

Effect of curing time on physical and mechanical properties of phenolic-treated bamboo strips

Abstract

Effect of pressing time on physical and mechanical properties of phenolic-impregnated bamboo strips was evaluated. Bamboo strips (*Gigantochloa scortechinii*) were impregnated with low molecular weight phenol formaldehyde (LMwPF) resin. Samples were submerged in LMwPF resin using a vacuum chamber of 750 mmHg for 1 h before it was released within 1.5 h. Treated strips were dried in an oven with a temperature of 60 °C within 6-9 h. It was hot pressed at 14 kg m⁻² and a temperature of 140 °C for 5, 8, 11, 14 and 17 min. The physical and mechanical properties of the test indicated that the properties of phenolic-treated strips have significantly increased as compared to control samples. Dimensional stability (water absorption, thickness swelling and linear expansion) of the phenolic-treated properties were significantly lower than control after 5-min pressing time. The antishrink efficiency (ASE) of phenolic-treated strips increased when pressing time were extended from 5 to 17 min. The mean value of modulus of rupture (MOR) for the control samples (177 N mm⁻²) showed a significant difference with phenolic-treated strips after 17-min pressing time (224 N mm⁻²). However, there is no significant difference in compression parallel to grain. The MOE of phenolic-treated strips was 21,777 N mm⁻² and for control was 18,249 N mm⁻², whereas the compression parallel to grain values for phenolic-treated and control samples were 94 and at 77 N mm⁻², respectively.

Keyword: Bamboo strips, Impregnation, Phenolic resin, Pressing time