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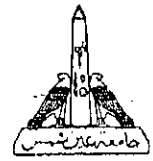

Ain Shams University

A STUDY ON THE APPROPRIATE CONDITIONS OF THE PRESS-CYCLE FOR THE MANUFACTURE OF PALM MIDRIB-CORE BLOCKBOARDS.

A THESIS
BY

MOATAZ SAAD EL-KINAWY
B. Sc. Mechanical Design & Production Engineering

Submitted in partial fulfillment of the requirements of the degree of
M. Sc. In Mechanical Design & Production Engineering.

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Statement

This dissertation is submitted in partial fulfillment for the degree of Master of Science in Mechanical Engineering, to Ain Shams University.

The work included in this thesis was carried out by the author at the laboratories of the Design and Production Engineering department, Ain Shams University.

No part of this thesis has been submitted for a degree or qualification at any other university.

Signature

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The undersigned certify that they have read and recommend to the Faculty of Engineering, Ain Shams University for acceptance a thesis entitled " A Study of the Appropriate Conditions of the Press-Cycle for the Manufacture of Palm Midrib-Core Blockboards.", submitted by Moataz Saad EL-Kinawy, in partial fulfillment of the requirements for the degree of Master of Science in Mechanical Engineering.

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A STUDY ON THE APPROPRIATE CONDITIONS OF THE PRESS-CYCLE FOR THE MANUFACTURE OF PALM MIDRIB-CORE BLOCKBOARDS.

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ABSTRACT

Due to shortage in local resources of wood, it is important to search for other resources that could substitute imported solid wood. Date palm leaves' midribs (DPLM) are available as a cheap secondary product resulting from annual pruning of palms.

Air-dried DPLM of known species were converted into strips of 8 x 12 mm cross-section, to be a substitute for the core layer of blockboard. Board specimens of 400 x 400 mm and 12 mm thick have been produced in a test rig under 3 different levels of pressure from 50 N/cm^2 to 100 N/cm^2 and 4 levels of pressing time from 5 to 15 min. and 3 levels of within the temperature range from 90°C to 120°C. The gluing process was conducted using Urea-formaldehyde as a resin and ammonium chloride as a hardener. The modulus of rupture (MOR) and the modulus of elasticity (MOE) in bending, compressive strength (Cs_{max}), tensile strength (Ts_{max}) and the glue bond strength (GBS) were determined. The results indicate that the strength properties of DPLM-core blockboards are comparable to those of the common Spruce-core blockboards. The results show also that, there is a specific set of pressing conditions at which the strength properties attain their highest level.

The aforementioned findings open the possibility of wide use of DPLM in core layer as a substitute of imported Spruce wood in blockboards. This could be a real support to the relatively new blockboard industry in Egypt.

Key words: Blockboard, CorePlywood, Date Palm Leaves' Midribs, Mechanical Properties.