

# STUDY OF THE THERMAL BEHAVIOR OF CEMENT MORTARS REINFORCED WITH WASTE MINERAL FIBERS THROUGH NUMERICAL SIMULATION

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**Keywords:** *Cement mortars, mineral fibres, CFD simulation, energy efficiency, construction and demolition waste*

This study is part of a research that analyses the viability of the mineral wool from the construction and demolition waste (CDW) as reinforcement of cement matrices. The objective is to analyse the thermal behavior of the new material of cement mortar with waste mineral fibers, as applied in mortar blocks for facades, is analyzed by numerical simulation in comparison with a block façade made of traditional mortar [1].

To perform this numerical simulation, a Computational Fluid Dynamics (CFD) program (Computational Fluid Dynamics) was used, specifically the STAR\_CCM + software [2].

Through this heat transfer simulation is evaluated in a constructive traditional facade system. The enclosure is composed of a cement mortar block of 20 cm thickness, a plastering of 1.5 cm, an air chamber of 4 cm, a thermal insulation of 5 cm, a double hollow brick walling of 7 cm and a coating 1.5 cm thick.

A reference model is defined on which the scenario of replacing the block of cement mortar without fibers with the block of cement additive with fiber residues is defined [3].

The decrease in energy flow per  $W / m^2$  and the temperature difference between the outer and inner face of the wall are analyzed on each model, assuming a winter scenario.

Tests indicate an improvement in the thermal behavior of the compounds, that reduces significantly its thermal conductivity, so it is suggested as material for construction applications requiring energy improvement of the building.

## REFERENCES

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