PROPERTIES OF PARTICLEBOARD FROM *Teminalia cattapa* AT 600 KG/M³ WITH 10% & AND 12% RESIN

By

ZHARIF ZHAFRAN BIN GHAZALI

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

OCTOBER 2004

ACKNOWLEDGEMENT

بسم الله الرحمن الرحيم

Alhamdullilah, the very grateful praise to the merciful Allah S.W.T. for His Blessing and Strength, then I can only manage to finish this final paper project successfully.

Besides that, I also want to give a very big thank to my beloved parents for their pray and blessing, also for their big support and advices. Not to forget, my advisor, Mr. Ahmad Fauzi Bin Othman for his cooperation in giving me guidance and advices that had a lot in helping me to finish this final paper project. I am so thankful to him because of the very kindness of him to be my advisor.

Also not to forget the student of semester 5 for giving a lot of help in completing this paper project. They give very good cooperation and needed information while making this project. Last but not least, thanks also for UiTM staff, Mr. Sardey and Mr. Anuar for their cooperation and guidance in using the testing machine and others that involving the process of particleboard making.

Lastly, thanks to my all kindness friends for their support and cooperation to complete this final paper project. May Allah S.W.T. bless all of them that have influence me in finishing this final paper project.

والسلم

TABLE OF CONTENTS

Page

APPROVAL SHEET	i
DEDICATION	ii
ACKNOWLEDGEMENTS	iii
LIST OF TABLES	vi
LIST OF GRAPHS	vii
LIST OF PLATES	viii
LIST OF FIGURES	ix
LIST OF ABBREVIATIONS	x
ABSTRACT	
ABSTRAK	

CHAPTER

I	1.0 INTRODUCTION OF KETAPANG	1
	1.1 GENERAL DESCRIPTION	1
	1.2 ANATOMICAL PROPERTIES.	2
	1.3 MECHANICAL PROPERTIES	3
	1.4 WORKING PROPERTIES.	3
	1.5 USES	3
	1.6 OBJECTIVES.	4
П	2.0 INTRODUCTION OF PARTICLEBOARD	5
	2.1 CLASSIFICATION OF PARTICLEBOARD.	8
	2.2 UREA FORMALDEHYDE.	9
	2.3 PARTICLEBOARD HISTORY	11
Ш		
Ш	3.0 MATERIAL AND METHOD	17
ш	3.0 MATERIAL AND METHOD 3.1 GENERAL MANUFACTURING PROCESS	17 17
ш		
ш	3.1 GENERAL MANUFACTURING PROCESS	17
ш	3.1 GENERAL MANUFACTURING PROCESS.3.2 METHODOLOGY.	17 21
ш	3.1 GENERAL MANUFACTURING PROCESS3.2 METHODOLOGY	17 21 21
ш	3.1 GENERAL MANUFACTURING PROCESS 3.2 METHODOLOGY	17 21 21 21
ш	 3.1 GENERAL MANUFACTURING PROCESS. 3.2 METHODOLOGY. 3.2.1 RAW MATERIAL. 3.2.2 CHIPPING. 3.2.3 FLAKING. 	17 21 21 21 21 22
ш	3.1 GENERAL MANUFACTURING PROCESS 3.2 METHODOLOGY	17 21 21 21 22 22
ш	3.1 GENERAL MANUFACTURING PROCESS. 3.2 METHODOLOGY. 3.2.1 RAW MATERIAL 3.2.2 CHIPPING. 3.2.3 FLAKING. 3.2.4 SCREENING. 3.2.5 DR YING.	17 21 21 21 22 22 23
m	 3.1 GENERAL MANUFACTURING PROCESS. 3.2 METHODOLOGY. 3.2.1 RAW MATERIAL. 3.2.2 CHIPPING. 3.2.3 FLAKING. 3.2.4 SCREENING. 3.2.5 DRYING. 3.2.6 GLUE MIXING AND BLENDING. 	17 21 21 21 22 22 23 23 23
ш	3.1 GENERAL MANUFACTURING PROCESS. 3.2 METHODOLOGY. 3.2.1 RAW MATERIAL. 3.2.2 CHIPPING. 3.2.3 FLAKING. 3.2.4 SCREENING. 3.2.5 DR YING. 3.2.6 GLUE MIXING AND BLENDING. 3.2.7 MAT FORMING.	17 21 21 22 22 23 23 23 24

	3.3 BOARD EVALUATION	27
	3.3.1 TESTING	27
	3.3.2 BENDING TEST.	27
	3.3.3 INTERNAL BONDING.	29
	3.3.4 THICKNESS SWELLING	
	AND WATER ABSORPTION	30
IV	4.0 RESULT AND DISCUSSION	31
	4.1 STRENGTH AND MECHANICAL PROPERTIES.	31
	4.1.1 BENDING TEST (MOE)	32
	4.1.2 BENDING TEST (MOR)	34
	4.1.3 WATER ABSORPTION TEST.	36
	4.1.4 THICKNESS SWELLING TEST	38
V	5.0 CONCLUSION AND RECOMMENDATION	40
	REFERENCES	42
	APPENDIXES	43
	VITA	51

.4

ABSTRACT

PARTICLEBOARD FROM KETAPANG (*Terminalia cattapa*) SPECIES AT 600 kg/m³ WITH 10% AND 12% RESIN

BY

ZHARIF ZHAFRAN BIN GHAZALI

OCTOBER 2004

In this study, research done to determine the suitability or strength properties of this Ketapang (*Terminalia cattapa*) species in using it as resources for particleboard manufacturing. 10% and 12% of resin used, Urea Formaldehyde, at density of 600 kg/m³ are required in making particleboard. It will be mixed with other additives. This mixed will be made a board called particleboard after been cured by heat and pressure. Several types of test are done to determine the strengths properties of its. There are "Modulus of Rupture" (MOR), "Modulus of Elasticity" (MOE), "Water Absorption" (WA) and "Thickness Swelling" (TS). Result obtained shows that the Ketapang species do not suit the standard to be as new sources in particleboard manufacturing.