Study on dimensional stability properties of laminated veneer lumber from oil palm trunk bonded with different cold set adhesives

ABSTRACT

The study was conducted to determine the dimensional stability properties of Laminated Veneer Lumber (LVL) from Oil Palm Trunk (OPT) bonded with three different cold set adhesives namely Emulsion Polymer Isocyanate (EPI) and polyvinyl acetate (PVAc). Three-ply experimental LVL from OPT veneers were bonded using two adhesive spread levels, 250 and 500 g m-2 for single glue line. Laminated veneer lumber from rubberwood was used as control. The dimensional stability properties investigated include dimensional changes associated with changes in relative humidity of 30 to 90%, hysteresis over a range of 30 to 90% and durability against biological attack through soil burial. Amongst the three adhesives, OPT LVL manufactured with EPI (VAc) had the highest Fibre Saturation Point (FSP) and the least was experienced by OPT LVL bonded with PVAc. Totally, the magnitude of hysteresis was below 1.00 which in the average 0.69 to 0.82 for OPT LVL panels while rubberwood LVL, 0.81 to 0.94, respectively. Overall, the dimensional stability properties of LVL from OPT bonded with cold setting adhesives namely EPI (SBR), EPI (VAc) and PVAc were found to be comparable with rubberwood.

Keyword: Emulsion polymeric isocyanate; Laminated veneer lumber; Oil palm trunk; Polyvinyl acetate