ANSI/AWWA **C950-20**

(Revision of ANSI/AWWA C950-13)

AWWA Standard

Fiberglass Pressure Pipe

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American Water Works Association

AWWA Standard

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Contents

All AWWA standards follow the general format indicated subsequently. Some variations from this format may be found in a particular standard.

Foreword

This foreword is for information only and is not a part of ANSI/AWWA C950.*

I. Introduction.

I.A. *Background.* This standard provides direction and guidance in selecting and purchasing fiberglass pipe for use as pressure pipe in water distribution (including services) and transmission systems for both aboveground and belowground installation.

This standard describes 1-in. through 156-in. (25-mm through 4,000-mm) diameter pressure pipes. The primary materials used are thermosetting polyester or epoxy resins, glass-fiber reinforcement, and, if used, aggregate. There are nine pressure classes, which range from 50 psi through 450 psi (345 kPa through 3,103 kPa), in 50-psi (345-kPa) increments. Stiffness classes described are 9, 18, 36, and 72 psi (62, 124, 248, and 496 kPa). This standard may be used to the extent applicable for other sizes, pressure classes, and stiffness classes.

I.B. *History.* In June 1971, the AWWA Engineering and Construction Technical and Professional Committee organized the Reinforced Plastics Committee to evaluate both the use of reinforced plastics in the water-supply industry and the need for appropriate AWWA standards. The Reinforced Plastics Committee found sufficient use and interest to support a recommendation that a standard be developed for fiberglass pipe. The Standards Council authorized the formation of the Standards Committee on Thermosetting Fiberglass Reinforced Plastic Pipe in October 1972, and committee organization was completed in December 1974. The first edition of the standard was approved by the AWWA Board of Directors on Jan. 25, 1981. Subsequent editions were approved on June 23, 1988; Jan. 22, 1995; June 17, 2001; Jan. 21, 2007, and Jan. 20, 2013. This edition was approved on April 20, 2020.

I.C. *Acceptance.* In May 1985, the US Environmental Protection Agency (USEPA) entered into a cooperative agreement with a consortium led by NSF International (NSF) to develop voluntary third-party consensus standards and a certification program for direct and indirect drinking water additives. Other members of the original consortium included the Water Research Foundation (formerly AwwaRF) and the Conference of State Health and Environmental Managers (COSHEM). The American Water Works Association and the Association of State Drinking Water Administrators (ASDWA) joined later.

* American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036.

In the United States, authority to regulate products for use in, or in contact with, drinking water rests with individual states.* Local agencies may choose to impose requirements more stringent than those required by the state. To evaluate the health effects of products and drinking water additives from such products, state and local agencies may use various references, including

1. Specific policies of the state or local agency.

2. Two standards developed under the direction of NSF, NSF[†]/ANSI[‡]/CAN 60, Drinking Water Treatment Chemicals—Health Effects, and NSF/ANSI/CAN 61, Drinking Water System Components—Health Effects.

3. Other references, including AWWA standards, *Food Chemicals Codex*, *Water Chemicals Codex*,[§] and other standards considered appropriate by the state or local agency.

Various certification organizations may be involved in certifying products in accordance with NSF/ANSI/CAN 61. Individual states or local agencies have authority to accept or accredit certification organizations within their jurisdiction. Accreditation of certification organizations may vary from jurisdiction to jurisdiction.

Annex A, "Toxicology Review and Evaluation Procedures," to NSF/ANSI/CAN 61 does not stipulate a maximum allowable level (MAL) of a contaminant for substances not regulated by a USEPA final maximum contaminant level (MCL). The MALs of an unspecified list of "unregulated contaminants" are based on toxicity testing guidelines (noncarcinogens) and risk characterization methodology (carcinogens). Use of Annex A procedures may not always be identical, depending on the certifier.

ANSI/AWWA C950 does not address additives requirements. Thus, users of this standard should consult the appropriate state or local agency having jurisdiction in order to

1. Determine additives requirements, including applicable standards.

2. Determine the status of certifications by all parties offering to certify products for contact with, or treatment of, drinking water.

3. Determine current information on product certification.

* Persons outside the United States should contact the appropriate authority having jurisdiction.

† NSF International, 789 N. Dixboro Road, Ann Arbor, MI 48105.

‡ American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036.

§ Both publications available from National Academy of Sciences, 500 Fifth Street, N.W., Washington, DC 20001.

II. Special Issues.

II.A. *Nominal Metric Pipe Sizes, Dimensions, and Tolerances*. Nominal metric pipe sizes, dimensions, and tolerances were obtained from International Organization for Standardization (ISO) and the European Committee for Standardization (CEN) product standards for fiberglass pipes.

III. Use of This Standard. It is the responsibility of the user of an AWWA standard to determine that the products described in that standard are suitable for use in the particular application being considered.

III.A. *Purchaser Options and Alternatives*. The following items should be covered by the purchaser:

1. Standard used—that is, ANSI/AWWA C950, Fiberglass Pressure Pipe, of latest revision.
2. Specific service and installation considerations.
3. Lineal feet of each pressure and stiffness class and size.
4. Details of federal, state, and local requirements (Sec. 4.4.1).
5. Pipe diameter size and series (Sec. 4.5.1).
6. Pressure classes (Sec. 4.6).
7. Stiffness classes (Sec. 4.7).
8. Whether plant inspection is required (Sec. 5.1.1).
9. Whether compliance with NSF/ANSI/CAN 61, Drinking Water System Components—Health Effects, is required.

The purchaser may also specify the following:

1. Line layout showing pressure zones, including applicable design and transient pressures within zones and points of change between zones.
2. Cell classification (Sec. 4.3).
3. Standard laying lengths (Sec. 4.5.2).
4. Joint configuration (Sec. 4.9).

III.B. *Manufacturer Options and Alternatives*. The following items should be provided by the manufacturer:

1. Nominal wall thickness.
2. Weight.
3. Total quantity of jointing materials and field allowances.
4. Cell classification (Sec. 4.3).
5. Stiffness class (Sec. 4.7).
6. Joint details (Sec. 4.9).

When requested by the purchaser, it is understood the manufacturer will also supply the following:

1. Special design calculations.
2. Special lengths (Sec. 4.5.2).
3. Special preparations needed for shipment (Sec. 6.2).
4. Affidavit of compliance (Sec. 6.3).

III.C. *Modification to Standard*. Any modifications to the provisions, definitions, or terminology in this standard must be provided by the purchaser or manufacturer.

IV. Major Revisions. Major revisions made to the standard in this edition include the following:

1. Definitions for potable water and wastewater were added.
2. The stiffness verification test accounts for adjusted or reduced levels of deflection for high stiffness pipes (Sec. 5.1.2.2).

V. Comments. If you have any comments or questions about this standard, please call AWWA Engineering & Technical Services at 303.794.7711, FAX at 303.795.7603, write to the department at 6666 West Quincy Avenue, Denver, CO 80235-3098; or email at standards@awwa.org.

ANSI/AWWA C950-20

American Water Works Association
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AWWA Standard

Fiberglass Pressure Pipe

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes the fabrication and the testing of nominal 1-in. through 156-in. (25-mm through 4,000-mm) fiberglass pipe and joining systems for use in both aboveground and belowground water systems. Service and distribution piping systems and transmission piping systems are included.

Both glass-fiber-reinforced thermosetting-resin pipe (RTRP) and glass-fiber-reinforced polymer mortar pipe (RPMP) are fiberglass pipes. Epoxy-resin and polyester-resin systems are described, and commercial-grade glass-fiber is specified as the reinforcement material in the pipe wall. Liner materials incorporated include thermosetting or thermoplastic resin, reinforced or unreinforced, with or without fillers. Pressure classes described are 50, 100, 150, 200, 250, 300, 350, 400, and 450 psig (345, 689, 1,034, 1,379, 1,724, 2,069, 2,414, 2,759, and 3,103 kPa). Stiffness classes described are 9, 18, 36, and 72 psi (62, 124, 248, and 496 kPa). This standard may be used to the extent applicable for other diameters, pressure classes, and stiffness classes. For information on design, hydraulics, and installation, refer to AWWA Manual M45, *Fiberglass Pipe Design*.

Sec. 1.2 Purpose

The purpose of this standard is to provide the minimum requirements for fiberglass pressure pipe, including design, fabrication, and testing requirements.

Sec. 1.3 Application

This standard can be referenced in specifications for purchasing and receiving fiberglass pressure pipe. This standard can be used as a guide for manufacturing this type of fiberglass pressure pipe. The stipulations of this standard apply when this document has been referenced and then only to fiberglass pressure pipe.

SECTION 2: REFERENCES

This standard references the following documents. In their latest editions, these documents form a part of this standard to the extent specified within the standard. In case of conflict, the requirements of this standard shall prevail.

ASTM* D638—Standard Test Method for Tensile Properties of Plastics.

ASTM D695—Standard Test Method for Compressive Properties of Rigid Plastics.

ASTM D1599—Standard Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings.

ASTM D2105—Standard Test Method for Longitudinal Tensile Properties of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Tube.

ASTM D2290—Standard Test Method for Apparent Hoop Tensile Strength of Plastic or Reinforced Plastic Pipe.

ASTM D2412—Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading.

ASTM D2992—Standard Practice for Obtaining Hydrostatic or Pressure Design Basis for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Fittings.

ASTM D3262—Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe.

ASTM D3517—Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pressure Pipe.

ASTM D3567—Standard Practice for Determining Dimensions of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Fittings.

ASTM D3681—Standard Test Method for Chemical Resistance of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe in a Deflected Condition.

* ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428.