

Use of Coir Fibre Waste as an Effective Raw Material for Fibre Boards Reinforced with Natural Rubber Latex Compounds and Phenol-Formaldehyde Resin

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Coir pith is a by-product resulted in extraction of coir from coconut husks. Small fibre particles namely "Kato" (mm) are accumulated during coir pith extraction process as a waste material, which has been an issue in the production process. There is a potential to utilize "Kates" as an economically viable raw material to manufacture coir boards (CBs). CBs can be used as alternative source for Hard & Particle Boards and other Synthetic Boards. An effort was made to develop a CB as an alternative to the above boards evaluating the basic parameters. Processing was undertaken using a coir cutter machine and then it was developed in to CB. Each CB (15 x 15 x 0.5 cm) was prepared using 35 g of "Kcitu" changing the mass of Natural Rubber Latex Compounds (NRLC) and Phenol-Formaldehyde Resin (PFR). Mass of NRLC in CBs varied as 30, 40 and 50 g and the PFR as 5, 10, 15 and 20 g. Having moulded, vulcanization was carried out at 120 °C for 20 min. For the CBs, moisture content (%), density (kg m⁻³), water absorption (%), swelling and physico-mechanical properties such as maximum force at break (N) and maximum elongation (%) were evaluated according to ASTM and IS standards. Tests were carried out at 27 °C temperature. CBs were prepared successfully by optimizing the composition. The density of CBs was within the acceptable range: 465.8 - 653.61 kg m⁻³, which is close to the density of 'Hard Boards' and 'Particle Boards'. Moisture content, water absorption and swelling properties were up to the standards. The force at break and maximum elongation showed an increase when the amount of NRLC and PFR was increased. In conclusion, "Katu" can be used as an effective raw material for manufacture of CBs reinforcing with NRCL and PFR for the use of other boards given above.

Keywords: Coir fibre board, Natural rubber, Phenol-formaldehyde