

Effects of polyurethane resin on the physical and mechanical properties of wood fiber/palm kernel shell composite boards

ABSTRACT

This article investigates the effect of polyurethane (PU) resin as a binding agent for wood fiber (WF) and palm kernel shell (PKS) composite board in terms of physical and mechanical properties. A series of fiber board samples consisting of WF/PKS at a ratio of 85/15 with different percentage of PU adhesive (40%, 50% and 60%) have been fabricated. The results showed that flexural modulus, flexural strength, tensile modulus, tensile strength and hardness of the boards were increased with the increase of PU adhesive percentage. The effects of the binder were also explained in terms of porosity and surface morphology. Based on the results, the board met the Japanese Industrial Standard A 5905 for type 5 and can be classified as medium density fibreboard, which could potentially be used in the decoration application. Replacing formaldehyde with the PU resin as a binding agent in fiber board composites is one way to avoiding health issues.

Keyword: Composite; WF; Oil PKS; PU adhesive; Mechanical properties
