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Development of Coir Mat for Thermal Insulation Purposes

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Thermal insulators are meant to reduce the rate of heat transfer by conduction, convection and radiation. This can be either in order to prevent heat loss or to keep heat out. This experimental study aimed to develop a thermal insulator based on a natural material namely, the coir from coconut fruit and combining with coir pith and threated rubber latex as a bonding material for low temperature usage. The composite samples were prepared by changing materials ratios and by changing coir fiber arrangement. Prepaired samples were tested for their thermal properties such as thermal conductivity within low temperature range, air permeability and fire retardancy. The experimental results show that thermal conductivity of coir composites decreases, when coir arranged randomly and coir fiber to latex ratio becomes 1:2 and the values were similar to the those of the glass wool, which is most widely used as a thermal insulator in many applications. It is clear that the coir can be used as a probable thermal insulating material to reduce the cost and health hazards coming from synthetic insulations, add value to coconut productions and reduce the wastage of the natural fiber.

Keywords: bio-degradable, coconut, coir, composite, thermal insulators