

## Conversion Factors §171.10

For compatibility with international transportation standards, most units of measure used in Subchapter C of the 49 CFR are expressed using International System of Units (SI).

Where SI units appear (L, kg, kPa) they are the regulatory standard. U.S. standard or customary units, (gal, lbs, psi) appearing in parentheses following SI units are for information only and not intended to be the regulatory standard.

10 kPa = 1.45 psi
75 kPa = 10.9 psi
95 kPa = 13.8 psi
100 kPa = 14.5 psi
150 kPa = 21.8 psi
250 kPa = 36.3 psi
1 kg = 2.2 lb
25 kg = 55 lb
50 kg = 110 lb
100 kg = 220 lb
150 kg = 330 lb
200 kg = 440 lb
250 kg = 551 lb
0.47 L = 1 pint (US)
0.95 L = 1 quart (US)
1 L = .264 gal (US)
3.8 L = 1 gal (US)
4 L = 1.06 gal (US)
5 L = 1.32 gal (US)
10 L = 2.6 gal (US)

## Packing Group (PG)

Packing group means a grouping according to the degree of danger presented by hazardous materials. Class 2, Class 7, Division 6.2 (other than regulated medical wastes), and ORM-D materials do not have packing groups.

**Packing Group I-Great Danger**

**Packing Group II-Medium Danger**

**Packing Group III-Minor Danger**

References for all Hazardous Materials Performance Packaging Standards and Tests can be found in the Code of Federal Regulations, Title 49, Part 178.



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

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U.S. Department of Transportation  
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**G U I D E T O**

**PERFORMANCE  
PACKAGING  
CODES**

FOR USE IN HAZARDOUS MATERIALS TRANSPORTATION

NOTE: This document is for general guidance only and must not be used to determine compliance with 49 CFR, Parts 100-185.

## Non-Bulk Packaging Codes

### §§178.504 - 178.521

1A1 Steel drum, non-removable head	4A Steel box
1A2 Steel drum, removable head	4B Aluminum box
1B1 Aluminum drum, non-removable head	4C1 Wood box, ordinary
1B2 Aluminum drum, removable head	4C2 Wood box, sift-proof walls
1D Plywood drum	4D Plywood box
1G Fiber drum	4F Reconstituted wood box
1H1 Plastic drum, non-removable head	4G Fiberboard box
1H2 Plastic drum, removable head	4H1 Plastic box, expanded
1N1 Metal drum, non-removable head	4H2 Plastic box, solid
1N2 Metal drum, removable head	5H1 Woven plastic bag, unlined or non-coated
2C1 Wooden barrel, bung type	5H2 Woven plastic bag, sift-proof
2C2 Wooden barrel, slack type, removable head	5H3 Woven plastic bag, water-resistant
3A1 Steel jerrican, non-removable head	5H4 Plastic film bag
3A2 Steel jerrican, removable head	5L1 Textile bag, unlined or non-coated
3B1 Aluminum jerrican, non-removable head	5L2 Textile bag, sift-proof
3B2 Aluminum jerrican, removable head	5L3 Textile bag, water-resistant
3H1 Plastic jerrican, non-removable head	5M1 Paper bag, multi-wall
3H2 Plastic jerrican, removable head	5M2 Paper bag, multi-wall water-resistant

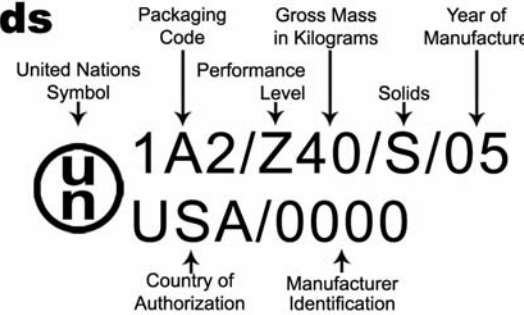
### §§178.522 and 178.523

6HA1 Plastic receptacle within a protective steel drum
6HA2 Plastic receptacle within a protective steel crate or box
6HB1 Plastic receptacle within a protective aluminum drum
6HB2 Plastic receptacle within a protective aluminum crate or box
6HC Plastic receptacle within a protective wooden box
6HD1 Plastic receptacle within a protective plywood drum
6HD2 Plastic receptacle within a protective plywood box
6HG1 Plastic receptacle within a protective fiber drum
6HG2 Plastic receptacle within a protective fiberboard box
6HH1 Plastic receptacle within a protective plastic drum
6HH2 Plastic receptacle within a protective plastic box
6PA1 Glass, porcelain, or stoneware receptacles within a protective steel drum
6PA2 Glass, porcelain, or stoneware receptacles within a protective steel crate or box
6PB1 Glass, porcelain, or stoneware receptacles within a protective aluminum drum
6PB2 Glass, porcelain, or stoneware receptacles within a protective aluminum crate or box
6PC Glass, porcelain, or stoneware receptacles within a protective wooden box
6PD1 Glass, porcelain, or stoneware receptacles within a protective plywood drum
6PD2 Glass, porcelain, or stoneware receptacles within a protective wickerwork hamper
6PG1 Glass, porcelain, or stoneware receptacles within a protective fiber drum
6PG2 Glass, porcelain, or stoneware receptacles within a protective fiberboard box
6PH1 Glass, porcelain, or stoneware receptacles within a protective expanded plastic packaging
6PH2 Glass, porcelain, or stoneware receptacles within a protective solid plastic packaging

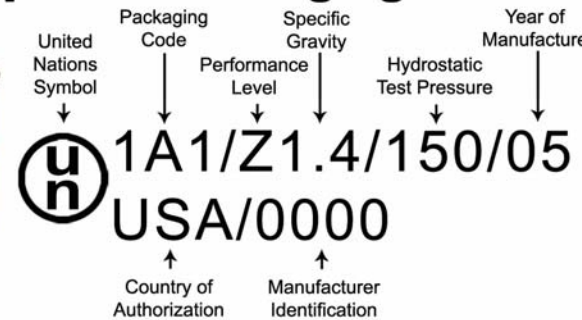
## Combination Packaging



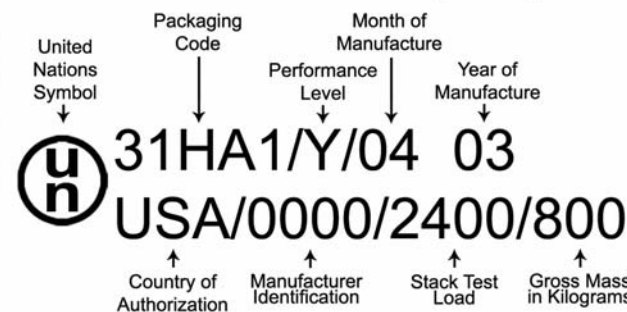
## Single, Combination, or Composite Packaging - Solids



## Single or Composite Packaging - Liquids



## Intermediate Bulk Containers (IBC)



## Interpreting Markings §§178.502 and 178.503

**United Nations Symbol:** For embossing metal receptacles, the letters UN may be applied in place of the symbol.

**Packaging Code:** Designates the type of packaging and material of construction. A letter "W" designates associate administrator approval. A letter "V" designates special "variation" packaging.

**Performance Level:** Identifies the performance standard for successful testing of the packaging.

X - For packagings meeting **Packing Group I, II and III tests.**  
 Y - For packagings meeting **Packing Group II and III tests.**  
 Z - For packagings meeting **Packing Group III tests.**

**Specific Gravity:** Specific gravity for which the packaging design type has been tested. If the specific gravity does not exceed 1.2, the designation may be omitted.

**Gross Mass:** Packaging type tested for maximum gross mass in kilograms.

S: Designates that the packaging is intended to contain solids or inner packagings.

**Hydrostatic Test Pressure:** Internal Hydrostatic Test Pressure in Kilopascals. This test is not required for inner packaging of combination packaging.

**Year of Manufacture:** Last two digits of year of manufacture. Plastic drums and jerricans (1H and 3H) must be marked with the month of manufacture. The month marking may be located elsewhere on the package.

**Country of Authorization:** Country designation code indicates where the package is manufactured and marked.

**Manufacturer Identification:** Name and address or authorized symbol of packaging manufacturer or certifying agency.

**Minimum Thickness:** For metal or plastic drums, jerricans or the outer packaging of composite packaging intended for reuse or reconditioning.

R: Reconditioned packaging.

L: Reconditioned packaging having successfully passed a leakproofness test. This test is not required for inner packaging of combination packaging.

Note: Additional marking requirements for Reconditioned packaging are found in §178.503.

### Additional Requirements for Intermediate Bulk Containers (IBC)

**Month and Year:** For IBCs, the month and year of manufacture.

**Stacking Test Load:** For IBCs, the stacked test load in kilograms. A number "0" shows that the IBC is not designed for stacking.

Note: Standards and codes for IBCs are found in §178.702 - 178.710

## Required Tests for Non-Bulk Packaging

**Drop Test (§178.603)** All packaging design types.

**Leakproofness Test (§178.604)** All packaging design types intended for liquids.

**Hydrostatic Test (§178.605)** All metal, plastic, and composite design types intended to contain liquids.

**Stacking Test (§178.606)** All packaging design types other than bags.

**Cooperage Test (§178.607)** All bung-type wooden barrels.

**Vibration Test (§178.608)** All packaging design types.

**Infectious Substances** See §178.609 for test requirements for packagings for infectious substances.

**Pressure Differential (§173.27)** Packagings intended for air transport.