

Article

The Mechanical Strength Properties, Treatability Retention and Hazard Classification of Treated Small-Clear Fast-Growing *Acacia mangium* Superbulk at Different Age Groups

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Abstract: The slow growth rate of primer species has affected the supply available to accommodate the market demand. To overcome these problems, a study was carried out to fully utilise fast-growing timber as the primary resource to ensure the demand for timber logs continues. This paper aimed to determine mechanical strength properties, treatability retention, and hazard classification of 7-, 10- and 13-year-old small-clear samples of *Acacia mangium* superbulk collected from Daiken Plantation Sdn. Bhd. Bintulu, Sarawak, following treatment with 10% copper chrome arsenic. As a result of this study, the maximum strength was obtained from the 10-year-old age group, with the modulus of rupture (MOR), the modulus of elasticity (MOE), and compression parallel to the grain values of small-clear treated *Acacia mangium* superbulk reaching 118.76 N/mm², 15,020 N/mm², and 57.82 N/mm², respectively. In addition, the treatability retentions obtained were 149.27 L/m³, 147.25 L/m³, and 141.09 L/m³, which were recorded from the 7-, 10-, and 13-year-old samples, respectively. Meanwhile, the dry-salt retentions obtained from the 7-, 10- and 13-year-old samples were 14.93 kg/m³, 14.73 kg/m³, and 14.11 kg/m³, respectively. Hence, this species is classified as moderately difficult to treat under CCA (treatability retention: 80–160 L/m³) and is categorised under the hazard class of H4 (dry salt retention: 12–16 kg/m³).

Keywords: *Acacia mangium* superbulk; fast-growing timber; small clear; copper chrome arsenic; treatability retention; hazard classification; mechanical strength properties

1. Introduction

The Malaysian Timber Industry Board (MTIB) and several other participating government agencies with timber-based industries have shown a serious commitment to establishing the National Forest Plantation Programme (NFPP). The NFPP was introduced with the aim of focusing on the plantation of fast-growing timber as a way to meet the current and future demand from the timber industry without disregarding the conservation of natural forests, and the NFPP plan requires Sarawak to achieve one million ha of planted