# The potential of utilising bamboo culm (Gigantochloa scortechinii) in the production of structural plywood

## Abstract

The potential of utilising 4-year-old Gigantochloa scortechinii culms for structural plywood was evaluated based on their gluing, physical and mechanical properties. Bamboo strips (without epidermis) were glued together edge to edge using polyvinyl acetate to produce a ply of 400 mm x 400 mm x 4 mm. The plies were assembled perpendicularly to each other to form a bamboo plywood of three plies. Phenol formaldehyde was used as a binder. The assembly time of the adhesive was 30 min. The hot press temperature and pressure were 140°C and 1.4 N/mm2, respectively, and they were maintained for 6.5 min. A commercial structural grade 5-ply plywood (Hopea sp.) with the same thickness of the bamboo plywood (12 mm) was used for comparison purposes. The bonding strength of bamboo plywood meets the minimum standard requirement of the Malaysian Standard. The modulus of rupture (MOR), modulus of elasticity (MOE) and compression parallel to grain of the bamboo plywood were significantly higher compared to commercial plywood. The values were 65.4 vs. 42.0 N/mm 2 for MOR and 8955 vs. 4583 N/mm2 for MOE and 35.39 vs. 19.93 N/mm2 (compression parallel to grain). The width expansion and thickness swelling of bamboo plywood (after soaking in water 24 h) were markedly higher than commercial plywood, i.e. 1.51 vs. 0.43% and 5.44 vs. 4.42%, respectively.

**Keyword:** Bamboo plywood; Gigantochloa scortechinii; Phenol formaldehyde; Ply