

Specification Sheet: Polyvinyl Chloride (PVC) Plastic Pipe and Fittings for Drainage, Waste and Vent Systems

1. PRODUCT NAME

PolyVinyl Chloride (PVC) Pipe and Fittings for Drainage, Waste and Vent Systems.

2. MANUFACTURER

For a list of member manufacturers contact the Plastic Pipe and Fittings Association, 800 Roosevelt Road, Building C, Suite 20, Glen Ellyn, IL 60137; (630) 858-6540; fax (630) 790-3095; www.ppfa.org.

3. PRODUCT DESCRIPTION

Basic Use: Sanitary drainage, waste, and vent systems, and storm water drainage systems. PVC pipe can be used in residential, commercial, and industrial applications. Pipe and fittings are joined by solvent cementing. There is a full complement of PVC drainage pattern fittings available for DWV and other gravity drainage applications. The pipe and fittings are available in sizes 1/4 through 24 inches in diameter.

Composition and Materials: PVC is a thermoplastic material and the PVC compounds commonly meet Class 12454 per ASTM D1784 or Class 11432 per ASTM D 4396 for cellular core pipe. PVC pipe is available in both solid and cellular core wall; these are used interchangeably.

Grades: PVC pipe identified as Schedule 40 DWV pipe, or informally as Schedule 40 pipe, is used for both above and below grade installations. A special 3.25 inch outside diameter pipe, which has a thinner wall than

Schedule 40 DWV, is referred to, informally, as Schedule 30 pipe. This pipe is intended to fit within a 2x4 inch wide stud wall assembly.

Limitations: PVC pipe is intended to be used in conventional sanitary drain, waste and vent systems or storm water drainage systems. While the pipe is resistant to certain chemicals, specific analysis should be performed before the pipe is considered for any special waste system.

Plastics are affected by ultraviolet radiation. Pigments are added to the PVC to make the pipe and fittings resistant to degradation. While pipe and fittings may be exposed to sunlight during construction, prolonged exposure should be avoided. When use conditions require longer-term exposure, consult the pipe or fitting manufacturer.

PVC pipe and fittings can withstand normal temperatures encountered in a sanitary waste and storm water drainage system. The recommended maximum temperature for continuous drainage applications is 140° F.

4. TECHNICAL DATA

Applicable Standards: ASTM D 2665, ASTM D 2949, and ASTM F 891, or CSA CAN/CSA B181.2 apply to PVC pipe for DWV applications. ASTM D 2665 specifies the requirements for solid wall Schedule 40 pipe. ASTM F 891 specifies the requirements for Schedule 40

pipe having a cellular core. ASTM D 2949 specifies 3.25 inch outside diameter pipe and fittings. ASTM F 409 applies to PVC tube and tubular fittings used for accessible waste traps and connections. ASTM D 2665 or CSA CAN/CSA B181.2 apply to solid wall PVC pipe fittings. Dimensions for drainage pattern fittings up to 8" size are shown in ASTM D 3311. ASTM F 1866 covers PVC Schedule 40 Drainage and DWV fabricated fittings in 4" through 24" sizes. ASTM D 2564 applies to solvent cements for PVC. ASTM F 656 applies to primer, if required.

Quality Control: Most pipe and fittings are listed and inspected by an ANSI accredited third party listing agency to conform to ANSI/NSF Standard 14, the IAPMO - Uniform Plumbing Code, and the Canadian Standards Association. Conforming pipe is marked "NSF- DWV, UPC and/or CSA." Note: Schedule 40 PVC may be dual marked for use as either DWV or pressure pipe when it meets all the requirements of both ASTM D 1785 and ASTM D 2665.

Laying Lengths: PVC pipe is normally supplied in 10 and 20 foot lengths, but other lengths are available. Laying lengths for common fittings are identified in Table 1 and Table 2.

Expansion and Contraction: PVC pipe has a higher expansion and contraction rate than metallic

pipe. The coefficient of linear expansion for PVC plastic is 0.000028 in/in/°F. This rate translates into an expansion of 0.67 inches for every 20 feet with a temperature change of 100°F.

Where PVC pipe is subjected to severe temperature fluctuations, provisions must be made for expansion and contraction. This can be accomplished by use of expansion joints, by piping offsets or by making provisions at changes in direction.

Hangers and Supports: Horizontal PVC pipe must be supported at maximum 4 foot intervals for pipe 4" and smaller. Support vertical piping at every normal height floor level. At midpoints provide intermediate guide supports for pipe 2" and smaller. Install hangers and supports to allow for thermal expansion and contraction. Piping must not be in contact with wallboard or paneling.

Fire Protection: PVC pipe and fitting materials are combustible; however, they are difficult to ignite and will not continue to burn without an outside heat source. PVC piping may be used in buildings that require non-combustible construction.

Through penetrations of fire-rated assemblies by PVC pipe are accepted in the model building codes when such assemblies meet the requirements of ASTM E 814. Verify local code interpretations related to through penetrations with jurisdiction having authority. Typically the "F" rating shall be a minimum of the hourly rating of the fire-rated assembly that the PVC pipe penetrates. Refer to local building department for regulations concerning use of PVC pipe and fittings.

5. INSTALLATION

Preparatory Work: PVC pipe must be cut square with a wheeled cutter, miter saw, or power saw designed for that use. Pipe ends must be deburred, chamfered, and wiped clean and dry.

Methods: Solvent cementing of PVC pipe and fittings is a multi-step process. Follow the procedure or instructions found on the cement container label. Use PVC solvent cement conforming to ASTM D 2564. If the plumbing code or the cement label instructions require the use of a primer, it shall conform to ASTM F 656. The joint is made while the solvent cement is still wet by inserting the pipe into the fitting socket and rotating $\frac{1}{8}$ to $\frac{1}{4}$ turn.

Precautions: Joining PVC pipe and fittings should be performed in well-ventilated locations. Contact of primer and solvent cement with the skin must be avoided. Eye protection is recommended during solvent cementing. See ASTM F 402 for more safe handling details.

Protect the pipe from contact with sharp objects or building materials. Care must be exercised to avoid rough handling or abrasion of the pipe and fittings. Pipe and fittings are not intended to be continuously exposed to direct sunlight. PVC pipe should not be installed in areas subject to high heat sources.

Plumbing Codes: The following model plumbing codes permit the use of PVC pipe in any sanitary drainage, waste, and vent system and in storm drainage systems: BOCA National Plumbing Code, ICC International Plumbing Code, NAPHCC National Standard Plumbing Code, SBCCI Standard Plumbing Code, and the IAPMO Plumbing Code (2000 version).

Previous versions of the UPC limit the installation of PVC plastic pipe to buildings three stories above grade or less in height. However, many jurisdictions that use this model code have deleted this restriction.

Verify acceptance and installation of PVC piping systems with local code enforcement authorities

having jurisdiction.

6. AVAILABILITY AND COST

Availability. PVC pipe and fittings are available through many sources including local plumbing supply wholesalers, hardware stores, and farm and home centers throughout North America.

Cost: PVC plastic pipe is less expensive than metallic piping materials used in equivalent sanitary and storm drainage systems.

7. WARRANTY

PVC pipe and fittings manufacturers generally warrant that their pipe and fittings are free from defects and conform to designated standards. However, most warranties contain limitations such as, for example, they are only applicable to pipe and fittings installed in accordance with manufacturer's installation instructions. Warranties should be read carefully. Manufacturers of the pipe and fittings are not responsible for improper use, handling, or installation of the product.

8. MAINTENANCE

Standard drainage system chemicals and equipment can be used.

9. TECHNICAL SERVICES

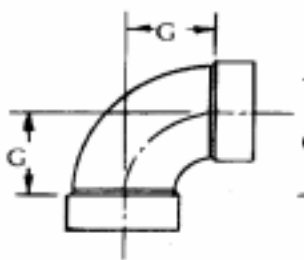
The manufacturers of PVC pipe and fittings will provide technical manuals and engineering data upon request.

10. MORE INFORMATION

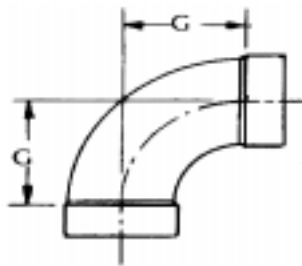
Additional product information is available upon request from the Plastic Pipe and Fittings Association, 800 Roosevelt Rd., Building C, Suite 20, Glen Ellyn, IL 60137; (630) 858-6540; FAX (630) 790-3095; www.ppfahome.org.

TABLE 1 LAYING LENGTHS (IN.)

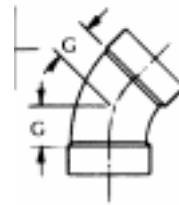
PIPE SIZE	¼ BEND	LONG SWEEP ¼ BEND	1/8 BEND	1/6 BEND	1/16 BEND
	G	G	G	G	G
1 ¼	1 9/16	2 ¼	1	7/8	7/16
1 ½	1 ¾	2 ¾	1 1/8	1	½
2	2 5/16	3 ¼	1 ½	1 5/16	11/16
3	3 1/16	4 1/16	1 ¾	1 11/16	13/16
4	3 7/8	4 15/16	2 3/16	2 1/16	1
6	5	9	2 9/16	3 3/8	1 ½
8	6	N/A	2 1/16	N/A	1 ½



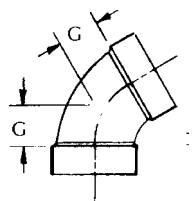
¼ BEND



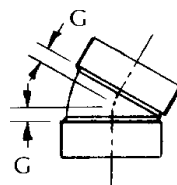
LONG SWEEP
¼ BEND



1/8 BEND



1/6 BEND

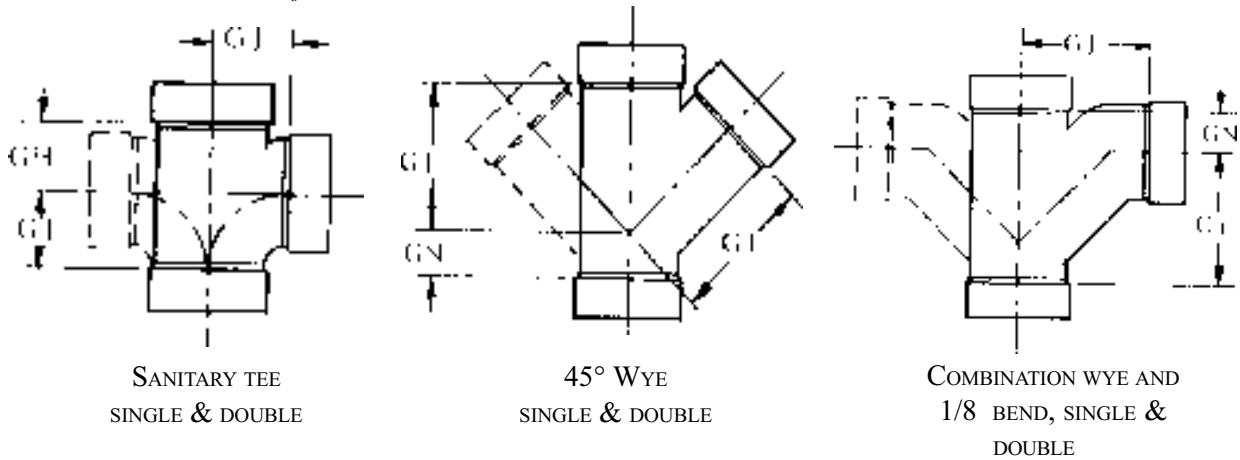


1/16 BEND

TABLE 2**LAYING LENGTHS (IN.)**

PIPE SIZE	SANITARY TEE, SINGLE AND DOUBLE		45° WYE, SINGLE AND DOUBLE		COMBINATION WYE AND 1/8 BEND, SINGLE AND DOUBLE	
	GH	GJ	GN	GJ	GN	GJ
1 1/4	3/4	1 9/16	1 1/16	2 9/16	7/16	2 1/16
1 1/2	1	1 3/4	1 1/8	2 7/8	1/2	3 3/8
2	1 3/8	2 5/16	1 3/8	3 5/8	1	4 1/2
3	1 13/16	3 1/16	1 5/8	5 11/16	6 15/16	
4	2 1/4	3 7/8	1 7/8	6 3/8	1 13/16	8 5/8
6	3 1/2	5	1 3/4	8 7/16	*	*
8	4 1/2	6	2 3/8	11 3/4	*	NA

*Combined Wye and 1/8 bend is assembled from two standard fittings.



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