

SCIGRIP Enables Fiberpipe to Develop a New Type of GFRP Pipe Bonding

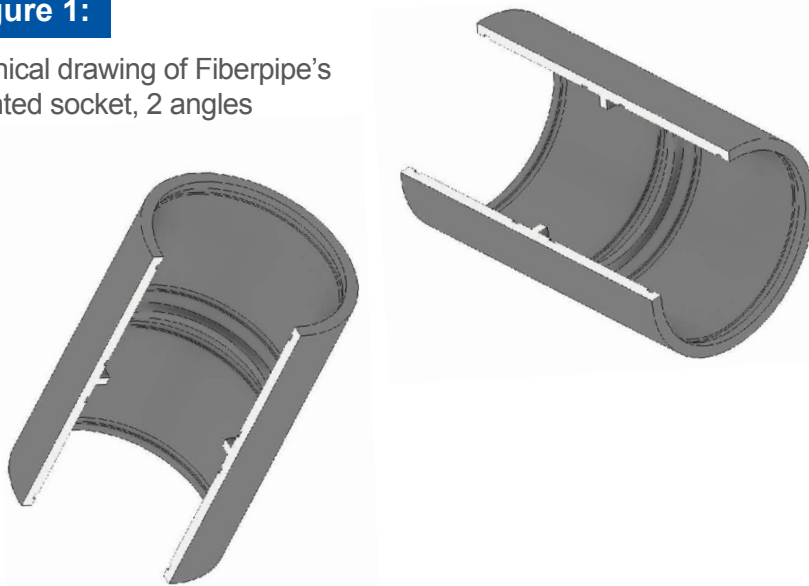
Fiberpipe manufactures GFRP pipes for various industries, providing a complete service from planning to installation. In partnership with SCIGRIP, they developed an advanced solution for joining GFRP pipes by using our fatigue-resistant adhesive solutions.

The Situation

- In 2018, Fiberpipe installed GFRP pipes in a power plant using the standard technique of sanding the surface and preparing it for over-lamination and bonding.
- This method ultimately proved unsatisfactory due to too much styrene evaporation, too much grinding dust, and an overall dirty installation process.
- Fiberpipe had already patented a new technique for bonding pipes in 2007, but it was not compatible with the conventional epoxy adhesives used at the time.
- They needed a new technique.

Figure 1:

Technical drawing of Fiberpipe's patented socket, 2 angles



The Challenge

Bonding a Non-Sanded Surface

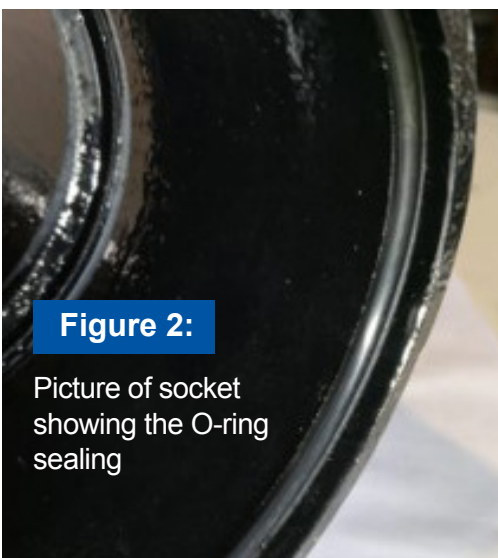
The new bonding technique was built around a special socket with four o-ring seals [fig. 1] that could center both GFRP pipes and set a defined bond line thickness (fig. 2). Through a small service hole, the adhesive could be applied into the cavitation between the GFRP pipe and the socket to create a reliable structural joint including an optimal sealing function (fig. 3). While the socket requires a smooth surface for installation, the standard epoxy adhesive only works on a sanded GFRP pipe – a tough challenge to master.

Twelve years later, when Fiberpipe entered into initial talks with one of our distributors, it was clear that they could provide exactly what was needed: specialized MMA adhesives, made by SCIGRIP.

See Solution, Next

Figure 2:

Picture of socket showing the O-ring sealing



The Solution

SCIGRIP 5000 with No Surface Prep

Figure 3:

Picture of the service hole

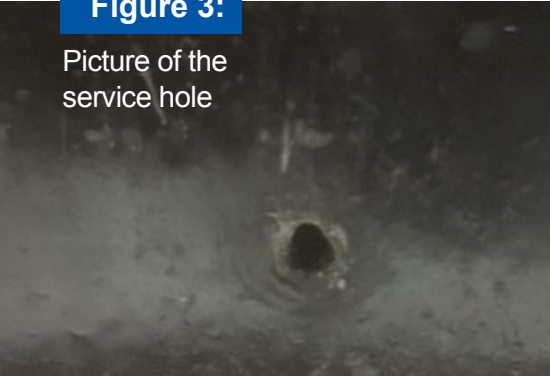


Figure 4:

The finished joint. Two GFRP pipes connected using Fiberpipe's innovative technique.



Figure 5:

Cross section of the cured joint. The visible o-ring sealings define the bond line thickness. Additionally, SG5000 created a homogeneous bond line around the GFRP pipe

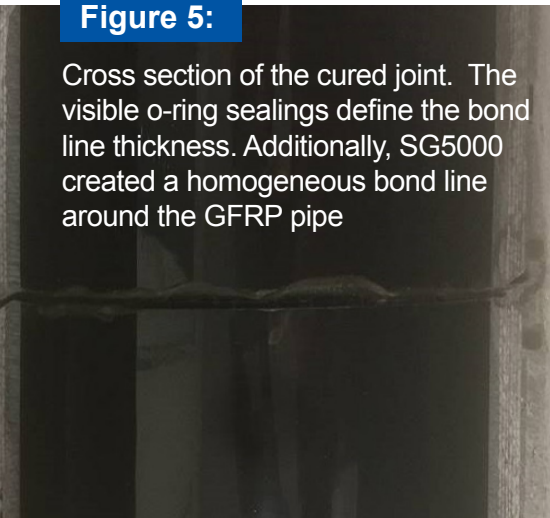


Figure 6:

Pressure test showed the joint is gastight up to 25 bar



Along with our distributor, Scigrup decided to use SG5000 as the best solution for connecting those GFRP pipes with Fiberpipe's patented sockets.

SG5000 is a structural adhesive that offers excellent tensile and impact strength. It requires minimal surface preparation and therefore minimizes dust or other surface residues. Additionally, the adhesive is compatible with a variety of substrates, from composites to metals or thermoplastics.

With a 1:1 mixing ratio and a range of working times, far greater flexibility during the assembly process was made possible.

Finally, Fiberpipe saw their chance to launch their patent for the very first time. After a few tests with SG5000 applied on differently sized sockets and pipes Fiberpipe was able to define the perfect inner and outer diameter for their innovative joint of GFRP pipes (fig. 4+5).

Further analysis of the joint has shown that SG5000 was homogeneously distributed in the cavitation between pipe and socket, forming a gas- and watertight joint, withstanding a pressure of up to 25 bar (fig. 6).

Scigrup's SG5000, along with our distributor's technical support benefitted Fiberpipe in terms of production time (50% faster) and a much better customer experience by completely resolving the issue around styrene emissions and grinding dust.