



**American Water Works
Association**

Dedicated to the World's Most Important Resource™

ANSI/AWWA C225-14
(Revision of ANSI/AWWA C225-07)

AWWA Standard

Fused Polyolefin Coatings for Steel Water Pipe

Effective date March 1, 2014.

First edition approved by AWWA Board of Directors Jan. 19, 2003.

This edition approved: Jan. 19, 2014.

Approved by American National Standards Institute: Nov. 26, 2013.



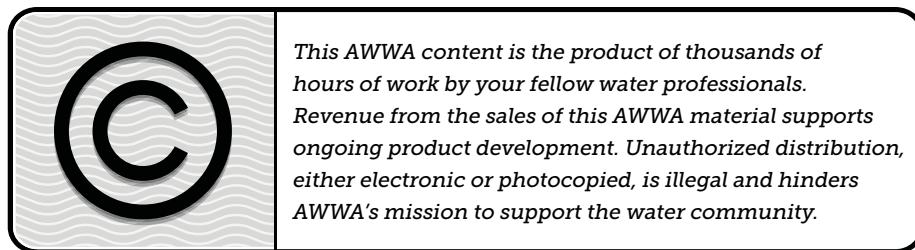
AWWA Standard

This document is an American Water Works Association (AWWA) standard. It is not a specification. AWWA standards describe minimum requirements and do not contain all of the engineering and administrative information normally contained in specifications. The AWWA standards usually contain options that must be evaluated by the user of the standard. Until each optional feature is specified by the user, the product or service is not fully defined. AWWA publication of a standard does not constitute endorsement of any product or product type, nor does AWWA test, certify, or approve any product. The use of AWWA standards is entirely voluntary. This standard does not supersede or take precedence over or displace any applicable law, regulation, or codes of any governmental authority. AWWA standards are intended to represent a consensus of the water supply industry that the product described will provide satisfactory service. When AWWA revises or withdraws this standard, an official notice of action will be placed on the first page of the Official Notice section of *Journal - American Water Works Association*. The action becomes effective on the first day of the month following the month of *Journal - American Water Works Association* publication of the official notice.

American National Standard

An American National Standard implies a consensus of those substantially concerned with its scope and provisions. An American National Standard is intended as a guide to aid the manufacturer, the consumer, and the general public. The existence of an American National Standard does not in any respect preclude anyone, whether that person has approved the standard or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standard. American National Standards are subject to periodic review, and users are cautioned to obtain the latest editions. Producers of goods made in conformity with an American National Standard are encouraged to state on their own responsibility in advertising and promotional materials or on tags or labels that the goods are produced in conformity with particular American National Standards.

CAUTION NOTICE: The American National Standards Institute (ANSI) approval date on the front cover of this standard indicates completion of the ANSI approval process. This American National Standard may be revised or withdrawn at any time. ANSI procedures require that action be taken to reaffirm, revise, or withdraw this standard no later than five years from the date of ANSI approval. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036; (212) 642-4900, or emailing info@ansi.org.



ISBN-13, print: 978-1-62576-004-3

eISBN-13, electronic: 978-1-61300-272-8

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information or retrieval system, except in the form of brief excerpts or quotations for review purposes, without the written permission of the publisher.

Copyright © 2014 by American Water Works Association
Printed in USA

Committee Personnel

The Steel Water Pipe-Manufacturer's Technical Advisory Committee (SWPMTAC) Task Group for AWWA C225, which developed this standard, had the following personnel at the time:

Huaisong Guo, *Chair*

Larry McKinney, *Vice Chair*

J. Bissett, Scapa North America, Mukilteo, Wash.	(AWWA)
B. Buchanan, Canusa-CPS, Toronto, Ont.	(AWWA)
J.D. Demore, Berry Plastics, Houston, Texas	(AWWA)
R. Dublin, Canusa-CPS, The Woodlands, Texas	(AWWA)
A. Fletcher, Pentair, Melbourne, Australia	(AWWA)
H. Guo, Berry Plastics, Houston, Texas	(AWWA)
D. Libby, Chase Corporation, Westwood, Mass.	(AWWA)
A. Mamish, Berry Plastics, Franklin, Mass.	(AWWA)
L. McKinney, Womble Company Inc., Houston, Texas	(AWWA)
M. Murphy, Ameron, Rancho Cucamonga, Calif.	(AWWA)
R. Newby, ICI Devoe Coatings, Mandeville, La.	(AWWA)
R.N. Satyarthi, Baker Coupling Company Inc., Los Angeles, Calif.	(AWWA)
S. Thomas, Berry Plastics, Franklin, Mass.	(AWWA)
J.A. Wise, Canus International Sales Inc., Surrey, B.C.	(AWWA)

The AWWA Standards Committee on Steel Pipe, which reviewed and approved this standard, had the following personnel at the time of approval:

John H. Bambei Jr., *Chair*

Dennis Dechant, *Vice Chair*

John Luka, *Secretary*

General Interest Members

W.R. Brunzell, Brunzell Associates Ltd., Skokie, Ill.	(AWWA)
R.J Card, Lockwood Andrew & Newnam, Houston, Texas	(AWWA)
R.L. Coffey, HDR Engineering Inc., Omaha, Neb.	(AWWA)
H.E. Dunham, MWH Inc., Snohomish, Wash.	(AWWA)
S.N. Foellmi, Black & Veatch Corporation, Irvine, Calif.	(AWWA)
R.L. Gibson, Freese and Nichols Inc., Fort Worth, Texas	(AWWA)

M.D. Gossett,* HDR, Denver, Colo.	(AWWA)
M.B. Horsley,* Horsley Engineering LLC, Overland Park, Kan.	(AWWA)
J.K. Jeyapalan, Pipeline Consultant, New Milford, Conn.	(AWWA)
R.A. Kufaas, Norske Corrosion & Inspection Services Ltd., Surrey B.C.	(AWWA)
J.L. Mattson, Corrosion Control Technologies, Sandy, Utah	(AWWA)
E.N. Olson,† Standards Council Liaison, Brown and Caldwell, Gold Hill, Ore.	(AWWA)
R. Ortega,* Lockwood Andrews & Newnam, Houston, Texas	(AWWA)
E.S. Ralph,† Standards Engineer Liaison, AWWA, Denver, Colo.	(AWWA)
A.E. Romer, AECOM, Orange, Calif.	(AWWA)
J.R. Snow,* MWH Americas Inc., Denver, Colo.	(AWWA)
H.R. Stoner, Consultant, North Plainfield, N.J.	(AWWA)
C.C. Sundberg, CH2M HILL Inc., Issaquah, Wash.	(AWWA)
W.R. Whidden, Woolpert, Orlando, Fla.	(AWWA)

Producer Members

S.A. Arnaout, Hanson Pressure Pipe Inc., Dallas, Texas	(AWWA)
H.R. Bardakjian, Consultant, Glendale, Calif.	(AWWA)
R.R. Carpenter, American SpiralWeld Pipe Company, Birmingham, Ala.	(MSS)
D. Dechant, Dechant Infrastructure Service, Aurora, Colo.	(AWWA)
W.B. Geyer, Steel Plate Fabricators Associates, Lake Zurich, Ill.	(AWWA)
B.D. Keil, Northwest Pipe Company, Draper, Utah	(AWWA)
J.L. Luka,* American SpiralWeld Pipe Company, Columbia, S.C.	(AWWA)
R. Mielke,* Northwest Pipe Company, Raleigh, N.C.	(AWWA)
J. Olmos, Ameron Water Transmission Group, Rancho Cucamonga, Calif.	(AWWA)
G.F. Ruchti,* Consultant, Punta Gorda, Fla.	(AWWA)
D. Walker, Avid Protective Products LTD/Tnemec Company, Oakville, Ontario	(AWWA)
J.A. Wise, Canus International Sales Inc., Surrey, B.C.	(AWWA)

User Members

G.A. Andersen, New York City Bureau of Water Supply, Little Neck, N.Y.	(AWWA)
J.H. Bambei Jr., Denver Water, Denver, Colo.	(AWWA)
Bob Cheng, Metro Vancouver, Burnaby, B.C.	(AWWA)
M.E. Conner, San Diego County Water Authority, San Diego, Calif.	(AWWA)

* Alternate

† Liaison, nonvoting

R.V. Frisz, US Bureau of Reclamation, Denver, Colo.	(USBR)
G. George, Tacoma Public Utilities, Tacoma, Wash.	(AWWA)
T.J. Jordan, Metropolitan Water District of Southern California, La Verne, Calif.	(AWWA)
M. McReynolds,* Metropolitan Water District of Southern California, Los Angeles, Calif.	(AWWA)
N.A. Wigner, Los Angeles Department of Water & Power, Los Angeles, Calif.	(AWWA)
J.V. Young, City of Richmond, Richmond, B.C.	(AWWA)

* Alternate

This page intentionally blank.

Contents

All AWWA standards follow the general format indicated subsequently. Some variations from this format may be found in a particular standard.

SEC.	PAGE	SEC.	PAGE
Foreword		5	Verification
I	ix	5.1	Coating-Materials
I.A	ix		Prequalification 12
I.B	ix	5.2	Prequalification Requirements of
I.C	ix		Coating System 12
II	ix	5.3	Quality Assurance and Records..... 14
III	ix	5.4	Inspection and Testing by the
III.A	ix		Purchaser 14
	ix	5.5	Quality Control Requirements of
	ix		Applied Coating Systems..... 14
III.B	x	5.6	Rejection 16
IV	x	6	Delivery
V	xi	6.1	Marking..... 17
		6.2	Packaging and Shipping 17
		6.3	Affidavit of Compliance 17
Standard		Tables	
1	General	1	Physical Properties of 100 Percent
1.1	Scope 1		Solids Single-Component
1.2	Purpose 2		Adhesive..... 4
1.3	Application..... 2	2	Prequalification Requirements of
2	References 2		Inner-Layer Tape..... 5
3	Definitions 3	3	Prequalification Requirements of
4	Requirements		the Outer-Layer Tape..... 5
4.1	Equipment 4	4	Prequalification Requirements of
4.2	Materials and Workmanship 4		the Total Coating System 6
4.3	Coating System 4	5	Quality Control Requirements of
4.4	Coating Application 8		Applied Coating System..... 6
4.5	Field Procedures 12	6	Inner-Layer and Outer-Layer
			Tape Widths 6

This page intentionally blank.

Foreword

*This foreword is for information only and is not a part of ANSI*AWWA C225.*

I. Introduction.

I.A. *Background.* This standard describes the minimum material and application requirements for a fused polyolefin coating system to be plant-applied to the exterior of steel water pipe for purposes of underground corrosion protection. Currently, the only fused-type coatings for which significant performance experience in this application has been accumulated are based on polyolefin.

I.B. *History.* The fused polyolefin coating system has been in existence since approximately 1988. Steel Pipe New Zealand has been applying this system to large-diameter water pipe since 1994. With the exception of a few water pipe projects around the world, the remainder of the history of this system has been in the oil and gas industry. The first edition of ANSI/AWWA C225 was approved by the AWWA Board of Directors on Jan. 19, 2003. The second edition was approved on June 24, 2007. This edition was approved on Jan. 19, 2014.

I.C. *Acceptance.* This standard has no applicable information for this section.

II. Special Issues. There are no special issues described in this standard.

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 C225, Fused Polyolefin Coatings for Steel Water Pipe, of latest edition.
2. Any exceptions to the standard that may be required.
3. Diameter, length, and location of pipeline.
4. Location of coating application with reference to environmental considerations.
5. Maximum internal operating temperature of the pipeline (Sec. 1.1.1).
6. Requirements for outdoor storage (Sec. 4.3.2.4).
7. Requirements for ultraviolet-light protection (Sec. 4.3.2.4).
8. Requirements for coating system thickness (Tables 2, 3, and 5).

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

9. Requirements for polyolefin layers and dimensions (Sec. 4.3.2.3 and Sec. 4.3.2.4).
10. Requirements for inspection and testing (Sec. 4.3.3 and Section 5).
11. Requirements for cleaning (Sec. 4.4.2.2).
12. Requirements for rubber roller (Sec. 4.4.3.3).
13. Requirements for cutback at pipe ends (Sec. 4.4.3.7).
14. Requirements for coating repair (Sec. 4.4.4).
15. Requirements for field-joint coating (Sec. 4.4.5).
16. Requirements for coating-materials prequalification (Sec. 5.1).
17. Requirements for optional inspection by purchaser (Sec. 5.3).
18. Requirements for coating-system test frequency (Sec. 5.5.3.4).
19. Requirements for selection of holiday detector (Sec. 5.5.2).
20. Requirements for pipe rejection (Sec. 5.6).
21. Requirements for delivery (Section 6).
22. Requirements for packaging (Sec. 6.2.1).
23. 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. The title of the standard was changed to be consistent with other AWWA steel pipe coating standards.
2. Requirements were divided into prequalification requirements and quality control requirements. Related changes were made to the titles of Tables 2–5.
3. Removed maximum thickness requirements in Table 2, 3, and 5.
4. Removed minimum value for nonpolyolefinic material in Table 2.
5. Changed Dielectric Strength in Table 2, 3, and 4 to 450 V/mil (was 900 V/mil and it was incorrect).
6. Added Cathodic Disbondment to Table 4. The maximum radius is 12 mm when tested per ASTM G8.
7. Table 5 was created to list quality control properties for the coated pipe.
8. Adhesion testing of tape was moved from the prequalification tables to Table 5 for quality control requirements.
9. All existing wording in Sec. 4.5, Field Procedures, was removed. The section now references AWWA C604.

10. Section 5, Verification, was updated to match the new language being used in all coating standards.

11. Test method 5.5.3 was created to detail the peel adhesion test method of a coated pipe and add language to address rejection of pipe.

12. Frequency of adhesion testing was added to Sec. 5.5.3.

13. Sec. 5.5.4 was added to address adhesion testing of the outer layer tape.

V. Comments. If you have any comments or questions about this standard, please call the 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.

This page intentionally blank.



**American Water Works
Association**

Dedicated to the World's Most Important Resource™

ANSI/AWWA C225-14
(Revision of ANSI/AWWA C225-07)

AWWA Standard

Fused Polyolefin Coatings for Steel Water Pipe

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes the materials and application of fused polyolefin coating systems for buried service. This system is applied in pipe coating plants, both portable and fixed, using coating techniques and equipment as recommended by the manufacturer. Normally, these prefabricated, polyolefin coatings are applied as a three-layer system consisting of (1) a liquid adhesive or 100 percent solids adhesive layer, (2) a corrosion-protection inner layer, and (3) a mechanical-protection outer layer.

1.1.1 *Maximum temperatures.* This standard is intended for pipe in potable-water service. Therefore, the maximum service temperature of this coating considered in this standard is based on the maximum service temperature of potable water. These coating systems will perform at higher temperatures. Consult the coating manufacturer for conditions and limitations.

1.1.2 *Conditions not described in this standard.* This standard does not describe the additional materials and procedures that may be required for difficult conditions, such as those encountered in rocky areas or where soil conditions are known to be severe and in construction of underwater lines, casing pipe, and river