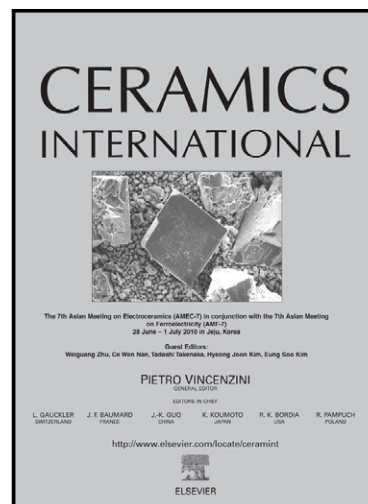


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## **Mechanical and thermal properties of ambient cured cotton fabric-reinforced fly ash-based geopolymer composites**

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### **Abstract**

This paper presents the mechanical and thermal properties of cotton fabric (CF)-reinforced fly ash-based geopolymer composites cured under ambient condition. Setting and hardening of above composite at ambient temperature are achieved by partial replacement of small amount of fly ash with ordinary Portland cement (OPC). The effects of different quantities of OPC on flexural strength, fracture toughness, impact strength and thermal stability of above composite are evaluated, and the microstructural characterisation of each composite and its matrix is also conducted. Results show that the mechanical properties of the composites are improved with the addition of OPC; however, SEM images of fracture surfaces reveal that OPC hinders toughening mechanisms by limiting the prevalence of fibre pull out and fibre debonding. At high temperatures, the thermal stability of the geopolymer composites increases with the presence of either OPC or CF layers.

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