

tests and/or test criteria will be specified by the Commandant.

[CGD 73-254, 40 FR 40164, Sept. 2, 1975, as amended by USCG-2000-7790, 65 FR 58460, Sept. 29, 2000]

§ 54.05-25 [Reserved]

§ 54.05-30 Allowable stress values at low temperatures.

(a) The Coast Guard will give consideration to the enhanced yield and tensile strength properties of ferrous and nonferrous materials at low temperature for the purpose of establishing allowable stress values for service temperature below 0 °F.

(b) The use of such allowable stress values must be specially approved by the Coast Guard for each application. Further information may be obtained by writing to the Coast Guard (G-MSE).

(c) Submittals must include information and calculations specified by the Coast Guard (G-MSE) to demonstrate that the allowable stress for the material cannot be exceeded under any possible combination of vessel loads and metal temperature.

[CGD 73-133R, 39 FR 9179, Mar. 8, 1974, as amended by CGD 82-063b, 48 FR 4781, Feb. 3, 1983; CGD 95-072, 60 FR 50462, Sept. 29, 1995; CGD 96-041, 61 FR 50727, 50728, Sept. 27, 1996]

Subpart 54.10—Inspection, Reports, and Stamping

§ 54.10-1 Scope (modifies UG-90 through UG-103 and UG-115 through UG-120).

(a) The inspection, tests, stamping, and reports for pressure vessels shall be as required by paragraphs UG-90 through UG-103 and UG-115 through UG-120 of the ASME Code except as noted otherwise in this subpart.

§ 54.10-3 Marine inspectors (replaces UG-90 and UG-91, and modifies UG-92 through UG-103).

(a) Only marine inspectors shall apply the Coast Guard Symbol. They will not apply any other code symbol to pressure vessels.

(b) All pressure vessels not exempted under provisions of § 54.01-15 shall be inspected by a marine inspector referring to procedures outlined in UG-92

through UG-103 of the ASME Code and §§ 50.30-10, 50.30-15, and 50.30-20 of this subchapter. The marine inspector will then stamp the vessel with the Coast Guard Symbol.

(c) Pressure vessels described in § 54.01-5(c)(3), except pressure vessels in systems regulated under § 58.60 of this chapter, must be visually examined by a marine inspector prior to installation. The marine inspector also reviews the associated plans and manufacturers' data reports. If, upon inspection, the pressure vessel complies with the applicable requirements in § 54.01-5, the marine inspector stamps the pressure vessel with the Coast Guard Symbol.

[CGFR 68-82, 33 FR 18828, Dec. 18, 1968, as amended by CGD 77-147, 47 FR 21810, May 20, 1982]

§ 54.10-5 Maximum allowable working pressure (reproduces UG-98).

(a) The maximum allowable working pressure for a vessel is the maximum pressure permissible at the top of the vessel in its normal operating position at the operating temperature specified for that pressure. It is the least of the values found for maximum allowable working pressure for any of the essential parts of the vessel by the principles given in paragraph (b) of this section and adjusted for any difference in static head that may exist between the part considered and the top of the vessel. (See UA-60 (a) of the ASME Code.)

(b) The maximum allowable working pressure for a vessel part is the maximum internal or external pressure, including the static head thereon, as determined by the rules and formulas in this Division (ASME Code), together with the effect of any combination of loadings listed in UG-22 of the ASME Code (see § 54.01-30) which are likely to occur, for the designated coincident operating temperature, excluding any metal thickness specified as corrosion allowance. (See UG-25 of the ASME Code.)

(c) Maximum allowable working pressure may be determined for more than one designated operating temperature, using for each temperature the applicable allowable stress value.

NOTE: Table 54.10-5 gives pictorially the interrelation among the various pressure

§ 54.10-10

46 CFR Ch. I (10-1-04 Edition)

levels pertinent to this part of the regulation. It includes reference to section VIII of the ASME Code for definitions and explanations.

TABLE 54.10-5—PICTORIAL INTER-RELATION AMONG VARIOUS PRESSURE LEVELS WITH REFERENCES TO SPECIFIC REQUIREMENTS ¹

Pressure differential, psi ²	Test pressures ³	Relief device pressure settings	Pressures upon which relief device flow capacity is based
	Burst proof test (UG-101(m) of ASME Code). Yield proof test (UG-101(j) of ASME Code). Standard hydrostatic test (UG-99 of ASME Code). Pneumatic test (UG-100 of ASME Code). Rupture disk burst (§ 54.15-13). Fire exposure, 120% MAWP. Normal, 110% MAWP.
	Maximum allowable working pressure (MAWP), UG-98 and UA-60(a) of ASME Code.	Maximum allowable working pressure (MAWP), UG-98 and UA-60(a) of ASME Code.	Maximum allowable working pressure (MAWP), UG-98 and UA-60(a) of ASME Code.
	Design pressure, UG-21, and UA-60(b) of ASME Code. Operating pressure (UA-60(f) of ASME Code).	Design pressure, UG-21 and UA-60(b) of ASME Code. Safety or relief value setting (UG-133 of ASME Code). Operating pressure (UA-60(f) of ASME Code).	Design pressure, UG-21 and UA-60(b) of ASME Code. Operating pressure (UA-60(f) of ASME Code).

¹ For basic pressure definitions see § 52.01-3(g) of this subchapter.
² For pressure differentials above 3,000 pounds per square inch (p.s.i.), special requirements may apply.
³ For the basis for calculating test pressures, see UA-60(e) of the ASME Code.

§ 54.10-10 Standard hydrostatic test (modifies UG-99).

(a) All pressure vessels shall satisfactorily pass the hydrostatic test prescribed by this section, except those pressure vessels noted under § 54.10-15(a).

(b) The hydrostatic test pressure shall be at least one and one-half times the maximum allowable working pressure stamped on the pressure vessel, multiplied by the ratio of the stress value "S" at the test temperature to the stress value "S" at the design temperature for the materials of which the pressure vessel is constructed. The values for "S" shall be taken from Tables UCS 23, UNF 23, UHA 23, or UHT 23 of the ASME Code. The value of "S" at test temperature shall be that taken for the material of the tabulated value of temperature closest to the test temperature. The value of "S" at design temperature shall be as interpolated from the appropriate table. No ratio less than one shall be used. The stress resulting from the hydrostatic test shall not exceed 90 percent of the yield stress of the material at the test temperature. External loadings which will

exist in supporting structure during the hydrostatic test should be considered. The design shall consider the combined stress during hydrostatic testing due to pressure and the support reactions. This stress shall not exceed 90 percent of the yield stress of the material at the test temperature. In addition the adequacy of the supporting structure during hydrostatic testing should be considered in the design.

(c) The hydrostatic test pressure shall be applied for a sufficient period of time to permit a thorough examination of all joints and connections. The test shall not be conducted until the vessel and liquid are at approximately the same temperature.

(d) Defects detected during the hydrostatic test or subsequent examination shall be completely removed and then inspected. Provided the marine inspector gives his approval, they may then be repaired.

(e) Vessels requiring stress relieving shall be stress relieved after any welding repairs have been made. (See UW-40 of the ASME Code.)