

**PROPERTIES OF PARTICLEBOARD FROM OIL PALM TRUNK IN
RELATION OF BOARD DENSITY, RESIN CONTENT AND WAX ADDITION**

By

**Ermadasila Bin Mohamad
Mohd Khairi Bin Muhammad Amin
Mohd Ashraf Bin Mohd Ridzuan**

**DIPLOMA IN WOOD INDUSTRY
UNIVERSITI TEKNOLOGI MARA**

OCTOBER 2007

TABLE OF CONTENT

TITLE	PAGE
PROJECT TITLE	
APPROVAL SHEET.....	i
DEDICATION.....	ii
ACKNOWLEDGEMENT.....	iii
LIST OF FIGURE.....	iv
LIST OF TABLE.....	vi
LIST OF PLATES.....	vii
LIST OF ABBREVIATIONS.....	viii
ABSTRACT.....	ix
ABSTRAK.....	x
TITLE	PAGES
CHAPTER ONE	1
1.0 INTRODUCTION	1
1.2 Justification	2
1.3 Objectives	3
CHAPTER TWO	
2.0 LITERATURE REVIEW	4
2.1 Oil palm plantation in Malaysia	4
2.2 Particle Board	6
2.3 Particle Board Characteristic	8
2.4 Particle Board effect	9
2.41 Effect of Resin Content	9
2.42 Effect of Wax Addition	10
2.43 Effect of Particle size	10
CHAPTER THREE	
3.0 METHOD OF PARTICLE BOARD MAKING AND TESTING	12
Method of Particle Board Making	12
3.1.1 Raw Material	12
3.1.2 Chipping and Flaking	12
3.1.3 Drying and Screening	12
3.1.4 Glue Mixing and Blending	13
3.1.5 Forming	13
3.1.6 Cold Pressing	14
3.1.7 Hot Pressing	14
3.1.8 Trimming	15
3.1.9 Testing	15
3.2 Particle Manufacturing in Flow Chart	16
3.3 Method Of Particle Board Testing	17
3.4 Method Of Cutting The Particle Board	18
3.5 Bending Testing	19
3.6 Thickness Swelling	20
3.7 Water Absorption	21

3.8	Internal Bonding Testing	22
3.9	Density	23
CHAPTER FOUR		
4.0	RESULT AND DISCUSSION	24
4.1	General	24
4.2	Effect of resin content	25
4.2.1	Mechanical Properties	25
4.2.1.1	Modulus of Rupture	25
4.2.1.2	Modulus of Elasticity	27
4.2.1.3	Internal Bonding	28
4.2.2	Physical Properties	29
4.2.2.1	Thickness swelling	29
4.2.2.2	Water Absorption	30
4.3	Effect of Density	31
4.3.1	Mechanical Properties	31
4.3.1.1	Modulus of Rupture	31
4.3.1.2	Modulus of elasticity	32
4.3.1.3	Internal Bonding	33
4.3.2	Physical Properties	34
4.3.2.1	Thickness Swelling	34
4.3.2.2	Water Absorption	35
4.4	Effect of Wax Additives	36
4.4.1	Mechanical properties	36
4.4.1.1	Modulus of Rupture	36
4.4.1.2	Modulus of Elasticity	37
4.4.1.3	Internal Bonding	38
4.4.2	Physical Properties	39
4.4.2.1	Thickness Swelling	39
4.4.2.2	Water Absorption	40
4.5	Density	41
4.5.1	Density of Board without wax additives	41
4.5.2	Density of Board with wax additives	43
CHAPTER FIVE		
5.0	Conclusion	46
REFERENCES		
APPENDICES		
VITA		
		105

ACKNOWLEDGEMENT

Thanks a lot to almighty Allah S.W.T for his blessing, we manage to complete this final project and had been successfully submitted. Thank very much to our parents and families for their support and wish or us.

I would like to express my deepest appreciation and sincere gratitude to my advisor, Pn Nurrohana Bt Ahmad for her support and idea in implementing this project until the end of my study. We also want to greet to my gratitude and appreciation to Prof. Madya Dr. Jamaludin Bin Kasim as a lecture WTE 375 (final year project) for his help, support, and guidance throughout the course of my study. We also want to thanks to all the wood tech staff that always helps us to finish this project.

Special hanks to all of our friends, classmates and our entire lecture that support us to finished this project.

**PROPERTIES OF PARTICLE BOARD FROM OIL PALM TRUNK IN
RELATION OF BOARD DENSITY, RESIN CONTENT, AND WAX
ADDITION**

By:

**ERMADASILA BIN MOHAMAD
MOHD KHAIRI BIN MUHAMMAD AMIN
MOHD ASHRAF BIN MOHD RIDZUAN**

October 2007

ABSTRACT

Oil palm (*Elaeis quineensis jacq*) has now becoming one of the most important raw materials in wood industries in Malaysia. However its important for production of reconstituted wood based products and furniture can be future enhance through research and development. This study examined the physical and mechanical properties of particle board made from 1mm oil palm particle in various density and percentage of resin. The result show that the strength properties of particleboard namely the Modulus of Rupture (MOR), Modulus of Elasticity (MOE) and Internal Bonding (IB) will be affect when increasing and decreasing of additives. From this study, the good particleboards are with the high density, resin content, and with wax addition. in this project, the good variation for oil palm particleboard is the board with 700 kg/m³, 10% resin content, and with wax additives.