

COMPOSITES BENEATH CITIES

Grupo Navec



SOLVING UNDERGROUND REPAIR ISSUES

The size of large cities and the complexity of water conveyance networks, which interfere with other infrastructures such as motorways, railways, and even emblematic buildings, sometimes make it impossible to recondition pipelines using traditional methods, like concrete or steel. For this reason, along with a commitment to a circular economy aimed at conserving and extending the value of water supply networks, Grupo Navec has developed the tecnoinvac® technology to rehabilitate existing pipes using Gurit PRIME™ 37 infusion resin and infusion and vacuum systems.

This technology offers a safe and effective alternative for pipelines where the execution of actions is extremely complex and involves deep excavations, interference with nearby facilities or services, and interruptions to traffic and/or the supply of goods. Imported from the aeronautical sector and adapted to the world of drinking water, this process makes it possible to restore structural integrity, provide the required mechanical properties at any point on the surface, and enable the withstanding of flow rates and pressures greater than the original design pressures without modifying the installation.

OVERVIEW

Industry
Industrial > Infrastructure

TARGET

Repair and recondition
underground pipelines with
composites

SOLUTION

Carbon fiber pipes with
PRIME™ 37 resin infusion

BENEFITS

A safe and reliable repair
alternative for water supply
pipeline

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Gurit Technical Support
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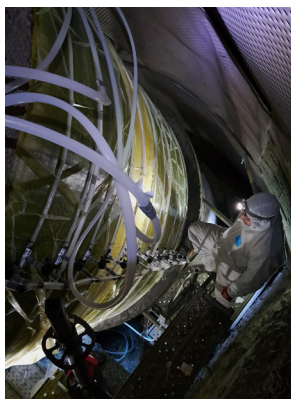
www.gurit.com



DESIGN, MANUFACTURE, AND INSTALLATION

This technology is an alternative to traditional rehabilitation with materials such as steel and concrete, but with a weight similar to that of plastic. Among other factors, four main loads must be taken into account in pipeline rehabilitation: tensile/traction loads, compression, shear and bending. In order to meet load demands, three key parameters associated with carbon fibre come into play: definition of the material type, configuration or architecture of the structure, and the implementation process.

Both the type of material and the configuration of the structure are key factors, Gurit resins make this possible, and the implementation process is decisive. The solution to these uncertainties lies in the automation of the process through the implementation of vacuum infusion. This technology, is perfectly adapted to the world of drinking water, eliminates the human factor and adverse conditions from the equation. It ensures homogeneity of mechanical properties and consistent results by putting the theoretical calculation hypotheses into practice in a precise manner.

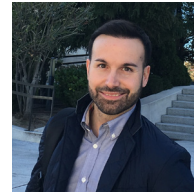


GURIT RESIN INTEGRAL TO THE PROCESS

- Cleaning, removal of visible contaminants, sludge and unbonded concrete by means of pressurised water.
- Installation of ventilation system to ensure oxygen (natural/ forced draft) inside the pipeline during the works, as well as monitoring at access points.
- Dehumidification and tempering with forced air heaters and fans.
- Surface preparation using abrasive blasting for steel, and hand tools, wire brushes and abrasive sandpaper for concrete. Vacuuming of dust, loose particles and waste generated.
- Inspection of quality of the surface preparation and checking of surface moisture.
- Continuous inspection of ambient conditions throughout the process with electronic hygrometers. Priming of the treated substrate with epoxy resin and temporary protective fabric.
- In-situ execution of monolithic structural reinforcement using vacuum infusion technology with carbon fibre and Gurit epoxy resin matrix, maintaining homogeneous and constant vacuum pressure until the end of the curing cycle.
- Application of finish coating for potable water.

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GRUPO NAVEC CHOOSES TO USE GURIT'S PRIME™ 37 INFUSION SYSTEM FOR ITS QUALITY AND THE EASE WITH WHICH IT WORKS WITH OUR VACUUM INFUSION PROCESS; THE IMPREGNATION TIMES AND FLUIDITY ARE PERFECTLY ADJUSTED TO OUR NEEDS AND WORKING WINDOWS.



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Francesc Robles
Director, Applied Engineering Division

About Grupo Navec

Grupo Navec is a Spain-based business group focused on solutions for industrial projects through the use of composites. Their mission is to bring added value to the industrial services in the engineering, manufacturing, assembly, and maintenance sectors, by presenting a global offering whose differentiating factors are innovation, specialisation and flexibility.

www.gruponavec.com

About Gurit

GURIT is specialized in the development and manufacture of advanced composite materials, composite tooling equipment, structural profiles and core kitting services. The product range comprises core materials, prepregs, formulated products such as adhesives, resins as well as structural composite engineering. Gurit supplies global growth markets such as the wind turbine industry, marine, architecture & building, transportation & rail and many more.

Gurit operates production sites and offices in Australia, Canada, China, Denmark, Ecuador, India, Italy, Mexico, New Zealand, Poland, Spain, Switzerland, Turkey, United Kingdom and the United States.

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