

SIREG AT GEOFLUID 2023
(13-16 September 2023 - Stand 180 C)

Innovation and Civil Engineering

Sireg Geotech supports Manini Prefabbricati

in the reconstruction of the first bridge in Europe with fibreglass reinforcement.

May 12, 2023, Milan - [Sireg Geotech](#) - Milan - Sireg Geotech - the Italian company that manufactures and exports its non-metallic and composite products for the geotechnical and civil engineering sectors to more than 70 countries around the world - is working alongside Manini Prefabbricati S.p.A. in the reconstruction with hybrid technology of the first reinforced concrete bridge in Europe prestressed with fibreglass reinforcement (GFRP Glass Fiber Reinforced Polymer).

This is the first concrete application of an innovative material such as glass fibre for the benefit of the civil engineering sector, made possible by: Manini Prefabbricati (Executing Company), Sireg Geotech (Glass Fiber Reinforced Polymer Structural Reinforcement), Secured Solutions (Design and Construction Management), University of Cagliari, University of Miami-Antonio Nanni (Technical Scientific Support). ASDEA, Autonomous Region of Sardinia, Gonnese Municipality (Clients).

Sireg designed and produced the [Glasspree](#)[®] reinforcements - the only ones in GFRP composite material with ETA (European Technical Assessment) certification available on the market to date - for the Manini prefabricated elements intended for the reconstruction of the bridge in Fontanamare-Gonnese (Cagliari). The bridge collapsed in 2020 under the weight of a lorry and was redesigned with this alternative material, which has an estimated life of twice that of steel, i.e. 100 years, a lower weight and greater resistance to corrosion in a brackish environment, as well as lower life-cycle costing and environmental impact compared to its traditional metallic relative. In a perspective of greater sustainability of Italian infrastructures, more environmentally friendly concretes can be produced, with less use of chemical additives that until today were necessary to guarantee the durability of the structure over time, with a significant reduction in maintenance costs, both ordinary and extraordinary.



"The Gonnese hybrid bridge rebuilt by Manini with Sireg's certified fibreglass reinforcements," said Sonja Blanc, CEO of Sireg Geotech, "represents a record of which we are very proud, after years of targeted research in collaboration with the Institute for Construction Technology ITC-CNR, the Polytechnic of Milan and the University of Miami to achieve European ETA certification of our Glasspree® fibreglass bars. The bridge is the first ever application in Europe for this composite product in the civil sector, which will have a strong strategic impact on the construction sector in a country where infrastructure is the product of design and construction dating back to the early post-war period. In thanking all the partners who have made this project possible, we hope that this bridge will soon become a model for the reinforcement of reinforced concrete infrastructures and structures exposed to particularly aggressive environments or subject to constant degradation."

The bridge is the first of its kind, having both the slab and the deck beams prestressed with stirrups and flexural reinforcement made of glass fiber bars (G-FRP). The length of the deck is 23.30 metres by a width of 9.10 metres. According to the tender notice, a cycle of load, shear and bending tests on a main beam is scheduled to take place in May at Manini Prefabbricati's premises in Umbria. The performance of the girder will be monitored by an innovative system of sensors and sophisticated Artificial Intelligence algorithms developed by ASDEA.

Designers, experts, students, and specialised journalists interested in learning about the potential of GRP for civil engineering can contact Sireg at the following e-mail address: ufficiotecnico@sireg.it
progettisti, esperti, studenti, giornalisti specializzati interessati a conoscere le potenzialità della vetroresina per l'ingegneria civile, possono contattare Sireg all'indirizzo di posta elettronica ufficiotecnico@sireg.it

Sireg ETA-certified Glasspree® rods are manufactured in different diameters through a process called *pultrusion*, enabling to obtain products with high mechanical properties and durability. Fiberglass plays a dominant role in terms of advantages, due to a combination of chemical-mechanical characteristics that, in relation to cost, make it nowadays the best solution for applications in environments particularly aggressive for common steel reinforcements, such as salty environments, or in the presence of electromagnetic fields or when antifreeze chlorides are used, etc.



Sireg Geotech Glasspree® Rebars

The **advantages** resulting from the use of ETA-certified materials for structural use are manifold and are essential to the proper execution of a work:

- ▶ due to their resistance to corrosion, fiberglass bars embedded in concrete find their ideal application in the construction of bridges, works on the sea, and generally works to be realized in particularly aggressive environments;
- ▶ they provide sustainability and infrastructure durability, double than that of steel, with an expected service life of 100 years and lower maintenance requirements;
- ▶ their weight is one-fourth that of steel, thus allowing for reduced transportation and installation costs;
- ▶ they require less concrete cover and can be used without the addition of admixtures in the concrete or with the new green concretes;
- ▶ the control and inspection activities of the Construction Managers are therefore simplified.

A range of benefits offering the utmost on the sustainability front as well.

The low environmental impact of the concrete structures reinforced with the new composite materials must be mentioned as well.

Sireg invests 5% of its revenue in R&D and pays special attention to the issue of sustainability of both the production processes and the products.

Sireg received numerous awards for its Research & Development activities: in March 2019 Sireg was the winner at the JEC Innovation Awards in Paris in the Constructions & Infrastructure category for the project "Bendable TP composite reinforcements for concrete", in partnership with Arkema, the University of Miami and the National Cooperative Highway Research Program (NCHRP). Also in 2019, the company won the "Best To Brianza" and the "GammaDonna" awards and entered the shortlist of 30 companies selected by Assolombarda for having believed and constantly invested in innovation and showcased (its revolutionary Glasspre® TP rebar out of thermoplastic fiberglass) in the multimedia exhibition "Genio e Impresa. Da Leonardo e Ludovico alle grandi storie di innovazione dei nostri giorni" (July-September 2019) at Palazzo Lombardia in Milan.

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