This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. 608893.

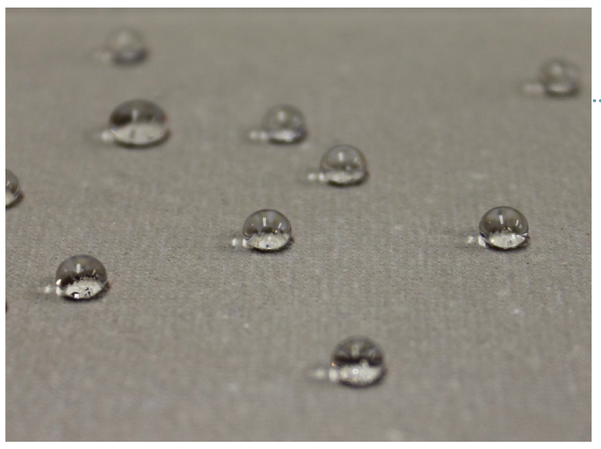
14th International Conference on DBMC
Durability of Building Materials and Components
presents

[H]house

HEALTHIER LIFE
WITH ECO-INNOVATIVE COMPONENTS FOR HOUSING CONSTRUCTIONS

We are represented by the following contributions

DAY 1

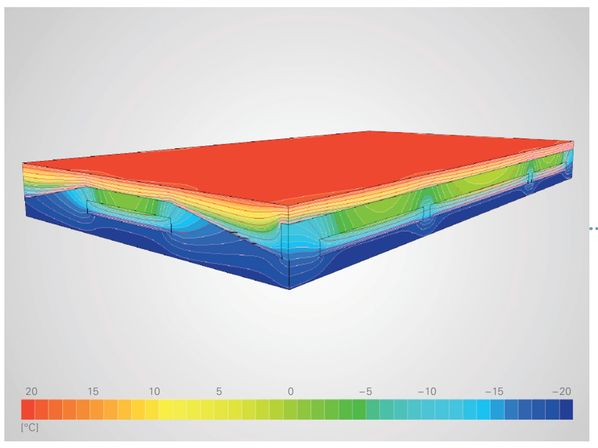


DURABILITY OF UHPC FOR FAÇADE ELEMENTS WITH SELF-CLEANING SURFACES

Session T7 / Theme E
Tuesday, 30 May 2017 3.15 pm

P. Fontana, D. Qvaeschning and J. Hoppe

Physical and chemical modification of the external concrete surfaces contributes to improved durability and reduced maintenance. Through micro-structuring of the concrete surfaces using a casting technique and water-repellent agents, superhydrophobic surfaces were created. This new method revealed higher efficiency and higher durability of the treatment leading to the application for a new patent. Bulk addition of titanium dioxide powder to the concrete or a simple method for coating the concrete surface, consisting of the application of titanium dioxide dispersion, allowed the development of photocatalytic and superhydrophilic properties.



DESIGN OF UHPC-AAC LIGHT-WEIGHT COMPOSITE FAÇADE ELEMENTS FOR REFURBISHMENT

Session T11 / Theme D
Tuesday, 30 May 2017 4.30 pm

L. Miccoli, P. Fontana, O. Kreft, B. Pietruszka, A. Łukaszewska and A. Klinge

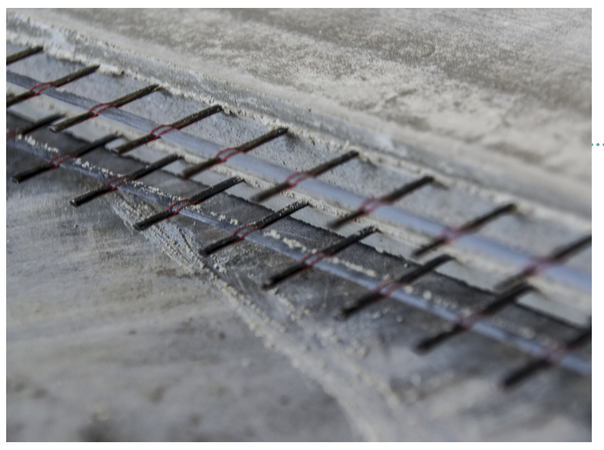
The aim of this study was to develop a lightweight composite façade element for refurbishment of existing façades. It was crucial to minimize the thermal bridges and to undercut the thermal requirement of the system existing façade new element. The awareness of the environmental impact of the building sector is increasing. In this context, ultra-high performance concrete (UHPC) materials are shown to be promising alternatives with advantages such as lower embodied energy and reduced environmental impact. Predictions suggest that UHPC composite elements for building envelopes could have other benefits such as an increased service life, optimized use of building area due to thinner elements and minimized maintenance due to the absence of reinforcement or use of non-corrosive reinforcing materials such as carbon fibers. In this framework, composite elements have been developed combining an autoclaved aerated concrete insulation layer with an external UHPC supporting layer. The results show that the lightweight composite element has a good performance in term of thermal transmittance and minimization of thermal bridges.

INTRODUCTION TO FP7 H-HOUSE PROJECT

Session T12 / Theme E
Tuesday, 30 May 2017 6:00 pm

K. Malaga

The project will develop new eco-innovative materials with the aim to design innovative building components (internal and external walls) for a healthier indoor environment. The developed systems are suitable for new buildings and renovation. They are appropriate for a society where environmental awareness and a high degree of living comfort are both required and expected. [H]house solutions cover aspects of chemical and physical activity of the developed building materials, their embodied energy, suitability for different applications and environments, durability, cost-efficiency and long-term improvement of energy efficiency of buildings.



ACCELERATED AGEING OF TEXTILE REINFORCED CONCRETE (TRC)

Session W3 / Theme E
Wednesday, 31 May 2017 9.45 am

K. Malaga, N. Williams Portal and I. Outras

Textile reinforced concrete (TRC) applied in innovative lightweight sandwich elements offers a number of advantages. Steel reinforcement is replaced by carbon, basalt or AR-glass textile fabrics, thus significantly reducing thickness and weight whilst avoiding steel corrosion. It is of key interest to determine which type of textile reinforcement would present the most promising long-term durability when being exposed to the alkaline concrete environment. For this purpose, investigations were conducted by means of exposing commercially available textile reinforcement products and TRC samples to accelerated ageing conditions. Ageing was evaluated by inspection of the external appearance of the textile reinforcement and by means of direct tensile and uniaxial tensile tests on both unaged and aged textile reinforcement and TRC samples, respectively. On the whole, the coating applied to the reinforcement products was found to be a governing parameter regarding the durability properties.

INFLUENCE OF LIFE SPAN PREDICTION ON BUILDING COMPONENT'S LCA PERFORMANCE

Session W8 / Theme G
Wednesday, 31 May 2017 1:45 pm

M. Sié, T. Susca, N. Williams Portal, O. During, P. Fontana, C. Sjöström and J. Payet

The sustainability of [H]house innovative components is of great concern to the project partners. In order to support the design of the composite elements, several variants have been compared according to the Life Cycle Assessment (LCA) methodology over the course of the project. Each material and design aspect was carefully selected taking into account stringent environmental criteria. Environmental impacts and costs of the innovative building components are estimated in comparison to conventional solutions.

Furthermore, the environmental datasets of the façade elements made of concrete will be available in the International Life Cycle Data (ILCD) format on the life cycle data network of the European Commission (http://eplca.jrc.ec.europa.eu).