

## STUDY OF COUPLED HEAT AND MOISTURE TRANSFER WITHIN A VEGETAL FIBRE MATERIAL FOR BUILDING ENVELOPE

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**ABSTRACT** The sustainable world's economic growth and people's life improvement greatly depend on the use of alternative products in the architecture and construction, such as industrial wastes conventionally called green materials. For this purpose, hemp concrete is more and more recommended by the eco-builders because hemp is a renewable plant, recyclable and does not degrade within time. It corresponds perfectly to the requirements of High Environmental Quality buildings. The objective of this article is to study transient hygrothermal behaviour of hemp concrete at whole building level. The physical model is one-dimensional and was implemented into the object-oriented simulation environment SPARK, using the finite difference technique with an implicit scheme. Model is validated referring to data given in literature. Simulations are run for winter conditions on whole building level. Our results suggest that hemp concrete has a good thermal performance. Its low conductivity reduces energy consumption. Besides its moisture buffering capacity dampens indoor relative humidity variation.