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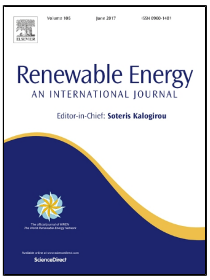

Thermohydraulic performance analysis of an arc shape wire roughened solar air heater

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PII:	S0960-1481(17)30161-1
DOI:	10.1016/j.renene.2017.02.075
Reference:	RENE 8582
To appear in:	*Renewable Energy*
Received Date:	30 September 2016
Revised Date:	14 January 2017
Accepted Date:	24 February 2017

Please cite this article as: Mukesh Kumar Sahu, Radha Krishna Prasad, Thermohydraulic performance analysis of an arc shape wire roughened solar air heater, *Renewable Energy* (2017), doi: 10.1016/j.renene.2017.02.075

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.