

CHOOSING THE RIGHT CPVC



AN E-BOOK FOR PIPING SYSTEM DESIGNERS AND INSTALLERS

CORZAN

INTRODUCTION

Corrosion; material price instability; high jobsite labor costs; scale buildup and the associated reduced flow area; concerns about biofilm growth and the risk of Legionella-based illness ... When these shortcomings of metallic piping materials are plaguing your projects, thermoplastic CPVC is an alternative that provides a solution to all of them.

All CPVC isn't the same, however, so when planning to use it in a piping project, it is important to make sure you are clear on the source of the CPVC and why that matters. In this e-book, we'll explain why a generic form of the material is not preferred, and why choosing Corzan® CPVC sets up a critical building system such as piping for long-term success.

While Corzan Piping Systems and Industrial Systems are descriptors for pipe and fittings sold under these brand names, they represent important intangibles: the innovation, experience and knowledge that, in combination, foster confidence in Corzan CPVC's reliability over the long term. The Corzan Piping Systems and Industrial Systems names bring the assurance of integrity and lasting performance on which building professionals stake their reputations with every piping system. They are the direct result of core competencies brought together by Lubrizol Advanced Materials, the Cleveland, Ohio, inventors of CPVC.



Merriam-Webster defines generic as “anything that is not sold or made under a particular brand name.” So a branded version of a material, such as Corzan CPVC, generally possesses certain elements in how it is sold or made that are exclusive to it, with difference-making benefits to the customer. These differences ensure the highest standard of product quality and performance.

Behind every pipe and fitting that bears the Corzan Piping Systems or Industrial Systems name can be found:

- The Lubrizol materials scientists who invented CPVC in 1959 and continue today to formulate and improve the piping compound, using proprietary base resins and additives delivering long-term performance and compatibility with ancillary products
- The select manufacturing partners with proven track records of quality and reliability who convert the compound into Corzan pipe and fittings
- The Lubrizol laboratory professionals who possess laser focus on quality control and product testing exceeding minimum industry standards for thermoplastic pipe

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WHY CORZAN PIPING SYSTEMS AND INDUSTRIAL SYSTEMS: THE TECHNOLOGY

The backbone of CPVC is its long chainlike tangle of polymer molecules. The innovation of CPVC as compared to other plastic materials was that approximately 40 percent of the bonding sites on its carbon backbone were filled with large, strategically placed chlorine atoms. For over 60 years this technology has protected the molecular chain from attack and provides CPVC with its superior chemical and temperature resistance.

Once manufactured into a product, CPVC polymer chains are meant to remain tangled and performing across the product's lifecycle. To deliver reliability and safeguard against performance failures means that stressors of any kind should never exceed the strength built into the original material. High-quality processed CPVC is in the best position to withstand mechanical stress and contact with chemically incompatible materials. Unlike generic CPVC, Corzan CPVC is:

- A proprietary resin with a specified molecular weight and chlorine content plus additives to ensure long-term performance
- Formulated to achieve pressure ratings, tensile strength and impact strength for the finished product that exceed minimum applicable industry standards

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Corzan CPVC excels under conditions that could degrade and reduce the service life of many metals and other plastic materials. While generic CPVC materials may be available at a lower initial cost, any immediate savings can be wiped out by longer-term liabilities no piping system should face. Almost 100 percent of Corzan CPVC raw materials are sourced in the United States, and all Corzan CPVC resin and compound sold in the U.S. is manufactured at one company-owned plant in Louisville, Kentucky.

In contrast, to achieve price reductions, generic CPVC manufacturers may source their resins and compounds overseas. Their supply chains are not integrated as Corzan Piping Systems' and Industrial Systems' are, so resin production and compounding may occur in two different facilities, resulting in mixing and mingling of resin and compounds, and zero consistency from one batch to the next. In short, a suboptimal product.

The outcome of these differences can be demonstrated through testing; for example, impact testing according to ASTM D2444, "Standard Practice for Determination of the Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)," shows Corzan CPVC resisting 300 foot-pounds of impact energy without failing. The generic CPVC sample, however, is brittle to the point that it shatters at lower energy levels.

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WHY CORZAN PIPING SYSTEMS AND INDUSTRIAL SYSTEMS: THE MANUFACTURING QUALITY ASSURANCE

Demanding protocols for resin production and compounding is just the beginning. The quality of the processing of the CPVC compound into pipe is equally important. That is why Corzan CPVC is only manufactured by partner pipe companies meeting rigorous production and quality standards with a track record of reliability.

To guarantee consistent and high quality production, each manufacturer is contractually required to participate in our Quality Assurance Program. You don't have to worry about when, where and by whom the CPVC is manufactured into your finished product.

Qualified manufacturers perform two discrete operations to impart full performance properties to the CPVC compound:

- Plasticizing it through extrusion – where a twin-screw extruder is equipped with a specific screw geometry that accounts for the heat and shear sensitivity of CPVC resin during plasticizing
- Die tooling to form a specific Schedule 80 pipe size – where the pipe die tooling is designed to accommodate the high viscosity flow characteristics of the compound once it is plasticized to reduce stress and flow shear when forming the pipe in the die-head

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WHY CORZAN PIPING SYSTEMS AND INDUSTRIAL SYSTEMS: THE VALUE-ADDED SUPPORT

Once Corzan CPVC pipe and fittings are ready for market, Lubrizol Advanced Materials takes a value-added approach no other company does. We believe in seeing project execution through to the end, because every step of the process determines the ultimate integrity of the system. Specifiers, project engineers and installers have their choice of online and in-person resources to ensure success.

Online – Lubrizol Advanced Materials provides a robust sets of online engineering tools to assist building teams in establishing the optimal system design for every project, from sample specifications, technical manuals, sizing tools, expansion loop calculators and e-books to the exclusive FBC™ System Compatible Program. To protect the integrity of the Corzan CPVC polymer backbone, we developed the FBC System Compatible program to eliminate guesswork from choosing chemically compatible ancillary materials. To qualify for inclusion in this program and be approved to display the FBC System Compatible mark on their labels, manufacturers must:

- Submit products for testing by a third-party lab
- Not alter the tested formulation
- Have their manufacturing facility audited annually by the third-party lab

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In person – When only face-to-face support will do to ensure a smooth execution of the chosen solution, Lubrizol Advanced Materials brings decades of plumbing and mechanical contracting experience in training and educating installers at the office or the jobsite. Likewise, project engineers can take advantage of our experienced, ASPE-approved CEU course instructors – fulltime Lubrizol Advanced Materials employees who are experts in plumbing, HVAC and industrial segments and bring you the most up-to-date training during every accredited session.



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WHY CORZAN PIPING SYSTEMS AND INDUSTRIAL SYSTEMS: THE REASONS TO BELIEVE

Although Corzan CPVC compound was first commercialized as a corrosion-resistant alternative to traditional metallic pipe in Schedule 80 industrial applications, over time it had become apparent that Corzan CPVC's combination of inherent and engineered properties in high temperature and demanding industrial process conditions lent itself well to a technology transfer: namely, for commercial hot and cold water distribution in buildings requiring the same large diameter piping systems.

Lubrizol Advanced Materials had a solution that already met the requirements:

- Corrosion-resistant Corzan CPVC pipe and fittings were NSF certified for potable water distribution;
- The pressure-rated Schedule 80 CPVC piping was referenced in plumbing codes (ASTM F441);
- Manufacturing partners had the Schedule 80 production infrastructure for Nominal Pipe Size (NPS) from ¼ inch to 24 inches, as well as the associated fittings; and
- Ultimately, Corzan CPVC offered the necessary mechanical strength and a broad spectrum of attributes needed for all aspects of commercial water distribution piping as well as hydronic HVAC applications

Corzan Piping Systems and Industrial Systems today offer the industry's largest network of technical support specialists to our specification and installation customer, ready to help each partner choose the best system to fit their timelines, budgets and system performance parameters. It's never too late to add a new material to the arsenal.

GO TO WWW.CORZAN.COM TO GET THE PROCESS STARTED.

