PVC DWV SPECIFICATION SHEET:

Polyvinyl Chloride (PVC) Plastic Pipe and Fittings for Drainage, Waste, and Vent Systems (DWV)

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Product Description

Basic Use

Polyvinyl Chloride (PVC) pipe can be used for sanitary drainage, waste, and vent systems (DWV), as well as storm water drainage systems, in residential, commercial, and industrial applications. Pipe and fittings are joined by solvent cementing. A full complement of PVC drainage pattern fittings is available for DWV and other gravity drainage applications. The pipe and fittings are available in sizes ranging from 1¼ inches to 24 inches in diameter. PVC pipe is normally supplied in 10- and 20-foot lengths, but other lengths are available.

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 D1785 and ASTM D2665.*

Composition and Materials

PVC is a thermoplastic material, and the PVC compounds commonly meet Class 12454 per ASTM D1784 or Class 11432 per ASTM D4396 for cellular core pipe. PVC pipe is available in both solid and cellular core walls, which are used interchangeably.

Grades

PVC pipe, identified as Schedule 40 DWV 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 informally referred to as Schedule 30 pipe. This pipe is intended to fit within a 2 x 4-inch-wide stud wall assembly.

Limitations

PVC pipe is intended for use in conventional sanitary DWV systems, as well as 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, so 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.

Technical Data

Applicable Standards

- ASTM D2665, ASTM D2949, ASTM F891, and CAN/CSA B181.2 apply to PVC pipe for DWV applications.
- ASTM D2665 specifies the requirements for solid wall Schedule 40 pipe.
- ASTM F891 specifies the requirements for Schedule 40 pipe having a cellular core.
- ASTM D2949 specifies 3.25-inch outside diameter pipe and fittings.
- ASTM F409 applies to PVC tubes and tubular fittings used for accessible waste traps and connections.
- ASTM D2665 or CAN/CSA B181.2 applies to solid wall PVC pipe fittings.
- Dimensions for drainage pattern fittings up to 8” size are shown in ASTM D3311.
- ASTM F1866 covers PVC Schedule 40 Drainage and DWV fabricated fittings in 4” through 24” sizes.
- ASTM D2564 applies to solvent cements for PVC.
- ASTM F656 applies to primer, if required.

Quality Control

Most pipe and fittings are third party certified and inspected by an American National Standards Institute (ANSI) accredited third-party listing agency to conform to NSF/ANSI Standard 14, the International Association of Plumbing and Mechanical Officials (IAPMO) Uniform Plumbing Code, the International Plumbing Code (IPC), and the Canadian Standards Association (CSA). Conforming pipe is third party certified and marked.

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Expansion and Contraction

PVC pipe has a documented expansion and contraction rate. 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 200 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 using expansion joints, piping offsets, or making provisions for 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. For pipes 2" and smaller provide mid-story guides for support. Install hangers and supports to allow for thermal expansion and contraction. Piping must not be in contact with wallboard or paneling.

Fire Resistance

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 E814. Verify local code interpretations related to through penetrations with the jurisdiction that has 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 the local building department for regulations concerning the use of PVC pipe and fittings.

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 ASTM D2855, the procedure or instructions found on the cement container label, or a manufacturer's literature. Use PVC solvent cement conforming to ASTM D2564. If the plumbing code or the cement label instructions require the use of a primer, it shall conform to ASTM F656. The joint is made while the solvent cement is still wet by inserting the pipe into the fitting socket and rotating 1/8" to 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 F402 for more details on safe handling.

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. For product installed where it may be exposed to direct sunlight or UV exposure applications, contact manufacturer for guidance, cover, or apply a light-colored comparable paint. 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 DWV system and storm drainage systems:

- International Code Council's (ICC) International Plumbing Code (IPC)
- ICC's International Residential Code (IRC)
- IAPMO's Uniform Plumbing Code (UPC)
- IAPMO's National Standard Plumbing Code (NSPC)
- The National Plumbing Code of Canada (NPCC)

Verify acceptance and installation of PVC piping systems with local code enforcement authorities that have jurisdiction.

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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 DWV and storm drainage systems.

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 only being applicable to pipes and fittings installed in accordance with the 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.

Maintenance

Standard drainage system chemicals and equipment can be used.

Technical Services

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

More Information

For a list of member manufacturers and more information visit Plastic Pipe and Fittings Association (PPFA) website at www.ppfahome.org.

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