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MATERIALS

§ 154.605 Toughness test.

(a) Each toughness test under §§ 154.610 through 154.625 must meet Subpart 54.05 of this chapter.

(b) If subsize test specimens are used for the Charpy V-notch toughness test, the Charpy V-notch energy must meet Table 54.05–20 (a) of this chapter.

§ 154.610 Design temperature not colder than 0° C (32°F).

Materials for cargo tanks for a design temperature not colder than 0°C (32°F) must meet the following:

(a) The tank materials must meet §§ 54.25–1 and 54.25–3 of this chapter.

(b) Plates, forgings, rolled and forged bars and shapes must be carbon manganese steel or other material allowed under §§ 154.615, 154.620, and 154.625.

(c) Plates must be normalized or quenched and tempered and where the thickness exceeds 20 mm (0.787 in.), made with fine grain practice, austenitic grain size of five or finer. A control rolling procedure may be substituted for normalizing if specially approved by the Commandant (G–MSO). Plate for an independent tank type C must also meet the requirements of ASTM A–20–75 and § 54.01–18(b)(5) of this chapter.

(d) For integral and independent type A tanks, the American Bureau of Shipping's grade D not exceeding 20 mm (0.787 in.) in thickness, and Grade E hull structural steel are allowed if the steel meets § 54.05–10 of this chapter.

(e) The tensile properties under paragraph (a) of this section must be determined for:

(1) Each plate as rolled; and

(2) Each five short ton batch of forgings, forged or rolled fittings, and forged or rolled bars and shapes.

(f) The specified yield strength must not exceed 637 MPa (92.43 Ksi) and when it exceeds 490 MPa (71.10 Ksi), the hardness of the weld and the heat affected zone must be specially approved by the Commandant (G–MSO).

(g) The Charpy V-notch impact energy must be determined for:

(1) Each plate as rolled; and

(2) Each five short ton batch of forgings, forged or rolled fittings and rolled or forged bars and shapes.

(h) The orientation and required impact energy of a 10 mm × 10 mm (0.394 in. × 0.394 in.) Charpy V-notch specimen must be:

(1) For plates; transverse specimen and 27.4 J (20 ft-lbs); and

(2) For forgings, forged and rolled fittings and rolled and forged bars: longitudinal specimen and 41.1 J (30 ft-lbs).

(i) The test temperature of the Charpy V-notch specimens is as follows:

Material Thickness	Test Temperature
t≤20 mm (0.788 in.)	0°C (32°F)
20< t<30 mm (1.182 in.)	−20°C (−4°F)
30< t<40 mm (1.576 in.)	−40°C (−40°F)

[CGD 74–289, 44 FR 26009, May 3, 1979, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983]

§ 154.615 Design temperature below 0°C (32°F) and down to −55°C (−67°F).

Plates, forgings, forged or rolled or forged bars and shapes for cargo tanks and secondary barriers for a design temperature below 0°C (32°F) and down to −55°C (−67°F) must meet § 54.25–10 of this chapter.

§ 154.620 Design temperature below −55°C (−67°F) and down to −165°C (−265°F).

Plates, forgings and forged or rolled fittings, and rolled, forged or extruded bars and shapes for cargo tanks, secondary barriers, and process pressure vessels for a design temperature below −55°C (−67°F) and down to −165°C (−265°F) must:

(a) Meet § 54.25–10(b)(2), § 54.25–15, or § 54.25–20 of this chapter; or

(b) Be of an aluminum alloy that is specially approved by the Commandant (G–MSO).

[CGD 74–289, 44 FR 26009, May 3, 1979, as amended by CGD 82–063b, 48 FR 4782, Feb. 3, 1983]

§ 154.625 Design temperature below 0°C (32°F) and down to −165°C (−265°F).

Pipes, tubes, forgings, castings, bolting, and nuts for cargo and process piping for a design temperature below 0°C (32°F) and down to −165°C (−265°F) must meet § 56.50–105 of this chapter.