

REFRIGERATION STUDY FOR DOMESTIC APPLICATION

ANIZAN BIN WAN RAMLI

A report submitted in partial fulfillment of the requirements for the award of the degree
Bachelor of Mechanical Engineering

Faculty of Mechanical Engineering
UNIVERSITI MALAYSIA PAHANG

NOVEMBER 2008

SUPERVISOR’S DECLARATION

We hereby declare that we have checked this project and in our opinion this project is satisfactory in terms of scope and quality for the award of the degree of Bachelor of Mechanical Engineering

Signature :

Name of Supervisor: Mohd Yusof bin Taib

Position : Lecturer

Date :

Signature :

Name of Panel :

Position :

Date :

STUDENT'S DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged. The thesis has not been accepted for any degree and is not concurrently submitted for award of other degree.

Signature :

Name : Anizan bin Wan Ramli

ID Number: MA05030

Date :

To my beloved father and mother,

Mr Wan Ramli bin Wan Abdul Rahman

Mdm Jariah binti Mohamad

ACKNOWLEDGEMENTS

Alhamdulillah, I would like to take this opportunity to express my deepest gratitude to Allah because of His willingness to give strength and will for me to finish this project successfully. First and foremost, many warm thanks to my supervisor Mr Yusof bin Taib for his constant help, support and guidance which has steered me to finish my project. His enthusiasm and professional works has motivated me whenever I feel down while doing my project. Whenever I really need help, he always provide me with his help and ideas which helped me overcome the difficulties in doing my project. I am very grateful for his willing helping me without asking for a repay

My sincere thanks go to all my friends, the staff of the Mechanical Engineering Department, UMP, who helped me in many ways and made my stay at UMP pleasant and unforgettable. Many special thanks go to my colleagues in M16, M17, M20, M23 and all mechanical students in UMP for their excellent co-operation, inspirations and supports during this study.

I acknowledge my sincere indebtedness and gratitude to my parents for their love, dream and sacrifice throughout my life. I cannot find the appropriate words that could properly describe my appreciation for their devotion, support and faith in my ability to attain my goals. Special thanks should be given to my committee members. I would like to acknowledge their comments and suggestions, which was crucial for the successful completion of this study.

ABSTRACT

Refrigeration, cooling, and heating processes are important in a variety of everyday situations, including the air conditioning and heating of buildings, and in a treatment, transportation, and preservation of foods and beverages. Refrigeration also finds large scale industrial application, for example, in the manufacture of ice and the dehydration of gases. This paper gives an understanding of refrigeration study for domestic application. By learning and understanding the basic vapour-compression refrigeration systems, the performance of refrigeration system expected can be determined using refrigerator test rig. The literature study has been conducted by two important parameters in order to analyze performance of the refrigerator. These parameters are pressure and temperature. The literature study is crucial at the location of parameter on the test rig that will be develop. This paper also describes procedure to fabricate the test rig. Then, the refrigerator test rig will test in order to analyse the performance of the refrigerator test rig. The performance of the refrigerator test rig analyse by the using the actual pressure-enthalpy diagram of actual refrigeration cycle and by using the equation. This study may help the audience to analyze the actual performance of the refrigerator performance for domestic application.

ABSTRAK

Penyejukan, pendinginan dan pemanasan adalah proses yang penting dalam pelbagai situasi setiap hari, termasuklah penghawa dingin dan pemanasan bangunan dan dalam rawatan, pengangkutan dan pengekalan kualiti makanan dan minuman. Penyejukan digunakan secara meluas dalam aplikasi perindustrian, contohnya dalam pembuatan ais dan dehidrasi gas. Kertas kerja ini memberi pemahaman dalam kajian untuk penggunaan domestik. Melalui pembelajaran dan pemahaman asas kemampuan wap sistem penyejukan, kecekapan sistem penyejukan yang dijangka boleh ditentukan menggunakan pengendali ujian peti ais. Kajian kesusasteraan telah dibimbing oleh dua parameter penting dalam mengkaji kecekapan sesebuah peti ais. Parameter-parameter tersebut adalah tekanan dan suhu. Kajian kesusasteraan genting di lokasi parameter pada pengendali ujian peti ais yang akan dibuat. Kertas kerja ini juga menghuraikan prosedur untuk membuat the pengendali ujian. Kemudian, pengendali ujian peti ais akan diuji untuk analisis kecekapan pengendali ujian peti ais tersebut. Kecekapan pengendali ujian peti sejuk dianalisis menggunakan gambar rajah tekanan-entalpi sebenar bagi putaran penyejukan dan menggunakan persamaan. Kajian ini dapat membantu masyarakat untuk analisis kecekapan sebenar bagi sesebuah peti ais untuk aplikasi domestik.

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LIST OF SYMBOLS

\dot{m}	Mass flow rate
\dot{Q}_L	Refrigeration capacity
\dot{Q}_H	Heating capacity
Q_H	Heat rejection in a condenser
Q_L	Refrigerant effect
P	Pressure
V	Volume
R	Gas constant value
T	Temperature
P	Compressor power
W	Work done
h	Enthalpy value
W_{comp}	Work of compressor
V	Voltage

LIST OF ABBREVIATIONS

ANSI	American National Standards Institute
ARI	Air Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigeration, Air Conditioning Engineers
COP	Coefficient of Performance
UMP	Universiti Malaysia Pahang