



**American Water Works  
Association**

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**ANSI/AWWA C219-17**  
(Revision of ANSI/AWWA C219-11)

**AWWA Standard**

# Bolted Sleeve-Type Couplings for Plain-End Pipe

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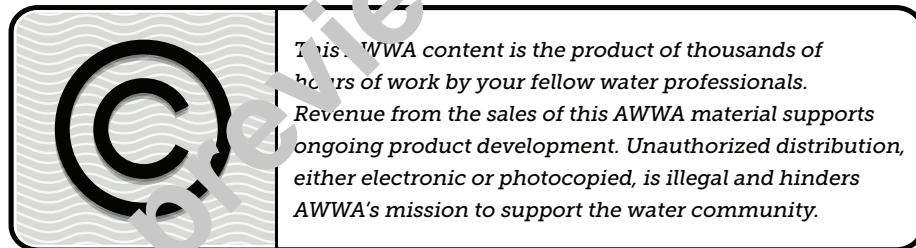
## AWWA Standard

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# Foreword

*This foreword is for information only and is not a part of ANSI\*/AWWA C219.*

## **I. Introduction.**

I.A. *Background.* This standard describes bolted sleeve-type couplings, reducing or transition couplings, and flanged coupling adapters used to join plain-end pipe. It also includes materials of construction, inspection, and testing.

I.B. *History.* The first edition of ANSI/AWWA C219 was approved by the AWWA Board of Directors on June 23, 1991. Subsequent editions were approved on June 15, 1997, Jan. 21, 2001, Feb. 12, 2006, and Jan. 23, 2011. This edition was approved on Jan. 14, 2017.

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 (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.<sup>†</sup> 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<sup>‡</sup>: NSF/ANSI 60, Drinking Water Treatment Chemicals—Health Effects, and NSF/ANSI 61, Drinking Water System Components—Health Effects.

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\* 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.

‡ NSF International, 789 North Dixboro Road, Ann Arbor, MI 48105.

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 61. Individual states or local agencies have authority to accept or accredit certification organizations within their jurisdictions. 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 a 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 C219 does not address additives requirements. 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.* Bolted sleeve-type couplings have been used for joining plain-end pipe since the latter part of the nineteenth century. Currently, there are several manufacturers that produce these couplings. Though details differ, couplings of this type work the same way and have similar components: a center sleeve (sometimes called a “middle ring”), end rings (sometimes called “followers”), and threaded fasteners (bolts and nuts) that when tightened, pull the end rings together. These components compress elastomeric gaskets in the space formed between the end rings, center sleeve, and pipes being joined, thereby sealing the coupling-and-pipe combination.

II.B. *Chlorine and Chloramine Degradation of Elastomers.* The selection of materials is critical for water service and distribution piping in locations where there is a possibility that elastomers will be in contact with chlorine or chloramines. Documented research has shown that elastomers such as gaskets, seals, valve seats, and

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

encapsulations may be degraded when exposed to chlorine or chloramines. The impact of degradation is a function of the type of elastomeric material, chemical concentration, contact surface area, elastomer cross section, and environmental conditions as well as temperature. Careful selection of and specifications for elastomeric materials and the specifics of their application for each water system component should be considered to provide long-term usefulness and minimum degradation (swelling, loss of elasticity, or softening) of the elastomer specified.

II.C. *Gasket Degradation Study.* A pipe gasket, having the hardness of a compressed elastomer with a large mass relative to the small exposed surface area, experiences minimal degradation. This was validated in a research paper reported in the *Journal AWWA*,\* where the pipe gasket degradation in a 110 mg/L chloramine solution was found to degrade just the exposed surface.

**III. Use of This Standard.** It is the responsibility of the user of a 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 provided by the purchaser

1. Standard used—that is, ANSI/AWWA C-19, Bolted Sleeve-Type Couplings for Plain-End Pipe, of latest revision.
2. Quantity.
3. Wall thickness, schedule, or class.
4. Flange specification for flanged coupling adapters.
5. For applications other than potable water, whether compliance with NSF/ANSI 61, Drinking Water System Components—Health Effects, is required.
6. Actual outside diameter(s) (OD) of pipe ends, including any coatings (Section 3 [Item 1]).
7. Nominal pipe size(s) (Section 3 [Item 12] and Table 4).
8. Rated pressure, including transient pressure, and the test pressure (Section 3 [Items 15, 19, and 20] and Sec. 4.3.1).
9. Details of other federal, state or provincial, and local requirements (Sec. 4.2.1).
10. Operating temperature range (Sec. 4.2.3.1 and 4.2.3.2).
11. Type of service (Sec. 4.2.3.2 and 4.2.3.3).

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\* R.W. Bonds. 2004. Effect of Chloramines on Ductile-Iron Pipe Gaskets of Various Elastomer Compounds. *Jour. AWWA*, 96(4):153–160.

12. Length and thickness of center sleeve where special performance or installation requirements exist (Sec. 4.3.2 and Table 2).
13. Anticipated angular deflection of pipes (Sec. 4.5 and Table 3).
14. Special requirements, such as coatings (Sec. 4.6.2), gasket material (Sec. 4.2.3 and 4.2.3.1), gaskets for electrical insulation (Sec. 4.2.3.3), and special type of bolting (Sec. 4.2.5).
15. Type of pipe(s), including specification to which the pipe is made or specification and tolerance of pipe ends (Sec. 4.7.2 and Table 4).
16. Purchaser's pipe-end preparation requirements (Sec. 4.7.2).
17. Additional nondestructive weld evaluation (Sec. 5.1.1.1.1).
18. Material certifications (Sec. 5.1.1.3).
19. Purchaser's inspection requirements (Sec. 5.1.2).
20. Hydrostatic test data report (Sec. 5.2.2.2).
21. Purchaser's proof test requirements (Sec. 5.2.4).
22. Marking of rated pressure (Sec. 6.1, Item 4).
23. Affidavit of compliance, if required (Sec. 6.3).

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 revisions made to the standard in this edition include the following:

1. An advisory statement was added in the foreword (Sec. II.B) regarding chlorine and chloramine degradation of elastomers per the AWWA Standards Council directive.
2. Malleable iron was removed from the standard as a coupling material since there is not a design standard to reference for this material and it is not widely used in the industry (Sec. 1.1, Sec. 4.2.2, Sec. 4.2.2.2, and Sec. 4.2.4.2).
3. The scope was revised to include sizes larger than 144 in. (Sec. 1.1).
4. Section 2, References, was updated.
5. A new Sec. 4.2.1.2, Certification, was added to include a requirement for NSF/ANSI 61 certification on products if they will be in contact with potable water.
6. The references to ASTM F568M and ASTM F738M were deleted from Sec. 4.2.5.1.1 on bolting since these standards have been withdrawn with no replacements.
7. In Sec. 4.3.2, Center Sleeves, the thickness determination was revised to reference the applicable AWWA manuals for steel and ductile-iron pipe.

8. In Sec. 4.3.3, End Rings, and Sec. 5.2.4, Purchaser's Proof Test, the term *maximum* was removed when referring to the rated pressure.

**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](mailto:standards@awwa.org).



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# Bolted Sleeve-Type Couplings for Plain-End Pipe

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## SECTION 1: GENERAL

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### **Sec. 1.1 Scope**

This standard describes bolted sleeve-type couplings, reducing or transition couplings, and flanged coupling adapters (couplings) used to join plain-end pipe. Couplings may be manufactured from carbon steel, stainless steel, or ductile iron and are intended for use in systems conveying water. This standard describes nominal coupling sizes ½ in. (13 mm)\* and larger.

### **Sec. 1.2 Purpose**

The purpose of this standard is to provide the minimum requirements for couplings of plain-end pipe, including requirements for materials, design, testing and inspection, installation, and shipping.

### **Sec. 1.3 Application**

This standard can be referenced in documents for purchasing the described couplings. The stipulations of this standard apply when this document has been referenced.

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\* 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.