

## **Properties of Phenol Formaldehyde-Bonded Layered Laminated Woven Bamboo Mat Boards Made from *Gigantochloa scortechinii***

### **ABSTRACT**

Bamboo is suitable to be a material for the production of new products that can be used indoors and outdoors. Five-, seven- and nine-ply laminated woven bamboo mat boards from semantan bamboo, *Gigantochloa scortechinii*, were fabricated in this study. *G. scortechinii* has been used commercially in a structural application and is easily available in Malaysia. The present work investigated the physico-mechanical properties and flammability of the laminated bamboo mat boards as a function of the number of ply. Phenol-formaldehyde resin was used as a binder. The panels' density, physical, mechanical properties, formaldehyde emission and flammability were evaluated. As the number of ply increased, the density of the laminated boards decreased. Similarly, the highest modulus of elasticity was found in 5-ply laminated boards. However, the lowest modulus of rupture was also measured in 5-ply laminated boards. Regarding shear strength, 5-ply and 7-ply laminated boards outperformed 9-ply laminated boards. Meanwhile, 7-ply laminated boards exhibited the highest dimensional stability, as evidenced by the lowest water absorption and thickness swelling. In terms of flammability, all composites are classified as V-0 because the burning stops within 10 s and no flaming drips are observed.