

UNIVERSITI TEKNOLOGI MARA

**STUDY ON SUITABILITY OF
BETING BAMBOO FOR BAMBOO
ALUMINUM SANDWICH
COMPOSITE**

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Thesis submitted in fulfilment
of the requirements for the degree of
Master of Science

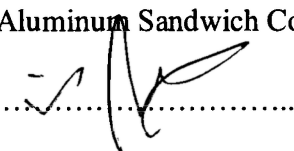
Faculty of Applied Sciences

February 2014

AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the requirements and 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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ABSTRACT

Environmental awareness is increasing globally and the demand for composite materials that possessed 'green' characteristic such as degradability and recyclability along with excellent mechanical and physical properties are also increased. Bamboo being a type of grass that is commonly available almost in every part of the world can be a suitable candidate. The main objective of this study is to determine the suitability of Beting bamboo (*Gigantochloa thoi*) as a raw material for bamboo-aluminum sandwich composites fabrication. Prior to that, the evaluation of physical and mechanical properties of Beting bamboo such as specific gravity, equilibrium moisture content, flexural and compression strength and stiffness, pH, buffering capacity and wettability were carried out. Additionally, surface properties of modified aluminum alloy and bamboo surface treated using silane coupling agent in water medium and also the adhesive shear strength between the bamboo-bamboo laminate and bamboo-aluminum laminate were also conducted. Prototype of bamboo-bamboo aluminum composites was prepared in the laboratory and the mechanical properties of the composites were also evaluated. It was concluded from the study that the prototype of composites exhibit good mechanical properties and Beting bamboo was technically suitable as a raw materials for fabrication of composites products although the specific gravity was found to be higher than other woody materials. The output of this research might contribute in development of green composites materials to meet the demand of rapidly rising market demand for green composites.

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