

Composite Panels from Under-Utilized Wood and Agricultural Fiber Resources

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Abstract : Rice straw, jute, coconut fiber, oil palm, bagasse and bamboo are some of agricultural resources that can be used to produce different types of value-added composite panels including particleboard and medium density fiberboard (MDF). Invasive species such as Eastern red cedar in South Western states in the USA would also be considered as viable raw material to manufacture above products. The main objective of this study was to investigate both physical and mechanical properties of both structural and non-structural panels manufactured from underutilized and agricultural species. Eastern red cedar, bamboo and rice straw were used to manufacture experimental panels. Properties of such samples including bending, internal bond strength, thickness swelling, density profiles and surface roughness were evaluated. Panels made 100% bamboo had the best properties among the other samples. Having rice straw in particleboard and medium density fiberboard panels reduced overall properties of the samples. Manufacturing interior sandwich type of panels having fibers on the face layers while particle of the same type of materials in the core improved their surface quality. Based on the findings of this work such species could have potential to be used as raw material to manufacture value-added panels with accepted properties.

Keywords : composite panels, wood and non-wood fibers, mechanical properties, bamboo

Conference Title : ICMSME 2014 : International Conference on Materials Science and Mechanical Engineering

Conference Location : Bangkok, Thailand

Conference Dates : December 18-19, 2014