NOTICE: This standard has either been superseded and replaced by a new version or withdrawn.
Contact ASTM International (www.astm.org) for the latest information

Designation: C668 – 98(Reapproved 2008)

Standard Specification for Asbestos-Cement Transmission Pipe[1]

This standard is issued under the fixed designation C668; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers asbestos-cement transmission pipe intended for use in transmission systems that carry fluids under pressure. A transmission system consists of pipe lines which convey fluids from their source to a point of distribution or discharge. The system is characterized by relatively steady flow and few appurtenances, thereby permitting reasonable hydraulic analysis, including surge analysis.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

NOTE 1—This specification is issued for product standardization and purchasing purposes only, and does not include requirements for installation or the relationships between operating conditions and the strength characteristics of the various classifications of pipe. The purchaser is cautioned that he must correlate installation and operating conditions with the specified characteristics of the pipe.

1.3 **Warning**—Breathing of asbestos dust is hazardous. Asbestos and asbestos products present demonstrated health risks for users and for those with whom they come into contact. In addition to other precautions, when working with asbestos-cement products, minimize the dust that results. For information on the safe use of chrysoltile asbestos, refer to "Safe Use of Chrysotile Asbestos: A Manual on Preventive and Control Measures."[2]

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* See for a specific hazard warning.

2. Referenced Documents

2.1 *ASTM Standards:*[3]

C150 Specification for Portland Cement
C458 Test Method for Organic Fiber Content of Asbestos-Cement Products
C500 Test Methods for Asbestos-Cement Pipe
C595 Specification for Blended Hydraulic Cements
C618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
D1869 Specification for Rubber Rings for Asbestos-Cement Pipe
D2946 Terminology for Asbestos and Asbestos–Cement Products

2.2 *Federal Standard:*

Fed. Std. No. 123 Marking for Shipment (Civil Agencies)[4]

2.3 *Military Standard:*

MIL-STD-129 Marking for Shipment and Storage[4]

2.4 *Other Standards:*

Uniform Freight Classification Rules[5]
National Motor Freight Classification Rules[6]

3. Terminology

3.1 *Definitions:*

3.1.1 *coupling*—fitting made from larger diameter pipe of the same type and class, or of Type II and a higher class for joining asbestos-cement pipe that, when properly installed with the proper accessories, develops a joint equivalent in strength and serviceability to the pipe sections.

3.1.2 *lot, n*—for pipe sizes 525 mm (21 in.) in diameter and smaller, each 300 lengths of pipe or less, of identical class and

[1] This specification is under the jurisdiction of ASTM Committee C17 on Fiber-Reinforced Cement Products and is the direct responsibility of C17.03 on Asbestos - Cement Sheet Products and Accessories.

Current edition approved May 1, 2008. Published July 2008. Originally approved in 1970. Last previous edition approved in 2003 as C668 – 98 (2003)ε2. DOI: 10.1520/C0668-98R08.

[2] Available from The Asbestos Institute, http://www.chrysotile.com/en/sr_use/manual.htm.

[3] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[4] Available from Standardization Documents Order Desk, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094 Attn: NPODS.

[5] Available from the Uniform Classification Commission, Room 1106, 222 S. Riverside Plaza, Chicago, IL 60606.

[6] Available from National Motor Freight Inc., 1616 "P" St., NW, Washington, DC 20036.

Copyright © ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959. United States

Documents
Document Sharing Hub
Full document details: ASTM C668-98(2008)

size manufactured on each machine during a 24-h period. For pipe larger than 525 mm (21 in.), each 300 lengths of pipe or less, of identical class and size manufactured on each machine during a period of consecutive working days not exceeding seven days.

3.1.3 Additional terminology is given in Terminology D2946.

4. Classification

4.1 Asbestos-cement pipe furnished under this specification shall be manufactured in Classifications 21, 24, 28, 31, 34, 41, 58, 55, and 62. Note that these numbers correspond to ten times the minimum hydrostatic strength, in MPa (30, 35, 40, 45, 50, 60, 70, 80, and 90. This classification corresponds to one tenth of the minimum hydrostatic strength, in psi).

4.2 The types of pipe shall be known as Type I and Type II corresponding to the chemical requirements in 7.1.

NOTE 2—To assist the purchaser in choosing the type of pipe most suitable for his use, guidelines for the definition of aggressiveness of water and of soil environments for selection of the proper type of asbestos-cement pipe are covered in Sections 19 to 25 of Test Methods C500.

5. Manufacture

5.1 Asbestos-cement furnished under this specification shall be composed of an intimate mixture of portland cement, conforming to Specification C150, or portland slag or pozzolan cements conforming to Specification C595, and asbestos fiber with or without finely divided silica or silica-containing mineral additives conforming to Specification C618 that can react to form calcium silicate reaction products, and asbestos fiber. The mixture shall not contain more than 0.2 % of non-deleterious organic components, as determined by Test Method C458. The material shall be of laminar construction formed under pressure to a homogeneous structure and cured to meet the physical and chemical requirements of this specification.

6. Rubber Rings

6.1 The rubber rings used to seal the joints of the asbestos-cement pipe shall conform to the requirements of Specification D1869.

7. Chemical Requirements

7.1 When uncombined calcium hydroxide tests are requested, one sample shall be taken from each lot of pipe and tested in accordance with Test Methods C500. The sample to be tested may be taken from one of the specimens selected for the crushing test. The amount of uncombined calcium hydroxide shall not exceed 1 % for Type II pipe.

NOTE 3—There are no chemical requirements for Type I pipe.

TABLE 1 Applied Hydrostatic Proof Pressures[A]

Pipe Classification		Applied Hydrostatic Pressure	
10 × MPa rating	(1/10 psi rating)	MPa	(psi)
21	(30)	1.55	(225)
24	(35)	1.81	(262)
28	(40)	2.07	(300)
31	(45)	2.32	(337)
34	(50)	2.58	(375)
41	(60)	3.10	(450)
48	(70)	3.62	(525)
55	(80)	4.13	(600)
62	(90)	4.65	(675)

[A] The pressures and classifications indicated apply to all sizes.

TABLE 2 Minimum Hydrostatic Strength[A]

Pipe Classification		Hydrostatic Pressure Rating	
10 × MPa rating	(1/10 psi rating)	MPa	(psi)
21	(30)	2.1	(300)
24	(35)	2.4	(350)
28	(40)	2.8	(400)
31	(45)	3.1	(450)
34	(50)	3.4	(500)
41	(60)	4.1	(600)
48	(70)	4.8	(700)
55	(80)	5.5	(800)
62	(90)	6.2	(900)

[A] The pressures and classifications indicated apply to all sizes.

8. Hydrostatic Strength

8.1 Each standard, random, or short length of pipe (see Section 11) and each coupling sleeve, manufactured from the same material as the pipe, shall be hydrostatically tested by the manufacturer prior to shipment and shall have sufficient strength to withstand the internal hydrostatic pressure prescribed in Table 1, when tested in accordance with Test Methods C500.

8.2 From each lot of pipe which has passed the routine hydrostatic proof test, one length shall be selected by the inspector. A 30 cm (12 in.) or longer section of pipe cut from an unmachined portion of the selected length shall have the minimum hydrostatic strength designated in Table 2, when tested in accordance with Test Methods C500, except that the pressure need not be held for 5 s.

9. Flexural Strength

9.1 Each length of pipe in sizes 15 and 20 cm (6 and 8 in.) nominal diameter having lengths 30 cm (12 in.) or longer shall have sufficient flexural strength to withstand without failure the total load prescribed in Table 3 when tested in accordance with Test Methods C500.

TABLE 3 Minimum Applied Flexural Proof Loads

Pipe Classification		Nominal Size			
10 × MPa rating	(1/10 psi rating)	15 cm (6 in.)		20 cm (8 in.)	
		kN	(lbf)	kN	(lbf)
21	(30)	—	—	16	(3700)
24	(35)	—	—	20	(4400)
28	(40)	10	(2300)	23	(5100)
31	(45)	11	(2500)	25	(5700)
34	(50)	12	(2800)	28	(6400)
41	(60)	14	(3200)	31	(6900)
48	(70)	16	(3700)	34	(7600)
55	(80)	18	(4000)	39	(8800)
62	(90)	22	(4900)	45	(10100)

AVA Documents
Document Sharing Hub

Full document details: ASTM C668-98(2008)