

Morphological behavior of densified low density plantation wood species: a preliminary study

ABSTRACT

This work presents the morphological effect of densification technique employed on underutilized low-density plantation wood species, Batai (*Falcataria moluccana*) with an average density of 360 kg/m³ on air-dried weight. Timbers were cut into laminas, air-dried and conditioned. Laminas were pre-treated using pressurized steamer at 130°C, 175 kPa for 10 minutes to soften the wood structure. Densification process happens when the laminas were hot pressed immediately at 170°C, 2 MPa, for 45 minutes. The targeted thicknesses of densified laminas were controlled with 5 mm, 10 mm, and 15 mm metal stoppers. The laminas were left to cool in the hot press machine until the temperature of the lamina reached below 100°C to reduce spring back effect before conditioning. Undensified laminas were used as control. Light microscopy was used to observe the morphological structure for both densified and undensified laminas. The microscopic result showed that the vessels of cell structures can be collapsed easily. The volume of the void spaces had decreased compared to undensified lamina which contributed to the improvement in the density of the lamina. However, as the densified lamina were left to condition until 7 days, the vessels started to swell up.