

**Properties of particleboard from
Mixed species Karas (*Aquilaria species*), Kedondong (*Burseraceae species*),
Mahang Kapur (*Macaranga Hypoleuca*) at 700 kg/m³ with 8%, 10%
And 12% resin and with 0% wax and 1% wax**

By

AHMAD FAEZAN BIN ABDUL RAHMAN

**Final Project Paper Submitted in Fulfillment for the Diploma in Wood Industry
Faculty of Applied Science, University Technology MARA**

OCTOBER 2004

ACKNOWLEDGEMENT

Alhamdulillah, for the first of all I would like to thank almighty ALLAH S.W.T for His blessing leading to the success of completing this final project.

To my respectful advisor Assoc. Professor Madya Dr. Jamaludin B. Kasim, appreciation for his suggestion, comment and advice towards in this final project paper. Beside that, the appreciation also goes to Assoc. Professor Abdul Jalil Hj. Ahmad for his entire lesson in finishing this final project paper. All the kindness you've showed I would remember for all my life.

Thank you to the staff of Diploma in Wood Industries laboratory and workshop, Mr. Rudaini and Mr. Sardey for their priceless help in preparing and information gave in these studies.

Also special thanks to my entire beloved friend for their everlasting support and helping through finishing this final project paper.

Finally, this special thanks greatest to my family for their continuously support and concern. Without their supporting and concerning, I would not be able to finish my final project paper.

Last but not least, for any individual who has involved directly or indirectly with this project paper. May ALLAH bless you. Thank you.....

TABLE OF CONTENTS

	Pages
APPROVAL SHEET	ii
DEDICATION	iii
ACKNOWLEDGMENT	iv
LIST OF FIGURE	v
LIST OF PLATE	vi
LIST OF ABBREVIATION	vii
ABSTRACT	viii
ABSTRAK	ix
CHAPTER I	
1.0 INTRODUCTION.....	1
1.1 Justification.....	2
1.3 Objective	2
CHAPTER II	
2.0 LITERATURE REVIEW	
2.1 Field characteristics: -	
2.1.1 Field characters of Karas (<i>Aquilaria species</i>).....	3
2.1.2 Field characters of Mahang Kapur (<i>Macaranga Hypoleuca</i>).....	3
2.1.3 Field characters of Kedondong (<i>Burseraceae species</i>).....	4
2.2 History of Particleboard	5-6
2.3 Structural of Board	
2.3.1 Particle Size and shape.....	7
2.3.2 Effect of wax addition	7

CHAPTER III

3.0 MATERIAL AND METHOD	8
3.1 Particle preparation	9
3.2 Board making	10-11
3.3 Board Evaluation: -	
3.3.1 Testing.....	13
3.3.2 Determination of Flexural Strength	14
3.3.3 Determination of Internal Bonding	14
3.3.4 Determination of Thickness Swelling and Water Absorption	15

CHAPTER IV

4.0 RESULT AND DISCUSSION	
4.1 Table 1: - Strength / Physical Properties of Particleboard from mixed Species Karas, Mahang Kapur, and Kedondong	16
4.2 Table 2: ANOVA	17
4.3 Effect of Resin:-	
4.3.1 The Modulus of Elasticity (MOE)	17
4.3.2 The Modulus of Rupture (MOR)	18
4.3.3 The Internal Bonding (IB)	19
4.3.4 The Thickness & Swelling (TS)	20
4.3.5 The Water Absorption (WA)	21
4.4 Effect of Wax: -	
4.4.1 The Modulus of Elasticity (MOE)	22
4.4.2 The Modulus of Rupture (MOR)	22
4.4.3 The Internal Bonding (IB)	23
4.4.5 The Thickness & Swelling (TS)	24
4.4.6The Water Absorption (WA).....	25-26

ABSTRACT

**Properties of particleboard from mixed species
Karas (*Aquilaria species*), Kedondong (*Burseraceae species*), Mahang
Kapur (*Macaranga Hypoleuca*) at 700 kg/m³ with
8%, 10% and 12% resin and with 0% wax and 1% wax**

AHMAD FAEZAN BIN ABDUL RAHMAN

OCTOBER 2004

In this study, three percentage of resin urea- formaldehyde (UF) that are 8%, 10% and 12% will be mixed with the mixed species Karas (*Aquilaria species*), Kedondong (*Burseraceae species*), Mahang Kapur (*Macaranga Hypoleuca*) wood particles and wax. This mixed will be made a board called particleboard after been cured by heat and pressure. The properties of this particleboard will be determined by several types of test. The results shows that the percentages of resin used and wax are affecting the properties of the board. For the standard of evaluating this particleboard reach the value that been specified.