

## Exergy Based Performance Analysis of Double Flow Solar Air Heater with Corrugated Absorber

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**Abstract :** This paper presents the performance, based on exergy analysis of double flow solar air heaters with corrugated and flat plate absorber. A mathematical model of double flow solar air heater based on energy balance equations has been presented and the results obtained have been compared with that of a conventional flat-plate solar air heater. The double flow corrugated absorber solar air heater performs thermally better than the flat plate double flow and conventional flat-plate solar air heater under same operating conditions. However, the corrugated absorber leads to higher pressure drop thereby increasing pumping power. The results revealed that the energy and exergy efficiencies of double flow corrugated absorber solar air heater is much higher than conventional solar air heater with the concept involving of increase in heat transfer surface area and turbulence in air flow. The results indicate that the energy efficiency increases, however, exergy efficiency decreases with increase in mass flow rate.

**Keywords :** corrugated absorber, double flow, exergy efficiency, solar air heater

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