

Mechanical properties of hybrid glass fiber/rice husk reinforced polymer composite

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ABSTRACT

The world today is experiencing a significant global warming problem. One of the causes of the problem is due to the use of excessive and uncontrollable material. Therefore, replacing the material with more environmental friendly is a challenging task, especially from wasted natural materials such as rice husk (RH) fiber. The aim of the study is to investigate the mechanical properties from composites made by reinforcing bi-directional glass fiber and RH short fiber with epoxy resin. Total of fibers content for each sample was 30 wt% and 70 wt% for epoxy resin. The weight distributions for RH fiber were ranging from 5 wt%, 10 wt% and 15 wt%, meanwhile 25 wt%, 20 wt% and 15 wt% for bi-directional glass fiber. The arrangement of fibers were alternate layers and hand lay-up for fabrication of hybrid composite. The best combination of hybrid composite was 5 wt% of RH fiber and 25 wt% of glass fiber with tensile strength value 215.42 MPa, tensile modulus 1.8 GPa, flexural strength 275.51 MPa and impact strength 447.19 J/m. It was indicated that the decreasing trend on its mechanical properties when the content of RH fiber exceeds 5 wt%.

KEYWORDS

Bi-directional glass fiber; Flexural strength; Hybrid composite; Impact strength; Mechanical properties; Rice husk fiber; Tensile strength

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