

Innovation for **AWWA C301 PRESSURE PIPES**

PRESTRESSING WIRE and MORTAR COATING
are replaced by
PRESTRESSING with FRP

ROBUSTNESS AND DURABILITY

REDUCED COST

REDUCED WEIGHT

FASTER AND SIMPLIFIED PRODUCTION PROCESS

Prestressed FRP

The “prestressed” composite wrapping is applied to the steel liner, and then the Pipe is **READY TO BE INSTALLED**. Advantages are:

REDUCED COSTS

- The Cost of composite material is lower than prestressing wire.
- The prestressing operation is carried out by an automated machine.
- The impermeable barrier created by the FRP and the resin eliminates the need for a cement rich, and brittle, exterior mortar coating for protecting the steel prestressing and the steel cylinder.

REDUCED WEIGHT

The weight of composite material is significantly less than prestressing wire + mortar. For example, for a Pipe 600 mm ID (24”), the weight saving is about 100 Kg/mt.

INCREASED ROBUSTNESS AND DURABILITY

The prestressed FRP is more impact resistant and impermeable than the mortar coating, and has no cracking or corrosion problems.



The Wrapping Materials

The FRP fiber rovings, such as E-Glass or Basalt, are readily available on the market.

A thermosetting resin for impregnating the fiber roving is applied after tensioning.

The resins can be a polyester, vinyl ester, epoxy, or polyurethane depending on the application.



Design Standards

The design of AWWA C301 pressure pipes is a direct design approach as detailed in AWWA C 304 where all factors affecting the design including materials, loads, and service pressures are all accounted for.

The FSC technology replaces the steel prestressing wire with prestressed FRP roving and a small amount of resin impregnated in the roving after the FRP has been prestressed.

The resin combined with the FRP fibers produce an impermeable membrane around the pipe eliminating water penetration to the steel cylinder and the associated corrosion.

It also eliminates the need for a cement rich, and brittle, mortar coating to protect the steel prestressing wire and steel cylinder.

There are existing standards such as ACI 440.4R or ISO 642 that provide the necessary provisions for using FRP tapes in place of steel wires for reinforcing concrete. These Standards are very conservative and produce a product with a higher burst pressure factor of safety.

FSC TECHNOLOGIES

FSC is a US company with R&D in Italy. Its core business is to help Customers develop solutions based on its Innovation in Structural Engineering by replacing embedded steel reinforcement with a system of wrapping concrete elements with pretensioned FRP and a small amount of resin.

FSC Technologies LLC

4779 Terrasonesta Dr, Davenport FL 33837 USA - tel +1 (321) 355-9523 +1 (705) 207-9990
R&D Branch: via V. Veneto 52, 43046 Rubbiano PR, Italy - tel +39 338 052 5728 +39 333 470 4829
info@fsc-tech.com - www.fsc-tech.com

