

Crosslinked Polyethylene (PEX) vs Chlorinated Polyvinyl Chloride (CPVC)

Crosslinked polyethylene (PEX) and chlorinated polyvinyl chloride (CPVC) are popular plastics used in plumbing systems today. Viega PureFlow® PEX is manufactured using the silane method, which achieves crosslinking during a post extrusion process with heat and moisture. CPVC is a thermoplastic produced by chlorination of polyvinyl chloride (PVC) resin, which allows it to withstand higher temperatures and pressures than standard PVC.

CPVC systems are installed by applying a solvent cement or glue to CPVC tubing and assembling the fittings. This system has several vulnerabilities when it comes to producing a safe, fast and reliable system.

Residential Applications



Save 78%

on total fitting install time with Viega PureFlow Press fittings vs CPVC*.

*Based on ambient temperature between 60° and 100°F.

Commercial Applications



Save 84%

on total fitting install time with Viega PureFlow Press fittings vs CPVC*.

*Based on ambient temperature between 60° and 100°F.

False positives caused by dry fit

Regular practice for installing CPVC systems is to dry fit the tubing and fittings before making a permanent connection with solvents. Unfortunately, it can be hard to tell when a connection has been successfully made versus when it has been left incomplete during dry fit. It is possible to have a successful pressure test which leaves the system vulnerable to failure and blow-off after construction has been finished, leading to major damage.

Inconsistency in solvent application

Similar to soldering copper joints, no two connections are exactly the same when applying solvents. A lack of full solvent adhesion leaves the joint vulnerable to small leaks. Excess solvent applied to the tubing will continue to soften the interface of the CPVC until it ultimately fails.

Downsides to CPVC solvent

If not sealed properly, CPVC solvent can evaporate or change in chemical nature, leading to ineffective bonding. Cans of CPVC solvent have a shelf life and the expiration date must be taken into account. CPVC solvent fumes can cause nausea and should only be used in well-ventilated areas. Contact with CPVC solvent can cause skin inflammation and ingestion can lead to serious health problems. Solvent vapors must be stored in proper locations as vapors can form explosive mixtures with air. According to the EPA, there is suggestive evidence of carcinogenic potential based on exposure.

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More fittings required

With the flexibility of PEX, especially at the 1/2" and 3/4" diameters, many fittings can be eliminated by bending PEX around corners. CPVC, however, is more rigid and requires elbows for directional changes.

More prep work required before making a connection

Many CPVC manufacturers recommend chamfering the end of the pipe and then taking time to check the insertion depth of the fitting. Some codes do not allow for one-step solvent application which means an additional primer must be applied before assembling the joint.



More fittings means more time

According to PHCC, a 1" CPVC joint takes almost one minute more than general PEX connections, which doesn't account for Viega's additional speed. The ability to not only eliminate fittings using PEX but gain approximately one minute per connection adds up to significant time savings for a job.

Pressure test immediately

Viega's PureFlow PEX connections are ready for pressure test as soon as the connection is made. CPVC and other types of PEX connections require cure time or time for constriction, which can add a day to every system installed.

Pressure test with air

CPVC manufacturers warn against pressure testing with air due to the brittle nature of CPVC. If the pipe is impacted or a joint has not properly bonded, the result can be a violent blow off or explosion of the piping. PEX, however, can be pressure tested with air and Viega includes standard practice instructions for prepping, pressurizing and concluding a pressure test up to 100psi in our installation manual.

Weather conditions affect CPVC solvent effectiveness

Unlike Viega's PureFlow PEX system, CPVC connections can be affected by rain and high humidity because the presence of moisture dilutes the solvent before the joint can properly seal.

Must avoid contact with plasticizers

Pthalate esters typically found in network cables and other flexible forms of wiring have an adverse reaction with CPVC that can lead to failure. CPVC manufacturers do not recommend contact with these materials. PEX tubing, however, does not have the same chemical reaction and it is generally acceptable for PEX tubing to come in contact with jacketed wiring.

Must avoid contact with pesticides

Many common pesticides contain chemicals that are detrimental to CPVC and can cause stress cracking which results in piping failure. PEX has been found to be able to withstand most types of pesticides, termiticides, and insecticides.

Minimum time to 100psi pressure test (minutes)

Temperature (F)	Viega PureFlow Press	CPVC solvent
0°	Immediately	30
32°	Immediately	20
40°	Immediately	15
60°	Immediately	15

**Values above are for 1" pipe chosen as middle of size range for likelihood of being somewhere in both residential and commercial jobs*

**CPVC values may fluctuate based on pipe diameter, temperature and relative humidity*

Feature comparison	Viega PureFlow Press	CPVC
Tight bend radius (flexibility)	✓	✗
Eliminate probability of dry fit	✓	✗
Visual indication of successful connection	✓	✗
Immediate pressure test regardless of humidity	✓	✗
Pressure test with air	✓ ^{100 PSI}	✗
Eliminates glues, solvents and fumes	✓	✗
Hanger support spacing	8ft. ^{with trays}	4ft.

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