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Effects of Cassava Starch and Natural Rubber as Binders on the Flexural and Water Absorption Properties of Recycled Paper Pulp Based Composites

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Abstract

Responsiveness was given to the effects of cassava starch and natural rubber as binders on the flexural strength and the water absorptivity properties of the developed rattan particulate reinforced paper pulp based composites. Paper pulp was produced by chopping waste papers into smaller pieces and soaked in boiled water after which it was stirred thoroughly to form paper pulp. Rattan particulate was produced by hammering, chopping, pounding and milling of rattan canes followed by sieving into a particle size of 437 µ. Varying mass of paper from 300-400 g and particulate rattan in treated and untreated form of 2-8 g were mixed and bonded with natural rubber and cassava starch, respectively for the various samples developed. The mixtures were thoroughly mixed to produce homogenous pastes and poured into 150 x 50 x 30 mm detachable mould and compacted for 5 minutes using a laboratory compaction machine maintained at 20 KN. The developed composites were allowed to cure at room temperature for 27 days after which flexural and water absorptivity tests were carried out on the samples. It was noticed that the composite samples ST4 and S5 containing cassava starch happen to be the best in terms of flexural strength while NR2 gave the best water- repellent outcome.

Keywords: rattan, particulate, waste paper, paper pulp, cassava starch, natural rubber, composite, flexural strength

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