

EFFECT OF RICE HUSK-DERIVED SiO₂-AEROGEL ON THE STRENGTH AND THERMAL INSULATING PROPERTY OF ORDINARY PORTLAND CEMENT

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ABSTRACT

Silica (SiO₂) aerogel is well known to have high porosity and light weight. In this study the effect of SiO₂ aerogel derived from local rice husks (RH-aerogel) on the strength and thermal conductivity of ordinary Portland cement (OPC) was investigated. The objective of the study was to produce a stronger building block with improved thermal insulating property. Increasing amounts of up to 7 % by weight of RH-aerogel were added to an OPC-water mixture as cement replacement. The mixture was well blended and casted into cubic blocks. The compressive strength and the thermal conductivity of the resultant blocks were determined at various intervals of hydration. Results of the study revealed that the addition of up to 7 wt% RH-aerogel to OPC did not significantly affect the compressive strength but reduced significantly the thermal conductivity by 50%. Comparison using rice husk ash in place of the RH-aerogel confirmed the superiority of the latter as a better cement replacement material since it has an added advantage of being thermally insulating, suitable for a hot country like Malaysia.

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