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Abstract

This paper focused on the viability of utilizing rice straw, a plentiful agricultural waste product, as reinforcement for gypsum-based composites to create environmentally friendly insulation boards. While, building industry has shown a great deal of interest in for using rice straw as a raw material for composite aggregates and increasing the utilization of agricultural waste for construction. The aim of the study was to find out how treating rice straw with gypsum changed the physical and mechanical characteristics of the finished boards. After being, the straw fibres cut into pieces ranging from 10 to 30 mm. Rice straw was treated with sodium hydroxide and combined in different amounts with gypsum. Boards containing 6% rice straw exhibited lower density (1.08 g/cm^3 vs 1.18 g/cm^3), higher water absorption (35.4% vs 28.6%), increased porosity (38.9% vs 33.7%), and decreased compressive strength (5.1MPa vs 12.6 MPa). While the addition of rice straw decreased mechanical properties. The obtained results revealed a positive correlation between the amount of rice straw and water absorption. In addition, the mixture of rice straw and gypsum leads to increase porosity. Finally, this mixture cause of decreasing compressive strength.

Keywords

[composite materials](#); [gypsum boards](#); [rice straw](#); [compressive strength](#); [physical properties](#)