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another stop-valve or other leak-tight closure at the end of such connection.

(d) Each cargo tank outlet that is not a loading/unloading outlet must be equipped with a stop-valve or other leak-tight closure located as close as practicable to the cargo tank outlet. Any connection extending beyond this closure must be fitted with another stop-valve or other leak-tight closure at the end of such connection.

[Amdt. 178-89, 56 FR 27877, June 17, 1991, as amended by Amdt. 178-97, 57 FR 45465, Oct. 1, 1992; Amdt. 178-118, 61 FR 51341, Oct. 1, 1996]

**§ 178.345-12 Gauging devices.**

Each cargo tank, except a cargo tank intended to be filled by weight, must be equipped with a gauging device that indicates the maximum permitted liquid level to within 0.5 percent of the nominal capacity as measured by volume or liquid level. Gauge glasses are not permitted.

[Amdt. 178-89, 55 FR 37062, Sept. 7, 1990, as amended by Amdt. 178-118, 61 FR 51342, Oct. 1, 1996]

**§ 178.345-13 Pressure and leakage tests.**

(a) Each cargo tank must be pressure and leakage tested in accordance with this section and §§ 178.346-5, 178.347-5, or 178.348-5.

(b) *Pressure test.* Each cargo tank or cargo tank compartment must be tested hydrostatically or pneumatically. Each cargo tank of a multi-cargo tank motor vehicle must be tested with the adjacent cargo tanks empty and at atmospheric pressure. Each closure, except pressure relief devices and loading/unloading venting devices rated at less than the prescribed test pressure, must be in place during the test. If the venting device is not removed during the test, such device must be rendered inoperative by a clamp, plug or other equally effective restraining device, which may not prevent the detection of leaks, or damage the device. Restraining devices must be removed immediately after the test is completed.

(1) *Hydrostatic method.* Each cargo tank, including its domes, must be filled with water or other liquid having similar viscosity, the temperature of which may not exceed 100 °F. The cargo tank must then be pressurized as pre-

scribed in the applicable specification. The pressure must be gauged at the top of the cargo tank. The prescribed test pressure must be maintained for at least 10 minutes during which time the cargo tank must be inspected for leakage, bulging, or other defect.

(2) *Pneumatic method.* A pneumatic test may be used in place of the hydrostatic test. However, pneumatic pressure testing may involve higher risk than hydrostatic testing. Therefore, suitable safeguards must be provided to protect personnel and facilities should failure occur during the test. The cargo tank must be pressurized with air or an inert gas. Test pressure must be reached gradually by increasing the pressure to one half of test pressure. Thereafter, the pressure must be increased in steps of approximately one tenth of the test pressure until test pressure is reached. Test pressure must be held for at least 5 minutes. The pressure must then be reduced to the inspection pressure which must be maintained while the entire cargo tank surface is inspected for leakage and other sign of defects. The inspection method must consist of coating all joints and fittings with a solution of soap and water or other equally sensitive method.

(c) *Leakage test.* The cargo tank with all its accessories in place and operable must be leak tested at not less than 80 percent of tank's MAWP with the pressure maintained for at least 5 minutes.

(d) Any cargo tank that leaks, bulges or shows any other sign of defect must be rejected. Rejected cargo tanks must be suitably repaired and retested successfully prior to being returned to service. The retest after any repair must use the same method of test under which the cargo tank was originally rejected.

[Amdt. 178-89, 54 FR 25026, June 12, 1989, as amended at 55 FR 37063, Sept. 7, 1990; Amdt. 178-105, 59 FR 55176, Nov. 3, 1994; Amdt. 178-118, 61 FR 51342, Oct. 1, 1996; 65 FR 58631, Sept. 29, 2000; 68 FR 19284, Apr. 18, 2003]

**§ 178.345-14 Marking.**

(a) *General.* The manufacturer shall certify that each cargo tank motor vehicle has been designed, constructed and tested in accordance with the applicable Specification DOT 406, DOT 407

or DOT 412 (§§ 178.345, 178.346, 178.347, 178.348) cargo tank requirements and, when applicable, with Section VIII of the ASME Code (IBR, see § 171.7 of this subchapter). The certification shall be accomplished by marking the cargo tank as prescribed in paragraphs (b) and (c) of this section, and by preparing the certificate prescribed in § 178.345–15. Metal plates prescribed by paragraphs (b), (c), (d) and (e) of this section, must be permanently attached to the cargo tank or its integral supporting structure, by brazing, welding or other suitable means. These plates must be affixed on the left side of the vehicle near the front of the cargo tank (or the frontmost cargo tank of a multi-cargo tank motor vehicle), in a place readily accessible for inspection. The plates must be permanently and plainly marked in English by stamping, embossing or other means in characters at least  $\frac{3}{16}$  inch high. The information required by paragraphs (b) and (c) of this section may be combined on one specification plate.

(b) *Nameplate.* Each cargo tank must have a corrosion resistant nameplate permanently attached to it. The following information, in addition to any applicable information required by the ASME Code, must be marked on the tank nameplate (parenthetical abbreviations may be used):

(1) DOT-specification number DOT XXX (DOT XXX) where “XXX” is replaced with the applicable specification number. For cargo tanks having a variable specification plate, the DOT-specification number is replaced with the words “See variable specification plate.”

(2) Original test date, month and year (Orig. Test Date).

(3) Tank MAWP in psig.

(4) Cargo tank test pressure (Test P), in psig.

(5) Cargo tank design temperature range (Design temp. range), °F to °F.

(6) Nominal capacity (Water cap.), in gallons.

(7) Maximum design density of lading (Max. lading density), in pounds per gallon.

(8) Material specification number—shell (Shell matl, yyy\*\*\*), where “yyy”

is replaced by the alloy designation and “\*\*\*\*” by the alloy type.

(9) Material specification number—heads (Head matl, yyy\*\*\*), where “yyy” is replaced by the alloy designation and “\*\*\*\*” by the alloy type.

NOTE: When the shell and heads materials are the same thickness, they may be combined, (Shell&head matl, yyy\*\*\*).

(10) Weld material (Weld matl.).

(11) Minimum thickness—shell (Min. shell-thick), in inches. When minimum shell thicknesses are not the same for different areas, show (top \_\_, side \_\_, bottom \_\_, in inches).

(12) Minimum thickness—heads (Min. heads thick.), in inches.

(13) Manufactured thickness—shell (Mfd. shell thick.), top \_\_, side \_\_, bottom \_\_, in inches. (Required when additional thickness is provided for corrosion allowance.)

(14) Manufactured thickness—heads (Mfd. heads thick.), in inches. (Required when additional thickness is provided for corrosion allowance.)

(15) Exposed surface area, in square feet.

(c) *Specification plate.* Each cargo tank motor vehicle must have an additional corrosion resistant metal specification plate attached to it. The specification plate must contain the following information (parenthetical abbreviations may be used):

(1) Cargo tank motor vehicle manufacturer (CTMV mfr.).

(2) Cargo tank motor vehicle certification date (CTMV cert. date), if different from the cargo tank certification date.

(3) Cargo tank manufacturer (CT mfr.).

(4) Cargo tank date of manufacture (CT date of mfr.), month and year.

(5) Maximum weight of lading (Max. Payload), in pounds.

(6) Maximum loading rate in gallons per minute (Max. Load rate, GPM).

(7) Maximum unloading rate in gallons per minute (Max. Unload rate).

(8) Lining material (Lining), if applicable.

(9) Heating system design pressure (Heating sys. press.), in psig, if applicable.

(10) Heating system design temperature (Heating sys. temp.), in °F, if applicable.

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(d) *Multi-cargo tank motor vehicle.* For a multi-cargo tank motor vehicle having all its cargo tanks not separated by any void, the information required by paragraphs (b) and (c) of this section may be combined on one specification plate. When separated by a void, each cargo tank must have an individual nameplate as required in paragraph (b) of this section, unless all cargo tanks are made by the same manufacturer with the same materials, manufactured thickness, minimum thickness and to the same specification. The cargo tank motor vehicle may have a combined nameplate and specification plate. When only one plate is used, the plate must be visible and not covered by insulation. The required information must be listed on the plate from front to rear in the order of the corresponding cargo tank location.

(e) *Variable specification cargo tank.* Each variable specification cargo tank must have a corrosion resistant metal variable specification plate attached to it. The mounting of this variable specification plate must be such that only the plate identifying the applicable specification under which the tank is being operated is legible.

(1) The following information must be included (parenthetical abbreviations are authorized):

Specification DOT XXX (DOT XXX), where "XXX" is replaced with the applicable specification number.

Equipment required	Required rating <sup>1</sup>
Pressure relief devices:	
Pressure actuated type	_____
Frangible type .....	_____
Lading discharge devices.	_____
Top .....	_____
Bottom .....	_____
Pressure unloading fitting.	_____
Closures:	
Manhole .....	_____
Fill openings .....	_____
Discharge openings ....	_____

<sup>1</sup>Required rating—to meet the applicable specification.

(2) If no change of information in the specification plate is required, the letters "NC" must follow the rating required. If the cargo tank is not so

equipped, the word "None" must be inserted.

(3) Those parts to be changed or added must be stamped with the appropriate MC or DOT Specification markings.

(4) The alterations that must be made in order for the tank to be modified from one specification to another must be clearly indicated on the manufacturer's certificate and on the variable specification plate.

[Amdt. 178-89, 54 FR 25027, June 12, 1989, as amended at 55 FR 37063, Sept. 7, 1990; Amdt. 178-99, 58 FR 51534, Oct. 1, 1993; Amdt. 178-104, 59 FR 49135, Sept. 26, 1994; Amdt. 178-105, 59 FR 55176, Nov. 3, 1994; 60 FR 17402, Apr. 5, 1995; Amdt. 178-118, 61 FR 51342, Oct. 1, 1996; 66 FR 45389, Aug. 28, 2001; 68 FR 19284, Apr. 18, 2003; 68 FR 52371, Sept. 3, 2003; 68 FR 75756, Dec. 31, 2003]

§ 178.345-15 Certification.

(a) At or before the time of delivery, the manufacturer of a cargo tank motor vehicle must provide certification documents to the owner of the cargo tank motor vehicle. The registration numbers of the manufacturer, the Design Certifying Engineer, and the Registered Inspector, as appropriate, must appear on the certificates (see subpart F, part 107 in subchapter A of this chapter).

(b) The manufacturer of a cargo tank motor vehicle made to any of these specifications must provide:

(1) For each design type, a certificate signed by a responsible official of the manufacturer and a Design Certifying Engineer certifying that the cargo tank motor vehicle design meets the applicable specification; and

(2) For each ASME cargo tank, a cargo tank manufacturer's data report as required by Section VIII of the ASME Code (IBR, see § 171.7 of this subchapter). For each cargo tank motor vehicle, a certificate signed by a responsible official of the manufacturer and a Registered Inspector certifying that the cargo tank motor vehicle is constructed, tested and completed in conformance with the applicable specification.

(c) The manufacturer of a variable specification cargo tank motor vehicle must provide:

(1) For each design type, a certificate signed by a responsible official of the