

LEADING JOURNAL FOR THE COATINGS INDUSTRY IN EUROPE AND THE MIDDLE EAST

VOL 208 - NO 4642 JUNE 2018

# PPCJ

POLYMERS PAINT COLOUR JOURNAL

Inside: Colour Technology

Inside: Adhesives & Sealants

## Elemental protection

Long-term solutions to the on-going fight against corrosion



# Protecting Croatia's most vulnerable historical buildings

**S**aint Donatus, symbol of the city of Zadar is classified among the most famous and most valuable monuments in Croatia. Moreover, due to its unusual cylindrical appearance and robust monumentality, it is one of the most significant European pre-Romanesque churches.

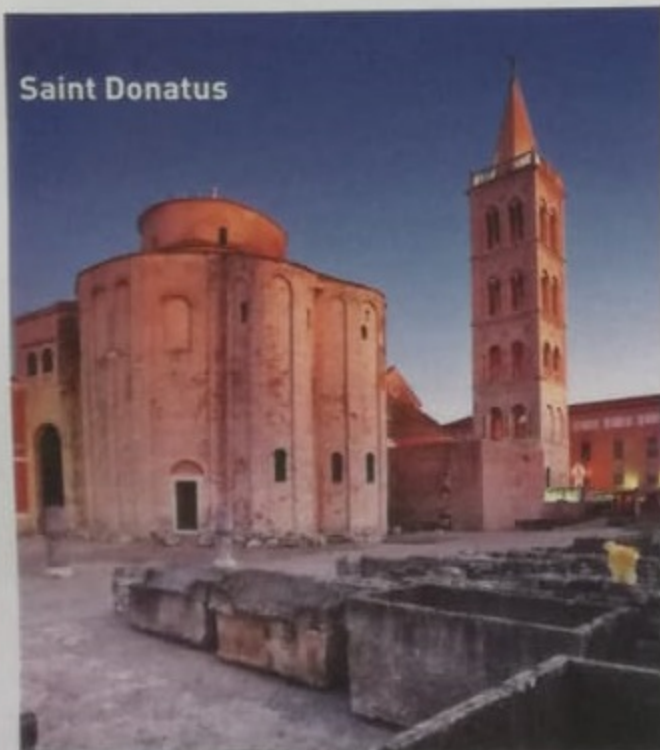
The church is a UNESCO-protected cultural heritage site but today, as a result of numerous factors, the church is in need of urgent rehabilitation.

## ■ RESCUING THE CHURCH

After analysing 3D scans it was determined that the biggest issue was the walls of the church and the construction itself along with the roof. During the period 1927-1930, the stability of the foundations was compromised and a reinforced concrete support construction was implemented under the roof from the south side, connecting the outer and inner rings of the church. The moisture penetrating into the medieval monument, in combination with the sea dust, was very seriously endangering the reinforced-concrete structure holding up the church.

Last year, a repair project was initiated and Cortec's MCI® 2020 inhibitor was specified as the coating to protect the support structure against corrosion.

MCI 2020 is a surface-applied corrosion inhibitor designed to migrate through even the densest concrete structures and seek out the steel reinforcement bars in concrete. Even when not in direct contact with metal, the product will migrate through concrete to provide full protection. This environmentally safe inhibitor stops further corrosion of reinforcing metals, significantly extending the service life of the structure.



Saint Donatus

## ■ SAVING ZAGREB CATHEDRAL WITH MINIMAL COST AND INTRUSION

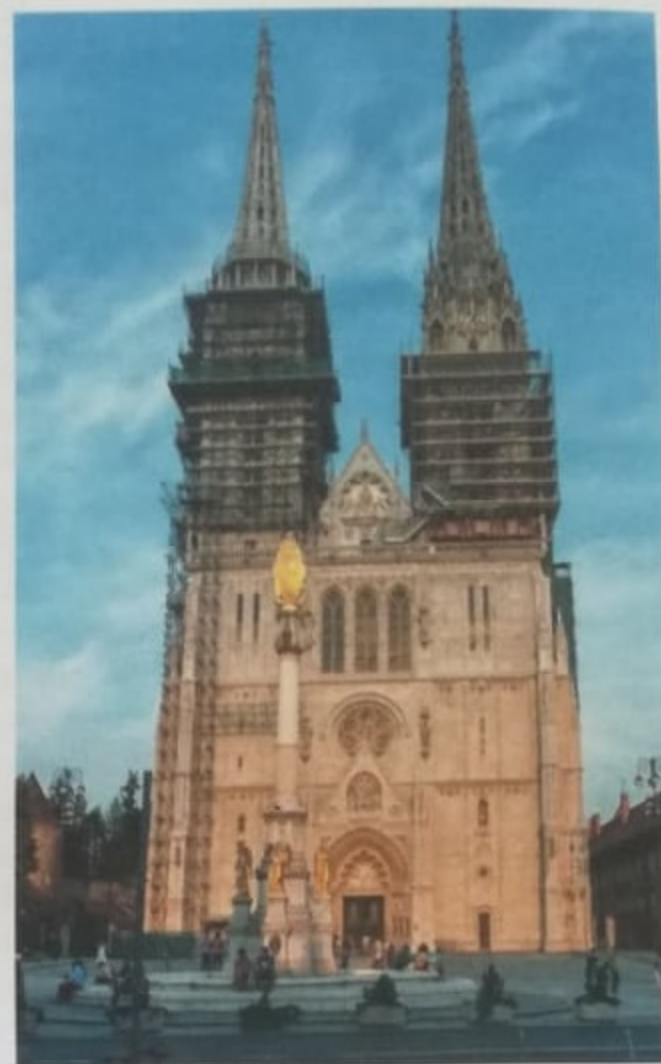
The famous Zagreb Cathedral is the tallest and one of the most valuable buildings in Croatia, attracting tourists from around the world. As the most impressive gothic-style sacral building southeast of the Alps, it is characterised by great architectural and historical value. Its original construction dates back to 1093 and it has been continually enriched and added to by famous architects during the following centuries.

Since low-quality stone was used in the past due to economic reasons, it soon started to deteriorate, affected by weather and city pollution. The Committee for Reconstruction of the Cathedral was founded and selected Cortec for reconstruction of its famous towers due to the recommendation of the Faculty of Mechanical Engineering and Naval Architecture in Zagreb.

During reconstruction work on the south tower, damaged steel bands were detected surrounding the tower approximately every three metres in height. They were covered with rust and situated in drainage areas. Visual damage to the diameter of the bands was present.

An economical approach with a minimum of intrusion to the structure was required to fix the condition of the bands. The mechanical resistance and structural stability of the tower needed to be maintained or improved. The Faculty of Mechanical Engineering examined the bands and performed experiments on the steel bars. They recommended removal of loose corrosion from the bands' surfaces, enhancing the bands in the areas of damage and application of Cortec's anticorrosion protection product, CorrVerter®.

This water-based primer quickly converts rust into a protective layer and



Zagreb Cathedral

is capable of penetrating into the depths of corroded surfaces. It contains a novel chemical chelating agent that modifies surface rust into a hydrophobic passive layer. Two-layers of CorrVerter coating were brushed onto smaller surfaces and sprayed in larger areas directly onto the metal bands. The bands were then reinforced with steel fishplates that were welded on the bands and also protected with CorrVerter.

With the help of a skilled team and good project management the entire project was completed successfully with minimal cost or intrusion as specified. CorrVerter coating penetrated to the non-corroded part of the metal and stopped further advancement of the corrosion process.

PPCJ

**Left picture: Damaged steel bands. Right picture: CorrVerter applied to the right side of the band; the coating has converted the corrosion into a protective layer**

