

**ABSTRACT:**

In this study, the impact strengths of E-glass, coir, oil palm as well as E-glass/coir and E-glass/oil palm hybrid polyester composites were studied. All types of composites were reinforced with fiber volume fractions of 30%, 40%, and 50% and fiber lengths 3, 7, and 10 mm. Composite laminates reinforced with longitudinal and transverse coir fiber mats were also studied. The number of fiber mats varied from 1, 2, 3, and 4 layers for non-spaced fiber mats and 2, 3, and 4 layers for 1.5 mm spaced fiber mats. Besides, coir-polyester composite with addition of sand filler was studied as well, with 40%, 50%, and 60% of volume fractions and fiber lengths of 3, 7, and 10 mm. Results show that impact strength improves with fiber content and fiber length. In addition, longitudinal fiber mats always exhibit better impact toughness compared to transverse fiber mats. Impact strength is improved with the number of fiber layers but worsened by the fiber spacing. As for coir/polyester concrete, low fiber content and fiber length improve the impact strength. The fractured surfaces were inspected under scanning electron microscope to investigate the fracture mechanisms in each type of composites.