

Hybrid particleboard made from bamboo (*Dendrocalamus asper*) veneer waste and rubberwood (*Hevea brasilienses*)

ABSTRACT

This study investigated adhesion properties, such as buffering capacity and wettability, of bamboo and rubberwood and evaluated the physical and mechanical properties of hybrid particleboard made from bamboo (B) veneer waste and rubberwood (RW) particles. The bamboo had an acidic pH value with a high buffering capacity compared with rubberwood. Hybrid bamboo-rubberwood particleboard displayed better mechanical properties compared to 100% bamboo and rubberwood particleboard. All hybrid particleboard panels passed and fulfilled the minimum standard requirements, except for thickness swelling and water absorption tests. However, for thickness swelling test, only boards consisting of 50B:50RW and 30B:70RW passed and fulfilled the minimum TS requirements of the British Standard EN 317 (1993). Panels made from 100% bamboo veneer waste displayed the highest modulus of rupture (MOR) and modulus of elasticity (MOE) values, 15.30 N/mm² and 2650.14 N/mm², respectively. Hybrid particleboard panels exhibited better screw withdrawal compared with panels made of only bamboo or rubberwood particles. It is concluded that bamboo veneer waste enhances the quality of particleboards, especially in terms of mechanical strength. Thus, bamboo veneer waste can decrease the dependence of the particleboard industry on rubberwood.

Keyword: Bamboo veneer waste; *Dendrocalamus asper*; Rubberwood; Particleboard; Hybrid