PHYSICAL AND MECHANICAL PROPERTIES OF OIL PALM TRUNKS

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ABSTRACT

Wood-based industry in Malaysia is dependent on the natural forest resources and forest plantations. The highly demand of this resource makes it more scarce and expensive. Currently the industries are searching for other resources to overcome the over dependence on local timber. The waste biomass from the oil palm industries can be turned into value-added products providing an alternative raw material for the wood industry, but OPT (Oil Palm Trunk) are reported to be difficult to dry, not only because of its extremely high green moisture content (MC), but also its drying defects. The objectives of this study are to characterize of physical and mechanical properties in the OPT at different layers of the trunk (bark to pith). To have different layer of trunk, the OPTs are sawn with sawing around pattern and were soaked with 85% concentration of ethanol liquids for 24 hours and dried using oven until archived 12 % moisture content. 30 samples for bending 20mm x 20mm x 300mm, and 20mm x 20mm x 60mm for compression were tested according to ASTM D2395-14. The result showed a gradual increase in mechanical and physical properties on trunk depth for both treatment, but the treatment sample show the highest value in MOR and MOE for both testing. It is concluded that the OPT soaked with Ethanol and dry with normal oven dry can improved the strength properties of OPL lumber.

Keywords: Oil Palm trunk (OPT), Ethanol, Physical Properties, Mechanical Properties, Modulus of Rupture, Modulus of Elasticity