ANSI/AWWA C226-13
(Revision of ANSI/AWWA C226-06)

American Water Works Association

The Authoritative Resource on Safe Water®

AWWA Standard

Stainless-Steel Fittings for Waterworks Service, Sizes ½ In. Through 72 In. (13 mm Through 1,800 mm)

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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.

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Foreword

This foreword is for information only and is not a part of ANSI/AWWA C226.*

I. Introduction.

I.A. *Background.* Stainless steel is a standard material used to construct fittings. It offers very low corrosion rates, which makes it suitable for the handling of potable water while maintaining purity and quality.

I.B. *History.* In 1999, the AWWA Standards Council directed the Standards Committee on Steel Pipe to develop a standard for stainless-steel fittings used in water treatment and conveying facilities. The standard for steel pipe was subsequently split into two committees, one for steel pipe and the other for stainless-steel pipe. This standard was approved by the latter and is the first AWWA standard for stainless-steel fittings used in water treatment and conveying facilities. The first edition of the standard was approved by the AWWA Board of Directors on Feb. 12, 2006. This edition was approved on Jan. 20, 2013.

I.C. *Acceptance.* In May 1985, the US Environmental Protection Agency (USEPA) entered into a cooperative agreement with the 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 (AWWA) and the Association of State Drinking Water Administrators (ASDWA) joined later.

In the United States, the authority to regulate products for use in, or 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 April 7, 1990.
2. Specific policies of the state or local agency.

* American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036.
† Persons outside the United States should contact the appropriate authority having jurisdiction.

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 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 C226 does not address additive requirements. Users of this standard should consult the appropriate state or local agency having jurisdiction in order to

1. Determine additive 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 the current information on product certification.

II. Special Issues.

II.A. *Basis of Design.* The wall thickness of stainless-steel fittings is determined by (1) internal pressures; (2) external pressures, (3) special physical loading, and (4) practical considerations for handling, shipping, lining and coating, or similar operations.

II.A.1 Application. The provisions of this standard cover the requirements for stainless-steel fittings for the use in water treatment plants, water transmission and distribution systems, and other water facilities. The purchaser is responsible for determining if any circumstance related to the project requires additional provisions

* NSF International, 789 N. Dixboro Road, Ann Arbor, MI 48106.

† Both publications are available from National Academy of Sciences, 500 Fifth Street NW, Washington, DC 20001.

‡ Appendix C of NSF/ANSI 61 defines those materials that are "Mechanical Devices Acceptable Materials," which conform to NSF/ANSI 61 requirements.

that are not included in the standard. Such special conditions might affect design, manufacture, quality control, corrosion protection, or handling requirements.

II.A.2 Testing of special sections. Sec. 5.2.3 provides for nondestructive testing of special sections.

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 the use in the particular application being considered.

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

1. Standard used—that is, ANSI/AWWA C226, Stainless-Steel Fittings for Waterworks Service, Sizes ½ In. Through 72 In. (13 mm Through 1,800 mm), of latest revision.
2. Whether compliance with NSF/ANSI 61, Drinking Water System Components—Health Effects, is required.
3. Internal working, transient, and test pressures.
4. Allowable stress in the fitting wall at specified internal design pressure (as a percentage of minimum yield point of stainless steel).
5. Minimum wall thickness required by considerations other than internal pressure.
6. The type of stainless steel (Sec. 4.1).
7. Details of other federal, state or provincial, and local requirements (Sec. 4.1.1).
8. Standard specification of fitting, or plate, sheet, or strip, including material type (Sec. 4.1.8).
9. A description or drawings detailing the total quantity of fittings required for the length and diameter of fittings (see Table 2) (Sec. 4.2.1.5).
10. Welding (Sec. 4.2.3.1, Sec. 4.2.3.3, and Sec. 4.2.3.4).
11. Drawings and calculations to be provided by the manufacturer, when required (Sec. 4.2.1.8 and Sec. 4.2.4).
12. Coatings, if necessary (Sec. 4.2.1.9).
13. Type of ends for fittings—description or drawings (Sec. 4.2.2).
14. Qualification code for welding operators, if different from Sec. 4.2.3.1 or Sec. 5.2.1.
15. Special sections, indicating dimensions (Sec. 4.2.4.2) and the grade of material (Sec. 4.1.6).
16. Requirements for cleaning, descaling, and passivating (Sec. 4.2.5).
17. Method of nondestructive testing (Sec. 5.2.3.).

18. Pressure for hydrostatic testing of fittings, if required (Sec. 5.2.3.3).
19. Instructions regarding inspection at place of manufacture (Sec. 5.3).
20. Requirements for marking, line diagrams, or laying schedules (Sec. 6.1).
21. Certification of compliance, if required (Sec. 6.2).
22. Handling requirements (Sec. 6.3).
23. Affidavit of compliance, if required (Sec. 6.4).

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

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

1. Updated scope to include wastewater and reclaimed water (Sec. 1.1).
2. Updated the reference documents in Section 2.
3. Added new definitions for duplex stainless steel, potable water, reclaimed water, supplier, wastewater, and UNS: Unified Numbering System.
4. Updated the definitions for passivation, schedule, stainless steel, test pressure, and working pressure for consistency with other AWWA standards.
5. Added duplex stainless steels to the materials allowed in the standard and to Table 1.
6. Standards Council language was added for a new section on permeation (Sec. 4.1.2).
7. Updated Figure 1 with corrected dimension references.
8. Added a new Sec. 4.2.1.6, Elbows, and deleted old Sec. 4.2.1.6, As-welded joints.
9. Revised the fitting wall thickness section (new Sec. 4.2.4.1).
10. Added a requirement for chloride content of test water to the hydrostatic test section (Sec. 5.2.3.3).
11. Updated Sec. 6.2, Certification.
12. Added a new section on affidavit of compliance (Sec. 6.4).

V. Comments. If you have any comments or questions about this standard, please call AWWA Engineering and 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.

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Stainless-Steel Fittings for Waterworks Service, Sizes ½ In. Through 72 In. (13 mm Through 1,800 mm)

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard pertains to the various classes and types of stainless-steel fittings that are intended for the transmission and distribution of potable water, reclaimed water, and wastewater, and for use in other water-supply system facilities.

1.1.1 *Classes.* This standard covers three classes of stainless-steel fittings: wrought, cast, and fabricated, in diameters ranging from ½ in. (13 mm) to 72 in. (1,800 mm).

1.1.2 *Large fittings.* Fittings larger than 72 in. (1,800 mm) in diameter may be manufactured in accordance with this standard.

1.1.3 *Appurtenances not covered by this standard.* Compression fittings, grooved-end fittings, grooved-end couplings, tapping sleeves, sleeve-type couplings, and split-sleeve couplings are covered by other ANSI*/AWWA standards.

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