

ANSI/AWWA **C223-25**
(Revision of ANSI/AWWA C223-19)



Fabricated Steel and Stainless-Steel Tapping Sleeves

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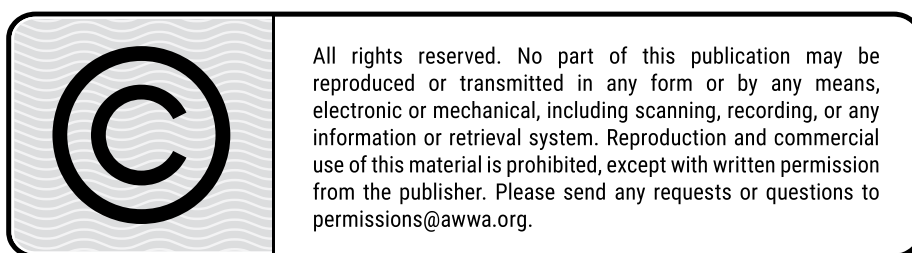
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Foreword

This foreword is for information only and is not a part of ANSI/AWWA C223.*

I. Introduction

I.A. *Background.* Fabricated tapping sleeves are used to provide outlets on piping systems. They are made by several producers and, though details differ, all tapping sleeves provide similar features. They provide a means of attaching a tapping valve and tapping machine and a means of sealing onto or around the existing pipe.

Tapping sleeves are most often connected to tapping valves and therefore require a recess per MSS[†] SP-60 to be machined or cast into the design of the flange. This recess modifies the flange beyond ANSI/AWWA standards C207 Steel Pipe Flanges for Waterworks Service and C228 Stainless-Steel Pipe Flanges for Water Service; however, flanges fabricated to ANSI/AWWA C207 and ANSI/AWWA C228 with an MSS SP-60 recess have been used successfully on tapping sleeves in the waterworks industry for more than 30 years. The use of an MSS SP-60 recess does not diminish the connection integrity between the flange and the pipe/neck and is substantiated by more than 30 years of successful usage and service records of existing installations. To further substantiate the use of an MSS SP-60 recess in ANSI/AWWA C207 and ANSI/AWWA C228 flanges, the AWWA Stainless-Steel Pipe Committee conducted testing, performed a finite element analysis, and prepared a document of the findings on the integral flange connection. This document, titled “AWWA Steel Slip-On Ring Flange Pipe Insertion Analysis,” was presented to the AWWA Steel Pipe Committee on June 12, 2018, and a copy was included in the meeting minutes.

I.B. *History.* The first edition was approved by the Board of Directors on June 16, 2002. Subsequent editions were approved on June 24, 2007; June 9, 2013; and Feb. 1, 2019. This edition was approved on Jan. 23, 2025.

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)

* American National Standards Institute, 1180 Avenue of the Americas, 10th Floor, New York, NY 10036.

† Manufacturers Standardization Society of the Valve and Fittings Industry, 441 North Lee Street, Alexandria, VA 22314.

and the Conference of State Health and Environmental Managers (COSHEM). 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. Four standards developed under the direction of NSF:[§] NSF/ANSI/CAN[¶] 60, Drinking Water Treatment Chemicals—Health Effects; NSF/ANSI/CAN 61, Drinking Water System Components—Health Effects; NSF/ANSI/CAN 372, Drinking Water System Components—Lead Content; and NSF/ANSI/CAN 600, Health Effects Evaluation and Criteria for Chemicals in Drinking Water.
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 jurisdictions. Accreditation of certification organizations may vary from jurisdiction to jurisdiction.

NSF/ANSI/CAN 600 (which formerly appeared in NSF/ANSI/CAN 60 and 61 as Annex A, “Toxicology Review and Evaluation Procedures”) 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 NSF/ANSI/CAN 600 procedures may not always be identical, depending on the certifier.

ANSI/AWWA C223 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.

[‡] Persons outside the United States should contact the appropriate authority having jurisdiction.

[§] NSF International, 789 North Dixboro Road, Ann Arbor, MI 48105.

[¶] Standards Council of Canada, 55 Metcalfe Street, Suite 600, Ottawa, ON K1P 6L5 Canada.

^{**} Both publications available from The National Academies Press, 500 Fifth Street, NW, Washington, DC 20001.

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. *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, environmental conditions, and 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. *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*,^{††} 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 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 C223, Fabricated-Steel and Stainless-Steel Tapping Sleeves, of latest revision.

2. Whether compliance with NSF/ANSI/CAN 61, Drinking Water System Components—Health Effects, is required.

3. Quantity.

4. Type of pipe(s), including specification to which the pipe(s) is made, or specification and tolerance of outside diameter.

5. Nominal pipe size(s).

^{††} Bonds, R.W. 2004. "Effect of Chloramines on Ductile-iron Pipe Gaskets of Various Elastomer Compounds." *Journal AWWA*, 96(4):153–160.