

Effect of kenaf parts on the performance of single-layer and three-layer particleboard made from kenaf and rubberwood

ABSTRACT

This study investigated the effect of kenaf parts (kenaf whole stem, kenaf core, and kenaf bast) on the mechanical and physical properties of single-layer and three-layer particleboards made from kenaf (*Hibiscus cannabinus* L.) and rubberwood (*Hevea brasiliensis*). The findings showed that the use of kenaf whole stem, which consists of both core and bast, had a positive effect on the modulus of rupture (MOR), modulus of elasticity (MOE), internal bond (IB), permeability, thickness swelling (TS), and water absorption (WA) values of single-layer and three-layer panels. Single-layer admixture panels made from a combination of 70% rubberwood and 30% kenaf had greater strength and stability than single-layer homogeneous panels. The presence of rubberwood particles on surface layers significantly improved the elastic properties of three-layer panels. Panels with kenaf whole stem in the middle layer had better performance than panels with kenaf core. The MOE values of 35RW-30KWS-35RW panels were 56% and 79%, which were higher than those comprising single layers of 100% KWS and 100% KC, respectively. This study suggests that kenaf whole stem is the preferred material to be used in particleboard manufacture incorporated with rubberwood as an admixture for three-layer panels.

Keyword: Kenaf whole stem; Kenaf core; Kenaf bast; Single-layer; Three-layer