



**Summary of Substantive Changes  
between the 2021 and the 2022 editions of  
NSF 14 “Plastics Piping System Components  
and Related Materials”**

**Presented to the IAPMO Standards Review Committee on May 15, 2023**

**General:** The changes to this standard will not have an impact on currently listed products.

The substantive changes are:

- Standard now defines “expected failure time”.
- Updates to normative references.

**Section 2, Normative references:** Referenced standards were added, updated, or deleted as follows:

ASME A112.18.6-2017 / CSA B125.6-17 ([R2021](#)), Flexible Water Connectors

~~ANSI/ASSE 1049-2009~~[2021](#), Performance Requirements for Individual and Branch Type Air Admittance Valves for Chemical Waste Systems

~~ANSI/ASSE 1050-2009~~[2021](#), Performance Requirements for Stack Air Admittance Valves for Sanitary Drainage Systems

~~ANSI/ASSE (Plumbing) 1050-2009~~[2021](#), Performance Requirements for Stack Air Admittance Valves for Sanitary Drainage Systems

~~ANSI/ASSE (Plumbing) 1051-2009~~[2021](#), Performance Requirements for Individual and Branch Type Air Admittance Valves for Sanitary Drainage Systems

ASTM D1785-~~15e~~[21a](#), Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120

ASTM D2672-~~14~~[20](#), Standard Specification for Joints for IPS PVC Pipe Using Solvent Cement

ASTM D2683-~~14~~[20](#), Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing

ASTM D2737-~~12a~~ (~~2020~~) [21](#), Standard Specification for Polyethylene (PE) Plastic Tubing

ASTM D2997-~~15~~[21](#), Standard Specification for Centrifugally Cast Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe

ASTM D3034-~~16~~[21](#), Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings

ASTM D3035-~~15~~[21](#), Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter

ASTM D3350-~~14~~[21](#), Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

ASTM F441/F441M-~~15~~[20](#), Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80

ASTM F477-14 ([2021](#)), Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

ASTM F480-14 ([2022](#)), Standard Specification for Thermoplastic Well Casing Pipe and Couplings Made in Standard Dimension Ratios (SDR) SCH 40 and SCH 80

ASTM F628-~~12e~~[322](#), Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe with a Cellular Core



ASTM F679-~~16~~[21](#), Standard Specification for Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings

ASTM F714-~~21a~~[22](#), Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter

ASTM F876-~~20b~~[22ae1](#), Standard Specification for Crosslinked Polyethylene (PEX) Tubing

ASTM F1281-17 ([2021](#))[e1](#), Standard Specification for Crosslinked Polyethylene / Aluminum / Crosslinked Polyethylene (PEX-AL-PEX) Pressure Pipe

ASTM F1504-~~14~~ (~~2021~~)[e1](#)[2021](#), Standard Specification for Folded Poly(Vinyl Chloride) (PVC) Pipe for Existing Sewer and Conduit Rehabilitation

ASTM F2159-~~19a~~[21](#), Standard Specification for Plastic Insert Fittings Utilizing a Copper Crimp Ring, or Alternate Stainless Steel Clamps for SDR9 Cross-Linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

ASTM F2306/F2306M-~~20~~[21](#), Standard Specification for 12 to 60 in. [300 to 1500 mm] Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Gravity-Flow Storm Sewer and Subsurface Drainage Applications

ASTM F2389-~~19~~[21](#), Standard Specification for Pressure-rated Polypropylene (PP) Piping Systems

ASTM F2618-~~19~~[21](#), Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Pipe Fittings for Chemical Waste Drainage Systems

ASTM F2623-~~19~~[22](#), Standard Specification for Polyethylene of Raised Temperature (PE-RT) Systems for Non-Potable Water Applications

ASTM F2648/F2648M-~~20~~[22](#), Standard Specification for 50 mm to 1500 mm [2 in. to 60 in.] Annular Corrugated Profile Wall Polyethylene (PE) Pipe and Fittings for Land Drainage Applications

ASTM F2788/F2788M-~~24~~[20](#), Standard Specification for Metric and Inch-sized Crosslinked Polyethylene (PEX) Pipe

ASTM F2881/F2881M-~~19~~[21e1](#), Standard Specification for 12 to 60 in [300 to 1500 mm] Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications

ASTM F2929-17 ([2021](#)), Standard Specification for Crosslinked Polyethylene (PEX) Tubing of 0.070 in. Wall and Fittings for Radiant Heating Systems up to 75 psig

ASTM F2969-~~12~~(~~2020~~) [17](#)([2021](#)), Standard Specification for Acrylonitrile Butadiene Styrene (ABS) IPS Dimensioned Pressure Pipe

[ASTM F3240-19e1, Standard Practice for Installation of Seamless Molded Hydrophilic Gaskets \(SMHG\) for Long-Term Watertightness of Cure-in-Place Rehabilitation of Main and Lateral Pipelines](#)

ASTM F3347-~~20a~~[21](#), Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

ASTM F3348-~~21~~[a](#), Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing [and SDR9 Polyethylene of Raised Temperature \(PE-RT\) Tubing](#)

[ASTM F3371-22, Standard Specification for Polyolefin Pipe and Fittings for Drainage, Waste, and Vent Applications](#)

AWWA C906-~~15~~[21](#), Polyethylene (PE) Pressure Pipe and Fittings, 4 in. through 65 in. [100 mm Through 1650 mm], for Waterworks

CAN/CSA B181.1:~~18~~[21](#), Acrylonitrile-Butadiene-Styrene (ABS) Drain, Waste, and Vent Pipe and Pipe Fittings

CAN/CSA B181.2:~~18~~[21](#), Polyvinylchloride (PVC) Drain, Waste, and Vent Pipe and Pipe Fittings

CAN/CSA B181.3:~~18~~[21](#), Polyolefin and Polyvinylidene Fluoride (PVDF) Laboratory Drainage Systems



CAN/CSA B181.5:~~1821~~, Coextruded Acrylonitrile-Butadienestyrene / PolyvinylChloride (ABS/PVC) Drain Waste and Vent Pipe  
CAN/CSA B182.1:~~1821~~, Plastic Drain and Sewer Pipe and Pipe Fittings  
CAN/CSA B182.2:~~1821~~, PSM Type Polyvinylchloride (PVC) Sewer Pipe and Fittings (PSM Type)  
CAN/CSA B182.4:~~1821~~, Profile Polyvinylchloride (PVC) Sewer Pipe and Fittings  
CAN/CSA B182.6:~~1821~~, Profile polyethylene (PE) Sewer Pipe and Fittings for Leak-Proof Sewer Applications  
CAN/CSA B182.8:~~1821~~, Profile polyethylene (PE) Storm Sewer and Drainage Pipe and Fittings  
CAN/CSA B182.11:~~1821~~, Standard Practice for the Installation of Thermoplastic Drain, Storm, and Sewer Pipe and Fittings  
CAN/CSA B182.13:~~1821~~, Profile Polypropylene (PP) Sewer Pipe and Fittings for Leak-Proof Sewer Applications  
CAN/CSA B182.14:~~1821~~, Profile Steel Reinforced Polyethylene (SRPE) Storm Sewer Pipe and Fittings  
CAN/CSA B182.15:~~1821~~, Profile Steel Reinforced Polyethylene (SRPE) Sewer Pipe and Fittings  
ANSI/CSA/IGSHPA C448 Series 16 (~~R2021~~), Design and Installation of Ground Source Heat Pump Systems for Commercial and Residential Buildings  
PPI TR-2 ~~2020~~~~2021~~, PPI PVC Range Composition Listing of Qualified Ingredients  
UL 1285 (~~78~~th edition), Standard for Pipe and Couplings, Polyvinyl Chloride (PVC), and Oriented Polyvinyl Chloride (PVCO) for Underground Fire Service<sup>9F</sup>

## **2.2 Normative references for compounds and other materials**

ASTM D3222-~~2021~~, Standard Specification for Unmodified Poly(Vinylidene Fluoride) (PVDF) Molding Extrusion and Coating Materials  
ASTM D6394-~~1421a~~, Standard Specification for Sulfone Plastics (SP)  
ASTM D3350-~~1421~~, Standard Specification for Polyethylene Plastics Pipe and Fittings Materials  
ASTM D3965-~~1621~~, Standard Classification System for and Basis for Specifications for Rigid Acrylonitrile-Butadiene-Styrene (ABS) Materials for Pipe and Fittings  
ASTM D4067-~~1621~~, Standard Classification System and Basis for Specification for Reinforced and Filled Poly(Phenylene Sulfide) (PPS) Injection Molding and Extrusion Materials Using ASTM Methods  
IAPMO PS 51-~~201621~~, Expansion Joints and Flexible Expansion Joints for DWV Piping Systems

## **2.3 International and other normative references**

21 CFR Parts 1-99, Food and Drugs (Rev ~~5~~/~~22~~)  
21 CFR Parts 100-169, Food and Drugs (~~5~~/~~22~~)  
21 CFR Parts 170-199, Food and Drugs (Rev ~~5~~/~~22~~)  
ASTM D543-~~2021~~, Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents  
ASTM D1243-~~1522~~, Standard Test Method for Dilute Solution Viscosity of Vinyl Chloride Polymers  
ASTM D2837-~~2021~~, Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products  
ASTM D2855-~~1520~~, Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly(Vinyl Chloride) (PVC) or Chlorinated Poly(Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets  
ASTM D3212-~~2021~~, Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals  
ASTM F1216-~~1621~~, Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube



ASTM F2023-~~1521~~, Standard Test Method for Evaluating the Oxidative Resistance of Cross-linked Polyethylene (PEX) Pipe, Tubing and Systems to Hot Chlorinated Water

[ASTM F3497-21, Standard Test Method for Evaluating the Oxidative Resistance of Polypropylene \(PP\) Piping Systems to Hot Chlorinated Water](#)

PPI TR-4 [2021](#), PPI HSB Listing of Hydrostatic Design Basis (HDB), Strength Design Basis (SDB), Pressure Design Basis (PDB) and Minimum Required Strength (MRS) Ratings for Thermoplastic Piping Materials or Pipe

Section 3, Definitions:

[3.21 expected failure time \(EFT\): Predicted failure time calculated using the regression equation developed in ASTM Test Method F2023 for the PEX material or ASTM Test Method F2263 for the PE material.](#)

Section 5, Physical and performance requirements:

**5.7 Chlorine resistance – Oxidative equivalency requirements**

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**5.7.3 Pipe with middle metal layer**

[– two data points at the highest pressure/temperature conditions \(for example 115 °C/60 psi\) as for the solid wall data set;](#)

[– two data points at a pressure condition higher than above but at the next lower temperature condition \(for example 105 °C/80 psi\) as for the solid wall data set. Pressures shall be separated by at least 20 psi; and](#)

[– all four data points shall meet or exceed the EFT of the inner layer at each of the conditions.](#)

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

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**5.8.2 Method B (1/2" DR 9 testing)**

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**Note:** Testing of the original compound (1/2" DR 9 pipe) is only required to be performed once. All modified compounds shall be compared to this original data set.

Section 9, Quality assurance:

**9.4 Verification of the calibration of equipment**

**9.4.1 Verification**

The calibration of all equipment used to check critical dimensions (as defined in Section 5.4) shall be verified weekly. **Note:** Consideration is given to thread gauges and go / no-go socket gauges which cannot be verified on a weekly basis. In lieu of verification, this equipment shall be calibrated in accordance with Section 9.4.2. The calibration of all in-line equipment used to check pipe or tubing critical dimensions during the extrusion process shall be performed at a minimum of once annually

Table 9 .10 and 9.14: Removed the word “note” to make it clear that the language is a requirement and not informative.