

Performance Analysis of Solar Air Heater with Fins and Perforated Twisted Tape Insert

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Abstract : The present paper deals with the analytical investigation on the thermal and thermo-hydraulic performance of the solar air collector fitted with fins and perforated twisted tapes (PTT) of twist ratio 2 with different axial pitch ratio. The mathematical models are presented, and the effect of mass flow rate and axial pitch ratios on the thermal and effective efficiency has been discussed. The results obtained are compared with the results of the solar air heater without fins and twisted tapes. Results conveyed that the collectors with fins and perforated twisted tape perform better but at the expense of increased pressure drop. Also, twisted tape with minimum axial pitch ratio is found to be more efficient than others.

Keywords : solar air heater, thermal efficiency, twisted tape, twist ratio

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