

Physical and Morphological Changes in HeatTreated and Densified Fast-Growing Timber Material

ABSTRACT

Heat treatment is a modification method that can alter the polymeric components of wood (cellulose, hemicellulose and lignin). Densification technology has emerged as one of the promising technologies capable of improving the properties of low-density wood. In this study, the effects of heat treatment and densification on moisture content, density, and morphological features of low-density *Paraserianthes falcataria* laminas were examined. Laminas were heat-treated (100°C, 120°C and 140°C for 1 hour) and compressed at 50% compression ratio. Non-heat-treated laminas, on the other hand, were compressed at 40-60% compression ratios. The changes in pores area, moisture content and density of the heat-treated and densified laminas were identified. The lowest moisture content for heattreated laminas was at 120°C. Laminas with 60% compression ratio were observed to have the highest deformed pores, where it increased the density of the laminas. In summary, heat treatment and densification affected the properties of the laminas. Heat treatment at high temperatures resulted in decreased density and moisture content, while increasing the compression ratio during densification increased the density. The results suggest that combining heat treatment and densification could be a viable method for improving the properties of low-density wood.