Effect of heat treatment using palm oil on properties and durability of Semantan bamboo

Abstract

This paper investigates the effect of heat treatment on Semantan bamboo (Gigantochloa scortechinii) with emphasis given to their properties and durability. Matured four-year-old bamboo culms were harvested and subjected to high temperature condition using palm oil as a heating media. Two groups of samples, green and air-dried, were used. The temperatures applied were 140°C, 180°C and 220°C, with exposure duration of 30, 60 and 90 min, respectively. The results of the investigations show that the heat-treated bamboos retained most of their original physical and strength properties after undergoing the heat treatment. Green or air-dried bamboo culms can be dried to an MC of 6-7% within 2-3 h of treatment. The basic densities of bamboo were found to improve slightly by the heat application. The overall strengths properties of the heat-treated bamboo were found to decrease. The modulus of elasticity in the bending strengths was reduced between 2 and 33% in the green- and 6-9% in the air-dried conditions. For the modulus of rupture in the bending strengths, the value was reduced between 1 and 23% in green- and 4-16% in air-dried conditions. The compression strengths were reduced in the range between 2 and 3% in green- and 2-35% in air-dried conditions. The shear strengths were reduced in the range between 16 and 24% and 12-24% in in green- and air-dried conditions, respectively.