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(Revision of ANSI/AWWA C227-11)

American Water Works Association

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AWWA Standard

Bolted, Split-Sleeve Couplings

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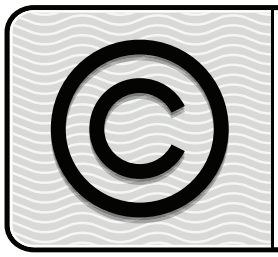

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Contents

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 C227.*

I. Introduction.

I.A. *Background.* This standard describes bolted, split-sleeve couplings used to join pipe. It also includes materials of construction, inspection, and testing. These couplings have been used on water pipe since 1981.

I.B. *History.* In October 1999, the AWWA Standards Council authorized the AWWA Standards Committee for Steel Pipe to develop a new standard for the use of bolted, split-sleeve couplings for plain-end pipe. The first edition of that standard was approved by the AWWA Board of Directors on Jan. 21, 2007. The second edition was approved on Jan. 23, 2011. This edition was approved on June 11, 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.† 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 60, Drinking Water Treatment Chemicals—Health Effects, and NSF/ANSI 61, Drinking Water System Components—Health Effects.

* 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 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 C227 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.* Although details differ, all couplings of this type work in a similar fashion and have similar components as depicted in the standard. Coupling manufacturers should be contacted for detailed design information regarding the capabilities of the couplings supplied and proper methods of field installation.

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 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

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

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.B.1 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 *Journal AWWA*,* in which 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 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 information should be provided by the purchaser.

1. Standard used—that is, ANSI/AWWA C227, Bolted, Split-Sleeve Couplings, of latest revision.
2. Quantity.
3. Nominal pipe size(s)
4. Flange specification for flanged coupling adaptors, if used.
5. Whether compliance with NSF/ANSI 61, Drinking Water System Components—Health Effects, is required.
6. Details of other federal, state or provincial, and local requirements (Sec. 4.2.1).
7. Standard classification of rubber gaskets (Sec. 4.2.5).
8. Special service conditions and operating temperature range (Sec. 4.2.5 and 4.2.6).
9. Anticipated angular deflection of pipes (Sec. 4.4 and Table 2).
10. Special requirements, such as coatings (Sec. 4.5.1 and Sec. 4.5.2), linings (Sec. 4.5.1 and Sec. 4.5.2), gasket material (Table 1), gaskets for electrical insulation (Sec. 4.2.7), and special types of bolting (Sec. 4.2.9.1).
11. Actual outside diameter(s) (OD) of pipe ends, including coating (Sec. 4.6.2).
12. Purchaser's pipe-end preparation requirements (Sec. 4.6.2).
13. Type of pipe(s), including specification to which it is made, or specifications and tolerance of pipe ends (Sec. 4.6.2.1).

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

14. Additional nondestructive weld evaluation (Sec. 5.1.1.2).
15. Material certifications to be provided by the manufacturer (Sec. 5.1.1.4).
16. Purchaser's inspection requirements (Sec. 5.1.2).
17. Rated pressure, including transient pressure and test pressure (Sec. 5.2.1).
18. Hydrostatic test data report (Sec. 5.2.2.2).
19. Purchaser's proof test requirements (Sec. 5.2.3).
20. Type of gasket material (Sec. 4.2.5).
21. Affidavit of compliance (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 changes made to the standard in this revision include the following:

1. The title of the standard was simplified and the reference to restraint and plain-end pipe was removed.
2. An advisory statement was added in the foreword (Sec. II.B) regarding chlorine and chloramine degradation of elastomers per the AWWA Standards Council directive.
3. The scope was revised to include sizes larger than 144 in. (Sec. 1.1).
4. Section 2, References, was updated.
5. In Section 3, Definitions, the definitions for *Closure Mechanism, Gasket, Nominal Pipe Size*, and *Restrained Bolted, Split-Sleeve Coupling* were revised for clarification.
6. Sec. 4.2.2, Body, was revised to add a requirement on thickness and the reference to ASTM A283 was deleted since it is no longer used.
7. Sec. 4.2.5, Gaskets, was revised to include a standard temperature rate for the gasket and to revise the indelible marking of the gasket to a recommendation.
8. Sec. 4.2.7, Special Gaskets for Electrical Insulation, was revised to add a clarifier that insulating boots may be used on nonrestrained couplings.
9. The bolting requirements in Sec. 4.2.9.2 were updated to provide high-strength bolting.
10. Sec. 4.3.2, Body, was revised to reference the AWWA Manual M11 hoop stress equation for use to determine the minimum body thickness.
11. In Sec. 4.3.4, Closure Mechanism, and Sec. 4.3.5, Fasteners, the language regarding pressures for leakproof tests was revised to reflect test pressure by replacing "1.5 times the rated pressure" with "1.0 times the test pressure," which are equivalent as defined in Sec. 5.2.1.

12. Sec. 4.4.1, Nonrestrained Couplings, was clarified to show that ⅜-in. total axial movement is a minimum value.

13. Notes were added to Table 2, Table 3, and Sec. 4.4.1.4 to address couplings designed for larger axial movements.

14. Sec. 4.4.2, Restrained Couplings, was revised to include some additional information on restrained couplings.

15. Sec. 5.1.1 3, Dimensions, was revised for clarity.

16. Sec. 5.2.3, Purchaser's Proof Test, was revised for clarity.

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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AWWA Standard

Bolted, Split-Sleeve Couplings

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes bolted, split-sleeve couplings (couplings) used to join pipe of similar outside diameter. Couplings may be manufactured from carbon steel or stainless steel and are intended for use in systems conveying water, wastewater, or air used in water treatment. This standard covers nominal coupling sizes ¾ in. (20 mm) and larger.

Sec. 1.2 Purpose

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

Sec. 1.3 Application

This standard can be referenced in purchaser's documents for bolted, split-sleeve couplings for pipe. The stipulations of this standard apply when this document has been referenced and then only to bolted, split-sleeve couplings for pipe.