

PLUMBER'S GUIDE TO CPVC



WHY CPVC IS THE
BEST CHOICE FOR
ALL HOMES

FLOWGUARD[®] PLUS
CPVC PLUMBING SYSTEMS[™]



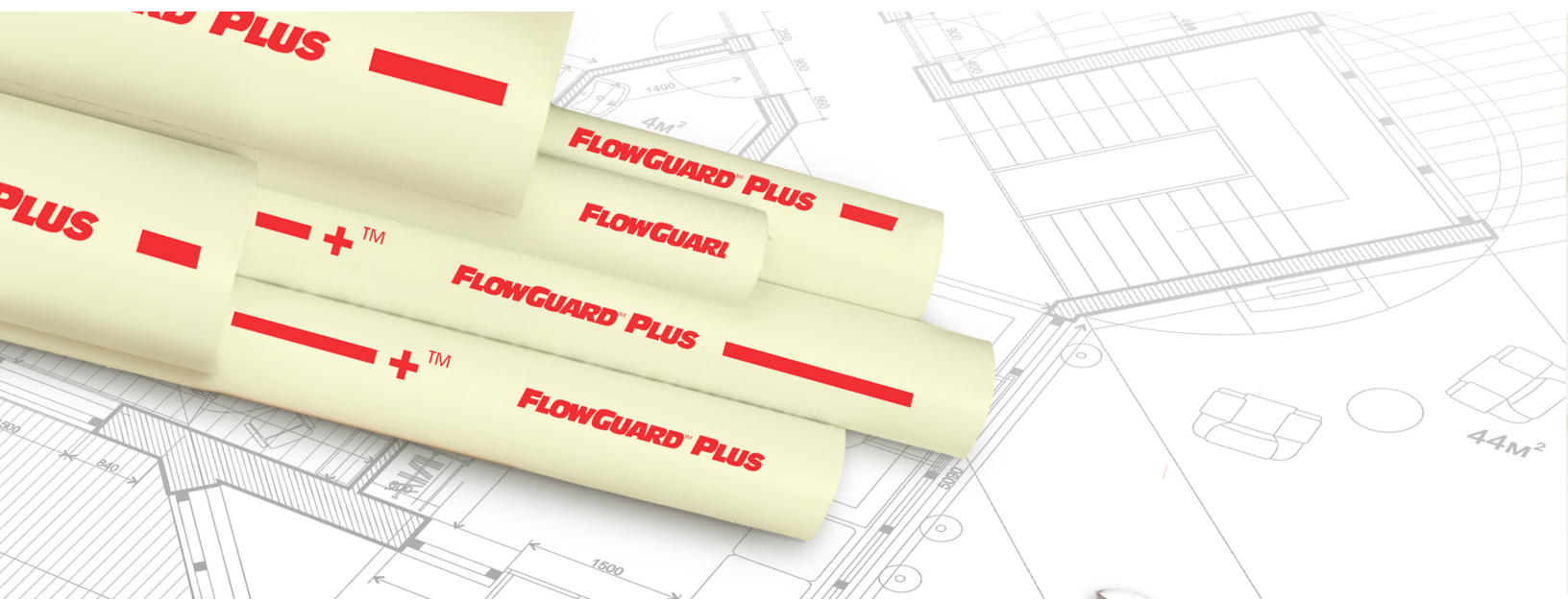
INTRODUCTION

To be confident in their work, plumbers need to choose reliable materials that will stand up to regular use. Not only must they consider the long-term life of the systems they work on, but the time and labor required to install them are also crucial factors.

How long installation will take, the risks and labor associated with installation and repairs, and the necessity of learning how to work with new materials all equate to the final profit a plumber makes on a project.

You must consider each of these factors to choose the right pipe and fitting material. For that reason, the material most often used by plumbers across India is chlorinated polyvinyl chloride, or CPVC—and FlowGuard® Plus CPVC is the most requested brand.

CPVC is the preferred choice for hot and cold plumbing applications in all construction works wherein potable water needs to be transported with highest number of installations not only in India but across the globe.



WHAT IS CPVC?

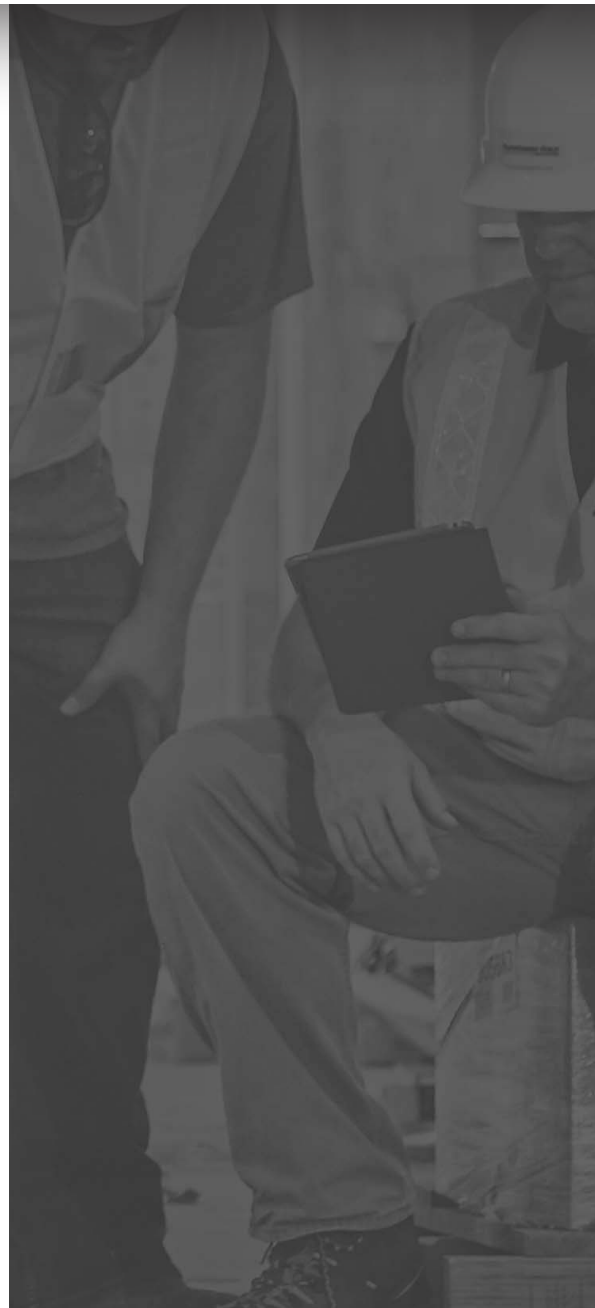
CPVC is a specially engineered thermoplastic designed for use in hot and cold water systems. It satisfies international potable water piping standards for residential homes, apartments, hotels and commercial buildings.

The material is **safe, durable, fire resistant, chlorine resistant, antimicrobial and recyclable.**

Additionally, CPVC outperforms other materials often used in hot and cold water plumbing systems, including:

- PPR
- PEX
- Galvanized Iron
- Polybutylene
- Copper

How? CPVC is **easier to install, more cost-effective, better for drinking water, and longer-lasting** than these alternatives.





CPVC OFFERS SAFER, MORE EFFICIENT INSTALLATIONS

Installation is greatly impacted by choosing CPVC pipes and fittings because the material is easy and quick to use.

A FASTER AND EASIER INSTALLATION PROCESS

Unlike PPR, CPVC doesn't require a heat welding process to join pipes and fittings. **It's much safer and easier thanks to the solvent cement welding process.**

Solvent cement is not glue. It is a mixture of CPVC resin, stabilizers and fillers dissolved in a cocktail of solvents. Instead of adhering two pieces of CPVC together, it chemically fuses them at the molecular level. The end result is a joint that becomes the strongest part of the piping system.

Installation with solvent cement welding **does not require heavy tools or machinery**, such as heat welding machines, which can result in injury to you or your employees or damage a job site. Instead, most CPVC projects can be completed with only a few handheld tools.

SOLVENT CEMENT WELDING

The simple steps for solvent cement welding are:

1. Cut the pipe squarely with a simple hand saw or wheel cutter.
2. Remove burrs from the pipe and create a beveled edge using beveling tool.
3. Prepare the pipe and fitting for joining by using a cleaner to remove dirt and moisture and testing the fit.
4. Apply the solvent cement to the pipe and fitting with a dauber.
5. Assemble the joint by inserting the pipe into the fitting socket immediately after applying solvent cement.
6. Allow the joint to cure and dry.



CPVC IS BETTER FOR SMALL AND ELEVATED WORKSPACES

CPVC installation is easy for plumbers to do in confined places thanks to the solvent cement process, which only requires a small dauber instead of a torch or heat fusion machine. This also makes repairs much simpler.

Additionally, it can be supplemented with simple fabrication on-site, as opposed to installation of a steel system, which requires off-site fabrication.

Elevated workspaces are also less of an obstacle with CPVC installation, because the process only requires one or two people. Conversely, PPR installation on elevated services is much more difficult: it requires two to three people plus a bulky welding machine, which can be dangerous at higher heights. Someone must hold the welding machine in place while another installer completes the welds, and it often takes two people to insert pipes into the fittings—especially for larger sized pipes.

COST SAVINGS WITH CPVC

CPVC is a cost-effective piping material thanks to savings in labor, material, and utilities.

LABOR COST SAVINGS

Labor is one of the biggest expenses of a piping system installation—in fact, it can make up half of the total plumbing system costs.

Because the time required to install a plumbing system can increase costs drastically, the result could be an incorrect quote and unhappy customer. Using CPVC can limit the amount of time plumbers spend on a job.

FlowGuard® Plus CPVC pipes and fittings can be installed at least 25% faster than other piping materials, thanks to the following features:

- Thanks to **CPVC's light weight**, it can effectively be installed by one person.
- **CPVC is more rigid** than many other plastics, such as PPR, meaning it sags less and requires up to 15% fewer hangers. This leads to quicker installation and up to 15% faster hanger installation.
- **FlowGuard® Plus CPVC expands and contracts less than PPR piping**, which means less time creating mechanisms to deflect the resulting compressive stress.
- The **solvent cement welding process is just as fast as it is simple**, meaning less time spent on jobs and on reworks.

With the quick installation process, **plumbers can experience up to 50% labor cost savings** when installing CPVC over other piping materials.



MATERIAL COST SAVINGS

In terms of material cost, FlowGuard® Plus pipes and fittings can save plumbers in a number of ways.

- As mentioned above, CPVC requires fewer expansion loops than a material like PPR (because it experiences less thermal expansion) and fewer hangers, meaning **cost savings on those additional materials (including up to 15% cost savings on hangers).**
- Because of **CPVC's superior hydraulic performance**, less material can be used to achieve the same flow rate as pipe materials like steel, which have smaller internal diameters.

COST SAVINGS PASSED TO THE CUSTOMER

The thermal conductivity of a copper system is 2,500 times that of a FlowGuard® Plus CPVC system, and FlowGuard® Plus CPVC thermal conductivity is about 30% better than other plastic pipes. This means FlowGuard® Plus CPVC will keep hot water hot for a longer period of time compared to other types of pipes, and **customers will be pleased with the long-term decrease in utility costs.**

RELIABILITY IS A STRENGTH OF CPVC

CPVC boasts a long service life thanks to its durability, corrosion resistance, chemical compatibility, and overall reliability, meaning you can recommend CPVC as product you'll be proud of.

CHLORINE RESISTANCE

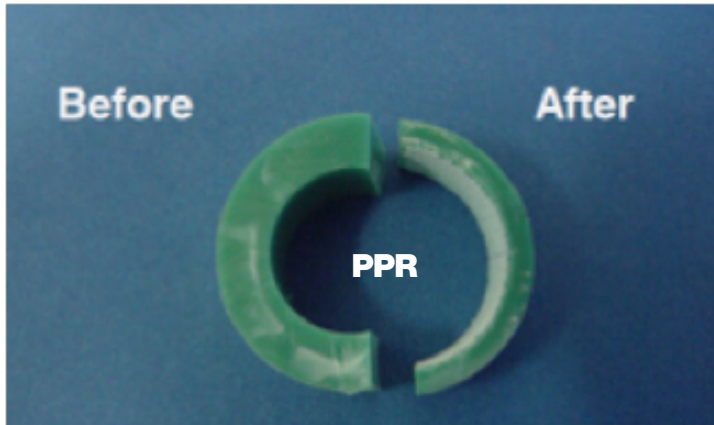
Chlorination is the most common method used for disinfecting drinking water all over the world, and according to the World Health Organization, "the use of chlorine to protect drinking water is one of the greatest public health advances in history."

However, materials like PPR and PEX can experience premature failure when they come in contact with chlorine. PPR reacts with the chlorine and forms an acid that corrodes the pipe and causes flaking. The flakes fall off into the water flow, lowering the system's water pressure and clogging it.

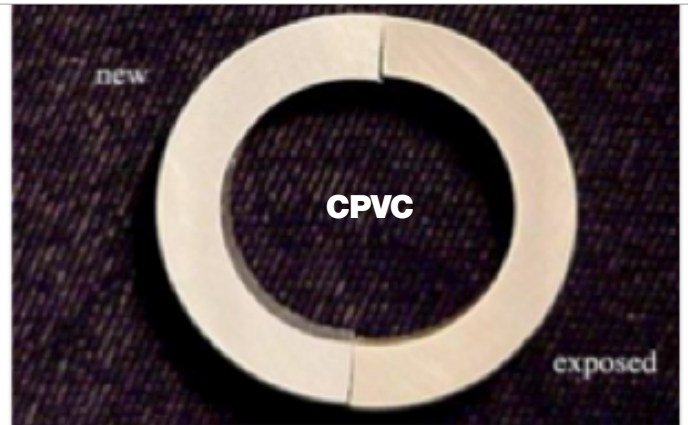
CPVC, however, is **naturally resistant to the effects of chlorine and chlorine dioxide** used to disinfect potable water supplies.

CHLORINE RESISTANCE OVER TIME

The image below depicts CPVC pipe and PPR pipe after exposure to chlorine. As you can see, PPR becomes prone to failure by chlorine degradation.



PPR Erosion
After 10 months (at 5ppm Chlorine)



CPVC: Real Life testing after 24 years

CHEMICAL COMPATIBILITY

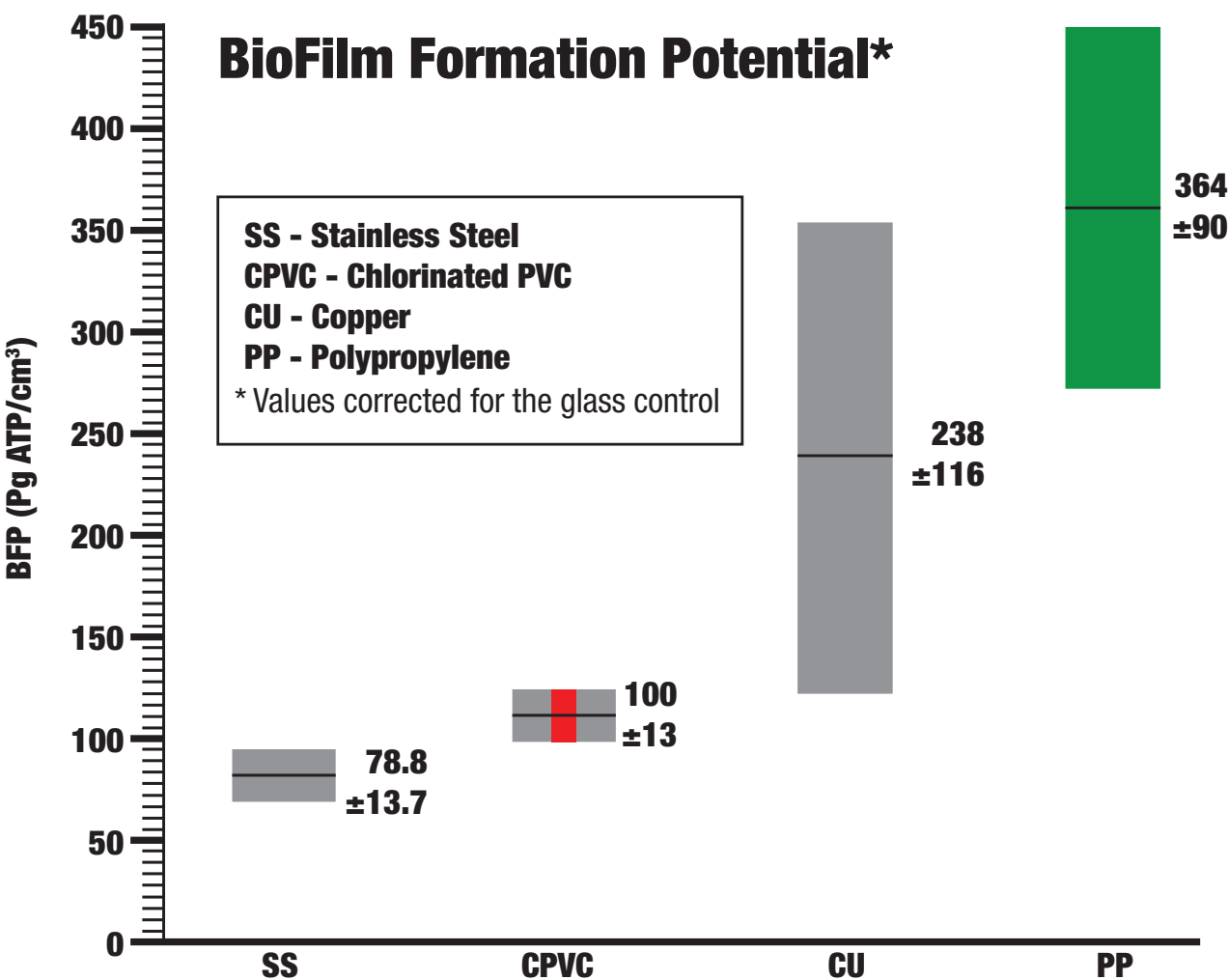
Chlorine isn't the only chemical that FlowGuard® Plus CPVC withstands. The high-performing material is compatible with a range of chemicals, offering peace of mind for plumbers installing and recommending the system and resulting in a long service life.

One way plumbers can have greater confidence in CPVC, especially during repairs and installation, is with the FBC™ System Compatible Program, which eliminates guesswork for FlowGuard® Plus CPVC pipes and fittings. With this program, which shows the safety of certain materials with a seal on the packaging, you never have to guess whether a related construction product is compatible with the piping or if it will cause a premature failure.



SAFER DRINKING WATER

FlowGuard® Plus CPVC is resistant to microbial buildup, thanks to a smooth surface that harmful biofilm cannot latch onto. Materials that require heat welding, such as PPR, can encourage biofilm growth as plastics fuse together and when beading occurs on the inside of the pipe. The table below shows the biofilm formation potential among various piping materials.



CPVC’s resistance to biofilm buildup keeps water pure by reducing the risk of:

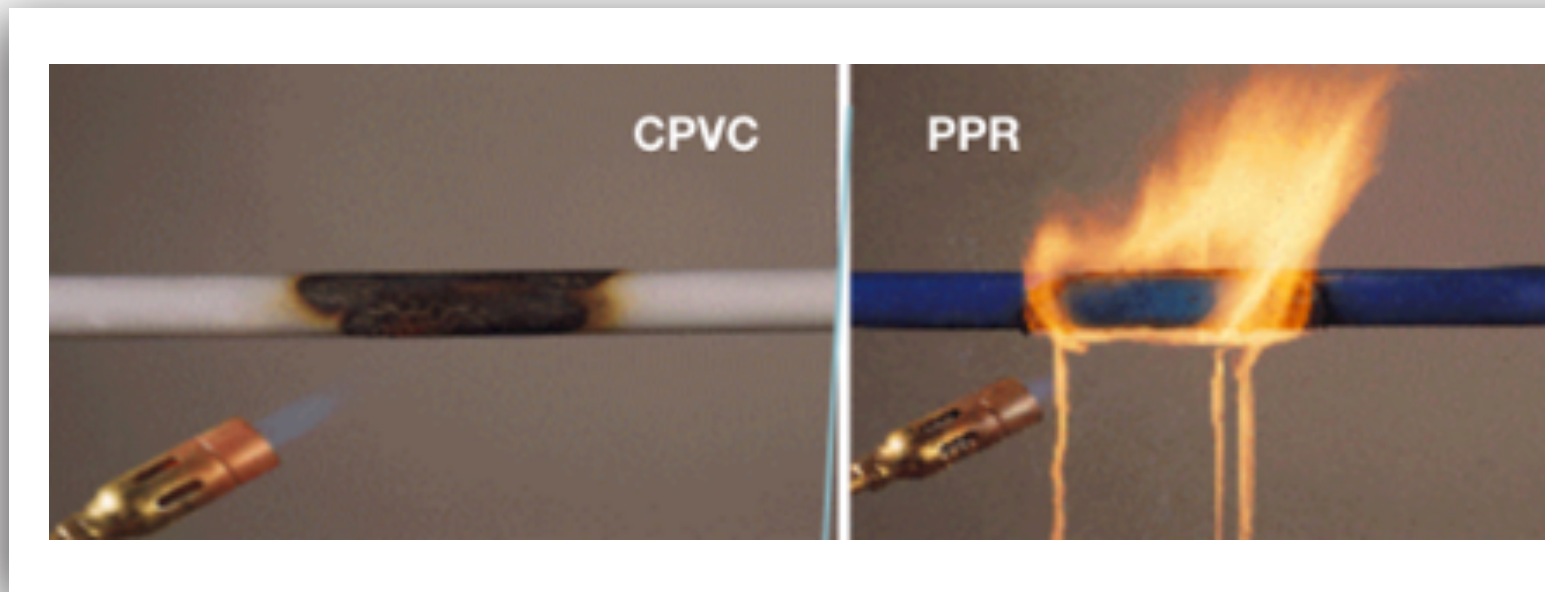
- Microorganisms, which can cause health problems.
- Poor water quality, including bad taste and smell.
- Bacterial growth that can cause illness, such as Legionella, Pseudomonas, and Coliform bacteria.



GREATER MATERIAL SAFETY

Plumbers can take comfort in knowing that when they recommend FlowGuard® Plus CPVC pipes and fittings, they're encouraging greater material safety with a thermoplastic piping system that does not sustain a flame. In the event of a fire, a piping system made with PPR or another thermoplastic can lead to greater damage by spreading the flames and releasing burning droplets throughout the building. However, FlowGuard® Plus CPVC pipes and fittings are fire resistant, thanks to their low Limiting Oxygen Index (LOI) factor.

LOI is the percentage of oxygen needed in the atmosphere to support combustion. The higher the value, the greater resistance to burning. CPVC has an LOI of 60 and does not support combustion. PPR, on the other hand, has an LOI of 18 meaning that PPR will sustain a flame.





A DURABLE, LONG-LASTING CHOICE

CPVC has been widely used for nearly 60 years and many of the initial installations are still up and running without problems. Non vinyl is a more recent addition to the market and has a higher lifespan.

FLOWGUARD® PLUS CPVC: PIPING SYSTEMS YOU CAN TRUST

A single material brand is often manufactured by a number of manufacturers. You should be confident that pipes and fittings will deliver the same performance and reliability regardless of by who, when and where they are produced.

The Lubrizol Corporation produces FlowGuard® Plus CPVC compound for licensed manufacturers, who each much participate in the quality assurance program and receive on-site technical assistance. This program assures FlowGuard® Plus pipes and fittings continually meet the highest international standards.

For more information about FlowGuard® Plus pipes and fittings or to discuss your next plumbing project with a technical expert, contact us today.

FLOWGUARD® PLUS
CPVC PLUMBING SYSTEMS™

RELIABILITY TESTED FOR LIFE



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Inventors and Pioneers of CPVC
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