SOLAR THERMAL COLLECTOR AIR CONDITIONING SYSTEM USING NANOFLUID

A PROJECT REPORT

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BONAFIDE CERTIFICATE

Certified that this project report titled **"SOLAR THERMAL COLLECTOR AIR CONDITIONING SYSTEM USING NANOFLUID"** is the bonafide work of **"DEEPAK SHARMA, SMITHA MURALIDHARAN and SAURAV DAS",** who carried out the project work under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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ABSTRACT

Air conditioning and refrigeration demand is rapidly increasing in many parts of the world, especially in moderate climatic regions. Air conditioners and refrigerators are the only equipment that consume more than 70% of the entire electricity usage in a household. This results in a dramatic increase in electricity demand on hot summer days, which causes an unwanted increase in the use of fossil fuel and nuclear energy, which in turn, leads to global warming and air pollution. This project aims to make use of solar thermal energy in air conditioning systems and reduces the power consumption of the compressor. In this system, work done by the compressor is decreased using solar thermal collectors for heating the refrigerant R-134a contained in a double pipe arrangement with the nanofluid circulated in the outer tube. The refrigerants temperature increases due to the thermal conductivity property possessed by the Al_2O_3/water nanofluid which comprises of nanoparticles having size less than 50nm dispersed in a base fluid of water. During this study, atmospheric temperature, fluid temperature at the collector and the temperature at compressor were measured to investigate the COP of the system.

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LIST OF SYMBOLS

Symbols	Symbol Description
F	Fahrenheit
Btu	British Thermal Unit
lb	Pound
PSI	Pounds per square inch
H	Enthalpy
℃	Degree Celsius