

An Experimental Investigation on Banana and Pineapple Natural Fibers Reinforced with Polypropylene Composite by Impact Test and SEM Analysis

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Abstract : This research paper gives an overview of the experimental analysis of natural fibers with polymer composite. The whole world is concerned about conserving the environment. Henceforth, the demand for natural and decomposable materials is increasing. The application of natural fibers is widely used in aerospace for manufacturing aircraft bodies, and ship construction in navy fields. Based on the literature review, researchers and scientists are replacing synthetic fibers with natural fibers. The selection of these fibers mainly depends on lightweight, easily available, and economical and has its own physical and chemical properties and many other properties that make them a fine quality fiber. The pineapple fiber has desirable properties of good mechanical strength, high cellulose content, and fiber length. Hybrid composite was prepared using different proportions of pineapple fiber and banana fiber, and their ratios were varied in 90% polypropylene mixed with 5% banana fiber and 5% pineapple fiber, 85% polypropylene mixed with 7.5% banana fiber and 7.5% pineapple fiber and 80% polypropylene mixed with 10% banana fiber and 10% pineapple fiber. By impact experimental analysis, we concluded that the combination of 90% polypropylene and 5% banana fiber and 5% pineapple fiber exhibits a higher toughness value with mechanical strength. We also conducted scanning electron microscopy (SEM) analysis which showed better fiber orientation bonding between the banana and pineapple fibers with polypropylene composites. The main aim of the present research is to evaluate the properties of pineapple fiber and banana fiber reinforced with hybrid polypropylene composites.

Keywords : toughness, fracture, impact strength, banana fibers, pineapple fibers, tensile strength, SEM analysis

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