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Association**

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ANSI/AWWA C203-15
(Revision of ANSI/AWWA C203-08)

AWWA Standard

Coal-Tar Protective Coatings and Linings for Steel Water Pipe

Effective date: Oct. 1, 2015.

First edition approved by AWWA Board of Directors April 25, 1940.

This edition approved June 7, 2015.

Approved by American National Standards Institute June 10, 2015.



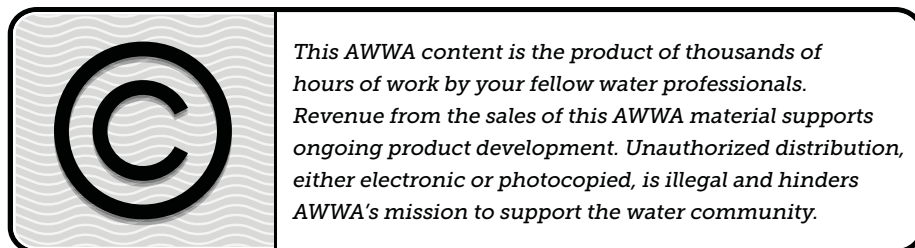
AWWA Standard

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ISBN-13, print: 978-1-62576-111-8

eISBN-13, electronic: 978-1-61300-346-6

DOI: <http://dx.doi.org/10.12999/AWWA.C203.15>

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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; and Jan. 20, 2002. This edition was approved on June 7, 2015.

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

† Water Research Foundation, 6666 West Quincy Avenue, Denver, CO 80235.

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. An advisory program formerly administered by USEPA, Office of Drinking Water, discontinued on Apr. 7, 1990.
2. Specific policies of the state or local agency.
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 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 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.
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.

* Persons outside the United States should contact the appropriate authority having jurisdiction.

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

‡ Both publications available from National Academy of Sciences, 500 Fifth Street, N.W., Washington, DC 20001.

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, 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. For applications other than potable water, whether compliance with NSF/ANSI 61 Drinking Water System Components—Health Effects, is required (Sec. 4.2.3).
8. Requirements for outdoor storage (Sec. 1.1.1).
9. Details of other federal, state or provincial, and local requirements (Sec. 4.2).
10. 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. 4.3.2); (2) coal-tar enamel by type (Sec. 4.3.3.1 and Table 1); (3) outerwrap (Sec. 4.3.4); and (4) glass fiber inner mat (Sec. 4.3.5). The purchaser should also specify if an affidavit of compliance is required (Sec. 6.3).
11. Type of liquid adhesive (Sec. 4.3.2).
12. Type of coal-tar enamel (Sec. 4.3.3).
13. Type of outerwrap (Sec. 4.3.4).
14. Length of pipeline requiring internal protection (Sec. 4.4.1.1).

15. Length of pipeline requiring: (1) normal exterior protection (Sec. 4.4.1.2) 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. 4.7).
16. Requirements for coating system thickness (Sec. 4.4.1.3 and 4.7).
17. Lining and coating of pipe ends (Sec. 4.4.10).
18. If materials only are being purchased according to the requirements of Sec. 4.6 of this standard, then, in addition to items 20 and 21, the purchaser should specify the following: (1) quantity of liquid adhesive (Sec. 4.6.5.1); (2) quantity of tape (Sec. 4.6.5.2); and (3) affidavit of compliance, if required (Sec. 6.3).
19. Additional materials or procedures (Sec. 4.6.2).
20. Thickness of tape (Table 4).
21. Adhesion tests (Sec. 4.6.8).
22. Additional exterior protection that may be required. Typically, the exterior coating includes a glass fiber innerwrap and outerwrap (Sec. 4.7).
23. Holdback of lining and coating at ends of pipe sections (Sec. 4.4.9)
24. Samples of materials, if required (Sec. 5.1.4).
25. Inspection, testing, and rejection (Sec. 5.1.4.1).
26. Testing frequency of coating thickness measurement (Sec. 5.3.1).
27. 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. The title of the standard was changed to be consistent with other AWWA steel pipe coating and lining standards.
2. All references to exterior coating and interior lining were changed to reference only coating and lining, respectively.
3. The definition for potable water was added to be consistent with other AWWA standards (Section 3).
4. Sec. 4.4.2.1, Cleaning and blasting, was revised to be consistent with other coating and lining standards.
5. Cathodic disbondment testing was added back into the standard to be consistent with other AWWA steel pipe coating and lining standards and an item was added to Table 1.

6. Sec. 4.7.2.3, Sand shield, of the previous edition of C203 was deleted since this material is covered in C604, which is referenced in Sec. 4.8.

7. Existing wording in Sec. 4.8, Field Procedures, of the previous edition of C203 was removed. The section now references AWWA C604.

8. Updated the ASTM reference from G12 to D7091 in Sec. 5.3.1, Coating thickness measurement.

9. Section 6, Delivery, was modified to be consistent with other AWWA steel pipe coating and lining standards

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

Coal-Tar Protective Coatings and Linings for Steel Water Pipe

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard provides the minimum requirements for coal-tar protective coatings and linings used in the water supply industry for buried steel water pipelines.

AWWA steel pipe coating and lining standards are written for and based on the service temperature of potable water. For operating temperatures higher than the normal temperature of potable water, consult the manufacturer for recommendations concerning temperature limitations for coal-tar protective coatings and linings.

1.1.1 *Storage conditions.* Because aboveground and environmental conditions vary, the purchaser should consult the manufacturer as to type of coating that is recommended for the specific anticipated storage conditions, including the necessity for ultraviolet-light protection.

1.1.2 *Safety and environmental considerations.* The components of the coal-tar system may contain skin irritants and may be flammable. Precautions should be taken to protect against these hazards and to comply with the manufacturer's recommendations concerning the use and handling of the components.