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THE DESIGN OF ADSORPTION AIR CONDITIONING
SYSTEM FOR CAR

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ABSTRACT

Air conditioning system is based on the principle of body comfort. This principle has to consider the factors that affect body comfort. The operation cycle is due to the principle of absorption heat from ambience and suit the temperature to the body comfort requirement. The refrigerant is used as a media of absorbing the heat. A conventional air conditioner usually consist of four basic equipment i.e. evaporator, condenser, compressor or generator and expansion valve. The compressor is used in vapor compression air conditioning system whilst the generator which includes an absorber is used in absorption air conditioning system.

Absorption air conditioning system is using the principle of absorbing the low pressure vapor into an appropriate absorbing liquid. Embodied in the absorption process is the conversion of vapor into liquid; since this process is similar to condensation, heat must be rejected during the process. The next step is to elevate the pressure of the liquid with a pump, and the final step releases the vapor from the absorbing liquid by adding heat. This is occurred in the generator.

In the analysis of the absorption air conditioning system, the objective is to produce a required low temperature of $50^{\circ}F$ ^(10°C) in the evaporator. The saturation vapor pressure of an hydrous ammonia at this temperature is 30 psia ^(0.206 atm). The temperature of the absorber is the atmospheric temperature which is assumed to be $86^{\circ}F$ ^(30°C). Thus in the absorber there is an aqua ammonia mixture ^(0.21 atm) at temperature of $86^{\circ}F$ with the partial pressure of ammonia vapor at 45 psia .

The using of British Standard Imperial unit is because most of our references are in that unit.

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CONTENT

PAGES

Preface	i
Acknowledgement	ii
Contents	iii
1.0 GENERAL INTRODUCTION	1
2.0 BASIC THEORY OF AIR-CONDITIONING SYSTEM	3
2.1 Heat	3
2.1.1 Sensible heat	3
2.1.2 Specific heat ⁴	4
2.1.3 Cold	4
2.2 Body comfort	5
2.3 The body reject heat.	5
2.3.1 Convection.	5
2.3.2 Radiation	6
2.3.3 Evaporation	6
2.4 Conditions that affect body comfort	7
2.4.1 Temperature	7
2.4.2 Humidity	7
2.4.3 Air movement	7

3.0 REFRIGERANT	9
3.1 Introduction	9
3.2 Characteristics of the refrigerant-Absorbent pair	9
3.3 Working Substances	11
4.0 ABSORPTION AIR CONDITIONING SYSTEM	12
4.1 Introduction	12
4.2 Basic component	12
4.2.1 Generator	12
4.2.2 Rectifier	13
4.2.3 Heat exchanger	13
4.2.4 Condenser	14
4.2.5 Expansion Valve	14
4.2.6 Evaporator	14
4.3 Refrigerant	15
4.4 Relation of the absorption to vapor-compression cycle	17
4.4.1 Advantages of the Absorption System over Vapor-compression System	18
4.5 The absorption cycle	19
4.6 Basic Absorption Air conditioning cycle operation	20
4.8 Theory of a Simple Absorption Air-conditioning System	22
4.8.1 Heat Balance in the Generator	24
4.8.2 Heat Balance in the Absorber	25
4.9 Applications	26