ADVANCES IN MATERIALS ENGINEERING

Volume 2

Edited By:
Md Abdul Maleque
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Chapter 013

Fabrication of Kenaf Sandwich Panel

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Keywords: Kenaf fiber, sandwich structure, foam core, cup shaped core, corrugated core, honeycomb core.

Abstract. This chapter is concerning with fabricating sandwich panel with various core structures. Aim of this study is in promoting sustainable design using bio-based composite as new material to replace the car bottom structure and to reduce the car overall weight. The main element of the core structure is kenaf and the skin used in this study is galvanised steel sheet. There are four types of core structures in this study which are foam core, cup shaped core, corrugated core and honeycomb core.

Introduction

In recent years, products, processes, and technology have been judged for their overall sustainability. Bio-based material is one of the two key parts of its plan to create a global sustainability network. There is also a direct correlation between the weight of a transportation system and the amount of fuel used. This results in growing in popularity of sandwich panels as they help reduce weight, save fuel, and curb emissions. Existing sandwich structure however does not use eco-core as the sandwich core. Natural fibers are currently only used as the reinforcement to plastic parts and employs them as an alternative to glass fibers.

Sandwich composite or also known as sandwich panel is a type of composite with structure is made up of two major elements, the skin (the top and bottom face sheets) and middle core material. The face sheets are comparatively thin and are made of a material of high strength and stiffness. The core materials are used to fabricate lightweight and stiff sandwich structures core. It is relatively thick and provides stiffness and strength in the direction normal to the plane of the face sheet. In sandwich construction the face sheets carry the bending stresses and core carries the compression and shear stresses. In other words, the core gives structure to the sandwich, and the skins protect the core. Sandwich panels imitate a solid structure with the fraction of the weight. Sandwich panels are a remarkable product because they can act as strong as a solid material, but weigh significantly less. The trend for "stronger-lighter" is becoming increasingly important in the transportation and aerospace industries, and sandwich panels are filling this need.