

Effect of various fiber content of kenaf fiber on mechanical properties of the composites.

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ABSTRACT

Kenaf fiber was cultivated in Malaysia to be used as an industrial crop. In this paper, the experiments of tensile test, flexural test and impact test were executed using untreated short kenaf fiber reinforced epoxy composites. Kenaf fiber content is varied with 5%, 10%, 15% and 20% kenaf fiber and was compared with neat epoxy (NEAT). By using hand lay-up technique, mixture of kenaf fiber and epoxy is poured into the mould and left to dry in a room temperature for 24 hours. Seven specimens were cut according to ASTM D3039, ASTM D790 and ASTM D256 for tensile test, flexural test and impact test, respectively. The results showed that the tensile, flexural and impact strengths of the kenaf fiber produced a lower values compared to the NEAT. It can be concluded that the surface of kenaf fiber need to be modified in order to increase the surface roughness of the fiber and enhanced the bonding performance.

Keywords: Short kenaf fiber; tensile test; flexural test; impact test; hand lay-up technique

INTRODUCTION

Kenaf fibers (*Hibiscus cannabinus*, *L. family Malvaceae*) are widely used lately because it has been appraised as environmentally advantageous and high commercial interests [1]. Kenaf fiber reinforced polymer was reported to have better mechanical strength and thermal properties as compared to other bast fiber reinforced polymer [1, 2]. Yet, the use of short kenaf fiber are not really popular among researchers. Still, short fiber composites are preferred in producing complex shaped product as it provides a simple manufacturing process [3]. The reinforcement of kenaf fiber with polymer such as the reinforcement of Kenaf with unsaturated polyester, kenaf with polypropylene and kenaf reinforced epoxy widely presented by researchers [4-9]. Nonetheless, the usage of kenaf fiber for various applications such as automotive, constructions and sports were only started getting attention from many researchers in 2000 and the trend is increasingly higher for market demand [10, 11].

The use of natural fiber as reinforcement in composite materials has greatly increased in this last few decades. Many researchers presented their works related to properties of the natural fiber composites. Khalil et al. [12] studied the basic characteristics and physical properties of kenaf fiber. Salleh et al. [13] studied the effect of water absorption on long kenaf hybrid woven glass that used cold press technique. The study shows deterioration of the composite occur due to the presence of liquid. The improvement of mechanical properties for natural fiber composites may be obtained