

Acoustic Absorption of Hemp Walls with Ground Granulated Blast Slag

Authors : Oliver Kinnane, Aidan Reilly, John Grimes, Sara Pavia, Rosanne Walker

Abstract : Unwanted sound reflection can create acoustic discomfort and lead to problems of speech comprehensibility. Contemporary building techniques enable highly finished internal walls resulting in sound reflective surfaces. In contrast, sustainable construction materials using natural and vegetal materials, are often more porous and absorptive. Hemp shiv is used as an aggregate and when mixed with lime binder creates a low-embodied-energy concrete. Cement replacements such as ground granulated blast slag (GGBS), a byproduct of other industrial processes, are viewed as more sustainable alternatives to high-embodied-energy cement. Hemp concretes exhibit good hygrothermal performance. This has focused much research attention on them as natural and sustainable low-energy alternatives to standard concretes. A less explored benefit is the acoustic absorption capability of hemp-based concretes. This work investigates hemp-lime-GGBS concrete specifically, and shows that it exhibits high levels of sound absorption.

Keywords : hemp, hempcrete, acoustic absorption, GGBS

Conference Title : ICABBM 2016 : International Conference on Architecture and Bio-based Building Materials

Conference Location : Tokyo, Japan

Conference Dates : September 05-06, 2016