

**MECHANICAL AND PHYSICAL PROPERTIES OF OSB FROM LEUCAENA
LEUCOCEPHALA AT DIFFERENT RESIN CONTENT**

By

**Ainul Munirah bt Abdul Jalil
Mufidah bt Md Husin**

**Final Project Paper Submitted in Partial Fulfillment for the Diploma In Wood
Industry, Faculty of Applied Sciences, University Teknologi MARA.**

MEI 2007

ACKNOWLEDGEMENT

First of all we would like to thank the Almighty ALLAH for giving us the opportunity and blessing to complete our project within the given time. Without His blessing and co-operation between group members and everyone that contributes to this project, we cannot complete this project.

Special thanks to our advisor, Miss Nurrohana bt Ahmad as well as Associate Professor Dr. Jamaluddin bin Kassim for their help and guideline to complete this project. Not forgetting special thanks to Mr. Wan Mohd Nazri bin Wan Abdul Rahman, and Mr. Shaikh Abdul Karim Yamani bin Zakaria for helping us along the way to finish this project and Madam Sa'diah binti Sahat for great help in SPSS and the analysis.

Special thanks is dedicated to our families for all the support and prayers and to our friends' thank you for the moral support much needed. To Aidi and Madi that give 100% commitment from the beginning until we finish this project, without co-operation between us, this project could not be done. Thank you very much.

Finally thank you to all that helps along the way in completing this project.

TABLE OF CONTENT

<u>TITLE</u>	<u>PAGE</u>
PROJECT TITLE	
APPROVAL SHEET.....	i
DEDICATION.....	ii
ACKNOWLEDGEMENT.....	iii
LIST OF FIGURES.....	iv
LIST OF TABLES.....	v
LIST OF PLATES.....	vi
LIST OF ABBREVIATIONS.....	vii
ABSTRACT.....	viii
ABSTRAK.....	ix

CHAPTER ONE	Pages
1.0 INTRODUCTION.....	1
1.1 Introduction.....	1
1.2 Problem Statement.....	2
1.3 Objectives.....	3
CHAPTER TWO	
2.0 LITERATURE REVIEW.....	4
2.1 Wood Composite.....	4
2.2 Oriented Strand Board.....	4
2.2.1 OSB Process.....	9
2.2.2 Properties of OSB.....	9
2.2.3 Board Dimensions.....	10
2.2.4 Particles Size and Shape.....	10
2.2.5 Particle Alignment.....	11
2.2.6 Structural Stability.....	12
2.2.7 Uses of Oriented Strand Board.....	12
2.3 Raw Material.....	15
2.3.1 Petai Belalang (<i>Leucaena leucocephala</i>).....	16
2.3.2 Characteristic of <i>Leucaena leucocephala</i>	16

2.3.3	Properties of <i>Leucaena leucocephala</i>	18
2.3.4	Habitat Description.....	18

CHAPTER THREE

3.0	MATERIALS AND METHODS.....	20
3.1	Material.....	20
3.2	Raw Material Preparation.....	21
3.2.1	Felling the Tree.....	21
3.2.2	Cut to Length.....	21
3.2.3	Cut to Billets.....	22
3.2.4	Billets Soaking.....	23
3.2.5	Debarking.....	23
3.3	Material preparation.....	24
3.3.1	Flaking.....	24
3.3.2	Air-Drying.....	25
3.3.3	Oven-Drying.....	26
3.4	Board Making Process.....	26
3.4.1	Glue blending.....	27
3.4.2	Forming.....	28
3.4.3	Cold-pressing.....	29
3.4.2	Hot pressing.....	29
3.4.3	Conditioning.....	30
3.5	Trimming.....	31
3.6	Board Testing.....	31
3.6.1	Mechanical Strength Testing.....	32
3.6.2	Physical Strength Testing.....	35
3.7	Data Analysis.....	36

CHAPTER FOUR

4.0	RESULT AND DISCUSSION.....	37
4.1	Eight years old <i>Leucaena leucocephala</i>	37
4.1.1	Properties of OSB.....	37
4.1.2	Statistical Analysis.....	38
4.1.3	Effect of Resin Content.....	38
4.1.3.1	Modulus of Rupture (MOR).....	38

**MECHANICAL AND PHYSICAL PROPERTIES OF OSB
FROM LEUCAENA LEUCOCEPHALA
AT DIFFERENT RESIN CONTENT**

By:

AINUL MUNIRAH BT. ABDUL JALIL

MUFIDAH BT. MD HUSIN

APRIL 2007

ABSTRACT

Oriented Strand Board (OSB) was produced from strands of wood sliced from small diameter logs. The strands were arranged alternately to each layer. In this study, Petai Belalang (*Leucaena leucocephala*) species of eight and sixteen years old were used to produce 700kg/m³ OSB with the resin contents of 5%, 7% and 9%, to identify the mechanical and physical properties of the OSB. The results show that the strength properties of OSB namely the Modulus of Rupture (MOR), Modulus of Elasticity (MOE) and Internal Bonding (IB) increase when the level of resin content increases. The physical properties, and increase in the resin content resulted in low water absorption and thickness swelling. Based on the mechanical and physical properties, *Leucaena leucocephala* can be used as raw material for the OSB making.