789 N. Dixboro Rd,
Ann Arbor, Michigan
48105-9753 USA

T +1 734 769 8010
E standards@nsf.org
nsf.org

Joint Committee on Plastics and Recreational Vehicle Plumbing Components

August 9, 2024

**Proposed revision to NSF/ANSI 14: *Plastics Piping System Components and Related Materials* (14i142r1)**

Revision 1 of NSF/ANSI 14, issue 142 is being forwarded to the Joint Committee for consideration. Please review the proposal and **submit your ballot by August 30, 2024** via the NSF Online Workspace.

Please review all ballot materials. When adding comments, please include the section number applicable to your comment and add all comments under one comment number whenever possible. If you need additional space, please use the attached blank comment template in the reference documents and upload online via the browse function.

## Purpose

The purpose of this ballot is to update normative references.

## Background

An issue paper (PLAS-2024-3) was submitted to 1) update the publication years and titles of many normative references, 2) add two new references (NSF/ANSI/CAN 600 and the Safe Drinking Water Act), and 3) remove ASTM F3451, which was a typo. There is no ASTM 3451 standard and the correct standard, ASTM F3541, is already listed.

This issue paper was presented at the 2024 Plastics and Recreational Vehicle Plumbing Components Joint Committee annual meeting and was voted unanimously to be balloted.

Another issue paper (PLAS-2024-10) noted that the ASTM F3451 normative reference typo also appears in Table 9.38. That table correction is also included in this ballot.

Please refer to both issue papers and the annual meeting discussion excerpt under Referenced Items for additional background information.

If you have any questions about the technical content of the ballot, you may contact me in care of:

Kevin Kalakay
Chair, Joint Committee on Plastics and Recreational Vehicle Plumbing Components
c/o Monica Milla
Joint Committee Secretariat
Tel: (734) 214-6223
E-mail: mmilla@nsf.org

**[Note – The recommended changes to the standard which include the current text of the relevant section(s) indicate deletions by use of ~~strikeout~~ and additions by gray highlighting. Rationale statements are in *italics* and only used to add clarity; these statements will NOT be in the finished publication.]**

NSF/ANSI Standard for Plastics —

# Plastics Piping System Components and Related Materials

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## 2 Normative references

The following documents contain requirements that, by reference in this text, constitute requirements of this standard. At the time of publication, the indicated editions were valid. All of the documents are subject to revision and parties are encouraged to investigate the possibility of applying the most recent editions of the documents indicated below. The most recent published edition of the document shall be used for undated references.

### 2.1 Normative references for plastic pipe and related components

ASME A112.4.4-2017, *Plastic Push-Fit Drain, Waste, and Vent (DWV) Fittings*[3]

ASME A112.4.14-2022 / CSA B125.14-22, *Manually Operated ~~Quarter-Turn~~ Shutoff Valves for Use in Plumbing Systems*[3]

ASME A112.14.1-2003 (R2022), *Backwater Valves*[3]

ASME A112.18.6-2017 / CSA B125.6-17 (R2021), *Flexible Water Connectors*[3]

ASSE (Plumbing) 1049-2021, *Performance Requirements for Individual and Branch Type Air Admittance Valves for Chemical Waste Systems*[4]

ASSE (Plumbing) 1050-2021, *Performance Requirements for Stack Air Admittance Valves for Sanitary Drainage Systems*[4]

ASSE (Plumbing) 1051-2021, *Performance Requirements for Individual and Branch Type Air Admittance Valves for Sanitary Drainage Systems*[4]

ASSE (Plumbing) 1061-2020, *Performance Requirements for Push-Fit Fittings*[4]

ASTM B858-06 (2018), *Standard Test Method for Ammonia Vapor Test for Determining Susceptibility to Stress Corrosion Cracking in Copper Alloys*[5]

ASTM D1785-21a, *Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120*[5]

[3] The American Society of Mechanical Engineers. Two Park Avenue, New York, NY 10016. <www.asme.org>

[4] ASSE International. 18927 Hickory Creek Drive, Suite 220, Mokena, IL 60448. <www.asse-plumbing.org>

[5] ASTM International. 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959. <www.astm.org>

ASTM D2235-22, *Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings*[5]

ASTM D2239-22, *Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter*[5]

ASTM D2241-~~20~~24, *Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)*[5]

ASTM D2464-~~15~~23, *Standard Specification for Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80*[5]

ASTM D2466-~~21~~23, *Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40*[5]

ASTM D2467-20, *Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80*[5]

ASTM D2513-20, *Standard Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings*[5]

ASTM D2564-20, *Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems*[5]

ASTM D2609-~~21~~24, *Standard Specification for Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe*[5]

ASTM D2661-21, S*tandard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings*[5]

ASTM D2665-~~20~~24, *Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings*[5]

ASTM D2672-20e1, *Standard Specification for Joints for IPS PVC Pipe Using Solvent Cement*[5]

ASTM D2683-20, *Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing*[5]

ASTM D2729-21, *Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings*[5]

ASTM D2737-22, *Standard Specification for Polyethylene (PE) Plastic Tubing*[5]

ASTM D2846/D2846M-~~19a~~24, *Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Hot- and Cold-Water Distribution Systems*[5]

ASTM D2949-22, *Standard Specification for 3.25-in Outside Diameter Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings*[5]

ASTM D2996-~~17~~23, *Standard Specification for Filament-Wound Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe*[5]

ASTM D2997-21, *Standard Specification for Centrifugally Cast Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe*[5]

ASTM D3034-~~21~~24, *Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings*[5]

ASTM D3035-22, *Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter*[5]

ASTM D3138-21, *Standard Specification for Solvent Cements for Transition Joints Between Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Non-Pressure Piping Components*[5]

ASTM D3261-16, *Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing*[5]

ASTM D3350-21, *Standard Specification for Polyethylene Plastics Pipe and Fittings Materials*[5]

ASTM D3517-~~19~~24, *Standard Specification for Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pressure Pipe*[5]

ASTM D5927-17, *Standard Classification System for and Basis for Specifications for Thermoplastic Polyester (TPES) Injection and Extrusion Materials Based on ISO Test Methods*[5]

ASTM F409-22, *Standard Specification for Thermoplastic Accessible and Replaceable Plastic Tube and Tubular Fittings*[5]

ASTM F437-~~21~~24, *Standard Specification for Threaded Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80*[5]

ASTM F438-~~17~~23, *Standard Specification for Socket-Type Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40*[5]

ASTM F439-~~19~~24, *Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80*[5]

ASTM F441/F441M-23, *Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80*[5]

ASTM F442/F442M-23, *Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR)*[5]

ASTM F477-14 (2021), *Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe*[5]

ASTM F480-14 (2022), *Standard Specification for Thermoplastic Well Casing Pipe and Couplings Made in Standard Dimension Ratios (SDR) SCH 40 and SCH 80*[5]

ASTM F493-22, *Standard Specification for Solvent Cements for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe and Fittings*[5]

ASTM F628-~~22~~23, *Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe with a Cellular Core*[5]

ASTM F656-21, *Standard Specification for Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride)(PVC) Plastic Pipe and Fittings*[5]

ASTM F667/F667M-16 (2021), *Standard Specification for 3 through 24 in. Corrugated Polyethylene Pipe and Fittings*[5]

ASTM F679-21, *Standard Specification for Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings*[5]

ASTM F714-~~22~~24, *Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter*[5]

ASTM F794-21, *Standard Specification for Poly(Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter*[5]

ASTM F876-~~23~~24, *Standard Specification for Crosslinked Polyethylene (PEX) Tubing*[5]

ASTM F877-~~23~~24, *Standard Specification for Crosslinked Polyethylene (PEX) Plastic Hot- and Cold- Water Distribution Systems*[5]

ASTM F891-~~16~~24, *Standard Specification for Coextruded Poly(Vinyl Chloride) (PVC) Plastic Pipe with a Cellular Core*[5]

ASTM F894-~~19~~24, *Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe*[5]

ASTM F949-20, *Standard Specification for Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings*[5]

ASTM F1055-16a (2022), *Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene and Crosslinked Polyethylene (PEX) Pipe and Tubing*[5]

ASTM F1281-~~23~~24, *Standard Specification for Crosslinked Polyethylene / Aluminum / Crosslinked Polyethylene (PEX-AL-PEX) Pressure Pipe*[5]

ASTM F1282-23a, *Standard Specification for Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure Pipe*[5]

ASTM F1336-20, *Standard Specification for Poly(Vinyl Chloride) (PVC) Gasketed Sewer Fittings*[5]

ASTM F1412-22, *Standard Specification for Polyolefin Pipe and Fittings for Corrosive Waste Drainage Systems*[5]

ASTM F1483-23, *Standard Specification for Oriented Poly(Vinyl Chloride), PVCO, Pressure Pipe*[5]

ASTM F1488-14 (2019), *Standard Specification for Coextruded Composite Pipe*[5]

ASTM F1498-08 (2020), *Standard Specification for Taper Pipe Threads 60° for Thermoplastic Pipe Fittings*[5]

ASTM F1499-22, *Standard Specification for Coextruded Composite Drain, Waste, and Vent Pipe (DWV)*[5]

ASTM F1504-21e1, *Standard Specification for Folded Poly(Vinyl Chloride) (PVC) Pipe for Existing Sewer and Conduit Rehabilitation*[5]

ASTM F1673-10 (2021)e1, *Standard Specification for Polyvinylidene Fluoride (PVDF) Corrosive Waste Drainage Systems*[5]

ASTM F1732-~~12 (2018)~~24, *Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer and Drain Pipe Containing Recycled PVC Material*[5]

ASTM F1760-16 (2020), *Standard Specification for Coextruded Poly(Vinyl Chloride) (PVC) Non-Pressure Plastic Pipe Having Reprocessed-Recycled Content*[5]

ASTM F1807-23, *Standard Specification for Metal 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*[5]

ASTM F1866-23, *Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Schedule 40 Drainage and DWV Fabricated Fittings*[5]

ASTM F1924-19, *Standard Specification for Plastic Mechanical Fittings for Use on Outside Diameter Controlled Polyethylene Gas Distribution Pipe and Tubing*[5]

ASTM F1960-23~~a~~b, *Standard Specifications for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) and Polyethylene of Raised Temperature (PE-RT) Tubing*[5]

ASTM F1970-23, *Standard Specification for Special Engineered Fittings, Appurtenances or Valves for Use in Poly(Vinyl Chloride) (PVC) or Chlorinated Poly(Vinyl Chloride)(CPVC) Systems*[5]

ASTM F1974-~~09~~23 (2020), *Standard Specification for Metal Insert Fittings for Polyethylene/Aluminum/ Polyethylene and Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene Composite Pressure Pipe*[5]

ASTM F2080-23, *Standard Specification for Cold-Expansion Fittings with Metal Compression Sleeves for Crosslinked Polyethylene (PEX) Pipe and SDR9 Polyethylene Raised Temperature (PE-RT) Pipe*[5]

ASTM F2098-18, *Standard Specification for Stainless Steel Clamps for Securing SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) to Metal Insert Fittings and Plastic Insert Fittings*[5]

ASTM F2158-08 (2016), *Standard Specification for Residential Central-Vacuum Tube and Fittings*[5]

ASTM F2159-23a, *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*[5]

ASTM F2263-14 (2019), *Standard Test Method for Evaluating the Oxidative Resistance of Polyethylene (PE) Pipe to Chlorinated Water*[5]

ASTM F2306/F2306M-21, *Standard Specification for 300 mm to 1500 mm [12 in. to 60 in.] Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Non-Pressure Gravity-Flow Storm Sewer and Subsurface Drainage Applications*[5]

ASTM F2389-23, *Standard Specification for Pressure-rated Polypropylene (PP) Piping Systems*[5]

ASTM F2390-21, *Standard Specifications for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent (DWV) Pipe and Fittings Having Post-Industrial Recycle Content*[5]

ASTM F2434-19, *Standard Specification for Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Cross-linked Polyethylene/Aluminum/Cross-linked Polyethylene (PEX-AL-PEX) Tubing*[5]

ASTM F2599-22, *Standard Practice for Sectional Repair of Damaged Pipe by Means of an Inverted Cured-In-Place Liner*[5]

ASTM F2561-20, *Standard Practice for Rehabilitation of a Sewer Service Lateral and Its Connection to the Main Using a One Piece Main and Lateral Cured-in-Place Liner*[5]

ASTM F2618-21, *Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Pipe and Fittings for Chemical Waste Drainage Systems*[5]

ASTM F2619-20/F2619M-20, *Standard Specification for High-Density Polyethylene (PE) Line Pipe*[5]

ASTM F2623-~~22~~24e1, *Standard Specification for Polyethylene of Raised Temperature (PE-RT) Systems for Non-Potable Water Applications*[5]

ASTM F2648/F2648M-23, *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*[5]

ASTM F2764/F2764M-23, *Standard Specification for 6 to 60 in [150 to 1500 mm] Polypropylene (PP) Corrugated Double and Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications*[5]

ASTM F2769-~~23a~~24, *Standard Specification for Polyethylene of Raised Temperature (PE-RT) Plastic Hot and Cold-Water Tubing and Distribution Systems*[5]

ASTM F2788/F2788M-21, *Standard Specification for Metric and Inch-sized Crosslinked Polyethylene (PEX) Pipe*[5]

ASTM F2806-23, *Standard Specification for Acrylonitrile Butadiene Styrene (ABS) Plastic Pipe (Metric* SDR PR)[5]

ASTM F2855-19(2024), *Standard Specification for Chlorinated Poly(Vinyl Chloride)/Aluminum Chlorinated Poly(Vinyl Chloride) (CPVC-AL-CPVC) Composite Pressure Tubing*[5]

ASTM F2881/F2881M-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*[5]

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*[5]

ASTM F2969-12 (2020), *Standard Specification for Acrylonitrile Butadiene Styrene (ABS) IPS Dimensioned Pressure Pipe*[5]

ASTM F3128-23, *Standard Specification for Poly(Vinyl Chloride) (PVC) Schedule 40 Drain, Waste, and Vent Pipe with a Cellular Core*[5]

ASTM F3240-19~~e1~~(2023), *Standard Practice for Installation of Seamless Molded Hydrophilic Gaskets (SMHG) for Long-Term Watertightness of Cure-in-Place Rehabilitation of Main and Lateral Pipelines*[5]

ASTM F3253-~~23~~24, *Standard Specification for Crosslinked Polyethylene (PEX) Tubing with Oxygen Barrier for Hot- and Cold-Water Hydronic Distribution Systems*[5]

ASTM F3347-23, *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*[5]

ASTM F3348-23a, *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*[5]

ASTM F3371-22, *Standard Specification for Polyolefin Pipe and Fittings for Drainage, Waste, and Vent Applications*[5]

~~ASTM F3451-22, *Standard Practice for Sectional Repair of Existing Gravity Flow, Non-Pressure Pipelines and Conduits by Pushed or Pulled-In-Place Installation of Cured-In-Place Thermosetting Resin Pipe (CIPP)*[5]~~

ASTM F3541-22, *Standard Practice for Sectional Repair of Existing Gravity Flow, Non-Pressure Pipelines and Conduits by Pushed or Pulled-In-Place Installation of Cured-In-Place Thermosetting Resin Pipe (CIPP)*[5]

AWWA C900-22, *Polyvinyl Chloride (PVC) Pressure Pipe, and Fabricated Fittings, 4 in. Through 60 in. (100 mm Through 1500 mm)*[6]

AWWA C901-20, *Polyethylene (PE) Pressure Pipe and Tubing, ¾ in. (19 mm) Through 3 in. (76 mm), for Water Service*[6]

AWWA C904-22, *Cross-Linked Polyethylene (PEX) Pressure Tubing, ½ in. (13 mm) Through 3 in. (76 mm), for Water Service*[6]

AWWA C906-21, *Polyethylene (PE) Pressure Pipe and Fittings, 4 in. through 65 in. [100 mm Through 1650 mm], for Waterworks*[6]

AWWA C907-~~17~~23, *Injection-Molded Polyvinyl Chloride (PVC) Pressure Fittings, ~~for Water –~~ 4 in. Through 12 in. (100 mm Through 300 mm) ~~for Water Distribution~~* [6]

AWWA C909-22, *Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe, 4 in. (100 mm) and Larger*[6]

AWWA C950-20, *Fiberglass Pressure Pipe*[6]

CSA B125.3:22, *Plumbing Fittings*[7]

CSA B137.1:23, *Polyethylene (PE) Pipe, Tubing, and Fittings for Cold Water Pressure Services*[7]

[6] American Water Works Association. 6666 W Quincy Avenue, Denver, CO 80235. <www.awwa.org>

[7] CSA Group. 178 Rexdale Boulevard, Toronto, ON M9W 1R3, Canada. <www.csagroup.org>

CSA B137.3:23, *Rigid Polyvinyl Chloride (PVC) Pipe and Fittings for Pressure Applications*[7]

CSA B137.4:23, *Polyethylene (PE) Piping Systems for Gas Services*[7]

CSA B137.5:23, *Cross-linked Polyethylene (PEX) Tubing Systems for Pressure Applications*[7]

CSA B137.6:23, *Chlorinated Polyvinylchloride (CPVC) Pipe, Tubing, and Fittings for Hot and Cold Water Distribution Systems*[7]

CSA B137.9:23, *Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure Pipe Systems*[7]

CSA B137.10:23, *Cross-linked Polyethylene/Aluminum/Cross-linked Polyethylene (PEX-AL-PEX) Composite Pressure Pipe Systems*[7]

CSA B137.11:23, *Polypropylene (PP-R and PP-RCT) Pipe and Fittings for Pressure Applications*[7]

CSA B137.18:23, *Polyethylene of Raised Temperature Resistance (PE-RT) Tubing Systems for Pressure Applications*[7]

CSA B137.19:23, *Crosslinked Polyethylene (PEX) Piping Systems for Gas Services*[7]

CSA B181.0-21, *Definitions, general requirements, and methods of testing for thermoplastic nonpressure piping*[7]

CSA B181.1:21, *Acrylonitrile-Butadiene-Styrene* (*ABS) Drain, Waste, and Vent Pipe and Pipe Fittings*[7]

CSA B181.2:21, *Polyvinylchloride* (*PVC) and Chlorinated Polyvinylchloride (CPVC) Drain, Waste, and Vent Pipe and Pipe Fittings*[7]

CSA B181.3:21, *Polyolefin and Polyvinylidene Fluoride (PVDF) Laboratory Drainage Systems*[7]

CSA B181.5:21, *Coextruded Acrylonitrile-Butadienestyrene / PolyvinylChloride (ABS/PVC) Drain Waste and Vent Pipe*[7]

CSA B182.1:21, *Plastic Drain and Sewer Pipe and Pipe Fittings*[7]

CSA B182.2:21, *PSM Type Polyvinylchloride* (*PVC) Sewer Pipe and Fittings (PSM Type)* [7]

CSA B182.4:21, *Profile Polyvinylchloride (PVC) Sewer Pipe and Fittings*[7]

CSA B182.6:21, *Profile polyethylene (PE) Sewer Pipe and Fittings for Leak-Proof Sewer Applications*[7]

CSA B182.8:21, *Profile polyethylene (PE) Storm Sewer and Drainage Pipe and Fittings*[7]

CSA B182.11:21, *Standard Practice for the Installation of Thermoplastic Drain, Storm, and Sewer Pipe and Fittings*[7]

CSA B182.13:21, *Profile Polypropylene (PP) Sewer Pipe and Fittings for Leak-Proof Sewer Applications*[7]

CSA B182.14:21, *Profile Steel Reinforced Polyethylene (SRPE) Storm Sewer Pipe and Fittings*[7]

CSA B182.15:21, *Profile Steel Reinforced Polyethylene (SRPE) Sewer Pipe and Fittings*[7]

ANSI/CSA/IGSHPA C448 Series-16 (R2021), *Design and Installation of Ground Source Heat Pump Systems for Commercial and Residential Buildings*[7]

FM 1612-2022, *Examination Standard for Polyvinyl Chloride (PVC) Pipe and Fittings for Underground Fire Protection Service*[8]

FM 1613-2022, *Examination Standard for Polyethylene (PE) Pipe and Fittings for Underground Fire Protection Service*[8]

IAPMO Z1157-2014e1, Ball Valves[9]

NSF/ANSI 358-1, *Polyethylene Pipe and Fittings for Water-Based Ground-Source "Geothermal" Heat Pump Systems*

NSF/ANSI 358-2, *Polypropylene Pipe and Fittings for Water-Based Ground-Source "Geothermal" Heat Pump Systems*

NSF/ANSI 358-3, *Cross-linked Polyethylene (PEX) Pipe and Fittings for Water-Based Ground-Source (Geothermal) Heat Pump Systems*

NSF/ANSI 358-4, *Polyethylene of Raised Temperature (PE-RT) Tubing and Fittings for Water-Based Ground-Source (Geothermal) Heat Pump Systems*

NSF/ANSI 359, *Valves for Crosslinked Polyethylene (PEX) Water Distribution Tubing Systems*

PPI TR-2 20~~21~~23, *PPI PVC Range Composition Listing of Qualified Ingredients*[10]

ANSI/CAN/UL/ULC 1285:2022, *Pipe and Couplings, Polyvinyl Chloride (PVC), and Oriented Polyvinyl Chloride (PVCO) for Underground Fire Service*[11]

ANSI/CAN/UL 1821:2019, *Thermoplastic Sprinkler Pipe and Fittings for Fire Protection Service*[11]

### 2.2 Normative references for compounds and other materials

ASTM D1784-20, *Standard Classification System and Basis for Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds*[5]

ASTM D3222-21, *Standard Specification for Unmodified Poly(Vinylidene Fluoride) (PVDF) Molding Extrusion and Coating Materials*[5]

ASTM D3350-21, *Standard Specification for Polyethylene Plastics Pipe and Fittings Materials*[5]

ASTM D3965-21, *Standard Classification System for and Basis for Specifications for Rigid Acrylonitrile-Butadiene-Styrene (ABS) Materials for Pipe and Fittings*[5]

ASTM D4066-13 (2019), *Standard Classification System for Nylon Injection and Extrusion Materials (PA)*[5]

[8] FM Approvals. 1151 Boston-Providence Turnpike, P.O. Box 9102, Norwood, MA 02062. <www.fmapprovals.com>

[9] International Association of Plumbing and Mechanical Officials. 4755 E Philadelphia St., Ontario, CA 91761. <www.iapmo.org>

[10] Plastic Pipe Institute. 105 Decker Court, Suite 825, Irving, TX 75062. <www.plasticpipe.org>

[11] UL Solutions. 33 Pfingsten Road, Northbrook, IL 60062. <www.ul.com>

ASTM D4067-23, *Standard Classification System and Basis for Specification for Reinforced and Filled Poly(Phenylene Sulfide) (PPS) Injection Molding and Extrusion Materials Using ASTM Methods*[5]

ASTM D4101-~~17e1~~24, *Standard Classification System and Basis for Specification for Polypropylene Injection and Extrusion Materials*[5]

ASTM D4396-22, *Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds for Plastic Pipe and Fittings Used in Nonpressure Applications*[5]

ASTM D5990-20a, *Standard Classification System and Basis for Polyketone Injection Molding and Extrusion Materials (PK)*[5]

ASTM D6394-21a, *Standard Classification System and Basis for Specification for Sulfone Plastics (SP)*[5]

ASTM D6778-20, *Standard Classification System and Basis for Specification for Polyoxymethylene Molding and Extrusion Materials (POM)*[5]

IAPMO PS 36-2014e1, *Lead-Free Sealing Compounds for Threaded Joints*[9]

IAPMO PS 51-2021, *Expansion Joints and Flexible Expansion Joints for DWV Piping Systems*[9]

UL 157-96, *Standard for Gaskets and Seals*[11]

### 2.3 International and other normative references

21 C.F.R. Parts 1-99, *Food and Drugs* (Rev 6/~~23~~24)[12]

21 C.F.R. Parts 100-169, *Food and Drugs* (Rev 6/~~23~~24)[12]

21 C.F.R. Parts 170-199, *Food and Drugs* (Rev 6/~~23~~24)[12]

ASTM D543-21, *Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents*[5]

ASTM D638-22, *Standard Test Method for Tensile Properties of Plastics*[5]

ASTM D1243-22e1, *Standard Test Method for Dilute Solution Viscosity of Vinyl Chloride Polymers*[5]

ASTM D2837-22, *Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products*[5]

ASTM D2855-20, *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*[5]

ASTM D2992-~~22~~24, *Standard Practice for Obtaining Hydrostatic or Pressure Design Basis for Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Fittings*[5]

ASTM D3139-19, *Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals*[5]

[12] National Archives and Records Administration, Office of the Federal Register. 7 G Street NW, Suite A-734, Washington, DC 20401. <www.ecfr.gov/>

ASTM D3212-21, *Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals*[5]

ASTM D6284-17(2023), *Standard Test Method for Rubber Property – Effect of Aqueous Solutions with Available Chlorine and Chloramine*[5]

ASTM F1216-22, *Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube*[5]

ASTM F2023-21, *Standard Test Method for Evaluating the Oxidative Resistance of Cross-linked Polyethylene (PEX) Pipe, Tubing and Systems to Hot Chlorinated Water*[5]

ASTM F3497-21, *Standard Test Method for Evaluating the Oxidative Resistance of Polypropylene (PP) Piping Systems to Hot Chlorinated Water*[5]

DIN 8074:2011, *Polyethylene (PE) – Pipes PE 80, PE 100 – Dimensions*[13]

DIN 8075:2018, *Polyethylene (PE) Pipes – PE 80, PE 100 – General Quality Requirements, Testing*[13]

DIN 8077:2008, *Polypropylene (PP) Pipes – PP-H, PP-B, PP-R, PP-RCT – Dimensions*[13]

DIN 8078:2008, *Polypropylene (PP) Pipes – PP-H, PP-B, PP-R, PP-RCT – General Quality Requirements and Testing*[13]

ISO 6509-1:2014, *Corrosion Of Metal And Alloys – Determination Of Dezincification Resistance Of Copper Alloys With Zinc – Part 1: Test Method*[14]

ISO 6957:1988, *Copper Alloys – Ammonia Test For Stress Corrosion Resistance*[14]

ISO 9080:2012, *Plastics Piping And Ducting Systems – Determination Of The Long-Term Hydrostatic Strength Of Thermoplastics Materials In Pipe Form By Extrapolation*[14]

ISO 12162:2009, *Thermoplastics Materials For Pipes And Fittings For Pressure Applications – Classification, Designation And Design Coefficient*[14]

National Institute of Standards and Technology (NIST)[15]

NSF/ANSI/CAN 60, *Drinking Water Treatment Chemicals – Health Effects*

NSF/ANSI/CAN 61, *Drinking Water System Components – Health Effects*

NSF/ANSI/CAN 600, *Health Effects Evaluation and Criteria for Chemicals in Drinking Water*

PPI TR-3 202~~1~~23, *Policies and Procedures for Developing Hydrostatic Design Basis (HDB), Pressure Design Basis (PDB), Strength Design Basis (SDB), and Minimum Required Strength (MRS) Ratings, and Categorized Required Strength (CRS) for Thermoplastic Piping Materials or Pipe*[10]

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[13] European Standards. Krimicka 134, 318 13 Pilsen, Czech Republic. <www.en-standard.eu>

[14] International Organization for Standardization. Chemin de Blandonnet 8, Case Postale 401, 1214 Vernier, Geneva, Switzerland. <www.iso.org>

[15] National Institute of Standards and Technology, U.S. Department of Commerce.100 Bureau Drive, Gaithersburg, MD 20899-8930. <www.nist.gov>

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*[10]

Title XIV of The Public Health Service Act: Safety of Public Water Systems (Safe Drinking Water Act)[16]

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***Rationale:***

***The proposed changes:***

- ***Update the publication years and titles of many normative references***
- ***Add two new references (NSF/ANSI/CAN 600 and the Safe Drinking Water Act)***
- ***Remove ASTM F3451, which was a typo. There is no ASTM 3451 standard and the correct standard, ASTM F3541, is already listed.***

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## 9 Quality assurance

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### 9.10 Product-specific quality assurance requirements

Tables 9.2 through 9.40 provide product-specific quality assurance requirements.

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**Table 9.38**
**Cured-in-place pipe liners**

| Test | Frequency |
|---|---|
| gravity leakage test [a] | quarterly |
| flexural strength | quarterly |
| flexural modulus | quarterly |
| product standard(s) | ASTM F1216<br>ASTM ~~F3451~~F3541 |
| [a] Gravity pipe leakage test is only required for products produced under ASTM F1216. | |

***Rationale:***

***Corrects ASTM F3451 to ASTM 3541 (to match update under normative references).***

[16] U.S. Congress Legislation, PL. 117–286, Enacted December 27, 2022. <www.congress.gov>