

Swedish Cement and Concrete Research Institute



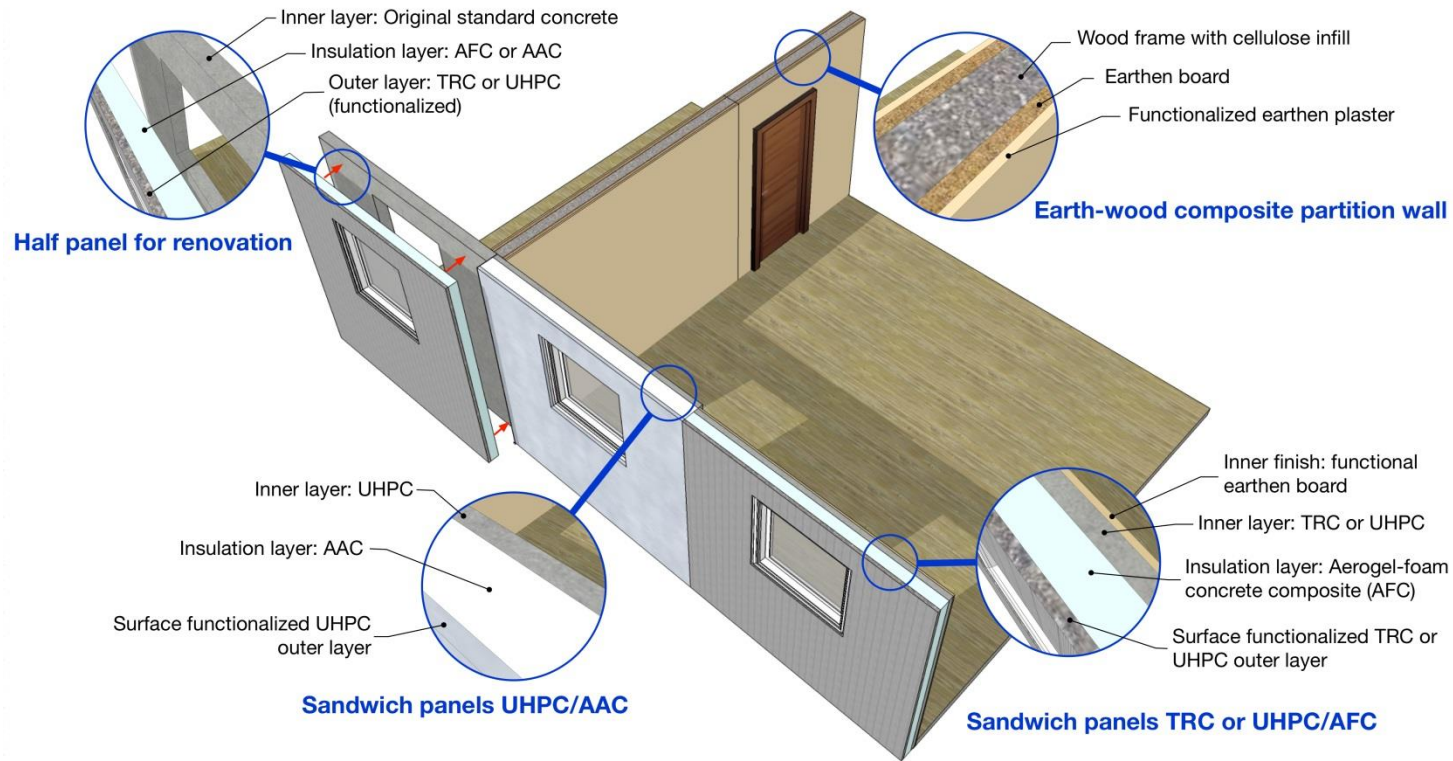
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CBI Betonginstitutet AB (SE)

PHOTOCATALYTIC ACTIVATION OF TEXTILE REINFORCED CONCRETE FACADE PANELS



Contents

- Project concept – H-HOUSE
- Goals & Challenges
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- Conclusions

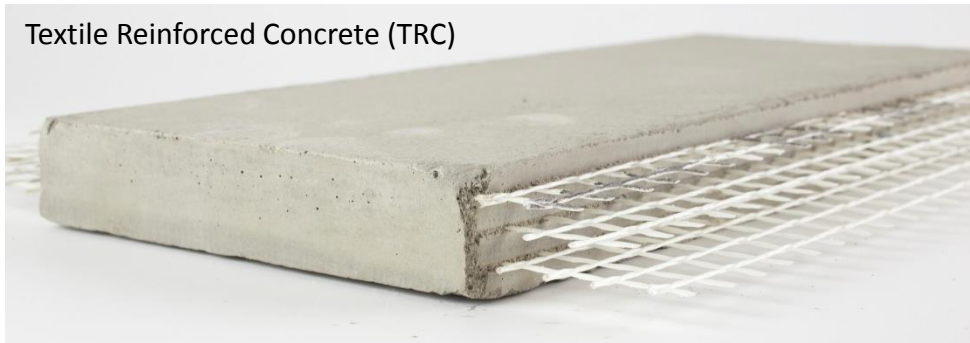


Project Goal

Development of materials and components:

- Physical and chemical properties (surface functionalization)
- Indoor air quality
- Energy efficiency and sound insulation
- Embodied energy
- Durability, maintenance and service life

Textile Reinforced Concrete (TRC)



Foam Concrete (FC)



TRC-FC-TRC

Earth plasters and biocomposites



UHPC-FC/AAC



Goal

- Easy-to-clean / self-cleaning concrete surfaces

Advantages

- Reduced maintenance
- Low-cost solution

Challenges

- Commercial products
- Method for incorporation
- Efficiency / Performance

Materials

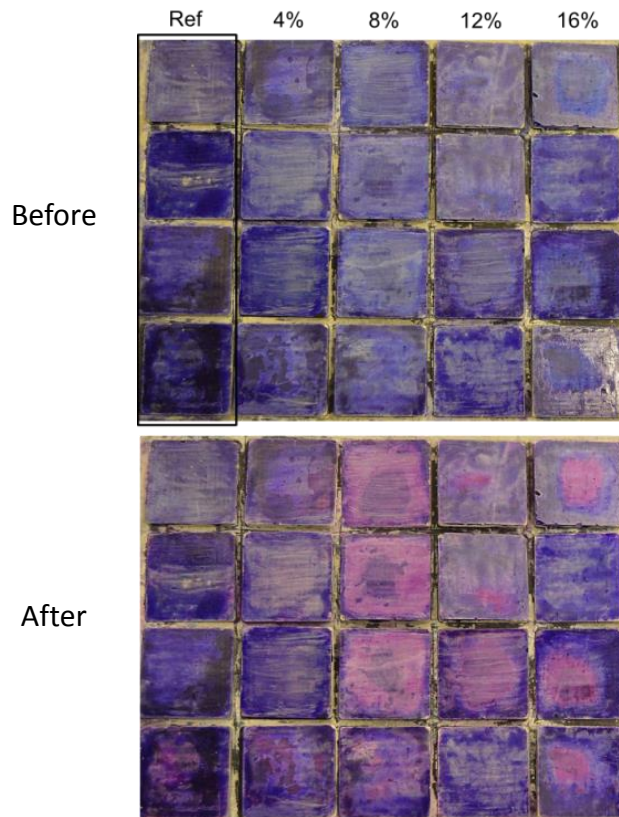
- TiOmix N (1)
- Aeroxide P25 (2)
- Aerodisp W 740 X (3)

Incorporation method

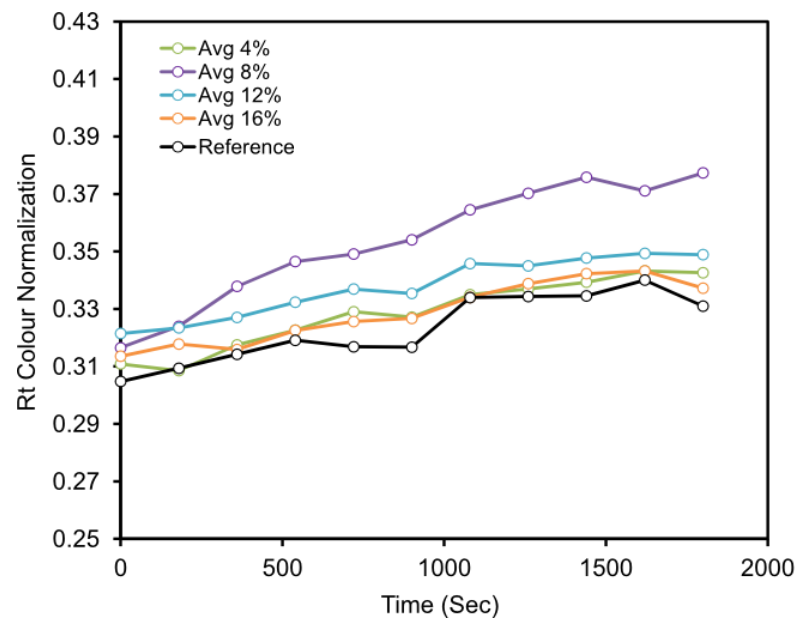
- Bulk addition (1,3)
- Dispersion (3)
- Coating (2)

Methodology

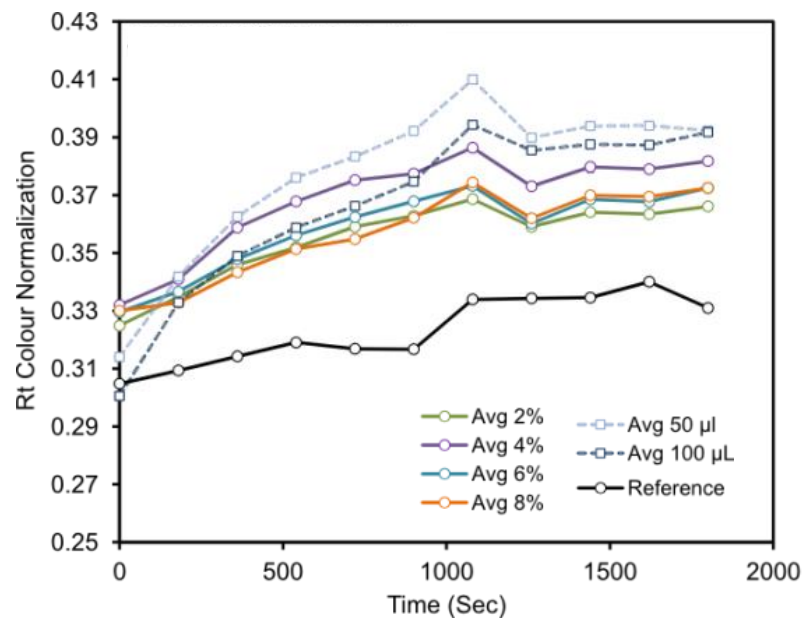
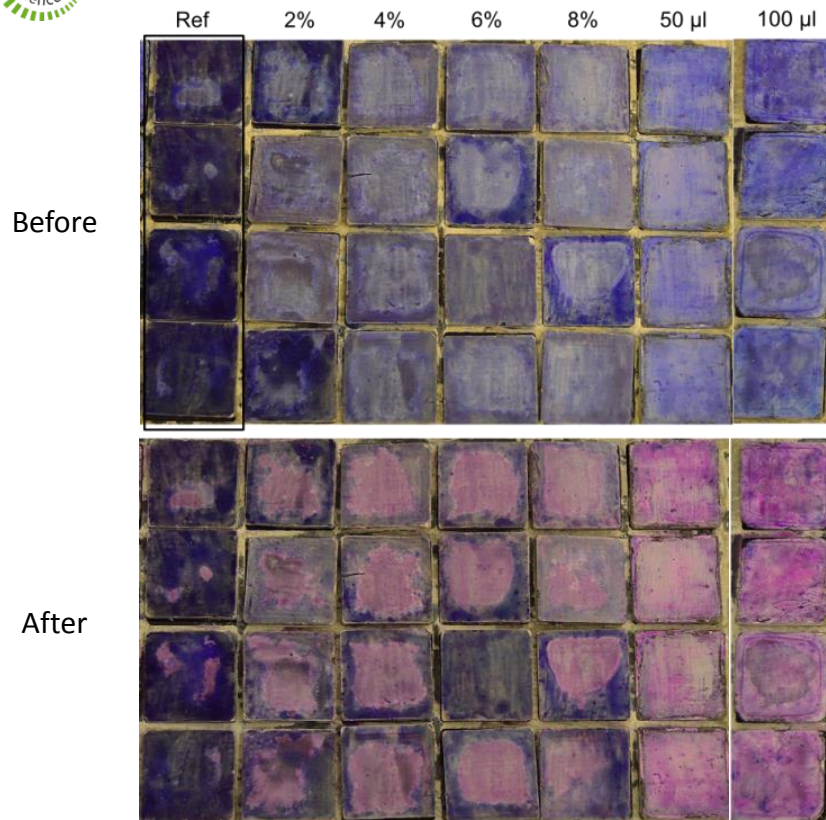
- Indicator ink
- Exposure (UV-A cycles)
- Photography
- Image analysis



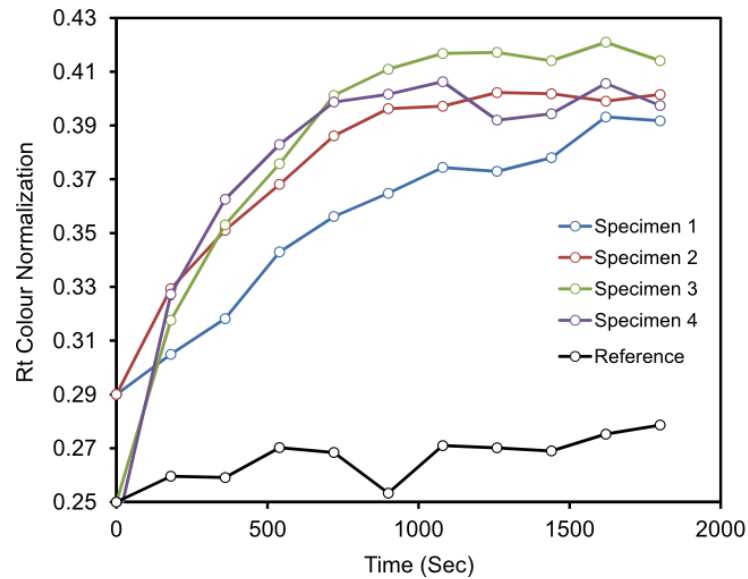
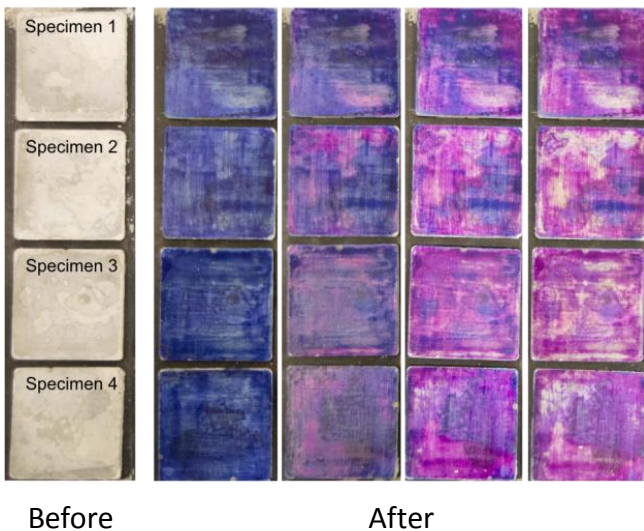
TiO mix (Bulk addition)



Aerodisp (Bulk / Dispersion)

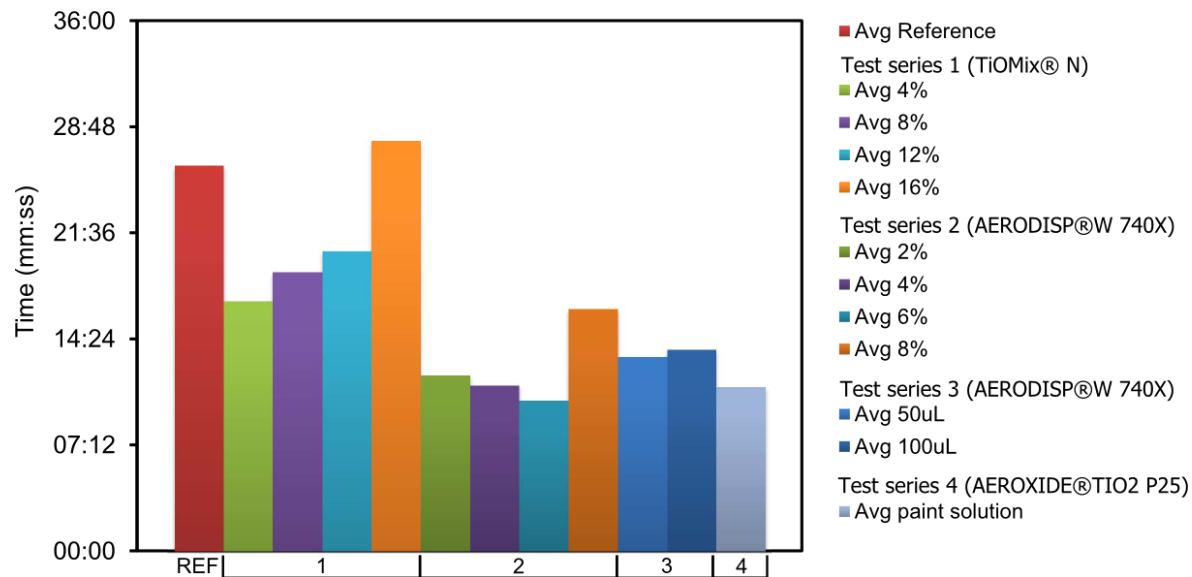


Aeroxide (Coating)

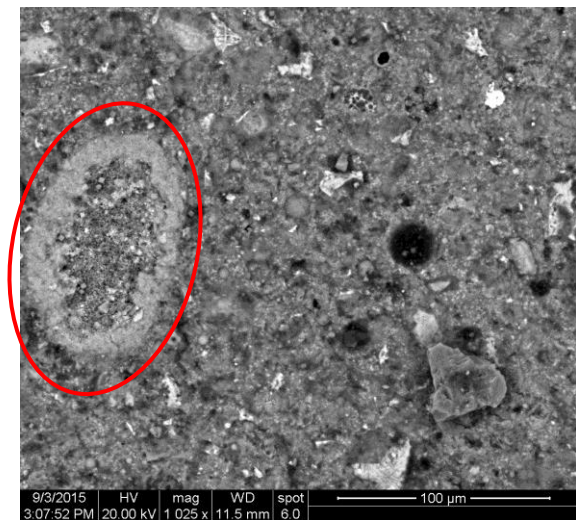




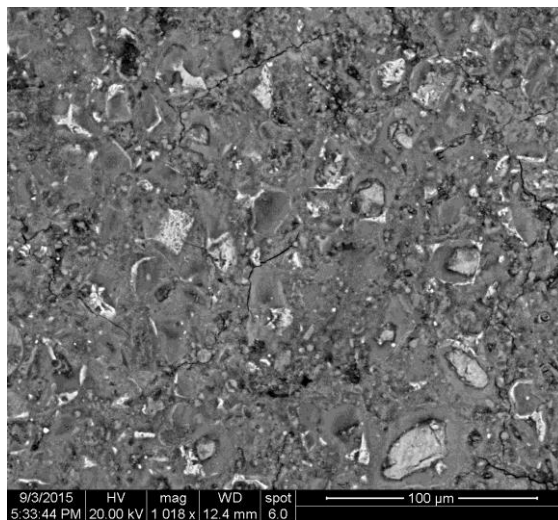
Time to bleach



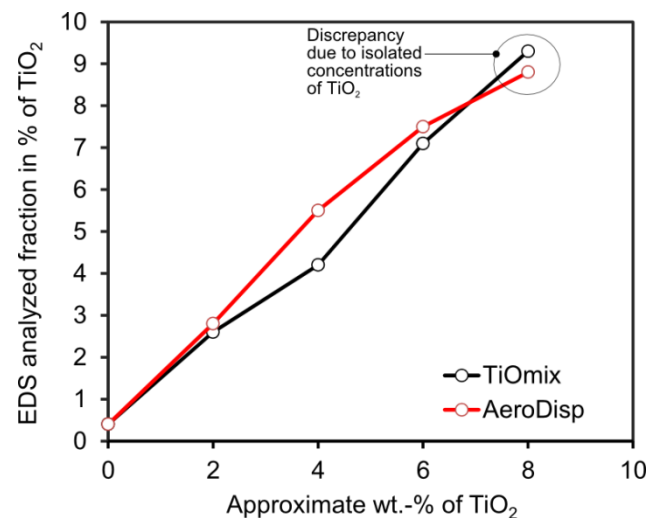
Surface analysis (SEM)



TiO mix



Aerodisp



Conclusions

- Indicator ink: rapid and cost-effective method;
- Bulk addition: higher TiO_2 concentrations not favorable (opt. 3wt.%);
- Dispersion: increased surface reactivity but poor aesthetics;
- Coating: highest rates of reaction and cost-effective.

Acknowledgments



www.h-house-project.eu



Roswag Architekten





Thank you for your attention!

