

MATERIAL SPECIFICATION

547. PLASTIC PIPE

1. SCOPE

This specification covers the quality of Poly Vinyl Chloride (PVC), Polyethylene (PE), High Density Polyethylene (HDPE), and Acrylonitrile-Butadiene-Styrene (ABS) plastic pipe, fittings and joint materials.

2. MATERIALS

a. Pipe

The pipe shall be as uniform as commercially practicable in color, opaqueness, density, and other specified physical properties and free from visible cracks, holes, foreign inclusions, or other defects. The dimensions of the pipe shall be measured as prescribed in ASTM D 2122.

Unless otherwise specified, the pipe shall conform to the requirements listed in this specification and the applicable reference specifications in Table 547-2, the requirements specified in Construction Specification 45, Plastic Pipe, and the requirements shown on the drawings.

b. Fittings and Joints

Fittings and joints shall be of a schedule, SDR or DR, pressure class, external load carrying capacity, or pipe stiffness that equals or exceeds that of the plastic pipe. The dimensions of fittings and joints shall be compatible with the pipe and measured in accordance with ASTM D 2122. Joint and fitting material shall be compatible with the pipe material. The joints and fittings shall be as uniform as commercially practicable in color, opaqueness, density, and other specified physical properties and free from visible cracks, holes, foreign inclusions, or other defects.

Fittings and joints shall conform to the requirements listed in this specification, the requirements of the applicable specification referenced in the ASTM or AWWA specification for the pipe, the requirements specified in Construction Specification 45, and the requirements shown on the drawings.

c. Solvents

Solvents for solvent welded pipe joints shall be compatible with the plastic pipe used and shall conform to the requirements of the applicable specification referenced in the ASTM or AWWA specification for the pipe, fitting, or joint.

d. Gaskets

Rubber gaskets for pipe joints shall conform to the requirements of ASTM F 477, Elastomeric Seals (Gaskets) for Jointing-Plastic Pipe.

3. PERFORATIONS

When perforated pipe is specified, perforations shall conform to the following requirements, unless otherwise specified in Construction Specification 45 or shown on the drawings:

- a. Perforations shall be either circular or slots.
- b. Circular perforations shall be $1/4 \pm 1/16$ -inch diameter holes arranged in rows parallel to the axis of the pipe. Perforations shall be evenly spaced along each row such that the center-to-center distance between perforations is not less than eight (8) times the perforation diameter. Perforations may appear at the ends of short and random lengths. The minimum perforation opening per foot of pipe shall be as shown in Table 547-1.

Rows shall be arranged in two (2) equal groups at equal distance from the bottom on each side of the vertical centerline of the pipe. The lowermost rows of perforations shall be separated by an arc of not less than 60° or more than 125° . The uppermost rows of perforations shall be separated by an arc not to exceed 166° . The spacing of rows between these limits shall be uniform. The minimum number of rows shall be as shown in Table 547-1.

- c. Slot perforations shall be symmetrically located in two (2) rows, one on each side of the pipe centerline. Slot perforations shall be located within the lower quadrants of the pipe with slots no wider than $1/8$ inch and spaced not to exceed 11 times the perforation width. Minimum perforation opening per lineal foot of pipe shall be as shown in Table 547-1.

TABLE 547-1
PERFORATIONS

NOMINAL PIPE SIZE	MINIMUM NUMBER OF ROWS		MINIMUM OPENING/FOOT (Square Inches)
	CIRCULAR	SLOT	
(Inches)			
4	2	2	0.22
6	4	2	0.44
8	4	2	0.44
10	4	2	0.44
12	6	2	0.66

- d. On both the inside and outside of the pipe, perforations shall be free of cuttings or frayed edges, and any materials that would reduce the effective opening.

TABLE 547-2

PIPE SPECIFICATIONS

<u>POLY VINYL CHLORIDE (PVC) PIPE</u>	<u>SPECIFICATION</u>
Plastic Pipe – Schedules 40, 80, 120	ASTM D 1785 ASTM D 2466
Pressure-Rated Pipe – SDR Series	AWWA C 900 ASTM D 2241
Plastic Drain, Waste, and Vent Pipe and Fittings	ASTM D 2665
Joints for IPS PVC Pipe Using Solvent Weld Cement	ASTM D 2672
Composite Sewer Pipe	ASTM D 2680
Type PSM PVC Sewer Pipe and Fittings	ASTM F 3034
Large-Diameter Gravity Sewer Pipe and Fittings	ASTM F 679
Smooth-Wall Underdrain Systems for Highway Airport, and Similar Drainage	ASTM F 758
Type PS-46 Gravity Flow Sewer Pipe and Fittings	ASTM F 789
Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter	ASTM F 794
Corrugated Sewer Pipe With a Smooth Interior and Fittings	ASTM F 949
Pressure Pipe, 4-inch through 12-inch for Water Distribution	AWWA C 900
Water Transmission Pipe, Nominal Diameters 14-inch through 36-inch	AWWA C 905

TABLE 547-2 (CONTINUED)

PIPE SPECIFICATIONS

<u>POLYETHYLENE (PE) PLASTIC PIPE</u>	<u>SPECIFICATION</u>
Schedule 40	ASTM D 2104
SDR-PR Based on Controlled Inside Diameter	ASTM D 2239
Schedules 40 and 80 Based on Outside Diameter	ASTM D 2447
SDR-PR Based on Controlled Outside Diameter	ASTM D 3035
<u>HIGH DENSITY POLYETHYLENE (HDPE) PLASTIC PIPE</u>	<u>SPECIFICATION</u>
Plastic Pipe and Fittings	ASTM D 3350
SDR-PR Based on Controlled Outside Diameter	ASTM F 714
Plastic Moldings and Extrusion Compounds	ASTM D 1248
Heat Joining Polyolefin Pipe and Fittings	ASTM D 2657
<u>ACRYLONITRILE-BUTADIENE-STYRENE (ABS) PIPE</u>	<u>SPECIFICATION</u>
Plastic Pipe, Schedules 40 and 80	ASTM D 1527
Plastic Pipe, SDR-PR	ASTM D 2282
Schedule 40 Plastic Drain, Waste, and Vent Pipe	ASTM D 2661
Composite Sewer Pipe	ASTM D 2680
Sewer Pipe and Fittings	ASTM D 2751