

PHYSICAL AND MECHANICAL PROPERTIES OF OIL PALM TRUNKS

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**Final Year Project Report Submitted in
Partial Fulfillment of the Requirements for the
Degree of Bachelor of Science (Hons.) Furniture Technology
in the Faculty of Applied Sciences
Universiti Teknologi MARA**

JANUARY 2015

ACKNOWLEDGEMENTS

Assalamualaikum Warahmatullah Wabarakatuh

Alhamdulillah, praise to Allah to give us finish our semester proposal project. We want to say thanks you to our beloved lecturer, Encik Fauzi bin Othman. He was helps me to done our thesis proposal. Even we have many obstacles to finish our proposal, but we have done our thesis proposal as soon as possible.

We also would like to say thank you to all staff at library. It is because they all is one the most assistant has many experience and expert to handle about the collecting proposal book.

Lastly, to all my beloved friends, we so lucky to get understand and always help each other. We would like to say thanks to my mother, Anisahbinti Abdul Rahman, because every day, she call me and give the support to finish my proposal. We was done to make our task complete and we very grateful because we done our task on time. i want apologize to all person involve in our thesis proposal. May Allah bless you

Thank you so much.

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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