

Press release from Jan de Beer, cell 082 456 3677:

'Twisting' Vitreous Enamel Cladding For Oman Airport Tower

Ekurhuleni-based Vitrex designed and supplied unique 'twisted' vitreous enamel the Air Traffic Control (ATC) Tower at Muscat International Airport in the Sultanate of Oman.

Vitraclad heavy gauge panels, exported by Vitrex to cover around 4 000m² of the fins of the Tower, were installed by the project's main contractor, Carillion Alawi LLC.

Cristian Cottino, Sales & Marketing Director of Vitrex, says the company developed the cladding system for the challenging, complex design in close collaboration with Quality Architectural Systems LLC (QAS) (Dubai) and QFS B.V. of The Netherlands. "The design is very unusual in that the position of the leading edge of the fins - located on the four corners of the Tower - changes progressively over the height of the structure, coming in towards the corner of the structure from ground level to Level 18, and then going out again thereafter, along the edge of the petal up to its tip on Level 23.

"However, at the same time, the trailing edge of the fins remains at the same position along a true vertical line, over all the levels. The face of the cladding across the fins at any given level therefore changes from true vertical, at the trailing edge, to sloped at the leading edge, thus creating the 'twist', with the angle of the face as measured from the true vertical changing from level to level."

Cottino says that for the bespoke cladding system, the Vitraclad vitreous enamel panels and the cladding system had to be designed to create the twist effect across the width, and over the height, of the fins. "A mathematical analysis of the architect's design allowed for the degree of twist to be determined over the full height of the fins. Based on this analysis, Vitrex was able to approximate the architects' design by gradually 'twisting' individual, rectangular, flat panels at each position by a given amount. The maximum 'twist' at any given point was 13mm.

"The use of flat, rectangular panels also enabled Vitrex to substantially reduce the number of panel types required. These panels were 'twisted' when secured to purpose-made, adjustable brackets during installation on site," he explained.

"To connect the panels to the special brackets, each panel was factory-fitted with a pair of full height aluminium frame profiles produced in the specified aluminium alloy and with a natural anodised aluminium finish, here in South Africa. The frame profiles were chemically bonded to the rear of the cladding panels using a pre-tested sequence of bonding agents. The application of aluminium elements directly to panels with a vitreous enamel finish was a 'first' for Vitrex."

To reduce the overall panel weight, the panels were constructed with an aluminium honeycomb core, resulting in a total mass saving of 10 kg/m². The aluminium honeycomb core was bonded to the rear face of the panels using a two-part

polyurethane adhesive - again a 'first' for Vitrex. A dedicated lamination line, which includes electronic dispensing equipment for the adhesive, was commissioned by Vitrex for this contract.

Cottino says the colour of the vitreous enamel coating had to be specifically matched for the project which added another facet to the execution of the contract.

"The colour RGL Tower Grey (VIT-411) was developed in-house by Vitrex and then tested in our laboratory to determine its functional characteristics and ensure that the coating was appropriate for the intended application. To ensure an objective assessment of colour and colour consistency in production, strict quality control procedures form part of Vitrex's ISO9001-certified Quality Management System. The colour of each individual panel produced was measured electronically, using a colourimeter combined with compatible software, and compared to that of the approved colour master plate.

"In addition to colour matching, a specific requirement for reduced gloss level had to be achieved. The Oman Civil Aviation Authority specified the need for a lower gloss level due to concerns that a highly reflective finish over such a large surface area may create issues for pilots during the approach and landing. So the development of the vitreous enamel to a Reduced Gloss Level (RGL) was undertaken in-house by Vitrex, after the colour matching process had been completed."

Cottino says that as the Control Tower is located in a corrosive environment, close to the coast, and exposed to wind-blown sand and high levels of UV radiation, Vitraclad vitreous enamel provided the ideal solution compared to the more traditional use of aluminium cladding panels, customary in the region. "The design and manufacture of the panels were undertaken in line with Vitrex's own recommendations for the use of vitreous enamel steel cladding in highly corrosive environments," he added.

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Caption:

Views of the Air Traffic Control (ATC) Tower at Muscat International Airport, which was clad with unique 'twisted' vitreous enamel panels supplied by Vitrex.

Ends

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