ULC Standards
Normes ULC

JOINT CANADA-UNITED STATES
NATIONAL STANDARD

ANSI/CAN/UL/ULC 1285:2022

STANDARD FOR SAFETY

Pipe and Couplings, Polyvinyl Chloride (PVC), and Oriented Polyvinyl Chloride (PVCO) for Underground Fire Service

Approved American National Standard
ANSI

ANSI/UL 1285-2022

scc ccn

SCC FOREWORD

National Standard of Canada

A National Standard of Canada is a standard developed by a Standards Council of Canada (SCC) accredited Standards Development Organization, in compliance with requirements and guidance set out by SCC. More information on National Standards of Canada can be found at www.scc.ca.

SCC is a Crown corporation within the portfolio of Innovation, Science and Economic Development (ISED) Canada. With the goal of enhancing Canada's economic competitiveness and social well-being, SCC leads and facilitates the development and use of national and international standards. SCC also coordinates Canadian participation in standards development, and identifies strategies to advance Canadian standardization efforts.

Accreditation services are provided by SCC to various customers, including product certifiers, testing laboratories, and standards development organizations. A list of SCC programs and accredited bodies is publicly available at www.scc.ca.

UL Standard for Safety for Pipe and Couplings, Polyvinyl Chloride (PVC), and Oriented Polyvinyl Chloride (PVCO) for Underground Fire Service, ANSI/CAN/UL/ULC 1285

Eighth Edition, Dated March 21, 2022

Summary of Topics

The Eighth Edition of ANSI/CAN/UL/ULC 1285 dated March 21, 2022 has been issued to reflect the latest ANSI and SCC approval dates and to incorporate the proposal dated October 29, 2021.

The requirements are substantially in accordance with Proposal(s) on this subject dated October 29, 2021.

No Text on This Page

ANSI/UL 1285-2022

MARCH 21, 2022

ANSI/CAN/UL/ULC 1285:2022

Standard for Pipe and Couplings, Polyvinyl Chloride (PVC), and Oriented Polyvinyl Chloride (PVCO) for Underground Fire Service

First Edition – January, 1982
Second Edition – March, 1991
Third Edition – April, 1995
Fourth Edition – April, 2001
Fifth Edition – July, 2008
Sixth Edition – March, 2016
Seventh Edition – November, 2020

Eighth Edition

March 21, 2022

This ANSI/CAN/UL/ULC Safety Standard consists of the Eighth Edition.

The most recent designation of ANSI/UL 1285 as an American National Standard (ANSI) occurred on March 21, 2022. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page, Preface or SCC Foreword.

This standard has been designated as a National Standard of Canada (NSC) on March 21, 2022.

No Text on This Page

CONTENTS

MARKING

MANUFACTURING AND INSTALLATION INSTRUCTIONS

Preface

This is the Eighth Edition of ANSI/CAN/UL/ULC 1285, Standard for Pipe and Couplings, Polyvinyl Chloride (PVC), and Oriented Polyvinyl Chloride (PVCO) for Underground Fire Service.

UL is accredited by the American National Standards Institute (ANSI) and the Standards Council of Canada (SCC) as a Standards Development Organization (SDO). ULC Standards is accredited by the Standards Council of Canada (SCC) as a Standards Development Organization (SDO).

This Standard has been developed in compliance with the requirements of ANSI and SCC for accreditation of a Standards Development Organization.

This ANSI/CAN/UL/ULC 1285 Standard is under continuous maintenance, whereby each revision is approved in compliance with the requirements of ANSI and SCC for accreditation of a Standards Development Organization. In the event that no revisions are issued for a period of four years from the date of publication, action to revise, reaffirm, or withdraw the standard shall be initiated.

In Canada, there are two official languages, English and French. All safety warnings must be in French and English. Attention is drawn to the possibility that some Canadian authorities may require additional markings and/or installation instructions to be in both official languages.

Comments or proposals for revisions on any part of the Standard may be submitted at any time. Proposals should be submitted via a Proposal Request in the On-Line Collaborative Standards Development System (CSDS) at https://csds.ul.com.

To purchase UL Standards, visit the UL Standards Sales Site at http://www.shopulstandards.com/HowToOrder.aspx or call tollfree 1-888-853-3503.

This Edition of the Standard has been formally approved by the UL Standards Technical Panel (STP) on Pipe And Couplings, Polyvinyl Chloride (PVC), And Oriented Polyvinyl Chloride (PVCO) For Underground Fire Service, STP 1285.

This list represents the STP 1285 membership when the final text in this standard was balloted. Since that time, changes in the membership may have occurred.

STP 1285 Membership

Name	Represent	Interest Category	Region
Talal Al Fahad	Kuwait Fire Force	AHJ	Kuwait
Roland Asp	National Fire Sprinkler Association	General	USA
Ken Bush	Maryland State Fire Marshal's Office	AHJ	USA
Flora Chen	City of Hayward	AHJ	USA
Diane J. Haithcock	Underwriters Laboratories	Chair	USA
Jeff Hebenstreit	UL LLC	Testing & Stds Org	USA
Serge Leroux	Ipex Inc	Producer	Canada

STP 1285 Membership Continued on Next Page

STP 1285 Membership Continued

Name	Represent	Interest Category	Region
Richard Nichols	Uni-Bell PVC Pipe Association	General	USA
Thomas Noble	American Fire Protection Group	Supply Chain	USA
Pardeep Sharma	Hamilton Kent, Inc.	Producer	Canada
Nicolette Weeks	Underwriters Laboratories	Project Manager	USA
Trevor Wraight	Spears Manufacturing Co.	Producer	USA

International Classification for Standards (ICS): 13.220.01, 13.220.20

For further information on UL standards, please contact:

Underwriters Laboratories Inc.
171 Nepean Street, Suite 400
Ottawa, Ontario K2P 0B4
Phone: 1-613.755.2729
E-mail: ULCStandards@ul.com
Web site: ul.org

This Standard is intended to be used for conformity assessment.

The intended primary application of this standard is stated in its scope. It is important to note that it remains the responsibility of the user of the standard to judge its suitability for this particular application.

CETTE NORME NATIONALE DU CANADA EST DISPONIBLE EN VERSIONS FRANÇAISE ET ANGLAISE

INTRODUCTION

1 Scope

1.1 These requirements cover polyvinyl chloride (PVC) pressure pipe, machined couplings, fabricated fittings and gaskets and oriented polyvinyl chloride (PVCO) pressure pipe and gaskets for use in underground fire protection systems and connections to such systems.

1.2 These requirements do not cover fittings that consist of mechanical joint retainer devices even when intended for use with polyvinyl chloride (PVC) pressure pipe.

1.3 PVC pipe and couplings covered by these requirements shall be designated according to the Nominal Size, Pressure Class (PC), and Dimension Ratio (DR), as specified in ANSI/AWWA C900 for use with cast iron outside diameter (CIOD) or steel (IPS) pipe as applicable.

1.4 PVCO pipe covered by these requirements shall be designated according to the Nominal Size, Pressure Class (PC), Expansion Ratio (ER) and Wall-Thickness-Ratio (WTR), as specified in ANSI/AWWA C909 for use with ductile-iron equivalent OD (DIOD) pipe.

1.5 Requirements for the installation and use of PVC pressure pipe and couplings for fire protection service are specified in the Standard for the Installation of Private Fire Service Mains and their Appurtenances, NFPA 24 or the Standard for the Installation of Sprinkler Systems, NFPA 13.

2 Units of Measurement

2.1 Where values of measurement are specified in both SI and U.S. Customary units, it is the responsibility of the user of this standard to determine the unit of measurement appropriate for the user's needs.

3 Components

3.1 Except as indicated in 3.2, a component of a product covered by this standard shall comply with the requirements for that component.

3.2 A component is not required to comply with a specific requirement that:

a) Involves a feature or characteristic not required in the application of the component in the product covered by this standard, or

b) Is superseded by a requirement in this standard.

3.3 A component shall be used in accordance with its rating established for the intended conditions of use.

3.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

4 Reference Standards

4.1 The following standards are referenced in this standard, and portions of these referenced standards and codes identified in this standard may be essential for compliance.

American Society for Testing and Materials (ASTM) Standards

ASTM D638, *Standard Test Method for Tensile Properties of Plastics*

ANSI/ASTM D1598, *Standard Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure*

ANSI/ASTM D1599, *Standard Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings*

ASTM D1784, *Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds*

ANSI/ASTM D2564, *Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems*

ASTM D2837, *Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products*

ANSI/ASTM D3139, *Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals*

ASTM E145, *Standard Practice for Evaluating Flat-Faced Gasketed Joint Assemblies*

ANSI/ASTM F477, *Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe*

ANSI/ASTM F1674, *Standard Test Method for Joint Restraint Products for Use with PVC Pipe*

American Water Works Association (AWWA) Standards

ANSI/AWWA C605, *Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings*

ANSI/AWWA C900, *Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 60 In. (100 mm Through 1,500 mm)*

ANSI/AWWA C909, *Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe, 4 in. (100 mm) and Larger*

AWWA M23, *PVC Pipe-Design and Installation*

CSA Group

CSA B137.3-17, *Thermoplastic pressure piping compendium, Rigid polyvinylchloride (PVC) pipe and fittings for pressure applications*

5 Glossary

5.1 For the purposes of this Standard, the following definitions apply in addition to those definitions provided in ANSI/AWWA C900 and ANSI/AWWA C909.

5.2 FUSION JOINT – A PVC joint where two sections of pipe or pipe fittings are joined by heating and melting the mating surfaces and pressing them together.

5.3 GASKET SEATING AREA – The section of pipe or coupling that is, or has the potential to be, in contact with the sealing surfaces of the gasket in intended assemblies.

5.4 PIPE SIZE – The nominal outside diameter of pipe that is compatible with cast or ductile iron (CIOD or DIOD) pipe, or steel pipe (IPS) of the same nominal size.

5.5 RESTRAINED JOINT – A PVC or PVCO joint which is constructed to resist separation mechanically through the use of integral joint features. The integral mechanical restraint may be designed to prevent separation due to hydrostatic thrust forces, or due to installation tensile forces, or both, as defined by the manufacturer.

CONSTRUCTION

6 Materials

6.1 PVC pipe and fitting materials and PVCO pipe materials shall:

a) Be made with virgin PVC resin;

b) Meet or exceed the physical and chemical properties of Cell Class 12454 virgin compounds, as defined in ASTM D1784 except as allowed by 6.3; and

c) Have an established hydrostatic-design-basis (HDB) rating of 4000 psig (27.6 MPa) for water at 73.4 °F (23.0 °C) as defined in ASTM D2837.

The manufacturer shall provide data demonstrating compliance with the HDB rating requirements. Materials which have been evaluated on behalf of the manufacturer in accordance with ASTM D2837 or listed on an equivalent basis, for example listing in PPI Technical Report TR-4 for PVC 1120, shall be considered to have met the intent of these requirements.

6.2 Finished PVCO pipe shall have an established hydrostatic-design-basis (HDB) rating of 7100 psig (49.0 MPa) as determined by testing in according with test method ANSI/ASTM D1598, with data evaluation as defined in ASTM D2837.

6.3 Noncontaminated PVC and PVCO pipe from the manufacturer's production that is reground, or pelletized, and dry blended by the manufacturer with the same grade and Cell Class of PVC virgin compound, is not prohibited from being used provided that the blended compound is the same Cell Class and the finished product complies with the requirements of this standard.

6.4 Qualification of alternate PVC pipe and fitting materials shall be evaluated on the basis of:

a) Sustained Pressure, 14.4 or 15.4;

b) Burst Pressure, 14.5 or 15.5;

c) Flattening, Section 18;

d) Apparent Hoop Tensile Strength (Ring-Tensile), Section 19; and

e) Extrusion Quality, Section 20.

7 Gasketed Joints

7.1 Gasketed PVC pipe joints, couplings and fittings shall be supplied with gaskets as specified in ANSI/AWWA C900.

7.2 If couplings are used to join the pipe, couplings and gaskets shall be supplied according to the quantities specified in ANSI/AWWA C900. Each coupling shall be of the same composition, nominal size, and Pressure Class as the pipe.

7.3 Gasketed PVCO pipe joints shall be supplied with gaskets as specified in ANSI/AWWA C909.

8 Dimensions and Pressure Class

8.1 For PVC pipe, couplings and fittings, the dimensions for each size and Pressure Class shall be as specified in ANSI/AWWA C900, with a minimum required PC of 150.

8.2 For PVCO pipe, the dimensions for each size and Pressure Class shall be as specified in ANSI/AWWA C909, with a minimum required PC of 165.

9 Imperfections

9.1 PVC Pipe shall meet the workmanship requirements of ANSI/AWWA C900.

9.2 PVC Fittings shall meet the workmanship requirements of ANSI/AWWA C900.

9.3 PVCO Pipe shall meet the quality requirements of ANSI/AWWA C909.

10 Sealing Gaskets

10.1 A sealing gasket shall be made of a vulcanized natural rubber or a synthetic rubber compound and shall have uniform dimensions and sufficient thickness to provide a compression-like seal. Elastomeric gaskets for PVC pipe and fittings shall meet the requirements of ANSI/AWWA C900. Elastomeric gaskets for PVCO pipe shall meet the requirements of ANSI/AWWA C909. Physical properties of the sealing material shall be in compliance with the criteria in ANSI/ASTM F477 for High-Head Applications (150 kPa or 50 ft of head and above). See Elastomeric Parts, Section 12.

PERFORMANCE

11 General

11.1 Representative samples of each Pressure Class and nominal size of PVC pipe and couplings or PVCO pipe shall be subjected to the tests described in Sections 12 – 22.

12 Nonmetallic Seals

12.1 A nonmetallic part used to provide a seal shall have the following properties when representative samples are tested as specified in the Standard for Gaskets and Seals, UL 157:

a) Single material and sealing (soft) portion of dual material gaskets:

1) For EPDM and nitrile – Minimum tensile strength of 1500 psi (10.3 MPa), and minimum ultimate elongation of 350 %.

2) For all other materials – Minimum tensile strength of 2000 psi (13.8 MPa), and minimum ultimate elongation of 350 %.

3) Maximum tensile set of 25 %.

4) After accelerated aging for 96 h at 70 °C (158 °F):

i) Maximum decrease in tensile strength – 15 % of original.

ii) Maximum decrease in elongation – 20 % of original.

iii) Maximum increase in hardness (Shore A) – 8 points.

5) The compression set of samples of rubber seals shall not exceed 20 % of the original thickness after being compressed to three-fourths of the original thickness.

b) Retaining (hard) portion of dual material gaskets:

1) Minimum tensile strength – 1200 psi (8.3 MPa), and minimum ultimate elongation – 125 % [1 to 2.25 inches (25.4 to 57.2 mm)].

2) Those properties relating to minimum tensile strength and elongation after oven aging as specified in UL 157. The maximum service temperature used to determine the oven time and temperature for oven aging is 60 °C (140 °F).

13 Plastic Components

13.1 Plastic components that are not fully encapsulated and are necessary to prevent separation or maintain joint integrity of the joint after installation shall meet the requirements of this section.

13.2 Following air-oven aging for 180 days at 121 °C (250 °F), there shall be no warping, creeping, or other signs of deterioration of a plastic component that may preclude the intended operation of the joint seal. There shall be no cracking of any plastic component. A joint with aged plastic components shall demonstrate acceptable performance when subjected to Leakage, 14.2 or 15.2 and Assembly, 14.3 or 15.3, as applicable.

13.3 The plastic components to be aged are to be supported in a full-draft, circulating-air oven that has been preheated at full draft, to 121 ±1 °C (250 ±8 °F). The manner of support is to be such that the samples are prevented from touching one another or the sides of the oven. The samples are to be aged for 180 days at full draft and then allowed to cool in air at 23 ±2 °C (73.4 ±3.6 °F) for at least 24 h before conducting any test or dimensional check. As used in this test, the term "full draft" refers to the air flow over the samples in the oven with the air inlet and outlets fully open. The oven used for accelerated aging is to be Type IIA as specified in the Standard Specification for Gravity-Convection and Forced-Ventilation Ovens, ASTM E145.

13.4 If a plastic material cannot withstand the temperature indicated without softening, distortion, or deterioration, an air-oven aging test at a lower temperature for a longer period of time may be used. If a material is capable of withstanding a higher temperature than that specified in 13.3 without excessive softening, distortion, or deterioration, an air-oven aging test at a higher temperature for a shorter period of time, but not less than 30 days, shall be permitted. The duration of exposure is to be calculated from the following equation:

$$D = (790000)e^{-0.0693t}$$

in which:

D is the test duration in days, and

t is the test temperature in °C

13.5 Following immersion in tap water at 87 ±2 °C (189 ±3.6 °F) for 180 days, there shall be no warping, creeping, or other signs of deterioration of a plastic component that may preclude the intended operation of the joint seal. There shall be no cracking of any plastic component. A joint with aged plastic components shall demonstrate acceptable performance when subjected to leakage and assembly. If a material cannot withstand the temperature specified in 13.3 without excessive softening, distortion, or deterioration, a water aging test at a lower temperature for a longer period of time shall be applied. The duration of exposure is to be calculated from the following formula:

$$D = (74800)e^{-0.0693t}$$

in which:

D is the test duration in days, and

t is the test temperature in °C

14 Tests for Pipe, Couplings, and Fittings with Unrestrained Joints

14.1 General

14.1.1 The requirements in this section apply to pipe, couplings and fittings with unrestrained joints. They also apply to pipe, couplings and fittings that are designed with a restrained joint intended only to resist tensile forces during installation. For pipe, couplings and fittings that are designed with a restrained joint intended to resist separation due to hydrostatic thrust forces under pressure, see Section 15.

14.1.2 All test pressures shall be in accordance with Table 14.1 for the applicable test. Joints may be restrained to prevent longitudinal separation at the joints during testing.

Table 14.1
Pressure Test Requirements

DR	Pressure Class/Rating psig (kPa)	Test pressure, psig (kPa)					
		Leakage (50 % / 2-1/2 times / burst)	Sustained	Hydrostatic	Burst	Peak	Base
27.5	150 (1,030)	75 / 375 / 475 (520 / 2,590 / 3,280)	320 (2,210)	300 (2,070)	475 (3,280)	122 (840)	61 (420)
26	160 (1,100)	80 / 400 / 500 (550 / 2,760 / 3,450)	340 (2,340)	320 (2,210)	500 (3,450)	127 (880)	63 (430)
25	165 (1,140)	85 / 415 / 535 (590 / 2,860 / 3,690)	350 (2,410)	330 (2,280)	535 (3,690)	132 (910)	66 (460)
21	200 (1,380)	100 / 500 / 630 (690 / 3,450 / 4,340)	420 (2,900)	400 (2,760)	630 (4,340)	159 (1,100)	79 (540)
18	235 (1,620)	120 / 590 / 755 (830 / 4,070 / 5,210)	500 (3,450)	470 (3,240)	755 (5,210)	188 (1,300)	94 (650)
17	250 (1,720)	125 / 625 / 800 (860 / 4,310 / 5,520)	530 (3,650)	500 (3,450)	800 (5,520)	198 (1,370)	99 (680)
14	305 (2,100)	155 / 765 / 985 (1,070 / 5,270 / 6,790)	650 (4,480)	610 (4,210)	985 (6,790)	244 (1,680)	122

14.2 Leakage

14.2.1 All joints shall be designed to be leak-free and shall not leak when subjected to the Internal Pressure Testing using the methods in ANSI/ASTM D3139 as specified in ANSI/AWWA C900 or ANSI/AWWA C909 as applicable. All samples are to be assembled in accordance with the manufacturer's installation instructions.

14.3 Assembly

14.3.1 Pipe joints made with minimum clearances between the pipe spigot and bell or coupling, determined in accordance with the manufacturer's tolerances, shall, when assembled as specified in 14.3.2, exhibit no damage to gaskets, pipe, or coupling sections. Cut or torn gasket materials and chipped or broken pipe or coupling sections do not comply with the requirement.

14.3.2 Representative samples of each Pressure Class and size of pipe and couplings shall be machined or otherwise modified as required to the minimum clearance specified on the manufacturer's drawings for each size. Where the minimum clearances for a joint are identical across multiple pressure classes, testing of a single pressure class is representative of other pressure class. Two pipe sections shall be joined together in accordance with the manufacturer's assembly instructions, using the manufacturer's recommended lubricant.

14.4 Sustained pressure

14.4.1 PVC pipe specimens shall not fail, balloon, burst or weep when tested in accordance with the sustained pressure tests in ANSI/AWWA C900.

14.4.2 PVCO pipe specimens shall not fail, balloon, burst or weep when tested in accordance with the sustained pressure tests in ANSI/AWWA C909.

14.5 Burst pressure

14.5.1 PVC pipe, including any integral bell end, shall not fail when tested in accordance with the burst pressure tests in ANSI/AWWA C900.

14.5.2 PVC couplings (if provided) shall not fail when tested in accordance with the burst pressure tests for machined couplings in ANSI/AWWA C900 for the pipe with which the couplings are designed to be used.

14.5.3 PVCO pipe, including any integral bell end, shall not fail when tested in accordance with the burst pressure tests in ANSI/AWWA C909.

14.6 Pressure integrity, fittings

14.6.1 Fabricated PVC fittings shall not fail, balloon, burst, or weep when tested in accordance with the pressure tests for fabricated fittings in ANSI/AWWA C900.

15 Tests for Pipe, Couplings and Fittings with Restrained Joints for Hydrostatic Thrust Forces (PVC only)

15.1 General

15.1.1 The requirements in this section apply to pipe, couplings and fittings that are designed with a restrained joint intended to resist separation due to hydrostatic thrust forces under pressure.

15.1.2 All test pressures shall be in accordance with Table 14.1 for the applicable test.

Exception: When specified in the individual test methods, the joint may be rated for a pressure lower than the pipe pressure class. In those cases, the test pressures may be reduced according to other available pressure ratings in Table 14.1. Only the indicated pressure ratings may be used, no interpolation or extrapolation is permitted. See also Marking, 25.2, and Installation Instructions, Section 28.

15.1.3 After assembling in accordance with the manufacturer's installation instructions, no adjustments are to be made. No external restraint is to be used during testing.

15.2 Leakage

15.2.1 In addition to the requirements in 14.2.1, restrained joint test specimens shall not separate during testing.

15.2.2 Testing at a pressure lower than the pipe pressure class is permitted. See 15.1.1.

15.3 Assembly

15.3.1 Restrained joint test specimens shall comply with the requirements in 14.3.1.

15.4 Sustained pressure

15.4.1 Restrained joint test specimens shall not fail, balloon, burst or weep when tested in accordance with the sustained pressure tests in ANSI/ASTM F1674.

15.4.2 Testing at a pressure lower than the pipe pressure class is permitted only when the pipe has been separately evaluated at the pressure indicated in Table 14.1 using a suitable joint configuration. See 14.4 and 15.1.1.

15.5 Burst pressure

15.5.1 Restrained joint test specimens shall not fail when tested in accordance with the burst pressure tests in ANSI/ASTM F1674.

15.5.2 Testing at a pressure lower than the pipe pressure class is permitted only when the pipe has been separately evaluated at the pressure indicated in Table 14.1 using a suitable joint configuration. See 14.5 and 15.1.1.

15.6 Cyclic surge pressure

15.6.1 Restrained joint test specimens shall reach 1,000,000 pressure cycles when tested in accordance with ANSI/ASTM F1674. Samples representative of size range, and maximum pipe pressure class for each joint design specified in the manufacturer's installation instructions shall be tested.

15.6.2 Testing at peak and base pressures lower than the pipe pressure class is permitted. See 15.1.1.

16 Tests for Fusion Joints

16.1 The highest pressure class of every nominal diameter of pipe manufactured for fusion shall meet the axial strength qualification test requirement using full wall thickness coupon samples in accordance with ANSI/AWWA C900.

17 Tests for Fittings

17.1 General

17.1.1 Unless otherwise specified in the individual methods, all test pressures shall be in accordance with Table 14.1 for the applicable test.

17.2 Hydrostatic integrity

17.2.1 Fabricated PVC fittings with butt-fusion or thermal weld segment joints shall not fail when tested in accordance with the burst pressure tests in ANSI/AWWA C900. Test specimens shall be prepared in accordance with the requirements of ANSI/AWWA C900 and with the manufacturer's recommended procedures and parameters. Test sample segments joined by thermal weld other than butt-fusion shall be tested only after the first 20 % or less of the weld thickness is applies. All test samples segments shall be checked for discontinuity prior to testing.

17.2.2 Solvent-cemented PVC joints shall not fail when tested in accordance with the burst pressure tests in ANSI/AWWA C900. Test specimens shall be prepared in accordance with the requirements of ANSI/ASTM D2564, ANSI/AWWA C900 and with the manufacturer's recommended procedures and parameters. All test sample segments shall be checked for quality prior to testing.

18 Flattening Test

18.1 PVC pipe specimens shall exhibit no evidence of splitting, cracking, or breaking, when tested as specified in ANSI/AWWA C900.

18.2 PVCO pipe specimens shall exhibit no evidence of splitting, cracking, or breaking, when tested as specified in ANSI/AWWA C909.

19 Apparent Hoop Tensile Strength (Ring-Tensile) Test

19.1 The apparent tensile strength of PVC pipe ring specimens at yield shall not be less than 6,300 psi when tested in accordance with ANSI/AWWA C900.

19.2 The apparent tensile strength of PVCO pipe ring specimens at yield shall not be less than 160 % of cell class 12454 pipe material in accordance with ANSI/AWWA C909.

20 Extrusion Quality Test

20.1 PVC pipe specimens shall not fail when tested in accordance with ANSI/AWWA C900.

20.2 Unexpanded PVCO pipe specimens shall not fail when tested in accordance with ANSI/AWWA C909.

21 Pipe Intended for Potable Water Supply

21.1 PVC pipe, couplings and fittings and PVCO pipe intended to supply potable water in addition to water for fire protection service shall be evaluated and Classified as suitable for potable-water service by a ANSI accredited third party Certification agency. The criteria of this certification shall be the requirements specified in Standard for Drinking Water System Components – Health Effects, ANSI/NSF 61.