

Review of kenaf reinforced hybrid biocomposites: potential for defence applications

ABSTRACT

Background: The present review deals with the recent development of kenaf hybrid composites. Kenaf reinforced polymer composites are made up of either thermoplastic or thermoset matrix, depending on their applications. The combination of kenaf fibre with more than two fibres in hybrid composites enhances the potential uses of kenaf in many applications. The well-known limitations of natural fibres, such as lack of thermal stability, strength degradation, water absorption and poor impact properties, encourage the exploration of hybridisation with high performance fibres. **Methods:** We review the researches on kenaf reinforced composites and kenaf reinforced hybrid biocomposites. This review covers the types of matrix used, methods applied in manufacturing the hybrid composites and the potential application of the hybrid composites. **Results:** Kenaf fibres are widely used in fibre reinforced composites. There are limitations in the use of kenaf in polymeric composites, including high moisture absorption, non-uniformity and poor mechanical properties. Hybridisation of kenaf fibre with other fibres resulted in the hybrid composites with comparable strength, stiffness, strength to weight ratio, resistance and other physical and mechanical properties. The selection of matrix materials also plays an important role in fibre reinforced composites materials. There will be an increase in the use of natural fibre hybrid composites in areas such as household products and automotives. **Conclusion:** Kenaf fibres play an important role in multi-application composites. This fibre is used solely in polymer matrix or in combination either with other natural fibres or with synthetic fibres. Kenaf hybrid composites are being developed as a potential alternative to reduce the use of synthetic fibres such as aramid or glass fibres.

Keyword: Natural fibres; Hybrid composites; Synthetic fibres; Thermoplastic; Thermoset; Defence