

Accepted Manuscript

Experimental and numerical evaluation of the hygrothermal performance of a hemp lime concrete building: A long term case study

Bassam Moujalled, Yacine Aït Ouméziane, Sophie Moissette, Marjorie Bart, Christophe Lanos, Driss Samri



PII: S0360-1323(18)30154-9

DOI: [10.1016/j.buildenv.2018.03.025](https://doi.org/10.1016/j.buildenv.2018.03.025)

Reference: BAE 5359

To appear in: *Building and Environment*

Received Date: 5 December 2017

Revised Date: 9 March 2018

Accepted Date: 18 March 2018

Please cite this article as: Moujalled B, Aït Ouméziane Y, Moissette S, Bart M, Lanos C, Samri D, Experimental and numerical evaluation of the hygrothermal performance of a hemp lime concrete building: A long term case study, *Building and Environment* (2018), doi: 10.1016/j.buildenv.2018.03.025.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Experimental and numerical evaluation of the hygrothermal performance of a hemp lime concrete building: a long term case study

Bassam Moujalled^{a,*}, Yacine Aït Ouméziane^b, Sophie Moissette^c, Marjorie Bart^c,
Christophe Lanos^c, Driss Samri^d

^a CEREMA, Direction Centre-Est, 46 Rue St Théobald, F-38081 L'Isle d'Abeau, France

^b FEMTO-ST Institute, Univ. Bourgogne Franche-Comte, CNRS, 2 avenue Jean Moulin,
90000 Belfort, France

^c LGCGM EA3913, University of Rennes 1, 3 rue du clos Courtel, 35704 RENNES, France

^d CEREMA, Direction Sud-Ouest, Rue Pierre Ramond, F-33166 Saint-Médard-en-Jalles,
France

* Corresponding author:

E-mail address: bassam.moujalled@cerema.fr

Tel: +33474275155, Fax: +33474275252

Abstract

Hemp-lime concrete (HLC) is a bio-based material which is currently undergoing a growing development. HLC is a low embodied energy material and an excellent hygrothermal regulator. Its thermal, hygric and mechanical properties are well known, and its capacity to reduce energy needs and to improve hygrothermal comfort is demonstrated across many laboratory and numerical studies. However, there are few works about its hygrothermal performance in real climatic conditions on the scale of a building. In order to address this issue, a long term in-situ measurement is carried out to analyze the hygrothermal performance of a HLC individual dwelling-house during 4 years. The analysis of the hygrothermal behavior of a wall is achieved by comparing measurements and numerical simulations results. In this study, two simulation tools are used and compared. The first tool

Download English Version:

<https://daneshyari.com/en/article/6697416>

Download Persian Version:

<https://daneshyari.com/article/6697416>

[Daneshyari.com](https://daneshyari.com)