

Smart Technology for Hygrothermal Performance of Low Carbon Material Using an Artificial Neural Network Model

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Abstract : Reducing the quantity of cement in cementitious composites can help to reduce the environmental effect of construction materials. By-products such as ferronickel slags (FNS), fly ash (FA), and *Crepidula fornicata* (CR) are promising options for cement replacement. In this work, we investigated the relevance of substituting cement with FNS-CR and FA-CR on the mechanical properties of mortar and on the thermal properties of concrete. Foraging intervals ranging from 2 to 28 days, the mechanical properties are obtained by 3-point bending and compression tests. The chosen mix is used to construct a prototype in order to study the material's hygrothermal performance. The data collected by the sensors placed on the prototype was utilized to build an artificial neural network.

Keywords : artificial neural network, cement, circular economy, concrete, by products

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