

HPC/UHPC double wall elements

High performance concretes | precast elements | thin-walled monolithic structure

Ultra high performance concrete is characterized by high strength, dense structure and quick hardening. The novel double wall elements comprise special connection and reinforcement elements adapted to the specificities of the new materials, which allows to reduce wall thickness from 50-70 mm to 20-45 mm in an easy and cost efficient way.

Background

Double wall elements are precast reinforced concrete elements filled with in-situ concrete. The bonding between precast element and filling concrete leads to a monolithic structure. HPC/UHPC is self-levelling, showing a very smooth surface, thus hindering the compound effects with adjacent layers. Therefore there are no functional double wall elements from HPC/UHPC on the market yet.

Technology

The new double wall technology comprises:

- Reinforcement elements embedded in UHPC concrete on their outer side, allowing a reduction of wall thickness
- The inner side of the reinforcement element protruding from the wall, improving the bonding between the precast element and the filling concrete
- Optimization of the pre-casting process for the new technology

Advantages

- Thin-walled double wall elements
- resistance to high tension, pressure and bending stresses
- Savings in material and weight
- Savings in transport and crane costs
- Dense structure of the precast wall, improving the durability of the construction

Potential applications

The technology is suited for the construction of double wall elements in residential and commercial buildings and especially suited for infrastructure and industrial buildings like bridges, traffic spaces, cut-off trenches as well as high rise buildings and towers like wind turbines, power plants or cooling towers.

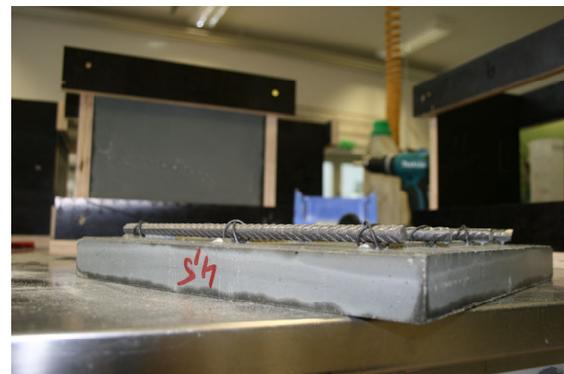


Fig. 1: UHPC double wall element

State of development

Proof of concept, Prototype under construction

Options

Expertise, R&D cooperation

Inventors

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