

tube sizes not exceeding 50 millimeters (2 inches) outside diameter within the limitations of applicable standards and specifications listed in this section and § 56.60–1 of this part.

(d) Flareless fittings must be of a design in which the gripping member or sleeve must grip or bite into the outer surface of the tube with sufficient strength to hold the tube against pressure, but without appreciably distorting the inside tube diameter or reducing the wall thickness. The gripping member must also form a pressure seal against the fitting body.

(e) For fluid services, other than hydraulic systems, using a combustible fluid as defined in § 30.10–15 of this chapter and for fluid services using a flammable fluid as defined in § 30.10–22 of this chapter, flared fittings must be used; except that flareless fittings of the nonbite type may be used when the tubing system is of steel, nickel copper or copper nickel alloy. When using copper or copper zinc alloy, flared fittings are required. (See also § 56.50–70 for gasoline fuel systems, § 56.50–75 for diesel fuel systems, and § 58.25–20 for hydraulic systems for steering gear.)

[CGD 95–027, 61 FR 26000, May 23, 1996; 61 FR 35138, July 5, 1996, as amended by USCG–1999–5151, 64 FR 67180, Dec. 1, 1999; USCG–2000–7790, 65 FR 58460, Sept. 29, 2000]

§ 56.30–27 Caulked joints.

Caulked joints may not be used in marine installations.

[CGD 77–140, 54 FR 40606, Oct. 2, 1989]

§ 56.30–30 Brazed joints.

(a) *General (refer also to subpart 56.75).* Brazed socket-type joints shall be made with suitable brazing alloys. The minimum socket depth shall be sufficient for the intended service. Brazing alloy shall either be end-fed into the socket or shall be provided in the form of a preinserted ring in a groove in the socket. The brazing alloy shall be sufficient to fill completely the annular clearance between the socket and the pipe or tube.

(b) *Limitations.* (1) Brazed socket-type joints shall not be used on systems containing flammable or combustible fluids in areas where fire hazards are involved or where the service tempera-

ture exceeds 425 °F. When specifically approved by the Commandant, brazed construction may be used for service temperatures up to 525 °F. in boiler steam air heaters provided the requirements of UB–12 of section VIII of the ASME Code are satisfied at the highest temperature desired.

(2) Brazed joints depending solely upon a fillet, rather than primarily upon brazing material between the pipe and socket are not acceptable.

§ 56.30–35 Gasketed mechanical couplings.

(a) This section applied to pipe fittings that form a seal by compressing a resilient gasket onto the pipe joint primarily by threaded fasteners and where joint creep is only restricted by such means as machined grooves, centering pins, or welded clips. Fittings to which this section applies must be designed, constructed, tested, and marked in accordance with ASTM F 1476 (incorporated by reference, see § 56.01–2) and ASTM F 1548 (incorporated by reference, see § 56.01–2). Previously approved fittings may be retained as long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection.

(b) Gasketed mechanical couplings may be used within the service limitations of pressure, temperature and vibration recommended by the manufacturer, except that gasketed mechanical couplings must not be used in—

(1) Any location where leakage, undetected flooding or impingement of liquid on vital equipment may disable the vessel; or

(2) In tanks where the liquid conveyed in the piping system is not chemically compatible with the liquid in the tank.

(c) Gasketed mechanical couplings must not be used as expansion joints. Positive restraints must be included, where necessary, to prevent the coupling from creeping on the pipe and uncovering the joint. Bite-type devices do not provide positive protection against creep and are generally not accepted for this purpose. Machined grooves, centering pins, and welded clips are

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considered positive means of protection against creep.

[CGD 95-027, 61 FR 26001, May 23, 1996, as amended by USCG-1999-5151, 64 FR 67180, Dec. 1, 1999]

§ 56.30-40 Flexible pipe couplings of the compression or slip-on type.

(a) Flexible pipe couplings of the compression or slip-on type must not be used as expansion joints. To ensure that the maximum axial displacement (approximately $\frac{3}{8}$ " maximum) of each coupling is not exceeded, positive restraints must be included in each installation.

(b) Positive means must also be provided to prevent the coupling from "creeping" on the pipe and uncovering the joint. Bite type devices do not provide positive protection against creeping and are not generally accepted for this purpose unless other means are also incorporated. Machined grooves or centering pins are considered positive means, and other positive means will be considered.

(c) Couplings which employ a solid sleeve with welded attachments on both pipes will require the removal of one set of attachments before dismantling. Rewelding of the attachments may require gas freeing of the line.

(d) The installation shall be such as to preclude appreciable difference in the vibration magnitudes of the pipes joined by the couplings. The couplings shall not be used as a vibration damper. The vibration magnitude and frequency should not exceed that recommended by the coupling manufacturer.

(e) Flexible couplings made in accordance with the applicable standards listed in Table 56.60-1(b) of this part and of materials complying with subpart 56.60 of this part may be used within the material, size, pressure, and temperature limitations of those standards and within any further limitations specified in this subchapter. Flexible couplings fabricated by welding must also comply with part 57 of this chapter.

(f) Flexible couplings must not be used in cargo holds or in any other space where leakage, undetected flooding, or impingement of liquid on vital equipment may disable the ship, or in

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tanks where the liquid conveyed in the piping system is not compatible with the liquid in the tank. Where flexible couplings are not allowed by this subpart, joints may be threaded, flanged and bolted, or welded.

(g) Damaged or deteriorated gaskets shall not be reinstalled.

(h) Each coupling shall be tested in accordance with § 56.97-5.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGD 77-140, 54 FR 40606, Oct. 2, 1989]

Subpart 56.35—Expansion, Flexibility and Supports

§ 56.35-1 Pipe stress calculations (replaces 119.7).

(a) A summary of the results of pipe stress calculations for the main and auxiliary steam piping where the design temperatures exceed 800 °F shall be submitted for approval. Calculations shall be made in accordance with one of the recognized methods of stress analysis acceptable to the Marine Safety Center to determine the magnitude and direction of the forces and movements at all terminal connections, anchor and junction points, as well as the resultant bending stress, longitudinal pressure stress, torsional stress, and combined expansion stress at all such points. The location of the maximum combined stress shall be indicated in each run of pipe between anchor points.

(b) Special consideration will be given to the use of the full tabulated value of S in computing S_h and S_c where all material used in the system is subjected to additional non-destructive testing as specified by the Marine Safety Center, and where the calculations prescribed in 119.6.4 and 102.3.2 of ANSI-B31.1 and § 56.07-10 are performed. The nondestructive testing procedures and method of stress analysis shall be approved by the Marine Safety Center prior to the submission of computations and drawings for approval.

[CGD 77-140, 54 FR 40607, Oct. 2, 1989]

§ 56.35-10 Nonmetallic expansion joints (replaces 119.5.1).

(a) Nonmetallic expansion joints certified in accordance with subpart 50.25