

## **Mechanical Properties of 3 Ply Plywood Made from Acacia Mangium Veneers and Green Starch-based Adhesives**

### **Abstract**

Recently, starch has attracted great consideration as a raw material on wood adhesives in the wood industry. Cassava and sago starchbased adhesive are renewable, biodegradable and environmental friendly product when compared with other petroleum-based adhesives. In this study, different starches-based adhesive has been produced. Mechanical properties of plywood made from Acacia mangium veneers with different starches-based adhesives (cassava and sago) as binder cured at different curing temperatures (100°C, 120°C and 140°C) has been determined. All materials (starch, vinegar, water and glycerol) were cooked and stirred until the mixture reached 70°C-80°C which become sticky and whitish. After that, starch-based adhesives were applied on the veneers by using spreader, and the plywood were pre-pressed for 30 minutes with 20 kg load before hot-press. Cassava starch-based adhesive showed the highest Modulus of Elasticity which was 12410.56 N/mm<sup>2</sup> than sago starch-based adhesive, while Modulus of Rupture of the cassava starch-based adhesive at 100°C showed highest mean value at 74.19 N/mm<sup>2</sup>. Sago-starch based adhesive at 140°C showed the highest shear strength with 1.11 N/mm<sup>2</sup>. In short, cassava and sago starch-based adhesives gave good performance in mechanical properties such as bending for pressed temperature (100°C and 120°C), and shear at 140°C pressed temperature.