Fire performance of basalt FRP mesh reinforced HPC thin plates - DTU Orbit (14/03/2019)

**Fire performance of basalt FRP mesh reinforced HPC thin plates**

An experimental program was carried out to investigate the influence of basalt FRP (BFRP) reinforcing mesh on the fire behaviour of thin high performance concrete (HPC) plates applied to sandwich elements. Samples with BFRP mesh were compared to samples with no mesh, samples with steel mesh and samples displaying a full sandwich structure. Final results confirmed the bond loss between concrete and BFRP mesh with temperature. The available void where the epoxy burnt away allowed the concrete matrix to release pressure and limit pore stresses, delaying spalling. It also reduced the mechanical resistance of the structure, since the ability of the mesh to bond on the concrete matrix was lost. A theoretical approach for numerical modelling is proposed based on the experimental observations. It describes the change of boundary condition at the vicinity of the mesh as an outer pressure dependent on a linear increase of the volume of melted epoxy and the outflow of moisture from the concrete matrix. It was concluded that the use of a BFRP mesh to reinforce HPC exposed to fire reduces the mechanical strength despite a beneficial effect related to spalling.

**General information**

State: Published
Organisations: Department of Civil Engineering, Section for Structural Engineering, Section for Building Design
Contributors: Hulin, T., Hodicky, K., Schmidt, J. W., Nielsen, J. H., Stang, H.
Number of pages: 6
Publication date: 2013

**Host publication information**

Title of host publication: Proceedings of the 4th Asia-Pacific Conference on FRP in Structures (APFIS 2013)
Publisher: Swinburne University of Technology
ISBN (Print): 9780987593016
Electronic versions:
prod11389309171439.full_paper_APFIS_reviewed_version_Thomas_Hulin.pdf
Source: dtu
Source-ID: u::10385
Research output: Research - peer-review > Article in proceedings – Annual report year: 2013