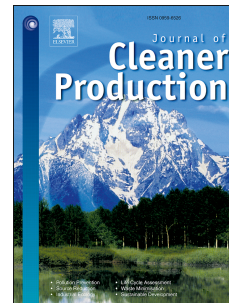


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## Characteristics and utilization of sugarcane filter cake waste in the production of lightweight foamed concrete

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### Abstract

This study investigates the properties of lightweight foamed concrete (LFC), in which Type 1 Portland cement (OPC) was replaced by incinerated sugarcane filter cake (ISF) at 0%, 5%, 10%, 15%, and 20% by weight (wt%). LFC densities of 900, 1,000, and 1,100 kg/m<sup>3</sup> were tested with a water–binder materials (OPC + ISF) ratio (W/B) of 0.5 for all mixtures. The study classifies the fresh (spreadability, density, setting time), mechanical (compressive strength, flexural strength, drying shrinkage, porosity), and functional (water absorption, thermal insulation) characteristics of the respective LFC mixtures. All LFC mixtures achieved a density within the defined tolerance limit during testing. For any given plastic density, a greater spread was obtained at higher than at lower density. Losses of compressive strength, flexural strength, and drying shrinkage were observed in all LFC mixes compared to the control LFC specimens. In terms of functional properties, as the percentage of ISF increased, the thermal conductivity of the mixture decreased. However, mixtures in which ISF was used at 10 wt% replacement for cement were more spreadable than other mixtures, including the

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