ANSI/AWWA **C203-25**

(Revision of ANSI/AWWA C203-20)

AWWA Standard

Coal-Tar Protective Coatings and Linings for Steel Water Pipe and Fittings

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American Water Works Association

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STANDARD Since 1881

AWWA Standard

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Foreword

This foreword is for information only and is not a part of ANSI/AWWA C203.*

I. Introduction

I.A. *Background*. Hot-applied coal-tar enamel has been used for corrosion protection of steel water pipe, both as an interior lining and as an exterior coating, since the mid-1930s. Internally, the coal-tar enamel is used without reinforcement or shielding. The hot enamel is spun into the pipe and provides a smooth internal lining having low hydraulic frictional resistance. When used as an external coating, the coal-tar enamel, when specified, is reinforced with glass fiber inner and outer wraps. These wraps have replaced the original fibrous material, such as asbestos felt, which was a standard wrap for many years until health concerns regarding asbestos surfaced. The glass fiber inner and outer wraps are now being specified as routine reinforcements for coal-tar enamel coatings.

I.B. *History*. The first AWWA standards for coal-tar enamel were approved Apr. 25, 1940, and were designated 7A.5, for steel water pipe in sizes 30 in. (750 mm) and larger, and 7A.6, for steel water pipe of sizes up to, but not including 30 in. (750 mm). Revisions of these documents were approved on Oct. 3, 1949; June 21, 1950; May 1, 1951; and July 14, 1955.

In 1951, the designations of 7A.5 and 7A.6 were changed to AWWA C203 and AWWA C204, respectively.

On Mar. 27, 1957, a revision was approved that combined the two standards into one document designated as AWWA C203. Subsequent revisions were approved by the AWWA Board of Directors on Jan. 23, 1962; May 22, 1966; Jan. 29, 1973; June 25, 1978; Jan. 26, 1986; June 23, 1991; Feb. 1, 1998; Jan. 20, 2002; June 7, 2015; and Oct. 26, 2020. This edition was approved on Oct. 13, 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) and the Conference of State Health and Environmental Managers (COSHEM). The

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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. 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 C203 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.

[†] 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 National Academies Press, 500 Fifth Street NW, Washington, DC 20001.

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2. Determine the status of certifications by all 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*. This standard defines coal-tar protective coatings and linings in terms of performance to establish the quality desired for long-term prevention of corrosion. The standard covers the external coating and internal lining of steel water pipelines for underground or underwater installation. If an extended period of aboveground storage of coated pipe is anticipated, consideration should be given to the ability of the coating to resist ultraviolet degradation and other atmospheric and environmental conditions.

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 C203, Coal-Tar Protective Coatings and Linings for Steel Water Pipe and Fittings, of latest revision.

2. Any exceptions to the standard that may be required.

3. Operating temperature.

4. Location of coating application with reference to environmental considerations.

5. Diameter, length, and location of pipeline, including maps and drawings necessary to show all details of the pipeline.

6. Application and use of materials covered in this standard should conform to warnings and instructions provided by the manufacturers and conform to existing federal and local governmental regulations.

7. Details of federal, state, provincial, territorial, and local requirements (Sec. 4.2.1).

8. For applications other than potable water, whether compliance with NSF/ANSI/CAN 61, Drinking Water System Components—Health Effects, is required (Sec. 4.2.2.3).

9. If materials only are being purchased according to the requirements of Sec. 4.3 of this standard, the purchaser shall specify quantities for the following items: (1) primer by type (Sec. 4.3.1.1); (2) coal-tar enamel by type (Sec. 4.3.1.2 and

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Table 1); (3) outerwrap (Sec. 4.3.1.3); and (4) glass fiber inner mat (Sec. 4.3.1.4). The purchaser should also specify if an affidavit of compliance is required (Sec. 6.3).

10. Type of liquid adhesive (Sec. 4.3.1.1).

11. Type of coal-tar enamel (Sec. 4.3.1.2).

12. Type of outerwrap (Sec. 4.3.1.3).

13. Length of pipeline requiring internal protection (Sec. 4.5.1.1).

14. Length of pipeline requiring: (1) normal exterior protection (Sec. 4.5.1.2) together with any preference regarding finish coat of whitewash, water-emulsion latex paint, or kraft paper; and (2) each type of additional exterior protection required for unusual underground or underwater conditions (Sec. 4.5.10).

15. Requirements for coating system thickness (Sec. 4.5.1.3 and Sec. 4.5.10).

16. Holdback of lining and coating at ends of pipe sections (Sec. 4.5.8).

17. Lining and coating of pipe ends (Sec. 4.5.9).

18. If materials only are being purchased according to the requirements of Sec. 4.8 of this standard, then, in addition to item 19, the purchaser should specify the following: (1) quantity of liquid adhesive (Sec. 4.8.1.1); (2) quantity of tape (Sec. 4.8.1.2); and (3) affidavit of compliance, if required (Sec. 6.3).

19. Thickness of tape (Table 4).

20. Adhesion tests (Sec. 4.10.4).

21. Additional exterior protection that may be required. Typically, the exterior coating includes a glass fiber innerwrap and outerwrap (Sec. 4.5.10).

22. Samples of materials, if required (Sec. 5.1).

23. Inspection and testing (Sec. 5.4).

24. Testing frequency of coating thickness measurement (Sec. 5.5.4).

25. Affidavit of compliance, if required (Sec. 6.3).

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. Updated Sec. I.C, Acceptance, in the foreword with the latest Standards Council language reflecting the addition of reference to NSF/ANSI/CAN 372 and NSF/ANSI/CAN 600.

2. Updated title of standard and Sec. 1.1, Scope, to include fittings. Fittings were a part of the standard but not included in the title or scope.

3. Added Sec. 1.1.2, Conditions not described in this standard.

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4. Added Sec. 1.1.3, Other substrates, to discuss considerations when C203 is referenced for substrates other than carbon steel.

5. Updated Section 3, Definitions, to remove *blasting* and *day,* and add *reclaimed water, supplier,* and *wastewater.*

6. Updated Sec. 4.2.1, Materials, with the latest Standards Council boilerplate language and added additional information for wastewater applications.

7. Updated Sec. 4.2.2, Certification, to include reference to NSF/ANSI/CAN 600.

8. Deleted service temperature limitations from Table 1 since they are described in Sec. 1.1.1, Maximum temperature, and to be consistent with other coating and lining standards.

9. Revised Sec. 4.3.2, Shelf life.

10. Updated Sec. 4.4, Surface preparation—hot coal-tar enamel systems, and Sec. 4.9, Surface preparation—hot coal-tar tape systems, and revised to have a similar format to other coating and lining standards.

11. Reorganized and updated Section 5, Verification, to have similar information and formatting as other coating and lining standards.

12. Deleted previous Sec. 5.2, Electrical inspection, since it is now covered more generally in Sec. 5.5.2.

13. Reorganized and updated Section 6, Delivery, to have similar information and formatting as other coating and lining standards.

V. Comments. If you have any comments or questions about this standard, please call AWWA Engineering and Technical Services at 303.794.7711, write to the department at 6666 West Quincy Avenue, Denver, CO 80235-3098; or email standards@awwa.org.

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ANSI/AWWA C203-25
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AWWA Standard

Coal-Tar Protective Coatings and Linings for Steel Water Pipe and Fittings

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard provides the minimum requirements for coal-tar protective coating and lining systems used in the water supply industry for buried steel water pipe and fittings.

1.1.1 *Maximum temperature*. AWWA steel pipe coating and lining standards are written for and based on the service temperature of potable water. Consult the coating manufacturer for conditions and limitations.

1.1.2 *Conditions not described in this standard*. The coating systems described in this standard are not intended for use on pipe that will be bent after the coating or lining system has been applied.

1.1.3 *Other substrates.* When this standard is referenced for substances other than carbon steel, the surface preparation methods, application methods, and performance data listed in this standard may not be applicable and the coating manufacturer should be consulted.

Sec. 1.2 Purpose

The purpose of this standard is to provide the requirements for hot-applied enamel and tape coal-tar protective coatings and linings for steel water pipe

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