

THERMOPLASTIC POLYURETHANE - GLASS FIBRE MAT REINFORCED COMPOSITE: EFFECT OF ALTERNATIVE MULTILAYER SANDWICH MODEL ON MECHANICAL PROPERTIES

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ABSTRACT

The paper presents the structural and environmentally sustainable aspects of glass fibre polyurethane composite as a valid construction material. Thermoplastic polyurethane (TPU) - glass fibre (GF) composites had been fabricated by using compression moulding machine. This technique was used with a specific alternative multilayer sandwich model. The multilayer sandwich model enhanced the Tensile, Modulus and Impact properties of TPU-GF composite. The key to obtain significant properties enhancement is to be attributed to the additional interaction site between the polymer matrix and reinforcing agents. Use of polymer-fibre alternative layer sandwich model gives advantages of high aspect ratio, interacted surface area and higher stiffness with better strength. The properties of the composites were believed to be predominantly influenced by the type of processing conditions and technique used. Glass fibre reinforced composites show a regular trend of increase in properties with fibre loading. Mechanical properties of fabricated composites were determined by using tensile, flexural and impact testing while surface investigated through the use of SEM (Scanning Electron Microscope) describing fiber orientation are also reported.

KEYWORDS: Composites; Glass fibers; Multilayer model; Polyurethane (TPU), Green Building Material.