

psig above the MAWP. The venting capacity required in §178.345-10(e) may be rated at these same pressures.

(2) Each vacuum relief system must have sufficient capacity to limit the vacuum to 1 psig.

(3) If pressure loading or unloading devices are provided, the relief system must have adequate vapor and liquid capacity to limit the tank pressure to the cargo tank test pressure at maximum loading or unloading rate. The maximum loading and unloading rates must be included on the metal specification plate.

[Amdt. 178-89, 54 FR 25029, June 12, 1989, as amended at 55 FR 37064, Sept. 7, 1990; Amdt. 178-105, 59 FR 55176, Nov. 3, 1994. Redesignated by Amdt. 178-112, 61 FR 18934, Apr. 29, 1996; 66 FR 45389, Aug. 28, 2001; 68 FR 75756, Dec. 31, 2003]

#### § 178.346-4 Outlets.

(a) All outlets on each tank must conform to §178.345-11 and this section.

(b) External self-closing stop-valves are not authorized as an alternative to internal self-closing stop-valves on loading/unloading outlets.

[Amdt. 178-89, 54 FR 25029, June 12, 1989. Redesignated by Amdt. 178-112, 61 FR 18934, Apr. 29, 1996]

#### § 178.346-5 Pressure and leakage tests.

(a) Each cargo tank must be tested in accordance with §178.345-13 and this section.

(b) *Pressure test.* Test pressure must be as follows:

(1) Using the hydrostatic test method, the test pressure must be the greater of 5.0 psig or 1.5 times the cargo tank MAWP.

(2) Using the pneumatic test method, the test pressure must be the greater of 5.0 psig or 1.5 times the cargo tank MAWP, and the inspection pressure must be the cargo tank MAWP.

(c) *Leakage test.* A cargo tank used to transport a petroleum distillate fuel that is equipped with vapor recovery equipment may be leakage tested in accordance with 40 CFR 63.425(e). To satisfy the leakage test requirements of this paragraph, the test specified in 40 CFR 63.425(e)(1) must be conducted using air. The hydrostatic test alternative permitted under Appendix A to 40 CFR Part 60 ("Method 27—Deter-

mination of Vapor Tightness of Gasoline Delivery Tank Using Pressure-Vacuum Test") may not be used to satisfy the leakage test requirements of this paragraph. A cargo tank tested in accordance with 40 CFR 63.425(e) may be marked as specified in §180.415 of this subchapter.

[Amdt. 178-89, 54 FR 25029, June 12, 1989, as amended at 55 FR 37064, Sept. 7, 1990; Amdt. 178-105, 59 FR 55176, Nov. 3, 1994. Redesignated by Amdt. 178-112, 61 FR 18934, Apr. 29, 1996; 68 FR 19285, Apr. 18, 2003]

#### § 178.347 Specification DOT 407; cargo tank motor vehicle.

##### § 178.347-1 General requirements.

(a) Each specification DOT 407 cargo tank motor vehicle must conform to the general design and construction requirements in §178.345 in addition to the specific requirements contained in this section.

(b) Each tank must be of a circular cross-section and have an MAWP of at least 25 psig.

(c) Any cargo tank motor vehicle built to this specification with a MAWP greater than 35 psig or any cargo tank motor vehicle built to this specification designed to be loaded by vacuum must be constructed and certified in accordance with Section VIII of the ASME Code (IBR, see §171.7 of this subchapter). The external design pressure for a cargo tank loaded by vacuum must be at least 15 psi.

(d) Any cargo tank motor vehicle built to this specification with a MAWP of 35 psig or less or any cargo tank motor vehicle built to this specification designed to withstand full vacuum but not equipped to be loaded by vacuum must be constructed in accordance with Section VIII of the ASME Code.

(1) The record-keeping requirements contained in Section VIII of the ASME Code do not apply. The inspection requirements of parts UG-90 through 94 do not apply. Inspection and certification must be made by an inspector registered in accordance with subpart F of part 107.

(2) Loadings must be as prescribed in §178.345-3.

(3) The knuckle radius of flanged heads must be at least three times the

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material thickness, and in no case less than 0.5 inch. Stuffed (inserted) heads may be attached to the shell by a fillet weld. The knuckle radius and dish radius versus diameter limitations of UG-32 do not apply for cargo tank motor vehicles with a MAWP of 35 psig or less.

(4) Marking, certification, data reports and nameplates must be as prescribed in §§ 178.345-14 and 178.345-15.

(5) Manhole closure assemblies must conform to § 178.347-3.

(6) Pressure relief devices must be as prescribed in § 178.347-4.

(7) The hydrostatic or pneumatic test must be as prescribed in § 178.347-5.

(8) The following paragraphs in parts UG and UW in Section VIII the ASME Code do not apply: UG-11, UG-12, UG-22(g), UG-32(e), UG-34, UG-35, UG-44, UG-76, UG-77, UG-80, UG-81, UG-96, UG-97, UW-12, UW-13(b)(2), UW-13.1(f), and the dimensional requirements found in Figure UW-13.1.

(9) UW-12 in Section VIII of the ASME Code does not apply to a weld seam in a bulkhead that has not been radiographically examined, under the following conditions:

(i) The strength of the weld seam is assumed to be 0.85 of the strength of the bulkhead.

(ii) The welded seam must be a full penetration butt weld.

(iii) No more than one seam may be used per bulkhead.

(iv) The welded seam must be completed before forming the dish radius and knuckle radius.

(v) Compliance test: Two test specimens of materials representative of

those to be used in the manufacture of a cargo tank bulkhead must be tested to failure in tension. The test specimen must be of the same thickness and joined by the same welding procedure. The test specimens may represent all the tanks that are made in the same facility within 6 months after the tests are completed. Before welding, the fit-up of the joints on the test specimens must represent production conditions that would result in the least joint strength. Evidence of joint fit-up and test results must be retained at the manufacturer's facility for at least 5 years.

(vi) Acceptance criteria: The ratio of the actual tensile stress at failure to the actual tensile strength of the adjacent material of all samples of a test lot must be greater than 0.85.

[Amdt. 178-89, 54 FR 25029, June 12, 1989, as amended at 55 FR 37064, Sept. 7, 1990; Amdt. 178-89, 56 FR 27877, June 17, 1991; 65 FR 58632, Sept. 29, 2000; 66 FR 45387, Aug. 28, 2001; 68 FR 19285, Apr. 18, 2003; 68 FR 75756, Dec. 31, 2003; 76 FR 3388, Jan. 19, 2011; 76 FR 43532, July 20, 2011]

**§ 178.347-2 Material and thickness of material.**

(a) The type and thickness of material for DOT 407 specification cargo tanks must conform to § 178.345-2, but in no case may the thickness be less than that determined by the minimum thickness requirements in § 178.320(a). Tables I and II identify the specified minimum thickness values to be employed in that the determination:

TABLE I—SPECIFIED MINIMUM THICKNESS OF HEADS (OR BULKHEADS AND BAFFLES WHEN USED AS TANK REINFORCEMENT) USING MILD STEEL (MS), HIGH STRENGTH LOW ALLOY STEEL (HSLA), AUSTENITIC STAINLESS STEEL (SS), OR ALUMINUM (AL)—EXPRESSED IN DECIMALS OF AN INCH AFTER FORMING

Volume capacity in gallons per inch	10 or less	Over 10 to 14	Over 14 to 18	Over 18 to 22	Over 22 to 26	Over 26 to 30	Over 30
Thickness (MS) .....	0.100	0.100	0.115	0.129	0.129	0.143	0.156
Thickness (HSLA) .....	0.100	0.100	0.115	0.129	0.129	0.143	0.156
Thickness (SS) .....	0.100	0.100	0.115	0.129	0.129	0.143	0.156
Thickness (AL) .....	0.160	0.160	0.173	0.187	0.194	0.216	0.237