

# Effects of reinforcing arrangement of kenaf fibres into unsaturated polyester for improved properties

M. R. Islam and M. D. H. Beg

## Abstract

In this current study, the mechanical, structural and morphological properties of kenaf fibre based polyester composites based on reinforcing arrangement were investigated. Fibres were placed in layers into the resin to enhance reinforcement. A hand lay-up technique was used to prepare the sandwich composite. Composites were characterized by tensile, flexural and impact testing. The structural properties as well as crystalline behaviour were observed by X-ray diffraction analysis. Additionally, the surface of the fractured samples was also examined using scanning electron microscopy to understand the interaction behaviour between the fibres and matrix. Results of the analyses revealed that single layered kenaf mat enhanced the tensile strength by 80%, whereas the double layered improved by 156%, in the presence of a fixed amount of curing agent. The thermal properties of the composites based on double layered kenaf mat were also found to improve compared to the others. The double layered composites can be used as high temperature -sustained roofing materials to replace traditional products.  
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**Keywords:** Kenaf fibres ; Mechanical properties ; Polyesters; Thermal properties

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