DUAL-WALL PIPE TECHNICAL DATA

Springfield Plastics, inc.

STANDARDS

Springfield Plastics, Inc.'s dual-wall drainage pipe (DWP) is manufactured to the highest quality control standards using only the highest quality high-density polyethylene. Springfield Plastics' DWP meets or exceeds all of the following specifications when run to the following standards: ASTM F2648, ASTM F2306, AASHTO M252, and AASHTO M294V.

MATERIALS

Raw materials used in the manufacturing of DWP shall be high-density polyethylene conforming to all requirements of ASTM D3350. All DWP meets or exceeds the following cell classes for each standard:

STANDARD	SIZES	CELL CLASS
ASTM F 2648	4" - 10"	424420C
	12" - 24"	435420C
ASTM F2306	12" - 24"	435400C
AASHTO M252	4" - 10"	424420C
AASHTO M294V	12" - 48"	435400C

Springfield Plastics uses only 100% virgin high-density polyethylene resin in the manufacturing of its drainage pipe and fittings.

NTPEP APPROVAL

All Springfield Plastics' DWP 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

Springfield Plastics' DWP 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.

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INSIDE DIAMETER

The average inside diameter of Springfield Plastics' DWP shall not vary more than ±1% from the nominal inside diameter when measured in accordance with ASTM D2122.

PIPE STIFFNESS

Springfield Plastics' DWP shall have a minimum pipe stiffness (psi) at 5% deflection as specified in Table 1 when tested in accordance with ASTM D2412.

Table 1

NOMINAL DIAMETER	PIPE OD (IN.)	STICK LENGTHS (FT.)	MIN. PIPE STIFFNESS @ 5% DEFLECTION (psi)	MANNING "n"	MIN. INNER LINER THICKNESS (IN.)
4"	4.61	20	50	0.012	0.020
6"	6.78	20	50	0.012	0.020
8"	9.32	10, 20	50	0.012	0.025
10"	11.66	10, 20	50	0.012	0.025
12"	14.38	8.5, 20	50	0.012	0.035
15"	18.10	8.5, 20	42	0.012	0.040
18"	21.35	9, 20	40	0.012	0.050
21"	24.76	9, 20	38	0.012	0.060
24"	27.68	9, 20	34	0.012	0.060
30"	34.63	13, 20	29	0.012	0.060
36"	41.41	13, 20	22.5	0.012	0.067
48"	54.88	14, 20	20	0.012	0.071

PIPE COEFFICIENTS IN MANNING'S "n" VALUES			
PIPE DIAMETERS (IN.)	SPRINGFIELD PLASTICS' DWP	CONCRETE PIPE	CORRUGATED METAL PIPE
4, 6, 8, 10, 12, 15, 18, 21, 24, 30, 36, 48	0.012	0.011-0.015	0.022-0.026

PIPE FLATTENING

Springfield Plastics' DWP shall withstand 20% deflection with no evidence of buckling, cracking, splitting, or delamination.

RESISTANCE TO EXTREME CONDITIONS

Springfield Plastics' DWP is tested for environmental stress cracking and high/low temperature strength with no evidence of failure.

INNER WALL (LINER)

Springfield Plastics' DWP 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

Springfield Plastics' DWP shall not be less than 99% of the stated length when measured in accordance with ASTM D2122.

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HYDRAULICS

The recommended Manning "n" to be used for engineering purposes shall be 0.012.

BURIAL DEPTH

Springfield Plastics' DWP can be buried at the depths in Table 2 when installed in accordance with ASTM D2321 and industry-recommended procedures.

Table 2

SPRINGFIELD PLASTICS BURIAL DEPTH TABLE – ASTM D2321									
NOMINAL DIAMETER	CLASS I – COMP.	CLASS I – DUMPED	CLASS II 95% SPD	CLASS II 90% SPD	CLASS II 85% SPD	CLASS III 95% SPD	CLASS III 90% SPD	CLASS III 85% SPD	MIN. DEPTH
12″	29	22	22	16	11	15	11	9	1
15″	26	20	20	14	10	14	10	8	1
18″	33	25	25	17	12	18	13	11	1
21″	30	22	22	15	11	15	11	10	1.5
24″	33	25	26	18	11	18	13	9	2
30″	26	20	18	13	8	13	9	8	2
36″	24	17	16	11	7	10	7	6	2
48″	21	16	14	10	6	10	7	6	2

JOINTS

Springfield Plastics' DWP is manufactured with two types of joints and also as plain-end sticks.

1) Bell and spigot pipe with no gasket is for soil-tight applications.

2) 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 F2306, and the gaskets will meet the requirements of ASTM F477.

INSTALLATION

Springfield Plastics' DWP shall be installed in accordance with ASTM D2321, ASTM F449, Plastic Pipe Institute (PPI), and Springfield Plastics guidelines or project engineer specifications.

PERFORATIONS

Springfield Plastics' DWP 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 3.

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

Table 3

NOMINAL ID	PERFORATION TYPE	ROWS OF PERFORATIONS	PERFORATIONS/ ROW/FOOT	PERFORATIONS/ VALLEY	PERFORATIONS/ FOOT
4″	Slots	4	9	2	36
6″	Slots	4	9	2	36
8″	Slots	4	12	4	48
10″	Slots	4	9	4	36
12″	Holes	6	6	8	36
15″	Holes	8	4.5	8	36
18″	Holes	8	3.5	8	28
21″	Holes	8	3.5	8	28
24”	Holes	8	3.5	8	28

NOMINAL ID	PERFORATION WIDTH	PERFORATION LENGTH	TOTAL OPENING/ FOOT (IN.^{2})
4″	0.050	0.75	1.35
6″	0.050	0.75	1.35
8″	0.052	0.75	1.87
10″	0.060	0.80	1.73
12″	0.312	0.312	2.75
15″	0.312	0.312	2.75
18″	0.312	0.312	2.14
21″	0.312	0.312	2.14
24”	0.312	0.312	2.14

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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″)