

THERMAL EVALUATION OF SOLAR WATER DESALINATION SYSTEM WITH EVACUATED TUBES

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ABSTRACT

A solar still coupled with evacuated tube collector was designed and developed for distillation of water. As the wind velocity increased, the convective heat loss from glass cover to ambient increased, hence the glass cover temperature decreased which helped to increase the water glass cover temperature difference thereby the overall yield increased. Heat loss coefficient increases until it reaches maximum in solar noon due to high temperature difference between the inside still and the ambient temperature at this time, then it decreased at afternoon. The average internal heat transfer coefficient i.e. convective, radiative and evaporative was found to be 3.7, 8.33, 99.24 W/m²K, respectively. The external heat transfer coefficient such as average overall top heat loss coefficient was found to be 9.92 W/m²K as compared to bottom heat loss coefficient 0.31 W/m²K. Therefore distillate yield was found to be maximum.

KEYWORDS: Evacuated Tubes, Heat Transfer Coefficients, Heat Transfer Rate, Solar Still