

PERFORMANCE-ORIENTED PACKAGING (POP) STANDARD

Classification, Hazard Communication, Packaging and Handling Requirements



On December 21, 1990, the Department of Transportation (DOT) published a final rule under docket HM-181 titled Performance-Oriented Packaging (POP) Standards; Changes to Classification, Hazard Communication, Packaging and Handling Requirements Based on UN Standards and Agency Initiative.

In the years following the introduction of the DOT standard, the UN Recommendations that it paralleled underwent several revisions. Accordingly, the DOT made similar changes to their standard. The DOT changes are recorded by the introduction of new dockets, which has been an ongoing process since the original docket HM-181. The Code of Federal Regulations (CFR) is also updated regularly to incorporate all dockets that have become final prior to that date.

HAZARDOUS MATERIALS TABLE

Checking the Hazardous Materials Table located in 49 CFR 172.101 is the first step toward understanding how to ship a product. This table provides the Proper Shipping Name, Hazard Class, UN Identification Numbers, Labels and Packaging Types necessary.

First, locate the **Proper Shipping Name (PSN)**. The PSN is listed alphabetically in the Hazardous Materials Table. You must know the technical name in order to do this. The example below gives a definition for each column of the Hazardous Materials Table. (*Example used is Toluene.*)

§ 172.101 HAZARDOUS MATERIALS TABLE—Continued

Sym- bols	Hazardous materials descriptions and proper shipping names	Hazard class or Division	Identifica- tion Num- bers	PG	Label Codes	Special provisions (§ 172.102)	(8)			(9)		(10)	
							Packaging (§ 173.***)			Quantity limitations		Vessel Stowage	
							Excep- tions	Non- bulk	Bulk	Passenger aircraft/rail	Cargo air- craft only	Loca- tion	Other
(1)	(2)	(3)	(4)	(5)	(6)	(7)	150	202	243	5 L	60 L	B
	Toluene	3	UN1294	II	3.....	IB2, T4, TP1	None....	202	243	5 L	60 L	D	25, 40
	Toluene diisocyanate	6.1	UN2078	II	6.1.....	IB2, T7, TP2, TP13							

Column 1: Symbols – Contains six symbols: “+,” “A,” “D,” “G,” “I” and “W.”

- The “+” fixes the proper shipping name, hazard class and packaging group for that entry.
- The letter “A” restricts the shipment of that particular material to air transport only.
- The letter “D” identifies proper shipping names which are appropriate for domestic shipments.
- The letter “G” identifies proper shipping names for which one or more technical names of the hazardous material must be entered in parentheses in association with the basic description.
- The letter “I” identifies proper shipping names for international transport.

- The letter “W” denotes that the material is subject to vessel req. when shipping by sea. It also may be used to describe a material for other modes of transportation.

(*Example: None applicable for Toluene.*)

Column 2: Hazardous Materials Descriptions and Proper Shipping Names – Lists hazardous materials and their proper shipping names.

Please refer to 49 CFR 172.101 Subpart B for further information on Column 2. (*Example: Toluene is a Proper Shipping Name.*)

Column 3: Hazard Class or Division –

Contains a numerical designation of the hazard class or division, which tells the hazardous properties of that specific material. This number is located in the bottom point of the square-on-



point labels or placards. (Example: Toluene is a Class 3.)

Column 4: Identification Number – Lists the identification number assigned to each proper shipping name. One of two prefixes may be found before an actual number. (Example: Toluene is UN 1294.)

“UN” is associated with those proper shipping names considered for international as well as domestic transport.

“NA” is associated with those proper shipping names recognized for “North American” shipments only (US and Canada).

Column 5: Packing Group (PG) – Packing groups I, II and III indicate the degree of danger presented by the material as great, medium or minor, respectively. If more than one packing group is designated for a proper shipping name, the criteria for assigning the packing group is specified in 49 CFR 173 Subpart D. (Example: Toluene is PG II.)

Column 6: Labels – Indicates which labels by their hazard classes are required for packages containing hazardous materials. If multiple labels are listed, a determination must be made to distinguish the primary hazard from the subsidiary hazards. Refer to the Precedence Table in 49 CFR 173.2a to make this determination. Other labels listed indicate additional hazards associated with the material that can be found in 49 CFR 172.402. (Example: Toluene requires a flammable liquid label.)

Column 7: Special Provisions – Consists of package prohibitions, exceptions from requirements and restrictions on quantities. The numbers and letters in the special provisions column are referred to in 49 CFR 172.102 with an explanation of their meanings.

Column 8: Packaging Authorization – Column 8A: Exceptions; 8B: Non-Bulk Packaging; and 8C: Bulk Packaging. All numbers that are shown in these columns relate to 49 CFR 173. (Example: Toluene packaging exceptions are found in 49 CFR 173.150, Non-Bulk Packaging is found in 49 CFR 173.202, and Bulk Packaging is in 49 CFR 173.242.)

Column 9: Quantity Limitations – Column 9A indicates passenger-carrying aircraft or passenger-carrying rail car. 9B indicates cargo aircraft. (Example: Maximum Shipping Quantity for Toluene 5L, and 60L respectfully.) For further clarification of this column refer to the International Civil Aviation Organization (ICAO)/ International Air Transport Association (IATA) guidelines for shipping by air.

Column 10: Vessel Stowage Requirements – Column 10A specifies categories for stowage locations onboard cargo and passenger vessels. Column 10B specifies codes (found in 49 CFR

176.84) for stowage of specific hazardous materials. For further information regarding sea shipment restrictions refer to the International Maritime Dangerous Goods Code (IMDG).

HAZARD CLASSES

There are nine hazard classes within the DOT system. Each hazard class is given a specific division number that will define the hazard. Both the hazard class and division are referenced in the Hazardous Materials Table. The following is a breakdown of the hazard classes and divisions:

Explosive (1.1–1.6)

Gases (2.1 Flammable, 2.2 Non-Flammable, 2.3 Poison)

Flammable/Combustible Liquids (Class 3)

Solids (4.1 Flammable, 4.2 Spontaneously Combustible, 4.3 Dangerous When Wet)

Oxidizing Agents (5.1 Oxidizer, 5.2 Organic Peroxide)

Poisons (6.1 Poison, 6.1 Toxic, 6.2 Infectious Substances)

Radioactive (Radioactive I, Radioactive II, Radioactive III) (Class 7)

Corrosive (Class 8)

Miscellaneous (Class 9)

MARKINGS, LABELS, PLACARDS

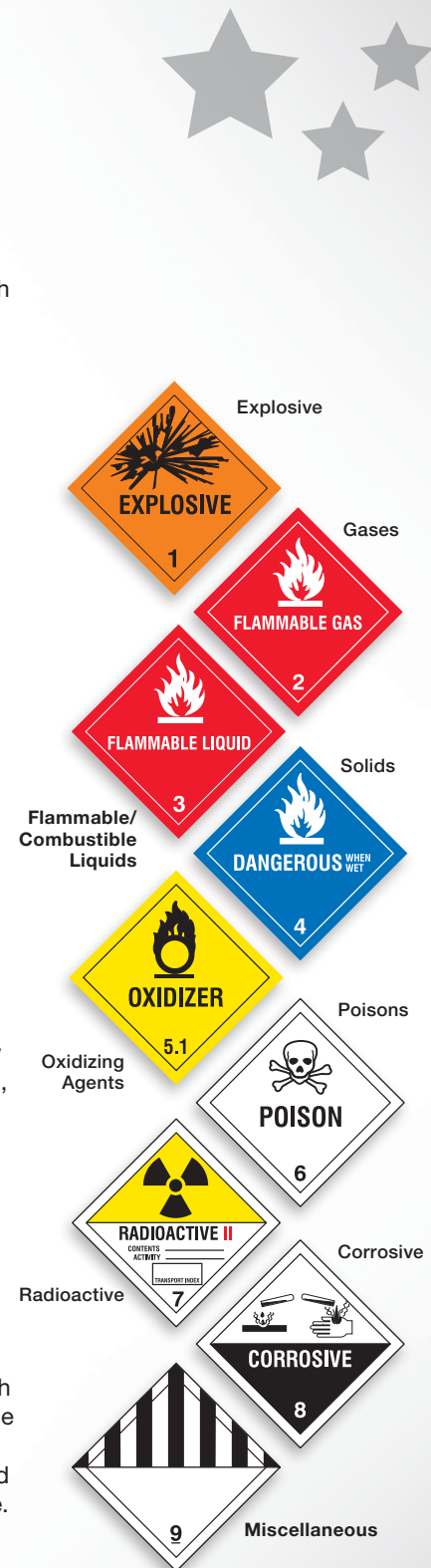
The contents of a shipment must be thoroughly identified through shipping papers and marking, labeling and placarding of the shipment. (The necessity of these three forms of identification depends largely on the size of the shipment. Refer to the Hazardous Materials Table, 49 CFR 172.101.)

MARKINGS

A marking a handwritten or a pre-printed, self-adhesive label containing required information: proper shipping name, the United Nations/North American (UN/NA) identification number, and the consignee's or consignor's name and address (49 CFR 172.300). The marking is only regulated by the information to be placed on the package.

LABELS

Labeling with a 4" x 4" square-on-point label is the second part of visibly identifying a hazardous materials package. Shipping labels are specific to the hazard classes of materials and have strict specifications for set-up including color, size and wording, as well as placement on a package (49 CFR 172.400-172.450). The Hazardous Materials Table has a label column referencing the label or labels



for the specific chemical by the hazard class. A label chart that shows hazard class or division and the associated label plus the section reference can be found in 49 CFR 172.400(b). If two labels are listed in the label column, the least hazardous of the two is a secondary hazard. This secondary hazard must also be labeled per 49 CFR 172.402.

Another form of labeling is the use of **Special Precautions Labels**. These labels have specifications for setup in the CFR and are intended for specific situations. Some examples of these labels are Up arrows, Empty, and Cargo Aircraft Only.

Only labels that meet the regulation after October 1, 1993 can be used in shipping practices. Labels that met the regulation prior to 1990 are now outdated and not legal for use in hazardous materials shipping.

PLACARDS

Depending on the nature and quantity of the shipment, placarding completes the shipment identification process. Placards are larger than labels, measuring 10" x 10", but similar in their square-on-point design. Placards are also specific to the hazard class of materials. The specifications are equally strict for color, size and wording, as well as placement on a shipping vehicle (49 CFR 172.500-172.560). Two tables help determine if placards are necessary (49 CFR 172.504). Placarding the secondary hazard is also required (similar to labeling). Secondary hazards must follow the requirements in 49 CFR 172.519(b)(4).

New placarding requirements were implemented on October 1, 1994, but placards conforming to the pre- HM-181 specifications, were allowable for highway transportation until October 1, 2001 (49 CFR 171.14(c)(2)).

CONTAINERS

Determining which container is applicable for

shipping a hazardous material depends on the UN identification code found on the drum. To better understand the code, a sample UN identification code with definitions of the values is printed below. Note: This criteria is specific only to the drum. The chemical used must fall under the specifications. For more information regarding the number refer to 49 CFR 178.

To find information on the chemical, refer to the Hazardous Materials Table, MSDS, Merck Index, CRC Handbook of Chemistry and Physics or contact the manufacturer of the chemical.

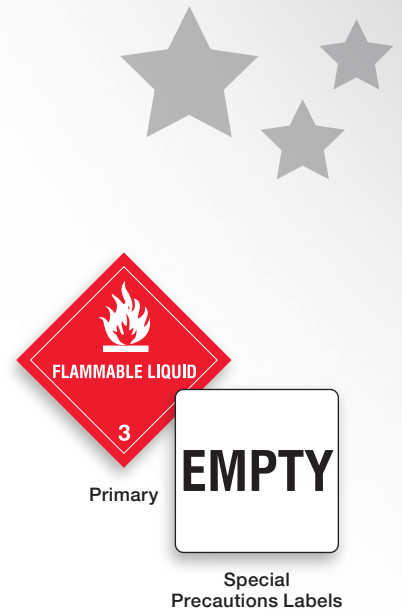
TRAINING

As of October 1, 1993, HM-126F has been implemented into the POP standards. The training provision requires coverage of these areas:

- General awareness**
- Function-specific training**
- Safety training**
- Driver training**
- Security awareness**
- In-depth security training**

To comply with this portion of the regulation, hazmat employees hired before July 2, 1993, must have been trained before October 1, 1993. Employees hired after July 2, 1993, or employees who have changed jobs must be trained within 90 days of starting the new job. Once training is complete, the employer is required to have refresher training at least once every three years. A record of the training must be kept within the employees training records (49 CFR 172).

In March 2003, the DOT created HM-232 which created a new training area for security. The security awareness training again must take place within the first 90 days for new hires. For employees already performing these functions, the security training must be conducted no later



UN/1A1/Y1.4/100/91/USA/VL1 .96mm									
UN	1A	1	Y	1.4	100	91	USA	VL1	.96mm
Certified Symbol	Package Identification	Package Type	Packing Group Testing						
	1A-Drum Steel	1-Closed Head	X-Meets Group I, II, III						
	1H-Drum Plastic		Y-Meets Group II, III	Specific Gravity or weight if test for solids (kg)	Test Pressure in kPa. An "S" may appear indicating solid or inner pkg. approved.	Year of Mfg	Country of Origin	Name or Symbol of Manufacturer	Minimum thickness intended for reuse.
		2-Open Head							
	6HA-Composite, Steel/Plastic		Z-Meets Group III						

than the first scheduled recurrent training. If an employer was required to implement a security plan due to the implementation of HM-232, all employees must be trained.

COMMONLY ASKED QUESTIONS

Q. Is there a combustible label?

A. Refer to the Hazardous Materials Table (49 CFR 172.101) to find the appropriate label. Combustible labels are not provided for within the regulation. Due to quantity sizes of the shipment, placards must be used.

Q. Should I remove the shipping label once I receive a hazardous materials package?

A. Due to a recent final rule issued by OSHA, shipping labels and placards must be retained on the package after the shipment has been received. (Federal Register, July 19, 1994)

Q. Where can I find information on labeling and placarding my explosive shipments?

A. Refer to 49 CFR 173.50-173.63. This classifies explosives according to the danger of the explosive and assigns a value by using a Classification Code.

Q. Can I create customized shipping labels?

A. Labels are federally regulated. Additional information can be added to a label as long as it does not change anything within the 4" x 4" space. The classification code can be added to the explosive labels. 4" x 4½" labels can be used if a chemical name and chemical identification number need to be displayed.

PRODUCT REFERENCE

Grainger has the products you need to keep your workers safe and comply with current regulations. Please refer to Drums and Labels on Grainger.com.

SOURCES

49 CFR 172.101 Subpart B, Purpose and use of hazardous materials table and Table of Hazardous Materials.

49 CFR 172.102, Special provisions.

49 CFR 172.300 Subpart D, Marking and Applicability.

49 CFR 172.400 Subpart E, Labeling.

49 CFR 172.400(b), General Labeling Requirements Table.

49 CFR 172.402, Additional labeling requirements.

49 CFR 172.500 Subpart F, Placarding.

49 CFR 172.504, General placarding requirements.

49 CFR 172.519(b)(4), Subsidiary placarding.

49 CFR 173, Definitions, Classifications, Packing Group Assignments and Exceptions for Hazardous Materials—Class 1 and Class 7.

49 CFR 173.2a, Classification of a material having more than one hazard.

49 CFR 173.50 Subpart C, Definitions, Classification and Packaging for Class 1.

49 CFR 173.150, Exceptions for Class 3 (flammable and combustible liquid).

49 CFR 173.202, Non-bulk packagings for liquid hazardous materials in Packing Group II.

49 CFR 173.242, Bulk packagings for certain medium-hazard liquids and solids, including solids with dual hazards.

49 CFR 176.84, Other requirements for stowage and segregation for cargo vessels and passenger vessels

(Rev. 6/2014)



The Grainger Choice badge signals a broad selection of products that deliver quality and value, brought to you by Grainger.