

**§ 178.360-4 Closure devices.**

(a) Each closure device must be as follows:

(1) Screw-type cap or plug; number of threads per inch must not be less than United States standard pipe threads and must have sufficient length of thread to engage at least 5 threads when securely tightened. Pipe threads must be luted with an appropriate non-hardening compound which must be capable of withstanding up to 149 °C (300 °F) without loss of efficiency. Tightening torque must be adequate to maintain leak tightness with the specific luting compound.

(2) An opening may be closed by a securely bolted flange and leak-tight gasket. Each flange must be welded or brazed to the body of the 2R vessel per (ANSI) Standard B16.5 or (AWWA) Standard C207–55, section 10 (IBR, see §171.7 of this subchapter). A torque wrench must be used in securing the flange with a corresponding torque of no more than twice the force necessary to seal the selected gasket. Gasket material must be capable of withstanding up to 149 °C (300 °F) without loss of efficiency. The flange, whether of ferrous or nonferrous metal, must be constructed from the same metal as the vessel and must meet the dimensional and fabrication specifications for welded construction as follows:

(i) Pipe flanges described in Tables 13, 14, 16, 17, 19, 20, 22, 23, 25 and 26 of ANSI B16.5 (IBR, see §171.7 of this subchapter).

(ii) For nominal pipe sizes, 6, 8, 10, and 12 inches, AWWA Standard C207–55, Table 1, class B, may be used in place of the tables prescribed by paragraph (a)(2)(i) of this section.

(iii) Sizes under 6 inches, nominal pipe size, the following table with the same configuration as illustrated in AWWA C207–55, Table 1, class B, may be used in place of paragraph (a)(2)(i) of this section.

Nominal pipe size		Flange O.D.		Number of bolts	Bolt circle diameter		Diameter of bolts		Flange thickness	
Inches	Cm	Inches	Cm		Inches	Cm	Inches	Cm	Inches	Cm
2	5	6	15	4	4 3/4	11.8	1/2	1.2	5/8	1.6
2 1/2	6.2	7	17.5	4	5 1/2	13.8	1/2		5/8	
3	7.5	7 1/2	18.8	4	6	15	1/2		5/8	
3 1/2	8.8	8 1/2	21.3	8	7	17.5	1/2		5/8	
4	10	9	22.5	8	7 1/2	18.8	1/2		5/8	
5	12.6	10	25.4	8	8 1/2	21.3	1/2		5/8	

(iv) Cast iron flanges prohibited.

(b) [Reserved]

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