Material Table or is in mixture with multiple hazards.
- 7) What is the reference location for the *Precedence of Hazard Table*, which is used to determine primary- and subsidiary-hazard class for mixtures?
49 CFR 173.2a(b)
- 8) Identify the primary- and subsidiary-hazards for the following mixtures:
a. Division 2.3 and Class 8, liquid, PG I
primary: 2.3 subsidiary: 8
b. Division 6.1, PG I (oral) not PIH, and Class 3, PG II.
primary: 3 subsidiary: 6.1
c. Class 8 (solid), PG III, and Division 5.1, PG III.
primary: 5.1 subsidiary: 8
d. Class 3, PG II; Class 8 (liquid), PG I; and Division 6.1, PG I (dermal) not PIH.
primary: 8 subsidiary: 3 subsidiary: 6.1
- 9) Identify the scope of each of the following special-provision codes as addressed in 49 CFR 172.102.
a. Numeric indicators only: multi-modal in application and may apply to bulk and non-bulk packagings.
b. Letter B codes: bulk packaging requirements
c. Letter N codes: non-bulk packaging requirements
d. Letter T codes: transportation in UN or IM Specification portable tanks (tankers)

- 10) Identify the special-provision code groups (e.g., A, B, N) that may apply to transportation of hazardous material by highway.
- a. numeric indicators only, multi modal, bulk and non-bulk
 - b. B (Bulk) not UN, IM or IBC
 - c. N (Nonbulk) < 119gallon, < 882 lbs. see definition in 49 CFR 171.8
 - d. T (Portable Tank) UN and IM authorized by DOT
- 11) List all the special-provision codes that apply to materials that meet the definition of PIHs or must be communicated as inhalation hazards.
- Numeric indicator codes 1 - 6 and 13
- 12) Where in 49 CFR are special provisions listed?
- 49 CFR 172.101, Hazardous Materials Table Special Provisions/ Codes-Column 7 Defined in 172.102
- 13) Identify each PG and its corresponding level of danger.
- PG I - great danger
 - PG II - medium danger
 - PG III - minor danger

References

Hazardous Materials Table in [49 CFR 172](#)

Hazardous material classes and index to hazard class definitions [49 CFR 173](#)