

Effect of polybutylene terephthalate (PBT) on impact property improvement of hybrid kenaf/glass epoxy composite.

Abstract

Environmental regulations, costs and lightweight encourage car manufacturers to develop new reliable products. Epoxy provides a reliable fibre impregnation and creates substantial three-dimensional (3D) cross-linking for proper load transmission and impact strength improvement, but their low toughness decreases their energy absorption. Thermoplastic toughening improves the epoxy impact property with a low thermo-mechanical defect. This study, focused on improving the impact property of hybrid kenaf/glass fibre epoxy composite by use of a modified sheet moulding compound (GMT). The results indicated that most of the mechanical properties of developed material were almost the same as those of the GMT, except impact. This result highlights the potential for utilisation of the toughened hybrid bio-composite in some automotive structural components. Moreover, geometric parameters, e.g., cross-section, thickness, and reinforcement ribs suggest an improvement of structural impact resistance to comply with the bumper beam product design specification (PDS).

Keyword: Composite materials; Natural materials; Epoxy; Impact property; Mechanical properties; Laminates