FLOW REGIMES, THERMAL AND HUMIDITY PATTERNS IN VENTILATED ARCHAEOLOGICAL TOMB OF HOREMHEB, VALLEY OF THE KINGS, LUXOR

By

Eng. Ahmed Hamdi Abdel-Wahed Metwally Aggoor

A Thesis Submitted to the Faculty of Engineering at Cairo University in Partial Fulfilment of the Requirements for the Degree of MASTER OF SCIENCE

In

MECHANICAL POWER ENGINEERING

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Under Supervision of

Prof. Dr. Essam E. Khalil
Mechanical Power Engineering Department
Faculty of Engineering
Cairo University

Dr. Mohamed Aly Ibrahim
Mechatronics Engineering Department
Faculty of Engineering
October 6 University

Dr. Esmail EL-Bialy
Mechanical Power Engineering Department
Faculty of Engineering
Cairo University

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Approved by the Examining Committee

Prof. Dr. Essam E. Khalil	**Thesis Advisors and Member**
Prof. Dr. Mahmoud Ahmed Fouad	**Member**
Prof. Dr. Osama Ezzat Abdel-lattif Head of Department of mechanical power engineering at shobra faculty of engineering benha university	**Member**

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2015

Engineer: Ahmed Hamdi Abdel-wahed Metwally Aggoor

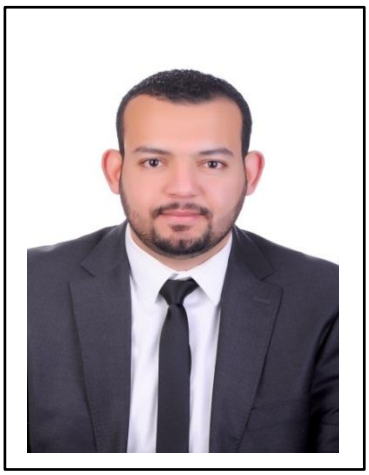
Date of Birth : 1 / 10 / 1988

Nationality : Egyptian

E-mail : ahmed_hamdi1988@yahoo.com

Phone. : 01007002396 - 01097930090

Address :



Registration Date : 01 / 10 /2012

Awarding Date :

Degree : Master of Science

Department : Mechanical Power Engineering

Supervisors : Prof. Dr. Essam E. Khalil Hassan Khalil

Dr. Mohamed Ali Ibrahem

Dr. Ismail Mohamed Ali El_Bialy

Examiners : Prof. Dr. Essam E. Khalil Hassan Khalil

Prof. Dr. Mahmoud Ahmed Fouad

Prof. Dr. Osama Ezzat Abdel-lattif

Head of Department of mechanical power engineering at shobra faculty of engineering benha university.

Title of Thesis:

FLOW REGIMES, THERMAL AND HUMIDITY PATTERNS IN VENTILATED ARCHAEOLOGICAL TOMB OF HOREMHEB, VALLEY OF THE KINGS, LUXOR

Key Words: **(**Thermal Comfort – Ventilation – KV "King Valley"**)**

Summary:

The discovery of the tomb of King Horemheb (KV57) is one of the greatest discoveries which were made before the discovery of the tomb of Tutankhamen (KV62) which was discovered on 25 February 1908. The tomb of Horemheb is another stage of the evolution of the royal tombs that is consist of two parallel axes. The present research targets to study the effect of mechanical ventilation systems on airflow patterns, in addition to relative humidity distribution and temperature inside the tomb KV57 and the thermal comfort prediction through this work was based on the PMV (Predicted Mean Vote) model and the PPD (Percentage Predicted Dissatisfied) model. The study was executed using computational fluid dynamics (CFD) simulation using a commercial CFD code. All mesh sizes that used in the present work went above 8,000,000 mesh volumes which allowed meaningful and better predictions of the flow regimes.

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