



**Summary of Substantive Changes
between the 2017 and the 2018 editions of
NSF 14, “Plastics Piping System Components
and Related Materials”**

Presented to the IAPMO Standards Review Committee on March 11, 2019

General: The change to this standard should not have an impact on currently listed products. The substantive change is:

- Added language to allow the use of reworked polyethylene materials in plastic piping system components and related materials (see Section 4).
- Updated Tables 9.5 through 9.41 to provide product-specific quality assurance requirements (see Section 9).

Section 2, Normative References: The following references were added, revised or deleted as follows:

2.1 Normative references for plastic pipe and related components

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

~~ASME A112.4.14-2004~~[2017/CSA B125.14-17. Manually Operated, Quarter-Turn Shutoff Valves for Use in Plumbing Systems](#)

~~ASME A112.14.1-2003~~ [\(2012\)2017. Backwater Valve](#)

~~ASME A112.18.6-2017~~ / ~~CSA B125.6-2009 (R2014)~~[17. Flexible Water Connector](#)

~~ASTM B858-06~~ [\(2012\)2018. Standard Test Method for Ammonia Vapor Test for Determining Susceptibility to Stress Corrosion Cracking in Copper Alloys](#)

~~ASTM D1785-15~~[e1. Standard Specification for Poly\(Vinyl Chloride\) \(PVC\) Plastic Pipe, Schedules 40, 80, and 120](#)

~~ASTM D2466-15~~[17. Standard Specification for Poly\(Vinyl Chloride\) \(PVC\) Plastic Pipe Fittings, Schedule 40](#)

~~ASTM D2513-16~~[a18. Standard Specification for Polyethylene \(PE\) Gas Pressure Pipe, Tubing, and Fittings](#)

~~ASTM D2661-14~~[e1. Standard Specification for Acrylonitrile-Butadiene-Styrene \(ABS\) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings](#)

~~ASTM D2729-11~~[17. Standard Specification for Poly\(Vinyl Chloride\) \(PVC\) Sewer Pipe and Fittings](#)

~~ASTM D2846/D2846M-14~~[17be1. Standard Specification for Chlorinated Poly\(Vinyl Chloride\) \(CPVC\) Plastic Hot- and Cold-Water Distribution Systems](#)

~~ASTM D2996-15~~[17. Standard Specification for Filament-Wound Fiberglass \(Glass-Fiber-Reinforced Thermosetting-Resin\) Pipe](#)

~~ASTM F438-15~~[17. Standard Specification for Socket-Type Chlorinated Poly\(Vinyl Chloride\) \(CPVC\) Plastic Pipe Fittings, Schedule 40](#)

~~ASTM F876-15~~[a17. Standard Specification for Cross-linked Polyethylene \(PEX\) Tubing](#)

~~ASTM F877-11~~[a18. Standard Specification for Cross-linked Polyethylene \(PEX\) Plastic Hot- and Cold-Water Distribution Systems](#)

~~ASTM F1055-16~~[a. Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene and Crosslinked Polyethylene \(PEX\) Pipe and Tubing](#)

~~ASTM F1281-11-17. Standard Specification for ~~Cross-linked~~ [Crosslinked](#) Polyethylene / Aluminum / ~~Cross-linked~~ [Crosslinked](#) Polyethylene (PEX-AL-PEX) Pressure Pipe~~



ASTM F1483-~~15~~[17](#). Standard Specification for Oriented Poly(Vinyl Chloride), PVCO, Pressure Pipe

ASTM F1488-[14e1](#). Standard Specification for Coextruded Composite Pipe

ASTM F1499-~~12~~[17](#). Standard Specification for Coextruded Composite Drain, Waste, and Vent Pipe (DWV)

~~ASTM F1533-01 (2009). Standard Specification for Deformed Polyethylene (PE) Liner~~

ASTM F1866-~~13~~[18](#). Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Schedule 40 Drainage and DWV Fabricated Fittings

~~ASTM F1961-09. Standard Specification for Metal Mechanical Cold Flare Compression Fittings with Disc Spring for Cross-linked Polyethylene (PEX) Tubing~~

ASTM F2098-15. Standard Specification for Stainless Steel Clamps for Securing SDR9 Cross-linked Polyethylene (PEX) Tubing to Metal Insert Fittings and ~~SDR9 polyethylene of Raised Temperature (PRRT) Tubing~~ [Plastic Insert Fittings](#)

ASTM F2159-~~14~~[18](#). Standard Specification for Plastic Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-Linked Polyethylene (PEX) Tubing [and SDR9 Polyethylene of Raised Temperature \(PE-RT\) Tubing](#)

~~ASTM F2262-09. Standard Specification for Cross-linked Polyethylene/Aluminum/Cross-linked Polyethylene Tubing OD-Controlled SDR9~~

ASTM F2390-12 ([2017](#)). Standard Specifications for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent (DWV) Pipe and Fittings Having Post-Industrial Recycle Content

ASTM F2648/F2648M-~~13~~[17](#). Standard Specification for 2 to 60 in [50 to 1500 mm] Annular Corrugated Profile Wall Polyethylene (PE) Pipe and Fittings for Land Drainage Applications

~~ASTM F2736-13e1. Standard Specification for 6 to 30 in [152 to 762 mm] Polypropylene (PP) Corrugated Single Wall Pipe and Double Wall Pipe~~

ASTM F2764/F2764M-[17e1](#). 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

ASTM F2788/F2788M-~~15~~[18](#). Standard Specification for Metric and Inch-sized Crosslinked Polyethylene (PEX) Pipe

ASTM ~~F2881-11 (2015)~~ / [F2881M-18](#). 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-~~13~~[17](#). Standard Specification for Crosslinked Polyethylene (PEX) Tubing of 0.070 in. Wall and Fittings for Radiant Heating Systems up to 75 psig

[ASTM F3128-15. Standard Specification for Poly\(Vinyl Chloride\) \(PVC\) Schedule 40 Drain, Waste, and Vent Pipe with a Cellular Core](#)

[ASTM F3253-17. Standard Specification for Crosslinked Polyethylene \(PEX\) Tubing with Oxygen Barrier for Hot- and Cold-Water Hydronic Distribution Systems](#)

ANSI/AWWA C901-~~08~~[17](#). Polyethylene (PE) Pressure Pipe and Tubing, 1/2 in (13 mm) Through 3 in (76 mm), for Water Service

ANSI/AWWA C907-~~12~~[17](#). Injection-Molded Polyvinyl Chloride (PVC) Pressure Fittings for Water – 4 in Through 12 in (100 mm Through 300 mm) for Water, Wastewater, and Reclaimed Water Service

ANSI/AWWA C909-16. Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe, 4 in [100 mm] and Larger ~~Through 24 in (100 mm through 600 mm), for Water, Wastewater, and Reclaimed Water Service~~

~~CAN/CSA B125.3-12~~[18](#). Plumbing Fittings

~~CAN/CSA B181.1-15~~[18](#). Acrylonitrile-Butadiene-Styrene (ABS) Drain, Waste, and Vent Pipe and Pipe Fittings

~~CAN/CSA B181.2-15~~[18](#). Polyvinylchloride (PVC) Drain, Waste, and Vent Pipe and Pipe Fittings

~~CAN/CSA B181.3-15~~[18](#). Polyolefin and Polyvinylidene Fluoride (PVDF) Laboratory Drainage Systems



~~CAN/CSA B181.5-1518~~. Coextruded Acrylonitrile-Butadienestyrene / PolyvinylChloride (ABS/PVC) Drain Waste and Vent Pipe

~~CAN/CSA B182.1-1518~~. Plastic Drain and Sewer Pipe and Pipe Fittings

~~CAN/CSA B182.2-1518~~. PSM Type Polyvinylchloride (PVC) Sewer Pipe and Fittings (PSM Type)

~~CAN/CSA B182.4-1518~~. Profile Polyvinylchloride (PVC) Sewer Pipe and Fittings

~~CAN/CSA B182.6-1518~~. Profile polyethylene (PE) Sewer Pipe and Fittings for Leak-Proof Sewer Applications

~~CAN/CSA B182.8-1518~~. Profile polyethylene (PE) Storm Sewer and Drainage Pipe and Fittings

~~CAN/CSA B182.11-1518~~. Standard Practice for the Installation of Thermoplastic Drain, Storm, and Sewer Pipe and Fittings

~~CAN/CSA B182.13-1518~~. Profile Polypropylene (PP) Sewer Pipe and Fittings for Leak-Proof Sewer Applications

~~CAN/CSA B182.14-1518~~. Profile Steel Reinforced Polyethylene (SRPE) Storm Sewer Pipe and Fittings

~~CAN/CSA B182.15-1518~~. Profile Steel Reinforced Polyethylene (SRPE) Sewer Pipe and Fittings

~~CAN/CSA ANSI/CSA/IGSHPA C448 Series 16~~. Design and Installation of Ground Source Heat Pump Systems for Commercial and Residential Buildings

[IAPMO Z1157-2014E1](#). Ball Valves

TR-2. PPI PVC Range Composition Listing of Qualified Ingredients (~~2016~~[2018](#))

UL 1821 ([3rd Edition](#)). Thermoplastic Sprinkler Pipe and Fittings for Fire Protection Service

2.2 Normative references for compounds and other materials

~~ASTM D2581-09~~. ~~Standard Specification for Polybutylene (PB) Plastics Molding and Extrusion Materials²~~

ASTM D3222-~~05~~ (~~2015~~)[18](#). Standard Specification for Unmodified Poly(Vinylidene Fluoride) (PVDF) Molding Extrusion and Coating Materials

ASTM D3965-~~11~~[16](#). Standard Classification System for and Basis for Specification for Rigid Acrylonitrile-Butadiene-Styrene (ABS) Materials for Pipe and Fittings

ASTM D4067-~~11~~[16](#). Standard Classification System for and Basis for Reinforced and Filled Poly(Phenylene Sulfide) (PPS) Injection Molding and Extrusion Materials Using ASTM Methods

ASTM D4101-~~14e~~[17](#). Standard Specification for Polypropylene Injection and Extrusion Materials

IAPMO PS 36-2014e[1](#). Lead-Free Sealing Compounds for Threaded Joints

2.3 International and other normative references

21 CFR Parts 1-99. Food and Drugs (Rev 4/~~15~~[17](#))

21 CFR Parts 100-169. Food and Drugs (Rev 4/~~15~~[17](#))

21 CFR Parts 170-199. Food and Drugs (Rev 4/~~15~~[17](#))

ASTM D2992-~~12~~[18](#). Standard Practice for Obtaining Hydrostatic or Pressure Design Basis for Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Fittings⁵

ASTM D6284-~~09~~[17](#). Standard Test Method for Rubber Property – Effect of Aqueous Solutions with Available Chlorine and Chloramine

ASTM F1216-~~09~~[16](#). Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube

DIN 8074. Polyethylene (PE) - Pipes, ~~PE-63~~, PE 80, PE 100, PE-HD – Dimensions (2011)

DIN 8075. Polyethylene (PE) pipes – ~~PE-63~~, PE 80, PE 100, PE-HD – General quality requirements, testing (2011)

ISO 6509-[1:2014](#). Corrosion of metal and alloys – Determination of dezincification resistance of ~~brass~~ [copper alloys with zinc – Part 1: Test method](#)



ISO 6957:1988. Copper Alloys – Ammonia test for stress corrosion resistance

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 (~~2017~~2018)

PPI TR-4. PPI 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 (~~2016~~2018)

Section 3, Definitions: A definition was added as follows:

3.56 start-up: Initiation of a production process involving a new material, process parameter (e.g., temperature, pressure, throughput), or manufacturing equipment (e.g., extruder, molder, compounder). A change in extrusion die size does not constitute start-up as long as the material and manufacturing equipment remain the same.

Section 4, Requirements for plastic piping system components and related materials: Added language to allow the use of reworked polyethylene materials in plastic piping system components and related materials as follows:

4.1.2 Rework materials

4.1.2.1 All materials excluding polyethylene

The use of clean rework material of the same formulation from the same manufacturer shall be acceptable provided that the finished products meet the requirements of the applicable product standard(s). Plastic piping system components and related materials shall be manufactured in such a way as to prevent contamination.

4.1.2.2 Polyethylene

The use of clean, rework polyethylene material from the same material designation and from the same manufacturer shall be acceptable provided that the finished products meet the requirements of the applicable product standard(s). Plastic piping system components and related materials shall be manufactured in such a way as to prevent contamination.

Section 9, Quality Assurance: Clarified the start-up concept and revised language to illustrate as follows:

9.2 Start-up and qualification

In each case, with the exception of annual and semi-annual tests, the frequency of testing indicated in Section 9.9 shall be interpreted as follows: ~~The indicated tests shall be performed at the start-up of any production operation, on each extruder or injection molder, and continued until a steady-state operation that meets the test requirement is obtained.~~ The test shall be repeated at the required frequency ~~until there is a change in the steady-state operation. When there is a change in operation, testing shall be conducted continuously until a new steady-state operation is achieved. After a steady-state operation is attained, the applicable testing frequencies~~ shown in 9.9 ~~shall resume.~~

Mold qualification as discussed in this Section shall be defined as molds that produce precise functional finish dimensions not otherwise obtained by an additional manufacturing process. The test frequency indicated for fittings shall be used only after the mold has been qualified. In order for a new or retooled mold to be considered “qualified,” all products from all cavities in the mold shall attain compliance with all of the appropriate dimensions and tests. This shall not include annual or semi-annual tests. After qualification, the indicated test frequencies shall apply to one cavity per mold, rotating cavities within



the mold, including start-ups. If any physical change is made to the mold itself, all cavities within the mold shall be re-qualified.

When annual testing is required, annual testing performed by a third-party certifier shall satisfy the requirement.

Section 9.9, Product-specific quality assurance requirements: Updated Tables 9.5 through 9.41 to provide product-specific quality assurance requirements as follows:

Table 9.9, CPVC fittings test frequency: Added footnote 6 to socket depth.

Table 9.10A, PEX, PE-RT, PE-water, PE-storm sewer pipe and tubing test frequency: Removed footnote 8 from the table and added ASTM F3253 as a reference for product standards.

Table 9.11, Fittings for PE and PEX tubing test frequency: Added the pull-out strength test, added footnote 8 and added ASTM F3253 as a reference for product standards.

Table 9.12, PVC pipe test frequency: Added the cellular structure test and added ASTM F3128 as a reference for product standards.

Table 9.13, PVC fittings and pipe bell ends test frequency: Added the deflection test, shear test, unrestrained hydrostatic test, added footnote 10 to the table, and added ASME A112.4.4 as a reference for product standards.

Table 9.18, Composite pipe test frequency: Added the cellular structure test and added footnote 3 to the table.

Table 9.33, PVC pressure pipe and fabricated fittings for water transmission and distribution: Revised all table to comply with AWWA C900.

Table 9.37, PEX geothermal pipe and fittings frequency: Removed ASTM F1961 from footnote 2.

Table 9.39, Corrugated polyethylene pipe and fittings for non-pressure storm sewer, land drainage and sanitary sewer applications: Combined double and triple corrugated PP walls into one column.