

Mechanical properties of longitudinal basalt/woven-glass-fiber-reinforced unsaturated polyester-resin hybrid composites

ABSTRACT

This work represents a study to investigate the mechanical properties of longitudinal basalt/wovenglass-fiber-reinforced unsaturated polyester-resin hybrid composites. The hybridization of basalt and glass fiber enhanced the mechanical properties of hybrid composites. The unsaturated polyester resin (UP), basalt (B) and glass fibers (GF) were fabricated using the hand lay-up method in six formulations (UP, GF, B7.5/G22.5, B15/G15, B22.5/G7.5 and B) to produce the composites, respectively. This study showed that the addition of basalt to glass-fiber-reinforced unsaturated polyester resin increased its density, tensile and flexural properties. The tensile strength of the B22.5/G7.5 hybrid composites increased by 213.92 MPa compared to neat UP, which was 8.14 MPa. Scanning electron microscopy analysis was used to observe the fracture mode and fiber pullout of the hybrid composites.

Keyword: Basalt fiber; Glass fiber; Natural-fiber composites; Hybrid composites; Mechanical properties