

Determination of the Thermophysical Characteristics of the Composite Material Clay Cement Paper

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Abstract : In Morocco, the building sector is largely responsible for the evolution of energy consumption. The control of energy in this sector remains a major issue despite the rise of renewable energies. The design of an environmentally friendly building requires mastery and knowledge of energy and bioclimatic aspects. This implies taking into consideration of all the elements making up the building and the way in which energy exchanges take place between these elements. In this context, thermal insulation seems to be an ideal starting point for reducing energy consumption and greenhouse gas emissions. In this context, thermal insulation seems to be an ideal starting point for reducing energy consumption and greenhouse gas emissions. The aim of this work is to provide some solutions to reduce energy consumption while maintaining thermal comfort in the building. The objective of our work is to present an experimental study on the characterization of local materials used in the thermal insulation of buildings. These are paper recycling stabilized with cement and clay. The thermal conductivity of these materials, which were constituted based on sand, clay, cement; water, as well as treated paper, was determined by the guarded-hot-plate method. It involves the design of two materials that will subsequently be subjected to thermal and mechanical tests to determine their thermophysical properties. The results show that the thermal conductivity decreases as well in the case of the paper-cement mixture as that of the paper-clay and seems to stabilize around 40%. Measurements of mechanical properties such as flexural strength have shown that the enrichment of the studied material with paper makes it possible to reduce the flexural strength by 20% while optimizing the conductivity.

Keywords : building, composite material, insulation, thermal conductivity, paper residue

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