

# Thermal Analysis of Horizontal and Vertical Falling Film Evaporators in MED Desalination System

By

**Mohamed Mahmoud Mohamed Ibrahim Abo-Aish**

A Thesis Submitted to the  
Faculty of Engineering at Cairo University

In Partial Fulfillment of the  
Requirements for the Degree of

**MASTER OF SCIENCE**

**In**

**Mechanical Power Engineering**

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**Under Supervision of**

**Prof. Dr. Abdalla Sayed Hanafi**

Mechanical Power Engineering Department  
Faculty of Engineering  
Cairo University

Dr. Galal Mostafa  
Mechanical Power Engineering  
Department  
Faculty of Engineering  
Cairo University

Dr. Omar Ahmed Huzayyin  
Mechanical Power Engineering  
Department  
Faculty of Engineering  
Cairo University

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Approved by the Examining Committee

**Prof. Dr. Abdalla Sayed Hanafi , Thesis Main Advisor**

Professor of Mechanical Power Engineering, Faculty of Engineering, Cairo University.

**Prof. Dr. Abdel-Wahed Fouad El-Dib**

Professor of Mechanical Power Engineering, Faculty of Engineering, Cairo University.

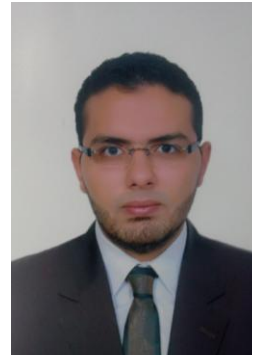
**Prof. Dr. Mahmoud Abdel-Fatah El-Kady**

Professor of Mechanical Engineering, Faculty of Engineering, Al Azhar University.

**FACULTY OF ENGINEERING, CAIRO UNIVERSITY  
GIZA, EGYPT**

**2016**

**Engineer:** Mohamed Mahmoud Mohamed Ibrahim Abo-Aish  
**Date of Birth:** 2 / 3 / 1988  
**Nationality:** Egyptian  
**E-mail:** [moh.aboish@yahoo.com](mailto:moh.aboish@yahoo.com)  
**Phone:** +2 01000875583  
**Address:** 306 El Sudan Street – El Mohandesen – Egypt  
**Registration Date:** 1 / 10 / 2010  
**Awarding Date:** / / 2016  
**Degree:** Master of Science  
**Department:** Mechanical Power Engineering  
**Supervisors:** Prof. Dr.Abdalla Sayed Hanafi  
Dr. Galal Mostafa  
Dr. Omar Ahmed Huzayyin



**Examiners:**

Prof. Dr. Abdalah Sayed Hanafi  
Prof. Dr. Abd Elwahed Fouad El-Dib  
Prof. Dr. Mahmoud Abd ElFatah El-Kady (Faculty of Engineering– Azhar University)

**Title of Thesis:**

Thermal Analysis of Horizontal and Vertical Falling Film Evaporators in MED  
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**Key Words:**

Falling film Evaporator, Horizontal Tubes Evaporator, Vertical Tubes Evaporator, Desalination, Thermo-Economic.

**Summary:**

The object of this study to Perform thermal analysis for horizontal and vertical falling film evaporators which used in Multiple Effect Distillation system under different operating conditions with variation of input parameters to investigate heat transfer area of each evaporator also focused on comparison between horizontal and vertical falling film evaporator to investigate the performance of each configuration under different operating conditions. Estimating the size required to fulfill the input heat load and comparing the capital costs of each evaporator configuration with using different profiles of tubes.

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

"وَمَا أُوتِيتُمْ مِنَ الْعِلْمِ إِلَّا قَلِيلًا" (٨٥) الإسراء

صدق الله العظيم

*"And of knowledge, you (mankind) have been given only a little",*

**Al-Isra', verse 85.**

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