

Effect of resin content and pressure on the performance properties of rubberwood-kenaf composite board panel

ABSTRACT

The possibility of manufacturing rubberwood and kenaf (*Hibiscus cannabinus* L.) stem medium density fibreboard (MDF) panels at different pressure and resin content were investigated. The effect of mechanisms of interacted independent variables (resin content and pressure) on MDF properties was analyzed. The board performance was evaluated by measuring internal bond (IB) strength, modulus of rupture (MOR), modulus of elasticity (MOE), water absorption (WA) and thickness swell (TS). The test results were statistically analyzed by using response surface method (RSM) to determine the significant independent variables that influenced MDF properties. A mathematical simulation or response surface models were developed to predict the MDF properties (MOR, MOE, IB, WA and TS). The obtained results showed that MDF density and all interactions between the experimental variables were significant factors that influenced the mechanical properties of MDF. At 8 bar and 14 % resin content, the MDF recorded WA of 83.12 % and TS of 20.2 %. It can be inferred that two parameters (resin content and pressure) had positive effect on physical and mechanical properties of MDF. We concluded that resin content show more significant effects on MDF manufacturing as compared to pressure parameters.

Keyword: Composites; Kenaf (*Hibiscus cannabinus* L.) fibre; Medium density fibreboard; Processing optimization; Rubberwood