

§ 178.360 Specification 2R; inside containment vessel.

§ 178.360-1 General requirements.

(a) Each vessel must be made of stainless steel, malleable iron, or brass, or other material having equivalent physical strength and fire resistance.

(b) Each vessel must meet all of the applicable requirements of §173.24 (c) and (d) of this subchapter. Letters and numerals at least 6 mm (¼-inch) in height are authorized for the marking of a vessel not exceeding 5 cm (2 inches) inside diameter.

[Amdt. 178-35, 39 FR 45245, Dec. 31, 1974. Re-designated by Amdt. 178-97, 55 FR 52716, Dec. 21, 1990; 66 FR 45387, Aug. 28, 2001]

§ 178.360-2 Manufacture.

The ends of the vessel must be fitted with screw-type closures or flanges (see §178.360-4), except that one or both ends of the vessel may be permanently closed by a welded or brazed plate. Welded or brazed side seams are authorized.

[Amdt. 178-35, 39 FR 45245, Dec. 31, 1974. Re-designated by Amdt. 178-97, 55 FR 52716, Dec. 21, 1990, as amended at 63 FR 37462, July 10, 1998]

§ 178.360-3 Dimensions.

(a) The inside diameter of the vessel may not exceed 30 cm (12 inches) exclusive of flanges for handling or fastening devices and must have wall thickness and length in accordance with the following:

Inside diameter maximum		Threaded closure		Wall thickness minimum—Flanged closure	Length maximum	
Inches	Cm	Inches	Mm		Inches	Cm
2	5	3/32	2.5	Not less than that prescribed for schedule 40 pipe	16	41
6	15	1/8	3.2	.....	72	183
12	30	1/4	6.5	.....	72	183

(b) [Reserved]

[Amdt. 178-35, 39 FR 45245, Dec. 31, 1974. Re-designated by Amdt. 178-97, 55 FR 52716, Dec. 21, 1990; 66 FR 45387, Aug. 28, 2001]

§ 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. 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.

(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.

§ 178.362

49 CFR Ch. I (10–1–02 Edition)

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	4¾	11.8	½	1.2	⅝	1.6
2½	6.2	7	17.5	4	5½	13.8	½	.....	⅝	.....
3	7.5	7½	18.8	4	6	15	½	.....	⅝	.....
3½	8.8	8½	21.3	8	7	17.5	½	.....	⅝	.....
4	10	9	22.5	8	7½	18.8	½	.....	⅝	.....
5	12.6	10	25.4	8	8½	21.3	½	.....	⅝	.....

- (iv) Cast iron flanges prohibited.
- (b) [Reserved]

[Amdt. 178–35, 39 FR 45245, Dec. 31, 1974; 40 FR 2435, Jan. 13, 1975, as amended at 40 FR 44327, Sept. 26, 1975. Redesignated by Amdt. 178–97, 56 FR 66284, Dec. 20, 1991]

§ 178.362 Specification 20WC wooden protective jacket.

§ 178.362–1 General requirements.

- (a) Each jacket must meet the applicable requirements of §173.24 of this subchapter.
- (b) Maximum gross weight of the jacket plus the contents may not exceed the following:
 - (1) Specification 20WC–1: 225 kg (500 pounds).
 - (2) Specification 20WC–2: 225 kg (500 pounds).
 - (3) Specification 20WC–3: 455 kg (1000 pounds).
 - (4) Specification 20WC–4: 910 kg (2000 pounds).
 - (5) Specification 20WC–5: 1820 kg (4000 pounds).
 - (6) Specification 20WC–6: 2730 kg (6000 pounds).

[Amdt. 178–35, 39 FR 45252, Dec. 31, 1974. Redesignated by Amdt. 178–97, 55 FR 52716, Dec. 21, 1990; 66 FR 45387, Aug. 28, 2001; 67 FR 61016, Sept. 27, 2002]

§ 178.362–2 Materials of construction.

- (a) The general configuration of the wooden protective jacket must be a hollow cylindrical shell constructed of one-piece discs and rings of plywood or solid hardwood reinforced with steel rods.
 - (1) The specification 20WC–2 must be additionally completely encased, snugly fit, within an 18-gauge steel shell. The steel shell must be provided with at least four 6 millimeter (0.25-inch) diameter vent holes. Each hole must be covered with durable weatherproof tape, or equivalent device.

(2) The specification 20WC–6 jacket must be additionally completely encased, snugly-fit, within a 12-gauge steel shell. The steel shell must be provided with at least twelve 1.2 cm (0.5-inch) diameter vent holes, located in 3 rows of 4 holes each, spaced at 90 degree intervals near the top, middle, and bottom of the drum. Each hole must be covered with durable weatherproof tape, or equivalent device.

(b) Plywood must be exterior-grade, void-free, Douglas fir (or equivalent) not more than 2.5 cm (1 inch) thick. Solid hardwood is authorized for specification 20WC–2 only.

(c) Discs and rings must be glued together with a strong, shock-resistant adhesive, such as either of the following:

- (1) A resorcinol-formaldehyde adhesive, which has been bonded under both heat and pressure; or
- (2) A polyvinyl-acetate emulsion, which has been reinforced with cement-coated nails. The nails must be randomly spaced and must be at least 2.5 times as long as the minimum thickness of the plywood discs or rings.

(d) Full-length steel rods are required for reinforcement and lid closure.

(1) The minimum number of rods and the minimum rod diameter are as shown in the following table:

Specification	Minimum number of rods	Minimum rod diameter	
		Inches	Mm
20WC–1	6	0.25	6.0
20WC–2	6	.25	6.0
20WC–3	12	.375	9.5
20WC–4	16	.375	9.5
20WC–5	16	.50	12.0
20WC–6	16	.50	12.0

(2) For specifications 20WC–1 and 20WC–2, steel rods must be equally spaced around the circumference to the rings and discs, midway between the O.D. and I.D. of the rings. For specifications 20WC–3 and 20WC–4, bolts may