ANSI/AWWA C151/A21.51-09
(Revision of ANSI/AWWA C151/A21.51-02)

American Water Works Association

The Authoritative Resource on Safe Water®

AWWA Standard

Ductile-Iron Pipe, Centrifugally Cast

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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.

Tables

Foreword

This foreword is for information only and is not a part of ANSI/AWWA C151/A21.51.

I. Introduction.

I.A. *Background.* The purpose of this standard is to provide information to specifiers and users of ductile-iron pipe on the minimum manufacturing requirements of this pipe. This standard includes requirements for laying lengths, dimensional and weight tolerances, marking, and plant tests. In addition to dimensional and weight tables, tables based on the design procedure in ANSI/AWWA C150/A21.50 are included on nominal thicknesses and standard classes of ductile-iron pipe required for various external load and internal pressure conditions as a convenience to the users of this standard.

Sec. III.A of this foreword lists certain purchaser options and alternatives that users of this standard should consider in purchaser documents for ductile-iron pipe.

Although ANSI/AWWA C151/A21.51 is commonly referenced for ductile-iron pipe for services other than water, users are also directed to ASTM A746, Standard Specification for Ductile Iron Gravity Sewer Pipe, and ASTM A716, Standard Specification for Ductile-Iron Culvert Pipe.

I.B. *History.* American National Standards Committee A21 on Cast-Iron Pipe and Fittings was organized in 1926 under the sponsorship of the American Gas Association (AGA), the American Society for Testing and Materials (ASTM), the American Water Works Association (AWWA), and the New England Water Works Association (NEWWA). Between 1972 and 1984, the co-secretariats were AGA, AWWA, and NEWWA, with AWWA serving as administrative secretariat. In 1984, the committee became an AWWA committee with the name of AWWA Standards Committee A21 on Ductile-Iron Pipe and Fittings. In 1988, NEWWA withdrew as a separate secretariat; however, it continues to maintain its representation on the AWWA Committee A21.

The present scope of AWWA Committee A21 activity is the development of standards and manuals addressing ductile-iron pressure pipe for water and other liquids, and ductile-iron and gray-iron fittings for use with such pipe. These standards and manuals include design, dimensions, materials, coatings, linings, joints, accessories, and methods of inspection and testing.

The work of AWWA Committee A21 is conducted by subcommittees. The scope of Subcommittee 1, Pipe, includes the periodic review of current Committee A21

standards for pipe, the preparation of revisions and new standards when needed, and other matters pertaining to pipe standards.

The first edition of ANSI/AWWA C151/A21.51, Standard for Ductile-Iron Pipe for Water and Other Liquids, was issued in 1965, and revisions were issued in 1971, 1976, 1981, 1986, 1991, 1995, and 2002. Subcommittee 1 reviewed the 2002 edition and submitted a proposed revision to AWWA Committee A21. This edition was approved by the AWWA Board of Directors on Jan. 25, 2009.

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 and the Conference of State Health and Environmental Managers (COSHEM). The American Water Works Association (AWWA) and the Association of State Drinking Water Administrators (ASDWA) joined later.

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. An advisory program formerly administered by USEPA, Office of Drinking Water, discontinued on Apr. 7, 1990.
2. Specific policies of the state or local agency.
3. Two standards developed under the direction of NSF, NSF†/ANSI‡ 60, Drinking Water Treatment Chemicals—Health Effects, and NSF/ANSI 61, Drinking Water System Components—Health Effects.
4. 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 61. Individual states or local agencies have authority to accept

*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, NW, Washington, DC 20001.

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 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 C151 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 parties offering to certify products for contact with, or treatment of, drinking water.
3. Determine current information on product certification.

II. Special Issues.

II.A. *Advisory Information on Product Application.* Unless otherwise provided by the purchaser, pipe and accessories shall comply with this standard. Pipe and accessories not complying with this standard shall be replaced by the supplier at the agreed point of delivery. The supplier shall not be liable for shortages or damaged pipe after the pipe is accepted at the agreed point of delivery, except as recorded on the delivery receipt or similar document by the carrier's agent.

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 C151, Ductile-Iron Pipe, Centrifugally Cast, of latest revision.
2. Whether compliance with NSF/ANSI 61, Drinking Water System Components—Health Effects, is required.
3. Size, joint type, thickness or class, and laying length (see tables).
4. Details of other federal, state or provincial, and local requirements (Sec. 4.1).
5. a. Special joints (Sec. 4.3.1).
   b. Specifying ductile-iron gland, if required (Sec. 4.3.1).

6. a. Elimination of outside coating (Sec. 4.4.1).

b. Elimination of cement–mortar lining (Sec. 4.4.2). Experience has indicated that asphaltic inside coating is not complete protection against loss in pipe capacity caused by tuberculation. Cement–mortar linings are recommended for most waters.

c. Special coatings and linings (Sec. 4.4.3).

7. Special marking on pipe (Sec. 4.7).
8. Certification by manufacturer (Sec. 5.1.1).
9. Inspection by purchaser (Sec. 5.1.2).
10. Orientation of impact-test specimen cut from pipe wall (Sec. 5.2.2.2).
11. Additional tests (Sec. 5.5).

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

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

1. Scope, purpose, and application of standard were expanded to include wastewater and reclaimed water systems.
2. Definitions for asphaltic, reclaimed water, and wastewater were added in Section 3.
3. A section for material requirements was added (Sec. 4.1).
4. Sec. 4.4.3 on special coatings and linings was revised to remove reference to one specific asphaltic material lining.
5. Notice of nonconformance was added as a requirement in Section 6, Delivery.
6. A section on affidavit of compliance was added (Sec. 6.2).

V. Comments. If you have any comments or questions about this standard, please call the AWWA Volunteer and Technical Support Group at 303.794.7711, FAX at 303.795.7603, write to the group at 6666 West Quincy Avenue, Denver, CO 80235-3098, or e-mail at standards@awwa.org.

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American Water Works Association

AWWA Standard

Ductile-Iron Pipe, Centrifugally Cast

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes 3-in. through 64-in. (76-mm* through 1,600-mm) ductile-iron pipe, centrifugally cast, for water, wastewater, and reclaimed water systems with push-on joints or mechanical joints. Requirements for pipe according to this standard are discussed in the text and are shown in Tables 1 through 7 and Figures 1, 2, and 3. This standard may be used for pipe with other types of joints as may be agreed on at the time of purchase.

Sec. 1.2 Purpose

The purpose of this standard is to provide the minimum requirements for ductile-iron pipe, centrifugally cast, for water, wastewater, and reclaimed water systems.

Sec. 1.3 Application

This standard can be referenced in specifications for ductile-iron pipe, centrifugally cast, for water, wastewater, and reclaimed water systems. The stipulations of this standard apply when this document has been referenced and then only to ductile-iron pipe, centrifugally cast, for water, wastewater, and reclaimed water systems.

*Metric conversions given in this standard are direct conversions of US customary units and are not those specified in International Organization for Standardization (ISO) standards.