



**American Water Works  
Association**

The Authoritative Resource on Safe Water®

ANSI/AWWA C213-07  
(Revision of ANSI/AWWA C213-01)

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*AWWA Standard*

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# Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines



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\* Alternate

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## Foreword

*This foreword is for information only and is not a part of ANSI/AWWA C530.*

### **I. Introduction.**

I.A. *Background.* Fusion-bonded epoxy coatings are one part dry-powder thermosetting coatings that, when heat activated, produce a chemical reaction to the steel pipe surface while maintaining the performance of its properties. The first known applications for corrosion protection in the United States occurred in 1960 on the external surfaces of small-diameter pipe for gas distribution. Since then, applications have expanded to larger pipe sizes as internal and external coatings for gas, oil, water, and wastewater applications. Custom application to accessory fittings, pumps, valves, couplers, flowmeters, and a variety of other parts is also possible. Materials are applied by electrostatic spray, air spray (flocking), or fluid bed, usually in a controlled plant environment. However, equipment is available that allows for internal or external application to pipe joints in the field.

I.B. *History.* The first edition of this standard was approved in 1979. The 1985 revision incorporated changes reflecting fusion-bonded epoxy coating technology, which was current at that time. The primer provision was deleted in the 1985 revision. The 2001 revision incorporated the latest technology and requirements at that time. This edition was approved on June 24, 2007.

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 American Water Works Association Research Foundation (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

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

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 jurisdiction. 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 C213 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 Material Application.* This standard defines the quality of fusion-bonded epoxy coatings to establish the characteristics desired for long-term corrosion protection. It is intended for interior and exterior coatings for steel water pipelines for underground and underwater installation under normal conditions.

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\* NSF International, 789 N. Dixboro Road, Ann Arbor, MI 48105.

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

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

**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 items should be specified by the purchaser:

1. Standard used—that is, ANSI/AWWA C213, Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines, of latest revision.
2. Whether compliance with NSF/ANSI 61, Drinking Water System Components—Health Effects, is required.
3. Any exceptions to the standard.
4. Diameter, length, and location of pipeline.
5. Temperature of conveyed water (Sec. 1.1.2).
6. Details of other federal, state or provincial, and local requirements (Sec. 4.2).
7. Requirements for coating application at pipe ends (Sec. 4.4.3.2).
8. Requirement for coating thickness (Sec. 4.4.3.3).
9. Optional coating performance (Sec. 4.4.3.7, Sec. 5.3.3.4).
10. Requirements for field-welded joint coating (Sec. 4.4.5).
11. Coating requirements for thread systems, special connections, and appurtenances (Sec. 4.5.3.2).
12. Provision for pipe bedding and trench backfill (Sec. 4.6.3).
13. Requirements of inspection and laboratory testing (Sec. 5.1.1, 5.1.3, and Sec. 5.3).
14. Requirements for adhesion testing of coating (Sec. 5.3.3.2).
15. Requirements for outdoor storage and handling (Sec. 6.2).
16. 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.** Revisions made to this standard in this edition include the following:

1. Sec. 5.3.2.5 Changed impact testing to ASTM G14.
2. 5.3.3.3 Added alternative method NACE RP0394.
3. 5.3.4.2 Added alternative method NACE RP0394.

**V. Comments.** If you have any comments or questions about this standard, please call the AWWA Volunteer and Technical Support Group at 303.794.7711,

FAX at 303.795.7603, write to the group at 6666 West Quincy Avenue, Denver, CO  
80235-3098, or e-mail at [standards@awwa.org](mailto:standards@awwa.org).



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*AWWA Standard*

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# **Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines**

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## **SECTION 1: GENERAL**

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### **Sec. 1.1 Scope**

This standard describes the material and application requirements for fusion-bonded epoxy coatings for the interior and exterior of steel water pipe, special sections, welded joints, connections, and fittings for steel water pipelines installed underground or underwater. Fusion-bonded epoxy coatings are heat-activated, chemically cured coating systems.

1.1.1 *Minimum pipe diameter.* The minimum pipe diameter for application of an internal coating that can be inspected and repaired by entering the pipe shall be 24 in. (600 mm).<sup>\*</sup> Pipe diameters less than 24 in. (600 mm) that can be electrically inspected internally may be included, provided the work complies with applicable provisions of this standard.

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<sup>\*</sup> 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.