

DUAL-WALL DRAINAGE PIPE (DWP) TECHNICAL DATA

Standards

Springfield Plastics, Inc. dual-wall drainage pipe (DWP) is manufactured to the highest quality control standards using only the highest quality high density polyethylene. SPI dual-wall pipe meets or exceeds all specifications when run to the following standards: ASTM F 2648, ASTM F 2306, AASHTO M252 and AASHTO M294.

Materials

Raw materials used in the manufacturing of dual-wall pipe shall be high-density polyethylene conforming with all requirements of ASTM 3350. All DWP meets or exceeds the following cell classes for each standard:

Standard	Sizes	Cell Class
ASTM F 2648	4" - 10"	424400C
	12" - 24"	435400C
ASTM F 2306	12" - 24"	435400C
AASHTO M 252	4" - 10"	424420C
AASHTO M 294	12" - 24"	435400C

As required by the above specifications, Springfield Plastics, Inc. uses only 100% virgin high-density polyethylene resin in the manufacturing of its drainage pipe and fittings.

NTPEP Approval

All SPI dual-wall pipe manufactured to AASHTO M252 and M294 has been approved by the Federal Highway Administration's National Transportation Product Evaluation Program (NTPEP). This program requires rigid adherence to quality control standards and procedures. Springfield Plastics is subjected to annual NTPEP reviews. Product approval certifications can be found at www.ntpep.org.

Workmanship

SPI dual-wall pipe shall be homogenous throughout and free of foreign inclusions or visible defects. All DWP shall be uniform in color and free of internal obstructions, defective seams or mold parting lines. The pipe walls shall be free of cracks, holes, blisters, voids, foreign inclusions, delamination or any other visible defects.

Inside Diameter

The average inside diameter of SPI dual-wall pipe shall not vary more than $\pm 1\%$ from the specified inside diameter when measured in accordance with ASTM D2122.

Pipe Stiffness

SPI dual-wall pipe shall have a minimum pipe stiffness (psi) at 5% deflection as specified in Table 1 when tested in accordance with ASTM D2412.

Pipe Flattening

SPI dual-wall pipe shall withstand 20% deflection with no evidence of buckling, cracking, splitting or delamination.

Resistance to Extreme Conditions

SPI dual-wall pipe is tested for environmental stress cracking, high/low temperature strength with no evidence of failure.

Inner Wall (Liner)

SPI dual-wall pipe shall have a minimum inner-liner thickness as specified in Table 1 when measured in accordance with ASTM D2122. There shall be no delamination or separation of the inner liner and the profile.

Length

SPI dual-wall pipe shall not be less than 99% of the stated length when measured in accordance with ASTM D2122.

Hydraulics

The recommended Manning "n" to be used for engineering purposes shall be .012.

Burial Depth

SPI dual-wall pipe can be buried as shallow as 1 foot and as deep as 50 feet with Class 1 backfills compacted to 90 percent Standard Proctor Density in accordance with ASTM D2321 and industry recommended procedures. Greater burial depths may be achieved with compacted backfills.

SPI dual-wall pipe will withstand H₂O loads.

Joints

SPI dual-wall pipe is manufactured with two types of joints and also as plain-end sticks. Bell and spigot pipe with no gasket is for soil-tight applications.

The water-tight and silt-tight joint is referred to as TufCor Tight. This pipe will meet water-tight and silt-tight requirements of ASTM 2306 and the gaskets will meet the requirements of ASTM F477.

Installation

SPI dual-wall pipe shall be installed in accordance with ASTM D2321, ASTM F449, Springfield Plastics guidelines or project engineer specifications.

TABLE 1

Nominal Size	Stick Lengths	Outside Diameter	5% Deflection Minimum	Manning "n"	Inner Liner Minimum Thickness
4"	20'	4.678"	50 psi	0.012	0.020"
6"	20'	6.848"	50 psi	0.012	0.020"
8"	10', 20'	9.394"	50 psi	0.012	0.024"
10"	10', 20'	11.720"	50 psi	0.012	0.024"
12"	6', 8.5', 20'	14.508"	50 psi	0.012	0.035"
15"	6', 8.5', 20'	18.225"	42 psi	0.012	0.040"
18"	6', 8.5', 20'	21.349"	40 psi	0.012	0.051"
21"	6', 8.5', 20'	24.759"	38 psi	0.012	0.060"
24"	6', 8.5', 20'	27.681"	34 psi	0.012	0.060"

Pipe Coefficients in Manning's "n" Values			
Pipe Diameters (in)	SPI DWP	Concrete Pipe	Corrugated Metal Pipe
4, 6, 8, 10, 12, 15, 18, 21, 24	.010 - .012	.011 - .015	.022 - .026

Perforations

SPI dual-wall pipe perforations shall be cleanly cut/drilled and uniformly spaced along the length and circumference of the pipe in the valleys between the corrugations. Perforation dimensions and the water inlet area shall be as listed in Table 2.

Special perforations and configurations shall be permitted where required to meet the needs of the purchaser.

TABLE 2

ID	Perforation Type	Rows of Perforations	Perforations/ Row/Foot	Perforations/ Valley	Perforations/ Foot	ID	Perforation Width	Perforation Length	Total Opening/ Foot (in ²)
4"	Slots	4	9	2	36	4"	0.050	0.75	1.35
6"	Slots	4	9	2	36	6"	0.050	0.75	1.35
8"	Slots	4	12	4	48	8"	0.052	0.75	1.87
10"	Slots	4	9	4	36	10"	0.060	0.80	1.73
12"	Holes	8	6	8	48	12"	0.312	0.312	4.67
15"	Holes	8	4.5	8	36	15"	0.312	0.312	3.50
18"	Holes	8	3.75	8	30	18"	0.312	0.312	2.92
21"	Holes	8	3	8	24	21"	0.312	0.312	2.34
24"	Holes	8	3.75	8	30	24"	0.312	0.312	2.92

Referenced Standards

- **ASTM D2122** - Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings
- **ASTM D2321** - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
- **ASTM D2412** - Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
- **ASTM D3350** - Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
- **ASTM F449** - Standard Practice for Subsurface Installation of Corrugated Polyethylene Pipe for Agricultural Drainage or Water Table Control
- **ASTM F477** - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
- **ASTM 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
- **ASTM 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
- **AASHTO M252** - Standard Specification for Corrugated Polyethylene Drainage Pipe (3"-10")
- **AASHTO M294** - Standard Specification for Corrugated Polyethylene Drainage Pipe (12"-60")