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COMPARATIVE INVESTIGATION ON THE TRANSVERSE AND LONGITUDINAL TENSILE PROPERTIES OF JUTE AND BANANA FIBERS REINFORCED POLYMER BASED HYBRID BIO COMPOSITES

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Abstract

Natural fiber reinforced bio composites have gained much more interests these days due to their extraordinary mechanical properties. These composites have primarily developed to improve physical and chemical properties. The present study aimed to develop hybrid bio composites from alkali treated jute fiber, banana fiber and liquid epoxy resin using hand lay-up technique of composite manufacturing. Furthermore, the tensile properties in the longitudinal and transverse directions were determined and compared. The hybrid bio composite samples were fabricated with the fibers orientation of 90° / $+45^{\circ}$ / -45° / 90° . Two composite samples have fabricated. The first composite sample has fabricated from jute fibers oriented at 90° and banana fibers oriented at $+45^{\circ}$ & -45° (JBBJ). Whereas the second composite sample has fabricated from banana fibers oriented at 90° and jute fibers oriented at $+45^{\circ}$ & -45° (BJJB). All the composite samples have fabricated with the average fiber volume fraction of 25.92%. It has observed that composite sample JBBJ have the maximum tensile strength of 18.561 MPa in the longitudinal direction whereas the minimum tensile strength of 14.802 MPa has observed in the transverse direction with the composite sample BJJB. It was also observed that the composite sample JBBJ have maximum load carrying capacity of 6.2 KN in the longitudinal direction.

Author Keywords

Hybrid Bio Composite, Jute Fiber, Banana Fiber, Tensile Properties.

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Jute Fiber, Banana Fiber.

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