

Influence of Fiber Loading and Surface Treatments on Mechanical Properties of Pineapple Leaf Fiber Reinforced Polymer Composites

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Abstract : In the current scenario, development of new biodegradable composites with the reinforcement of some plant derived natural fibers are in major research concern. Abundant quantity of these natural plant derived fibers including sisal, ramp, jute, wheat straw, pine, pineapple, bagasse, etc. can be used exclusively or in combination with other natural or synthetic fibers to augment their specific properties like chemical, mechanical or thermal properties. Among all natural fibers, wheat straw, bagasse, kenaf, pineapple leaf, banana, coir, ramie, flax, etc. pineapple leaf fibers have very good mechanical properties. Being hydrophilic in nature, pineapple leaf fibers have very less affinity towards all types of polymer matrixes. Not much work has been carried out in this area. Surface treatments like alkaline treatment in different concentrations were conducted to improve its compatibility towards hydrophobic polymer matrix. Pineapple leaf fiber epoxy composites have been prepared using hand layup method. Effect of variation in fiber loading up to 20% in epoxy composites has been studied for mechanical properties like tensile strength and flexural strength. Analysis of fiber morphology has also been studied using FTIR, XRD. SEM micrographs have also been studied for fracture surface.

Keywords : composite, mechanical, natural fiber, pineapple leaf fiber

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