# PHYSICAL PROPERTIES OF PULAI (*Alstonia angustiloba*) FROM DIFFERENT HEIGHT LEVEL AND NEAR PITH, NEAR BARK

By

SITI AISHAH BT RAJAB NORITA BT MHD.KEPLI SAMSUL HADI BIN MISNAN ABDUL HAFIZ BIN IBRAHIM

Final Project in Partial for the Diploma in Wood Industry,

Faculty of Applied Science, Universiti Teknologi MARA Pahang.

### ACKNOWLEDGEMENTS

Assalamualaikum Warahmatullahi Wabarakatuh.....

First at all, we would like to thank to the Almighty ALLAH S.W.T for His Blessing and Strength rendered for us to complete our thesis about Physical Properties of Pulai (*Alstonia angustiloba*).

To our advisor, Professor Dr.Suhaimi Bin Muhammed whose willingness to contribute his knowledge, time and effort until the completion of this final projects for guiding, reading and offering comment as the project involved. We gratefully acknowledge his helpful suggestion.

Also, a lot of thanks should be given to all of lectures and staff in the Department of Wood Industry, University Technology of MARA especially Miss Mazlin Binti Hj Kusin as Head Program for their help during our three years studies in this UiTM. Deep appreciation to Associate Prof. Abdul Jalil as Coordinator Final Project (WTE 375).

We also like to thanks to all our friends because they were given a lot of cooperation to make this project paper become successful. Without them, this project will become difficult.

Lastly, we wish to our special gratitude to our beloved parents and family for their support throughout the study period.

# **TABLE OF CONTENTS**

## CONTENTS

## PAGE

DEDICATION	íí
ACKNOWLEDGEMENTS	ííí
TABLE OF CONTENTS	ίν - ν
LIST OF TABLES	ví
LIST OF FIGURES	víí
LIST OF PLATES	vííí
LIST OF ABBREVIATIONS	íx
ABSTRACT	X
ABSTRAK	xí

# CHAPTER ONE: INTRODUCTION

1.0 General	1 - 2	
1.1 Justification	2	
1.3 Objectives	2	

# CHAPTER TWO: LITERATURE REVIEW

2.0 Overview of Pulai	3 - 4
2.1 Uses of Pulai	4
2.2 Factors affecting the strength of timber	5
2.2.1 Moisture Content	5
2.2.2 Density	6
2.2.3 Specific Gravity	7
2.2.4 Shrinkage and Swelling	8
2.2.5 Other inherent factors	9
2.2.5.1 Strength variation among species	9
2.2.5.2 Anatomical features	9 - 10
2.2.5.3 Chemical constituent	10
2.2.5.4 Position of timber	11
2.2.5.5 Abnormal growth of wood	11
2.2.5.6 Defects.	11
2.2.5.7 Tension wood	12

# CHAPTER THREE: MATERIALS AND METHODS 3.0 Preparation of Raw Materials. 3.2 Testing Methods. 19 3.2.1 Moisture Content. 19 3.2.2 Density. 20 3.2.3 Specific Gravity. 21 3.2.4 Shrinkage and Swelling.

### CHAPTER FOUR: RESULTS AND DISCUSSION

4.0 Introduction	24
4.1 Moisture Content of Pulai	25 - 27
4.2 Density of Pulai	.27 - 29
4.3 Specific Gravity of Pulai	.30 - 32
4.4 Shrinkage and Swelling of Pulai	.32 - 37

CHAPTER FIVE: SUMMARY AND CONCLUSION	
5.1 Conclusion	
5.2 Recommendation	
REFERENCES	40 - 42
APPENDICES	
VITA	

### ABSTRACT

Wood has an organic that happens causes from process grow thing of tree, that are introduce as primer grow thing and secondary growth thing. Wood tissue that produced has external characteristic (physical properties) and internal characteristic (structure properties) that difference from other characteristic that have on metal like iron, cuprum, aluminums and other. That occurrence has become wood is very unique than metal. Wood growth process consists of primary and secondary growth. From this process, wood tree can become more high and growth from diameter aspect. Wood tissue firmly form have more bigger volume compare with wood bark that source from divided cell moves to pitch that said if more fast from divided cell moves to pitch. Wood area divided to two that are sapwood and heartwood. Sapwood that near with bark is less compact from cell aspect if compare with heartwood that near with pith. This study examined the physical properties from one species of wood is Pulai (Alstonia angustiloba) from height aspect of tree (top, middle and bottom) and from growth ring (near bark and near pitch) of that tree. The physical test is from four ways that are density aspect, moisture content, specific gravity, and also shrinkage and swelling aspect. It is hoped that the values derived from this study can be a beneficial the suitability of wood for various uses.