

§ 179.200-7 Materials.

(a) Plate material used to fabricate the tank and, when used, expansion dome or manway nozzle material, must meet one of the following specifications with the indicated minimum tensile strength and elongation in the welded condition.

(b) *Carbon steel plate:* The maximum allowable carbon content must be 0.31 percent when the individual specification allows carbon content greater than this amount. The plates may be clad with other approved materials:

Specifications	Minimum tensile strength (p.s.i.) welded condition¹	Minimum elongation in 2 inches (percent) weld metal (longitudinal)
AAR TC 128, Gr. B	81,000	19
ASTM A 516 ²	70,000	20

¹Minimum stresses to be used in calculations.

²This specification is incorporated by reference (IBR, see §171.7 of this subchapter).

(c) *Aluminum alloy plate:* Aluminum alloy plate must be suitable for welding and comply with one of the following specifications (IBR, see §171.7 of this subchapter):

Specifications	Minimum tensile strength (p.s.i.) welded condition^{3,4}	Minimum elongation in 2 inches (percent) 0 temper weld metal (longitudinal)
ASTM B 209, Alloy 5052 ¹	25,000	18
ASTM B 209, Alloy 5083 ²	38,000	16
ASTM B 209, Alloy 5086 ¹	35,000	14
ASTM B 209, Alloy 5154 ¹	30,000	18
ASTM B 209, Alloy 5254 ¹	30,000	18
ASTM B 209, Alloy 5454 ¹	31,000	18
ASTM B 209, Alloy 5652 ¹	25,000	18

¹For fabrication, the parent plate material may be 0, H112, or H32 temper, but design calculations must be based on minimum tensile strength shown.

²0 temper only.

³Weld filler metal 5556 must not be used.

⁴Maximum stresses to be used in calculations.

(d) *High alloy steel plate:* High alloy steel plate must comply with one of the following specifications:

Specifications	Minimum tensile strength (p.s.i.) welded condition¹	Minimum elongation in 2 inches (percent) weld metal (longitudinal)

ASTM A 240/A 240M (incorporated by reference; <i>see</i> §171.7 of this subchapter), Type 304	75,000	30
ASTM A 240/A 240M (incorporated by reference; <i>see</i> §171.7 of this subchapter), Type 304L	70,000	30
ASTM A 240/A 240M (incorporated by reference; <i>see</i> §171.7 of this subchapter), Type 316	75,000	30
ASTM A 240/A 240M (incorporated by reference; <i>see</i> §171.7 of this subchapter), Type 316L	70,000	30

¹Maximum stresses to be used in calculations.

²High alloy steel materials used to fabricate tank and expansion dome, when used, must be tested in accordance with Practice A of ASTM Specification A 262 titled, "Standard Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels" (IBR; *see* §171.7 of this subchapter). If the specimen does not pass Practice A, Practice B or C must be used and the corrosion rates may not exceed the following:

Test procedure	Material	Corrosion rate i.p.m.
Practice B	Types 304, 304L, 316, and 316L	0.0040
Practice C	Type 304L	.0020

Type 304L and Type 316L test specimens must be given a sensitizing treatment prior to testing. (A typical sensitizing treatment is 1 hour at 1250 F.)

(e) *Nickel plate*: Nickel plate must comply with the following specification (IBR, *see* §171.7 of this subchapter):

Specifications	Minimum tensile strength (psi) welded condition ¹	Minimum elongation in 2 inches (percent) weld metal (longitudinal)
ASTM B 162 ²	40,000	20

(f) *Manganese-molybdenum steel plate*: Manganese-molybdenum steel plate must be suitable for fusion welding and comply with the following specification (IBR, *see* §171.7 of this subchapter):

Specifications	Minimum tensile strength (p.s.i.) welded condition ¹	Minimum elongation in 2 inches (percent) weld metal (longitudinal)
ASTM A 302, Gr. B	80,000	20

¹Maximum stresses to be used in calculations.

(g) All parts and items of construction in contact with the lading must be made of material compatible with plate material and not subject to rapid deterioration by the lading, or be coated or lined with suitable corrosion resistant material.

(h) All external projections that may be in contact with the lading and all castings, forgings, or fabrications used for fittings or attachments to tank and expansion dome, when used, in contact with lading must be made of material to an approved

specification. See AAR Specifications for Tank Cars, appendix M, M4.05 (IBR, see §171.7 of this subchapter) for approved material specifications for castings for fittings.

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