

Fabrication and Mechanical Testing of Multi-layered Jute HDPE Composite

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Abstract

This paper discusses fabrication and mechanical performance testing of multi-layered jute fabric reinforced HDPE (high-density polyethylene) composite material. Six layers of jute hessian fabrics in 0° orientation were sandwiched into seven layers of HDPE sheets and pressed at 195 °C temperature using a high-pressure compression-moulding machine to form layered composite laminates. Both physical and mechanical characteristics of the laminates were analysed using standard techniques. Microscopic analysis revealed that the fibre and yarn orientation of fabrics within composite remained intact and no visible void was identified. Mechanical performance of the composite having 10% (wt) of fibre content was found to have improved significantly when compared with pure HDPE laminate. The tensile strength of the composite was improved by more than 60%, while flexural strength and flexural modulus were increased by approximately 56% and 115% respectively. Fracture morphology of the composite investigated by Scanning Electron Microscope (SEM) showed excellent adhesion of the jute fabrics with the HDPE matrix.

Keywords: Jute fabric, HDPE, Composite, Laminate

Full paper is not available. The speaker can be contacted for further details