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Mechanical, physical and thermal properties of rattan fibre-based binderless board (Article)

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Abstract

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About 50% is of harvest is wasted when producing rattan furniture. With such huge amount of waste, we undertook a study to convert rattan waste into binderless board with superior properties. This study compared the mechanical and physical properties and morphologies of binderless boards manufactured from rattan fibres with boards made from kenaf, coconut husk and sugarcane bagasse using hot press process. Raw fibres were characterised using scanning electron microscopy and thermal analysis to study their suitability in producing self-bonded board, and then dried in the oven before being hot pressed at a pressure of 147.5 kPa. Modulus of rupture (MOR), internal bonding strength, thickness swelling and water absorption of the manufactured binderless boards were evaluated based on the Japanese Industrial Standards. Results showed that rattan binderless boards exhibited slightly lower MOR and higher internal bonding strength with good dimensional stability compared with the rest of the binderless boards. It was concluded that rattan fibres have high potential to be used as binderless boards under hot press conditions. © Forest Research Institute Malaysia.

Author keywords

Coconut husk Hot press Kenaf Natural fibres Sugarcane bagasse

Indexed keywords

Engineering controlled terms: Bagasse Diffusion bonding Fibers Hemp Hot pressing Natural fibers Presses (machine tools) Scanning electron microscopy Thermoanalysis Water absorption

Compendex keywords: Coconut husk Hot-press conditions Japanese industrial standards Kenaf Mechanical , physical and thermal properties Mechanical and physical properties Modulus of rupture Sugar-cane bagasse

Engineering main heading: Bins

GEOBASE Subject Index: absorption biogenic material manufacturing mechanical property physical property scanning electron microscopy shear modulus solid waste swelling temperature effect

PaperChem Variable: Calamus Furniture Harvesting Hot Presses Thermal Analysis Thermal Properties

Species Index: Calamus rotang Hibiscus cannabinus

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