

## Cargo Tanks: Markings

### **Description:**

Cargo tanks must be marked in accordance with U.S. DOT Hazardous Materials Regulations to verify that the cargo tank is proper for the hazardous materials transported. Specific marking requirements apply to LP-gas and to the cargo tank itself.

### **Regulatory Reference**

49 CFR § 172.101	Hazardous materials tables
49 CFR § 172.304	Marking requirements
49 CFR § 172.328	Cargo tanks
49 CFR § 178.337-17	Marking (Specification MC 331)
49 CFR § 178.338-18	Marking (Specification MC 338)
49 CFR § 180.415	Test and inspection markings

### **Applies to:**

The regulations apply to all cargo tanks used to transport propane or any other LP-gas.

### **General Requirements:**

- (1) The Hazardous Materials Tables found in 49 CFR § 172.101 give labeling, placarding and cargo tank specifications for various commodities. The table entry for liquefied petroleum gas contains the general requirements for propane and other LP-gases. Transporters of ethane-propane mixes need to consult the specific listing for that commodity.
- (2) General marking requirements given in 49 CFR § 172.304 specify that markings:
  - (a) Must be durable, in English and printed on or affixed to the surface of a package or on a label, tag, or sign.
  - (b) Must be displayed on a background of sharply contrasting color;
  - (c) Must be unobscured by labels or attachments; and
  - (d) Must be located away from any other marking (such as advertising) that could substantially reduce its effectiveness.
- (3) Marking requirements for DOT specification MC 331 cargo tanks are found in 49 CFR § 178.337-17 and include:
  - (a) Metal identification plate. Each cargo tank built after July 1, 1985 through October 1, 2004 shall have a corrosion resistant metal plate permanently affixed by brazing or

welding around its perimeter, on the left side (on the right side prior to July 1, 1985) near the front, in a place readily accessible for inspection. It must be maintained in a legible condition. On multi-cargo tank motor vehicles plates shall be attached to each cargo tank at the front in a place readily accessible for inspection. Each insulated cargo tank shall have an additional plate, as described, affixed to the jacket in the location specified. Neither the plate itself nor the means of attachment to the cargo tank or jacket may be subject to attack by the cargo tank contents. If the plate is attached directly to the cargo tank by welding it shall be welded thereto before the cargo tank is post-weld heat treated. The plate shall be plainly marked by stamping, embossing, or other means of forming letters into the metal of the plate, with the following information in addition to that required by the ASME Code, in characters at least 3/8 inch high:

- Vehicle manufacturer\*
- Vehicle manufacturer's serial number
- D.O.T. specification number MC-331
- Vessel material specification number
- Water capacity in pounds (see Note 1)
- Original test date

Note 1: See §173.315(a) of this chapter regarding water capacity.

Each MC 331 cargo tank certified after October 1, 2004 must have a corrosion-resistant metal Name Plate (ASME Plate) and Specification Plate permanently attached to the cargo tank on the left side near the front, in a place accessible for inspection. The plate(s) must be legibly marked in characters at least 3/16 inch high. All plates must be maintained in legible condition. The following information must be marked on the Name Plate:

1. DOT specification number MC331
2. Original test date
3. MAWP (maximum allowable working pressure) in psig
4. Cargo tank design temperature (range) °F to °F
5. Nominal (water) capacity in pounds
6. Maximum design density of lading in pounds per gallon
7. Material specification number—shell (alloy designation number & type)
8. Material specification number—heads (alloy designation number & type)  
[where material thickness are the same, items 8 and 9 may be a combined marking]
9. Minimum thickness—shell in inches
10. Minimum thickness—heads in inches
11. Manufactured thickness—shell in inches [required when additional thickness is provided for corrosion allowance]
12. Manufactured thickness—heads in inches [required when additional thickness is provided for corrosion allowance]
13. Exposed surface area in square feet

\* [Editorial Note: The term “vehicle manufacturer” is confusing to some enforcement personnel who mistakenly expect to see a chassis manufacturer name such as “Ford” on the cargo tank data plate. In reality, the name of the cargo tank motor vehicle assembler is appropriate, but could change if, over its service life, the cargo tank is fitted to more than one chassis by different CTMV assemblers.]

Each MC 331 cargo tank certified after October 1, 2004 must have a corrosion-resistant metal Specification Plate permanently attached to either the cargo tank in conjunction with the Name Plate on the left side near the front, in a place accessible for inspection, or it may be attached to the cargo tank motor vehicle chassis rail. The plate must be legibly marked in characters at least 3/16 inch high. All plate must be maintained in legible condition. The following information must be marked on the Specification Plate:

1. Cargo tank motor vehicle manufacturer
2. Cargo tank motor vehicle certification date
3. Cargo tank manufacturer
4. Cargo tank date of manufacturer month and year
5. Maximum weight of lading in pounds
6. Lining materials, if applicable
7. Cargo tank serial number assigned by cargo tank manufacturer if applicable: if the Specification Plate is attached to the chassis rail, then the cargo tank serial number assigned by the cargo tank manufacturer must be included on the plate.

The markings required on the Name Plate and Specification Plate may be combined on a single plate.

- (b) Each cargo tank must also be marked as required by § 172.328.
- (4) 49 CFR § 172.328 (a) requires proper placards for the commodity shipped.
- 49 CFR § 172.328 (b) requires that a cargo tank transporting a Class 2 material be marked, in lettering no less than 2.0 inches, on each side and each end with
- (a) The proper shipping name specified for the gas in the §172.101 table (e.g., “Liquefied Petroleum Gas”); or
  - (b) An appropriate common name for the material (e.g., “Flammable Gas”).
  - (c) QT/NQT markings. Each MC 330 and MC 331 cargo tank must be marked near the specification plate [Name Plate], in letters no less than 2.0 inches in height, with-
    - (1) “QT”, if the cargo tank is constructed of quenched and tempered steel; or
    - (2) “NQT”, if the cargo tank is constructed of other than quenched and tempered steel.
  - (d) After October 3, 2005, each on-vehicle manually-activated remote shutoff device for closure of the internal self-closing stop valve must be identified by marking “Emergency Shutoff” in letters at least 3/4-inch in height in a color that contrasts with its background, and located in an area immediately adjacent to the means of closure.
- (5) 49 CFR § 180.415 requires that each cargo tank be durably and legibly marked, in English, with the date (month and year) and the type of test or inspection performed. The date must be readily identifiable with the applicable test or inspection. The marking must be in letters and numbers at least 1.25 inches high, on the tank shell near the Name Plate or anywhere on the front head. The type of test or inspection may be abbreviated as follows: V for external visual inspection and test; I for internal visual inspection; P for pressure test; L for lining inspection, K for leakage test; and T for thickness test. For example, the markings

“10-95 P, V, L” would indicate that in October 1995 the cargo tank received and passed the prescribed pressure test, external visual inspection and test, and the lining inspection.

### **Training Requirements:**

There are no prescribed training requirements for the cargo tank marking regulations. Drivers and operators of cargo tank motor vehicles should be trained in the marking requirements as part of their hazmat employee training so that they can ensure that the equipment they operate or drive is in compliance before it is loaded or driven on public roadways.

### **Maintenance and Review**

Many companies incorporate a check of cargo tank marking in pre-trip inspections to avoid being cited for driving a vehicle in violation of marking regulations. It is good practice to include verification of proper cargo tank marking in periodic safety audits conducted by company supervisors, managers, or safety specialists.

### **Additional Information and Resources**

The applicable regulations listed on page 161 can be accessed on the Internet at [www.rspa.dot.gov](http://www.rspa.dot.gov), left clicking on the HAZMAT Safety link in the left column, then left clicking on the “Regulations & Federal Hazmat Law” red diamond.