

Storm Sewer Specification

CPPA Standard *Specification (100-99) for* **Corrugated Polyethylene (PE)** **Pipe For Storm Sewer** **Applications**

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a non-profit industry trade
association dedicated to
providing unbiased, non-branded
information about the use and
installation of corrugated
polyethylene pipe.

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1. Scope

- 1.1 This specification covers requirements and test methods for corrugated polyethylene pipe and fittings in nominal diameters of 75mm to 1500mm (3" to 60") with either a smooth or corrugated interior. This specification provides for soil tight, silt tight, and watertight joints.
- 1.2 The requirements of this specification are intended to provide pipe and fittings suitable for underground use in non-pressure storm drainage applications. This specification covers both perforated and non-perforated pipe.
- 1.3 Pipe and fittings produced in accordance with this specification shall be installed in compliance with ASTM D2321, except other minimum cover may be specified.

Note 1 – For perforated pipe applications, the size of the embedment zone and permeability of the embedment material are important to the system's ability to provide the desired level of infiltration or exfiltration. In addition, the gradation of the embedment material must be compatible with the perforation size to minimize backfill migration into the pipe. Alternatively, a filter material surrounding the pipe and suitable for the backfill material may be used.

- 1.4 The values stated in SI units are to be regarded as the standard and those provided in parentheses are for information purposes only.
- 1.5 This specification covers pipe and fittings using an open or closed profile (Figure 1).
- 1.6 This specification is compatible, where appropriate, with current AASHTO and ASTM specifications. In relevant instances, when one of these reference documents departs from this specification, or vice versa, a description of that departure is noted for the designer's consideration.

The Canadian Standard Association (CSA) has specification CSA B182.6 for polyethylene storm drain pipe with a smooth interior. Although similar in requirement to this CPPA specification, CSA B182.6 should continue to be referenced for Canadian projects.

- 1.7 The following precautionary caveat pertains only to Section 7, the test method portion, of this specification. This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety and health practices and determine the applicability of regulatory limitations prior to use.



2. Standards

2.1 American Society of Testing and Materials (ASTM) Standards

D618	Methods of Conditioning Plastics and Electrical Insulating Materials for Testing
D1056	Standard Specification for Flexible Cellular Materials – Sponge or Expanded Rubber
D1600	Terminology for Abbreviated Terms Relating to Plastics
D1693	Test Method for Environmental Stress-Cracking of Ethylene Plastics
D2122	Method of Determining Dimensions of Thermoplastic Pipe and Fittings
D2321	Practice for Underground Installation of Flexible Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
D2412	Test Method for External Loading Properties of Plastic Pipe by Parallel-Plate Loading
D2444	Test Method for Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)
D3212	Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
D3350	Standard Specification for Polyethylene Plastic Pipe and Fittings Materials
F405	Standard Specification for Corrugated Polyethylene (PE) Tubing and Fittings
F412	Definitions of Terms Relating to Plastic Piping Systems
F477	Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
F667	Standard Specification for Large Diameter Corrugated Polyethylene (PE) Tubing and Fittings
F1417	Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air

2.2 Federal Standards – Fed. Std. No. 123 Marking for Shipment (Civil Agencies)

2.3 Military Standard – MIL-STD-129 Marking for Shipment and Storage

2.4 American Association of State Highway and Transportation Officials (AASHTO) Standards

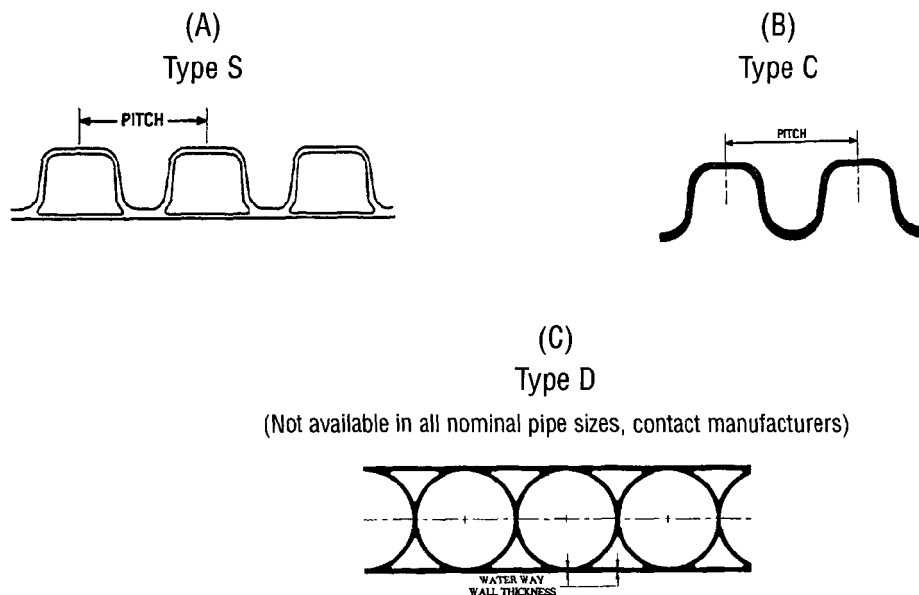


- M252 Standard Specification for Corrugated Polyethylene Drainage Tubing, 75mm to 250mm (3" to 10") Diameter
- M294 Standard Specification for Corrugated Polyethylene Pipe, 300mm to 1200mm (12" to 48") Diameter
- MP7-97 Provisional Specification for Corrugated Polyethylene Pipe, 1350 and 1500mm (54" and 60") Diameter

3. Terminology

- 3.1 Definitions – Definitions are in accordance with ASTM F412 and abbreviations are in accordance with ASTM D1600, unless otherwise specified. The abbreviation for polyethylene is PE.
- 3.2 Definitions of Terms Specific to this Standard
 - 3.2.1 Type S – A profile having a full circular cross section with a corrugated surface outside and an essentially smooth waterway inside. Corrugations may be annular or helical [Figure 1(A)].
 - 3.2.2 Type C – A profile having a full circular cross section with a corrugated surface both inside and outside. Corrugations may be either annular or helical [Figure 1(B)].
 - 3.2.3 Type D – A profile having an essentially smooth interior waterway braced circumferentially or spirally with projections or ribs joined to an essentially smooth outer wall. Both walls are fused to, or continuous with, the internal supports [Figure 1(C)].

Figure 1
Pipe Wall Types





4. Significance and Use

- 4.1 The requirements of this specification are intended to provide pipe and fittings suitable for use for underground non-pressure drainage applications including subdrainage, land drainage, storm sewers, storm water management systems, and culverts.

5. Materials

5.1 Basic Materials

- 5.1.1 Pipe and Blow-Molded Fittings – Compounds used in the manufacture of pipe and blow-molded fittings shall conform to Table 1.
- 5.1.2 Rotationally Molded Fittings – Compounds used in the manufacture of rotationally molded fittings shall have a cell classification of 213320C as defined in ASTM D3350. Compounds that have a higher cell classification in one or more properties shall be acceptable provided product requirements are met.

- 5.2 Rework Material – In lieu of virgin polyethylene compounds, clean rework material may be used by the manufacturer provided that it meets the cell class requirements as described in 5.1.

Table 1

Cell Class Requirements for Pipe and Blow-Molded Fittings According to ASTM D3350

Property	Diameter	
	Sizes 75mm to 250mm (3" to 10")	Sizes 300mm to 1500mm (12" to 60")
Density (Base Resin)	3	3, with the addition that maximum density not exceed 0.955g/cm ³
Melt Index	2, 3, 4, 5 or 6	3, 4, 5 or 6
Flexural Modulus	4 or 5	5
Tensile Strength	4, 5 or 6	4, 5 or 6
ESCR	2	2
HDB	0	0
Color and UV Stabilizer Code	C ^A	C ^A

^A Carbon black content shall not exceed 5%.