



TECHNOBELL
TECHNOLOGY

GRP PIPES

Glass reinforced polyester pipes



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Glass Reinforced Polyester pipes are manufactured with polyester resins and fibrous glass reinforcements and – depending on the type – with inorganic filler. The design philosophy of GRP pipes is to provide products with suitable properties and the required margin of safety that will enable the pipe to continue to work satisfactorily after an extended period of operation (50 years) under typical service conditions.

Glass Reinforced Polyester pipes represent the ideal solution for conveying any kind of water and the majority of chemicals, because they combine the advantage of corrosion resistance, which is typical of plastics, and high mechanical strength, typical of steel.



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Fields of application for GRP pipes:

- Water distribution
- Water transmission
- Potable water
- Geothermal water
- Desalination plants
- Seawater intake and outfalls
- Sanitary sewers
- Storm sewers
- Irrigation
- Oil fields
- Ships
- Chemical process
- Power plant cooling and raw water supply



The key properties that comprise the advantages of GRP pipes can be summarised as follows:

- **High mechanical resistance** due to glass reinforcement.
- **Corrosion resistance** for both the external wall and the internal wall that is in contact with the conveyed fluid. No protections such as coating, painting or cathode are required. GRP pipes are resistant to nearly all chemicals.
- **The smoothness of the internal wall** minimizes head losses and avoids the formation of deposits. In contrast to steel, cast iron and concrete, GRP pipe maintains initial smoothness through the entire period of exploitation.
- **Very long life, virtually infinite**, of the material, which does not require maintenance.
- **Absolute impermeability of pipes** and joints from internal to external and vice-versa.
- **Low overall weight of pipes**, allowing the use of lighter laying and transport equipment.
- **Long pipe sections**, longer than those made of other materials, resulting in fast installation and fewer joints.
- **Workability of the material on site** with the use of simple tools. It is possible to make any kind of shapes (tees, elbows...), joints and connections.
- **Possibility of nesting** different pipe diameters during transport, allowing additional saving in transport operations.

GRP pipes can be produced with continuous (CFW) and discontinuous (DFW) manufacturing process.



Pipe wall description

The GRP pipe wall consists of three layers perfectly adherent with one another, each having different characteristics and properties in relation to their function. The properties of chemical resistance and impermeability are, anyway, equivalent for the three layers, namely:

Liner:

This is in direct contact with the conveyed fluid and provides maximum resistance to chemical attack from the fluid itself. Moreover, the liner presents the internal surface as particularly smooth. The liner is composed of glass veil, chopped glass (glass mat) and resin.

Mechanical resistant layer:

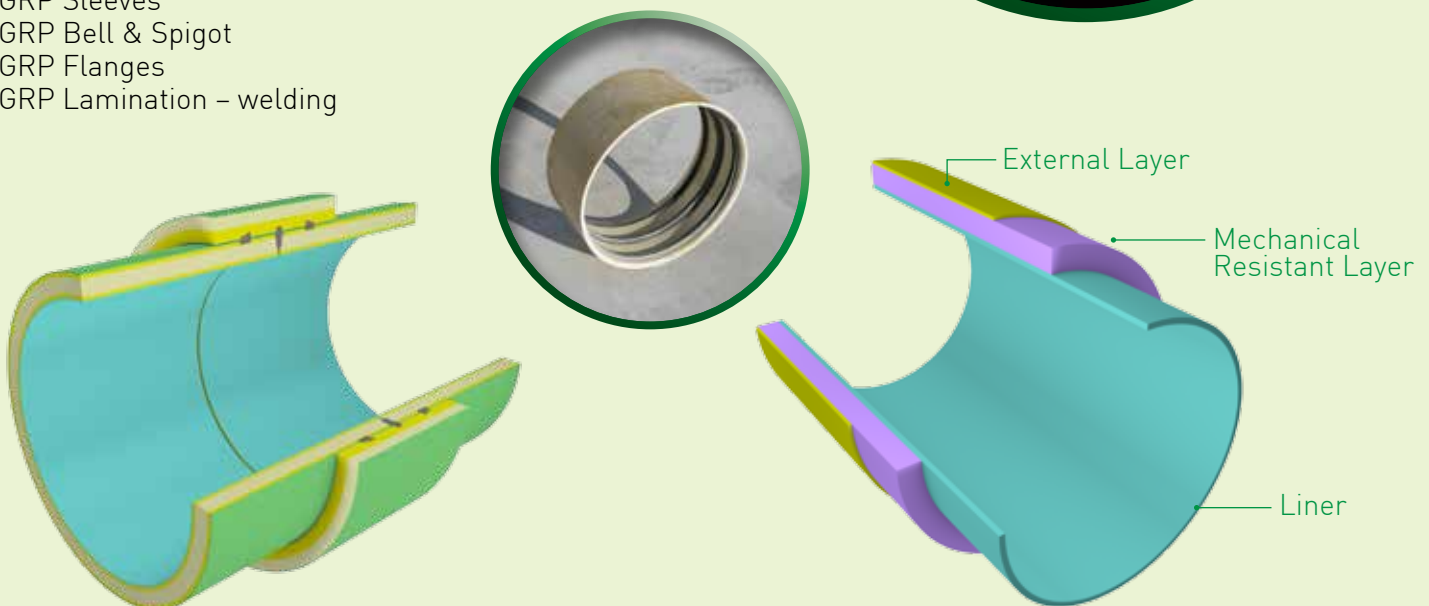
Its function is to render the pipe wall resistant to the stresses due to the design conditions (stress due to the internal and/or external pressure, flexural strength due to the external loads). The thickness of the filament depends on the design conditions. The mechanical layer is composed of continuous glass filament roving, chopped glass, resin and silica sand to reduce the pipe cost.

Topcoat or external layer:

This has a thickness of about 0.2 mm and consists of resin with or without glass reinforcement. It guarantees a complete impregnation of the peripheral fibres, thus yielding an external pipe surface completely free of protruding fibres and well finished.

GRP pipes are joined with:

- GRP Sleeves
- GRP Bell & Spigot
- GRP Flanges
- GRP Lamination – welding





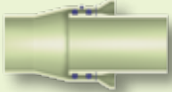
90° elbow



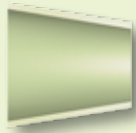
45° elbow



tee



bell/spigot



concentric reducer



end cap



blind flange



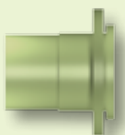
plain flange



sleeve joint



eccentric reducer



stub end flange



unequal tee

Fittings production

Technobell know-how and equipment enables the manufacture of a full range of fittings such as elbows, tees, reducers, end caps, flanges and others.

Fittings are manufactured from pipe sections (after the produced pipe has been hydro-tested) and laminated together using fibreglass reinforcements and resin. The thickness and width of the lamination are designed to equal or to exceed the pipe performance. Fittings can be supplied either as standard pieces or custom designed spools making the installation easier.

Customised fittings are one advantage of the GRP pipe systems offered by Technobell. Fittings are joined to GRP pipes with standard sleeve couplings and require thrust blocks for pressure systems; please consult Technobell for further details on the proper construction of thrust blocks.

