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Title:

Incorporation of paper fibers from cement sacks recycling in the production of compressed earth blocks

Abstract:

Most of the cement sacks used in civil construction every year is thrown out without any environmental treatment, having associated an enormous negative environmental impact. For example, in 2009 the cement production in Brazil reached 51.5 million tonnes. Of this production, 71% was bagged, which is equivalent to 731.3 million cement sacks (50 kg).

The fibers of these cement sacks have excellent mechanical and physical properties. There is great potential on its reuse for the production of new construction materials. Plant and vegetable fibers have been used extensively in traditional earth construction to improve the mechanical properties of constructive components whose raw material is the soil.

A series of tests to characterize the mechanical behavior of KRAFTTERRA COMPOSITE were developed. The study's objective focuses on the development and performance evaluation of Compressed Earth Blocks - CEBs, incorporating kraft-paper fibers from cement sacks recycling.

This paper describes the Kraftterra mixture and production processes, as well as the performance of prisms produced with Kraftterra tested in axial and diagonal compression. The inclusion of Kraft paper disperse fibers from recycled cement sacks in CEBs and mortars allows for a large increase in the walls' ability to resist to compression and diagonal compression, even after the maximum strength is reached. Furthermore, the mortar made with Kraftterra results in strong connections between blocks and produces more homogeneous building walls, with more uniform properties and high monolithicity, which induces better performance to the wall elements.