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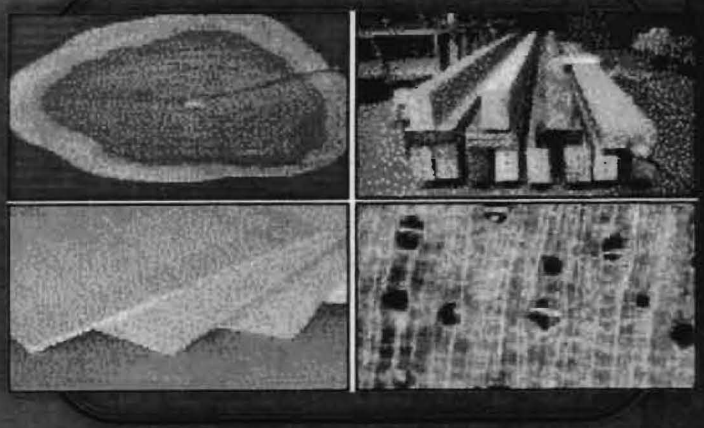
Program and Abstract



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A3. Development of High Quality Ply Bamboo Using Three Kind Adhesives Made From Three Bamboo Species

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Abstract

Bamboo has a big potency to be used as wood substitute materials for any kind utilization. Bamboo diversification have been produced any variations composite board include particleboard, fiberboard, bamboo lamination and ply bamboo. The research objective was developed high quality ply bamboo made from three species bamboo: Tali bamboo, Andong bamboo and Betung bamboo using phenol formaldehyde (PF), urea formaldehyde (UF) and polyvinyl acetat (PVAc) as adhesive. Research results show that the produced ply bamboo classified as high quality ply bamboo in term of physical and mechanical properties. Ply bamboo made from andong bamboo without bamboo node with phenol formaldehyde as adhesive and stitches on a cut piece of bamboo performed highest quality in terms of physical and mechanical properties. This kind of ply bamboo fulfills JAS 2003 standards. The produced ply bamboo is feasible to be used for furniture and building material.

Keywords: Ply bamboo, phenol formaldehyde, urea formaldehyde, polyvinyl acetat.

A4. Effect of Adhesive Content and Strand Combination on the Properties of OSB Made from Mixed Tropical Fast Growing Tree Species

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Abstract

The objective of this research was to evaluate the physical and mechanical properties of OSB made from several fast growing tree species (i.e., *Paraserianthes falcatari (P), Maesopsis eminii (M)*, and *Acacia mangium (A)*) under various resin content and various strand combination. Three-layered OSBs bonded with 3%, 5%, and 7% Methane di-isocyanate (MDI, Type H3M) resin with the core layer orientation perpendicular to the face and back layers. The strand composition for face, core, and back was 25%, 50, and 25%, respectively. Nine (9) strand combinations were applied consisted of 3 homogenous boards (i.e., PPP, MMM, and AAA) and 6 (six) mixed boards (i.e., PMP, PAP, MPM, MAM, AMA, and APA). The results indicated that at the same resin content, OSB manufactured from strand with lower density (PPP board) had low dimensional stability (high water absorption and thickness swelling values). Board prepared from a mixture of low density strands and higher density strands (PMP and PAP boards) had better dimensional stability. OSB manufactured from higher density strand (AAA board) had low MOR and MOE values, the values increased by mixing strands with lower density strands

(AMA and APA boards). The higher the resin content applied resulted in the better the performance of OSB. All parameters of OSB prepared from MAM and AMA strand combination with 7% resin content and MAM strand combination with 5% resin content met the requirement of CSA 0437.0) standard for grade 0-2 panels.

Keywords: OSB, resin content, strand combination, fast growing tree species, MDI resin.

A5. Physics and Mechanicals Properties of Laminated Board Made of Bamboo

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Abstract

Bamboo is one of non wood forest product that have been known as multiple use plant. It has straight trunk, smooth bark, light, hard, and easy to split. Because its stem comprise of internode (hollow inside) and nodes, therefore special technology and engineering have been established to optimize bamboo that in the future it might be replace wood. Laminated board made of bamboo has been used for house building because it is considered as environment friendly material. Quality of laminated board was measured based on physical, mechanical properties and delamination. Viscosity of adhesives, wet ability of bamboo and solidity of glue join determined the quality of the board beside type of adhesives. Objective of the study was to measure moisture content, specific gravity, and modulus of elasticity (MOE), modulus of rupture (MOR), compression and shearing strength, and percentage of bamboo failure. Factorial experiment in simple random sampling was applied in the study with 3 replications Result of the study indicated that there was significant effect of water treatment to the specific gravity of laminated board of Jawa (*Schizostachyum brachycladumi*), Kuning (*Bambusa vulgaris*) and Petung (*Dendrocalamus asper*). Effect of water treatment was significant to the compressive strength of laminated board of Petung (*Dendrocalamus asper*), and Suanggi (*Bambusa blumeana*), and modulus of elasticity of suanggi's laminated board (*Bambusa blumeana*). Moisture content of laminated board made of bamboo was 9.93% - 10.82%. Specific gravity of laminated board was 0.83 - 0.87; MOE was 30,728.84-66,054.13 kg/cm^2; MOR was 775.93 - 999.57 kg/cm^2; compressive strength perpendicular to grain was 740.62 - 875.75 kg/cm^2; shearing strength was 71.16 - 78.65 kg/cm^2; and percentage of bamboo failure was 52.31- 65.85%.

Keywords: laminated board, SG, CS, MOE

A6. Injection Molded of Bio-Micro-Composites from Natural Fibers and Polylactic Acid

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Abstract

Green composites were needed by automotive industries because they are environmentally friendly, recyclable, lightweight and strong. The European Union End of Life of Vehicles (ELV) program requires that in the year of 2015 all new cars should have 95% recyclable materials. Natural fibers such as bamboo are potential source of these materials and can be used as substitutes of fiber glass which is hard to recycle and not renewable. In this experiment, bio-composites made from micro fibers of betung bamboo (*Dendrocalamus asper*) and sisal (*Agave sisalana*) mixed with a natural polymer of polylactic acid (PLA) were developed. Bamboo or sisal fibers were processed into pulp