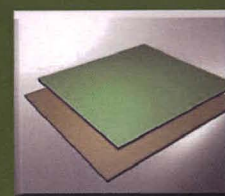


ADVANCES IN COMPOSITE MATERIALS



Iskandar Idris Yaacob
Md Abdul Maleque
Zahurin Halim



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Mechanical Behaviour of Eco Core Composite Sandwich Structure

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Keywords: Composite sandwich structure, kenaf, eco core, fibre, rubber

Abstract: This chapter concerns on fabricating the composites sandwich structures with kenaf as the core and aluminium as the facesheet with a view to replace the conventional sandwich structure using synthetic core which is not biodegradable. Two types of kenaf fibre were used in this research which is long fibre and short fibre. Composites were prepared by hand lay-up technique. Mechanical study of composites was performed by using tensile test, impact test and flat wise compression test respectively. A significant increase has been observed in the mechanical properties such as tensile strength and compressive strength with the addition of the rubber.

Introduction

Sandwich structures have wide area of application nowadays and many studies have been done to improve the conventional sandwich structure to make it excellent sandwich structure. Sandwich structures have been used in three major applications such as in military ship, airplane and building construction. The many advantages of sandwich constructions, the development of new materials and the need for high performance, low-weight structures ensure that sandwich construction will continue to be in demand. Sandwich structure is one of composite materials are fabricated by joining two thin stiff skins and lightweight core to form a unique structure. Using composite sandwich construction, pre-made sandwich structure is readily to use compare to conventional construction which taking a long time. Add to this the advantage of no corrosion and the light weight afforded by the composite sandwich construction [1].

Increasing worldwide environment awareness is encouraging scientific research into the development of cheaper, more environmental friendly and sustainable construction. Natural fibers are widely used for environment concern. Mostly, the available cores in sandwich structures used synthetic fibers. Several problems have been faced when using synthetic fiber as core for sandwich structure such as heavy weight, poor mechanical properties and less wear resistance. Therefore, in this chapter a sandwich structure development using kenaf as a core and aluminium as skin is presented in order to improve and optimize mechanical properties of this composite[2].

One of the unique aspects of designing parts with fibre reinforced composite materials is that the mechanical properties of the material can be tailored to fit a certain application. By changing the orientation or placement of the fibres the material can be designed to exhibit properties that are isotropic or highly anisotropic depending on the desired end result.