

Effect of the Tilt Angle of Natural Convection in A Solar Collector with Internal Longitudinal Fins

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Abstract

We present in this paper, a series of experimental tests carried out on a solar plan, with an area of 1.8236 m² capture, designed in the laboratory and tested in the region of Biskra. The complete experimental setup includes the measurement of global solar radiation, wind speed, airflow velocity and temperature and the ambient air at the inlet and outlet; optimize a tilt angle. The solar collector was oriented facing south Renewable and domestic energy source, and is essential components of a sustainable energy future. This paper deals with the influence of the tilt angle of solar collectors. The optimum angle is measured by searching for the values for which the total radiation on the collector surface is a maximum for a particular day or a specific period. An application of the model is done using the experimental data measured for Biskra in Algeria. For increasing the utilization efficiency of solar collectors, it is recommended that, if it is possible, the solar collector should be mounted at the monthly average tilt angle, and the slope adjusted once a month.

Keywords : Solar tilt angle; solar intensity; heat transfer.

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