



**Summary of Substantive Changes  
between the 2016a and 2017 editions of  
NSF/ANSI 14 “Plastics Piping System Components and Related Materials”**

**Presented to the IAPMO Standards Review Committee on October 15, 2018**

**General:** The changes to this standard might have an impact on currently listed products. The significant changes are:

- Updated the referenced standards to reflect the current editions (see Section 2).
- Clarified the dimensional requirements for plastic piping system components and related materials (see Sections 5.1 and 5.4)
- Added new chlorine resistance equivalency tests for modified polyethylene compounds that already have a chlorine resistance classification (see Section 5.8)
- The table was revised to remove requirements for polybutylene fittings (see Table 9.11)
- New tables were added for PEX geothermal pipe and fittings, corrugated PE pipe and fittings for sewer, and (CIPP) cured-in-place pipe liners (see Tables 9.37 through 9.40)

Section 2, Normative references: Updated the referenced standards to reflect the current editions as follows:

*2.1 Normative references for plastic pipe and related components*

*ASTM D2235-04 (~~2011~~2016). Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings*

*ASTM D2513-~~14e1~~16a. Standard Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings*

*ASTM D3034-~~15e1~~16. Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings*

*ASTM D3138-04 (~~2011~~2016). Standard Specification for Solvent Cements for Transition Joints Between Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Non-Pressure Piping Components*

*ASTM D3261-~~15~~16. Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing*

*ASTM D5927-~~14~~17. Standard Classification System for and Basis for Thermoplastic Polyester (TPES) Injection and Extrusion Materials Based on ISO Test Methods*

*ASTM F409-~~12~~17. Standard Specification for Thermoplastic Accessible and Replaceable Plastic Tube and Tubular Fittings*

*ASTM F679-~~15~~16. Standard Specification for Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings*

*ASTM F891-~~10~~16. Standard Specification for Coextruded Poly(Vinyl Chloride) (PVC) Plastic Pipe with a Cellular Core*

*ASTM F1055-~~15~~16. Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene and Crosslinked Polyethylene (PEX) Pipe and Tubing*

*ASTM F1282-~~10~~17. Standard Specification for Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure Pipe*

*ASTM F1673-10 (2016). Standard Specification for Polyvinylidene Fluoride (PVDF) Corrosive Waste Drainage Systems*



ASTM F1760-~~01 (2011)~~16. Standard Specification for Coextruded Poly(Vinyl Chloride) (PVC) Non-Pressure Plastic Pipe Having Reprocessed-Recycled Content

ASTM F1807-~~15~~17. Standard Specification for Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

ASTM F2080-~~15a~~16. Standard Specification for Cold-Expansion Fittings with Metal Compression Sleeves for Cross-linked Polyethylene (PEX) Pipe and SDR9 Polyethylene Raised Temperature (PE-RT) Pipe  
ASTM F2158-08 (2016). Standard Specification for Residential Central-Vacuum Tube and Fittings

ASTM F2389-~~15~~17a. Standard Specification for Pressure-rated Polypropylene (PP) Piping Systems

ASTM F2764/F2764M-~~11a~~<sup>e2</sup>17. Standard Specification for ~~306~~ to 60 in [~~750~~150 to 1500 mm] Polypropylene (PP) Corrugated Double and Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications

ASTM F2769-~~14~~16. Standard Specification for Polyethylene of Raised Temperature (PE-RT) Plastic Hot and Cold-Water Tubing and Distribution Systems

ANSI/AWWA C900-~~07~~16. Polyvinyl Chloride (PVC) Pressure Pipe, and Fabricated Fittings, 4 in Through ~~1260~~ in (100 mm Through ~~300~~1500 mm), ~~for Water Transmission and Distribution~~

~~ANSI/AWWA C905-10. Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 in Through 48 in (350 mm Through 1,200 mm) for Water Transmission and Distribution~~

CAN/CSA B137.1-~~17~~13. Polyethylene (PE) Pipe, Tubing, and Fittings for Cold Water Pressure Services

CAN/CSA B137.3-~~17~~13. Rigid Polyvinyl Chloride (PVC) Pipe for Pressure Applications

CAN/CSA B137.4-~~17~~13. Polyethylene (PE) Piping Systems for Gas Services

CAN/CSA B137.5-~~17~~13. Cross-linked Polyethylene (PEX) Tubing Systems for Pressure Applications

CAN/CSA B137.6-~~17~~13. CPVC Pipe, Tubing, and Fittings for Hot and Cold Water Distribution Systems

CAN/CSA B137.8-~~17~~13. Polybutylene (PB) Piping for Pressure Applications

CAN/CSA B137.9-~~17~~13. Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure Pipe Systems

CAN/CSA B137.10-~~17~~13. Cross-linked Polyethylene/Aluminum/Cross-linked Polyethylene (PEX-AL-PEX) Composite Pressure Pipe Systems

CAN/CSA B137.11-~~17~~13. Polypropylene (PP-R) Pipe and Fittings for Pressure Applications

CAN/CSA B137.18-~~17~~13. Polyethylene of Raised Temperature Resistance (PE-RT) Tubing Systems for Pressure Applications

### 2.3 International and other normative references

PPI TR-3. Policies and Procedures for Developing Hydrostatic Design Basis (HDB), Pressure Design Basis (PDB), Strength Design Basis (SDB), and Minimum Required Strength (MRS) Ratings for Thermoplastic Piping Materials or Pipe (~~2016~~ 2017)

Section 5, Physical and performance requirements: Product dimensional requirements were clarified in Section 5.1 and Section 5.4 as follows:

#### 5.1 General

Plastic piping system components and related materials shall comply with the physical and performance requirements of the applicable normative standards (as referenced in Section 2) ~~of this standard~~ and with the requirements of Sections 5.2 through 5.8.

#### 5.4 Critical dimensions

~~Plastic piping system components shall comply~~ Compliance with the critical dimensions dimensional requirements of the applicable standards ~~as~~ referenced in Section 2 of this standard shall be determined by verifying the following critical dimensions:

— for pipe and spigot ends of fittings, ....



Section 5.7.2, Pipe with middle polymeric layer: A note was added for testing guidance and clarification as follows:

**5.7.2 Pipe with middle polymeric layer**

- five (5) data points at one hoop stress level at the highest temperature conditions as for the original data set;
- the 95% LPL shall be calculated for the original material data at these temperatures/stress conditions; and
- all five (5) data points (failure times) shall meet or exceed the LPL for that condition.

NOTE — The hoop stress level shall be chosen so that there are no mixed mode failures. In the occurrence of such failures, the testing shall be repeated at a lower stress that would generate brittle failures.

Section 5.8, Chlorine resistance: Added new chlorine resistance equivalency tests for modified polyethylene compounds that already have a chlorine resistance classification as follows:

**5.8 Chlorine resistance – Equivalency for polyethylene compound modifications**

In order to qualify a modification to a compound that already has a chlorine resistance classification, the following minimum requirements shall be met using either Method A or Method B.

**5.8.1 Method A (4" DR 11 testing)**

- a) Test the modified compound per ASTM D3350-14 Section 10.1.11 with an exception in the number of specimens. A minimum of 3 specimens shall be tested.
- b) Specimens shall be tested to failure or until the log average (geometric mean) test time meets the minimum test time requirement in ASTM D3350-14 Table 2 for the original compound's Oxidative Resistance Classification.
- c) The modified compound shall be considered equal to the original compound if its Oxidative Resistance Classification meets or exceeds that of the original compound.

**5.8.2 Method B (½" DR 9 testing)**

- a) Test 6 specimens of the original compound per ASTM D3350-14 Section 10.1.11 with an exception in the pipe size. Test specimens shall be ½" DR 9 pipe.
- b) Test 6 specimens of the modified compound per ASTM D3350-14 Section 10.1.11 with an exception in the pipe size. Test specimens shall be ½" DR 9 pipe.
- c) Testing shall be performed at 90°C and at a test stress of 360, 400, or 450 psi as per ASTM D3350-14 Table 2.
- d) Specimens of the original compound shall be tested to failure.
- e) Specimens of the modified compound shall be tested to failure or until the log average (geometric mean) test time is above that of the original compound.

Analysis:

- Failures shall be oxidatively induced Stage II failures.
- Calculate the log average failure time for the original compound ( $ft^{orig}$ ) and of the new compound ( $ft_{new}$ ).
- Calculate the % difference in the log average failure time of the new compound relative to the original compound based on the following equation:  
$$\% \text{ difference in failure time} = (ft_{new}/ft^{orig}) \times 100\%$$
- The modified compound shall be considered equal to the original compound if:  
$$\% \text{ difference in failure time} \geq 87\%$$

NOTE — Testing of the original compound (½" DR 9 pipe) is only required to be performed once. All modified compounds shall be compared to this original data set.



Tables: The tables in the 2017 edition have been changed to reflect the appropriate section in which it is located.

Table 9.11 – Fittings for PE and PEX tubing test frequency: The table was revised to remove requirements for polybutylene fittings.

Table 9.20 – PP pipe and fittings test frequency: The table was revised to add a column of the frequency requirements and an apparent tensile strength test frequency for CSA B137.11 and to remove reference to DIN 16962.

Table 9.29 – PVC pressure pipe: The table was revised to correlate with the referenced standards and add CSA B137.3.1 QC requirements.

Table 9.35 – Standard specification for elastomeric seals (gaskets) for joining plastic pipe: Added CSA B181.0 as a reference.

Table 9.36 – Thread Sealants: A row identifying the product standard IAPMO PS 36 was added for clarification.

The following new tables were added for PEX geothermal pipe and fittings, corrugated PE pipe and fittings and CIPP:

[Table 9.37 – PEX Geothermal Pipe and Fitting Frequency Table:](#)

[Table 9.38 – Corrugated Polyethylene Pipe and Fittings for Storm Drainage, Land drainage and Sanitary Sewer Applications](#)

[Table 9.39 – Corrugated Polyethylene Pipe and Fittings for Non-Pressure Storm Sewer, Land drainage and Sanitary Sewer Applications](#)

[Table 9.40 – Cured-in-place pipe liners](#)