

# Hazmat Made Easier Handbook

Second  
Edition



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## Marking (Part 172, Subpart D)

Markings play an important part in the hazmat transportation process because they provide information about the hazardous material inside a packaging, freight container, or transport vehicle.

Marking requirements apply to non-bulk and bulk packagings transported by rail, air, vessel, and highway. Markings are sometimes confused with labeling and placarding. Labels and placards communicate the hazard class or division of the hazardous material; markings provide additional and more specific information about the hazmat.



### **Specifications (172.304)**



Markings must be durable, in English, and printed on or affixed to the surface of a package or on a label, tag, or sign. Markings must be:

- displayed on a background of sharply contrasting color (like black letters on a white box),
- not concealed or hidden by other labels or attachments, and
- located away from any other markings, like advertising or trademarks, that could reduce their effectiveness substantially.

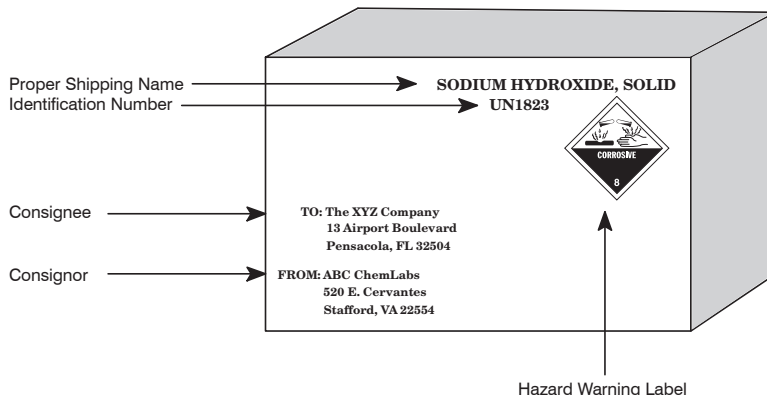
### **Non-bulk markings (172.301)**

Non-bulk packagings must be marked with:

- The proper shipping name.
- Technical names, if required.
- Identification numbers.

## Marking

- The consignee's or consignor's name and address.
- A DOT-SP (special permit number), if required



The consignee's or consignor's name and address are not required if the non-bulk package is transported by highway only and will not be transferred from one motor carrier to another, or if it is transported as part of a carload lot, truckload lot, or freight container load, and the entire contents are shipped from one consignor to one consignee.

## Large quantities of non-bulk packages (172.301)

A transport vehicle or freight container carrying a single hazmat in non-bulk packages must be marked on each side and each end with the hazmat's identification number, subject to the following:

- Each package is marked with the same proper shipping name and identification number;
- The aggregate gross weight of the hazmat is 4,000 kg (8,820 lb) or more;
- All of the hazmat is loaded at one loading facility; and
- The transport vehicle contains no other hazmat or non-hazardous material.

This requirement does not apply to Class 1 material, Class 7 material, or non-bulk packages that do not require identification numbers (such as limited quantities or ORM-D).

### **Poisonous hazmat (172.313)**

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A transport vehicle or freight container loaded at one loading facility with 1,000 kg (2,205 lb) or more of PIH material in Hazard Zone A or B in non-bulk packaging, all with the same shipping name and identification number, must be marked with the proper identification number on each side and each end.

If the transport vehicle or freight container has more than one PIH material that requires the markings just covered, the load must be marked with an identification number for only one of the hazardous materials. You determine the identification number by the following:

- The identification number of the hazmat having the greatest aggregate gross weight for different materials in the same hazard zone.
- The identification number of the hazmat for Hazard Zone A material when you have different materials in both Zone A and B.

### **Bulk markings (172.302)**

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Unless specifically excepted from the regulations, bulk packagings containing hazmat must be marked with the identification number specified in the Hazardous Materials Table for that material.

The identification number may be displayed on an orange panel, a placard, or on a white square-on-point configuration with the same outside dimensions as a placard.



## Marking



The numbers must be marked on:

- Each side and each end if the packaging has a capacity of 3,785 L (1,000 gallons) or more.
- Two opposing sides if the packaging has a capacity less than 3,785 L (1,000 gallons).
- Each side and each end of a tube trailer motor vehicle with cylinders permanently installed.

### **Tanks (172.326 & 172.328)**

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Besides identification number markings, portable tanks containing a hazardous material must have the hazmat's proper shipping name legibly marked on two opposite sides, and the owner or lessee's name also displayed.

Except for certain nurse tanks, cargo tanks transporting Class 2 hazmat must be marked on each side and each end with the proper shipping name or appropriate common name of the gas.

## Marking

A transport vehicle or freight container must be marked with identification numbers on each side and each end if the markings displayed on a portable tank or cargo tank transported on or in the transport vehicle or freight container are not visible.

A permanently installed cargo tank inside an enclosed cargo body of a transport vehicle or freight container is required to have the identification numbers displayed only on each side and end of the tank that are visible when the cargo tank is accessed.

### **NON-ODORIZED marking (172.301, 172.326, 172.328 & 172.330)**

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After September 30, 2006, no person may offer for transportation or transport certain cylinders (2P, 2Q, 39), portable tanks, cargo tanks and tank cars containing unodorized liquefied petroleum gases (LPG) unless the packagings are legibly marked NON-ODORIZED or NOT ODORIZED.

- Cylinders must be marked by the proper shipping name.
- Portable tanks must be marked on two opposing sides near the proper shipping name or the placards.
- Cargo tanks must be marked on two opposing sides near the proper shipping name or the placards.
- Tanks cars and multi-unit tank car tanks must be marked on two opposing sides near the proper shipping name or the placards. The marking may appear on a tank car or multi-unit tank car tank used for both unodorized and odorized LPG.

## Marking

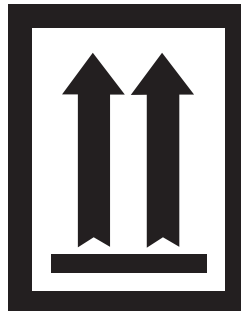
### Additional marking requirements

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#### Orientation arrows (172.312)

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Non-bulk combination packages having inner packagings containing liquid hazardous materials, single packagings fitted with vents (mandatory January 1, 2008), or open cryogenic receptacles intended for the transport of refrigerated liquefied gases (mandatory January 1, 2008), must be legibly marked with package orientation markings that are similar to the illustration shown.



The arrows must be either black or red on white or other suitable contrasting background and commensurate with the size of the package (mandatory January 1, 2008). Depicting a rectangular border around the arrows is optional.

Arrow markings are not required on non-bulk packagings with:

- Inner packagings that are cylinders.
- Flammable liquids in inner packagings of 1 L or less, except for transport by air.
- Flammable liquids in inner packagings of 120 mL (4 fluid oz.) or less, when packed with sufficient absorption material to completely absorb the liquid contents, when transported by air.
- Liquids in manufactured articles (alcohol or mercury in thermometers) that are leak-tight in all orientations.
- Hermetically-sealed inner packagings not exceeding 500 ml.



## Marking

- Liquid infectious substances in primary receptacles not exceeding 50 ml.
- Class 7 radioactive material in Type A, IP-2, IP-3, Type B(U), or Type B(M) packages.

### **Inhalation hazards and poisons (172.313)**

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Packagings containing materials poisonous-by-inhalation must be marked "INHALATION HAZARD," in addition to the required labels or placards or proper shipping name.



The marking is not required if the package already has a poison gas or inhalation hazard label or placard that displays the words "Inhalation Hazard."

The word "POISON" must be permanently marked on each non-bulk plastic outer packaging used as a single or composite packaging for Division 6.1 hazmat.

"PG III" may be marked adjacent to the POISON label on a package containing a Division 6.1 PG III hazmat.

### **Limited quantities (172.315)**

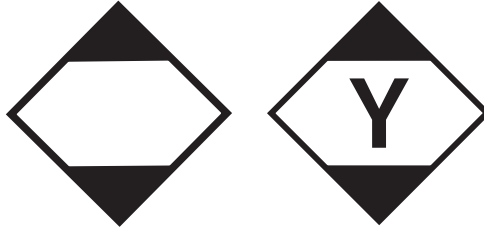
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A package containing a limited quantity must be marked with the proper shipping name and identification number

OR

Must be marked with the square-on-point limited quantity marking as shown below left (packages meeting the requirements for air transport must be marked with the square-on-point "Y" limited quantity marking as shown below right)

## Marking



OR

Before January 1, 2012, marked with the identification number in a square-on-point border and no proper shipping name as shown below.



Before January 1, 2014, a limited quantity properly marked as an ORM-D is not required to be marked with the square-on-point limited quantity marking.

Before January 1, 2013, for transportation by air, a limited quantity properly marked as an ORM-D-AIR is not required to be marked with the square-on-point “Y” limited quantity marking.

## **ORM-Ds (172.316)**

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Packagings that contain a material classed as a consumer commodity (ORM-D) must be marked on at least one side or end with the ORM-D designation — immediately following or below the proper shipping name. If the shipment is to be by air, the marking must be ORM-D-AIR.

## Marking



Both the ORM-D and ORM-D-AIR markings must be within a rectangle that is approximately 6.3 mm (0.25 in) larger on each side than the designation.

Before January 1, 2013, an air shipment that meets the requirements for an ORM-D may be marked with ORM-D-AIR. Beginning January 1, 2013, only the appropriate square-on-point limited quantity marking may be used.

Before January 1, 2014, packages of ORM-D material may be marked with the ORM-D marking. Beginning January 1, 2014, only the appropriate square-on-point limited quantity marking may be used.

### **KEEP AWAY FROM HEAT handling mark (172.317)**

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For transportation by aircraft, each package containing Division 4.1 self-reactive substances or Division 5.2 organic peroxides must be marked with the KEEP AWAY FROM HEAT marking.

The marking must be durable, legible, and displayed on a background of contrasting color.

### **Marine pollutants (172.322)**

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Marine pollutants in bulk packagings of 3,785 L (1,000 gallons) or more must be marked on each side and each end with the marine pollutant marking. Bulk packagings less than 3,785 L (1,000 gallons) must be marked on at least two opposing sides or ends.

However, a bulk packaging displaying a label or placard is not required to display the marking, except for transportation by vessel.

Non-bulk packaging containing marine pollutants transported by vessel must display the marine pollutant marking.

## Marking

Effective January 14, 2010, the MARINE POLLUTANT mark must appear as follows:



The MARINE POLLUTANT mark **is not** required on single or combination packagings when each single package or each inner packaging of combination packagings has a net quantity of 5 L (1.3 gallons) or less for liquids or a net mass of 5 Kg (11 pounds) or less for solids.

The MARINE POLLUTANT mark **is not** required on a combination packaging containing a marine pollutant other than a severe marine pollutant in inner packagings each that contains 5 L (1.3 gallons) or less net capacity for liquids or 5 Kg (11 pounds) or less net capacity for solids.

## Infectious substances (172.323)

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A bulk packaging containing a regulated medical waste must be marked with a BIOHAZARD marking:

- On two opposing sides or two ends other than the bottom if the packaging has a capacity of less than 3,785 L (1,000 gallons). The BIOHAZARD marking must measure at least 152.4 mm (6 inches) on each side and must be visible from the direction it faces.
- On each end and each side if the packaging has a capacity of 3,785 L (1,000 gallons) or more. The BIOHAZARD marking must measure at least 152.4 mm (6 inches) on each side and must be visible from the direction it faces.

## Marking

For a bulk packaging contained in or on a transport vehicle or freight container, if the BIOHAZARD marking on the bulk packaging is not visible, the transport vehicle or freight container must be marked as required on each side and each end.

The background color for the BIOHAZARD marking must be orange and the symbol and letters must be black. Except for size, the BIOHAZARD marking must appear as follows:



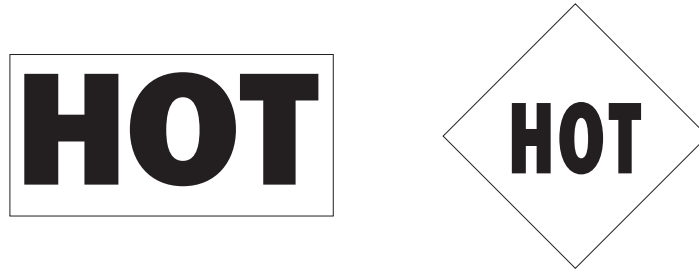
The BIOHAZARD marking must be displayed on a background of contrasting color. It may be displayed on a plain white square-on-point configuration having the same outside dimensions as a placard.

## **Elevated temperature materials (172.325)**

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Except for bulk packagings containing molten aluminum or molten sulfur, a bulk packaging containing an elevated temperature material must be marked on two opposing sides with the word "HOT" in black or white Gothic lettering on a contrasting background. Packaging containing molten aluminum or molten sulfur must instead be marked "MOLTEN ALUMINUM" or "MOLTEN SULFUR," respectively.

## Marking



You can also combine the “HOT” marking with the required identification number on a white square-on-point configuration. The identification number must be displayed in the center of the configuration and the word “HOT” may be displayed in the upper corner.



## **Overpacks (173.25)**

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Overpacks must be marked with the proper shipping name, identification number, and labeled for each hazmat contained inside, unless the marking and labels on the inside packagings are visible.

Overpacks must be marked with the word “OVERPACK” when specification packagings are required, unless the specification markings on the inside packagings are visible.

Orientation arrows must be marked on two opposing vertical sides of an overpack with the arrows pointing in the correct direction, and each package in the overpack must be packed with its filling hole(s) up.

## **Marking**

When packages of limited quantity materials are overpacked, packages bearing the ORM-D AIR marking (until December 31, 2012) or the ORM-D marking (until December 31, 2013) must be marked "OVERPACK" unless all required markings are visible through the overpack.

