

Experimental Approach and Numerical Modeling of Thermal Properties of Porous Materials: Application to Construction Materials

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Abstract : This article presents experimental and numerical results concerning the thermal properties of the porous materials used as heat insulator in the buildings sector. Initially, the thermal conductivity of three types of studied walls (classic concrete, concrete with cork aggregate and polystyrene concrete) was measured in experiments by the method of the boxes. Then a numerical modeling of the heat and mass transfers which occur within porous materials was applied to these walls. This work shows the influence of the presence of water in building materials on their thermophysical properties, as well as influence of the nature of materials and dosage of fibers introduced within these materials on the thermal and mass transfers.

Keywords : modeling, porous media, thermal materials, thermal properties

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