

FRP-Frequently Asked Questions

How do FRP pipe and fittings compare to PVC?

Fibreglass Reinforced Plastic (FRP, also GRP, GRE, FRE, RTRP) pipe is constructed using thermoset resins, meaning that they are fully cured using heat or chemical additives, and as a result become infusible, and insoluble (1).

PVC pipe is made from polymeric thermoplastic materials which soften under the application of heat, and become brittle at low temperatures. Fibreglass pipe is manufactured via filament-winding or centrifugally casting glass fibre to reinforce the thermoset resin. This results in superior span lengths, higher pressure ratings, and a lower rate of thermal expansion. The glass fibre reinforcement also means that the pipe is impact resistant, and allows for a non-catastrophic mode of failure (i.e. weeping) after instances of severe impact stress.

(1) Fibreglass Pipe Handbook,

The Composites Institute of the society of the Plastics Industry, Inc., N.Y., N.Y., (1989)

How do FRP pipe systems compare to steel?

Fibreglass pipe weighs about one-tenth the weight of a traditional metallic piping system. This allows for ease of handling, and also less loading on the underlying support structure. Most diameters are assembled using adhesive bonded bell x spigot or straight socket joints, which take a fraction of the time to install compared to a welded system. FRP pipe has a smooth inner surface (Hazen-Williams $c=150$), and sometimes has a slightly larger inside diameter than steel, which results in significantly better flow characteristics. These piping systems expand about twice as much as Schedule 40 carbon steel, but will develop 3 to 5% of the expansion forces. (see expansion & contraction).

What about expansion and contraction?

FRP pipe expands much less than PVC, HDPE, PP, or other plastics, and considerably more than steel pipe (but with much less force). A good rule of thumb is to allow for one inch of expansion for every one hundred feet of pipe with each one hundred degree (F) temperature increase. A low modulus of elasticity means that these forces can be absorbed by the pipe, as long as anchors and guides are used to prevent the pipe from deflecting. Pipe can also be allowed to float, or expansion loops/ joints can be used to compensate for any movement.

Underground systems normally do not require thrust blocking, as long as proper bedding/ backfill procedures are used. Our products can be supplied complete with a closed cell polyurethane foam insulation that is bonded directly to the pipe. The insulation can then be covered with a water impermeable jacket for chilled water, freeze protection, hot water, and steam condensate return systems up to 275 F and 150 p

Chemical Resistance?

Vinyl ester resin based piping systems are generally resistant to medium to strong acids. Epoxy resin based products are resistant to mild acids, solvents, and hydrocarbons. Special proprietary resin systems are resistant to all concentrations of sulphuric acid, and extremely aggressive solvents. Detailed Chemical Resistance charts for all products are available for review. It is important to note that these charts are based on testing of these chemicals on the pipe, fittings, and joints by the pipe manufacturer, not an extrapolation of data provided by the resin manufacturer.

Hard To Install?

We can offer a variety of adhesive bonded joints that allow for joint preparation and assembly in minutes. Bell x Spigot O-ring piping allows for the installation of large diameter pipe in a fraction of the time that is normally allowed for pipe assembly. Flanged joints or spools are available to reduce on site installation labour costs. On site installer training and certification for each project is critical to ensure that all members of the assembly crew are familiar with all facets of the installation procedure. The techniques employed are simple enough to allow us to describe the labour requirements as relatively unskilled. Special procedures are sometimes required during extremely cold or hot installation conditions. These are reviewed during the installation training session.

Where can I find these products?

We concentrate our efforts on projects in Canada. Our suppliers have a qualified network of international representatives and distributors to service their products in every corner of the world. Most of our suppliers have distributor listings that can be found at their websites. If you prefer, drop us an e-mail, and we will refer your requirements directly to the pertinent contact.

We have materials inventoried in both Ontario and Alberta to service the Eastern & Western markets. Some products, such as ULC listed underground petroleum piping will be available from local Provincial distribution.