

TABLE 54.01-5(b)—PRESSURE VESSEL CLASSIFICATION—Continued

[Note to table 54.01-5(b): All classes of pressure vessels are subject to shop inspection and plan approval.⁴]

Class	Service contents	Class limits on pressure and temperature	Joint requirements ^{1 6 7}	Radiography requirements, section VIII of the ASME Boiler and Pressure Vessel Code (incorporated by reference, see 46 CFR 54.01-1) ^{3 7}	Post-weld heat treatment requirements ^{5 7}
II-L Low Temperature.	(a) Vapor or gas, or liquid. (b) Hazardous Materials ² .	0 through 250 p.s.i. and service temp. below 0 °F.	(1) For category A; (1) or (2) for category B. All categories C and D must have full-penetration welds extending through the entire thickness of the vessel wall or nozzle wall.	Spot. The exemption of UW-11(c) of section VIII of the ASME Boiler and Pressure Vessel Code does not apply.	Same as for I-L except that mechanical stress relief may be substituted if allowed under subpart 54.30 of this chapter.
III	(a) Vapor or gas ... (b) Liquid (c) Hazardous Materials ^{2 3 6} .	Vapor or gas: Under 30 p.s.i. and 0 through 275 °F. Liquid: Under 200 p.s.i. and 0 through 250 °F.	In accordance with section VIII of the ASME Boiler and Pressure Vessel Code.	Spot, unless exempted by UW-11(c) of section VIII of the ASME Boiler and Pressure Vessel Code.	In accordance with section VIII of the ASME Boiler and Pressure Vessel Code.

¹ Welded joint categories are defined under UW-3 of section VIII of the ASME Boiler and Pressure Vessel Code. Joint types are described in table UW-12 of section VIII of the ASME Boiler and Pressure Vessel Code, and numbered (1), (2), etc.
² See 46 CFR 54.20-2.
³ See 46 CFR 54.25-8(c) and 54.25-10(d).
⁴ See 46 CFR 54.01-15 and 54.10-3 for exemptions.
⁵ Specific requirements modifying table UCS-56 of section VIII of the ASME Boiler and Pressure Vessel Code appear in 46 CFR 54.25-7.
⁶ See 46 CFR 54.20-3(c) and (f).
⁷ Applies only to welded pressure vessels.

(Approved by the Office of Management and Budget under OMB control number 2130-0181)
 [CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9976, June 17, 1970; CGD 77-147, 47 FR 21809, May 20, 1982; 55 FR 696, Jan. 8, 1990; CGD 88-057, 55 FR 24236, June 15, 1990; CGD 85-061, 55 FR 41917, Oct. 16, 1990; CGD 95-027, 61 FR 26000, May 23, 1996; USCG-2000-7790, 65 FR 58460, Sept. 29, 2000; USCG-2003-16630, 73 FR 65165, Oct. 31, 2008]

§ 54.01-10 Steam-generating pressure vessels (modifies U-1(g)).

(a) Pressure vessels in which steam is generated are classed as “Unfired Steam Boilers” except as required otherwise by paragraph (b) of this section. Unfired steam boilers must be fitted with an efficient water level indicator, a pressure gage, a blowdown valve, and an approved safety valve as required by § 54.15-15. Unfired steam boilers must be constructed in accordance with this part other than when the pressures are more than 206 kPa (30 psig) or the temperatures of the working fluid are more than 454 °C (850 °F) when such boilers must be constructed in accordance with part 52 of this subchapter.

(b) Vessels known as “Evaporators” or “Heat Exchangers” are not classified as unfired steam boilers. They

shall be fitted with an approved safety device as required under § 54.15-15 and constructed in accordance with this part.

(c) An evaporator in which steam is generated shall be fitted with an efficient water level indicator, a pressure gage, and a blowdown valve.

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGD 81-79, 50 FR 9436, Mar. 8, 1985; CGD 95-012, 60 FR 48044, Sept. 18, 1995; USCG-2003-16630, 73 FR 65166, Oct. 31, 2008]

§ 54.01-15 Exemptions from shop inspection and plan approval (modifies U-1(c)(2)).

(a) The following classifications are exempt from shop inspection and plan approval requirements of this part:

(1) Vessels containing water at a pressure not greater than 689 kPa (100

§ 54.01-17

pounds per square inch gauge or “psig”), and at a temperature not above 93 °C (200 °F) including those containing air, the compression of which serves only as a cushion. Air-charging lines may be permanently attached if the air pressure does not exceed 103 kPa (15 psig).

(2) Hot water supply storage tanks heated by steam or any other indirect means when none of the following limitations is exceeded:

(i) A heat input of 58 kW (200,000 B.t.u. per hour);

(ii) A water temperature of 93 °C (200 °F);

(iii) A nominal water-containing capacity of 454 liters (120 gallons); or

(iv) A pressure of 689 kPa (100 psig).

The exemption of any tank under this subparagraph requires that it shall be fitted with a safety relief valve of at least 1-inch diameter, set to relieve below the maximum allowable working pressure of the tank.

(3)(i) Vessels having an internal operating pressure not exceeding 103 kPa (15 psig) with no limitation on size. (See UG-28(f) of section VIII of the ASME Boiler and Pressure Vessel Code (incorporated by reference; see 46 CFR 54.01-1.)

(ii) Cargo tanks of pressure vessel configuration are not included in the exemption in paragraph (a)(3)(i) of this section.

(4) Class I, II, and III pressure vessels that meet the requirements of § 54.01-5(c)(3) and (c)(4).

(5) Condensers and heat exchangers, regardless of size, when the design is such that the liquid phase is not greater than 689 kPa (100 psig) and 200 °F (93 °C) and the vapor phase is not greater than 103 kPa (15 psig) provided that the Officer in Charge, Marine Inspection is satisfied that system overpressure conditions are addressed by the owner or operator.

(b) For fluid conditioner fittings see § 56.15-1 of this subchapter.

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9977, June 17, 1970; CGFR 70-143, 35 FR 19906, Dec. 30, 1970; CGD 77-147, 47 FR 21810, May 20, 1982; USCG-2003-16630, 73 FR 65166, Oct. 31, 2008; USCG-2010-0759, 75 FR 60002, Sept. 29, 2010]

46 CFR Ch. I (10-1-14 Edition)

§ 54.01-17 Pressure vessel for human occupancy (PVHO).

Pressure vessels for human occupancy (PVHO's) must meet the requirements of subpart B (Commercial Diving Operations) of part 197 of this chapter.

[CGD 76-009, 43 FR 53683, Nov. 16, 1978]

§ 54.01-18 Plan approval.

(a) Manufacturers intending to fabricate pressure vessels, heat exchangers, evaporators, and similar appurtenances, covered by the regulations in this part shall submit detailed plans in accordance with subpart 50.20 of this subchapter.

(b) The following information shall be submitted:

(1) Calculations for all pressure containment components including the maximum allowable working pressure, the hydrostatic or pneumatic test pressure, and the intended safety device setting.

(2) Joint design and methods of attachment of all pressure containment components.

(3) Foundations and supports (design and attachment).

(4) Pertinent calculations for pressure vessel foundations and/or supports.

(5) A bill of material meeting the requirements of section VIII of section VIII of the ASME Boiler and Pressure Vessel Code (incorporated by reference; see 46 CFR 54.01-1), as modified by this part.

(6) A diagrammatic arrangement drawing of the assembled unit indicating location of internal and external components.

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by USCG-2003-16630, 73 FR 65166, Oct. 31, 2008]

§ 54.01-25 Miscellaneous pressure components (modifies UG-11).

(a) Pressure components for pressure vessels shall be as required by UG-11 of section VIII of the ASME Boiler and Pressure Vessel Code (incorporated by reference; see 46 CFR 54.01-1) except as noted otherwise in this section.

(b) All pressure components conforming to an accepted ANSI (American National Standards Institute)