



A study of Coir Fibre as Low Temperature Insulation Material

Sumith Baduge^a and L.K.T. Srimal^b

^a*Department of Mechanical and Manufacturing Engineering, Faculty of Engineering,
University of Ruhuna*

^b*Department of Mechanical Engineering, Saitam University, Japan*

^a sumithb@mme.ruh.ac.lk

^b thanujasrimal@email.com

Abstract

Coconut is a most essential food item in Sri Lanka. After getting the coconut, the coconut husk can be used to produce couple of products which can be compostable in environmental friendly. The long fibres of coir are extracted from the coconut husk and utilized in the manufacture of brushes, automobile seats and mattress stuffing, drainage pipe filters, and other products. Traditionally, the short fibres and dust left behind have accumulated as a waste product for which no industrial use had been discovered. Sri Lanka has become the leading processor of what had previously been considered a waste product into a form suitable for horticultural use. At the present, coir sector of the coconut industry is looking for expanding existing market by exploring new applications of coir fibres. One of the key strategies the industry identified is the high level of local value addition in Sri Lanka. This will lead to higher foreign exchange earnings and better wages in the sector. Therefore, the objective of this research work is to study the use of coir fibre as a thermal insulation material for low temperature usage. This value addition increases huge potential of coir as a material in the market where sustainability is emerging as a key factor in specifying and purchasing materials. In this study, coir composites are exclusively developed by coir fibre with an addition of latex, pith and then along. The composite samples are prepared by different compression ratios and tested for their thermal conductivity within low temperature range from 0 to 90°C. The experimental results show that thermal conductivity of coir composites decreases with increasing the compression ratio and its value becomes closer to the thermal conductivity of the glass wool, which most widely used insulator in many applications in spite of their harmfulness to human and the environment.

Keywords: *Core fibre, Thermal insulation, Value addition, composites*