



A GUIDE TO POLYPROPYLENE PIPING

Polypropylene piping systems are a premium, longer-lasting alternative to traditional, metallic piping systems.



POLYPROPYLENE

Polypropylene is an advanced plastic with unique properties that make it an ideal choice for a wide range of piping applications. In many parts of the world, polypropylene pipes and fittings are industry-standard materials for builders, engineers, and property owners. Despite its relative scarcity compared to metallics, the material is rapidly increasing in popularity in North America due to its superior performance and lifespan.

This guide is intended to introduce you to the properties and advantages that polypropylene piping brings to building projects around the world. Data in this guide comes courtesy of the Plastic Pipe Institute, a trade association based in Dallas representing all segments of the plastics piping industry.



WHAT IS POLYPROPYLENE?

Polypropylene is a durable synthetic resin that is a polymer of propylene. It's particularly useful for making molded and extruded objects, including pipes and fittings. There are two different kinds of polypropylene used in pressurized pipe-making: polypropylene random copolymer (PP-R) and polypropylene random copolymer with modified crystallinity and temperature resistance (PP-RCT). Of the two, PP-R is the more common and broadly useful.

PP-R is a high-temperature plastic pressure piping system first used for plumbing and hydronic heating in the 1980s in Europe. PP-R piping products are rated for continuous operation at 180°F (82°C) temperature, with pressure ratings dependent on their wall type (SDR). PP-R pipes commonly include reinforcement layers for benefits such as reducing longitudinal thermal expansion/contraction.

PP-R pipes provide resistance to highly acidic and basic solutions, making them ideal for a wide range of applications. Common uses include HVAC piping, outdoor piping, industrial piping, plumbing, and food-grade piping. PP-R joints are heat-fused, not glued. Their high-heat and/or pressure performance makes PP-R pipes suitable for demanding applications, such as pressure piping (plumbing, hydronics) in commercial high-rise buildings.

PP-R AND PP-RCT ADVANTAGES



Safety of potable water

Polypropylene is non-leaching, chemically pure, and highly resistant to corrosion.



Long-term reliability

Polypropylene piping systems operate at peak functionality for 60 years or more.



Resistance to corrosion, tuberculation, and deposits

Polypropylene is largely immune to common problems faced by metallic pipes.



Lightweight, easy to transport

Lighter PP-R saves money on transportation and labor costs.



No scrap value, eliminating jobsite theft

Polypropylene will never simply “walk off” a job.



Durability and toughness to survive jobsite installations

PP-R/CT is highly impact resistant and leak-free.



No flame, glue or solders are used for joining heat-fused joints

Anti-leak heat fusion does not require welding permits.



Available in wide range of sizes

PP-R/CT piping is available to suit any job.



Natural insulator, low thermal conductivity

Reduce the additional insulation work or materials required.



Professional installed appearance

PP-R/CT pipes require no paint or upkeep to look attractive for decades.



COMMON APPLICATIONS

- Hot- and cold-water plumbing distribution, residential and commercial
- Hydronic piping and distribution (radiators, fan coils, etc.)
- Heating and chilled water piping
- Suitable for many industrial and process piping applications
- Food processing
- Compressed Air



ECO-FRIENDLY

In addition to its many other advantages, polypropylene piping is also a greener solution than galvanized pipe and other metallics. PP-R/CT production requires as little as a quarter of the electricity and generates a fraction of the waste compared to metal and certain other plastics. After 60 years or more, at the end of its lifespan, polypropylene is 100-percent recyclable.

The background of the entire page is a close-up, high-angle photograph of several large-diameter blue pipes. The pipes are arranged in a circular pattern, with their open ends facing the viewer. The blue color is a vibrant, slightly metallic shade. The interior of the pipes is a lighter, silvery-blue, showing some texture and reflections. The lighting creates strong highlights on the inner surfaces of the pipes, particularly in the center of the foreground pipe, and deep shadows in the recessed areas between them. The overall composition is abstract and geometric, focusing on the circular forms and textures of the industrial material.

AN ALTERNATIVE TO STEEL

In 2018, the U.S. government imposed a 25-percent tariff on foreign steel as well as other metals and materials. U.S. producers quickly raised their prices to match, breaking the building-materials budgets for commercial construction and investment across the country. The tariffs exacerbated the already-unstable global pricing for steel and with no end to the tariffs in sight, many industry experts expect steel prices to remain volatile.

Polypropylene offers a new, cutting-edge solution to the problem. PP-R/PP-RCT piping systems offer a superior alternative to steel pipes for large-diameter applications in many ways. They are approximately 80 percent lighter than steel pipes and do not require any welding or open flames. PP-R pipes do not scale, corrode or release any volatile organic compounds, making them far more hygienic than steel. More importantly, they provide superior longevity and durability to steel pipes without being subject to tariffs or unpredictable price fluctuations.



DISEASE PREVENTION

Safety is a critical concern when choosing the best piping system for installation in a building project, particularly for hospitals and other developments whose occupants are at high risk from infectious diseases. In recent years, the growth and spread of *Legionella* bacteria has become a widely recognized threat among pipe installers. This bacteria can cause potentially deadly respiratory infections, and its growth is often fostered by certain kinds of pipe and water supply systems.

Corroded water pipes can help feed *Legionella* growth in a water or plumbing system. While disinfectants are necessary to treat water in plumbing systems, some of the best-known methods of disinfection, such as monochloramine and chlorine dioxide, do very little to prevent corrosion issues.

PP-R/CT pipes, of course, can't corrode like metal pipes. Replacing metallic piping systems with polypropylene immediately eliminates a major contributor to *Legionella* growth.

LEARN MORE

For more information on polypropylene piping and other plastic products, visit the Plastic Pipe Institute at

www.PlasticPipe.org