VALUE ADDITION FOR COIR FIBER AS THERMAL INSULATION MATERIAL

Liyanaarachchi Kankanamge Thanuja Srimal

(09/8617)

Degree of Master of Engineering

Department of Mechanical Engineering

University of Moratuwa

Sri Lanka

March 2014

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Thesis submitted in partial fulfillment of the requirements for the degree Master of Engineering

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DECLARATION

Student

"I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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The above candidate has carried out research for the Master thesis under my supervision.

Signature of the co-supervisor:……. Date:……

Supervisor

The above candidate has carried out research for the Master thesis under my supervision.

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ABSTRACT:

The use of biodegradable natural fibres as thermal insulation material benefits to achieve a sustainable living condition. Aim of this study was to evaluate the use of coir fibre as a thermal insulation material. Sri Lanka is a largest producer of coconut (Cocos nucifera L.). Coconut crops generate several waste, including coir fibre. The main use of coir fibre is as a fibre material in mattress, ropes and brushes industries. In this work, composites were produced exclusively by coir fibre with an addition of latex, coir pith and then along. The composites developed were tested for their thermal conductivities to evaluate the performances first with thermal conductivity apparatus and then with a specially designed arrangement. Five samples of each composite were tested and their thermal conductivities were averaged with an error. The experimental results showed that the thermal conductivity of coir composite was comparable with the value of glass wool which is frequently being used as a thermal insulator. These results shows a potential to use coir fibre as a thermal insulation material in the form of composite.

ACKNOWLEDGEMENT:

Manufacturing Engineering is a rapid advancing field, which combines scientific theory and technology to develop new processes for specific task.

All Master of Engineering postgraduates must complete a research project successfully at the second year.
"Value addition for Coir Fiber as Thermal Insulation Material" was done as research project. I have received much help in this work, for which I would like to use this opportunity to give my heartfelt thanks.

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