

**PROPERTIES OF SCARF JOINT WITH DIFFERENT ANGLE
USING OIL PALM LUMBER AND KELEMPAYAN**

MOHD YUSMIZAN BIN AB MANAN

**Final Year Project Report Submitted in
Partial Fulfillment of the Requirements for the
Degree of Bachelor of Science (Hons.) Furniture Technology
in the Faculty of Applied Sciences
Universiti Teknologi MARA**

JANUARY 2015

ACKNOWLEDGEMENT

Alhamdulillah, First of all I would like to take this opportunity to express our special thanks to Allah S.W.T for blessing and strength rendered to me to complete my final year project the subject FSG 660 with title properties of scarf joint with different angles using oil palm lumber and kelempayan and also. Thanks to my beloved family that give me support and spirit to keep up with this study and encourage leading toward to success of this project. I would like to say my special thanks to my advisor for the project, Encik Fauzi bin Awang @ Othman for helping me at every phase of study who contributed the knowledge, time, and guidance until complete my thesis. Appreciation is also to extended to coordinator committee. Assc Prof. Madya Dr. Wan Mohd Nazri bin Wan Abdul Rahman as a lecturer for this subject who is helping to find the information and resources for my project paper. I would like to express my most sincere thanks to him. These thanks are also to extend our appreciation to those who are involved either directly or indirectly for completing this proposal. I believe, without their helps, I would not be able to complete this thesis.

TABLE OF CONTENT

	Page
ACKNOWLEDGEMENT	ii
TABLE OF CONTENT	iii
LIST OF TABLE	v
LIST OF FIGURE	vi
LIST OF ABBREVIATION	vii
ABSTRACT	viii
ABSTRAK	ix
CHAPTER 1 INTRODUCTION	
1.1 General	1
1.2 Problem Statement	3
1.3 Objective	4
CHAPTER 2 LITERATURE REVIEW	
2.1 General Review	5
2.2 Oil Palm	5
2.2.1 Characteristic of oil palm lumber	6
2.2.2 Properties of oil palm	7
2.2.3 Uses of oil palm	7
2.3 Kelempayan	8
2.3.1 Properties of kelempayan	8
2.3.2 Mechanical strength properties of Kelempayan	9
2.3.3 Uses of Kelempayan	9
2.3.4 Tree and Distribution	10

2.4	Jointing system	10
	2.4.1 Design of furniture jointing	11
	2.4.2 Scarf joint	11
	2.4.3 Structure of scarf joint	13
2.5	Polyvinyl Acetate	14

CHAPTER 3 METHODOLOGY

3.1	Sample Preparation	15
3.2	Method	16
	3.2.1 Preparation of scarf joint	16
3.3	Flowchart process	18
3.4	Bending testing	19
3.5	Compression testing	20
3.6	Experimental design	21
3.7	Statistical Significance Using ANOVA	22

CHAPTER 4 RESULTS AND DISCUSSIONS

4.1	Introduction	23
4.2	Strength properties of oil palm lumber and kelempayan with different angle	24
4.3	Comparison between Two Species with Different Angles in Compression Test	27
4.5	Comparison between Two Species with Different Angles in Bending Test	30

CHAPTER 5 CONCLUSION AND RECOMMENDATIONS

REFERENCES

APPENDIX

ABSTRACT

PROPERTIES OF SCARF JOINT WITH DIFFERENT ANGLE USING OIL PALM LUMBER AND KELEMPAYAN

The purpose of this study was to determine the suitability and strength properties of scarf joint for the species oil palm (*Elaeis guineensis*) and kelepayan (*Neolamarckia cadamba*). It has been tested on different cutting angles such as 30, 45, 60 and uses a type of polyvinyl acetate adhesive for both species. The samples were tested using the method of bending and compression using standard ASTM D7469. The results of this study show an angle of 30 species of oil palm and Kelepayan is the strongest compared to an angle of 45 and 60 in bending test. When comparing the two species of oil palm and Kelepayan, Oil palm is stronger than Kelepayan. For the compression test, the angle 60 is more resistant than an angle of 30 and 45 for both species. Therefore, the cutting angle 30 and 60 is suitable for used by industry because it is most resistant compared to the other angles following the furniture that want to produce. It can be concluded that species oil palm (*Elaeis guineensis*) and kelepayan (*Neolamarckia cadamba*) can be utilized for scarf joint in the production of furniture by using the appropriate angle.