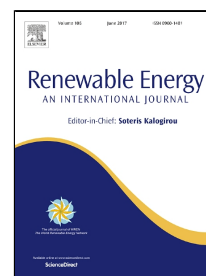


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Thermohydraulic performance analysis of an arc shape wire roughened solar air heater

Mukesh Kumar Sahu, Radha Krishna Prasad



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Highlights

- A comprehensive theoretical analysis to evaluate thermal (η_{th}) and thermohydraulic (η_{eff}) efficiency of arc shaped roughened solar air heater has been done.
- η_{th} and η_{eff} were found to be 79.84 % and 75.24 % respectively at rib height-to-duct hydraulic diameter ratio $e/D = 0.0422$ and flow-attack-angle $\alpha/90 = 0.3333$ and Rib pitch-to-height ratio $P/e = 10$.
- The maximum values of η_{eff} with temperature rise parameter $\Delta T/I$ have been optimized.
- Thermal Efficiency Improvement Factor (TEIF) of various roughness geometries has been compared.

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