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Review of Mechanical Characteristics of Kenaf, Sisal Fiber Mat Reinforced with Filler

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A B S T R A C T

Development of the Polymer Composites with natural fibers and fillers as a sustainable alternative material for some engineering applications, particularly in aerospace applications and automobile applications are being investigated. Natural fibre composites such as sisal, Kenaf, polymer composites appear more attractive due to their higher specific strength, lightweight and biodegradability and low cost. In this study, Sisal and Kenaf with Filler Materials of Almond Shell/Sic fibre reinforced epoxy composites are prepared and their mechanical properties such as tensile strength, flexural strength, Hardness and impact strength are evaluated. Composites of Natural fibres with the filler material of silicon carbide and Almond Shell are investigated and results show that the composites compared to the composites with silicon carbide filler

KEYWORDS: NATURAL FIBRE SISAL/KENAF, RESIN AND MECHANICAL PROPERTIES.

1. LITERATURE REVIEW

S.Sathish , et al [1] , The mechanical properties of composites increase with increase in SiC up to 7 wt. %. Hence the optimum SiC for better mechanical properties of this present composite is found to be 7 wt. %. Thus it can be concluded that the obtained composites will acts as a low cost, lightweight and eco friendly composites to be used for a brake pad, on account of their better mechanical properties.

Araya AberaBetelie , Anthony Nicholas Sinclair [2], In this steady The experimental investigation on mechanical properties of sisal fiber-reinforced composites leads to the following conclusions. The maximum tensile strength and modulus are 85.5 MPa and 4.5 GPa respectively, observed for specimens with 30 wt% fiber in a (0, 90, 90, 0) pattern. The maximum flexural strength and chord modulus are 87.1 MPa and 3.6 GPa respectively which are observed in specimens with random fiber orientation and 30 wt% fiber. The maximum impact strength is24.5 kJ/m2 , correspond to specimens with random fiber orientation and 40 wt% fiber content. For all tests, evidence of fiber pullout, matrix cracks, and fiber fracture are observed. From the results, composite materials with 30 wt% fiber content have the best overall mechanical properties. It is possible to use sisal reinforced epoxy composites as a substitute material for automotive parts, such as door panels, seat backs, bolsters, load floors, and packaging trays

P.Sabarinathan[3],In this study explore the way of effective utilization of the agricultural wastages into useful product. Maleic anhydride treated type‘B’ composite showsa superior tensile strength, flexural strength and impact property than the other type of composites.Hence maleic anhydride treatment is preferable to the natural fiber reinforced polymer composites. This improvement arises from the effectively removed the hydroxyl group from the natural fiber.

SubhashNimanpure,[4],Comparing the properties of sisal fibril/kenaf fiber reinforced hybrid polyester composites with various single and hybrid fiber composites, it can be concluded that developed novel hybrid composite has the potential to replace various existing natural and synthetic fiber composites. These composites are specially designed for press board used in transformer assembly as high mechanical strength and electrical insulating material. Additionally, these composites may be useful for various fields such as electrical and aerospace industry.

Satish Kumar, Dr. Alok Agrawal, Dr. Basant Agrawal[5],In this Research on walnutshell powder reinforced polymer composite is yet to be explored as till date very little work has been reported as seen from the past work. But in recent time, researcher started working on it as a lot of scope is available owing to its outstanding properties and environmental deliberations

SivasubramanianPalanisamy, MayandiKalimuthu[6],The application of kenaf/banana hybrid composites with up to 40 wt.% of fibers proved suitable for wear applications, such as disc brakes, etc., in real conditions, including the possibility of water absorption to saturation, which does not lead to a substantial decrease in mechanical strength. It is a hybrid that is inherently superior to similar materials, e.g., jute/banana hybrids or even hemp fiber composites, provided that a sufficient number of fibers is introduced in the thermosetting resin. This work is to be considered preparatory to possible improvements of the material, in particular the introduction of further harder fillers and the possible adoption of more sustainable bio-epoxy resins in the future

Omar El Hawary 1, Luca Boccarusso 2,* , Martin P. Ansell 3, Massimo Durante[7],In this review, the state of the art of NFRP composites utilized in the marine industrywas discussed.The most prominent concerns about NFRP composites for applications such as themarine industry were addressed; such concerns mainly lie in the variability of the mechanicalproperties of natural fibers and their hydrophilic nature, which affects their structureand damages fiber–matrix interfacial adhesion, which is key to the mechanical propertiesof NFRP composites. Consequently, it was pointed out that there are available strategies,such as different treatments and processes, to mitigate these problems, as well as moistureabsorption. This literature review reveals how the hybridization method is an appealingsolution to expand the application of NFRP composites. Hybridization allows theimprovement of certain mechanical properties of composites, combining the sustainablecredentials of natural fibers with the favorable mechanical properties of synthetic fibers,possibly improving damage resistance and damping performance compared to traditional FRP composites utilizing one material as reinforcement.

ReshamTaluja1 ,Pravin P Patil2 , Sanjeev Kumar ,(8) The current study focused on the effects of using sisal/kenaf fabric blends to strengthen hybrid composites. Once at a sisal to kenaf mix ratio of 65/35, polyester hybridization composite manufactured at a continuous filament weight percentage of 10% achieved excellent bending, tension, as well as compression strength. The impact energy of a fibre mix rose even as the sisal component improved. Throughout this work, the spalling for sisal/ kenaffiber-reinforced polymer composite included fibre pull-outs as well as filament breakage. More research should be conducted to investigate the influence of chemical modification of a filament on the characteristics of a strengthened biocomposite

2. CONCLUSIONS

From these journals, we learned some information regarding mechanical properties such as Tensile Strength, Compressive Strength, Flexural Strength, Impact test, Water absorption test of natural wood/flour with epoxy resin are analyzed and calculated. The present hybrid wood composite can be proposed for industrial applications such as automobile interior parts, construction and building, households, and packaging because of its better performance than single kenaf and sisal composites. More over to that because of its toughness, hardness and light in weight it can be used in maximum of mechanical parts.

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