



INNOVATIONS FOR LIVING®

CASE STUDY

Façade Reinforced with Cem-FIL® AR Glass is Enduring Image of 2010 FIFA World Cup

Stadium echoing appearance of African pot covered with custom-colored fibreC panels from Rieder Smart Elements GmbH

Application

- Custom-colored concrete façade panels with sustainability benefits

Reinforcement

- Cem-FIL® AR glass fibers

Panel Benefits

- Significantly higher tensile strength than steel reinforced panels with lighter weight and lower mass
- Excellent weatherability and durability to reduce maintenance and extend useful life
- Fire resistance (class A1 according to the DIN standard)
- Recyclability after grinding; up to 15% can be used for new panels



Along with selected match highlights and the buzz of countless vuvuzela horns, the 2010 FIFA World Cup South Africa™ may well be remembered for an iconic image that appeared regularly behind television commentators – the concrete façade of Soccer City Stadium near Johannesburg.

The colorful calabash or African pot design certainly caught the eye of soccer fans when they entered the stadium or saw it on television, especially at night. The redesigned appearance of the stadium was created by South African architects Boogertman Urban Edge & Partners. Perhaps their biggest challenge was finding a way to execute the unusual design requiring curved panels and a checkerboard of colors and textures that echo the appearance of the calabash gourd. Added to those challenges was a need to help the stadium achieve its sustainability goals – using building materials that minimize resource use, extend the life of the structure and be recyclable.

The architects addressed all of those issues by covering the stadium with custom-colored fibreC panels from Rieder Smart Elements GmbH, reinforced with Owens Corning Cem-FIL® alkali-resistant (AR) glass fibers. The use of concrete panels reinforced with alkali-resistant glass fibers helped make it possible to create the necessary sculpted forms without compromising strength and resilience.

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The outer shell was divided into a roof section consisting of transparent polycarbonate elements and the façade section based on the glass fiber-reinforced concrete. The AR glass-reinforced panels are 1.2 x 1.8 meters (about 4 feet by 6 feet) with a thickness of only 13 millimeters (about a half inch). In total, more than 2,100 modules, each having 16 panels, were prefabricated in a field factory.

The concrete panels in eight colors are suspended on a sub-construction of more than 100,000 specially designed steel elements by Valenta Metallbau. While the structure supporting the panels is substantial, it weighs and costs less than supporting elements required for other types of panels. Glass-reinforced concrete (GRC) panels reduce the weight and thickness of the concrete by up to 10 times compared to conventional steel reinforced concrete panels.

The panels are solid, moldable and durable like concrete, but thanks to the glass fibers the panels are also thin-walled, fire resistant and light weight. Glass fibers allow the construction of very slim elements with good tensile strength. This allows the building or renovation of façades with the excellent reproduction of complex details and fine texture.

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For more about Rieder Smart Elements, visit www.rieder.cc.

For more about Cem-FIL® AR glass fibers, visit www.ocvreinforcements.com/CemFIL.



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