

Specifications	Minimum tensile strength (p.s.i.) welded condition <sup>1</sup>	Minimum elongation in 2 inches (percent) weld metal (longitudinal)
ASTM A 240/A 240M (incorporated by reference; see § 171.7 of this subchapter), Type 304L .....	70,000	30
ASTM A 240/A 240M (incorporated by reference; see § 171.7 of this subchapter), Type 316L .....	70,000	30

<sup>1</sup> Maximum stresses to be used in calculations.

(2)(i) High alloy steels used to fabricate tank must be tested in accordance with the following procedures in ASTM Specification A262 titled, "Standard Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steel," and must exhibit corrosion rates not exceeding the following:

Test procedures	Material	Corrosion rate i.p.m.
Practice B .....	Types 304L and 316L ..	0.0040
Practice C .....	Type 304L .....	0.0020

(ii) Type 304L and 316L test specimens must be given a sensitizing treatment prior to testing.

(d) All attachments welded to tank shell must be of approved material which is suitable for welding to the tank.

[Amdt. 179-10, 36 FR 21344, Nov. 6, 1971, as amended by Amdt. 179-32, 48 FR 27707, June 16, 1983; Amdt. 179-47, 58 FR 50237, Sept. 24, 1993; Amdt. 179-52, 61 FR 28679, June 5, 1996; Amdt 179-52, 61 FR 50255, Sept. 25, 1996; 66 FR 45186, Aug. 28, 2001; 67 FR 51660, Aug. 8, 2002]

**§ 179.100-8 Tank heads.**

(a) The tank head shape shall be an ellipsoid of revolution in which the major axis shall equal the diameter of the shell adjacent to the head and the minor axis shall be one-half the major axis.

(b) Each tank head made from steel which is required to be "fine grain" by the material specification, which is hot formed at a temperature exceeding 1700 °F., must be normalized after forming by heating to a temperature between 1550° and 1700 °F., by holding at that temperature for at least 1 hour per inch of thickness (30-minute minimum), and then by cooling in air. If

the material specification requires quenching and tempering, the treatment specified in that specification must be used instead of the one specified above.

[29 FR 18995, Dec. 29, 1964. Redesignated, 32 FR 5606, Apr. 5, 1967 and amended by Amdt. 179-12, 39 FR 15038, Apr. 30, 1974]

**§ 179.100-9 Welding.**

(a) All joints shall be fusion-welded in compliance with the requirements of AAR Specifications for Tank Cars, appendix W. Welding procedures, welders and fabricators shall be approved.

(b) [Reserved]

[29 FR 18995, Dec. 29, 1964, as amended at 65 FR 58632, Sept. 29, 2000]

**§ 179.100-10 Postweld heat treatment.**

(a) After welding is complete, steel tanks and all attachments welded thereto must be postweld heat treated as a unit in compliance with the requirements of AAR Specifications for Tank Cars, appendix W.

(b) For aluminum tanks, postweld heat treatment is prohibited.

(c) Tank and welded attachments, fabricated from ASTM A 240/A 240M (incorporated by reference; see §171.7 of this subchapter), Type 304L or Type 316L materials do not require postweld heat treatment, but these materials do require a corrosion resistance test as specified in §179.100-7(c)(2).

[Amdt. 179-10, 36 FR 21345, Nov. 6, 1971, as amended by Amdt. 179-47, 58 FR 50238, Sept. 24, 1993; Amdt. 179-52, 61 FR 28679, June 5, 1996; 67 FR 51660, Aug. 8, 2002]

**§ 179.100-12 Manway nozzle, cover and protective housing.**

(a) Manway nozzles must be of approved design of forged or rolled steel for steel tanks or of fabricated aluminum alloy for aluminum tanks, with access opening at least 18 inches inside diameter, or at least 14 inches by 18 inches around or oval. Nozzle must be welded to the tank and the opening reinforced in an approved manner in compliance with the requirements of AAR Specifications for Tank Cars, appendix E, Figure E10.

(b) Manway cover shall be machined to approved dimensions and be of forged or rolled carbon or alloy steel,

rolled aluminum alloy or nickel when required by the lading. Minimum thickness is listed in §179.101. Manway cover shall be attached to manway nozzle by through or stud bolts not entering tank, except as provided in §179.103-2(a).

(c) Except as provided in §179.103, protective housing of cast, forged or fabricated approved materials must be bolted to manway cover with not less than twenty 3/4-inch studs. The shearing value of the bolts attaching protective housing to manway cover must not exceed 70 percent of the shearing value of bolts attaching manway cover to manway nozzle. Housing must have steel sidewalls not less than three-fourths inch in thickness and must be equipped with a metal cover not less than one-fourth inch in thickness that can be securely closed. Housing cover must have suitable stop to prevent cover striking loading and unloading connections and be hinged on one side only with approved riveted pin or rod with nuts and cotters. Openings in wall of housing must be equipped with screw plugs or other closures.

[29 FR 18995, Dec. 29, 1964. Redesignated at 32 FR 5606, Apr. 5, 1967, and amended by Amdt. 179-10, 36 FR 21345, Nov. 6, 1971]

**§179.100-13 Venting, loading and unloading valves, measuring and sampling devices.**

(a) Venting, loading and unloading valves must be of approved design, made of metal not subject to rapid deterioration by the lading, and must withstand the tank test pressure without leakage. The valves shall be bolted to seatings on the manway cover, except as provided in §179.103. Valve outlets shall be closed with approved screw plugs or other closures fastened to prevent misplacement.

(b) The interior pipes of the loading and unloading valves shall be anchored and, except as prescribed in §§173.314(j), 179.102 or 179.103, may be equipped with excess flow valves of approved design.

(c) Gauging device, sampling valve and thermometer well are not specification requirements. When used, they shall be of approved design, made of metal not subject to rapid deterioration by the lading, and shall withstand

the tank test pressure without leakage. Interior pipes of the gauging device and sampling valve, except as prescribed in §§173.314(j), 179.102 or 179.103, may be equipped with excess flow valves of approved design. Interior pipe of the thermometer well shall be anchored in an approved manner to prevent breakage due to vibration. The thermometer well shall be closed by an approved valve attached close to the manway cover, or other approved location, and closed by a screw plug. Other approved arrangements that permit testing thermometer well for leaks without complete removal of the closure may be used.

(d) An excess flow valve as referred to in this specification, is a device which closes automatically against the outward flow of the contents of the tank in case the external closure valve is broken off or removed during transit. Excess flow valves may be designed with a by-pass to allow the equalization of pressures.

(e) Bottom of tank shell may be equipped with a sump or siphon bowl, or both, welded or pressed into the shell. Such sumps or siphon bowls, if applied, are not limited in size and must be made of cast, forged or fabricated metal. Each sump or siphon bowl must be of good welding quality in conjunction with the metal of the tank shell. When the sump or siphon bowl is pressed in the bottom of the tank shell, the wall thickness of the pressed section must not be less than that specified for the shell. The section of a circular cross section tank to which a sump or siphon bowl is attached need not comply with the out-of-roundness requirement specified in AAR Specifications for Tank Cars, appendix W, W14.06. Any portion of a sump or siphon bowl not forming a part of cylinder of revolution must have walls of such thickness and be so reinforced that the stresses in the walls caused by a given internal pressure are no greater than the circumferential stress which would exist under the same internal pressure in the wall of a tank of circular cross section designed in accordance with §179.100-6(a). In no