



“Gheorghe Asachi” Technical University of Iasi, Romania



WATER RECOVERY FROM ATMOSPHERIC AIR USING WICK DESICCANT SOLAR STILL

Abd elnaby Kabeel

*Mechanical Power Engineering Department, Faculty of Engineering, Tanta University, Tanta, Egypt
E- mail: Kabeel6@f-eng-tanta.edu.eg; Phone: 00201001543587; Fax.: 0020403453860*

Abstract

The atmospheric air is considered a large and renewable source of fresh water. The present work investigates the application of solar energy to heat wick clothes impregnated with calcium chloride to extract water from atmospheric air. A wick desiccant solar collector is erected at Tanta – Egypt for this purpose. The desiccant concentration at the beginning of regeneration is determined according to the climatic conditions. The saturated wick desiccant is exposed to an ambient atmosphere to absorb water vapor at night. At the sunshine period, the solar still is covered with glass cover. The desiccant is regenerated and the water vapor is arisen from the wick. Due to the temperature difference across the cover, the raised vapor is condensed on the glass cover inner surface. The experimental results showed that, the wick type solar still is considered a cheap, powerless and effective method to collect water from moist air. This method provides up to 1.4 liter of fresh water per square meter of glass cover per day. An economic study for this type of wick stills will be a matter of interest.

Key words: desiccant system, solar energy, solar still, water from air

Received: February, 2012; Revised final: September, 2012; Accepted: October, 2012
