



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



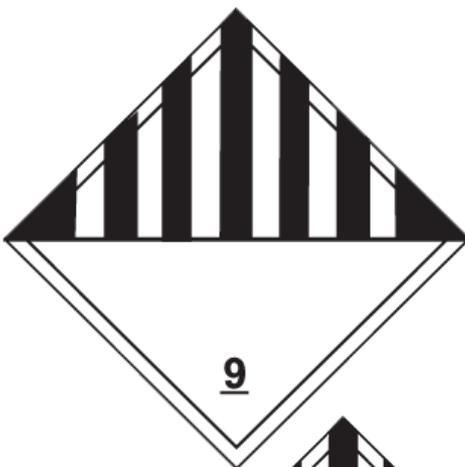


HM215J and UN Harmonization Labels

Line



§172.446



No Line



Old



New

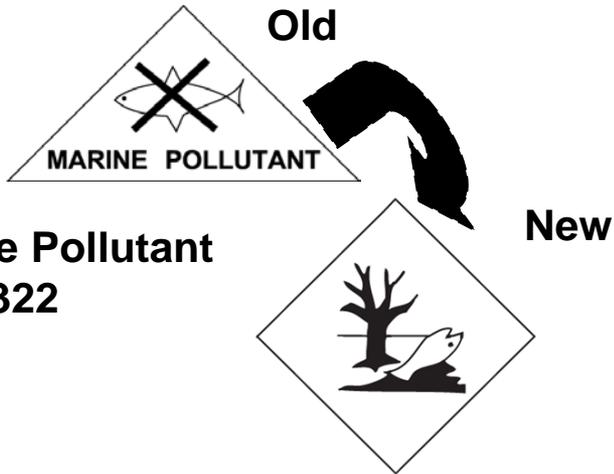
§172.448

Text Changes



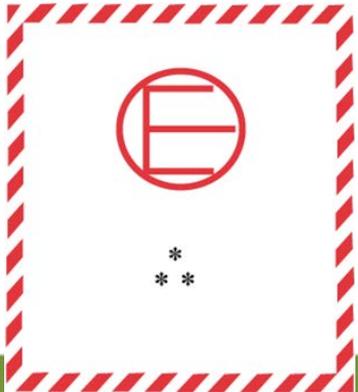


HM215J and UN Harmonization Markings

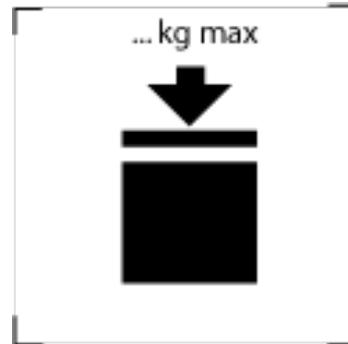


Marine Pollutant
§172.322

Excepted Quantities
§172.448



Non-Stackable IBC
§178.703



Stackable IBC
§178.703





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 |
| | Phosphoric acid solution | 8 | UN1805 | III | 8 | A7, IB3, N34, T4, TP1 | 154 | 203 | 241 | 5L | 60L |





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 | |
|----------------|---|---------------------------------|-------------------------------|-----------|--------------------|--|--------------------------|----------------|-----------|------------------------------|----------------------------|
| | | | | | | | Excep- tions (8A) | Non- bulk (8B) | Bulk (8C) | Passenger aircraft/rail (9A) | Cargo air- craft only (9B) |
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| | | | | 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 |

§172.101 Hazardous Materials Table Excerpts





§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 | |
|----------------|---|---------------------------------|-------------------------------|-----------|--------------------|--|--------------------------|---------------|-----------|------------------------------|--------------------------|
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| | | | | 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 |

§172.101 Hazardous Materials Table Excerpts

§172.102





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 (c)(4)





Manufactures 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.





Manufactures 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 ICAQ/ATA, IMO AND UN STANDARDS, "ONLY", IF ALL PACKAGE COMPONENTS ARE ASSEMBLED AND PURCHASED AS A SINGLE INTEGRATED UNIT.



Written



**GREIF INDUSTRIAL PACKAGING & SERVICES LLC
 DOT REQUIRED NOTIFICATION STATEMENT
 INTERMEDIATE BULK CONTAINERS**

The below listed statement is printed on the bottom of each packing list copy of the customer order that is shipped from Greif, Inc. Lavonia, Georgia Intermediate Bulk Container plant.

The recent g that manufac writing of:

1. A
2. B



The followir regulatory requirement.

UN IBC'S

- TOP OPENINGS IN GREIF UN-IBC'S MUST BE FITTED WITH 6" COVERS AND GASKETS SUPPLIED BY GREIF INC. 6" COVERS MUST BE TIGHTENED 1/2 TURN AFTER GASKET CONTACT WITH THE TOP OF THE BOTTLE AND TO AT LEAST 45 FT. LBS TORQUE. FITTINGS IN THE COVER MUST BE TIGHTENED TO A TORQUE OF 20 FT-LBS FOR 2"NPT FITTINGS AND 9 FT-LBS FOR 3/4" BUNGS, IF INSTALLED.

TOP OPENINGS IN GREIF UN-IBC'S MUST BE FITTED WITH 6" COVERS AND GASKETS SUPPLIED BY GREIF INC. 6" COVERS MUST BE TIGHTENED 1/2 TURN AFTER GASKET CONTACT WITH THE TOP OF THE BOTTLE AND TO AT LEAST 45 FT. LBS TORQUE. FITTINGS IN THE COVER MUST BE TIGHTENED TO A TORQUE OF 20 FT-LBS FOR 2"NPT FITTINGS AND 9 FT-LBS FOR 3/4" BUNGS, IF INSTALLED.

meet UN performance standards. MAUSER is prepared to provide this training in addition to supplying closing instructions. It has been the practice of MAUSER to send closing instructions attached to the shipping documents with each shipment of drums. This document provides specific information on closing MAUSER packaging.

These closing instructions must be given to the individuals responsible for closing the packagings prior to shipment. A hard copy (printed) must be maintained by the filler or offeror for shipment. Copies should be immediately available at the fill lines.

The following tables and text give examples of the parts and closing torque required to prepare the drum or IBC for shipment so

PACKAGING CLOSURE INFORMATION

CLOSURE SPECIFICATIONS FOR TIGHT HEAD DRUMS

PLUGS MUST BE TORQUED TO THE FOLLOWING TORQUE

| IBC Type | Gasket Type | Torque |
|---|-------------|----------------|
| A Bulkdrum ® II | EPDM/FKM | 70 ft.-lbs. |
| B MAUSER ® SM series 275/330 gallon | EPDM | 70 ft.-lbs. |
| C MAUSER ® SM series 275/330 gallon | FKM/FPM | 70 ft.-lbs. |
| D 2" plug in 150 mm lid, vented and solid | EPDM/FKM | 20-25 ft.-lbs. |
| E 56 mm plug in 150 mm lid vented and solid | EPDM/FKM | 20-25 ft.-lbs. |

| IBC Type | Gasket Type | Torque |
|---|-------------|----------------|
| A Bulkdrum ® II | EPDM/FKM | 70 ft.-lbs. |
| B MAUSER ® SM series 275/330 gallon | EPDM | 70 ft.-lbs. |
| C MAUSER ® SM series 275/330 gallon | FKM/FPM | 70 ft.-lbs. |
| D 2" plug in 150 mm lid, vented and solid | EPDM/FKM | 20-25 ft.-lbs. |
| E 56 mm plug in 150 mm lid vented and solid | EPDM/FKM | 20-25 ft.-lbs. |

All UN 31HA1 and 31 HG1 Composite IBC's 40CFR § 178.707 (a) (5) that are supplied with lids, cages, pallets and service equipment must be closed for shipment using only the components supplied and specified in the design qualification tests for that IBC.

remove this plug. Fitting should be done through the 6" or 3" opening.)

VALVE NUT - 55 FT LBS
 note: caps, valves, and plugs must have gaskets to seal

CLOSURE SPECIFICATIONS FOR IBC'S

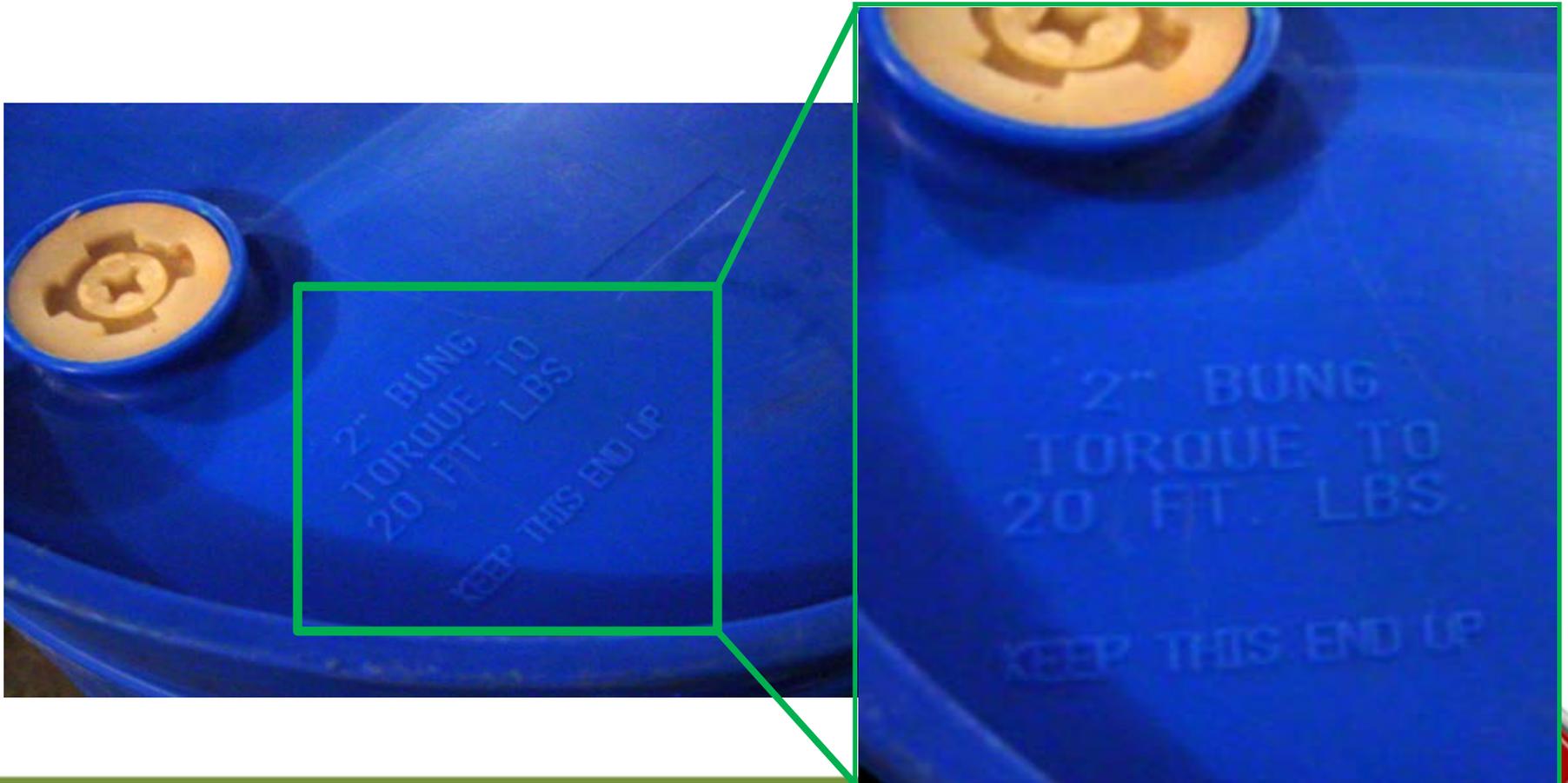
FILL PORT CAP AND VALVE MUST BE TORQUED TO THE FOLLOWING:

6" AND 9" FILL PORT CAP - 75 FT LBS



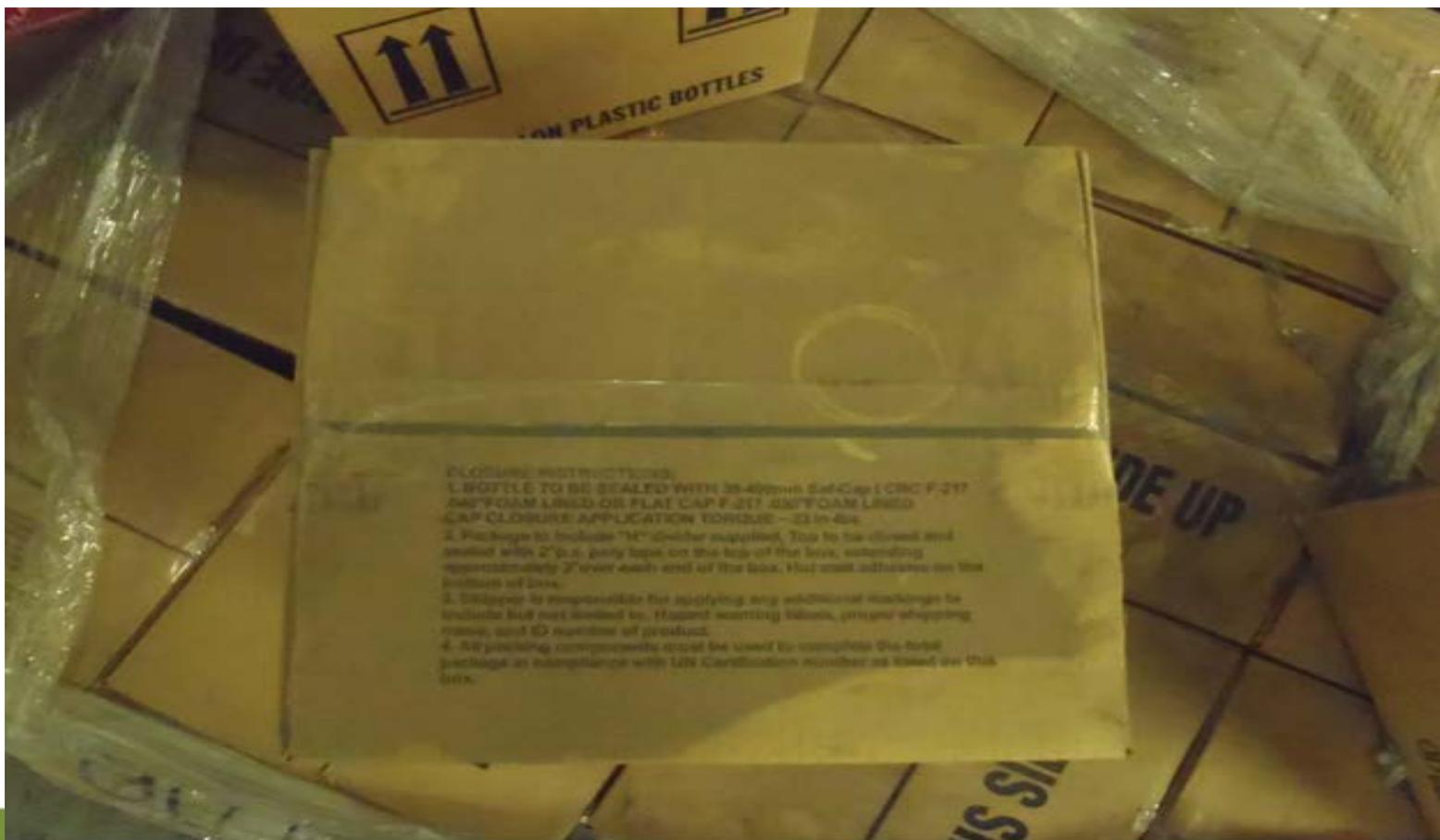


Embossed





Printed on Package





Shipper 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 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)



1A1/Z1.4/150/05
USA/0000

§178.502; §178.503





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





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) | Codes (6) | 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 |

§172.301(d)





Inhalation Hazard



Optional with label

§172.033



Hazardous Substance and Marine Pollutants



§172.322, §172.324



Additional Requirements of Subpart D

- Prohibited marking – §172-303
- Limited Quantities – §172.301
- 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





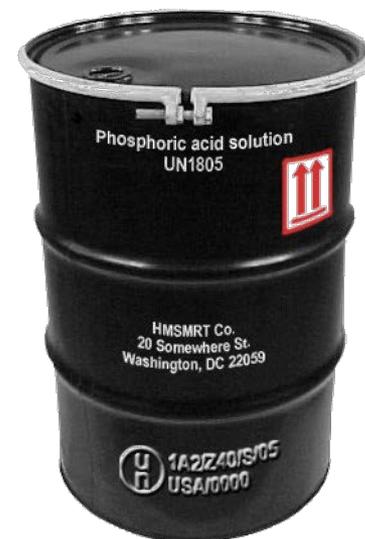
Display of Markings

- 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





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 | B52, IB3, T4, TP1, TP29 | 150 | 202 | 242 | 5L | 60L |
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| | Phosphoric acid solution | 8 | UN1805 | III | 8 | A7, IB3, N34, T4, TP1 | 154 | 203 | 241 | 5L | 60L |

§172.101 Hazardous Materials Table Excerpts

§172.102





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

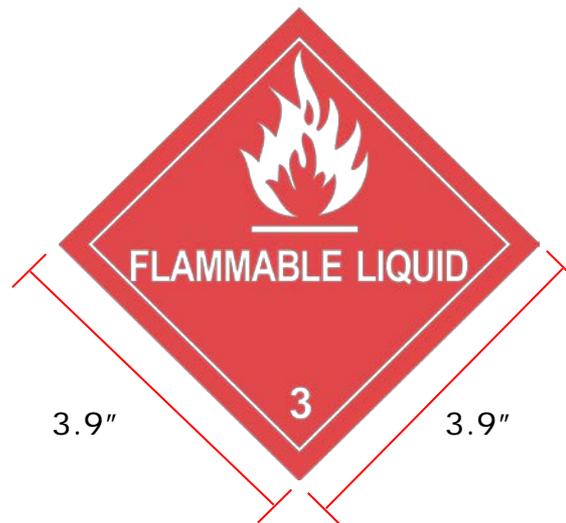




Label Specifications

■ Hazard labels

- Design
- Size
- Color



■ Cargo Aircraft Only

- Rectangle
- Danger



§172.407



4.7"

4.3"



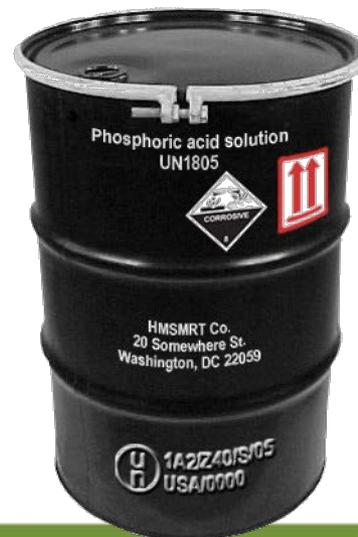
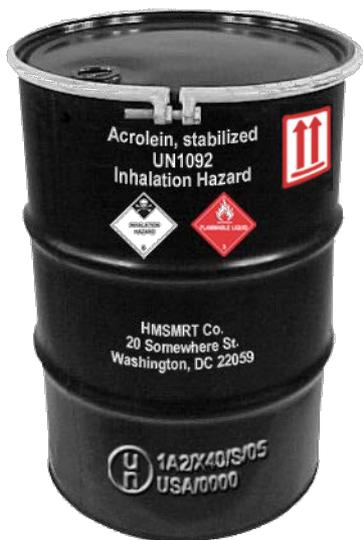
Placement of Labels

- 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





Completed Examples



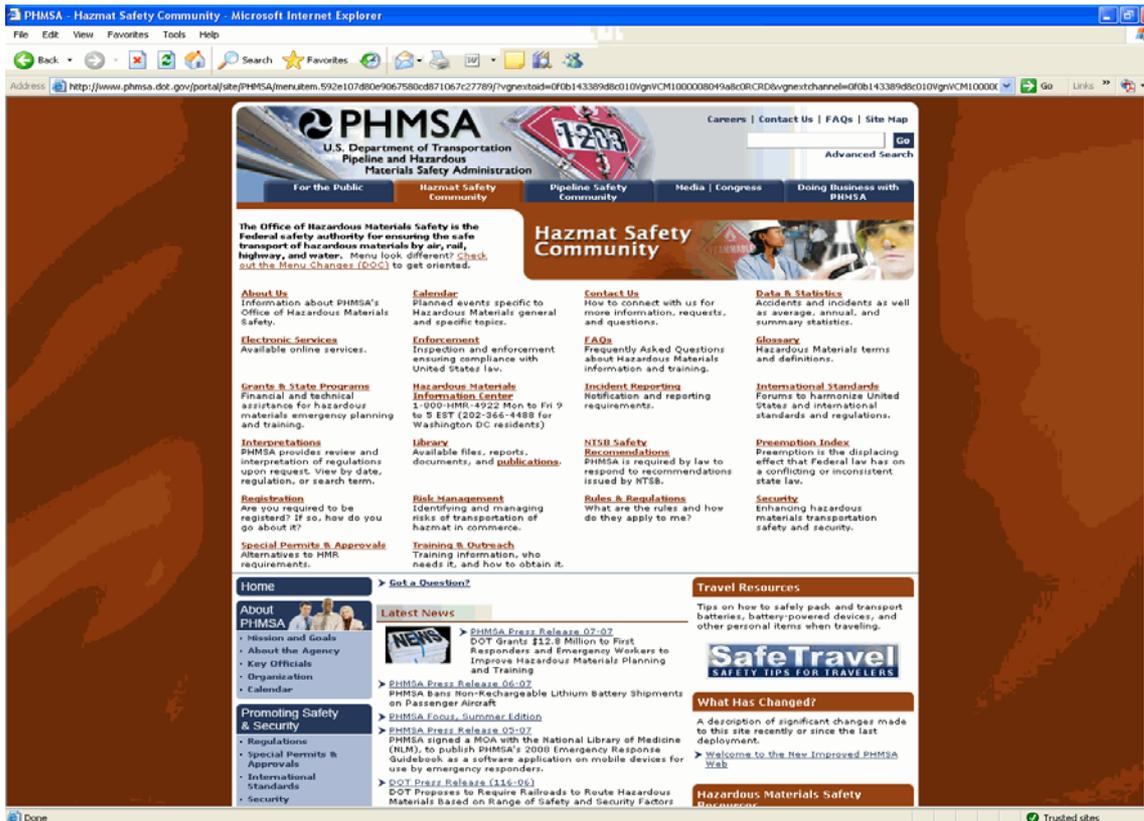


Label Questions?





Where to Find More Information . . .



<http://hazmat.dot.gov>





How You Reach Us

Hazardous Materials INFO-LINE

1-800-HMR49-22 (1-800-467-4922)

Hours of Operation: 9 am – 5 pm ET



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

E-mail: infocntr@dot.gov



