

§ 56.70–20

46 CFR Ch. I (10–1–13 Edition)

127.4.2(C) of ASME B31.1 for girth welds.

(5) In branch connections having reinforcement pads or saddles, the reinforcement shall be attached by welds at the outer edge and at the branch periphery as follows:

(i) If the weld joining the added reinforcement to the branch is a full penetration groove weld, it shall be finished with a cover fillet weld having a minimum throat dimension not less than t_c ; the weld at the outer edge, joining the added reinforcement to the run, shall be a fillet weld with a minimum throat dimension of $0.5 t_c$.

(ii) If the weld joining the added reinforcement to the branch is a fillet weld, the throat dimension shall not be less than $0.7 t_{min}$. The weld at the outer edge joining the outer reinforcement to the run shall also be a fillet weld with a minimum throat dimension of $0.5 t_c$.

(6) When rings or saddles are used, a vent hole shall be provided (at the side

and not at the crotch) in the ring or saddle to reveal leakage in the weld between branch and main run and to provide venting during welding and heat treating operations. Rings or saddles may be made in more than one piece if the joints between the pieces have strength equivalent to ring or saddle parent metal and if each piece is provided with a vent hole. A good fit shall be provided between reinforcing rings or saddles and the parts to which they are attached.

(7) Branch connections 2 in. NPS and smaller that do not require reinforcement may be constructed as shown in Fig. 127.4.8F of ASME B31.1. This construction is limited to use in Class I and II piping systems at a maximum design temperature of 750 °F. or a maximum pressure of 1025 psi.

(h) *Heat treatment.* Heat treatment for welds shall be in accordance with subpart 56.85.

TABLE 56.70–15—REINFORCEMENT OF GIRTH AND LONGITUDINAL BUTT WELDS

Thickness (in inches) of base metal	Maximum thickness (in inches) of reinforcement for design temperature		
	Below 0 °F or above 750 °F	350° to 750 °F	0 °F and above but less than 350 °F
Up to 1/8, inclusive	1/16	3/32	3/16
Over 1/8 to 3/16, inclusive	1/16	1/8	3/16
Over 3/16 to 1/2, inclusive	1/16	5/32	3/16
Over 1/2 to 1, inclusive	3/32	3/16	3/16
Over 1 to 2, inclusive	1/8	1/4	1/4
Over 2	5/32	(1)	(1)

¹ The greater of 1/4 in. or 1/8 times the width of the weld in inches.

NOTES: 1. For double welded butt joints, this limitation on reinforcement given above applies separately to both inside and outside surfaces of the joint.

2. For single welded butt joints, the reinforcement limits given above apply to the outside surface of the joint only.

3. The thickness of weld reinforcement is based on the thickness of the thinner of the materials being joined.

4. The weld reinforcement thicknesses must be determined for the higher of the abutting surfaces involved.

5. For boiler external piping use the column titled "Below 0 °F. or above 750 °F." for weld reinforcement thicknesses.

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69–127, 35 FR 9978, June 17, 1970; CGD 73–254, 40 FR 40165, Sept. 2, 1975; CGD 77–140, 54 FR 40614, Oct. 2, 1989; 55 FR 39969, Oct. 1, 1990; CGD 95–012, 60 FR 48050, Sept. 18, 1995; USCG–2003–16630, 73 FR 65184, Oct. 31, 2008]

§ 56.70–20 Qualification, general.

(a) Qualification of the welding procedures to be used, and of the performance of welders and welding operators, is required, and shall comply with the requirements of section IX of the ASME Boiler and Pressure Vessel Code (incorporated by reference; see 46 CFR 56.01–2) except as modified by part 57 of this subchapter.

(b) Each butt-welded joint of Class I of Class I-L piping shall be marked with the welder's identification symbol. Dies shall not be used to mark the pipe where the pressure exceeds 600

pounds per square inch or the temperature exceeds 750 °F. or in Class I-L systems.

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by USCG–2003–16630, 73 FR 65184, Oct. 31, 2008]

Subpart 56.75—Brazing

§ 56.75–5 Filler metal.

(a) The filler metal used in brazing must be a nonferrous metal or alloy having a melting point above 1,000 °F. and below that of the metal being joined. The filler metal must meet and flow freely within the desired temperature range and, in conjunction with a suitable flux or controlled atmosphere, must wet and adhere to the surfaces to be joined. Prior to using a particular brazing material in a piping system, the requirements of § 56.60–20 of this part should be considered.

(b) The brazing material used shall have a shearing strength of at least 10,000 pounds per square inch. The maximum allowable working pressure for brazing piping shall be determined by this part.

(c) Fluxes that are fluid and chemically active at the brazing temperature must be used when necessary to prevent oxidation of the filler metal and of the surfaces to be joined and to promote free flowing of the filler metal.

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by CGD 77–140, 54 FR 40615, Oct. 2, 1989; USCG–2003–16630, 73 FR 65184, Oct. 31, 2008]

§ 56.75–10 Joint clearance.

(a) The clearance between surfaces to be joined shall be no larger than is necessary to insure complete capillary distribution of the filler metal; between 0.002-inch minimum and 0.006-inch maximum.

(b) [Reserved]

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by USCG–2003–16630, 73 FR 65184, Oct. 31, 2008]

§ 56.75–15 Heating

(a) The joint shall be brought to brazing temperature in as short a time as possible to minimize oxidation.

(b) [Reserved]

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by USCG–2003–16630, 73 FR 65184, Oct. 31, 2008]

§ 56.75–20 Brazing qualification.

(a) The qualification of the performance of brazers and brazing operators shall be in accordance with the requirements of part C, section IX of the ASME Boiler and Pressure Vessel Code (incorporated by reference; see 46 CFR 56.01–2) and part 57 of this subchapter.

(b) Manufacturers shall perform those tests required by paragraph (a) of this section prior to performing production brazing.

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by USCG–2003–16630, 73 FR 65184, Oct. 31, 2008]

§ 56.75–25 Detail requirements.

(a) Pipe may be fabricated by brazing when the temperature to which such connections may be subjected does not exceed 425 °F. (For exception refer to § 56.30–30(b)(1).)

(b) The surfaces to be brazed must be clean and free from grease, oxides, paint, scale, and dirt of any kind. Any suitable chemical or mechanical cleaning method may be used to provide a clean, wettable surface for brazing.

(c) After the parts to be joined have been thoroughly cleaned the edges to be brazed shall be given an even coating of flux prior to heating the joint as a protection against oxidation.

[CGFR 68–82, 33 FR 18843, Dec. 18, 1968, as amended by USCG–2003–16630, 73 FR 65184, Oct. 31, 2008]

§ 56.75–30 Pipe joining details.

(a) *Silver brazing.* (1) Circumferential pipe joints may be either of the socket or butt type. When butt joints are employed the edges to be joined shall be cut or machined square and the edges shall be held closely together to insure a satisfactory joint.

(b) *Copper-alloy brazing.* (1) Copper-alloy brazing may be employed to join pipe, valves, and fittings. Circumferential joints may be either of the butt or socket type. Where butt joints are employed, the included angle shall be not less than 90° where the wall thickness