

# **NUMERICAL ANALYSIS OF INDOOR AIR QUALITY IN CLINICAL PHARMACIES**

**By**

**Eng.Rana Essam El-Din Khalil Hassan Khalil**

**A Thesis Submitted to the**

**Faculty of Engineering at Cairo University**

**in Partial Fulfilment of the**

**Requirements for the Degree of**

**DOCTOR of PHILOSOPHY**

**In**

**MECHANICAL POWER ENGINEERING**

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## **Title**

NUMERICAL ANALYSIS OF INDOOR AIR QUALITY IN CLINICAL PHARMACIES

## **Summary**

The present work describes and analyses the flow and heat transfer regimes inside Clinical Pharmacies through investigating a typical pharmacy. Five different design configurations of Clinical Pharmacies HVAC systems have been compared numerically to assess their agreement with international standards of clean room ventilation and airflow pattern requirements. It was concluded that the third configuration is the best in contaminant control. Numerical approach was utilized to adequately identify the airflow patterns, temperatures, relative humidity distributions and particle concentrations.

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