# Physical and Mechanical Properties of Medium Density of Oriented Bamboo Scrimber Board from Betung Bamboo (*Dendrocalamus asper* (Schult.f.) Backer)

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*Abstract:* Bamboo is a sustainable and biodegradable raw material that is widely used as a composite raw material. Betung bamboo (*Dendrocalamus asper* (Schult.f.) Backer) has been known and introduced in many areas of the world. This bamboo has a thick and strong wall to be used mainly as a building component. The objective of this research was to analyze the physical and mechanical characteristics medium density of oriented scrimber board from betung bamboo. The alkali treatment was applied with different concentrations 0% (control), 2% NaOH, and 5% NaOH. Scrimber board was made using isocyanate adhesive with a glued spread of 280 g/m2 and a density target of 0.6 g/cm3. The evaluation of physical characteristics carried out of moisture content, density, thickness swelling, and anti-swelling efficiency (ASE). The modulus of elasticity (MOE), modulus of rupture (MOR), internal bonding strength (IB), and compressive strength were evaluated for the mechanical properties. The results showed that the average values of moisture content, density, thickness swelling, water absorption, and ASE was in a range of 8.940% to 18.402%, 0.57 g/cm3 to 0.642 g/cm3, 12.21% to 17.941%, 71.32% to 83,042%, and 16.57% to 49.51% respectively. Meanwhile, the modulus of elasticity (MOE), modulus of rupture (MOR), internal bonding strength (IB), and compressive strength ranged from 1178 MPa to 3206 MPa, and 8.75 MPa to 21.53 MPa, and 0.06 MPa to 0.28 MPa, and 7.11 MPa to 15.09 MPa, respectively. The alkali treatment has led to a decrease in physical and mechanical properties. The higher alkali treatment, the lower the physical and mechanical properties.

*Keywords: sustainable raw material, betung bamboo, isocyanate adhesives, alkali treatments, NaOH*