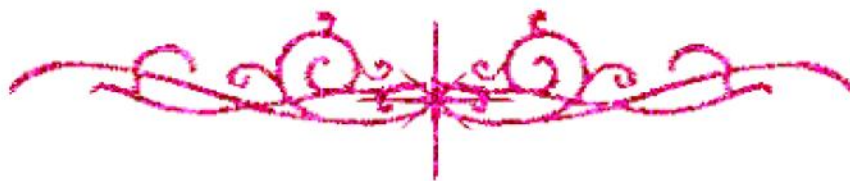


بسم الله الرحمن الرحيم





شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم



جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

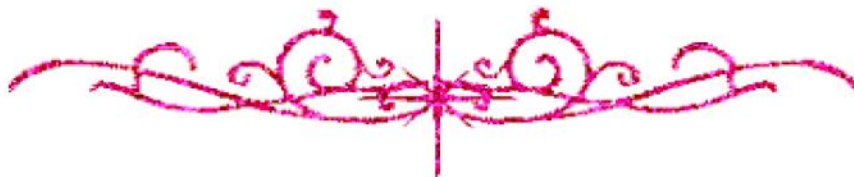
قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
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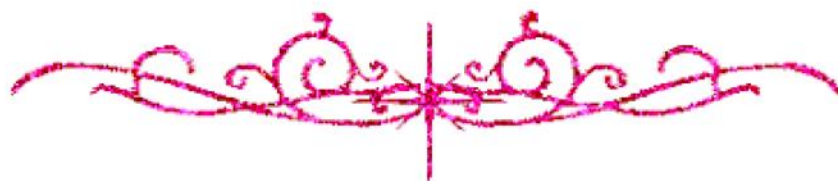


بعض الوثائق الأصلية تالفة





بالرسالة صفحات
لم ترد بالأصل





AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING
Mechanical Design and Production Department

***Study of the potentiality of manufacturing of MDF
from products of pruning of palms***

A thesis submitted in partial fulfillment of the requirements of the
Master of Science in Mechanical Engineering

(Mechanical Design and production Engineering)

By

Omar Abd elMoneim Ahmed Hassan

B.Sc., Mechanical Engineering, Design and Production Department
Ain Shams University, 2013

Supervised by

Prof. Dr. Hamed Ibrahim El-Mously

Dr. Abdel Baset A. Adam

Cairo – (2020)



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STATEMENT

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The author carried out the work included in this thesis and no part of it has been submitted for a degree or qualification at any other scientific entity.

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Abstract

This research investigates the potentiality of using date palm pruning products for production of medium density fiberboard (MDF) and suggests the possible applications for the produced MDF according to the achieved results. Chemical and physical characterization of three products of pruning forms of materials: the whole products of pruning: leaves (midribs and leaflets), midrib bases, fruit bunches and coir, palm midribs only and fruit bunches only, were evaluated on basis of chemical constituents of the defibrated materials and electron micrographs were taken for the defibrated forms of the three materials.

MDF samples with 12 mm thickness were produced from each of the three raw materials using two different resins for each material: urea-formaldehyde (UF) and polymeric diphenyl methane di-isocyanate (MDI) at two resin contents 10% and 12% for UF, while resin contents for MDI were 3% and 5%. The MDF samples for each material were studied for the main physical and mechanical properties. The average density produced was 0.723 g/cm^3 , the immersion of the specimens in distilled water for 24 hours showed an average swelling of 11%. Investigating the flexural strength of the specimens showed an average value for MOR of 24.4 N/mm^2 , while MOE showed an average of 2730 N/mm^2 with an internal bond strength of 0.89 N/mm^2 . These results indicate that it is technically feasible to use the products of pruning of date palms in the manufacture of MDF.

Keywords: Date palm (*Phoenix dactylifera* L), products of pruning, medium density fiberboard, MDF, SEM, midrib, fruit bunch

Contents

Chapter 1: Introduction.....	1
Chapter 2: Literature review	3
2.1. Definition of fiberboard	8
2.2. Medium density fiberboards range of applications	9
2.2.1. Interiors	11
2.2.2. Exteriors	11
2.2.3. Special purposes.....	12
2.3. MDF Materials.....	13
2.3.1. Date palm pruning products	13
2.3.2. Resin	18
2.3.3. Bonding in MDF	20
2.4. Manufacturing of fiberboard	20
2.4.1. Methods of manufacturing	21
2.5. Selection of research topic.....	27
Chapter 3: Objective and work plan.....	30
Chapter 4: Experimental work	31
.4.1 Materials	31
.4.1.1 Date palm pruning products	31
4.1.2. Chemicals	32
4.2. Preparation of DPPP	32
4.2.1. Size-reduction of the DPPP material	33
4.2.2. Soaking of DPPP.....	34
4.2.3. Defibration of DPPP.....	34
4.2.4. Resination of DPPP	35

4.2.5. Fiber forming and pre-pressing.....	36
4.2.6. Pressing of MDF.....	36
4.3. Characterization of DPPP fiber and medium density fiberboard.....	38
4.3.1. Microscopic investigation.....	38
4.3.2. Chemical analysis	38
4.3.3. Mechanical properties of DPPP MDF	39
4.3.4. Thickness swelling and water adsorption of DPPP MDF	39
4.4. Test samples preparation.....	39
4.5 Characterization of MDF sample.....	40
4.5.1. Mechanical properties of MDF.....	40
Chapter 5: Results and discussion.....	44
5.1. Characterization of date palm pruning products.....	44
5.1.1. Microscopic investigation.....	44
5.1.2. Chemical analysis	46
5.2 Characterization of MDF samples	48
5.2.1. Density.....	48
5.2.2. Physical properties of MDF	49
5.2.3. Mechanical properties of MDF.....	51
5.3. General discussion.....	56
Chapter 6: Conclusions.....	57
Chapter 7: Recommendations for future work.....	58
Appendix “1”	59
References.....	60

List of Abbreviations

DPPP	Date palm pruning products
EGP	Egyptian Pound
GDP	Gross domestic product
HDF	High density fiberboard
IB	Internal bond
MC	Moisture content
MDF	Medium density fiberboard
MDI	Methylene diphenyl diisocyanate
MF	Melamine formaldehyde
MOE	Modulus of elasticity
MOR	Modulus of rupture
	Melamine-modified urea
MUF	formaldehyde
PB	Particleboard
PF	Phenol formaldehyde
SEM	Scanning electron microscope
SG	Density
TS	Thickness swelling
UF	Urea formaldehyde
USD	United States Dollar
WA	Water absorption
WRV	Water retention value