



Designation: F2881/F2881M – 21^{ε1}

Standard Specification for 12 to 60 in. [300 to 1500 mm] Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications¹

This standard is issued under the fixed designation F2881/F2881M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

^{ε1} NOTE—Section 6.1 was editorially corrected in October 2021.

1. Scope*

1.1 This specification covers requirements and test methods for dual wall polypropylene pipe and fittings. The nominal inside diameters covered are 12 to 60 in. [300 to 1500 mm].

1.2 The requirements of this specification are intended to provide pipe and fittings suitable for underground use for non-pressure storm sewer systems. Pipe and fittings produced in accordance with this specification shall be installed in compliance with Practice D2321.

1.3 This specification covers pipe and fittings with an interior smooth wall and an annular corrugated profile outer wall (Fig. 1).

1.4 *Units*—The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.5 The following precautionary statement caveat pertains only to the test method portion, Section 8, of this specification. *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

- A666 Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar
- 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
- D790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
- D792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
- D1238 Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer
- D1505 Test Method for Density of Plastics by the Density-Gradient Technique
- D1600 Terminology for Abbreviated Terms Relating to Plastics
- D2122 Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings
- D2321 Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
- D2412 Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
- D2444 Practice for Determination of the Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)
- D2990 Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics
- D3212 Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
- D3895 Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry

¹ This specification is under the jurisdiction of ASTM Committee F17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.62 on Sewer.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

*A Summary of Changes section appears at the end of this standard

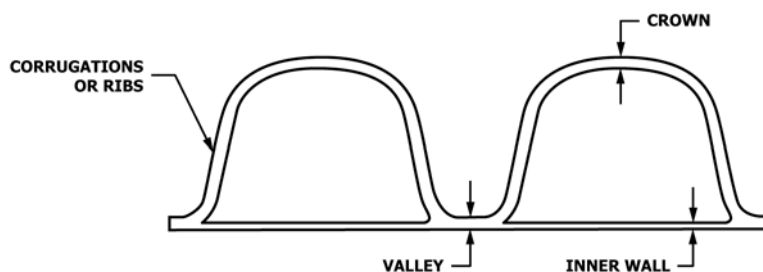


FIG. 1 Interior Smooth Wall and an Annular Corrugated Profile Outer Wall

D4101 Classification System and Basis for Specification for Polypropylene Injection and Extrusion Materials

D4218 Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique

D4389/D4389M Specification for Finished Glass Fabrics Woven From Rovings

D5630 Test Method for Ash Content in Plastics

D6992 Test Method for Accelerated Tensile Creep and Creep-Rupture of Geosynthetic Materials Based on Time-Temperature Superposition Using the Stepped Isothermal Method

F412 Terminology Relating to Plastic Piping Systems

F477 Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

2.2 *AASHTO Standard*.³

LRFD, Section 12 AASHTO LRFD Bridge Design Specifications Section 12 – Buried Structures and Tunnel Liners

M288 Geotextile Specification for Highway Applications

2.3 *Federal/Military Standards*.⁴

Fed. Std. No. 123 Marking for Shipment (Civil Agencies)

MIL-STD-129 Marking for Shipment and Storage

3. Terminology

3.1 *Definitions*—Definitions are in accordance with Terminology **F412** and abbreviations are in accordance with Terminology **D1600**, unless otherwise specified. The abbreviation for polypropylene is PP.

3.2 *Definitions of Terms Specific to This Standard*:

3.2.1 *dual wall, n*—In this case, the dual pipe wall construction provides an interior wall in the waterway and includes ribs, corrugations, or other shapes, which can be either solid or hollow, that helps brace the pipe against diametrical deformation.

3.2.2 *silt-tight joint, n*—Joint that prevents the passage of silt or soil, does not restrict water passage.

3.2.3 *water-tight joint, n*—Joint that restrains the passage of water to not exceed a specified limit.

4. Classification

4.1 Pipe manufactured in accordance with this specification shall be of two classes identified as Class I or Class II. The corresponding pipe stiffness requirements are prescribed in Table 1.

5. Ordering Information

5.1 Orders for product made to this specification shall include the following information to adequately describe the desired product:

5.1.1 This ASTM designation and year of issue,

TABLE 1 Pipe Stiffness and Pipe Dimensions

Nominal Size	Minimum Inside Diameter		Minimum Inner Liner Thickness		Minimum Valley Thickness		Minimum Crown Thickness		Class I		Class II	
									Minimum Pipe Stiffness at 5 % Deflection		Minimum Pipe Stiffness at 5 % Deflection	
	in.	[mm]	in.	[mm]	in.	[mm]	in.	[mm]	lb/in./in.	[kPa]	lb/in./in.	[kPa]
12	11.82	[300]	0.045	[1.1]	0.103	[2.6]	0.052	[1.3]	70	[482]	...	...
15	14.78	[375]	0.050	[1.3]	0.126	[3.2]	0.068	[1.7]	60	[413]	...	...
18	17.73	[450]	0.055	[1.4]	0.132	[3.4]	0.074	[1.9]	56	[386]	...	...
24	23.64	[600]	0.060	[1.5]	0.144	[3.7]	0.093	[2.4]	50	[344]	...	...
30	29.55	[751]	0.065	[1.7]	0.148	[3.8]	0.108	[2.7]	46	[317]	...	...
36	35.46	[901]	0.070	[1.8]	0.153	[3.9]	0.132	[3.4]	40	[275]	46	[317]
42	41.37	[1051]	0.070	[1.8]	0.158	[4.0]	0.160	[4.1]	35	[241]	46	[317]
48	47.28	[1201]	0.072	[1.8]	0.179	[4.6]	0.165	[4.2]	30	[206]	46	[317]
54	53.19	[1351]	0.078	[2.0]	0.194	[4.9]	0.178	[4.5]	26	[175]	46	[317]
60	59.10	[1501]	0.085	[2.2]	0.215	[5.5]	0.180	[4.6]	25	[170]	46	[317]