

Investigation of hydrophobic properties and mechanical stability of hydrophobic compressed oil palm trunk (OPT) panel

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ABSTRACT

Oil palm trunk (OPT) panel has high potential of being the substitution of wood due to the abundant of its availability in Malaysia and correspondingly resulted an increase in the export of palm oil in recent years. The properties of OPT has widely been studied including improvement on their strength and stability properties. In the present work, a hydrophobic coating was applied on compressed OPT panel prior to improve its surface quality. The hydrophobic properties were determined by water contact angle (WCA) and water sliding angle (WSA). The addition of SiO₂ and chlorotrymethylsilane (CTMS) as a hydrophobic agent plays a critical role in enhancing the panel surface by generate roughness at nanoscales and lower its surface free energy which turn to higher WCA and smaller WSA values. Based on mechanical stability of hydrophobic compressed OPT, it shows that the WCAs of the surface panel remained almost constant and the coated surface remain non-wettable with the nanoscales features remain intact after performing scratch test.

KEYWORDS

Coating; Contact angle; Hydrophobic; Mechanical durability; Oil Palm Trunk (OPT); Surface roughness

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