

Effect of post-thermal treatment on the density profile of rubberwood particleboard and its relation to mechanical properties

ABSTRACT

The objective of the study was to investigate the effect of heat treatment on the changes in density profile of rubberwood particleboard samples. The relationship between density profile and mechanical properties of particleboard samples was determined using regression analysis. Single layer particleboard made from rubberwood particles with dimensions of 340 mm × 340 mm × 12 mm and targeted density of 700 kg m⁻³ was heat-treated using oven and hot press at three different temperature levels, namely, 100, 150 and 200 °C for 30 min. All density profile attributes were significantly affected by heat treatment. Bending properties, internal bond strength and hardness were influenced by treatment temperature. However, samples treated using hot press had better mechanical properties compared with those treated using oven. Mean and peak densities exerted profound effects on mechanical properties of the samples.

Keyword: Bending properties; Brinell hardness; Compression; Heat treatment; Internal bonding