

Package Selection Marking and Labeling Requirements

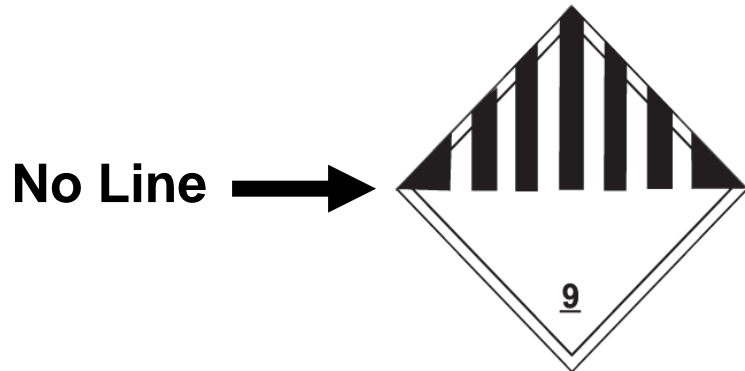
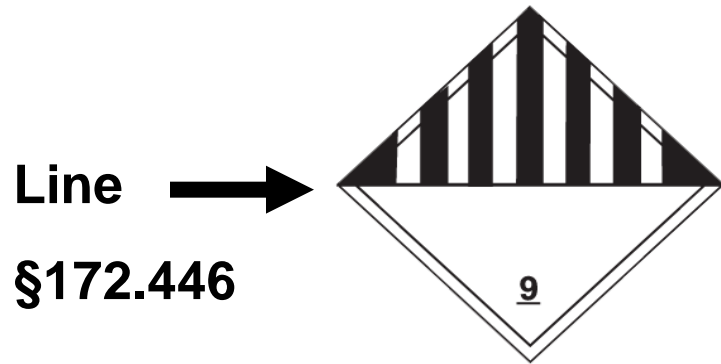


Objectives

- Identify Applicable Parts of Hazardous Materials Regulations (HMR)
- Describe United Nations (UN) Packaging Standards and Codes
- Determine Hazard Communication Marking and Labels



HM215J and UN Harmonization Labels



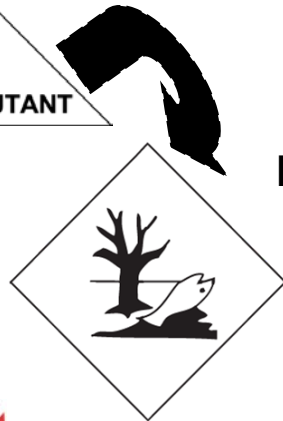
Text Changes ←



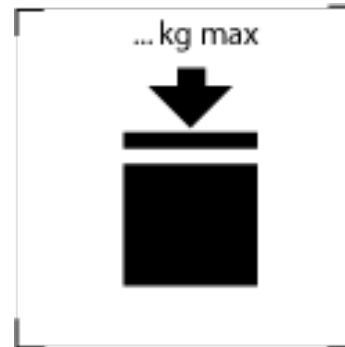
HM215J and UN Harmonization Markings



Marine Pollutant
§172.322



Non-Stackable IBC
§178.703



Stackable IBC
§178.703



Excepted Quantities
§173.4a

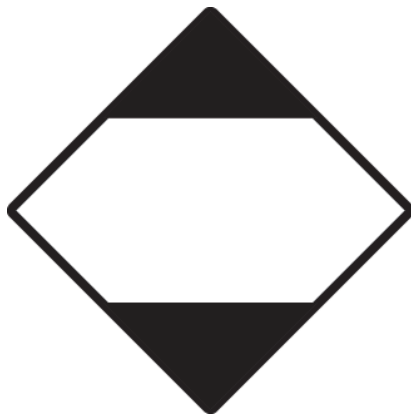


Limited Quantities and ORM-D

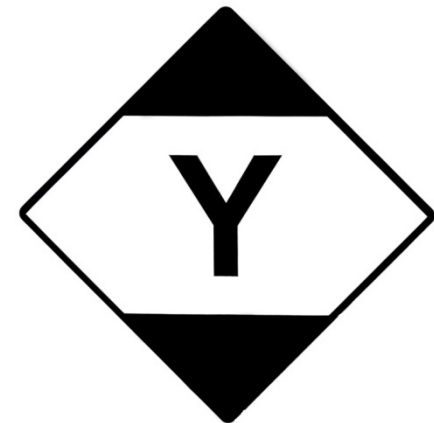
CONSUMER COMMODITY



For use in modes other than air until December 31, 2020



Limited quantities for modes other than air (see § 172.315(a))



Limited quantities by air (see § 172.315(b))



HMR 49 CFR

- **Part 172 –**
Subparts B, D
and E
- **Part 173**
- **Part 178 –**
Subpart L and M



Is The Material Hazardous?

- Check Table §172.101 (HMT)
- Identify the HM by Proper Shipping Name – Column 2

Symbols (1)	Hazardous Materials Descriptions and Proper Shipping Names (2)	Hazard Class or Division (3)	Identification Numbers (4)	PG (5)	Label Codes (6)	Special Provisions (§172.102) (7)	(8) Packaging (§173.***)			(9) Quantity Limitations	
							Excep- tions (8A)	Non- bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo air- craft only (9B)
	Acrolein, stabilized	6.1	UN1092	I	6.1, 3	1, B9, B14, B30, B42, B72, B77, T22, TP2, TP7, TP13, TP38, TP44	None	226	244	Forbidden	Forbidden
	Copper cyanide	6.1	UN1587	II	6.1	IB8, IP2, IP4, T3, TP33	None	204	242	25kg	100kg
G	Flammable liquid, n.o.s.	3	UN1993	I II III	3 3 3	T11, TP1, TP27, 1B2, T7, TP1, TP8, TP28, B1, B52, IB3, T4, TP1, TP29	150 150 150	201 202 203	243 242 242	1L 5L 60L	30L 60L 220L
	Dangerous Goods in Machinery	9	UN3363			136, A105	None	222	None	See A105	See A105



Column 8 Packaging (173.***)

Symbols (1)	Hazardous Materials Descriptions and Proper Shipping Names (2)	Hazard Class or Division (3)	Identification Numbers (4)	PG (5)	Label Codes (6)	Special Provisions (§172.102) (7)	(8) Packaging (§173.***)			(9) Quantity Limitations	
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	Copper cyanide	6.1	UN1587	II	6.1	IB8, IP2, IP4, T3, TP33	None	204	242	25kg	100kg
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				II	3		150	202	242	5L	60L
				III	3		150	203	242	60L	220L
	Dangerous Goods in Machinery	9	UN3363			136, A105	None	222	None	See A105	See A105



§173.203

Non-Bulk Packagings for Liquid Hazardous Materials in Packing Group III

- **Combination Packagings**
- **Single Packagings**



1A2 STEEL DRUM
removable head
used as combination packaging



FIBERBOARD BOX
used as combination packaging
showing inner packagings



1A1 STEEL DRUM
non-removable head
used as single packaging



Other Requirements of §173.203

- Packaging Conforms to Subpart B of Part 173
- Packaging Meets Requirements of Part 178 at PG I, II or III level
- Special Provisions of Column 7, HMT are Met



Column 7 Special Provisions

Symbols (1)	Hazardous Materials Descriptions and Proper Shipping Names (2)	Hazard Class or Division (3)	Identification Numbers (4)	PG (5)	Label Codes (6)	Special Provisions (§172.102) (7)	(8) Packaging (§173.***)			(9) Quantity Limitations	
							Exceptions (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo aircraft only (9B)
	Acrolein, stabilized	6.1	UN1092	I	6.1, 3	1. B9, B14, B30, B42, B72, B77, T22, TP2, TP7, TP13, TP38, TP44	None	226	244	Forbidden	Forbidden
	Copper cyanide	6.1	UN1587	II	6.1	IB8, IP2, IP4, T3, TP33	None	204	242	25kg	100kg
G	Flammable liquid, n.o.s.	3	UN1993	I	3	T11, TP1, TP27, 1B2, T7, TP1, TP8, TP28, B1, B52, IB3, T4, TP1, TP29	150	201	243	1L	30L
				II	3		150	202	242	5L	60L
				III	3		150	203	242	60L	220L
	Phosphoric acid solution	8	UN1805	III	8	A7, IB3, N34, T4, TP1	154	203	241	5L	60L



Column 7 Special Provisions

- Identifies additional provisions for the specific hazardous material
 - “1” means poisonous by inhalation, Hazard Zone A
- May impose limitations or additional requirements on packaging
 - A7 requires steel packaging to be corrosion resistant when shipped by air
 - N34 requires aluminum constructed materials not in contact with the hazardous material



Performance-Oriented Packaging



1A2 STEEL DRUM
used as combination packaging



1A1 STEEL DRUM
used as single packaging



Required Tests for Non-Bulk Packagings and Packages

- **Drop Test – §178.603**
 - All packagings
- **Leakproofness Test – §178.604**
 - All packagings intended for liquids
- **Hydrostatic Test – §178.605**
 - Metal, plastic and composite intended for liquids
- **Stacking Test – §178.606**
 - All packaging other than bags
- **Vibration Standard – §178.608**
 - All packaging



Closure Requirements

DOT Specification or UN standard packaging must be closed in accordance with the instructions provided by the packaging manufacturer or subsequent distributor

§173.22 (a)(4)



Manufacturer's Responsibility

§178.2(c) *paraphrased*

...the manufacturer...of that packaging must:

specifying the type(s) and dimensions of the closures, including gaskets and any other components needed to ensure that the packaging is capable of successfully passing the applicable performance tests.



Manufacturer's Responsibility

Continued

§178.2(c) *paraphrased*

This information must include any procedures to be followed, including closure instructions for inner packagings and receptacles, to effectively assemble and close the packaging for the purpose of preventing leakage in transportation.

Closure instructions must provide for a consistent and repeatable means of closure that is sufficient to ensure the packaging is closed in the same manner as it was tested.



Closure Notifications

- Types of Notifications
 - Written
 - Embossed
 - Printed on the Package



Closure Instructions

1. SEAL PAINT CANS:
FOR GROUND SHIPMENTS ONLY, ATTACH 6 CAN CLIPS.
FOR AIR OR GROUND SHIPMENTS, SEAL WITH LOCKING RING.
(LOCKING RING REQUIRED FOR AIR SHIPMENTS)
2. IF SHIPPING 1 UNIT, SEAL 1 CAN AND ASSEMBLE SINGLE SHIPMENT CORRUGATED BOX.
IF SHIPPING 2 UNITS, SEAL 2 CANS AND ASSEMBLE 2 PACK CORRUGATED BOX.
IF SHIPPING 4 UNITS, SEAL 4 CANS AND ASSEMBLE 4 PACK CORRUGATED BOX.
3. PLACE EPS FOAM CAP INSERTS INTO BASE OF BOX.
4. PUT FILLED CAN/CANS IN EPS FOAM CAP INSERTS.
5. PLACE EPS FOAM CAP INSERTS ON TOP OF CAN/CANS.
6. TAPE BOX CLOSED WITH 3" REINFORCED GUMMED TAPE OR MINIMUM 2 MIL 2" CLEAR CARTON SEALING TAPE.



ATTENTION

To seal can:
Apply downward pressure to lid until seated completely into grooves on can.
Air: Apply downward pressure to locking ring until contacting top of can.
Ground: Lock clips into grooves on can in an evenly spaced pattern.

Outer flaps meet. Use center seam tape pattern 2.5" min. overlap

SINGLE KIT CONTAINS: ONE SINGLE SHIPMENT CARTON AND 2 EPS FOAM CAPS.

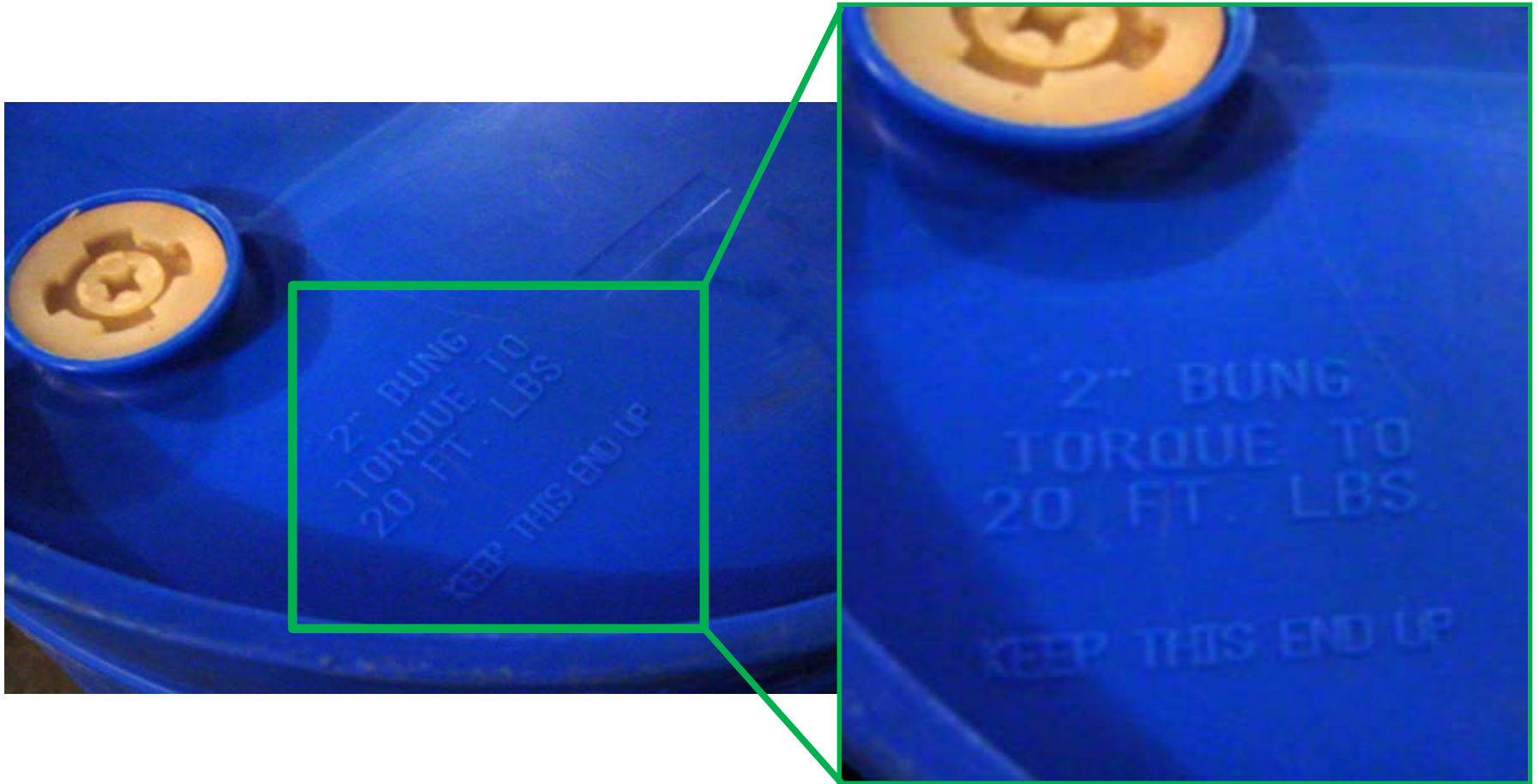
2 PACK KIT CONTAINS: ONE 2 PACK CARTON AND 4 EPS FOAM CAPS.

4 PACK KIT CONTAINS: ONE 4 PACK CARTON AND 8 EPS FOAM CAPS.

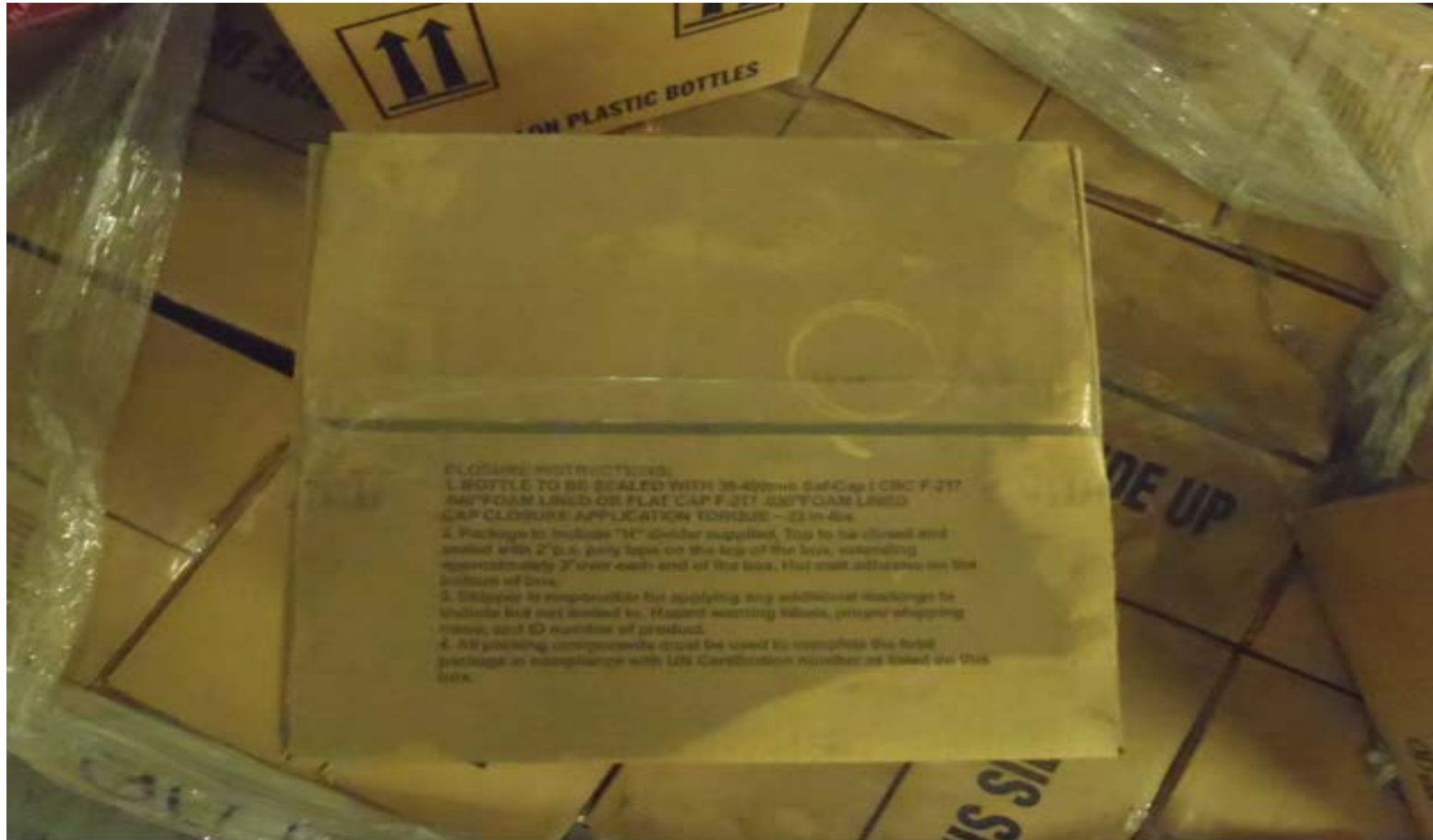
***LPS WILL ASSUME RESPONSIBILITY FOR PACKAGE INTEGRITY AND COMPLIANCE WITH ICAO/IATA, IMO AND UN STANDARDS, "ONLY", IF ALL PACKAGE COMPONENTS ARE ASSEMBLED AND PURCHASED AS A SINGLE INTEGRATED UNIT.



Embossed



Printed on Package



Shipper's Responsibility

- § 173.22(a)(4)
 - For a DOT Specification or UN standard packaging subject to the requirements of part 178 of this subchapter, **a person must perform all functions necessary to bring the package into compliance** with parts 173 and 178 of this subchapter, **as identified by the packaging manufacturer or subsequent distributor** (for example, applying closures consistent with the manufacturer's closure instructions) in accordance with §178.2 of this subchapter...



Shipper's Responsibility

- § 173.22(a)(4)
 - A person must maintain a copy of the manufacturer's notification, including closure instructions (see §178.2(c) of this subchapter) unless permanently embossed or printed on the packaging.
- § 173.27
 - General requirements for transportation by aircraft



UN Specification Marking Requirements

Part 178, Subpart L

- Manufacturers test and mark packagings according to UN Standards
- Specified Codes used for marking
- Markings must be durable, legible and placed according to Subpart L



Identification Code for UN Standard Packaging


SINGLE PACKAGING



Z – PGIII
(minor danger)

Y – PGII
(medium
danger)

X – PGI
(great danger)

 6 HH1/Y2.0 /170/96
USA/0000

§178.502; §178.503v



Identification Code for UN Standard Packaging

COMBINATION PACKAGING



Removable Head

Inner Packaging

 **1A2/Z40/S/05**
USA/0000



Marking Specification Packagings

- **Durable**
 - Stamped
 - Embossed
 - Burned
 - Printed or otherwise marked
- **Legible**
 - Readily visible
- **Size**
 - Relative to packaging size
- **Location**
 - On non-removable component

§178.503(a)



Questions on Package Selection?



Markings that Communicate the Hazard

- **49 CFR Part 172 Subpart D Applicability**
 - Each person offering a hazardous material for transportation
 - Each carrier when assigned the function by Subpart D
- **General Markings that Identify the Hazardous Material Shipment**
 - Proper shipping name
 - UN identification number
 - Consignee or Consignor



General Hazard Communication Markings



§172.301





Orientation Arrows



Additional Hazard Communication Markings

- Technical Names – §172.301(b)
- Inhalation Hazard – §172.313(a)
- Marine Pollutant – §172.322
- RQ (Hazardous Substance) – §173.324



Technical Names



Symbols (1)	Hazardous Materials Descriptions and Proper Shipping Names (2)	Hazard Class or Division (3)	Identification Numbers (4)	PG (5)	Label Codes (6)	Special Provisions (§172.102) (7)	(8) Packaging (§173.***)			(9) Quantity Limitations	
							Excep-tions (8A)	Non-bulk (8B)	Bulk (8C)	Passenger aircraft/rail (9A)	Cargo air-craft only (9B)
G	Flammable liquid, n.o.s.	3	UN1993	I	3	T11, TP1, TP27,	150	201	243	1L	30L
				II	3	1B2, T7, TP1, TP8, TP28, B1,	150	202	242	5L	60L
				III	3	B52, IB3, T4, TP1, TP29	150	203	242	60L	220L



Inhalation Hazard



Optional with label

§172.313



Hazardous Substance and Marine Pollutants



§172.322, §172.324



Additional Requirements of Subpart D

- Prohibited marking – §172-303
- Limited Quantities – §172.315
- Special Permits/Exemption – §172.301(c)
 - DOT-SP
 - DOT-E
- Authorized abbreviations – §172.308
- Class 7 (radioactive) – §172.310
- Liquid hazardous materials – §172.312
 - Combination packagings
 - Vented closures
- ORM-D – §173.316
- Explosives – §172.320
- Infectious Substance – §172.323



Column 8A Excepted Packagings



CONSUMER COMMODITIES



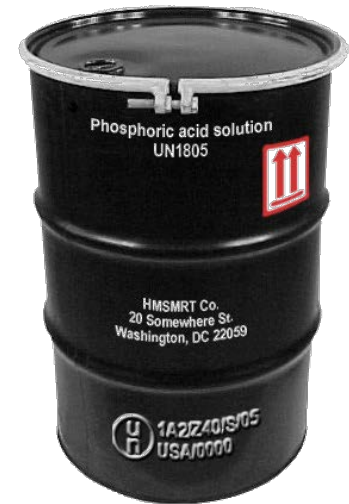
Display of Markings

- Durable
- English
- Affixed to surface or label, tag or sign
- Sharply contrasting background
- Un-obscured by labels or other
- Located away from other marking such as advertising
- Only authorized abbreviations

§172.304



Display of Markings



Marking Questions?



Hazard Labels

- **49 CFR Part 172 Subpart E Applicability**
 - Each person offering a hazardous material for transportation
 - Exceptions - §172.400a
- **Hazard Labels**
 - Primary Hazard Class
 - Subsidiary Risk
- **Other Labels**
 - Cargo Aircraft Only



Selecting Hazard Labels

Symbols (1)	Hazardous Materials Descriptions and Proper Shipping Names (2)	Hazard Class or Division (3)	Identification Numbers (4)	PG (5)	Label Codes (6)	Special Provisions (§172.102) (7)	(8) Packaging (§173.***)			(9) Quantity Limitations	
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	Copper cyanide	6.1	UN1587	II	6.1	IB8, IP2, IP4, T3, TP33	None	204	242	25kg	100kg
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				II	3		150	202	242	5L	60L
				III	3		150	203	242	60L	220L
	Dangerous Goods in Machinery	9	UN3363			136, A105	None	222	None	See A105	See A105

§172.402



Labeling for Subsidiary Risks



Acrolein Stabilized



Note: ALL primary AND subsidiary labels MUST have the hazard class or division number displayed on each label

§172.402



Label Restrictions

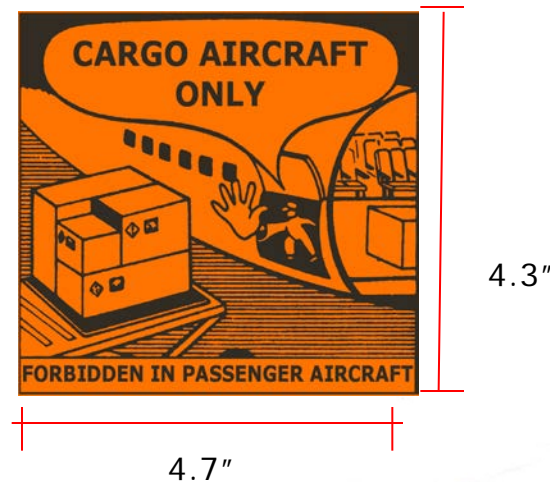
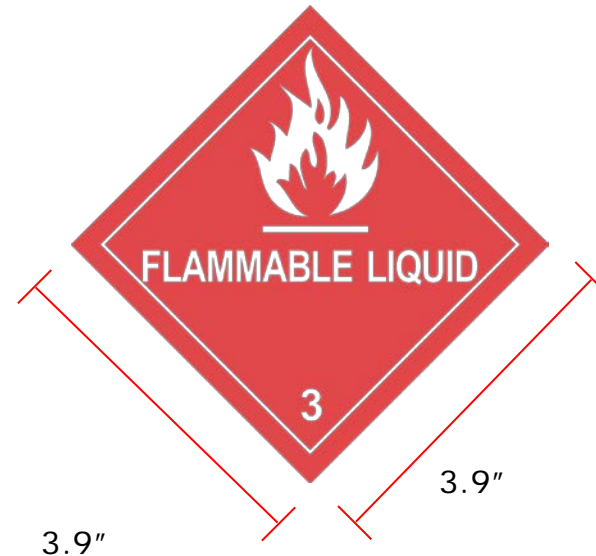
- Package contains a hazardous material
- Label represents the hazardous material inside package
- Label meets specification requirements of HMR

§172.401



Label Specifications

- **Hazard labels**
 - Design
 - Size
 - Color
- **Cargo Aircraft Only**
 - Rectangle
 - Danger



§172.407



Placement of Labels

- On package surface other than bottom
- Same surface near proper shipping name
- Affixed to tag
- Hazard labels
 - Primary and subsidiary label displayed next to each other
 - Within 6 inches
- Contrasting background
- Visible – not obscured

§172.406



Completed Examples



Label Questions?



Got A
Question?



Where to Find More Information . . .

The screenshot shows the PHMSA website interface. At the top left is the PHMSA logo and name. To the right is the U.S. Department of Transportation logo and social media icons for Twitter, YouTube, and LinkedIn. Below the logo is a navigation menu with tabs for 'About PHMSA', 'Pipeline Safety', and 'Hazardous Materials Safety'. A search bar is located to the right of the navigation menu. The main content area features a large image of the '2016 Emergency Response Guidebook' with the text 'DOT announces release of new 2016 Emergency Response Guidebook'. To the right of this image is a 'News & Updates' section with a list of links: 'U.S. Department of Transportation Announces Flammable Liquid Unit Trains Response Curriculum', 'HM-253 Reverse Logistics Final Rule - March 2016 (PDF)', 'The Fixing America's Surface Transportation (FAST) Act', and 'Briefing Room'. Below the news section is a 'Find PHMSA Offices' section with a 'Key Officials' dropdown menu and a map of the United States divided into regions: western, central, eastern, southern, and southwest. To the right of the map is a 'PHMSA Resources' section with sub-sections for 'Regulations' and 'Data & Reports', each accompanied by a small icon.

<http://www.phmsa.dot.gov/hazmat>





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



NEW: Hazardous Materials Transportation Training Modules

Free, interactive training modules available online:

<http://phmsa.dot.gov/hazmat>



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

To Protect People and the Environment From the Risks of
Hazardous Materials Transportation



Hazardous Material Info-Center

1-800-HMR-4922

(1-800-467-4922)

E-mail: infocntr@dot.gov



- Obtain answers to HMR questions
- Request copies of Federal Register, special permits or training materials
- Fax on Demand

51

