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The Effect of Global Solar Radiation on the Thermal and Thermohydraulic Performance of Double Flow Corrugated Absorber Solar Air Heater

Authors : Suresh Prasad Sharma, Som Nath Saha

Abstract : This paper deals with the effect of Global Solar Radiation (GSR) on the performance of double flow solar air heater having corrugated plate as an absorber. An analytical model of a double flow solar air heater has been presented, and a computer program in C++ language has been developed to calculate the outlet air temperature, heat gain, pressure drop for estimating the thermal and thermohydraulic efficiencies. The performance of double flow corrugated absorber is compared with double flow flat plate and conventional solar air heaters. It is found that the double flow arrangement effectively increases the air temperature rise and efficiencies in comparison to a conventional collector. However, corrugated absorber is more superior to that of flat plate double flow solar air heater. The results indicate that increasing the solar radiation leads to achieve higher air temperature rise and efficiencies.

Keywords : corrugated absorber, double flow, flat plate, solar air heater
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