

**PROPERTIES OF ORIENTED STRAND BOARD FROM
KELEMPAYAN AND SENTANG**

SUHAINI BINTI SURIA

**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 Science
Universiti Teknologi MARA**

JULY 2014

ACKNOWLEDGEMENTS

First of all I would like to express my grateful feeling to God because of the blessing until I have been successfully finished and submitted my final year project within the given time. Alhamdulillah, I kindly complete my report even that the time is not much. Thanks also to my family whose give a lot of motivation support and expenses for me during I start until finished the study especially to Mr Suria Bin Bidin and Madam Hayati binti Hashim.

Special thanks to my lecturer as my advisor for this subject Assc. Prof. Dr. Wan Mohd Nazri Bin Wan Abdul Rahman who is willing to contributed his knowledge, efforts and times till I complete my final project paper. He also was gives all his support, suggestion, comment and advice towards in this final project paper.

My thanks also go to Wood Department staff especially to Mr. Sharil Ezani who has given me a lot of knowledge and help me during the testing process and help in the preparing and information gave in this study. Also not forget to my classmates AS227 intake September 2011 especially my group partner Iskandar bin Mustapa for doing this project together. Not to forget, the seniors; Asnawi Seraila, Iffah Izzah, Hazwani, Azizul Radhi and Shafie Ansar who are given the responses and opinions in help me to complete my study.

All the kindness you have showed I would remember in my life. I really appreciate all of your kindness. May Allah bless you.

Thank you so much.

TABLE OF CONTENTS

	Page
CANDIDATE'S DECLARATION	i
DEDICATIONS	ii
ACKNOWLEDGEMENTS	iii
TABLES OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF PLATES	viii
LIST OF ABBREVIATIONS	ix
ABSTRACT	x
ABSTRAK	xi
CHAPTER 1 INTRODUCTION	
1.2 Problem Statement	2
1.3 Objectives	3
CHAPTER 2 LITERATURE REVIEW	
2.1 Raw Material for Wood Composite	4
2.2 Rubberwood	5
2.3 Kelempayan (<i>Neolamarckia cadamba</i>)	6
2.3.1 Strength Properties	8
2.3.2 Physical Properties	8
2.4 Sentang (<i>Azadirachta excelsa</i>)	9
2.4.1 Characteristics of Sentang	9
2.4.2 Strength Properties	10
2.4.3 Wood Working Properties	10
2.5 Oriented Strand Board	11
2.5.1 OSB Process	12
2.5.2 Structure of OSB	13
2.5.3 Properties and Types of OSB	14
2.5.4 Uses of OSB	16
2.6 Adhesive	16
2.6.1 Phenol Formaldehyde	17
2.6.1.1 Physical Properties	18
CHAPTER 3 MATERIALS AND METHODS	
3.1 OSB Manufacturing	19
3.2 Materials Preparation	20
3.2.1 Kelempayan and Sentang Logs	20
3.2.2 Debarking	21
3.2.3 Stranding	21

3.2.4	Screening	23
3.2.5	Drying	24
3.3	Board Fabrication	25
3.3.1	Blending	25
3.3.2	Mat Forming	26
3.3.3	Pre Pressing	27
3.3.4	Hot Pressing and Cooling	28
3.4	Board Evaluation	29
3.4.1	Dimension of Test Samples	30
3.5	Board Testing	31
3.5.1	Mechanical Testing	31
3.5.1.1	Bending	32
3.5.1.2	Internal Bonding	33
3.5.2	Physical Testing	35
3.6	Experimental Design of Main Study	36
 CHAPTER 4 RESULTS AND DISCUSSIONS		
4.1	Mechanical and Physical Properties of OSB	37
4.2	Statistical Significance	39
4.3	Effects of Resin Content	39
4.4	Effects of Strand Size	42
 CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS		
5.1	Conclusions	46
5.2	Recommendations	47
 REFERENCES		48
APPENDIXES		52
<i>CURRICULUM VITAE</i>		60

ABSTRACT

PROPERTIES OF ORIENTED STRAND BOARD FROM KELEMPAYAN AND SENTANG

This study used Kelempayan and Sentang woods as a raw material in the manufacture of Oriented Strand Board (OSB). Currently rubberwood supply is decreasing and limited in resources thus another fast growing species were promoted as very promising raw material for wood composite product. The objectives of this study are to determine the properties and to evaluate the effects of resin content and strand size of OSB properties. Target board density was 700 kg/m³ with applied 9% and 11% of Phenol Formaldehyde as a binder. The quality of the boards were evaluated by determine of bending properties including modulus of rupture (MOR), modulus of elasticity (MOE), internal bond (IB) strength and thickness swelling (TS) based on BS EN standard. All of the results testing show the mechanical and physical properties of OSB have meet the standard requirement based on BS EN 300:1997 OSB Type 1.