Mechanical properties of particleboard using acacia mangium wood particles binded with seaweed-based adhesives

ABSTRACT

The purpose of this study was to evaluate the mechanical properties of particleboards made from Acacia mangium wood particles binded with three different types of seaweed-based adhesive. Red seaweed (RS), brown seaweed (BS) and green seaweed (GS) were used as the seaweed-based adhesives., while particleboard using urea formaldehyde (UF) adhesive was produced as control. Adhesives and wood particles were mixed and then undergone mat-forming, pre-pressing, hot-pressing and conditioning process. The test pieces for bending test (Modulus of Elasticity, MOE; Modulus of Rupture, MOR), and internal bonding strength (IB) were cut into size according to JIS A 5908: 2003. From mechanical properties results attained, for internal bonding strength test, all boards using RS, BS and GS adhesives were found to be significantly different at $p \leq 0.05$. Apart from that, RS adhesive showed highest MOE and MOR at 529.4259 N/mm2 and 1.7900 N/mm2, respectively. As a conclusion, the mechanical properties of particleboard using RS, BS, and GS adhesives showed RS stands out as the better adhesive among them which have significant effects on its strength.