

**PROPERTIES OF ORIENTED STRAND BOARD (OSB) FROM MIX
TROPICAL SPECIES**



**INSTITUTE OF RESEARCH, DEVELOPMENT AND
COMMERCIALISATION
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM, SELANGOR
MALAYSIA**

By

**AHMAD FAUZI OTHMAN
NORHAFIZAH ROSMAN
WAN MOHD NAZRI WAN ABDUL RAHMAN**

March 2007

PROPERTIES OF ORIENTED STRAND BOARD (OSB) FROM MIX TROPICAL SPECIES

By:

*Ahmad Fauzi Othman, Norhafizah Rosman and Wan Mohd Nazri Wan Abdul
Rahman*

Universiti Teknologi MARA, 26400 Jengka, Pahang Darul Makmur

ABSTRACT

Development of lesser-known tropical species can provide tools to help forester to preserve virgin forest area and restore native eco-systems. OSB from fast growing and lesser-known tropical species in this study seem to have good potential for filling needs in various structural and exterior applications. However, this potential will depend on further research and improvements in physical and mechanical properties of the OSB. The main objective of the study is to develop and determine properties of oriented strand board from mix tropical species (lesser-known and fast growing) as a raw material in the manufacturing of OSB. Species like Ludai, Mahang, *Acacia mangium* and *leucaena leucocephala* were found by this study to be a suitable alternative raw material since the result showed that most of the treatments meet the minimum requirement of mechanical and physical properties. It can be deduced from this study, that mixing Ludai and Mahang, *acacia mangium* and *leucaena leucocephala* from fast growing tropical species had improved board performance as compared to single species. All mechanical and physical properties evaluated met the requirements set by the EN 310:1994, EN 317:1994 and EN 319:1994 standards for general purpose used.

TABLE OF CONTENTS

	Page
DECLARATION FORM.....	ii
ACKNOWLEDGEMENTS.....	iv
ABSTRACT.....	v
LIST OF TABLES.....	vi
LIST OF FIGURES.....	ix
LIST OF PLATES.....	x

CHAPTER

I	INTRODUCTION.....	1
	1.1 Problem Statement.....	3
	1.2 Objectives.....	4
II	LITERATURE REVIEW.....	5
	2.1 Oriented Strand Board.....	5
	2.1.1 OSB Process.....	4
	2.2 Raw Material.....	10
	2.2.1 Tropical Species.....	11
III	MATERIALS AND METHODS.....	13
	3.1 Materials.....	13
	3.2 Manufacture of OSB and Testing.....	15
IV	RESULTS AND DISCUSSIONS.....	31
	4.1 Performance of OSB Board from Mahang and Ludai.....	31
	4.1.1 Performance of OSB Board from Mix Mahang and Ludai.....	35
	4.2 Performance of OSB Board from <i>Leucaena leucocephala</i> and <i>Acacia Mangium</i>	38
V	CONCLUSION	45
REFERENCES		47

CHAPTER I

INTRODUCTION

Environmental and economic concerns combined with an increased demand for wood products have led the forest products industry to make better and more complete use of wood residues. With the demand for forest products continuing to be strong and the available land base for timber production decreasing the utilization of small diameter and whole trees has become more important. Therefore, due to some of the constraints and changes in wood utilization technology, tropical fast growing species have assumed greater potential as components of wood composite products. Furthermore, in view of the changing trend of available wood resources, wood composite products in general will become increasingly important in meeting the demand for wood products. Wood composites make up a family of materials distinct from solid wood; they are composed of wooden elements of varying sizes (including fibers), held together by an adhesive bond. The bonding agent is either natural or synthetic in origin (Razali and Mohd. Hamami, 1993). According to Seibel (2004), the possibility of using timber from low commercial value and the local supply of fast growing wood species from planted sustainable forests are the main reasons to establish information and studies on the properties and utilization of wood species from planted forest for the OSB production.

Currently, the wood industry has contributed significantly towards the socio-economic development of Malaysia. Oriented strand board (OSB) is significantly cheaper to produce as small diameter and low quality logs can be used unlike plywood, which requires good quality, and larger diameter logs. Generally, OSB is used in almost

similar application to plywood, the panel being comparable with plywood in terms of strength and versatility (Doyle, 1996). Mohd. Nor and Home (1997) reported that OSB from rubberwood was successfully manufactured in the Forest Research Institute Malaysia (FRIM) laboratory for the first time in 1996. The potential of rubberwood OSB which has high strength properties exceeded the minimum requirements of the Japanese Standards.

According to Douglas H. W (1997), plywood manufacture will decline across the Asia-Pacific region as the supply of peeler-quality logs declines and consumers adopt reconstituted panels. Based on the forecast made by ITTO (1996), plywood exports from Asia-Pacific region to drop by 60% while imports to the main consumer countries will decline by 80% by the year 2010 (Figure 1.1).

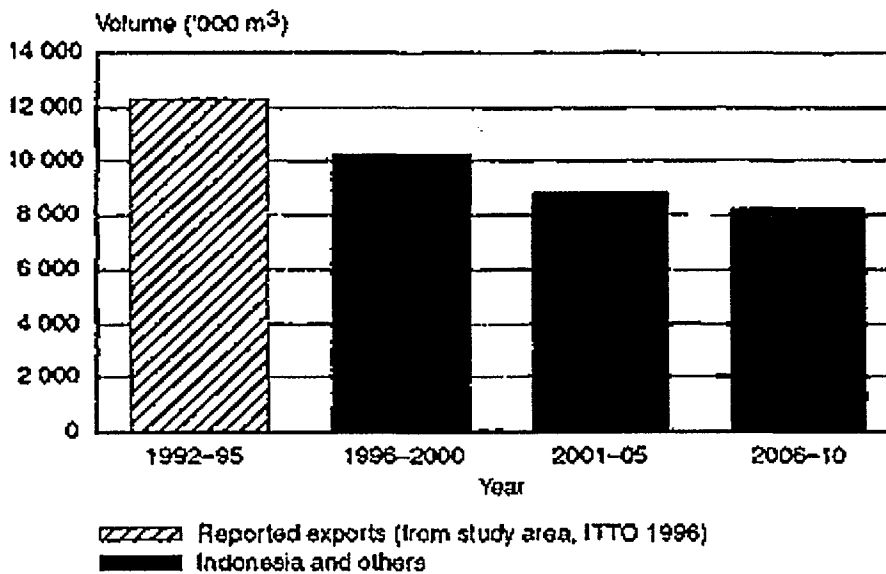


Figure 1.1: Forecast of Plywood/veneer Exports by 2010