

Effect of incorporating biofiller reinforcement on viscoelastic behavior, thermal analysis, and impact resistance of natural fiber composite

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Structural application of composite material had many scope, in order to the meet the requirement it required high mechanical strength, impact strength, and thermal stability. Hazardous and nonbiodegradable waste cause many environmental issues. Composite material became an integral part of the industrial domain with its unique properties, although natural fiber composite also is in the race to fulfill the industrial and structural application, to enhance the mechanical properties of natural fiber composites, reinforced filler material was added during preparation. For natural fiber composites, a biofiller with high cellulose content is preferable. In this current work, biofiller reinforced natural fiber was prepared and the effect of biofiller was analyzed with a ballistic impact test, thermogravimetric analysis, and dynamic mechanical analyzer. The results show significant improvement in the final temperature degradation from 312°C to 417°C and energy storage module increase of up to 23% compared to composite material without fillers, and also the impact strength and energy absorption was comparatively higher in 30% of filler composite plate. Indeed of its plenty of raw material availability and eco-friendly nature, it was suitable for many applications including automobiles, sports types of equipment, and construction of structural application.

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