

Gurit to present its expertise in composite materials and design for architectural applications at the AIA, Denver, CO

13th June 2013, Gurit (SIX Swiss Exchange: GUR), a leading global manufacturer and supplier of composite materials, engineering, tooling, parts and systems will be exhibiting for the first time at the AIA (The American Institute of Architects) Convention in Denver, CO, from 20th to 22nd June 2013 on stand 1366 and will be showcasing advanced composite products, case studies and solutions for architectural applications.

Advanced FRP composites materials for architectural applications

Advanced FRP composites, featuring moulded structures using high performance polymer resins reinforced with continuous glass and carbon reinforcement fibres, have been used extensively in a range of markets over the last 40 years, including marine, aerospace and renewable energy. These materials can also offer significant advantages to architectural and civil structures.

Advanced FRP composites can be used to save significant amounts of weight for structures supporting distributed loads such as facades, roofs and bridges. This is due to the strength and stiffness to weight ratio of the materials and also the ability to use efficient sandwich construction. Lightweight structures can allow quicker installation, reduced temporary works or installation in difficult to access areas.

The ability to form complex shapes offers advantages to architects, giving them more freedom to develop curved forms and also introduce decorative elements into the structures. The materials resistance to corrosion and environmental degradation offers the opportunity for reduced maintenance compared with traditional materials such as wood, steel and concrete.

Gurit's expertise in architectural applications

Gurit has over 30 years of experience in the technology of advanced FRP composites across a range of markets, and in recent years has supported a number of clients to extend the use of the materials into the architectural market. Gurit's in-house structural engineering department can provide a range of support to architects and contractors to enable the use of advanced FRP composites. These include structural concept development, loading analysis, laminate design and optimisation, material specification and construction methodology.

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The Haramain High Speed Railway

The Haramain High Speed Rail project is a new high speed rail line in Saudi Arabia, running between the holy cities of Makkah and Medinah, with additional stations at Jeddah and the King Abdullah Economic City. The stations, designed by a joint venture of Fosters and Partners and Buro Happold, have a modular arrangement, with a steel main structure supporting structural FRP roof panels that have panel spans of up to nine metres. In total there is over 160,000 m² of FRP panels across the four stations.

Gurit and Premier Composite Technologies worked closely with the design team during the concept and tender design stages of the roof to develop the concept of using FRP panels in the station roof. The lightweight nature and inherent insulation achieved with advanced FRP sandwich panels, combined with the accuracy obtained by moulding panels using CNC machined tooling and the durability of advanced composites offered significant advantages to the project. The large panel spans made feasible by the use of sandwich construction also enable rapid installation of the roof without requiring any secondary structure, and the modular design of the station meant that there was a large degree of repetition of panels which allowed efficient use of moulds.

Following award of the detailed design and fabrication of the roof of Medinah station to Premier Composites Technologies by main contractor Yapi Markazi, Gurit has carried out the structural analysis and optimisation of the roof panels for this station, which has a surface area of around 28,000 m² (300,000 square feet). The weight of the composite is approximately 720 tonnes, which makes the station roof one of the most extensive uses of advanced composites in the architectural industry.

Materials chosen for the laminating of the panels were Ampreg 21FR, a fire retardant epoxy laminating system, Spabond 340LV structural adhesive and G-PET™ 75FR and G-PET™ LITE™, a lightweight, fire retardant, closed cell structural foam core.

Lamination of the panels is now well underway at Premier Composite Technologies premises in female moulds, and a trial installation of part of the roof has been erected and tested. The correlation between the deflections of the full scale test and those predicted by the FE model developed by Gurit engineers was very good, with a difference of less than 2% between the two. Installation of the roof panels will be carried out by Premier Composite Technologies during 2013 once the steel supporting structure erection has been completed in Medinah.

Dr Mark Hobbs, Senior Engineer will be available at our stand to discuss the opportunities for use of advanced FRP composites in your projects.

Ends

About Gurit: The companies of Gurit Holding AG, Wattwil/Switzerland, (SIX Swiss Exchange: GUR) are specialised in the development and manufacture of advanced composite materials, tooling systems, structural engineering solutions, and select finished parts. The comprehensive product range comprises epoxy and phenolic prepregs, SPRINT™, structural cores (CoreCell™, PVCeCell™, G-PET™ and Balsaflex™), epoxy Ampreg and PRIME™ laminating systems, Spabond adhesives, and other related products. Gurit is uniquely positioned to serve global growth markets, and has production sites and offices in Switzerland, Germany, the UK, Canada, Spain, Australia, New Zealand, the USA, Ecuador, Brazil, India and China.

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