

Performance assessment of basalt FRCM for the confinement of clay brick masonry cylinders

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ABSTRACT

Fibre Reinforced Cementitious Matrix (FRCM) materials have started to be employed during the last years with the aim of overcoming the drawbacks related to the use of Fibre Reinforced Polymer (FRP) composites, proving to be potentially suitable for strengthening masonry structures [1]. Moreover, the will to develop materials able to guarantee a certain degree of sustainability without renounce to adequate mechanical properties has drawn the attention on the use of basalt fibres, which appear to be a material that could offer interesting opportunities in the future as alternative to carbon or glass fibres [2]. Literature review reveals that a small number of studies is currently available on the use of FRCMs for the confinement of masonry members [3, 4] and only a few address the use of basalt fibres [5, 6].

The goal of this work is to investigate the capabilities of FRCM composites involving the use of basalt in improving the mechanical characteristics of masonry confined using this system. With this aim, an experimental study was carried out by testing clay brick masonry cylinders strengthened with basalt FRCM and subjected to axial compression. A total of fifteen specimens was prepared by using two different arrangements in order to investigate on the influence of the number of vertical mortar joints. The role of the reinforcing ratio was also studied by considering specimens wrapped by one or two layers of basalt textile. The study is supported by a preliminary investigation on the mechanical properties of constituent materials of masonry and of the jacket. The results are discussed in terms of strength and strain enhancement of confined cylinders compared to control specimens

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