

Common misconceptions about plastic piping can complicate residential plumbing repairs

The top 4 issues relating to CPVC and PEX piping materials.



A NEW WAVE | Service plumbers are encountering a new wave of plastic piping systems when making residential repairs, including a rise in CPVC piping and fittings such as the above from FlowGuard Gold CPVC.



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Lifestyle changes driven by the pandemic have kept many service plumbers especially busy over the previous months. More people at home more often puts added stress on residential plumbing systems. More toilet flushes, more dishwasher cycles and more water running through pipes can all lead to increased demand for repair services.

Of course, service plumbers are expected to be an encyclopedia of plumbing knowledge with the ability to diagnose any plumbing problem from a blurry cell phone picture while always having the right products on the truck to make a quick and flawless repair. If only it were that easy.

Where once service plumbers encountered mostly copper, with the occasional need to work with galvanized iron piping, and knew exactly how to diagnose and repair issues like electrolysis or misapplication of type M copper, today the material landscape is more complicated. A new wave of plastic piping systems, CPVC and PEX, have become dominant in new construction for most of this century. As these systems become a growing percentage of the installed base, service plumbers are dealing with them more frequently and sometimes without the benefit of proper training, which can lead to misconceptions and complications during repairs.

Here are the top issues related to these materials uncovered through an online quiz designed to test service plumbers' knowledge of plastic plumbing repair practices.

1. Tool usage

Nearly every plumber takes pride in their collection of tools, but when it comes to CPVC and PEX piping, roughly half of plumbers indicated they would use the wrong tool to cut into the pipe for service.

PEX piping can be cut with ratchet cutters or scissors-style shears, but many plumbers appear to be using c-style tubing cutters as well for this material. Because PEX is a soft plastic, most c-style tubing cutters will not effectively cut into PEX tubing.

Similar misconceptions exist with CPVC. Scissors-style shears should never be used with CPVC because the pipe is too rigid. Ratcheting cutters can be used on new CPVC piping, but as CPVC ages, it becomes more rigid and actually increases its pressure bearing capability. However, this increased rigidity can cause issues when ratchet cutters are used on older CPVC piping, which appears to be a common practice today.

Aged CPVC should be cut with a c-style tubing cutter, or alternately a wheel cutter or a fine-tooth saw. If you encounter CPVC in the field, just think of that "C" in CPVC when reaching for your cutting tool.

2. Fittings

PEX and CPVC use very different style fittings. CPVC uses a solvent weld process in which the pipe slides into the fitting, maintaining full flow through the pipe. Use of the right size dauber in applying the solvent cement helps ensure an even coating that results in a strong bond. This is best achieved with a dauber one-half the size of the pipe diameter.

Some service plumbers still believe repairs that require solvent cement will take hours to cure. That isn't the case when you use a solvent cement designed specifically for repairs. Specially formulated repair solvent cements can cut curing times down to as little as 15 minutes on cold water lines.

With PEX, the pipe fits around the outside of the fitting so the internal diameter of the pipe is reduced at each fitting. Depending on the fitting used, this can reduce the internal diameter of a 1/2-inch pipe anywhere from 21% to 35%, which can have a noticeable impact on flow rates. Yet, roughly half of plumbers believe that ASTM F1960 expansion PEX fittings provide full flow performance.

There is no such thing as a full flow PEX fitting, just different degrees of restriction. Using PEX to replace a copper or CPVC system can result in unwanted pressure drop or require the use of upsized pipe to maintain system performance.

3. Repair versus repipe

One challenge service plumbers face when making repairs is determining when older pipe needs to be replaced. This was another area identified by the quiz in which a misunderstanding of material characteristics could lead to unnecessary repairs.

When asked whether aged or “brittle” CPVC needed to be replaced, a majority of plumbers taking the quiz say, “Yes.” In fact, as mentioned previously, older CPVC has excellent pressure-bearing capability and actually gets stronger with age. Also, remember that CPVC is immune to the chlorine degradation that can occur in copper and PEX. In those materials, the risk of failure due to degradation increases with age, and degradation in one pipe could indicate broader problems. Provided it was installed correctly, aged CPVC pipe can continue to perform for many years when the correct tools are used in service. Just remember to think of that “C” in CPVC before making the cut.

4. Diagnosing pipe failures

Pipe failures can often indicate problems that simply replacing the failed pipe won't address. For example, CPVC is rated to handle 100 psi at 180° F. If you come across a CPVC pipe failure that appears pressure or temperature related, it's worth investigating as the pipe would not be expected to fail under normal conditions. One thing to look for is a malfunctioning boiler or water heater that is overheating the water to more than 200° F. This is not only a problem for the pipes; it could be dangerous to residents of the home. Instead of simply replacing a failed pipe, create a happy customer by performing necessary repairs that resolve the true cause of the problem.

Another example is the common misconception that UV light causes PEX failures. UV light can contribute to chlorine-related failures in PEX; however, it doesn't actually cause the failure. UV light acts as a catalyst for the oxidation process that consumes the chlorine-inhibiting antioxidants that protect the pipe from chlorine induced oxidation. As these chlorine inhibitors get consumed, piping is left vulnerable to attack from chlorine in the water. If you simply replace a failed pipe thinking the problem was UV light exposure, you could be ignoring broader water incompatibility issues within the system and end up coming back in a few years to replace the pipe you put in.

Service plumbers today have to shift from working with copper to PEX to CPVC, sometimes in a single workday. And, with the increased use of plastic in new construction due to the cost benefits, they are working on more plastic piping than ever. Understanding the fundamental differences in the proper procedures and performance of CPVC and PEX allows plumbers to repair more efficiently and ensure the satisfaction of customers.

To help plumbers access training and education on servicing CPVC, the FlowGuard Gold team has created an online information hub specifically for service plumbers at flowguardgold.com/servicesuccess.