

American Water Works Association

ANSI/AWWA C900-97

(Revision of ANSI/AWWA C900-89)



AWWA STANDARD
FOR
**POLYVINYL CHLORIDE (PVC) PRESSURE PIPE
AND FABRICATED FITTINGS, 4 IN.
THROUGH 12 IN. (100 mm THROUGH
300 mm), FOR WATER DISTRIBUTION**



Effective date: Feb. 1, 1998.

First edition approved by AWWA Board of Directors June 8, 1975.

This edition approved June 15, 1997.

Approved by American National Standards Institute Dec. 1, 1997.

AMERICAN WATER WORKS ASSOCIATION

6666 West Quincy Avenue, Denver, Colorado 80235

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. 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 classified advertising section of *Journal AWWA*. The action becomes effective on the first day of the month following the month of *Journal AWWA* 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 publication. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute, 11 W. 42nd St., New York, NY 10036; (212) 642-4900.

Copyright © 1998 by American Water Works Association
Printed in USA

Committee Personnel

The AWWA subcommittee that developed this standard had the following personnel at the time:

Leo A. Kinney Jr., *Chair*

K.F. Cerotsky, Springfield Utility Board, Springfield, Ore.	(AWWA)
T.L. Chance, Camp, Dresser & McKee Inc., Houston, Texas	(AWWA)
Claude Corcos, J-M Manufacturing Company Inc., Livingston, N.J.	(AWWA)
A.T. Davies, Edmonton Public Works, Edmonton, Alta.	(AWWA)
H.R. Fraser, Mississauga, Ont.	(AWWA)
S.B. Gross, Certainteed Corporation, Blue Bell, Pa.	(AWWA)
Greg Gundel, Pro-Fitt, Bellingham, Wash.	(AWWA)
R.J. Holme, Proctor & Redfern Ltd., Don Mills, Ont.	(AWWA)
L.A. Kinney Jr., U.S. Bureau of Reclamation, Denver, Colo.	(USBR)
Bruce McPhee, Le-Ron Plastics Inc., Surrey, B.C.	(AWWA)
E.L. Melear, Pitman-Hartenstein & Associates, Jacksonville, Fla.	(AWWA)
R.P. Walker, Uni-Bell PVC Pipe Association, Dallas, Texas	(UNI-BELL)

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

T.L. Chance, *Chair*

Robert P. Walker, *Vice-Chair*

Leo A. Kinney Jr., *Secretary*

Consumer Members

J.L. Diebel,* Council Liaison, Denver Water Department, Denver, Colo.	(AWWA)
D.A. Kellondonk, Aqualta, Edmonton, Alta.	(AWWA)
L.A. Kinney Jr., U.S. Bureau of Reclamation, Denver, Colo.	(USBR)
J.L. May, City of Garland Water Utilities, Garland, Texas	(AWWA)
Mike Rickman, Dallas Water Utilities, Dallas, Texas	(AWWA)
V.R. Speight, Utilities Maintenance, Public Works & Engineering, Houston, Texas	(AWWA)
L.A. Wettering, Neenah Water Department, Neenah, Wis.	(AWWA)
D.R. Young, Florida Cities Water Company, Sarasota, Fla.	(AWWA)

General Interest Members

K.M. Bell, Underwriters Laboratories Inc., Northbrook, Ill.	(UL)
J.P. Castronovo, CH2M Hill Inc., Gainesville, Fla.	(AWWA)
M.J. Devine, Coler & Colantonio Inc., Norwell, Mass.	(NEWWA)
R.J. Holme, Proctor & Redfern Ltd., Don Mills, Ont.	(AWWA)

*Liaison, nonvoting

J.H. Lee, Dayton & Knight Ltd., West Vancouver, B.C.	(AWWA)
S.A. McKelvie, Parsons Brinkerhoff, Boston, Mass.	(AWWA)
E.W. Misichko,* Underwriters Laboratories Inc., Northbrook, Ill.	(UL)
J.R. Paschal, NSF International, Ann Arbor, Mich.	(NSF)
J.G. Richard Jr., Consulting Engineer, Baton Rouge, La.	(AWWA)
J.K. Snyder, Snyder Environmental Engineering Associates, Audubon, Pa.	(AWWA)
J.H. Wilber,† Standards Engineer Liaison, AWWA, Denver, Colo.	(AWWA)

Producer Members

Maria Boitz, J-M Manufacturing Company Inc., Livingston, N.J.	(AWWA)
J.E. Calkins, Certainteed Corporation, Valley Forge, Pa.	(AWWA)
Claude Corcos,* J-M Manufacturing Company Inc., Livingston, N.J.	(UNI-BELL)
D.L. Eckstein,* Uni-Bell PVC Pipe Association, Dallas, Texas	(UNI-BELL)
D.W. Harrington, Harrington Corporation, Lynchburg, Va.	(AWWA)
J.F. Houle, Pacific Western Extruded Plastics Company, Eugene, Ore.	(UNI-BELL)
P.H. Lockett, Multi Fittings USA, Austin, Texas	(AWWA)
J.H. Miller, JHM Enterprises, Oakville, Ont.	(AWWA)
Veso Sobot, IPEX Inc., Mississauga, Ont.	(AWWA)
R.P. Walker, Uni-Bell PVC Pipe Association, Dallas, Texas	(UNI-BELL)

*Alternate

†Liaison, nonvoting

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		4.6	Joint Requirements 9
I	Introduction vii	4.7	Pressure-Class Designations 9
I.A	Background vii	5	Verification
I.B	History vii	5.1	Quality-Control and Qualification
I.C	Acceptance vii		Test Requirements 9
II	Special Issues viii	5.2	Quality-Control Records 11
III	Use of This Standard viii	5.3	Plant Inspection 11
III.A	Purchaser Options and	6	Delivery
	Alternatives viii	6.1	Marking 11
III.B	Modification to Standard ix	6.2	Shipping and Delivery 12
IV	Major Revisions ix	6.3	Affidavit of Compliance 12
V	Comments ix		
Standard		Appendix	
1	General	A	Bibliography 13
1.1	Scope 1	Figure	
1.2	Purpose 1	1	Lap Shear Test 8
1.3	Application 1	Tables	
2	References 2	1	Dimensions, Pressure Classes,
3	Definitions 2		and Dimension Ratios (DRs) for
4	Requirements		PVC Pipe With Cast-Iron-Pipe-
4.1	Permeation 3		Equivalent ODs 5
4.2	Materials 3	2	Sustained-Pressure Requirements 6
4.3	Pipe Requirements 4	3	Burst-Pressure Requirements 6
4.4	Machined Coupling Requirements 6	4	Temperature Coefficients 7
4.5	Fabricated Fitting Requirements 7		

This page intentionally blank.

Foreword

This foreword is for information only and is not a part of AWWA C900.

I. Introduction.

I.A. *Background.* This standard pertains to 4-in. through 12-in. (100-mm through 300-mm) polyvinyl chloride (PVC) pressure pipe and fabricated fittings with cast-iron-pipe-equivalent (CI) outside diameter (OD) dimensions and with wall-thickness dimension ratios (DRs) of 14, 18, and 25. Design considerations are provided in AWWA M23, *PVC Pipe—Design and Installation* (1980), which provides detailed information on PVC pipe covered by ANSI/AWWA C900. The manual includes chapters on general properties of PVC pipe; manufacturing, testing, and inspection; pressure capacity; design factors for external forces; hydraulics; receiving, storage, and handling; testing and maintenance; and service connections (tapping). Recommended installation guidance is provided in ANSI/AWWA C605, *Standard for Underground Installation of PVC Pressure Pipe and Fittings for Water*.

In addition, ANSI/AWWA C907, *Standard for Polyvinyl Chloride (PVC) Pressure Fittings for Water, 4 in. Through 8 in. (100 mm Through 200 mm)*, provides information on injection-molded fittings for use with the PVC pipes covered by ANSI/AWWA C900.

For PVC pipe and fittings diameters greater than 12 in. (300 mm), refer to ANSI/AWWA C905, *Standard for PVC Pressure Pipe and Fabricated Fittings, 14 in. Through 36 in., for Water Transmission*.

I.B. *History.* This is the fourth edition of AWWA C900. In 1966, AWWA appointed Committee 8350-D to study and report on the adaptability of plastic pipe for use within the water industry. The committee presented its report on June 6, 1967, at AWWA's annual conference. The report included a recommendation that a task group be appointed to prepare standards for the use of plastic materials. The AWWA Standards Committee on Thermoplastic Pressure Pipe was established in 1968. The first, second, and third editions of this standard were approved by the AWWA Board of Directors on June 8, 1975; Jan. 25, 1981; and Jan. 29, 1989, respectively.

In June 1988, the Thermoplastic Pressure Pipe Committee was divided into two separate committees: the Polyvinyl Chloride Pressure Pipe and Fittings Standards Committee and the Polyolefin Pressure Pipe and Fittings Standards Committee. This edition of ANSI/AWWA C900 was approved by the AWWA Board of Directors on June 15, 1997.

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 all 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

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, ANSI[†]/NSF[‡] 60, Drinking Water Treatment Chemicals—Health Effects, and ANSI/NSF 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 ANSI/NSF 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.

Appendix A, “Toxicology Review and Evaluation Procedures,” to ANSI/NSF 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 Appendix A procedures may not always be identical, depending on the certifier.

AWWA C900-97 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.

II. Special Issues. This standard has no applicable information for this section.

III. Use of This Standard. AWWA has no responsibility for the suitability or compatibility of the provisions of this standard to any intended application by any user. Accordingly, each user of this standard is responsible for determining that the standard’s provisions are suitable for and compatible with that user’s intended application.

III.A. Purchaser Options and Alternatives. The following items should be covered in the purchaser’s specifications:

*Persons in Canada, Mexico, and non-North American countries should contact the appropriate authority having jurisdiction.

[†]American National Standards Institute, 11 W. 42nd St., New York, NY 10036.

[‡]NSF International, 3475 Plymouth Rd., Ann Arbor, MI 48106.

[§]Both publications available from National Academy of Sciences, 2102 Constitution Ave. N.W., Washington, DC 20418.