

§ 56.70-15(d)(3) of this part for Class I service and in § 56.50-105 of this part for low temperature service. These sections should be checked when designing for these systems. See § 56.70-15(d)(4) of this part for Class II service.

(3) (Reproduces 111.3.4.) Drains and bypasses may be attached to a valve of fitting by socket welding provided the socket depth, bore diameter, and shoulder thickness conform to ANSI B16.11.

(d) *Fillet welds.* Fillet welds may vary from convex to concave. The size of a fillet weld is determined as shown in Figure 127.4.4A of ANSI B31.1. Fillet weld details for socket-welding components must meet § 56.30-5(c) of this part. Fillet weld details for flanges must meet § 56.30-10 of this part. See also § 56.70-15(d)(3) and (d)(4) of this part for applications of fillet welds.

(e) *Seal welds.* Seal welds may be used but shall not be considered as contributing any strength to the joint.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGD 77-140, 54 FR 40605, Oct. 2, 1989; CGD 95-012, 60 FR 48050, Sept. 18, 1995]

**§ 56.30-10 Flanged joints (modifies 104.5.1(a)).**

(a) Flanged or butt-welded joints are required for Classes I and I-L piping for nominal diameters exceeding 2 inches, except as otherwise specified in this subchapter.

(b) Flanges may be attached by any method shown in Figure 56.30-10(b) or by any additional means that may be approved by the Marine Safety Center. Pressure temperature ratings of the appropriate ANSI standard must not be exceeded.

(1) *Figure 56.30-10(b), Method 1.* Flanges with screw threads may be used in accordance with Table 56.30-20(c) of this part.

(2) *Figure 56.30-10(b), Method 2.* ANSI B16.5 class 150 and class 300 low-hubbed flanges with screw threads, plus the addition of a strength fillet weld of the size as shown, may be used in Class I systems not exceeding 750 °F or 4 NPS, in Class II systems without diameter limitations, and in Class II-L systems not exceeding 1 NPS. If 100 percent radiography is required by § 56.95-10 of this part for the class, diameter, wall thickness, and material of pipe being

joined, the use of the threaded flanges is not permitted and butt-welding flanges must be provided. For Class II piping systems, the size of the strength fillet may be limited to a maximum of 0.525 inch instead of 1.4T.

(3) *Figure 56.30-10(b), Method 3.* ANSI B16.5 slip-on flanges may be used in Class I, Class II, or Class II-L systems not to exceed the service pressure-temperature ratings for the class 300 and lower class flanges, within the temperature limitations of the material selected for use, and not to exceed 4 NPS in Class I and Class II-L systems. If 100 percent radiography is required by § 56.95-10 of this part for the class, diameter, wall thickness, and material of the pipe being joined, the use of slip-on flanges is not permitted and a butt welding flange must be provided. The configuration in Figure 127.4.4B(b) of ANSI B31.1, utilizing a face and backweld may be preferable in those applications where it is desirable to eliminate void spaces. For Class II piping systems, the size of the strength fillet may be limited to a maximum of 0.525 inch instead of 1.4T and the distance from the face of the flange to the end of the pipe may be a maximum of three-eighths inch. Restrictions on the use of slip-on flanges appear in § 56.50-105 of this part for low temperature piping systems.

(4) *Figure 56.30-10(b), Method 4.* ANSI B16.5 socket welding flanges may be used in Class I or II-L systems not exceeding 3 NPS for class 600 and lower class flanges and 2½ NPS for class 900 and class 1500 flanges within the service pressure-temperature ratings of the standard. Whenever full radiography is required by § 56.95-10 for the class, diameter, and wall thickness of the pipe being joined, the use of socket welding flanges is not permitted and a butt weld type connection must be provided. For Class II piping, socket welding flanges may be used without diameter limitation, and the size of the fillet weld may be limited to a maximum of 0.525 inch instead of 1.4T. Restrictions on the use of socket welds appear in § 56.50-105 for low temperature piping systems.

(5) *Figure 56.30-10(b), Method 5.* Flanges fabricated from steel plate meeting the requirements of part 54 of

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this chapter may be used for Class II piping for pressures not exceeding 150 pounds per square inch and temperatures not exceeding 450 °F. Plate material listed in UCS-6(b) Section VIII of the ASME Code may not be used in this application, except that material meeting ASTM Specification A 36 (incorporated by reference, see §56.01-2) may

be used. The fabricated flanges must conform at least to the American National Standard class 150 flange dimensions. The size of the strength fillet weld may be limited to a maximum of 0.525 inches instead of 1.4T and the distance from the face of the flange to the end of the pipe may be a maximum of three-eighths inch.

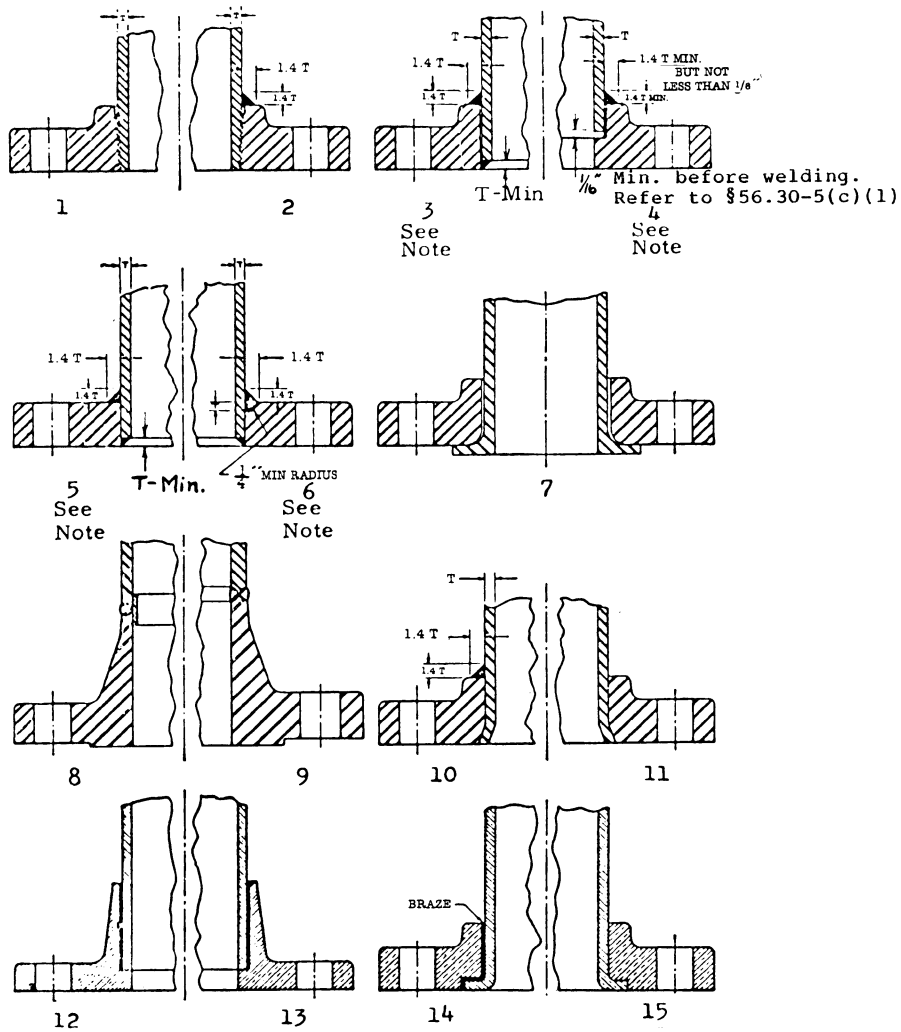


FIGURE 56.30-10(B)—METHODS OF ATTACHMENT

NOTE: T is nominal pipe wall thickness used. Refer to text in §56.30-10(b) for modifications on Class II piping systems. Fillet weld leg size need not exceed the thickness of the applicable ANSI hub.

(6) *Figure 56.30-10(b), Method 6.* Steel plate flanges meeting the material and construction requirements listed in subparagraph (5) of this paragraph may be used for Class II piping for pressures not exceeding 150 pounds per square inch or temperatures not exceeding 650 °F. The flange shall be attached to the pipe as shown by Figure 56.30-10(b), Method 6. The pressure shall not exceed the American National Standard Service pressure temperature rating. The size of the strength fillet weld may be limited to a maximum of 0.525 inch instead of 1.4T and the distance from the face of the flange to the end of the pipe may be a maximum of three-eighths inch.

(7) *Figure 56.30-10(b), Method 7.* Lap joint flanges (Van Stone) may be used for Class I and Class II piping. The Van Stone equipment shall be operated by competent personnel. The ends of the pipe shall be heated from 1,650° to 1,900 °F, dependent on the size of the pipe prior to the flanging operation. The foregoing temperatures shall be carefully adhered to in order to prevent excess scaling of the pipe. The extra thickness of metal built up in the end of the pipe during the forming operation shall be machined to restore the pipe to its original diameter. The machined surface shall be free from surface defects and the back of the Van Stone lap shall be machined to a fine tool finish to furnish a line contact with the mating surface on the flange for the full circumference as close as possible to the fillet of the flange. The number of heats to be used in forming a flange shall be determined by the size of the pipe and not more than two pushups per heat are permitted. The width of the lap flange shall be at least three times the thickness of the pipe wall and the end of the pipe shall be properly stress relieved after the flanging operation is completed. Manufacturers desiring to produce this type of joint shall demonstrate to a marine inspector that they have the proper equipment and personnel to produce an acceptable joint.

(8) *Figure 56.30-10(b), Method 8.* Welding neck flanges may be used on any piping provided the flanges are butt-welded to the pipe. The joint shall be welded as indicated by Figure 56.30-10(b), Method 8, and a backing ring employed which will permit complete penetration of the weld metal. If a backing ring is not used, refer to §56.30-5(b) for requirements.

(9) *Figure 56.30-10(b), Method 9.* Welding neck flanges may also be attached to pipe by a double-welded butt joint as shown by Figure 56.30-10(b), Method 9.

(10) *Figure 56.30-10(b), Method 10.* Flanges may be attached by shrinking the flange on to the end of the pipe and flaring the end of the pipe to an angle of not less than 20°. A fillet weld of the size shown by Figure 56.30-10(b), Method 10, shall be used to attach the hub to the pipe. This type of flange is limited to a maximum pressure of 300 pounds per square inch at temperatures not exceeding 500 °F.

(11) *Figure 56.30-10(b), Method 11.* The flange of the type described and illustrated by Figure 56.30-10(b), Method 10, except with the fillet weld omitted, may be used for Class II piping for pressures not exceeding 150 pounds per square inch and temperatures not exceeding 450 °F.

(12) *Figure 56.30-10(b), Method 12.* High-hub bronze flanges may be used for temperatures not exceeding 425 °F. The hub of the flange shall be bored to a depth not less than that required for a threaded connection of the same diameter leaving a shoulder for the pipe to butt against. A preinserted ring of silver brazing alloy having a melting point not less than 1,000 °F, and of sufficient quantity to fill the annular clearance between the flange and the pipe shall be inserted in the groove. The pipe shall then be inserted in the flange and sufficient heat applied externally to melt the brazing alloy until it completely fills the clearance between the hub and the flange of the pipe. A suitable flux shall be applied to the surfaces to be joined to produce a satisfactory joint.

(13) *Figure 56.30-10(b), Method 13.* The type of flange as described for Figure 56.30-10(b), Method 12, may be employed and in lieu of an annular groove being machined in the hub of the flange

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for the preinserted ring of silver brazing alloy, a bevel may be machined on the end of the hub and the silver brazing alloy introduced from the end of the hub to attach the pipe to the flange.

(14) *Figure 56.30-10(b), Method 14.* Flanges may be attached to nonferrous pipe by inserting the pipe in the flange and flanging the end of the pipe into the recess machined in the face of the flange to receive it. The width of the flange shall be not less than three times the pipe wall thickness. In addition, the pipe shall be securely brazed to the wall of the flange.

(15) *Figure 56.30-10(b), Method 15.* The flange of the type described and illustrated by Figure 56.30-10(b), Method 14, except with the brazing omitted, may be used for Class II piping and where the temperature does not exceed 250 °F.

[CGFR 68-82, 33 FR 18843, Dec. 18, 1968, as amended by CGFR 69-127, 35 FR 9978, June 17, 1970; CGD 77-140, 54 FR 40605, Oct. 2, 1989; USCG-2000-7790, 65 FR 58460, Sept. 29, 2000]

**§ 56.30-15 Expanded or rolled joints.**

(a) Expanded or rolled joints may be used where experience or test has demonstrated that the joint is suitable for the design conditions and where adequate provisions are made to prevent separation of the joint. Specific application for use must be made to the Commandant.

(b) [Reserved]

**§ 56.30-20 Threaded joints.**

(a) Threaded joints may be used within the limitations specified in subpart 56.15 of this chapter and within other limitations specified in this section.

(b) (Reproduces 114.1.) All threads on piping components must be taper pipe threads in accordance with the applicable standard listed in Table 56.60-1(b). Threads other than taper pipe threads may be used for piping components where tightness of the joint depends on a seal weld or a seating surface other than the threads, and where experience or test has demonstrated that such threads are suitable.

(c) Threaded joints may not be used where severe erosion, crevice corrosion, shock, or vibration is expected to occur; or at temperatures over 925 °F.

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Size limitations are given in Table 56.30-20(c) of this section.

TABLE 56.30-20(c)—THREADED JOINTS<sup>1 2</sup>

Maximum nominal size, inches	Maximum pressure, p.s.i.g.
Above 2" .....	(Not permitted in Class I piping service.)
Above 1" up to 2" .....	600.
Above 3/4" up to 1" .....	1,200.
3/4" and below .....	1,500.

<sup>1</sup> Further restrictions on the use of threaded joints appear in the low temperature piping section.

<sup>2</sup> Threaded joints in hydraulic systems are permitted above the pressures indicated for the nominal sizes shown when commercially available components such as pumps, valves and strainers may only be obtained with threaded connections.

(d) Pipe with a wall thickness less than that of standard weight of ANSI B36.10 steel pipe must not be threaded regardless of service. For additional threading limitations for pipe used in steam service over 250 pounds per square inch or water service over 100 pounds per square inch and 200 °F, see part 104.1.2(c)(1) of ANSI B31.1. Restrictions as to the use of threaded joints appear for low temperature piping and should be checked when designing for these systems.

[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 40164, Sept. 2, 1975; CGD 77-140, 54 FR 40606, Oct. 2, 1989]

**§ 56.30-25 Flared, flareless, and compression fittings.**

(a) This section applies to pipe fittings that are mechanically connected to pipe by such means as ferrules, flared ends, swaging, elastic strain pre-load, crimping, bite-type devices, and shape memory alloys. Fittings to which this section applies must be designed, constructed, tested, and marked in accordance with ASTM F 1387 (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) Flared, flareless and compression fittings may be used within the service limitations of size, pressure, temperature, and vibration recommended by the manufacturer and as specified in this section.

(c) Flared, flareless, and compression type tubing fittings may be used for