

UNIVERSITI TEKNOLOGI MARA

**PERFORMANCE OF A FREE
STANDING AIR-COOLED
CONDENSING UNIT IN A CONFINED
SPACE IN HOT AND HUMID
CLIMATES**

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Thesis submitted in fulfillment
of the requirements for the degree of
Master of Science

Faculty of Mechanical Engineering

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledge as referenced work. This thesis has not been submitted to any other academic institution for any other degree or qualification.

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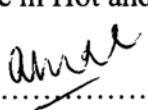
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ABSTRACT

The purpose of the research is to analyze the performance of free standing air-cooled condensing unit in a confined space under hot and humid environment. The performance is measured based on the on coil temperature, which determines the capability of air cooled condenser to operate under limited air circulation as this will affect the final outcome of performance of the evaporator unit (cooling coil). The work was initially carried out based on a single condenser unit and using the validated computational fluid dynamic (CFD) model to investigate a multi-storey building. From the result, the size of a confined space of 2m X 3.3m X 1m for 6 storey building with 4 meters protruding wall is sufficient to maintain the on-coil temperature within 10°C against the ambient temperature of 33.5°C. The outcome of the research can be used as a guide for designing a space for condenser to be installed outside the building.

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