

Research on Natural Fiber Polymer Composites: The Way Forward

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Natural fibre reinforced polymer composites are emerging materials that are used as materials for various applications ranging from furniture, building and construction, automotive and marine industries. Kenaf, jute, sisal, hemp, oil palm, sugar palm, pineapple leaf, and roselle stem, are among natural fibres reported to be used as reinforcements and fillers in polymer composites. Natural fibre reinforced polymer composites demonstrated excellence performances and positive attributes such as low cost, renewable, environmentally friendly, abundantly available, light weight and good specific strength and stiffness properties. However, there are some fundamental issues that have to be resolved before these materials can replace conventional materials like glass fibre reinforced polymer composites in greater scales such as poor adhesion between fibres and matrices due to hydrophobic nature of matrices and hydrophilic nature of fibres. In addition high percentages of water and moisture absorption posed some issues during their applications. Natural fibre composites do not fully solve environmentally problem upon degradation and disposal, as in majority of cases, the polymers used are mainly from petroleum base. The use of bio-polymers in place of synthetic polymers along with natural fibres offers full solution of environmental problem. However, the major drawback in their application is in securing huge amount of biopolymers. As far as using plant based natural fibres like banana pseudo-stem, cocoa pod, husk, cassava bagasse and peel and roselle stem as reinforcement in polymer composites is concerned, it may raise some ethical issue of

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consuming foodstuff for secondary purpose. During the shortage of supply of natural fibres, do we still wait for agricultural wastes to be available or we just simply harvesting the plants solely for extracting fibres? Using kenaf plants to produce fibres may be the ideal solution to this issue as kenaf is generally planted exclusively for producing fibres. The applications of natural fibre composites are no longer restricted to mundane applications like as partition boards and household products but they have penetrated important markets like automotive, aerospace, and building and construction industries. The major challenges in their uses including to ensure continuous supply of natural fibres and bio-polymers and to ensure the products and their business can be sustained at the marketplace.