

UNIVERSITI TEKNOLOGI MARA

PROPERTIES OF ORIENTED STRAND BOARD
FROM PETAI BELALANG (*Leucaena leucocephala*)
WOOD

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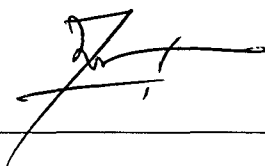
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ABSTRACT

In recent years, wood material used by the panel industry has become scarce and expensive. This has led to research and utilization of potential substitute materials. Therefore, the introduction of multipurpose trees such as *Leucaena leucocephala* is to provide both the basic needs of people as well as environmental benefits. The main objectives of the study are to develop and determine properties of oriented strand board (OSB) from *Leucaena leucocephala* as raw material in the manufacturing of OSB under laboratory conditions and to evaluate the potentials of *Leucaena leucocephala* wood. In this study, the main character of wood anatomy is determined using the terminology and methodology from the International Association of Wood Anatomists (IAWA). Physical and chemical properties, sampling and preparation of samples for these analyses were carried out according to the Technical Association of the Pulp and Paper Industry Standards, (TAPPI). In OSB manufacturing, *Leucaena leucocephala* wood is used as the raw material and phenol formaldehyde (PF) resin as a binder. The experimental design involved four (4) fix factors of age, resin content, board density and strand size. The quality of the boards was evaluated by determining the bending properties; modulus of elasticity (MOE) and modulus of rupture (MOR), internal bond (IB) strength and thickness swelling (TS). Test specimen preparation and evaluation of board quality were carried out according to European Standards. From this study, the statistical analysis revealed that age and tree portion were found to significantly affect the anatomical, physical and chemical properties. Strand analysis, age and strand size were found to affect strand parameters. In the manufacture of OSB, variables of age, board density, resin content, and strand size were found to affect physical and mechanical properties, significantly. Correlations of anatomical, physical and chemical properties had less association with board properties. However, strand properties had a strong correlation with mechanical properties. Regression analysis of the data revealed that there is good relationship between the main factors of manufacturing variables and board properties. This study had proven that it is suitable to used eight-year-old *Leucaena leucocephala*

tree and technically possible to use short rotation *Leucaena leucocephala* for the manufacture of OSB boards that meet the European Standard requirements.

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