STRENGTH PROPERTIES OF SANDWICH PANEL MADE FROM MEDIUM DENSITY FIBERBOARD AND CORRUGATD PAPERBOARD

AHMAD BASIRUN BIN ABDUL RASHID

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

JANUARY 2013

ACKNOWLEDGEMENT

Assalamu'alaikumwarahmatullahwabarakatuh.

Praise to Allah s.w.t. I am finally managed to finish this thesis through the time and obstacles. I would like to make a special dedication to Miss Ainul Munirah binti Abdul Jalil for her constructive comments and support. I am so much appreciating her concern and kindness for my progress. Nevertheless, I also would like to thank Mr. Amran bin Shafie for giving me support and help during this thesis completion. I also would like to thank Associate Prof. Dr. Wan Muhammad Nazri Wan Abdul Rahman as the project coordinator for his beneficial lessons and imperative views during my thesis completion. Last but not least, a special thanks to my family and my collegues for giving me morale support to complete this project. Thank you and may Allah s.w.t repays all your kindness.

TABLE OF CONTENTS

		Page
ACI	KNOWLEDGEMENTS	iv
	BLE OF CONTENTS	v
LIST	Γ OF TABLES	vii
LIS	Γ OF FIGURES	viii
LIS	Γ OF PLATES	ix
LIS	Γ OF ABBREVIATIONS	X
ABS	TRACT	xi
ABS	STRAK	xii
	APTER 1 INTRODUCTION	
1.1	Background of the study	1
1.2	Problem statement	3
1.3		4
	Limitation	4
1.5	Objectives	5
CII	A DODED A LUCED A TUDE DESCRESS	
	APTER 2 LITERATURE REVIEW	6
2.1	Corrugated paperboard 2.1.1 Definition	6
2.2		6 7
	2.1.2 Types of corrugated paperboard	
	2.1.3 Properties and utilization	8
2.2	Medium density fiberboard 2.2.1Definition	9
2.2		9
	2.2.2 Properties and usage of MDF	
2.3	Polyvinyl acetate 2.3.1 Definition	10 10
		10
2.4	2.3.2 Properties and usage	10
2.4	Sandwich panel 2.4.1 Definition	11
	2.4.1 Definition 2.4.2 Characteristics and utilization	11
2.5		12
2.5	Bending test	12
26	2.5.1 3-Point bending test Compression strength	12
2.6	1	
	2.6.1 Flatwise compression test	13
CH	APTER 3 METHODOLOGY	
3.1	Materials	14
3.2	Material preparation	14
5.2	3.2.1 Old corrugated container (OCC)	14

	3.2.2 Medium density fiberboard	15
	3.2.3 Polyvinyl acetate	15
3.3	Sandwich panel fabrication	15
	3.3.1 Corrugated core	15
	3.3.2 Skins	18
	3.3.3 Assembly	18
	3.3.4 Stacking	19
	3.3.5 Conditioning	20
	3.3.6 Cutting and trimming	21
3.4	Sandwich panel evaluation	23
	3.4.1 Test specimens	23
	3.4.2 Test procedures	24
3.5	Experimental design	26
3.6	Statistical analysis	26
CITA	DEED A DECLUTE AND DISCUSSION	
	APTER 4 RESULTS AND DISCUSSION	27
4.1	Statistical Analysis	27
4.2	Effects of the arrangement of corrugated core to bending strength	29 29
	4.2.1 Effects of the arrangement of corrugated core to MOR4.2.2 Effects of the arrangement of corrugated core to MOE	
4.3	8	30 31
4.3	Effects of the type of layer of corrugated core to bending strength 4.3.1 Effects of the type of layer of corrugated core to MOR	31
	4.3.2 Effects of the type of layer of corrugated core to MOE	32
4.4	Effects of the arrangement of corrugated core to MOE	33
4.4	4.4.1 Effects of the arrangement of corrugated core to maximum	33
	stress	33
	4.4.2 Effects of the type of layer of corrugated core to maximum	35
	stress	50
4.5	Failure effects of bending and compression to the sandwich panel	35
	Ç T	
CHA	APTER 5 CONCLUSION AND RECOMMENDATIONS	38
	TERENCES	39
APP	PENDICES	41
CUR	RRICULUM VITAE	46

ABSTRACT

STRENGTH PROPERTIES OF SANDWICH PANEL MADE FROM MEDIUM DENSITY FIBERBOARD AND CORRUGATED PAPERBOARD

This research was conducted to study the strength properties of sandwich panel made from medium density fiberboard and corrugated paperboard. The analysis carried out was based on the flexural bending and compression properties of the sandwich panel made from medium density fiberboard as the top and bottom facings or skins and also corrugated paperboard from old corrugated containers as the core. Overall, the sandwich panel fabricated from medium density fiberboard and corrugated paperboard showed significant relationship to the strength properties of sandwich panel based on the modulus of elasticity (MOE) and modulus of rupture (MOR) for bending and maximum stress for compression.