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An American National Standard

Standard Specification for Polymer Concrete Pipe [1]

This standard is issued under the fixed designation D6783; 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 polymer concrete pipe, 6 in. (150 mm) through 144 in. (3 660 mm), intended for use in gravity-flow systems for conveying sanitary sewage, storm water, and industrial wastes.

1.2 Although this specification is suited primarily for pipe to be installed by direct burial and pipe jacking, it may be used to the extent applicable for other installations such as sliplining and rehabilitation of existing pipelines.

NOTE 1—Unlike reinforced thermosetting resin pipes, polymer concrete pipe is designed and installed using rigid pipe design theory and practices.

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 The following safety hazards caveat pertains only to the test methods portion, Section 8, of this specification. *This standard ~~may involve hazardous materials, operations, and equipment. 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~~ safety, health, and ~~health~~environmental practices and determine the applicability of regulatory ~~requirements~~limitations prior to use.*

NOTE 2—There is no known ISO equivalent to this standard.

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

A276 Specification for Stainless Steel Bars and Shapes
C33 Specification for Concrete Aggregates
C117 Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
C125 Terminology Relating to Concrete and Concrete Aggregates
C136 Test Method for Sieve Analysis of Fine and Coarse Aggregates
C579 Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes
D648 Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position
D883 Terminology Relating to Plastics
D1600 Terminology for Abbreviated Terms Relating to Plastics
D2584 Test Method for Ignition Loss of Cured Reinforced Resins
D3567 Practice for Determining Dimensions of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Pipe and Fittings
D3681 Test Method for Chemical Resistance of "Fiberglass" (Glass–Fiber–Reinforced Thermosetting-Resin) Pipe in a Deflected Condition
D3892 Practice for Packaging/Packing of Plastics
D4161 Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals
F412 Terminology Relating to Plastic Piping Systems

[1] This specification is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.23 on Reinforced Plastic Piping Systems and Chemical Equipment.

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[2] 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.

F477 Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

3. Terminology

3.1 *Definitions*—Unless otherwise indicated, definitions are in accordance with Terminologies C125, D883, and F412, and abbreviations are in accordance with Terminology D1600.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *aggregate, n*—a granular material, such as sand, gravel, or crushed stone, in accordance with to the requirements of Specification C33 except that the requirements for gradation shall not apply.

3.2.2 *pipe jacking, n*—a system of directly installing pipes behind a shield machine by hydraulic jacking from a drive shaft, such that the pipes form a continuous string in the ground.

3.2.3 *polymer concrete, n*—a composite material that consists essentially of a thermosetting resin within which are embedded particles or fragments of aggregate.

3.2.4 *polymer concrete pipe, n*—tubular product containing aggregate, embedded in or surrounded by cured thermosetting resin, which may also contain granular or platelet fillers, thixotropic agents, pigments, or dyes.

3.2.5 *qualification test, n*—one or more tests used to prove the design of a product and which are not routine quality control tests.

4. Classification

4.1 Polymer concrete pipe furnished under this specification is manufactured in strength classes I, II, III, IV, or V as given in Table 1. (See also Note 5.)

NOTE 3—The D-Load is the three-edge bearing strength per unit length divided by the inside diameter.

NOTE 4—Other strength categories shall be permitted by agreement between the purchaser and the manufacturer.

5. Materials and Manufacture

5.1 *Wall Composition*—The wall composition shall consist of a thermosetting resin and aggregate.

5.1.1 *Thermosetting Resin*—The resin shall have a minimum deflection temperature of 158°F (70°C) when tested at 264 psi (1.820 mPa) following Test Method D648. The resin content shall not be less than 7 % of the weight of the sample as determined by Test Method D2584.

5.1.2 *Aggregate*—Aggregate, and mineral fillers tested in accordance with all requirements of Test Methods C117 and C136, except requirements for gradation shall not apply.

5.2 *Joints*—The pipe shall have a gasket sealed joining system that shall prevent leakage of fluid in the intended service condition.

5.2.1 *Couplings*—Stainless Steel 316 , in accordance with, Specification A276, or a glass-fiber- reinforced-thermosetting-resin coupling which uses an elastomeric seal. Alternate materials may be permitted by agreement between the purchaser and the manufacturer. Figs. 1 and 2 show typical couplings.

5.2.2 *Gaskets*—Elastomeric gaskets used with this pipe shall conform to the requirements of Specification F477, except that composition of the elastomer shall be as agreed upon between the purchaser and the supplier as being resistant to the intended chemical environments.

6. Requirements

6.1 *Workmanship*—Each pipe shall be free from all defects, including indentations, cracks, foreign inclusions, and resin-starved areas that, due to their nature, degree, or extent, detrimentally affect the strength and serviceability of the pipe. The pipe shall be as uniform as commercially practicable in color, opacity, density, and other physical properties.

6.1.1 The inside surface of each pipe shall be free of bulges, dents, ridges, and other defects that result in a variation of inside diameter of more than ⅛ in. (3.2 mm) from that obtained on adjacent unaffected portions of the surface.

6.1.2 Joint sealing surfaces shall be free of dents, gouges, and other surface irregularities that will affect the integrity of the joints.

6.2 *Dimensions:*

TABLE 1 Strength Classes for Polymer Concrete Pipe

Strength Class	D-Load lb/ft/ft (kN/m/m)
I	1200 (57.5)
II	1500 (71.9)
III	2000 (95.8)
IV	3000 (143.8)
V	3750 (179.7)