

attachments which are subject to the pressure of the contents of the tank, except pressure relief devices, must be hydrostatically tested by completely filling the tank (including domes, if any) with water or other liquid having a similar density and viscosity and applying a pressure of at least 150 percent of the MAWP. The pressure shall be maintained for at least 10 minutes. While under pressure, the tank shall be inspected for leakage, undue distortion, or other conditions which indicate weakness or which might render the tank unsafe for transportation service. Failure to successfully meet the test criteria shall be deemed evidence of failure to meet the requirements of this specification. Tanks failing to pass the test shall be suitably repaired and must successfully pass the prescribed tests prior to use for transporting any hazardous material.

(b) *Testing of internal coils.* Internal coils, if installed, must be hydrostatically tested to an internal pressure of 13.8 bar (200 psig) or 150 percent of the rated pressure of the coils, whichever is greater.

(c) *Tank container qualification test.* For each tank design, a prototype tank, using a framework for containerized transport, must fulfill the requirements of parts 450-453 of this title for compliance with the requirements of Annex II of the International Convention for Safe Containers. In addition, the following tests must be completed without leakage or deformation that would render the tank unsuitable for use:

(1) *Longitudinal inertia.* The tank loaded to its maximum gross weight must be positioned with its longitudinal axis vertical. It shall be held in this position for five minutes by support at the lower end of the base structure providing vertical and lateral restraint and by support at the upper end of the base structure providing lateral restraint only.

(2) *Lateral inertia.* The tank loaded to its maximum gross weight must be positioned for five minutes with its transverse axis vertical. It shall be held in this position for five minutes by support at the lower side of the base structure providing vertical and lateral restraint and by support at the upper

side of the base structure providing lateral restraint only.

(d) *Approval of smaller tanks of the same design.* Design approval must include the prototype testing of at least one tank of each design and each size; however, a set of tests made on a tank of one size may serve for the approval of smaller tanks with equal or lesser diameter and length) made of the same material and thickness by the same fabrication technique and with identical supports and equivalent closures and other appurtenances.

(e) *Pressure and vacuum relief devices.* Each spring loaded relief device must be tested for the accuracy of the setting prior to installation on a tank and must be effectively sealed to maintain the required setting.

[Amdt. 178-65, 46 FR 9898, Jan. 29, 1981; 46 FR 24184, Apr. 30, 1981, as amended by 66 FR 45387, Aug. 28, 2001]

§ 178.270-14 Marking of tanks.

(a) *General.* Each tank must bear a corrosion resistant metal identification plate that is permanently attached to the portable tank and readily accessible for inspection. The information required in paragraph (b), and, when appropriate, paragraph (c) of this section must be stamped, embossed or otherwise marked by an equally durable method on the plate in characters at least 3 mm (0.118 inches) high. The plate must not be painted.

(b) *Required information.* At least the following information must appear on the metal identification plate for each tank:

- (1) US DOT Specification number.
- (2) Country of manufacture.
- (3) Manufacturer's name.
- (4) Date of manufacture.
- (5) Manufacturer's serial number.
- (6) Identification of USA/DOT approval agency and approval number.
- (7) MAWP, in bar or psig.
- (8) Test pressure, in bar or psig.
- (9) Total measured water capacity at 20 °C (68 °F), in liters or gallons.
- (10) Maximum allowable gross weight, in kg or lbs.
- (11) Equivalent minimum shell thickness in mild steel, in mm or inches.
- (12) Tank material and specification number.

(13) Metallurgical design temperature range, in °C or °F.

(c) *Additional information.* The following additional information must appear on the metal identification plate when applicable:

- (1) Lining material.
- (2) Heating coil MAWP in bar and psig.

(3) Corrosion allowance, in mm or in.

(d) In addition to the markings required above, each tank used in international transport must have a Safety Approval Plate containing the information required in §§ 451.21 through 451.25 of this title.

(e) Nothing in this section shall be deemed to preclude the display of other pertinent information on the required metal identification plate.

[Amdt. 178-65, 46 FR 9899, Jan. 29, 1981, as amended at 62 FR 51561, Oct. 1, 1997; 66 FR 45387, Aug. 28, 2001]

§ 178.271 Specification IM 101 steel portable tanks.

§ 178.271-1 General requirements.

(a) Specification IM 101 portable tanks must conform to the general design and construction requirements in § 178.270 of this subpart in addition to the specific design requirements contained in this section.

(b) The MAWP of each tank shall be equal to or greater than 1.75 bar (25.4 psig) and less than 6.8 bar (100 psig).

(c) Each tank shall be designed and constructed in accordance with the requirements of Section VIII, Division 1, of the ASME Code except as limited or modified in this section or in § 178.270 of this subpart. ASME certification or stamp is not required.

[Amdt. 178-65, 46 FR 9899, Jan. 29, 1981, as amended by Amdt. 178-104, 59 FR 49135, Sept. 26, 1994; 66 FR 45387, Aug. 28, 2001]

§ 178.272 Specification IM 102 steel portable tanks.

§ 178.272-1 General requirements.

(a) Specification IM 102 portable tanks must conform to the general design and construction requirements in § 178.270 of this subpart in addition to the specific design requirements contained in this section.

(b) The MAWP of each tank shall be less than 1.75 bar (25.4 psig) but at least 1.0 bar (14.5 psig).

(c) Each tank shall be designed and constructed in accordance with the requirements of Section VIII, Division 1, of the ASME Code except as limited or modified in this section or in § 178.270 of this subpart. ASME certification or stamp is not required.

[Amdt. 178-65, 46 FR 9899, Jan. 29, 1981, as amended by Amdt. 178-104, 59 FR 49135, Sept. 26, 1994; 66 FR 45387, Aug. 28, 2001]

§ 178.272-2 Minimum thickness of shells and heads.

(a) The approval agency may authorize a minimum thickness less than that required by § 178.270-5 of this subpart where additional protection against tank puncture provides equal integrity.

(b) The shell and head thickness of a tank must be at least:

(1) 3.18 mm (0.125 inches) for a tank with a maximum cross-sectional dimension of 1.8 m (5.9 feet) or less; or

(2) 4 mm (0.157 inches) for a tank constructed of the reference mild steel having a maximum cross-sectional dimension exceeding 1.8 m (5.9 feet). For tanks having a maximum cross-sectional dimension exceeding 1.8 m (5.9 feet) constructed of other steels, an equivalent head and shell thickness calculated in accordance with § 178.270-5(c) of this subpart may be used, subject to an absolute minimum of 3.18 mm (0.125 inches).

(c) The following additional puncture protection systems are authorized:

(1) An overall external structural protection, such as a jacket, which is rigidly secured to the tank with a layer of cushioning material installed between the external structural protection and the tank; or

(2) A complete framework surrounding the tank including both longitudinal and transverse structural members.

[Amdt. 178-65, 46 FR 9899, Jan. 29, 1981, as amended at 66 FR 45387, Aug. 28, 2001]

§ 178.273 Approval of Specification IM portable tanks and UN portable tanks.

(a) *Application for approval.* (1) An owner or manufacturer of a portable