

**PROPERTIES OF PARTICLEBOARD FROM *Neolamarckia
cadamba* (KELEMPAYAN)**

AHMAD AFIQ BIN MAT ZLAN

**BACHELOR OF SCIENCE (Hons.)
FURNITURE TECHNOLOGY
FACULTY OF APPLIED SCIENCES
UNIVERSITI TEKNOLOGI MARA**

JULY 2014

TABLE OF CONTENTS

	Page
APPROVAL SHEET	i
CANDIDATE'S DECLARATION	ii
ACKNOWLEDGEMENT	iii
TABLE 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
1.1 General	1
1.2 Problem Statement	4
1.3 Objectives	5
CHAPTER 2 LITERATURE REVIEW	6
2.1 Particleboard	6
2.1.1 General Uses of Particleboard	8
2.2 Urea Formaldehyde	9
2.3 Factors That Affecting Particleboard Properties	10
2.3.1 Effect of Particle Geometry	10
2.3.2 Effect of Resin Content	11
2.4 <i>Neolamarckia cadamba</i>	11
CHAPTER 3 MATERIALS AND METHODS	13
3.1 Particleboard Manufacturing	14
3.1.1 Cutting And Debarking	15
3.1.2 Chipping	15
3.1.3 Flaking	16
3.1.4 Screening	17
3.1.5 Drying	17
3.1.6 Mixing And Blending	18
3.1.7 Mat Forming	19
3.1.8 Pre-Press	20
3.1.9 Hot Press	21
3.1.10 Cooling And Trimming	22
3.1 Method of Testing	23
3.2.1 Board Evaluation	23
3.2.2 Static Bending Test	24
3.2.3 Internal Bonding Test	26
3.2.4 Thickness Swelling And Water Absorption Test	27
3.2.5 Experimental Design	28

CHAPTER 4 RESULT AND DISCUSSION	29
4.1 Physical And Mechanical Properties	29
4.2 Analysis of Kelempayan Particleboard	31
4.3 Effects of Particle Size	32
4.3.1 MOR And MOE	32
4.3.2 IB	33
4.3.3 TS And WA	34
4.4 Effects of Particle Size	36
4.4.1 MOR And MOE	36
4.4.2 IB	37
4.4.3 TS And WA	38
CHAPTER 5 CONCLUSION AND RECOMMENDATION	40
CITED REFERENCES	41
APPENDICES	44
CURRICULUM VITAE	54

LIST OF TABLES

Table	Caption	Page
3.1	Stages of Pressure Applied	21
3.2	No. of Samples And Standard Size	22
4.1	Physical And Mechanical Properties of Kelempayan Particleboard	30
4.2	Summary of ANOVA On The Properties of Kelempayan Particleboard	32

**PROPERTIES OF PARTICLEBOARD FROM *NEOLAMARCKIA*
CADAMBA (Kelempayan)**

ABSTRACT

This study focus on alternative species to produce particleboard with the targeted density of 600 kg/m³. The wood species used is Kelempayan (*Neolamarckia cadamba*). The main objectives of this study are to determine the physical and mechanical properties of particleboard made from Kelempayan (*Neolamarckia cadamba*). The study was also done to evaluate the effect of particle size and resin content and on particleboard properties. The particle sizes are 1.0 mm, mix particles (1.0 mm with 2.0 mm) and 2.0 mm. The percentages of resin content are 8%, 10% and 12%. The modulus of rupture, modulus of elasticity, internal bonding, thickness swelling and water absorption of particleboard were determined according to Japanese Industrial Standard (JIS). As a result, the particleboard produced from Kelempayan made from 1.0 mm particle size and using 12% resin content was met the MOR, MOE and IB minimum requirement set by JIS Standard for general uses.