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PERFORMANCE EVALUATION OF SOLAR COLLECTORS USING A SOLAR SIMULATOR

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Abstract

Solar water heating systems is one of the applications of solar energy. One of the components of a solar water heating system is a solar collector that consists of an absorber. The performance of the solar water heating system depends on the absorber in the solar collector. In countries with unsuitable weather conditions, the indoor testing of solar collectors with the use of a solar simulator is preferred. Thus, this study is conducted to use a multilayered absorber in the solar collector of a solar water heating system as well as to evaluate the performance of the solar collector in terms of useful heat of the multilayered absorber using the multidirectional ability of a solar simulator at several values of solar radiation. It is operated at three variables of solar radiation of 400 W/m², 550 W/m² and 700 W/m² and using three different positions of angles at 0 degrees, 45 degrees and 90 degrees. The results show that the multilayer absorber in the solar collector is only able to best adapt at 45 degrees of solar simulator with different values of radiation intensity. At this angle the maximum values of useful heat and temperature difference are achieved.

Keywords

Author Keywords: solar water heating system; solar collector; multilayered absorber; solar simulator; solar radiation

KeyWords Plus: HOT-WATER SYSTEMS; ENERGY

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