

# Testing of Peltier Module in Desert Cooler

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**Abstract**— In this manuscript, This design and fabrication of desert cooler with certain modifications so that it can be used as low cost air conditioner. The cooling in conventional cooler is done along Wet Bulb Temperature line that reduces Dry Bulb Temperature but simultaneously it increases specific humidity. This paper aims to reduce this humidity with the use of peltier module. This system provides better results than that of conventional cooler. The only disadvantage observed; is long time required to get the desired cooling effect.

**Keywords:** Desert Cooler, Peltier Module, Dry Bulb Temperature, Wet Bulb Temperature

- 6) 12v dc water pump
- 7) Heat sink
- 8) Thermal pest
- 9) Pvc pipe
- 10) coupling

## I. INTRODUCTION

A desert cooler is a device that cools air through the evaporation of water. The temperature of dry air can be dropped significantly through the phase transition of liquid water to water vapour (evaporation), which can cool air using much less energy than refrigeration. The air supplied by the conventional air cooler is generally 80–90% relative humidity; very humid air reduces the evaporation rate of moisture. High humidity in air causes corrosion. The only two mechanical parts in most basic evaporative coolers are the fan motor and the water pump which requires very low maintenance. This paper presents a peltier module driven dehumidification system to control humidity in traditional cooling system. It is low cost and low power consumption system that can find a wide range of applications in urban as well as rural areas.

## II. COMPONENT OF DESERT COOLER

To make desert cooler following component required

- 1) Peltier module
- 2) 12v with variable amperes power sources
- 3) Cooling pad
- 4) Angle frame
- 5) 12 v dc fan with 9 inch blade

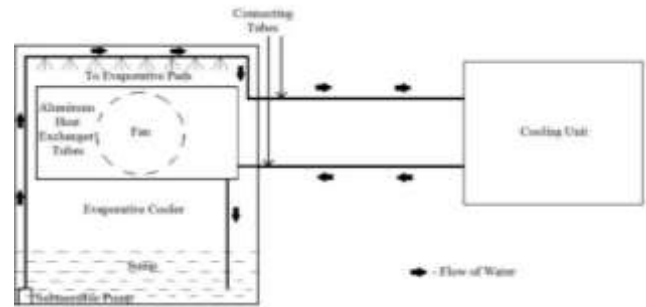


Fig. 1: basic diagram of desert cooler

## III. MAKING OF DESERT COOLER USING PELTIER

In this cooler as basic diagram shown component are connected

First weld angle frame as a box shape then arrange pvc pipe line on cooling pad and drip droplet on cooling pad, bind cooling pad to this box a water pump connect between peltier module heat exchanger and pvc outlet heat exchanger mean heat sink are connect to peltier module using thermal pest and connect supply to 12 v power sources as well as fan and water pump connect to power supply

## IV. WORKING

When start dc supply at moderate current then pump start to pump water toward heat exchanger and peltier module heat one side and cool another side so by using cool side we cool water and this water are circulate through pvc pipe on cooling pad this cooling pad when wet then fan extract air from cooling pad this cooling pad are made by honey comb its make moisture in air more so we get cool air having aprox low temperature 18°C

## V. OBSERVATION DURING TEST OF PELTIER IN DESERT COOLER

Sr No.	Test at different ampers connect to peltier at normal fan speed with in 5 min time period	Normal Temperature before connect supply to peltier	Temperature after connect peltire	observation
1	2 amp	30°C	28°C	At 2 amp 12 v efficiency low
2	5 amp	30 °C	25 °C	At 5 amp 12 v fast cooling get

## VI. ADVANTAGES

- Advantages of using Peltier in desert cooler
- It is readily available. It is produce a powerful clean energy source.
- It doesn't produce harmful gases like cfc
- It produce Low emission, environment is not a pollutant.
- It's we can run on renewable energy source and bountiful in supply.
- It's far more efficient than normal desert cooler
- It practically a clean energy source.

## VII. DISADVANTAGES

- Disadvantages of using Peltier in desert cooler
- It is expensive. While widely available, it is expensive.

## VIII. APPLICATION

- Automobile vehicle: automobile vehicle like bus, cars, bikes, are require ac so traditional ac we can replace by this peltier module
- Industries application: In small scale as well as large scale industry
- Cold storage: to store preservative element near 18 to 20 °c temperature
- For home cooling purpose we use this type of cooler

## IX. CONCLUSION

In this paper From above we conclude that Peltier Module In Desert Cooler are increase performance of traditional desert cooler, this increase efficiency 10% more than normal cooler so its a type of heat exchanger by using this we get faster cooling in desert cooler

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