

MECHANICAL PROPERTIES OF OIL PALM FRUIT BUNCH (OPFB) FIBER COMPOSITE

MOHD YUSOF BIN HJ. MOHD AMIN (2001194673)

A thesis submitted in partial fulfillment of the requirement for the award of Bachelor Engineering (Hons.) Mechanical

> Faculty of Mechanical Engineering Universiti Teknologi Mara (UiTM)

> > **APRIL 2005**

ACKNOWLEDGEMENT

Firstly, I would like to thank Pn. Anizah Bte Kalam for her kindness, guidance, advice and sharing her experiences in the research of Mechanical Properties of Oil Palm Fruit Bunch (OPFB) Fiber Composite. I am also grateful to En. Muhammad Hussian for his opinion and view, especially for the scanning electron microscopy (SEM) test . Thanks to the laboratory staffs, especially to Mr. Ziyadi who is Strength Lab assistance for his cooperation during the testing execution and special thanks are also extended to Pn Siti, (Strength Lab Assistant in the Applied Science Faculty) for her guidance in the application of the Izod machine. To Mr. Hayub Ta (Material Science Lab Technician), thank you for your help during the fracture observation and densities measurement. Lastly, to my parent, family and everyone who was involve in this project, thank you.

ABSTRACT

This project required the studies on the natural fiber composite material which is the oil palm fruit bunch as a fiber component. By conducting through several experiments, the data will be collected to determine the mechanical properties of the material. Mechanical properties from the study will be compared with the previous natural fiber composite. Hence, this material should give possible practice for engineering applications.

TABLE OF CONTENTS

CONTENTS

PAGE

Title	i
Acknowledgement	ii
Abstract	iii
Table of Contents	iv
List of Tables	vii
List of Figures	viii
List of Abbreviations	х

CHAPTER I INTRODUCTION

1.0	Background of the Project	1
1.1	Objective	2
1.2	Scope	2
1.3	Methodology	3
1.4	Significance of project	3

CHAPTER II LITERATURE REVIEW

2.0	Introduction	4
2.1	Definition of composite material	5
2.2	The Matrix	6

	2.2.1 Epoxies resin	7
2.3	The Fibers or reinforcement	9
	2.3.1 Fiber dispersion	13
	2.3.2 Fiber matrix adhesion	14
	2.3.3 Fiber aspects ratio	14
	2.3.4 Fiber volume fraction	17
2.4	The advantages of composite material	18
2.:	Previous finding on natural fiber composites	19
2.0	Potential applications of Natural fiber	24
	composites	Р.
2.2	Summary	25
CHAPTER III TH	EORITICAL ANALYSIS	.1
	3	<i>4</i>
3.0	Introduction	26
3.7	Material description	26
	3.1.1 Resin	26
	3.1.2 Hardener	27
	3.1.3 Fiber	27
3.2	Sample preparation	28
3.3	Testing	29
	3.3.1 Tensile test	29
	3.3.1.1 Test procedure	31
	3.3.2 Topology Observation (Microscope)	31
	3.3.3 Scanning Electron Microscopy	31
	(SEM)	
	3.3.4 Densities measurement	31
	3.3.4.1 Densities measurement	32
	procedure	
	3.3.5 Impact test	32
	3.3.5.1 Test procedure	33
3.4	Summary	34