UNIVERSITI TEKNOLOGI MARA

BIO-BASED CELLULOSIC COMPOSITES MADE FROM LOCAL CELLULOSIC FIBRES MIXED WITH KENAF

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of the requirements for the degree of
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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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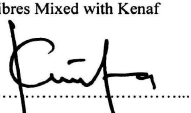
Signature of Student : 

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ABSTRACT

The utilization of natural fibres such as kenaf into composites materials have been exploited globally especially for low-load-bearing applications. Bio-based cellulosic composites have advantages in terms of lower material cost and promote green technology in comparisons with composites from synthetic fibres which are relatively expensive and can contribute to environmental problems. In this research, bio-based composites were fabricated from several natural fibres and blends (100% and 50/50% blends), initially converted into non-woven and woven fabric structures. Four different natural cellulosic fibres were utilized including kenaf, pineapple leaf, banana stem and coir. The composites were fabricated using epoxy, polyester, polypropylene and polyethylene resins. These composites were then tested for tensile strength and flexural strength. The results showed that for non-woven composites, the 100% pineapples fiber with epoxy resin gave the highest tensile strength while 100% kenaf fibres with epoxy resin gave the highest flexural strength. For both tensile and flexural strength results, the non-woven composites consisting of 100% coir fibres gave the lowest results. As for the woven composites, the 100% kenaf fibres with epoxy gave the highest tensile strength while the 100% kenaf fibres with polyester resin gave the highest flexural strength. Composites fabricated with epoxy resin gave the best tensile strength and flexural strength properties regardless of the types of fibres and fabric structure.

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