Hazmat Made Easier Handbook

Second Edition

J. J. Keller & Associates, Inc.®
Since 1953

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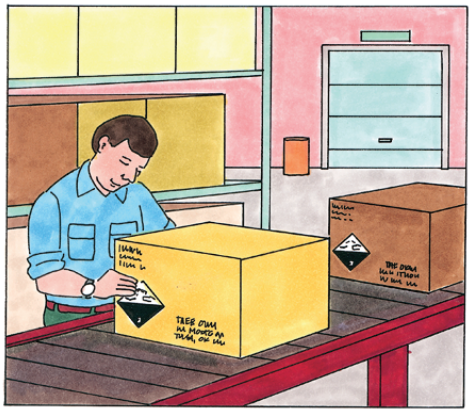
Labeling
(Part 172, Subpart E)



Hazard warning labels are meant to communicate immediate warning of a hazmat's hazards. The colors and symbols on the various labels are designed to provide easy recognition of the hazard(s) a hazmat presents in transportation. Labeling requirements are targeted almost exclusively at non-bulk packaging. The responsibility for the labeling process belongs to the person offering the hazmat for transportation. However, the carrier also is responsible. The carrier must make sure that packages containing hazmat have been properly labeled according to the requirements before accepting and transporting them.

Label specifications (172.407)

Labels must be durable, weather resistant, and able to withstand, without deterioration or substantial change in color, a 30-day exposure to transport conditions.

Each diamond-shaped label must be at least 100 mm (3.9 inches) on each side, with each side also having a solid line inner border 5.0 to 6.3 mm (0.2 to 0.25 inch) from the edge of the label.

The hazard class/division number must be at least 6.3 mm (0.25 inch) and not greater than 12.7 mm (0.5 inch). If text indicating a hazard is displayed, the text must be shown in letters measuring at least 7.6 mm (0.3 inch) in height. The words "Spontaneously" and "When Wet" must be at least 5.1 mm (0.2 inch) in height, respectively, for SPONTANEOUSLY COMBUSTIBLE or DANGEROUS WHEN WET labels.

The background color for the various labels must be as prescribed in 172.411 through 172.448, and the printing, inner border and symbol on each label must be as shown.

In most cases, the symbol, test, numbers, and border must be black. However, white may be used on a label with a one color background of green, red, or blue. White must be used for the text and class number for the CORROSIVE label.

Primary and subsidiary labels (172.402)

There are two types of hazard warning labels. A primary hazard label indicates a hazmat's most hazardous property; a subsidiary hazard label indicates other less hazardous properties.

Subsidiary labels have numbers in the lower corner, just like primary labels.

You may see subsidiary labels that have no number in the lower corner. Subsidiary labels without a number in the lower corner could not be used in domestic transportation starting October 1, 2005.

When primary and subsidiary hazard labels are required together, they must be displayed next to each other (within 6 inches).

Determining labels (172.101 & 172.400)

The Hazardous Materials Table is used for determining appropriate hazard warning labels.

First, locate the proper shipping name in Column 2 of the Table.

Then, refer to Column 6 for the appropriate label code(s).

The first label code indicates the hazmat's primary hazard. Any additional label codes listed are subsidiary hazards. Usually the label code is the same as the hazard class or division for the label. You can also use the Label Substitution Table in 172.101(g). There is another table located in 172.400, that should be used in determining additional subsidiary labels.

For the 6.1 label code, there are two possible labels. Hazmat that has a Hazard Zone A or B requires a POISON INHALATION HAZARD label; any other 6.1 hazmat will require a POISON label.

Exceptions (172.400a)

As mentioned earlier, not all non-bulk packages of hazmat need to be labeled. Labels are not required on:

- A cylinder or Dewar flask (173.320) containing a Division 2.1, 2.2, or 2.3 material; that is not overpacked; and that is durably and legibly marked in accordance with CGA Pamphlet C-7, Appendix A.
- A package or unit of military explosives, including ammunition, shipped by or on behalf of the U.S. Department of Defense (DOD) when in freight container-load, car-load, or truck-load shipments, if loaded and unloaded by the shipper or DOD, or in unitized or palletized break-bulk shipments by cargo vessel under charter to DOD, if at least one required label is displayed on each unitized or palletized load.
- A package of hazmat, other than ammunition, that is loaded and unloaded under the supervision of DOD personnel and is escorted by DOD personnel in a separate vehicle.
- A compressed gas cylinder that is permanently mounted in or on a transport vehicle.
- A freight container, aircraft unit load device, or portable tank that is placarded in accordance with or identified as provided in the International Civil Aviation Organization (ICAO) Technical Instructions.
- An overpack or unit load device in or on which labels that represent the hazard(s) inside are visible.
- A package of low specific-activity radioactive material when being transported in a conveyance assigned for the exclusive use of the consignor under 173.427(a)(6).
- A package containing a PIH material in a closed transport vehicle or freight container may be excepted from labeling or placarding under certain conditions in 49 CFR 171.23.
- Not withstanding the provisions of 49 CFR 172.402(a), a Division 6.1 subsidiary label is not required on a package

containing a Class 8 (corrosive) material that has a subsidiary hazard of Division 6.1 (poisonous) if the toxicity of the material is based solely on the corrosive destruction of tissue rather than systemic poisoning. In addition, a Division 4.1 subsidiary hazard label is not required on a package bearing a Division 4.2 label.

Certain exceptions for labeling requirements are also provided for small quantities and limited quantities in 49 CFR Part 173.

Label placement (172.406)

A label must be printed or affixed to the outside surface of a package containing hazmat, but not on the bottom. Labels should not be hidden or concealed; they must be easily seen. Labels must be on a background of contrasting color or have a dotted or solid line outer border. You must also put the label on the same side and near the proper shipping name, when possible.

Duplicate labeling is not usually required on a package, only one of each required label is necessary. However, duplicate labeling may be required for larger packages and radioactive packages. See 172.406(e).

What if the package is very small? A label may be printed on or put on a securely affixed tag or affixed by other suitable means to:

- a package that is smaller than the required label if it is not a radioactive hazmat;
- a cylinder; and
- a package that has an irregular surface.

Mixed and consolidated packaging (172.404)

Hazmat with different hazard classes packed in the same packaging, or within the same outside container or overpack, must be labeled for each of the different hazard classes.

Also, an outside container or overpack must be labeled as required for each class of hazmat when two or more packages with compatible hazardous materials are put in the outside container or overpack.

Label modifications (172.405)

Text indicating a hazard is not required on Class 1, 2, 3, 4, 5, 6, and 8 primary or subsidiary labels.

The OXIDIZER label may be modified to display the word “OXYGEN” and the class number “2,” which can then be used instead of the NON-FLAMMABLE GAS and OXIDIZER labels for packages with the proper shipping names “Oxygen, compressed” or “Oxygen, refrigerated liquid.” The word “OXYGEN” must appear on the label.

The POISON label may be modified to display the text “PG III” below the midline of the label for packages containing a Division 6.1, Packing Group III hazmat.

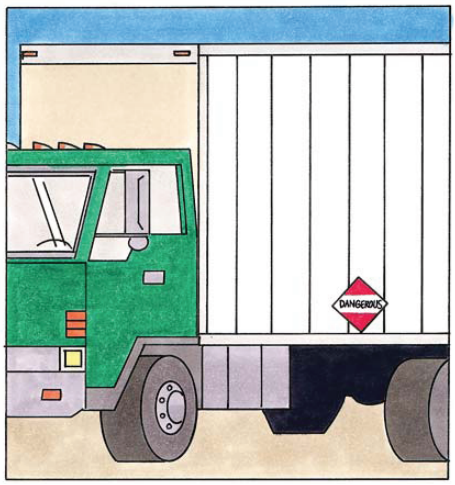
ORGANIC PEROXIDE label (172.427)

HM-215I revised the ORGANIC PEROXIDE label. The new label reflects the fact that organic peroxides are highly flammable and enables transport workers to readily distinguish peroxides from oxidizers.

Except for size and color, the ORGANIC PEROXIDE label must be as follows:

The background on the label must be red in the top half and yellow in the lower half. White may also be used for the symbol for the ORGANIC PEROXIDE label.

Placarding (Part 172, Subpart F)



Placards are often confused with labels, simply because they look so much alike. Placards are much larger and are usually placed on much larger packages.

The purpose of placards is very similar to the purpose of labels. Placards communicate the hazards associated with various materials in transportation, and also provide emergency personnel with the information they need when incidents occur — two good reasons why it is important to make sure you select and display the right placards.

Placarding requirements (172.504)

Each bulk packaging, freight container, unit load device, transport vehicle, or rail car containing hazmat must be placarded, with some exceptions.

To determine the placards required, you must know:

- Whether the packaging is bulk or non-bulk.
- The hazard category (class, division, packing group, or description), and subsidiary hazard(s), if any.
- The weight of non-bulk packages in each hazard category.

Table 1 (172.504)

The most dangerous hazmat categories are located in Table 1. Any quantity of hazmat in the categories listed in Table 1 must be placarded.

Table 1		
Category of material (Hazard class or division number and additional description, as appropriate)	**Placard name**	**Placard design section reference (§)**
1.1	EXPLOSIVES 1.1	172.522
1.2	EXPLOSIVES 1.2	172.522
1.3	EXPLOSIVES 1.3	172.522
2.3	POISON GAS	172.540
4.3	DANGEROUS WHEN WET	172.548
5.2 (Organic peroxide, Type B, liquid *or* solid, temperature controlled).	ORGANIC PEROXIDE	172.552
6.1 (Material poisonous by inhalation (see §171.8 of this subchapter))	POISON INHALATION HAZARD	172.555
7 (Radioactive Yellow III label only)	RADIOACTIVE[1]	172.556

[1] RADIOACTIVE placard also required for exclusive use shipments of low specific activity material and surface contaminated objects transported in accordance with 173.427(b)(4) and (5) or (c) of this subchapter.

Table 2 (172.504)

The remaining hazard categories are in Table 2. Any quantity of hazmat in Table 2 must also be placarded, with some exceptions allowed in the regulations.

Table 2		
Category of material (Hazard class or division number and additional description, as appropriate)	**Placard name**	**Placard design section reference (§)**
1.4	EXPLOSIVES 1.4	172.523
1.5	EXPLOSIVES 1.5	172.524
1.6	EXPLOSIVES 1.6	172.525
2.1	FLAMMABLE GAS	172.532
2.2	NON-FLAMMABLE GAS	172.528
3	FLAMMABLE	172.542
Combustible liquid	COMBUSTIBLE	172.544
4.1	FLAMMABLE SOLID	172.546
4.2	SPONTANEOUSLY COMBUSTIBLE	172.547
5.1	OXIDIZER	172.550
5.2 (Other than organic peroxide, Type B, liquid or solid, temperature controlled)	ORGANIC PEROXIDE	172.552
6.1 (Other than material poisonous by inhalation)	POISON	172.554
6.2	(None)	
8	CORROSIVE	172.558
9	CLASS 9 (see §172.504(f)(9))	172.560
ORM-D	(None)	

Placarding exceptions (172.504) 1,001 lb rule (172.504)

A transport vehicle or freight container that has less than 454 kg (1,001 lb) aggregate gross weight of hazmat in non-bulk packages, covered by Table 2, is not required to display placards. This exception does not apply to bulk packages or materials with subsidiary hazards that must be placarded.

DANGEROUS placard (172.504)

A transport vehicle, rail car, freight container, or unit load device containing non-bulk packagings of two or more categories of Table 2 hazmat may display a DANGEROUS placard instead of the separate placards specified in Table 2.

When 1,000 kg (2,205 lb) or more of one hazard category is loaded at one facility, on one vehicle, rail car, freight container, or unit load device, the DANGEROUS placard can not be used instead of the placard specified in Table 2.

For example, when three or more different categories of Table 2 hazmat are in one vehicle, rail car, freight container, or unit load device, and one material is over 1,000 kg (2,205 lb) and an individual class placard from Table 2 is required, the DANGEROUS placard may still be displayed for other Table 2 categories falling under the 1,000 kg (2,205 lb) limit.

Residue (172.504)

A non-bulk packaging containing just the residue of a Table 2 hazmat does not have to be included when determining placards for a transport vehicle, rail car, freight container, or unit load device.

Freight containers/unit load devices (172.512)

A motor vehicle transporting freight containers or aircraft unit load devices that are not required to be placarded is not required to display placards.

Freight containers and unit load devices being transported for delivery to a consignee immediately after an air or water shipment are also allowed to use the exception for less than 454 kg (1,001 lb) of Table 2 materials.

A freight container or aircraft unit load device that is only transported by air and is prepared according to Part 7, Chapter 2, Section 2.7 of the ICAO Technical Instructions is not required to be placarded.

Class 1 (explosives) (172.504)

When more than one division placard is required for Class 1 materials on a transport vehicle, rail car, freight container, or unit load device, only the placard representing the lowest division number must be displayed.

Example: *A transport vehicle carrying Division 1.3, 1.4, and 1.5 materials could be placarded for Division 1.3.*

For shipments of Class 1 materials by aircraft or vessel, the applicable compatibility group letter must be displayed on the required placards.

The EXPLOSIVES 1.4 placard is not required for Division 1.4 Compatibility Group S (1.4S) materials not required to be labeled 1.4S.

Flammable/combustible (172.504)

A FLAMMABLE placard may be used instead of a COMBUSTIBLE placard on a cargo tank or portable tank, or a compartment tank containing flammable and combustible liquids.

Gases (172.504)

A NON-FLAMMABLE GAS placard is not required on a motor vehicle containing a non-flammable gas if the vehicle also contains flammable gas or oxygen and is placarded FLAMMABLE GAS or OXYGEN, as required.

The OXYGEN placard may be used for domestic shipments of "Oxygen, compressed," or "Oxygen, refrigerated liquid," in place of a NON-FLAMMABLE GAS placard.

Oxidizers (172.504)

OXIDIZER placards are not required for Division 5.1 materials on freight containers, unit load devices, transport vehicles, or rail cars that also contain Division 1.1 or 1.2 materials and that are placarded with EXPLOSIVES 1.1 or 1.2 placards, as required.

For transportation by transport vehicle or rail car only, an OXIDIZER placard is not required for Division 5.1 materials on a transport vehicle, rail car, or freight container that also contains Division 1.5 materials and is placarded with EXPLOSIVES 1.5 placards, as required.

Class 9 (172.504)

CLASS 9 placards are not required for domestic transportation, including that portion of international transportation that occurs within the U.S.

Poisons (172.504)

For domestic transportation, a POISON placard is not required on a transport vehicle or freight container required to display a POISON INHALATION HAZARD or POISON GAS placard.

Prohibited & permissive placarding (172.502)

"Drive Safely" is a perfect example of prohibited placarding. Any sign, slogan, or advertisement with color, design, shape, or content that could be confused with any DOT placard is not allowed.

You may not display any DOT placard on a packaging, freight container, unit load device, motor vehicle, or rail car unless the:

- Material offered or transported is a hazmat.
- Placard displayed represents a hazard of the material being offered or transported.
- Placarding is in compliance with the regulations.

Placarding may be displayed for hazmat, even when not required, if done according to the requirements.

Placard placement (172.516)

Placards on a motor vehicle or rail car must be clearly visible from the direction it faces, except from the direction of another transport vehicle or rail car to which the motor vehicle or rail car is coupled.

Required placarding for the front of a motor vehicle may be on the front of a truck-tractor instead of, or in addition to, the placarding on the front of the cargo body attached to the truck-tractor.

Each placard on a transport vehicle, bulk packaging, freight container, or aircraft unit load device must:

- Be securely attached or put in a placard holder.
- Be on a background of contrasting color, or have a dotted or solid line outer border that contrasts with the background color.

- Be clear of appurtenances and devices like ladders, pipes, doors, and tarps.
- Be located so dirt or water is not directed to it from the wheels of the transport vehicle.
- Be located away from any marking (at least 3 inches) that could reduce its effectiveness.
- Have the words or identification number printed on it displayed horizontally, reading from left to right.
- Be maintained in a condition to insure its effectiveness will not be reduced.

ORGANIC PEROXIDE placard (172.552)

HM-215I revised the ORGANIC PEROXIDE placard. The new placard reflects the fact that organic peroxides are highly flammable and enables transport workers to readily distinguish peroxides from oxidizers. Placards meeting the specifications in effect on December 31, 2006, are authorized to continue to be displayed until January 1, 2014, for transportation by highway.

Except for size and color, the ORGANIC PEROXIDE placard must be as follows:

The background on the placard must be red in the top half and yellow in the lower half. The text, division number, and inner border must be black; the symbol may be either black or white.

Use of the new placard will become mandatory January 1, 2014, for transportation by highway.