

Department : **Mechanical**

Year : **2016-2017**

Group No: **23**

Guided By

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### **Project Title**

### **PASSIVE SOLAR STILL WITH ENERGY ABSORBING MATERIAL**

#### **Abstract:**

Solar still is a simple device which can convert available waste or brackish water into portable fresh water by utilising solar energy. In present research work, an attempt has been made to store excess heat energy in solar stills during the day times for the continuation of the process at late evening and night hours for increment distillate output. To investigate the effect of energy storage materials on the productivity under the same climate conditions, three same size single basin single slope, solar still with the area of 1m<sup>2</sup> made of galvanised sheet and tested with 0.04 m of layer of water level to investigate effects on solar still. A different energy storage materials like marble pieces and sandstones used for easy availability and lower price. It has found that, sand stones are more productive compared with marble pieces and without materials inside solar still.

The simplest and easily accessible type of solar distillation is passive solar still which utilizes freely and abundantly available sun energy for removal of impurities from brackish water. The main drawback of passive solar still is its lower efficiency and distillation outputs. Different designs of passive solar still are fabricated and tested by various researchers to meet water demand economically. Double basin solar still is showed by an average of 85 % higher yield than passive solar still.

Despite large efforts carried out on passive solar distillation, there are some challenges like bulkiness, high initial cost, and optimization of spacing between condensing cover and water surface of inclined still, thermo-physical properties on basin materials, flow rate, insulation material and its thickness, which need to be improved to make this technique efficient in practical utilization. this review paper mainly presents the results of previous work carried out on the designs, operational and process parameters affecting distillation, cost analysis, further scope of improvement in preceding work along with their limitations. The decade reviews on solar stills based on different context authored by many researchers have also been summarised. Moreover, this review paper will help the researchers to understand the basics of solar still with the need, developments and challenges in passive solar distillation to improve its thermal performance.

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