

Fire Resistance Properties of Low-density *Neolamarckia cadamba* (Roxb.) Bosser Timber

ABSTRACT

The inherent flammability of timber rises the concern of society about the stability and firmness of timber materials when exposed to fire. This study illustrated the fire resistance properties of low-density *Neolamarckia cadamba* timber to evaluate its charred area (CA), charred depth (CD), mass loss rate (MLR), and charring rate (CR). Three different burning durations – 60, 90, and 120 min – were subjected to the timber test pieces following the NIST PS1-09 2010 standard. The CA and CD of the test pieces were measured using ImageJ before the determination of MLR and CR. *N. cadamba* showed a statistically significant difference on the top CA (14040.56 mm²) at 90 min compared to its side CA (1957.93 mm²). CD remained statistically unchanged for three burning durations. Top CA increased gradually with burning durations. Side CA and CD, however, were reduced to 1957.93 and 17.84 mm², respectively, for 90 min, before being increased back to 120 min. For CR and MLR, a gradual dropped in trend can be seen in the burning durations. Significant differences were detected when comparing the CR (0.30 mm/ min) at 60 min with that in 90 min (0.20 mm/min), whereas the MLR was 2.15 g/m²s at 60 min with 1.42 g/m²s at 120 min. Generally, top CA, side CA, and CD showed an increased trend in the area and depth value. whereas CR and MLR showed the opposite.