



**Standards  
For  
Plastics Piping**

**TR – 5**

# STANDARDS FOR PLASTICS PIPING

## Foreword

This technical report has been prepared to provide producers, users, engineers, code officials, installers and others interested in plastics piping with an up-to-date list of standards covering high quality plastic piping components. Standards for the purpose of this report include component specifications, methods of test and recommended practices for pipe, tubes, conduits, fittings and related products made of plastics. Although the Plastics Pipe Institute is concerned only with thermoplastics, standards for thermoset plastics are also included.

The only piping products and regulations listed in this publication are those of national standing. State, regional and local plumbing and other piping codes—many of which are adoptions in total, or in part, of national model codes—are not covered.

It should be noted that most of these product standards (specifications) include product quality control requirement values that usually cannot be used for engineering design criteria. Such criteria are covered in recommended practices, codes, model codes, installation procedures, separate reports and the appendices of some of these product standards. Those standards that contain information on engineering design criteria and/or the closely related installation procedures are herein identified.

Before selecting the type of plastic and the related standards for an application, the design criteria, limitations, and installation techniques must be considered to achieve satisfactory service. Also, any applicable codes must be considered. Information on these aspects may be obtained from the pertinent codes; the standards listed herein, the publications or staff of the Plastics Pipe Institute and of other organizations (identified in this report), or from the manufacturers of plastic pipe components and plastic materials.

As the plastics industry has grown, other trade organizations have been formed. Their scopes are listed at the end of this report to enable you to direct your inquiries to the appropriate organization.

*The Plastics Pipe Institute, Inc., as a service to the industry has prepared this report. The information in this report is offered in good faith and believed to be accurate at the time of its preparation, but is offered without any warranty, express or implied. PPI does not endorse the proprietary products or processes of any manufacturer and assumes no responsibility for compliance with applicable laws and regulations.*

***This Technical Report is a living document and is updated on a regular basis. If standards need to be added, please forward the standard title to PPI.***

*“This Technical Report was first issued in December 1979. This revision was prepared in September 2009.”*

# STANDARDS FOR PLASTICS PIPING

## Introduction

This publication contains listings of standards for various types of plastics piping as promulgated by numerous standards-making organizations, such as the American Society for Testing and Materials (ASTM), the American Association of State Highway and Transportation Officials (AASHTO), various U.S. Government agencies and so on.

For the convenience of the reader, this publication has been arranged into three sections. Section I and II are devoted to ASTM standards, which are published in Volume 08.04 of the Annual Book of ASTM Standards.

Section I categorizes the ASTM standards into one of eight listings:

- Plastic Pipe Specifications
- Plastic Fittings Specifications
- Plastic Pipe Joints and Joining Materials
- Systems Specifications (both pipe and fittings)
- Methods of Test
- Recommended Practices
- Terminology
- Plastic Pipe and Fittings Materials

Section II categorizes the ASTM Standards into listings such as:

- Piping by Type of Material (PE, PVC, etc.)
- Piping Systems by Type of Application (DWV, gas, sewer, water, etc.)
- Pipe Installation and Components (fittings, joints, seals, solvent cement and primers, underground installation)
- General Test Methods

Section III contains listings of standards promulgated by organizations other than ASTM (with their addresses) as well as sources of further information.

- American Association of State Highway and Transportation Officials (AASHTO)
- American National Standards Institute (ANSI)
- American Petroleum Institute (API)
- American Society of Agricultural Engineers (ASAE)
- American Water Works Association (AWWA)
- Canadian Government Standards Board (CGSB)
- Canadian Standards Association (CSA)
- U.S. Department of Agriculture – Natural Resources Conservation Service (NRCS)
- U.S. Department of Transportation

U.S. Department of Housing & Urban Development (HUD)  
International Association of Plumbing & Mechanical Officials (IAPMO)  
International Standards Organization (ISO)  
National Electrical Manufacturer's Association (NEMA)  
National Fire Protection Association (NFPA)  
NSF International  
Underwriters Laboratories (UL)  
UniBell PVC Pipe Association (UniBell)  
International Code Council (ICC)  
National Association of Plumbing-Heating-Cooling Contractors (PHCC)  
Plastic Pipe and Fittings Association (PPFA)  
The Vinyl Institute (VI)

# **SECTION I**

ASTM                    American Society for Testing and Materials  
                              100 Barr Harbor Drive  
                              West Conshohocken, PA 19428  
                              (610) 832-9500  
                              Internet: www.astm.org

## **Plastic Pipe Specifications**

- D1527    Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe, Schedules 40 and 80
  
- D1785    Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedule 40, 80, and 120
- D2104    Polyethylene (PE) Plastic Pipe, Schedule 40
  
- D2239    Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Inside Diameter
- D2241    Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)
- D2282    Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe (SDR-PR)
- D2310    Machine-Made "Fiberglass" (Glass-fiber-reinforced Thermosetting-resin) Pipe
- D2447    Polyethylene (PE) Plastic Pipe, Schedules 40 and 80 Based on Outside Diameter
- D2466    Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
- D2513    Thermoplastic Gas Pressure Pipe, Tubing and Fittings
- D2737    Polyethylene (PE) Plastic Tubing
- D2996    Filament-Wound "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe
- D2997    Centrifugally Cast "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe
- D3035    Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter
- D3262    "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe
- D3517    "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pressure Pipe
- F187     Specification for Folded/Formed Poly (Vinyl Chloride) Pipe Type A for Existing Sewer and Conduit Rehabilitation
- F405     Corrugated Polyethylene (PE) Pipe and Fittings
- F441     Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80
- F442     Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR)
- F714     Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
- F810     Smoothwall Polyethylene (PE) Pipe for Use in Drainage and Waste Disposal Absorption Fields

- F876 Crosslinked Polyethylene (PEX) Tubing
- F891 Coextruded Poly (Vinyl Chloride) (PVC) Plastic Pipe with a Cellular Core
- F894 Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe
- F949 Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings
- F1281 Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene (PEX-AL-PEX) Pressure Pipe
- F1282 Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure Pipe
- F1335 Pressure-Rated Composite Pipe and Fittings for Elevated Temperature Service
- F1483 Oriented Poly (Vinyl) Chloride PVCO, Pressure Pipe
- F1488 Coextruded Composite Pipe
- F1499 Coextruded Composite Drain, Waste and Vent Pipe (DWV)
- F1533 Specification for Deformed Polyethylene (PE) Liner
- F2160 Specification for Solid Wall High Density Polyethylene (HDPE) Conduit Based on Controlled Outside Diameter (OD)
- F2262 Specification for Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene Tubing OD Controlled SDR9

### **Plastic Fittings Specifications**

- D2464 Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings Schedule 80
- D2466 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
- D2467 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
- D2609 Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe
- D2683 Socket-Type Polyethylene (PE) Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing
- D3261 Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
- D3311 Drain, Waste and Vent (DWV) Plastic Fittings Patterns
- D3840 Fiberglass (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Fittings for Non-Pressure Applications
- D5685 Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pressure Pipe Fittings
- F409 Thermoplastic Accessible and Replaceable Plastic Tube and Tubular Fittings
- F437 Threaded Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80
- F438 Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40
- F439 Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80
- F1055 Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing
- F1336 Poly (Vinyl Chloride) (PVC) Gasketed Sewer Fittings

- F1380 Metal Insert Fittings for Polybutylene (PB) Tubing
- F1733 Butt Heat Fusion Polyamide (PA) Plastic Fittings for Polyamide (PA) Plastic Pipe and Tubing
- F1807 Standard Specification for Metal Insert Fittings utilizing a Copper Crimp Ring for SDR9 Cross-Linked Polyethylene (PEX) Tubing
- F1924 Specification for Plastic Mechanical Fittings for Use on Outside Diameter Controlled Polyethylene Gas Distribution Pipe and Tubing
- F1970 Specification for Special Engineered Fittings, Appurtenances or Valves for use in Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Systems
- F1974 Specification for Metal Insert Fittings for Polyethylene/Aluminum/Polyethylene and Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene Composite Pressure Pipe
- F2080 Specification for Cold-Expansion Fittings With Metal Compression-Sleeves for Cross-Linked Polyethylene (PEX) Pipe
- F2135 Specification for Molded Drain, Waste, and Vent (DWV) Short-Pattern Plastic Fittings
- F2159 Specification for Plastic Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing
- F2434 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
- F2735 Specification for Plastic Insert Fittings For SDR9 Cross-linked Polyethylene (PEX) and Polyethylene of Raised Temperature (PE-RT) Tubing

### **Plastic Pipe Joints and Joining Materials**

- D2235 Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings
- D2564 Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems
- D3138 Solvent Cements for Transition Joints Between Acrylonitrile-Butadiene Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Non-Pressure Piping Components
- D3139 Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
- D3212 Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
- D4161 "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals
- D2672 Joints for IPS PVC Pipe Using Solvent Cement
- D3122 Solvent Cement for Styrene-Rubber (SR) Plastic Pipe and Fittings
- F477 Elastomeric Seals (Gaskets) for Joining Plastic Pipe
- F493 Solvent Cement for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe and Fittings
- F656 Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings

- F913 Thermoplastic Elastomeric Seals (Gaskets) for Joining Plastic Pipe
- F1056 Socket Fusion Tools for Use in Socket Fusion Joining Polyethylene Pipe or Tubing and Fittings

**Systems Specifications (Both Pipe and Fittings)**

- D2513 Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing, and Fittings
- D2517 Standard Specification for Reinforced Epoxy Resin Gas Pressure Pipe and Fittings
- D2661 Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings
- D2665 Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste and Vent Pipe and Fittings
- D2680 Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping
- D2729 Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
- D2751 Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings
- D2846 Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Hot- and Cold-Water Distribution Systems
- D2852 Standard Specification for Styrene-Rubber (SR) Plastic Drain Pipe and Fittings
- D2949 3.25-In. Outside Diameter Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
- D3034 Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
- D3754 "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer and Industrial Pressure Pipe
- F194 Specification for Metallic Mechanical Fittings for Use on Outside Diameter Controlled Thermoplastic Gas Distribution Pipe and Tubing
- F480 Standard Specification for Thermoplastic Well Casing Pipe and Couplings Made in Standard Dimension Ratios (SDR), SCH 40 and SCH 80
- F512 Specification for Smooth-Wall Poly Vinyl Chloride) (PVC) Conduit and Fittings for Underground Installation
- F667 Standard Specification for Large Diameter Corrugated Polyethylene Pipe and Fittings
- F679 Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings
- F714 Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
- F771 Polyethylene (PE) Thermoplastic High-Pressure Irrigation Pipeline Systems
- F794 Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter
- F877 Crosslinked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems
- F1412 Polyolefin Pipe and Fittings for Corrosive Waste Drainage Systems

- F1498 Taper Pipe Threads 60° for Thermoplastic Pipe and Fittings
- F1865 Specification for Mechanical Cold Expansion Insert Fitting With Compression Sleeve for Cross-linked Polyethylene (PEX) Tubing
- F1866 Specification for Poly (Vinyl Chloride) (PVC) Plastic Schedule 40 Drainage and DWV Fabricated Fittings
- F1960 Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Tubing
- F1986 Specification for Multilayer Pipe Type 2, Compression Fittings, and Compression Joints for Hot and Cold Drinking-Water Systems
- F2164 Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure
- F2206 Specification for Fabricated Fittings of Butt-Fused Polyethylene (PE) Plastic Pipe, Fittings, Sheet Stock, Plate Stock, or Block Stock
- F2307 Specification for Series 10 Poly(Vinyl Chloride) (PVC) Closed Profile Gravity Pipe and Fittings Based on Controlled Inside Diameter
- F2389 Specification for Pressure-rated Polypropylene (PP) Piping Systems
- F2390 Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent (DWV) Pipe and Fittings Having Post-Industrial Recycle Content
- F2618 Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Fittings for Chemical Waste Drainage Systems

### **Methods of Test**

- D256 Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics
- D618 Practice for Conditioning Plastics for Testing
- D638 Test Method for Tensile Properties of Plastics
- D882 Test Method for Tensile Properties of Thin Plastic Sheeting
- D883 Terminology Relating to Plastics
- D1043 Test Method for Stiffness Properties of Plastics as a Function of Temperature by Means of a Torsion Test
- D1045 Test Methods for Sampling and Testing Plasticizers Used in Plastics
- D1525 Standard Test Method for Vicat Softening Temperature of Plastics
- D1598 Time-to-Failure of Plastic Pipe Under Constant Internal Pressure
- D1599 Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings
- D1603 Test Method for Carbon Black Content in Olefin Plastics
- D1693 Test Method for Environmental Stress-Cracking of Ethylene Plastics
- D2105 Longitudinal Tensile Properties of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Tube
- D2122 Determining Dimensions of Thermoplastic Pipe and Fittings
- D2143 Cyclic Pressure Strength of Reinforced, Thermosetting Plastic Pipe
- D2152 Adequacy of Fusion of Extruded Poly (Vinyl Chloride) (PVC) Pipe and Molded Fittings by Acetone Immersion

- D2222 Test Method for Methanol Extract of Vinyl Chloride Resins
- D2290 Apparent Hoop Tensile Strength of Plastic or Reinforced Plastic Pipe by Split Disk Method
- D2412 Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
- D2444 Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)
- D2837 Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials, or Pressure Design Basis for Thermoplastic Pipe Products
- D2924 External Pressure Resistance of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe
- D2925 Beam Deflection of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Pipe Under Full Bore Flow
- D2990 Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics
- D2992 Obtaining Hydrostatic or Pressure Design Basis for "Fiberglass"(Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Fittings
- D3681 Chemical Resistance of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe in a Deflected Condition
- F243 Test Method for Determining Thermoplastic Pipe Wall Stiffness
- F610 Evaluating the Quality of Molded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings by the Heat Reversion Technique
- F948 Time-to-Failure of Plastic Piping Systems and Components under Constant Internal Pressure with Flow
- F1057 Estimating the Quality of Extruded Poly (Vinyl Chloride) (PVC) Pipe by the Heat Reversion Technique
- F1365 Water Infiltration Resistance of Plastic Underground Conduit Joints Which Use Flexible Elastomeric Seals
- F1417 Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air
- F1429 Assembly Force of Plastic Underground Conduit Joints that use Flexible Elastomeric Seals Located in the Bell
- F1473 Notch Tensile Test to Measure the Resistance to Slow Crack Growth of Polyethylene Pipes and Resins
- F1588 Constant Tensile Load Joint Test (CTLJT)
- F2018 Test Method for Time-to-Failure of Plastics Using Plane Strain Tensile Specimens
- F2023 Test Method for Evaluating the Oxidative Resistance of Crosslinked Polyethylene (PEX) Tubing and Systems to Hot Chlorinated Water
- F2136 Test Method for Notched, Constant Ligament-Stress (NCLS) Test to Determine Slow-Crack-Growth Resistance of HDPE Resins or HDPE Corrugated Pipe
- F2231 Test Method for Charpy Impact Test on Thin Specimens of Polyethylene Used in Pressurized Pipes
- F2261 Test Method for Pressure Rating Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40 and 80 Socket-Type.

- F2263 Test Method for Evaluating the Oxidative Resistance of Polyethylene (PE) Pipe to Chlorinated Water
- F2330 Test Method for Evaluating the Oxidative Resistance of Multilayer Polyolefin Tubing to Hot Chlorinated Water
- F2634 Test Method for Laboratory Testing of Polyethylene (PE) Butt Fusion Joints using Tensile-Impact Method
- F2657 Test Method for Outdoor Weathering Exposure of Crosslinked Polyethylene (PEX) Tubing

### **Recommended Practices**

- D1972 Practice for Generic Marking of Plastic Products
- D2321 Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
- D2488 Description and Identification of Soils (Visual-Manual Procedure)
- D2657 Heat-Joining Polyolefin Pipe and Fittings
- D2774 Underground Installation of Thermoplastic Pressure Piping
- D2839 Practice for Use of a Melt Index Strand for Determining Density of Polyethylene
- D2855 Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings
- D3567 Determining Dimensions of “Fiberglass” (Glass-Fiber-Reinforced Thermosetting Resin) Pipe and Fittings
- D3839 Underground Installation of “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe
- F402 Safe Handling of Solvent Cements, Primers, and Cleaners Used for Joining Thermoplastic Pipe and Fittings
- F449 Subsurface Installation of Corrugated Polyethylene Pipe for Agricultural Drainage or Water Table Control
- F481 Installation of Thermoplastic Pipe and Corrugated Pipe in Septic Tank Leach Fields
- F585 Insertion of Flexible Polyethylene Pipe into Existing Sewers
- F645 Selection, Design, and Installation of Thermoplastic Water-Pressure Piping Systems
- F689 Determination of the Temperature of Above-Ground Plastic Gas Pressure Pipe within Metallic Casings
- F690 Underground Installation of Thermoplastic Pressure Piping Irrigation Systems
- F905 Qualification of Polyethylene Saddle-Fused Joints
- F1025 Selection and Use of Full-Encirclement-Type Band Clamps for Reinforcement or Repair of Punctures or Holes in Polyethylene Gas Pressure Pipe
- F1041 Squeeze-Off of Polyolefin Gas Pressure Pipe and Tubing
- F1176 Design and Installation of Underground Thermoplastic Irrigation Systems With Maximum Working Pressure of 125 psi
- F1216 Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube
- F1290 Electrofusion Joining Polyolefin Pipe and Fittings

- F1563 Specification for Tools to Squeeze-off Polyethylene (PE) Gas Pipe or Tubing
- F1668 Construction Procedures for Buried Plastic Pipe
- F1734 Qualification of a Combination of Squeeze Tool, Pipe, and Squeeze-Off Procedures to Avoid Long-Term Damage in Polyethylene (PE) Gas Pipe
- F1743 Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP)
- F1804 Practice for Determining Allowable Tensile Load for Polyethylene (PE) Gas Pipe During Pull-In Installation
- F1867 Practice for Installation of Folded/Formed Poly (Vinyl Chloride) (PVC) Pipe Type A for Existing Sewer and Conduit Rehabilitation
- F2620 Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings

### **Terminology**

- D883 Standard Terminology Relating to Plastics
- D1600 Standard Terminology for Abbreviated Terms Relating to Plastics
- D2749 Standard Symbols for Dimensions of Plastic Pipe Fittings
- F412 Standard Terminology Relating to Plastic Piping Systems

### **Plastic Fittings Materials**

- D1784 Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
- D2581 Polybutylene (PB) Plastics Molding and Extrusion Materials
- D3350 Polyethylene Plastics Pipe and Fittings Materials
- D3915 Rigid Poly (Vinyl Chloride) (PVC) and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds for Plastic Pipe and Fittings Used in Pressure Applications
- D3965 Rigid Acrylonitrile-Butadiene-Styrene (ABS) Materials for Pipe and Fittings
- D4066 Nylon Injection and Extrusion Materials (PA)
- D4396 Rigid Poly (Vinyl Chloride) (PVC) and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds for Plastic Pipe and Fittings Used in Nonpressure Applications
- D4976 Standard Specification for Polyethylene Plastics Molding and Extrusion Materials
- F876 Standard Specification for Crosslinked Polyethylene (PEX) Tubing

## **SECTION II**

### **A. PLASTIC PIPE MATERIALS CLASSIFICATIONS**

#### **Materials**

##### **Specification for:**

- D1784 Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
- D2581 Standard Classification System for Polybutylene (PB) Plastics Molding and Extrusion Materials
- D3350 Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
- D3915 Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds for Plastic Pipe and Fittings Used in Pressure Applications
- D3965 Standard Specification for Rigid Acrylonitrile-Butadiene-Styrene (ABS) Materials for Pipe and Fittings
- D4066 Standard Classification System for Nylon Injection and Extrusion Materials (PA)
- D4396 Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds for Plastic Pipe and Fittings Used in Nonpressure Applications
- D4976 Standard Specification for Polyethylene Plastics Molding and Extrusion Materials

#### **Type of Plastics Piping**

##### **Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings**

##### **Specifications for:**

- D1527 Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe, Schedules 40 and 80
- D2235 Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings
- D2661 Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings
- D2680 Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping
- D2751 Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings
- D3138 Standard Specification for Solvent Cements for Transition Joints Between Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Non-Pressure Piping Components

- D3965 Standard Specification for Rigid Acrylonitrile-Butadiene-Styrene (ABS) Materials for Pipe and Fittings
- F409 Standard Specification for Thermoplastic Accessible and Replaceable Plastic Tube and Tubular Fittings
- F628 Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe with a Cellular Core

**Test Method for:**

- D2444 Standard Test Method for Determination of the Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)

**Polyamide (PA) Plastic Pipe and Fittings**

**Specifications for:**

- F1733 Standard Specification for Butt Heat Fusion Polyamide(PA) Plastic Fitting for Polyamide(PA) Plastic Pipe and Tubing

**Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Tubing, and Fittings**

**Specifications for:**

- D2846 Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Hot- and Cold-Water Distribution Systems
- F437 Standard Specification for Threaded Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80
- F438 Standard Specification for Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40
- F439 Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80
- F441 Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80
- F442 Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR)
- F493 Standard Specification for Solvent Cements for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe and Fittings
- F1336 Standard Specification for Poly (Vinyl Chloride) (PVC) Gasketed Sewer Fittings

## **Polyethylene (PE) Plastic Pipe, Tubing, and Fittings**

### **Specifications for:**

- D2104 Standard Specification for Polyethylene (PE) Plastic Pipe, Schedule 40
- D2239 Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter
- D2447 Standard Specification for Polyethylene (PE) Plastic Pipe, Schedules 40 and 80, Based on Outside Diameter
- D2609 Standard Specification for Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe
- D2683 Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing
- D2737 Standard Specification for Polyethylene (PE) Plastic Tubing
- F2306 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
- F2619 Standard Specification for High-Density Polyethylene (PE) Line Pipe
- F2623 Standard Specification for Polyethylene of Raised Temperature (PE-RT) SDR 9 Tubing
- F2769 Standard Specification for Polyethylene of Raised Temperature (PE-RT) Plastic Hot and Cold-Water Tubing and Distribution Systems

### **Specifications for:**

- D3035 Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter
- D3261 Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
- D3350 Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
- F405 Standard Specification for Corrugated Polyethylene (PE) Pipe and Fittings
- F667 Standard Specification for Large Diameter Corrugated Polyethylene Pipe and Fittings
- F2648 Standard Specification for 2 to 60 inch [50 to 1500 mm] Annular Corrugated Profile Wall Polyethylene (PE) Pipe and Fittings for Land Drainage Applications

### **Specifications for:**

- F714 Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
- F771 Standard Specification for Polyethylene (PE) Thermoplastic High-Pressure Irrigation Pipeline Systems

- F810 Standard Specification for Smoothwall Polyethylene (PE) Pipe for Use in Drainage and Waste Disposal Absorption Fields
- F876 Standard Specification for Crosslinked Polyethylene (PEX) Tubing
- F877 Standard Specification for Crosslinked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems
- F894 Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe
- F1055 Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing
- F1533 Standard Specification for Deformed Polyethylene (PE) Liner
- F2788 Standard Specification for Crosslinked Polyethylene (PEX) Pipe

**Practice for:**

- F905 Standard Practice for Qualification of Polyethylene Saddle-Fused Joints

**Poly (Vinyl Chloride) (PVC) Plastic Pipe, Tubing, and Fittings**

**Specifications for:**

- D1785 Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
- D2464 Standard Specification for Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
- D2466 Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
- D2467 Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
- D2564 Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems
- D2665 Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
- D2672 Standard Specification for Joints for IPS PVC Pipe Using Solvent Cement
- D2729 Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
- D2949 Standard Specification for 3.25-in. Outside Diameter Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
- D3034 Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
- D3138 Standard Specification for Solvent Cements for Transition Joints Between Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Non-Pressure Piping Components
- D3915 Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds for Plastic Pipe and Fittings Used in Pressure Applications

- D4396 Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds for Plastic Pipe and Fittings Used in Nonpressure Applications
- F409 Standard Specification for Thermoplastic Accessible and Replaceable Plastic Tube and Tubular Fittings
- F512 Standard Specification for Smooth-Wall Poly (Vinyl Chloride) (PVC) Conduit and Fittings for Underground Installation
- F656 Standard Specification for Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings
- F679 Standard Specification for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings
- F758 Standard Specification for Smooth-Wall Poly (Vinyl Chloride) (PVC) Plastics Underdrain Systems for Highway, Airport, and Similar Drainage
- F794 Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter
- F891 Standard Specification for Coextruded Poly (Vinyl Chloride) (PVC) Plastic Pipe with a Cellular Core
- F949 Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings
- F1483 Standard Specification for Oriented Poly (Vinyl Chloride), PVCO, Pressure Pipe
- F1504 Standard Specification for Folded Poly (Vinyl Chloride) (PVC) Pipe for Existing Sewer and Conduit Rehabilitation
- F1697 Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Strip for Machine Spiral-Wound Liner Pipe Rehabilitation of Existing Sewers and Conduits
- F1732 Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer and Drain Pipe Containing Recycled PVC Material
- F1760 Standard Specification for Coextruded Poly(Vinyl Chloride) (PVC)
- F1803 Standard Specification for Poly (Vinyl Chloride)(PVC) Closed Profile Gravity Pipe and Fittings Based on Controlled Inside Diameter
- F2307 Standard Specification for Series 10 Poly(Vinyl Chloride) (PVC) Closed Profile Gravity Pipe and Fittings Based on Controlled Inside Diameter
- F2390 Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent (DWV) Pipe and Fittings Having Post-Industrial Recycle Content
- F2618 Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Fittings for Chemical Waste Drainage Systems
- F2658 Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) SDR 51 and SDR 64 Sewer Pipe and Fittings

**Test Method for:**

- D2152 Standard Test Method for Adequacy of Fusion of Extruded Poly (Vinyl Chloride) (PVC) Pipe and Molded Fittings by Acetone Immersion
- D2444 Standard Test Method for Determination of the Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)
- F610 Standard Test Method for Evaluating the Quality of Molded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings by the Heat Reversion Technique
- F1674 Standard Test Method for Joint Restraint Products for Use with PVC Pipe

**Practice for:**

- D2855 Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings
- F1741 Standard Practice for Installation of Machine Spiral Wound Poly (Vinyl Chloride) (PVC) Liner Pipe for Rehabilitation of Existing Sewers and Conduits

**Polybutylene (PB) Plastic Pipe and Tubing**

**Specification for:**

**Practice for:**

**Fiberglass Pipe and Fittings**

**Specification for:**

- D2517 Standard Specification for Reinforced Epoxy Resin Gas Pressure Pipe and Fittings
- D2996 Standard Specification for Filament-Wound “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe
- D2997 Standard Specification for Centrifugally Cast “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe
- D3262 Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe
- D3517 Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pressure Pipe
- D3754 Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer and Industrial Pressure Pipe
- D3840 Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Fittings for Nonpressure Applications

- D4161 Standard Specification for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals
- F2720 Standard Specification for Glass Fiber Reinforced Polyethylene (PE-GF) Spiral Wound Large Diameter Pipe

**Test Methods for:**

- D2105 Standard Test Method for Longitudinal Tensile Properties of “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Tube
- D2143 Standard Test Method for Cyclic Pressure Strength of Reinforced, Thermosetting Plastic Pipe
- D2924 Standard Test Method for External Pressure Resistance of “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe
- D2925 Standard Test Method for Beam Deflection of “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Under Full Bore Flow
- D3681 Standard Test Method for Chemical Resistance of “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe in a Deflected Condition

**Practice for:**

- D2992 Standard Practice for Obtaining Hydrostatic or Pressure Design Basis for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Fittings
- D3567 Standard Practice for Determining Dimensions of “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Fittings
- D3839 Standard Guide for Underground Installation of “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe

**Classification for:**

- D2310 Standard Classification for Machine-Made “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe

**Styrene-Rubber Plastic Pipe and Fittings**

**Specifications for:**

- D2852 Standard Specification for Styrene-Rubber (SR) Plastic Drain Pipe and Fittings
- D3122 Standard Specification for Solvent Cements for Styrene-Rubber (SR) Plastic Pipe and Fittings

## **Plastic Lined Metal Pipe and Fittings**

### **Specifications for:**

- F1545 Standard Specification for Plastic-Lined Ferrous Metal Pipe, Fittings, and Flanges

## **B. PLASTICS PIPE SYSTEM CLASSIFICATIONS**

### **Conduit and Fittings**

### **Specifications for:**

- C875 Standard Specification for Asbestos-Cement Conduit
- D2466 Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
- D2467 Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
- D2661 Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe
- D2665 Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
- D2683 Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing
- D2750 Acrylonitrile-Butadiene-Styrene (ABS) Plastic Utilities Conduit and Fittings
- D2949 3.25-In. Outside Diameter Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
- D3261 Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
- D3311 Drain, Waste and Vent (DWV) Plastic Fittings Patterns
- F409 Thermoplastic Accessible and Replaceable Plastic Tube and Tubular Fittings
- F437 Standard Specification for Threaded Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80
- F438 Standard Specification for Socket-Type Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40
- F628 Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe with a Cellular Core
- F1335 Standard Specification for Pressure-Rated Composite Pipe and Fittings for Elevated Temperature Service
- F1412 Standard Specification for Polyolefin Pipe and Fittings for Corrosive Waste Drainage Systems
- F1429 Standard Test Method for Assembly Force of Plastic Underground Conduit Joints That Use Flexible Elastomeric Seals Located in the Bell
- F1499 Coextruded Composite Drain, Waste, and Vent Pipe (DWV)
- F1673 Polyvinylidene Fluoride (PVDF) Corrosive Waste Drainage Systems

- F1807 Standard Specification for Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing
- F1866 Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Schedule 40 Drainage and DWV Fabricated Fittings
- F1867 Standard Practice for Installation of Folded/Formed Poly (Vinyl Chloride) (PVC) Pipe Type A for Existing Sewer and Conduit Rehabilitation
- F1871 Standard Specification for Folded/Formed Poly (Vinyl Chloride) Pipe Type A for Existing Sewer and Conduit Rehabilitation
- F1901 Standard Specification for Polyethylene (PE) Pipe and Fittings for Roof Drain Systems
- F1924 Standard Specification for Plastic Mechanical Fittings for Use on Outside Diameter Controlled Polyethylene Gas Distribution Pipe and Tubing
- F1947 Standard Practice for Installation of Folded Poly (Vinyl Chloride) (PVC) Pipe into Existing Sewers and Conduits
- F1948 Standard Specification for Metallic Mechanical Fittings for Use on Outside Diameter Controlled Thermoplastic Gas Distribution Pipe and Tubing
- F1960 Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Tubing
- F1961 Standard Specification for Metal Mechanical Cold Flare Compression Fittings with Disc Spring for Crosslinked Polyethylene (PEX) Tubing
- F1962 Standard Guide for Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit Under Obstacles, Including River Crossings
- F1970 Standard Specification for Special Engineered Fittings, Appurtenances or Valves for use in Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Systems
- F1973 Standard Specification for Factory Assembled Anodeless Risers and Transition Fittings in Polyethylene (PE) and Polyamide 11 (PA11) and Polyamide 12 (PA12) Fuel Gas Distribution Systems
- F1974 Standard Specification for Metal Insert Fittings for Polyethylene/Aluminum/Polyethylene and Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene Composite Pressure Pipe
- F1986 Standard Specification for Multilayer Pipe Type 2, Compression Fittings, and Compression Joints for Hot and Cold Drinking-Water Systems
- F1987 Standard Specification for Multilayer Pipe Type 2, Compression Fittings, and Compression Joints for Hydronic Heating Systems
- F2018 Standard Test Method for Time-to-Failure of Plastics Using Plane Strain Tensile Specimens
- F2019 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP)

- F2021 Standard Guide for Design and Installation of Plastic Siphonic Roof Drainage Systems
- F2023 Standard Test Method for Evaluating the Oxidative Resistance of Crosslinked Polyethylene (PEX) Tubing and Systems to Hot Chlorinated Water
- F2080 Standard Specification for Cold-Expansion Fittings With Metal Compression-Sleeves for Cross-Linked Polyethylene (PEX) Pipe
- F2098 Standard Specification for Stainless Steel Clamps for Securing SDR9 Cross-linked Polyethylene (PEX) Tubing to Metal Insert and Plastic Insert Fittings
- F2135 Standard Specification for Molded Drain, Waste, and Vent (DWV) Short-Pattern Plastic Fittings
- F2136 Standard Test Method for Notched, Constant Ligament-Stress (NCLS) Test to Determine Slow-Crack-Growth Resistance of HDPE Resins or HDPE Corrugated Pipe
- F2138 Standard Specification for Excess Flow Valves for Natural Gas Service
- F2145 Standard Specification for Polyamide 11 (PA 11) and Polyamide 12 (PA12) Mechanical Fittings for Use on Outside Diameter Controlled Polyamide 11 and Polyamide 12 Pipe and Tubing
- F2158 Standard Specification for Residential Central-Vacuum Tube and Fittings
- F2159 Standard Specification for Plastic Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing
- F2160 Standard Specification for Solid Wall High Density Polyethylene (HDPE) Conduit Based on Controlled Outside Diameter (OD)
- F2164 Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure
- F2165 Standard Specification for Flexible Pre-Insulated Piping
- F2176 Standard Specification for Mechanical Couplings Used on Polyethylene Conduit, Duct and Innerduct
- F2206 Standard Specification for Fabricated Fittings of Butt-Fused Polyethylene (PE) Plastic Pipe, Fittings, Sheet Stock, Plate Stock, or Block Stock
- F2207 Standard Specification for Cured-in-Place Pipe Lining System for Rehabilitation of Metallic Gas Pipe
- F2231 Standard Test Method for Charpy Impact Test on Thin Specimens of Polyethylene Used in Pressurized Pipes
- F2261 Standard Test Method for Pressure Rating Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40 and 80 Socket-Type
- F2262 Standard Specification for Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene Tubing OD Controlled SDR9
- F2263 Standard Test Method for Evaluating the Oxidative Resistance of Polyethylene (PE) Pipe to Chlorinated Water
- F2306 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

- F2307 Standard Specification for Series 10 Poly(Vinyl Chloride) (PVC) Closed Profile Gravity Pipe and Fittings Based on Controlled Inside Diameter
- F2331 Standard Test Method for Determining Chemical Compatibility of Thread Sealants with Thermoplastic Threaded Pipe and Fittings Materials
- F2389 Standard Specification for Pressure-rated Polypropylene (PP) Piping Systems
- F2390 Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent (DWV) Pipe and Fittings Having Post-Industrial Recycle Content
- F2418 Standard Specification for Polypropylene (PP) Corrugated Wall Stormwater Collection Chambers
- F2433 Standard Test Method for Determining Thermoplastic Pipe Wall Stiffness
- F2434 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
- F2435 Standard Specification for Steel Reinforced Polyethylene (PE) Corrugated Pipe
- F2487 Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Corrugated High Density Polyethylene Pipelines
- F2509 Standard Specification for Field-assembled Anodeless Riser Kits for Use on Outside Diameter Controlled Polyethylene Gas Distribution Pipe and Tubing
- F2510 Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and Corrugated High Density Polyethylene Drainage Pipes
- F2536 Standard Guide for Installing Plastic DWV Piping Suspended from On-Grade Slabs
- F2561 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
- F2562 Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage
- F2599 Standard Practice for The Sectional Repair of Damaged Pipe By Means of An Inverted Cured-In-Place Liner
- F2600 Standard Specification for Electrofusion Type Polyamide-11 Fittings for Outside Diameter Controlled Polyamide-11 Pipe and Tubing
- F2618 Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Fittings for Chemical Waste Drainage Systems
- F2619/F2619M-Standard Specification for High-Density Polyethylene (PE) Line Pipe
- F2620 Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings
- F2623 Standard Specification for Polyethylene of Raised Temperature (PE-RT) SDR 9 Tubing

- F2634 Standard Test Method for Laboratory Testing of Polyethylene (PE) Butt Fusion Joints using Tensile-Impact Method
- F2648 Standard Specification for 2 to 60 inch [50 to 1500 mm] Annular Corrugated Profile Wall Polyethylene (PE) Pipe and Fittings for Land Drainage Applications
- F2649 Standard Specification for Corrugated High Density Polyethylene (HDPE) Grease Interceptor Tanks
- F2657 Standard Test Method for Outdoor Weathering Exposure of Crosslinked Polyethylene (PEX) Tubing
- F2658 Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) SDR 51 and SDR 64 Sewer Pipe and Fittings
- F2718 Standard Specification for Polyethylene (PE) and Cement Materials for an Encapsulated Cement Mortar Formed in Place Liner System (FIPLS) for the Rehabilitation of Water Pipelines
- F2719 Standard Practice for Installation of Polyethylene (PE) and Encapsulated Cement Mortar Formed in Place Lining System (FIPLS) for the Rehabilitation of Water Pipelines
- F2720 Standard Specification for Glass Fiber Reinforced Polyethylene (PE-GF) Spiral Wound Large Diameter Pipe
- F2735 Standard Specification for Plastic Insert Fittings For SDR9 Cross-linked Polyethylene (PEX) and Polyethylene of Raised Temperature (PE-RT) Tubing
- F2736 Standard Specification for 6 to 30 in. (152 To 762 mm) Polypropylene (PP) Corrugated Single Wall Pipe and Double Wall Pipe
- F2737 Standard Specification for Corrugated High Density Polyethylene (HDPE) Water Quality Units
- F2767 Standard Specification for Electrofusion Type Polyamide-12 Fittings for Outside Diameter Controlled Polyamide-12 Pipe and Tubing for Gas Distribution
- F2768 Standard Specification for Modified Stub ACME Thread Joint with Elastomeric Seal in Plastic Piping Components
- F2769 Standard Specification for Polyethylene of Raised Temperature (PE-RT) Plastic Hot and Cold-Water Tubing and Distribution Systems
- F2785 Standard Specification for Polyamide 12 Gas Pressure Pipe, Tubing, and Fittings
- F2786 Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Gaseous Media Under Pressure (Pneumatic Leak Testing)
- F2787 Standard Practice for Structural Design of Thermoplastic Corrugated Wall Storm water Collection Chambers
- F2788 Standard Specification for Crosslinked Polyethylene (PEX) Pipe
- F2805 Standard Specification for Multilayer Thermoplastic And Flexible Steel Pipe And Connections
- F2817 Standard Specification for Poly (Vinyl Chloride) (PVC) Gas Pressure Pipe and Fittings For Maintenance or Repair

## Gas Pipe, Tubing, and Fittings

### Specifications for:

- D2235 Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings
- D2321 Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
- D2513 Thermoplastic Gas Pressure Pipe, Tubing, and Fittings
- D 2517 Reinforced Epoxy Resin Gas Pressure Pipe and Fittings
- D2680 Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping
- D3138 Standard Specification for Solvent Cements for Transition Joints Between Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Non-Pressure Piping Components
- D3212 Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
- D3262 Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe
- F405 Standard Specification for Corrugated Polyethylene (PE) Pipe and Fittings
- F481 Standard Practice for Installation of Thermoplastic Pipe and Corrugated Pipe in Septic Tank Leach Fields
- F794 Standard Specification for Poly(Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter
- F891 Standard Specification for Coextruded Poly(Vinyl Chloride) (PVC) Plastic Pipe With a Cellular Core
- F894 Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe
- F1336 Standard Specification for Poly(Vinyl Chloride) (PVC) Gasketed Sewer Fittings
- F1504 Standard Specification for Folded Poly(Vinyl Chloride) (PVC) Pipe for Existing Sewer and Conduit Rehabilitation
- F1675 Standard Practice for Life-Cycle Cost Analysis of Plastic Pipe Used for Culverts, Storm Sewers, and Other Buried Conduits
- F1803 Standard Specification for Poly (Vinyl Chloride)(PVC) Closed Profile Gravity Pipe and Fittings Based on Controlled Inside Diameter
- F1867 Chloride) (PVC) Pipe Type A for Existing Sewer and Conduit Rehabilitation
- F1871 Standard Specification for Folded/formed Poly (Vinyl Chloride) Pipe Type A for Existing Sewer and Conduit Rehabilitation
- F1947 Standard Practice for Installation of Folded Poly (Vinyl Chloride) (PVC) Pipe into Existing Sewers and Conduits
- F2145 Standard Specification for Polyamide 11 (PA 11) and Polyamide 12 (PA12) Mechanical Fittings for Use on Outside Diameter Controlled Polyamide 11 and Polyamide 12 Pipe and Tubing

- F2306 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
- F2307 Standard Specification for Series 10 Poly(Vinyl Chloride) (PVC) Closed Profile Gravity Pipe and Fittings Based on Controlled Inside Diameter
- F2562 Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage
- F2620 Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings
- F2648 Standard Specification for 2 to 60 inch [50 to 1500 mm] Annular Corrugated Profile Wall Polyethylene (PE) Pipe and Fittings for Land Drainage Applications
- F2658 Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) SDR 51 and SDR 64 Sewer Pipe and Fittings
- F2736 Standard Specification for 6 to 30 in. (152 To 762 mm) Polypropylene (PP) Corrugated Single Wall Pipe And Double Wall Pipe
- F2785 Standard Specification for Polyamide 12 Gas Pressure Pipe, Tubing, and Fittings

**Practice for:**

- F689 Determination of the Temperature of Above-Ground Plastic Gas Pressure Pipe within Metallic Casings

**Guide for:**

- F1025 Selection and Use of Full-Encirclement-Type Band Clamps for Reinforcement or Repair of Punctures or Holes in Polyethylene Gas Pressure Pipe
- F1041 Squeeze-Off of Polyolefin Gas Pressure Pipe and Tubing

### **Sewer Pipe and Fittings**

**Specification for:**

- D256 Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics
- D494 Standard Test Method for Acetone Extraction of Phenolic Molded or Laminated Products
- D542 Standard Test Method for Index of Refraction of Transparent Organic Plastics
- D543 Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents
- D570 Standard Test Method for Water Absorption of Plastics
- D618 Standard Practice for Conditioning Plastics for Testing

- D635 Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position
- D638 Standard Test Method for Tensile Properties of Plastics
- D648 Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position
- D695 Standard Test Method for Compressive Properties of Rigid Plastics
- D696 Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C With a Vitreous Silica Dilatometer
- D704 Standard Specification for Melamine-Formaldehyde Molding Compounds
- D705 Standard Specification for Urea-Formaldehyde Molding Compounds
- D706 Standard Classification System and Basis for Specifications for Cellulose Acetate Molding and Extrusion Compounds
- D707 Standard Classification System and Basis for Specification for Cellulose Acetate Butyrate Molding and Extrusion Compounds
- D731 Standard Test Method for Molding Index of Thermosetting Molding Powder
- D732 Standard Test Method for Shear Strength of Plastics by Punch Tool
- D746 Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
- D747 Standard Test Method for Apparent Bending Modulus of Plastics by Means of a Cantilever Beam
- D785 Standard Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials
- D787 Standard Specification for Ethyl Cellulose Molding and Extrusion Compounds
- D788 Standard Classification System for Poly(Methyl Methacrylate) (PMMA) Molding and Extrusion Compounds
- D789 Standard Test Methods for Determination of Solution Viscosities of Polyamide (PA)
- D790 Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
- D792 Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
- D882 Standard Test Method for Tensile Properties of Thin Plastic Sheeting
- D883 Standard Terminology Relating to Plastics
- D952 Standard Test Method for Bond or Cohesive Strength of Sheet Plastics and Electrical Insulating Materials
- D953 Standard Test Method for Bearing Strength of Plastics
- D955 Standard Test Method of Measuring Shrinkage from Mold Dimensions of Thermoplastics
- D957 Standard Practice for Determining Surface Temperature of Molds for Plastics
- D1003 Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics

- D1004 Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheet
- D1042 Standard Test Method for Linear Dimensional Changes of Plastics Under Accelerated Service Conditions
- D1043 Standard Test Method for Stiffness Properties of Plastics as a Function of Temperature by Means of a Torsion Test
- D1044 Standard Test Method for Resistance of Transparent Plastics to Surface Abrasion
- D1045 Standard Test Methods for Sampling and Testing Plasticizers Used in Plastics
- D1055 Standard Specifications for Flexible Cellular Materials-Latex Foam
- D1056 Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber
- D1201 Standard Specification for Thermosetting Polyester Molding Compounds
- D1203 Standard Test Methods for Volatile Loss From Plastics Using Activated Carbon Methods
- D1204 Standard Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheet or Film at Elevated Temperature
- D1238 Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer
- D1239 Standard Test Method for Resistance of Plastic Films to Extraction by Chemicals
- D1243 Standard Test Method for Dilute Solution Viscosity of Vinyl Chloride Polymers
- D1248 Standard Specification for Polyethylene Plastics Extrusion Materials For Wire and Cable
- D1430 Standard Classification System for Polychlorotrifluoroethylene (PCTFE) Plastics
- D1435 Standard Practice for Outdoor Weathering of Plastics
- D1494 Standard Test Method for Diffuse Light Transmission Factor of Reinforced Plastics Panels
- D1499 Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Plastics
- D1505 Standard Test Method for Density of Plastics by the Density-Gradient Technique
- D2680 Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping
- D2729 Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
- D2751 Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings
- D2852 Styrene-Rubber (SR) Plastic Drain Pipe and Fittings
- D 3034 Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
- D3262 "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer Pipe
- D3754 "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer and Industrial Pressure Pipe
- D3840 "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Fittings for Non-Pressure Applications

- F679 Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings
- F949 Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings
- F1417 Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air
- F1504 Folded Poly (Vinyl Chloride) (PVC) Pipe for Existing Sewer and Conduit Rehabilitation
- F1697 Poly (Vinyl Chloride) (PVC) Profile Strip for Machine Spiral Wound Liner Pipe Rehabilitation of Existing Sewers and Conduits
- F1698 Installation of Poly (Vinyl Chloride) (PVC) Profile Strip Liner and Cementitious Grout for rehabilitation of Existing Man-Entry Sewers and Conduits

**Practice for:**

- D2321 Underground Installation of Thermoplastic Sewer Pipe for Sewers and Other Gravity-Flow Applications
- F1606 Rehabilitation of Existing Sewers and Conduits with Deformed Polyethylene (PE) Liner
- F1675 Life-Cycle Cost Analysis of Plastic Pipe used for Culverts, Storm Sewers and Other Buried Conduits
- F1759 Practice for Design of High Density Polyethylene (HDPE) Manholes for Subsurface Applications

**Hot and Cold Water Distribution Pipe and Fittings**

**Specification for:**

- D2846 Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Hot- and Cold-Water Distribution Systems
- F877 Crosslinked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems

**C. PLASTICS PIPE INSTALLATION AND COMPONENTS**

**Fittings**

**Specification for:**

- D2464 Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
- D2466 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
- D2467 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
- D2609 Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe
- D2683 Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing

- D3261 Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
- F437 Threaded Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80
- F438 Socket-Type Chlorinated Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
- F439 Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80
- F1055 Electrofusion-Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing

**Practice for:**

- F725 Drafting Impact Test Requirements in Thermoplastic Pipe and Fittings Standards

**Joints, Seals, Solvent Cements and Primers**

**Specification for:**

- D2235 Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings
- D2564 Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
- D3122 Solvent Cements for Styrene-Rubber (SR) Plastic Pipe and Fittings
- D3138 Solvent Cements for Transition Joints Between Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Non-Pressure Piping Components
- D3139 Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
- D3212 Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
- D4161 "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe Joints Using Flexible Elastomeric Seals
- F477 Elastomeric Seals (Gaskets) for Joining Plastic Pipe
- F493 Solvent Cements for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe and Fittings
- F656 Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings
- F913 Thermoplastic Elastomeric Seals (Gaskets) for Joining Plastic Pipe
- F1056 Socket Fusion Tools for Use in Socket Fusion Joining Polyethylene Pipe or Tubing and Fittings

**Practice for:**

- D2657 Heat Fusion Joining of Polyolefin Pipe and Fittings
- D2855 Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings
- F402 Safe Handling of Solvent Cements, Primers, and Cleaners Used for Joining Thermoplastic Pipe and Fittings

## Underground Installation

### Practice for:

- D2321 Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
- D2774 Underground Installation of Thermoplastic Pressure Piping
- D3839 Underground Installation of "Fiberglass" (Glass-Fiber Reinforced Thermosetting-Resin) Pipe
- F449 Subsurface Installation of Corrugated Polyethylene Pipe for Agricultural Drainage or Water Table Control
- F481 Installation of Thermoplastic Pipe and Corrugated Pipe in Septic Tank Leach Fields
- F585 Insertion of Flexible Polyethylene Pipe into Existing Sewers
- F690 Underground Installation of Thermoplastic Pressure Piping Irrigation Systems
- F1176 Design and Installation of Underground Thermoplastic Irrigation Systems with Maximum Working Pressure of 125 psi
- F1216 Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin Impregnated Tube
- F1668 Construction Procedures for Buried Plastic Pipe

## D. GENERAL TEST METHODS

### Test Method for:

- D1598 Time-to-Failure of Plastic Pipe Under Constant Internal Pressure
- D1599 Short-Time hydraulic Failure Pressure of Plastic Pipe, Tubing, and Fittings
- D2105 Longitudinal Tensile Properties of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Tube
- D2122 Determining Dimensions of Thermoplastic Pipe and Fittings
- D2143 Cyclic Pressure Strength of Reinforced, Thermosetting Plastic Pipe
- D2152 Adequacy of Fusion of Extruded Poly (Vinyl Chloride) (PVC) Pipe and Molded Fittings by Acetone Immersion
- D2290 Apparent Hoop Tensile Strength of Plastic or Reinforced Plastic Pipe by Split Disk Method
- D2412 Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
- D2444 Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)
- D2837 Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products
- D2924 External Pressure Resistance of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Pipe

- D2925 Beam Deflection of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Pipe Under Full Bore Flow
- D3681 Chemical Resistance of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe in a Deflected Condition
- F948 Time-to-Failure of Plastic Piping Systems and Components Under Constant Internal Pressure with Flow

**Practice for:**

- D2487 Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- D2488 Description and Identification of Soils (Visual-Manual Procedure)
- D2992 Obtaining Hydrostatic or Pressure Design Basis for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and fittings
- D3567 Determining Dimensions of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Pipe and Fittings
- F1057 Estimating the Quality of Extruded Poly (Vinyl Chloride) (PVC) Pipe by the Heat Reversion Technique

## **SECTION III**

### **AASHTO**

American Association of State Highway and  
Transportation Officials  
444 North Capitol St., NW, Suite 249  
Washington, DC 20001  
(202) 624-5800  
Internet Address: [www.transportation.org](http://www.transportation.org)

- M 252 Standard Specification for Corrugated Polyethylene Drainage Pipe
- M 264 Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS)  
and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping
- M 278 Standard Specification for Class PS46 Poly(Vinyl Chloride) (PVC)  
Pipe
- M 294 Standard Specification for Corrugated Polyethylene Pipe, 300- to  
1500-mm Diameter
- M 297 Standard Specification for Preformed Polychloroprene Elastomeric  
Joint Seals for Bridges
- M 304 Standard Specification for Poly(Vinyl Chloride) (PVC) Profile Wall  
Drain Pipe and Fittings Based on Controlled Inside Diameter

### **ANSI**

American National Standards Institute, Inc.  
25 West 43<sup>rd</sup> Street, 4<sup>th</sup> floor  
New York, NY 10036  
(212) 642-4900  
Internet Address: [www.ansi.org](http://www.ansi.org)

- Z223.1 National Fuel Gas Code Handbook
- ANSI/SPI B151.1-2007 Plastics Machinery -Horizontal Injection Molding  
Machines -Safety Requirements for Manufacture, Care, and Use
- ANSI/SPI B151.15-2003 Extrusion Blowmolding Machines - Safety  
Requirements for the Manufacture Care and Use
- ANSI/SPI B151.20-1999 American National Standard for Plastic Sheet  
Production Machinery - Manufacture, Care and Use
- ANSI/SPI B151.21-2003 Injection Blowmolding Machinery - Safety  
Requirements for Manufacture, Care and Use
- ANSI/SPI B151.2-1999 Film Casting Machines - Construction, Care, and Use  
(revision and redesignation of ANSI B151.2-1982 (R1988))
- ANSI/SPI B151.29-2002 Safety Requirements for the Manufacture, Care and  
Use of Vertical Clamp Injection Molding Machines
- ANSI/SPI B151.5-2000 Plastic Film and Sheet Winding Machinery -  
Manufacture, Care, and Use

**API** American Petroleum Institute  
Publications and Distribution Section  
1220 L St., NW  
Washington, DC 20005  
(202) 682-8000  
Internet Address: [www.api.org](http://www.api.org)

15LE Specification for Polyethylene Line Pipe (PE), Fourth Edition  
15HR Specification for High Pressure Fiberglass Line Pipe  
  
15LR Specification For Low Pressure Fiberglass Line Pipe and Fittings  
15LT Specification for PVC Lined Steel Tubular Goods  
RP5L2 Internal Coating of Line Pipe for Non-Corrosive Gas  
Transmission Service, Fourth Edition

**ASABE** American Society of Agricultural and Biological Engineers  
2950 Niles Road  
St. Joseph, MI 49085-9659  
(269) 429-0300  
Internet Address: [www.asabe.org](http://www.asabe.org)

S376.2 Design, Installation and Performance of Underground  
Thermoplastic Irrigation Pipelines  
S435 Polyethylene Pipe used for Microirrigation Laterals  
ANSI/ASAE S261.7 OCT96 Design and Installation of Nonreinforced  
Concrete Irrigation Pipe Systems

**ASME** United Engineering Center  
345 East 47th Street  
New York, NY 10017  
(212) 705-7722

#### ASME Guide for Gas Transportation and Distribution Piping Systems

B16.40 Manually Operated Thermoplastic Gas Shutoffs and Valves in Gas  
Distribution Systems  
B31.3 Process Piping  
B31.4 Pipeline Transportation Systems for Liquid Hydrocarbons and  
Other Liquids  
B31.8 Gas Transmission and Distribution Piping Systems  
B31.9 Building Services Piping  
B31.11 Slurry Transportation Piping Systems

**AWWA**

American Water Works Association  
6666 West Quincy Ave.  
Denver, CO 80235  
Internet Address: [www.awwa.org](http://www.awwa.org)

- C105 American National Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems
- C215 Extruded Polyolefin Coatings for the Exterior of Steel Water Pipelines
- C216 Heat-Shrinkable Cross-Linked Polyolefin Coatings for the Exterior of Special Sections, Connections, and Fittings for Steel Water Pipelines
- C303 Concrete Pressure Pipe, Bar-Wrapped, Steel-Cylinder Type
- C605 Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water
- C900 Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In.-12In. (100 mm-300 mm), for Water Transmission and Distribution
- C901 Polyethylene (PE) Pressure Pipe and Tubing, 1/2 In. (13 mm) Through 3 In. (76 mm), for Water Service
- C904 ANSI/AWWA C904-06, AWWA Standard for Cross-Linked Polyethylene (PEX) Pressure Pipes, ½ In. (12 mm) Through 3 In. (76 mm) for Water Service
- C906 AWWA Standard for Polyethylene (PE) Pressure Pipe and Fittings, 4 In. (100 mm) Through 63 In. (1,575 mm), for Water Distribution and Transmission
- C907 Polyvinyl Chloride (PVC) Pressure Fittings for Water-4IN. through 8 In. (100 mm through 200 mm)
- C908 PVC Self-Tapping Saddle Tees for Use on PVC Pipe
- C909 ANSI/AWWA C909-09, AWWA Standard for Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe, 4 In. Through 24 In. (100 mm Through 600 mm), for Water, Wastewater, and Reclaimed Water Service
- C950 Fiberglass Pressure Pipe

**Bell Communication Research Inc.**  
445 South Street  
Morristown, NY 07960  
Internet Address: [www.telcordia.com](http://www.telcordia.com)

- GR356 Generic Requirements for Optical Cable Innerduct, Associated Conduit, and Accessories

**CGSB** Public Works and Government Services Canada  
11 Laurier Street, PDP III  
Gatineau, Quebec  
K1A 0S5  
Canada  
ATTN: General Enquiry  
  
(800) 622-6232  
Internet Address: [www.pwgsc.gc.ca](http://www.pwgsc.gc.ca)

41-GP-25M Pipe, Polyethylene for the Transport of Liquids, October, 1977

**CSA** Canadian Standards Association  
178 Rexdale Blvd.  
Toronto, Ontario  
Canada M9W 1R3  
(416) 747-4000  
Internet Address: [www.csa-international.org](http://www.csa-international.org)

- B 125.1 Plumbing Supply Fittings
- B 125.2 Plumbing Waste Fittings
- B 125.3 Plumbing Fittings
- B 137.0 Definitions, General Requirements and Methods of Testing for Thermoplastic Pressure Piping
- B 137.1 Polyethylene (PE) Pipe, Tubing, and Fittings for Cold-Water Pressure Services
- B 137.2 Polyvinylchloride (PVC) Injection-Moulded Gasketed Fittings for Pressure Applications
- B 137.3 Rigid Polyvinylchloride (PVC) Pipe and Fittings for Pressure Applications
- B 137.4 Polyethylene (PE) Piping Systems for Gas Services
- B 137.4.1 Electrofusion-Type Polyethylene (PE) Fittings for Gas Services
- B 137.5 Crosslinked Polyethylene (PEX) Tubing Systems for Pressure Applications
- B 137.6 Chlorinated polyvinylchloride (CPVC) Pipe, Tubing, and Fittings for Hot- and Cold- Water Distribution Systems
- B 137.8 Polybutylene (PB) Piping Systems for Pressure Applications
- B 137.9 Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure-Pipe Systems
- B 137.10 Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene (PEX-AL-PEX) Composite Pressure-Pipe Systems
- B 137.11 Polypropylene (PP-R) Pipe and Fittings for Pressure Applications
- B 137.12 Polyamide (PA) Piping Systems for Gas Services
- B 180.0 Definitions, General Requirements, and Methods of testing for Thermoplastic Nonpressure Piping
- B 181.1 Acrylonitrile-butadiene-styrene (ABS) Drain, Waste and Vent Pipe and Pipe Fittings
- B 181.2 Polyvinylchloride (PVC) and Chlorinated Polyvinylchloride (CPVC) Drain, Waste and Vent Pipe and Pipe Fittings

- B 181.3 Polyolefin and Polyvinylidene (PVDF) Laboratory Drainage Systems
- B 181.5 Coextruded Acrylonitrile-butadienestyrene/polyvinylchloride (ABS/PVC) Drain, Waste and Vent Pipe
- B 182.1 Plastic Drain and Sewer Pipe and Pipe Fittings
- B 182.2 PSM Type Polyvinylchloride (PVC) Sewer Pipe and Fittings
- B 182.4 Profile Polyvinylchloride (PVC) Sewer Pipe and Fittings
- B 182.6 Profile Polyethylene (PE) Sewer Pipe and Fittings for Leak-Proof Sewer Applications
- B 182.7 PSM Type Multilayer Polyvinylchloride (PVC) Sewer Pipe Having Reprocessed-Recycled Content
- B 181.8 Profile Polyethylene (PE) Storm Sewer and Drainage Pipe and Fittings
- B 181.11 Standard Practice for the Installation of Thermoplastic Drain, Storm, and Sewer Pipe and Fittings
- B 196.3 PVC Underground Telecommunication Cable Ducting and Fittings
- B 602 Mechanical Couplings for Drain, Waste and Vent Pipe and Sewer Pipe
- C 22.2 General Requirements and Methods of Testing for NonMetallic Conduit (No. 211.0)
- C 22.2 Rigid Types EB1and DB2/ES2 PVC Conduit (No. 211.1)
- C 22.2 Rigid PVC (Unplasticized) Conduit (No. 211.2)

**Department of  
Agriculture**

U.S. Department of Agriculture  
 Natural Resources Conservation Service  
 P.O. Box 2890  
 Washington, DC 20013  
 Internet Address: [www.nrcs.usda.gov](http://www.nrcs.usda.gov)

- NHCP National Handbook of Conservation Practices
- NHCP 378 Pond, July 2002
- NHCP 410 Grade Stabilization Structure, October 1985
- NHCP 430-DD Irrigation Water Conveyance, High-Pressure, Underground, Plastic Pipeline, December 1988
- NHCP 430-EE Irrigation Water Conveyance, Low Pressure, Underground, Plastic Pipeline, December 1988
- NHCP 430-GG Irrigation Water Conveyance, Reinforced Plastic Mortar, Pipeline, April 1982
- NCHP 431 Above Ground, Multi-Outlet Pipeline, August 2006
- NHCP 441 Irrigation System, Microirrigation, August 2006
- NHCP 442 Irrigation System, Sprinkler, December 2003
- NHCP 443 Irrigation System, Surface and Subsurface, March 2003
- NHCP 447 Irrigation System, Tailwater Recovery, June 2007
- NHCP 516 Pipeline, August 2000
- NCHP 587 Structure for Water Control, December 2003
- NHCP 606 Subsurface Drain, September 2003
- NHCP 614 Watering Facility, August 2006
- NHCP 620 Underground Outlet, September 2008

NHCP 630	Vertical Drain, May 2004
NHCP 634	Waste Transfer, November 2008
NHCP 636	Water Harvesting Catchment, September 2003
NHCP 638	Water and Sediment Control Basin, September 2008
NHCP 640	Waterspreading, July 2002
NHCP 642	Well, February 2005

**U.S. Department of Transportation (DOT)**

Pipeline and Hazardous Materials Safety Administration

1200 New Jersey Ave, SE  
 East Building, 2<sup>nd</sup> Floor  
 Washington, D.C. 20590  
 202-366-0656

Pipeline Safety, Title 49, CFR Part 192. Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards. (Included in 49 CFR Parts 190 to 199). Available at <http://ecfr.gpoaccess.gov>

**HUD**

U.S. Department of Housing & Urban  
 Development  
 451 7<sup>th</sup> Street S.W.  
 Washington, DC 20410  
 (202) 708-1122  
<http://portal.hud.gov>

UM-76	CPVC and PB Hot and Cold Water Distribution Piping
UM-78	PE, ABS, PVC, and PB Plastic Piping for Domestic Cold Water Service
UM-79	ABS and PVC Plastic Drain, Waste and Vent Pipe and Fittings

The following are former FHA standards that have been superseded by those listed above:

UM-31e	Polyethylene Plastic Pipe and Fittings for Domestic Water Service (September 1, 1966)
UM-41	PVC Plastic Pipe and Fittings for Domestic Water service (August 1, 1996)
UM-43	Acrylonitrile-Butadiene-Styrene Plastic Pipe and Fittings for Domestic Water Service (November 1, 1966)
UM-49	ABS and PVC Plastic Drainage and Vent Pipe and Fittings, FHA 4550.49 (May 1, 1968)
UM-53a	Polyvinyl Chloride Plastic Drainage, Waste and Vent Pipe and Fittings (February 22. 1971)
UM-54	ABS (Acrylonitrile-Butadiene-Styrene) Plastic Drainage, Water and Vent Pipe and Fittings (March 2, 1970)

- UM-61 (CPVC) - -Hot and Cold Water Distribution Systems - - Chlorinated Polyvinyl Chloride (April 9, 1971)
- MR-562 Rigid Chlorinated Polyvinyl Chloride (CPVC) Hi/Temp Water Pipe and Fittings (November 3, 1967)
- MR-563 PVC Plastic Drainage and Vent Pipe and Fittings (November 6, 1967)

**IAPMO**

International Association of Plumbing and Mechanical Officials  
 5001 E. Philadelphia St.  
 Ontario, CA 91761  
 (909) 472-4100  
 Internet Address: [www.iapmo.org](http://www.iapmo.org)

- IS 01-2006 Non-Metallic Building Sewers
- IS 05-2006 ABS Building Drain, Waste and Vent Pipe and Fittings
- IS 07-2008 Polyethylene (PE) Cold Water Building Supply and Yard Piping
- IS 08-2006 PVC Cold Water Building Supply and Yard Piping
- IS 09-2006 PVC Building Drain, Waste and Vent Pipe and Fittings
- IS 11-2006 ABS Sewer Pipe and Fittings
- IS 12-2006 Polyethylene (PE) for Gas Yard Piping
- IS 20-2006 CPVC Solvent Cemented Hot and Cold Water Distribution Systems
- IS 26-2006 Trenchless Insertion of Polyethylene (PE) Pipe for Sewer Laterals
- IS 28-2005 Composite PEX-AL-PEX Hot and Cold PE-AL-PE Water Distribution Systems
- PS 25-2002 Metallic Fittings for Joining Polyethylene Pipe for Water Service and Yard Piping
- PS 34-2003 Polyethylene Encasement Sleeve for Potable Water Pipe and Tubing
- PS 53-2008 Grooved Mechanical Pipe Couplings and Grooved End Fittings
- PS 64-2007a Pipe Flashings
- IGC 109-2009c Water Distribution Manifolds for Use with SDR 9 PEX Tubing, PE-AL-PE, & PEX-AL-PEX Composite Piping
- IGC 116-99 Metal Insert Fittings for Polyethylene/Aluminum/Polyethylene and Crosslinked Polyethylene/Aluminum/Polyethylene Composite Pressure Pipe
- IGC 121-98a PVC Plastic Valves for Cold Water Distribution Systems Outside a Building and CPVC Plastic Valves for Hot and Cold Water Distribution Systems
- IGC 122-2005a Test Caps and Test Gates with ABS (Acrylonitrile-Butadiene-Styrene) or PVC (Poly Vinyl Chloride) Housings
- IGC 157-2009a Ball Valves

- IGC 166-2001e1 Plastic DWV to Sewer Adapter Fittings
- IGC 176-2002 Compression Fittings for PEX-AL-PEX Tubing
- IGC 188-2009 Removable and Non-Removable Push Fit Fittings  
(Recognized in Canada)
- IGC 192-2004 Plastic Acrylonitrile-Butadiene Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Drain, Waste and Vent (DWV) Pressure Test Fittings for Use in ABS, PVC or Cast Iron DWV Piping Systems
- IGC 212-2009a Factory Applied Aluminum and Polyethylene or Crosslinked Polyethylene Coated SDR 9 PEX Tubing
- IGC 223-2007 Polypropylene-Aluminum-Polypropylene Multilayer Piping Systems for Hot and Cold Water
- IGC 224-2009 ABS, PVC and Cast Iron DWV Test Fitting with Integral Cleanout
- IGC 228-2006 Polyethylene of Raised Temperature (PE-RT) Tubing
- IGC 232-2006 PVC Valve with Integral Ball and Spring-Check or Swing-Check Features
- IGC 239-2007 Aluminum-Polypropylene Multilayer Piping Systems for Hot- and Cold- Water
- IGC 243-2007 Chlorinated Poly (Vinyl Chloride)-Aluminum-Chlorinated Poly (Vinyl Chloride) (CPVC-AL-CPVC) Tubing and Fittings
- IGC 251-2008 Structural Adhesive Fitting Systems for Joining PVC, CPVC, ABS, PP, PE, PEX, and Copper Tubing
- IGC 265-2008 PVC Reinforcement Ring for PVC DWV Joints
- IGC 266-2010 Polyethylene of Raised Temperature (PE-RT) Multilayer Piping Systems for Hot- and Cold- Water
- IGC 269-2009 PVC or ABS Cover for Use with Unshielded Flexible Transition Couplings for Underground Piping Systems

**ISO**

International Organization for Standardization (ISO)  
 1, ch. de la Voie-Creuse,  
 Case postale 56  
 CH-1211 Geneva 20, Switzerland  
 +41-22-749-01-1  
 Internet Address: [www.iso.ch](http://www.iso.ch)

**USA Secretariat:**

American National Standards Institute  
 1430 Broadway  
 New York, NY 10019  
 (212) 354-3300

## Plastics Pipes

- 161-1:1996 Thermoplastics Pipes for the Conveyance of Fluids – Nominal Outside Diameters and Nominal Pressures – Part 1: Metric Series
- 161-2:1996 Thermoplastic Pipes for the Conveyance of Fluids – Nominal Outside Diameters and Nominal Pressures – Part 2: Inch Series
- 1167-1:2006 Plastics Pipes, Fittings, and Assemblies for the Conveyance of Fluids – Determination of the Resistance to Internal Pressure – Part 1: General Method
- 1167-2:2006 Plastics Pipes, Fittings, and Assemblies for the Conveyance of Fluids – Determination of the Resistance to Internal Pressure – Part 2: Preparation of Pipe Test Pieces
- 1167-3:2006 Plastics Pipes, Fittings, and Assemblies for the Conveyance of Fluids – Determination of the Resistance to Internal Pressure – Part 3: Preparation of Components
- 1167-4:2006 Plastics Pipes, Fittings, and Assemblies for the Conveyance of Fluids – Determination of the Resistance to Internal Pressure – Part 4: Preparation of Assemblies
- 2505:2005 Thermoplastics Pipes – Longitudinal Reversion – Test Method and Parameters
- 2507-1:1995 Thermoplastics Pipes and Fittings – Vicat Softening Temperature – Part 1: General Test Method
- 2507-2:1995 Thermoplastics Pipes and Fittings – Vicat Softening Temperature – Part 2: Test Conditions for Unplasticized Poly (Vinyl Chloride) (PVC-U) or Chlorinated Poly (vinyl chloride) Pipes and Fittings and for High Impact Resistance Poly (vinyl chloride) (PVC-HI) Pipes
- 2507–3:1995 Thermoplastics Pipes and Fittings – Vicat Softening Temperature – Part 3: Test Conditions for Acrylonitrile/Butadiene/Styrene (ABS) and Acrylonitrile/Styrene/Acrylic Ester (ASA) Pipes and Fittings
- 3126:2005 Plastics Piping Systems – Plastics Components – Determination of Dimensions
- 3127:1994 Thermoplastics Pipes – Determination of Resistance to External Blow – Round-the-Clock Method
- 3213:1996 Polypropylene (PP) Pipes – Effect of Time and Temperature on Expected Strength
- 3514:1976 Chlorinated Polyvinyl Chloride (CPVC) Pipes and Fittings – Specification and Determination of Density
- 4059:1978 Polyethylene (PE) Pipes – Pressure Drop in Mechanical Pipe-Joining Systems – Method of Test and Requirements
- 4065:1996 Thermoplastic Pipes – Universal Wall Thickness Table
- 4433-1:1997 Thermoplastic Pipes – Resistance to Liquid Chemicals – Classification – Part 1: Immersion Test Method
- 4433-2:1997 Thermoplastic Pipes – Resistance to Liquid Chemicals – Classification – Part 2: Polyolefin Pipes

- 4433-3:1997 Thermoplastics Pipes – Resistance to Liquid Chemicals – Classification – Part 3: Unplasticized Poly(vinyl chloride) (PVC-U), High-impact Poly(vinyl chloride) (PVC-HI) and Chlorinated Poly(vinyl chloride) (PVC-C) Pipes
- 4433-4:1997 Thermoplastics Pipes – Resistance to Liquid Chemicals – Classification – Part 4: Poly(vinylidene fluoride) (PVDF) pipes
- 4439:1979 Unplasticized Polyvinyl Chloride (PVC) Pipes and Fittings – Determination of Specification of Density
- 6964:1986 Polyolefin Pipes and Fittings – Determination of Carbon Black Content by Calcination and Pyrolysis – Test Method and Basic Specification
- 7245:1984 Pipes and Fittings of Acrylonitrile/Butadiene/Styrene (ABS) – General Specification for Moulding and Extrusion Materials
- 7246:1984 Pipes and Fittings of Acrylonitrile/Styrene/Acrylester (ASA) –
- 7686:2005 Plastics Pipes and Fittings – Determination of Opacity
- 8361-1:1991 Thermoplastics Pipes and Fittings – Water Absorption – Part 1: General Test Method
- 8361-2:1991 Thermoplastics Pipes and Fittings – Water Absorption – Part 2: Test Conditions for Unplasticized Poly (vinyl chloride) (PVC-U) Pipes and Fittings
- 8361-3:1991 Thermoplastics Pipes and Fittings – Water Absorption – Part 3: Test Conditions for Acrylonitrile/Butadiene/Styrene (ABS) Pipes and Fittings
- 9852:2007 Unplasticized Poly (vinyl chloride) (PVC-U) Pipes – Dichloromethane Resistance at Specified Temperature (DCMT) – Test Method
- 9854-1:1994 Thermoplastics Pipes for the Transport of Fluids – Determination of Pendulum Impact Strength by the Charpy Method – Part 1: General Test Method
- 9854-2:1994 Thermoplastics Pipes for the Transport of Fluids – Determination of Pendulum Impact Strength by the Charpy Method – Part 2: Test Conditions for Pipes of Various Materials
- 9967:2007 Thermoplastics Pipes – Determination of Creep Ratio
- 9969:2007 Thermoplastics Pipes – Determination of Ring Stiffness
- 10146:2007 Crosslinked Polyethylene (PE-X) Pipes - Effect of Time and Temperature on the Expected Strength
- 10147:2004 Pipes and Fittings Made of Crosslinked Polyethylene (PE-X) – Estimation of the Degree of Crosslinking by Determination of the Gel Content
- TR 10358:1993 Plastics Pipes and Fittings – Combined Chemical-Resistance Classification Table
- TR 10501:1993 Thermoplastics Pipes for the Transport of Liquids Under Pressure – Calculation of Head Losses
- 11173:1994 Thermoplastics Pipes – Determination of Resistance to External Blows – Staircase Method
- 12091:1995 Structured-Wall Thermoplastics Pipes – Oven Test

- 12162:1995 Thermoplastics Materials for Pipes and Fittings for Pressure Applications – Classification and Designation – Overall Service (Design) Coefficient
- 12230:1996 Polybutene (PB) Pipes - Effect of Time and Temperature on the Expected Strength
- 13760:1998 Plastics Pipes for the Conveyance of Fluids under Pressure – Miner’s Rule Calculation Method for Cumulative Damage
- 11295:2010 Classification and information on design of plastics piping systems used for renovation
- 11296-1:2009 Plastics piping systems for renovation of underground non-pressure drainage and sewerage networks -- Part 1: General
- 11296-3:2009 Plastics piping systems for renovation of underground non-pressure drainage and sewerage networks -- Part 3: Lining with close-fit pipes
- 11296-4:2009 Plastics piping systems for renovation of underground non-pressure drainage and sewerage networks -- Part 4: Lining with cured-in-place pipes
- ISO/DIS 11296-7 Plastics piping systems for renovation of underground non-pressure drainage and sewerage networks -- Part 7: Lining with spirally-wound pipes
- ISO 11298-1:2010 Plastics piping systems for renovation of underground water supply networks -- Part 1: General
- ISO 11298-3:2010 Plastics piping systems for renovation of underground water supply networks -- Part 3: Lining with close-fit pipes
- ISO/DIS 11299-1 Plastics piping systems for renovation of underground gas supply networks -- Part 1: General
- ISO/DIS 11299-3 Plastics piping systems for renovation of underground gas supply networks -- Part 3: Lining with close-fit pipes
- ISO 11922-1:1997 Thermoplastics pipes for the conveyance of fluids -- Dimensions and tolerances -- Part 1: Metric series
- ISO 11922-2:1997 Thermoplastics pipes for the conveyance of fluids -- Dimensions and tolerances -- Part 2: Inch-based series
- ISO 13966:1998 Thermoplastics pipes and fittings -- Nominal ring stiffnesses

## Water Piping

ISO 4427-1:2007	Plastics piping systems -- Polyethylene (PE) pipes and fittings for water supply -- Part 1: General
ISO 4427-2:2007	Plastics piping systems -- Polyethylene (PE) pipes and fittings for water supply -- Part 2: Pipes
ISO 4427-3:2007	Plastics piping systems -- Polyethylene (PE) pipes and fittings for water supply -- Part 3: Fittings
ISO 4427-5:2007	Plastics piping systems -- Polyethylene (PE) pipes and fittings for water supply -- Part 5: Fitness for purpose of the system
ISO 10508:2006	Plastics piping systems for hot and cold water installations -- Guidance for classification and design
ISO 15875-1:2003	Plastics piping systems for hot and cold water installations -- Crosslinked polyethylene (PE-X) -- Part 1: General
ISO 15875-2:2003	Plastics piping systems for hot and cold water installations -- Crosslinked polyethylene (PE-X) -- Part 2: Pipes
ISO 15875-3:2003	Plastics piping systems for hot and cold water installations -- Crosslinked polyethylene (PE-X) -- Part 3: Fittings
ISO 15875-5:2003	Plastics piping systems for hot and cold water installations -- Crosslinked polyethylene (PE-X) -- Part 5: Fitness for purpose of the system
ISO/TS 15875-7:2003	Plastics piping systems for hot and cold water installations -- Crosslinked polyethylene (PE-X) -- Part 7: Guidance for the assessment of conformity
ISO 21003-1:2008	Multilayer piping systems for hot and cold water installations inside buildings -- Part 1: General
ISO 21003-2:2008	Multilayer piping systems for hot and cold water installations inside buildings -- Part 2: Pipes
ISO 21003-3:2008	Multilayer piping systems for hot and cold water installations inside buildings -- Part 3: Fittings
ISO 21003-5:2008	Multilayer piping systems for hot and cold water installations inside buildings -- Part 5: Fitness for purpose of the system
ISO/TS 21003-7:2008	Multilayer piping systems for hot and cold water installations inside buildings -- Part 7: Guidance for the assessment of conformity
ISO 21004:2006	Plastics piping systems -- Multilayer pipes and their joints, based on thermoplastics, for water supply
ISO 22391-1:2009	Plastics piping systems for hot and cold water installations -- Polyethylene of raised temperature resistance (PE-RT) -- Part 1: General
ISO 22391-2:2009	Plastics piping systems for hot and cold water installations -- Polyethylene of raised temperature resistance (PE-RT) -- Part 2: Pipes
ISO 22391-3:2009	Plastics piping systems for hot and cold water installations -- Polyethylene of raised temperature resistance (PE-RT) --

### Part 3: Fittings

- ISO 22391-5:2009 Plastics piping systems for hot and cold water installations -- Polyethylene of raised temperature resistance (PE-RT) -- Part 5: Fitness for purpose of the system
- ISO/PRF TR 22391-7 Plastics piping systems for hot and cold water installations -- Polyethylene of raised temperature resistance (PE-RT) -- Part 7: Guidance for the assessment of conformity

### Gas Piping

- ISO 4437:2007 Buried polyethylene (PE) pipes for the supply of gaseous fuels -- Metric series -- Specifications
- ISO 8085-1:2001 Polyethylene fittings for use with polyethylene pipes for the supply of gaseous fuels -- Metric series -- Specifications -- Part 1: Fittings for socket fusion using heated tools
- ISO 8085-2:2001 Polyethylene fittings for use with polyethylene pipes for the supply of gaseous fuels -- Metric series -- Specifications -- Part 2: Spigot fittings for butt fusion, for socket fusion using heated tools and for use with electrofusion fittings
- ISO 8085-3:2001 Polyethylene fittings for use with polyethylene pipes for the supply of gaseous fuels -- Metric series -- Specifications -- Part 3: Electrofusion fittings
- ISO 10838-1:2000 Mechanical fittings for polyethylene piping systems for the supply of gaseous fuels -- Part 1: Metal fittings for pipes of nominal outside diameter less than or equal to 63 mm
- ISO 10838-2:2000 Mechanical fittings for polyethylene piping systems for the supply of gaseous fuels -- Part 2: Metal fittings for pipes of nominal outside diameter greater than 63 mm
- ISO 10838-3:2001 Mechanical fittings for polyethylene piping systems for the supply of gaseous fuels -- Part 3: Thermoplastics fittings for pipes of nominal outside diameter less than or equal to 63 mm
- ISO/TS 10839:2000 Polyethylene pipes and fittings for the supply of gaseous fuels -- Code of practice for design, handling and installation
- ISO 12176-1:2006 Plastics pipes and fittings -- Equipment for fusion jointing polyethylene systems -- Part 1: Butt fusion
- ISO 12176-2:2008 Plastics pipes and fittings -- Equipment for fusion jointing polyethylene systems -- Part 2: Electrofusion
- ISO 12176-3:2006 Plastics pipes and fittings -- Equipment for fusion jointing polyethylene systems -- Part 3: Operator's badge
- ISO 12176-4:2003 Plastics pipes and fittings -- Equipment for fusion jointing polyethylene systems -- Part 4: Traceability coding
- ISO 13950:2007 Plastics pipes and fittings -- Automatic recognition systems for electrofusion joints
- ISO 14531-1:2002 Plastics pipes and fittings -- Crosslinked polyethylene (PE-X) pipe systems for the conveyance of gaseous fuels -- Metric

series -- Specifications -- Part 1: Pipes

- ISO 14531-2:2004      Plastics pipes and fittings -- Crosslinked polyethylene (PE-X) pipe systems for the conveyance of gaseous fuels -- Metric series -- Specifications -- Part 2: Fittings for heat-fusion jointing
- ISO 14531-3:2006      Plastics pipes and fittings -- Crosslinked polyethylene (PE-X) pipe systems for the conveyance of gaseous fuels -- Metric series -- Specifications -- Part 3: Fittings for mechanical jointing (including PE-X/metal transitions)
- ISO 14531-4:2006      Plastics pipes and fittings -- Crosslinked polyethylene (PE-X) pipe systems for the conveyance of gaseous fuels -- Metric series -- Specifications -- Part 4: System design and installation guidelines
- ISO 15439-1:2007      Plastics piping systems for the supply of gaseous fuels for maximum operating pressure up to and including 0,4 MPa (4 bar) -- Polyamide (PA) -- Part 1: General
- ISO 15439-2:2007      Plastics piping systems for the supply of gaseous fuels for maximum operating pressure up to and including 0,4 MPa (4 bar) -- Polyamide (PA) -- Part 2: Pipes
- ISO 15439-3:2007      Plastics piping systems for the supply of gaseous fuels for maximum operating pressure up to and including 0,4 MPa (4 bar) -- Polyamide (PA) -- Part 3: Fittings
- ISO 21307:2009      Plastics pipes and fittings -- Butt fusion jointing procedures for polyethylene (PE) pipes and fittings used in the construction of gas and water distribution systems

## Test Methods

- ISO 9080:2003      Plastics piping and ducting systems -- Determination of the long-term hydrostatic strength of thermoplastics materials in pipe form by extrapolation
- ISO 13477:2008      Thermoplastics pipes for the conveyance of fluids -- Determination of resistance to rapid crack propagation (RCP) -- Small-scale steady-state test (S4 test)
- ISO 13478:2007      Thermoplastics pipes for the conveyance of fluids -- Determination of resistance to rapid crack propagation (RCP) -- Full-scale test (FST)
- ISO 13479:2009      Polyolefin pipes for the conveyance of fluids -- Determination of resistance to crack propagation -- Test method for slow crack growth on notched pipes
- ISO 16241:2005      Notch tensile test to measure the resistance to slow crack growth of polyethylene materials for pipe and fitting products (PENT)

ISO 16871:2003	Plastics piping and ducting systems -- Plastics pipes and fittings -- Method for exposure to direct (natural) weathering
ISO 18553:2002	Method for the assessment of the degree of pigment or carbon black dispersion in polyolefin pipes, fittings and compounds
ISO 24033:2009	Polyethylene of raised temperature resistance (PE-RT) pipes -- Effect of time and temperature on the expected strength
ISO/PRF TR 26873	Plastics pipes and fittings -- Definition and construction procedures for reference lines

### **Flanges, Couplings and Other Pipe Connections**

2535:2001	Plastics -- Unsaturated-polyester resins -- Measurement of gel time at ambient temperature
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### **Pipelines in General**

3459:1976	Polyethylene (PE) Pressure Pipes – Joints Assembled with Mechanical Fittings – Internal Under-Pressure Test Method and Requirement
3501:1976	Assembled Joints Between Fittings and polyethylene (PE) pressure pipes – Test of resistance to pull out
3503:1976	Assembled joints between fittings and polyethylene (PE) pressure pipes – Test of leakproofness under internal pressure when subjected to bending

### **Irrigation Equipment**

8779:2001	Polyethylene (PE) Pipes for Irrigation Laterals – Specifications
8796:2004	Polyethylene PE 32 and PE 40 pipes for irrigation laterals – Susceptibility to Environmental Stress-Cracking Induced by Insert-Type Fittings – Test Method and requirements

### **Petroleum Products and Natural Gas Handling Equipment**

6993:2006	Buried, High-Impact Poly (vinyl chloride) (PVC-HI) Piping Systems for the Supply of Gaseous Fuels – Part 1: Pipes for a maximum operating pressure of 1 bar (100 kPa)
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### **Materials**

1628-3:2001	Plastics – Determination of the Viscosity of polymers in dilute solution using capillary viscometers – Part 3: Polyethylenes and Polypropylenes
1872-1:1993	Plastics – Polyethylene (PE) Moulding and Extrusion materials – Part 1: Designation System and Basis for Specifications
1872-2:2007	Plastics – Polyethylene (PE) moulding and extrusion materials – Part 2: Preparation of Test Specimens and Determination of Properties
1873-1:1995	Plastics – Polypropylene (PP) Moulding and Extrusion Materials – Part 1: Designation System and Basis for Specifications
1873-2:2007	Plastics – Polypropylene (PP) moulding and extrusion materials – Part 2: Preparation of Test Specimens and Determination of Properties
1874-1:1992	Plastics – Polyamide (PA) Moulding and Extrusion Materials – Part 1: Designation
1874-2:2006	Plastics – Polyamide (PA) Moulding and Extrusion Materials – Part 2: Preparation of Test Specimens and Determination of Properties
2580-1:2002	Plastics – Acrylonitrile-Butadiene-Styrene (ABS) Moulding and Extrusion Materials – Part 1: Designation system and basics for specifications
2580-2:2003	Plastics – Acrylonitrile-Butadiene-Styrene (ABS) Moulding and Extrusion Materials – Part 2: Preparation of Test Specimens and Determination of Properties
3451-4:1998	Plastics – Determination of Ash – Part 4: Polyamides
3451-5:2002	Plastics – Determination of Ash – Part 5: Poly (vinyl chloride)
4577:1983	Plastics – Polypropylene and Propylene-Copolymers – Determination of Thermal Oxidative Stability in Air – Oven Method
4894-1:1997	Plastics – Styrene/Acrylonitrile (SAN) Moulding and Extrusion Materials – Part 1: Designation system and basis for specifications
4894-2:1995	Plastics – Styrene/Acrylonitrile (SAN) Moulding and Extrusion Materials – Part 2: Preparation of Test Specimens and Determination of Properties
8986-1:1993	Plastics -- Polybutene (PB) moulding and extrusion materials -- Part 1: Designation system and basis for specifications

## Reinforced Plastics

- 8283-1:1991 Plastics Pipes and Fittings – Dimensions of Sockets and Spigots for Discharge Systems Inside Buildings – Part 1: Unplasticized Poly (vinyl chloride) (PVC-U) and Chlorinated Poly (vinyl chloride) (PVC-C)
- 8283-2:1992 Plastics Pipes and Fittings – Dimensions of Sockets and Spigots for Discharge Systems Inside Buildings – Part 2: Polyethylene (PE)
- 8283-3:1992 Plastics Pipes and Fittings – Dimensions of Sockets and Spigots for Discharge Systems Inside Buildings – Part 3: Polypropylene (PP)
- 8283-4:1992 Plastics Pipes and Fittings – Dimensions of Sockets and Spigots for Discharge Systems Inside Buildings – Part 4: Acrylonitrile/Butadiene/Styrene (ABS)
- 8659:1989 Thermoplastics Valves – Fatigue Strength – Test Method
- 8770:2003 Plastics Piping Systems for Soil and Waste Discharge (Low and High Temperature) Inside Buildings – Polyethylene (PE)
- 8772:2006 Plastics Piping Systems for non-pressure underground drainage and sewerage - Polyethylene (PE)
- 8773:2006 Plastics piping systems for non-pressure underground drainage and sewerage--Polypropylene(PP)
- 8779:2001 Polyethylene (PE) Pipes for Irrigation Laterals – Specifications
- 8795:2001 Plastics Piping Systems for the Transport of Water Intended for Human Consumption – Migration assessment -- Determination of migration values of plastics pipes and fittings and their joints

## NEMA

National Electrical Manufacturers Association  
1300 North 17<sup>th</sup> Street  
Suite 1752  
Rosslyn, VA 22209  
(703) 841-3200  
Internet Address: [www.nema.org](http://www.nema.org)

- NEMA RN 1-2005 Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit (IMC)
- NEMA TC 2-2003 Electrical Polyvinyl Chloride (PVC) Tubing and Conduit
- NEMA TC 3-2004 Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing
- NEMA TC 6 & 8-2003 Polyvinyl Chloride (PVC) Plastic Utilities Duct for Underground Installations
- NEMA TC 7-2005 Smooth Wall Coilable Electrical Polyethylene Conduit

NEMA TC 9-2004	Fittings for Polyvinyl Chloride (PVC) Plastic Utilities Duct for Underground Installation
NEMA TC 13-2005	Electrical Nonmetallic Tubing (ENT)
NEMA TC 14-2002	Reinforced Thermosetting Resin Conduit (RTRC) and Fittings
NEMA TC 18-2004	Packaging of Master Bundles for EPC-40 Polyvinyl Chloride (PVC) Conduit
NEMA TC 19-2001	Nonmetallic Riser U-Type Guards
NEMA TCB 2-2000	NEMA Guidelines for the Selection and Installation of Underground Nonmetallic Duct

**NFPA**

National Fire Protection Association  
 1 Batterymarch Park  
 Quincy, MA 02169  
 (617) 770-3000  
 Internet Address: [www.nfpa.org](http://www.nfpa.org)

NFPA 13	Standard for the Installation of Sprinkler Systems
NFPA 13D	Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes
NFPA 13R	Standard for the Installation of Sprinkler Systems in Residential Occupancies Up to and Including Four Stories in Height
NFPA 30	Flammable and Combustible Liquids Code
NFPA 54	National Fuel Gas Code
NFPA 70	National Electrical Code
NFPA 70A	National Electrical Code Requirements for One- and Two-Family Dwellings and Mobile Homes
NFPA 79	Electrical Standard for Industrial Machinery
NFPA 90A	Standard for the Installation of Air-Conditioning and Ventilating Systems
NFPA 90B	Standard for the Installation of Warm Air Heating and Air-Conditioning Systems
NFPA 414	Standard for Aircraft Rescue and Fire-Fighting Vehicles

**NSF**

NSF International  
 789 N Dixboro Rd.  
 Ann Arbor, MI 48105  
  
 (734) 769-8010  
[www.nsf.org](http://www.nsf.org)

NSF/ANSI 14	Plastics Piping Components and Related Materials (2009)
NSF/ANSI 61	Drinking Water System Components – Health Effects (2009)

NSF Listing of Plastic Materials, Pipe, Fittings and Appurtenances for Potable Water and Waste Water  
NSF Listing of Drinking Water Additives – Health Effects

**UL** Underwriters Laboratories, Inc.  
2600 N.W. Lake Rd.  
Camas, WA 98607  
(877) 854-3577  
[www.ul.com](http://www.ul.com)

UL 94 Tests for Flammability of Plastic Materials for Parts in Devices and Appliances  
UL 514 B Conduit, Tubing, and Cable Fittings  
UL 514 C Standard for Nonmetallic Outlet Boxes, Flush-Device Boxes and Covers  
UL 651 Standard for Schedule 40 and 80 Rigid PVC Conduit and Fittings  
UL 651 A Type EB and A Rigid PVC Conduit and HDPE Conduit  
UL 651 B Standard for Continuous Length HDPE Conduit  
UL 746 A Standard for Polymeric Material – Short Term Property Evaluations  
UL 746 B Standard for Polymeric Materials – Long Term Property Evaluations  
UL 1285 Standard for Pipe and Couplings, Polyvinyl Chloride (PVC), and Oriented Polyvinyl Chloride (PVCO) for Underground Fire Service  
UL 1660 Liquid-Tight Flexible Nonmetallic Conduit  
UL 1713 Standard for Safety for Pressure Pipe and Couplings, Glass-Fiber Reinforced, for Underground Fire Service  
UL 1821 Standard for Safety for Thermoplastic Sprinkler Pipe and Fittings for Fire Protection Service  
UL 1887 Standard for Fire Test of Plastic Sprinkler Pipe for Visible Flame and Smoke Characteristics

**UNI-Bell** Uni-Bell PVC Pipe Association  
2711 LBJ Freeway, Suite 1000  
Dallas, TX 75234  
(972) 243-3902  
[www.uni-bell.org](http://www.uni-bell.org)

UNI-B-1 Recommended Standard Specification for Thermoplastic Pipe Joints, Pressure and Non-Pressure Applications  
UNI-B-6 Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe

UNI-B-8	Recommended Practice for the Direct Tapping of Polyvinyl Chloride (PVC) Pressure Water Pipe (Nominal Diameters 6-12 Inch)
UNI-B-9	Recommended Performance Specification for Polyvinyl Chloride (PVC) Profile Wall Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter (Normal Pipe Sizes 4-48 Inches)

## Model Codes

### ICC

International Code Council  
 500 New Jersey Avenue, NW,  
 6th Floor,  
 Washington, DC 20001-2070  
 1-888-ICC-SAFE (422-7233)  
 (202) 783-2348

[webmaster@iccsafe.org](mailto:webmaster@iccsafe.org)

2009 International Building Code  
 2009 International Residential Code  
 2009 International Fire Code  
 2009 International Fuel Gas Code  
 2009 International Plumbing Code  
 2009 International Mechanical Code  
 2009 International Private Sewage Disposal Code

### IAPMO

International Association of Plumbing and Mechanical Officials  
 5001 E. Philadelphia St.  
 Ontario, CA 91761  
 1-909-472-4100  
[iapmo@iapmo.org](mailto:iapmo@iapmo.org)

2009 Uniform Plumbing Code  
 2009 Uniform Mechanical Code

## **PHCC**

Plumbing-Heating-Cooling Contractors-National Association  
180 S. Washington Street  
P.O. Box 6808  
Falls Church, VA 22046  
Phone: (703) 237-8100  
[naphcc@naphcc.org](mailto:naphcc@naphcc.org)

2009 National Standard Plumbing Code

## **UNI-BELL PVC PIPE ASSOCIATION**

This association limits membership to producers of PVC pipe with elastomeric gasketed bell ends. This type of pipe is used extensively in buried water, sewer and irrigation systems. Uni-Bell was formed in 1971 to service the technical, education and research needs of this large and important segment of the plastic pipe industry. Uni-Bell has responded to the engineering, regulatory, public health and standardization communities by sponsoring research projects, providing technical assistance, and publishing the Uni-Bell Handbook of PVC Pipe Design and Construction.

For more information contact: Uni-Bell PVC Pipe Association  
2655 Villa Creek Drive, Suite 155  
Dallas, TX 75234  
(972) 243-3902  
[www.members.aol.com/unibell](http://www.members.aol.com/unibell)

## **PLASTIC PIPE AND FITTINGS ASSOCIATION**

PPFA is the national trade association of manufacturers of plastics piping products used for plumbing applications. Its membership includes pipe and fittings manufacturers and suppliers of materials, equipment and solvent cements. It was formed in 1978 to promote the use and code acceptance of plastics piping and plumbing applications. These applications include, but are not limited to, water service, water distribution, DWV, building drain, sewer and fire sprinkler systems.

For more information contact: Plastic Pipe and Fittings Association  
800 Roosevelt Road  
Bldg. C, Suite 20  
Glen Ellyn, IL 60137-5833  
(703) 858-6540

## Sources of Other Information

Various organizations issue manuals, guides, and reports dealing with selection, design, installation and maintenance of plastics piping systems. Some of the more commonly referenced publications and the issuing organizations are as follows:

- ◆ **American Gas Association**

400 North Capitol Street NW  
Washington, DC 20001  
(202) 824-9091  
[www.aga.com](http://www.aga.com)

*Plastic Pipe Manual for Gas Service  
Guide for Gas Transmission and Distribution Systems*

- ◆ **U.S. Army**

*Maintenance and Operation of Gas Systems, Nov. 1970, Army TM  
5-654*

- ◆ **American Water Works Association** (address given earlier)

*AWWA M23 – PVC Pipe – Design and Installation  
AWWA Committee Report on the Design and Installation of  
Polyethylene Pipe made in  
Accordance with AWWA C906*

- ◆ **American Association of State and Highway Transportation Officials**  
(address given earlier)

*Section 18, Soil-Thermoplastic Pipe Interaction Systems, Standard  
Specifications for Highway Bridges*

- ◆ **Plastics Pipe Institute**

*A listing of the currently issued reports can be obtained from PPI at  
[www.plasticpipe.org](http://www.plasticpipe.org).*