

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: 2230 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]

§ 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

§ 178.362-3

be staggered alternately in two rows, at ± 1.2 cm (0.5-inch) from the line midway between the O.D. and I.D. of the rings. For specifications 20WC-5 and 20WC-6, bolts may be staggered alternately in two rows at ± 2.5 cm (1 inch) from the line midway between the O.D. and I.D. of the rings.

(3) Rod ends must be threaded and secured with lock nuts and steel washers, or equivalent device, to provide at least a 2.5 cm (1 inch) diameter bearing surface on each end. Ends of the rods must terminate 1.4 cm (0.75-inch) below the surface of the plywood for specifications 20WC-1 and 20WC-2. For specifications 20WC-3, 20WC-4, 20WC-5 and 20WC-6, the ends of the rods must terminate 3.7 cm (1.5 inches) below the surface of the plywood, and that portion of each end disc which extends beyond the rod ends must be further held in place with lag screws at least 10 cm (4 inches) long.

(e) Thickness of wooden shell:

(1) Specification 20WC-1: At least 10 cm (4 inches) thick.

(2) Specification 20WC-2: At least 7.5 cm (3 inches) thick.

(3) Specification 20WC-3: At least 13 cm (5 inches) thick for the jacket wall, and at least 15 cm (6 inches) thick for the end discs. In addition, at least 3 plywood chines, 5 cm (2 inches) wide and protruding 5 cm (2 inches) beyond the outer surfaces, must be located at each end and midway along the length of the jacket.

(4) Specification 20WC-4: At least 15 cm (6 inches) thick for the jacket wall, and at least 15 cm (6 inches) thick for the end discs. In addition, at least 3 plywood chines, 5 cm (2 inches) wide and protruding 5 cm (2 inches) beyond the outer surfaces, must be located at each end and midway along the length of the jacket.

(5) Specifications 20WC-5 and 20WC-6: At least 15 cm (6 inches) thick for the jacket wall, and at least 20 cm (8 inches) thick for the end discs. In addition, at least 5 plywood chines, 5 cm (2 inches) wide and protruding 5 cm (2 inches) beyond the outer surfaces, must be located at each end and equal-

49 CFR Ch. I (10-1-01 Edition)

ly spaced along the length of the jacket.

[Amdt. 178-35, 39 FR 45252, Dec. 31, 1974. Re-designated by Amdt. 178-97, 55 FR 52716, Dec. 21, 1990, and amended by Amdt. 178-99, 58 FR 51534, Oct. 1, 1993; 66 FR 45387, Aug. 28, 2001]

§ 178.362-3 Closure.

(a) Closure for the wooden protective jacket is provided by the steel reinforcing rods. The end cap (lid) must fit tightly to the body of the jacket to prevent a heat path to the inside of the jacket. The lid joint for specifications 20WC-3, 20WC-4, 20WC-5, and 20WC-6, may not be coplanar with the end of the inner containment vessel.

(b) Specifications 20WC-2 and 20WC-6. Locking ring closure, if used, must conform to §178.354-4. Flanged closure, if used, must have at least 8 steel bolts (at least 6 mm (0.25-inch) diameter for 20WC-2 or 1.2 cm (0.50-inch) diameter for 20WC-6) and lock nuts (or equivalent device), spaced not more than 13 cm (5 inches) between centers.

[Amdt. 178-35, 39 FR 45252, Dec. 31, 1974. Re-designated by Amdt. 178-97, 55 FR 52716, Dec. 21, 1990, as amended at 63 FR 37462, July 10, 1998; 66 FR 45387, Aug. 28, 2001]

§ 178.362-4 Tests.

Prior to each use, each jacket must be visually inspected for defects such as improper bonding, cracking, corrosion of steel rods, and improperly fitting closure lid, or other manufacturing defects. Particular attention must be given to any separation of the plywood discs and rings which would provide a heat path to the inside of the jacket.

[Amdt. 178-35, 39 FR 45252, Dec. 31, 1974. Re-designated by Amdt. 178-97, 55 FR 52716, Dec. 21, 1990]

§ 178.362-5 Painting.

Each jacket (other than 20WC-2 and 20WC-6) must be completely painted with a high quality exterior weather resistant paint.

[Amdt. 178-35, 39 FR 45252, Dec. 31, 1974. Re-designated by Amdt. 178-97, 55 FR 52716, Dec. 21, 1990]