

Properties and performance of rubberwood particleboard treated with BP® fire retardant

ABSTRACT

Rubberwood composites are available in many sizes and are frequently used as furniture and partitioning inputs. However they are naturally combustible and may limit its usage for other value-added products. Treating wood composites with fire retardant was one of the most effective ways to prevent such occurrence. In this study, Rubberwood (*Hevea brasiliensis*) particleboards were incorporated with BP® fire retardant through hot and cold soaking processes. Four different concentrations of fire retardant were applied for the study i.e., 15, 20, 25 and 30% (w/v). Treated and untreated particleboards were exposed to early burning performance test. Fire performance was assessed based on the amount of weight loss and width of burnt area formed on the boards after they were exposed to a fire source. The study shows that BP® had significantly affected the burnt area of the treated particleboards. Insignificant reductions of weight loss were recorded between 15-30% treatment concentrations. Early burning performance showed that increase of fire retardant concentration up to 25% (w/v) reduced the weight loss. There was no further weight loss reduction recorded above that concentration. The burnt area decreased as the concentration level of BP® increased. The smallest burnt area was recorded for the boards treated with 30% BP®. The addition of fire retardant had interfered slightly with the physical and mechanical properties of the treated particleboards. The physical and mechanical properties of the particleboards were adversely affected compared to untreated boards with increasing concentration of BP®.

Keyword: Early burning performance; Fire retardant; Rubberwood; Exfoliation strength; *Hevea brasiliensis*; Urea formaldehyde