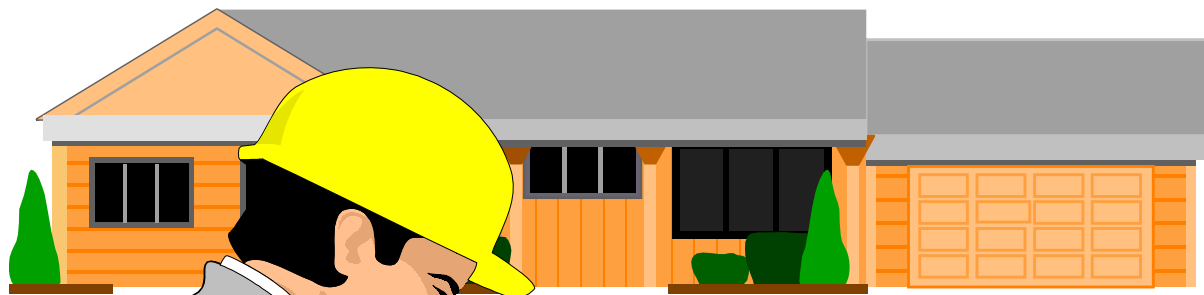


Installation Handbook: CPVC Hot & Cold Water Piping



PPFA

Plastic Pipe and Fittings Association

General Information

This handbook is intended to provide basic information for the installation of CPVC (Chlorinated PolyVinyl Chloride) piping¹ for hot and cold water distribution systems and is published for the benefit of installers, contractors, code officials, distributors, and home owners. The information has been presented as simply and concisely as possible, but the reader should be aware that more detailed information is available from the manufacturer of your CPVC piping or from the supplier of the raw material used in the piping. Some subjects in this handbook are interrelated and may be discussed in more than one section. The authors strongly recommend reading the entire handbook, so the user will be familiar with all aspects of the interrelated items.

The statements and descriptions in this handbook are informational only and are not intended as an endorsement or warranty with respect to any product or system. The Plastic Pipe and Fittings Association (PPFA) and its members make no warranties or representations as to the fitness of any product or system for any particular purpose; the suitability of any product or system for any specific application; or the performance of any product or system in actual construction.

In all cases, the appropriate local authorities should be consulted concerning the requirements covering the use of any particular product or system in any specific application. The manufacturer's label and/or instructions should also be followed. General questions on piping system design or installation described herein may be directed to the Plastic Pipe and Fittings Association.

¹ *The term piping covers pipe, tube, and fittings, and the terms pipe and tube are used interchangeably.*

Introduction

Chlorinated polyvinyl chloride (CPVC) pipe, tube, and fittings have been successfully used in hot and cold water distribution systems since 1960. From 1960 through 1990, enough CPVC tubing was sold to plumb millions of typical, single-family dwelling units and usage is increasing each year.

The following standards apply to CPVC and related products:

- ASTM D2846 — Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Hot and Cold Water Distribution Systems;
- ASTM F493 — Standard Specification for Solvent Cements for CPVC Pipe and Fittings;
- NSF Standard 14 — Plastic Piping Components and Related Materials;
- NSF/ANSI Standard 61 — Drinking Water System Components — Health Effects; and
- ASTM F402 — Standard Practice for Safe Handling of Solvent Cements, Primers and Cleaners for Joining Thermoplastic Pipe and Fittings.

The product consists of SDR 11 CPVC tube made to the Copper Tube Size (CTS) ODs (outside diameters), and CPVC socket-type fittings. The standard covers sizes 1/2" through 2" and both the tube and fittings are tan in color. As hot and cold water piping, the system carries a continuous use rating of 100 psi at 180° F and 400 psi at 73° F. When sizes larger than 2" are needed, Sch. 80 CPVC pipe (ASTM F441) made to iron pipe size (IPS) ODs (outside diameters), and Sch. 80 CPVC fittings (ASTM F437 and F439) are used. Some codes require proof testing of assemblies for 48 hours at 150 psi/210° F. Most products have had these tests performed and qualify for use under such codes.

How to Identify the Product

In order to comply with the standard, CPVC tube shall have the following information printed on it: (a) manufacturer's name, (b) certification or listing agency mark (e.g. NSF-PW or other acceptable agency's mark), (c) size, (d) ASTM D2846 CPVC 4120, (e) SDR 11, (f) 100 psi @ 180° F.

In order to comply with the standard, CPVC pipe shall have the following information printed on it: (a) manufacturer's name, (b) certification or listing agency mark, (c) ASTM standard number F441, (d) size, (e) Sch. 80, (f) pressure rating.

In order to comply with the standard, CPVC fittings shall have molded markings of (a) manufacturer's name, (b) certification or listing agency mark, (c) ASTM standard number (D2846 or F439), (d) material designation (CPVC 4120 or CPVC for CPVC 23447).

In order to comply with the standard, CPVC solvent cement shall have on the label (a) CPVC Solvent Cement, (b) ASTM F493, (c) certification or listing agency mark, (d) manufacturer's or seller's name and address.

In order to comply with the standard, primer or cleaner shall have on the label (a) primer or cleaner, (b) ASTM standard number, (c) certification or listing agency mark, (d) manufacturer's name.

Product that does not have legible marking or has a marking that does not contain all pertinent information may not conform with the applicable standard.

Verify local code approval before installing CPVC piping.

CPVC piping is included in all major model plumbing codes — BOCA National Plumbing Code, SBCCI Standard Plumbing Code, IAPMO Uniform Plumbing Code, ICC International Plumbing Code, the BOCA One & Two Family Dwelling Code, the National Standard Plumbing Code (NAPHCC), and in FHA/HUD Bulletins. State and local government/agencies can adopt these model codes as published or modify them. Therefore, among the questions to be asked are the following: Is a model code being used? If so, which one, and have any modifications been made in regard to CPVC piping?

Basics

Since most of the system design parameters, e.g. minimum pressure, fixture unit or flow sizing of pipe, and limiting velocity, are prescribed in the applicable plumbing code and in ASTM D2846, CPVC tube is usually used as a direct size-for-size replacement for copper tube. However, because CPVC is a thermoplastic rather than a metal, there are certain differences in handling, cutting, joining, and installation, and these are detailed here.

Identification & Storage

- **Pipe:** Check the markings to make sure the pipe is ASTM D2846 SDR 11 CPVC with a certification or listing agency mark. Look at the pipe to make sure there are no signs of damage or cracked ends. Store straight lengths of pipe flat with full length support. Cover or store indoors.

- **Fittings:** Check for marking on bag (or box) and on fittings. Store indoors.

- **Solvent cement, primer and cleaner:** Check for markings on cans and store indoors.

Cutting & Chamfering

CPVC pipe is easy to cut with a tubing cutter (photo A), a power saw, hand saw, or a ratchet cutter. When using a ratchet cutter, blades should be sharpened regularly. The tubing cutter should be equipped with a blade made especially for cutting plastic. A roller type tubing cutter with a cutting blade designed for metal is not satisfactory even if the blade is new. All cuts should be made so they are square to the tubing.

Chamfer the end of the pipe (photo B) and remove any burrs. Although this can be done with a knife or file, a chamfering tool that produces a 10° to 15° chamfer is ideal. **Use a clean, dry rag;** wipe dirt and moisture from the fitting sockets and tubing ends.

Check Dry Fit

This is done just before a joint is solvent cemented, and it verifies the pipe OD and the fitting socket tolerances (photo C). The pipe should go into the socket $\frac{1}{3}$ to $\frac{2}{3}$ of the socket depth before it makes contact with the socket wall. This interference is necessary and provides a joint that will quickly attain the desired handling strength and give good, long-term service.



A



B



C