

Accepted Manuscript

Experimental investigation on heat transfer and pumping power of forced circulation flat plate solar collector using heat transfer enhancer in absorber tube

K. Balaji, S. Iniyan, V. Muthusamyswami

PII: S1359-4311(16)31681-7

DOI: <http://dx.doi.org/10.1016/j.applthermaleng.2016.09.074>

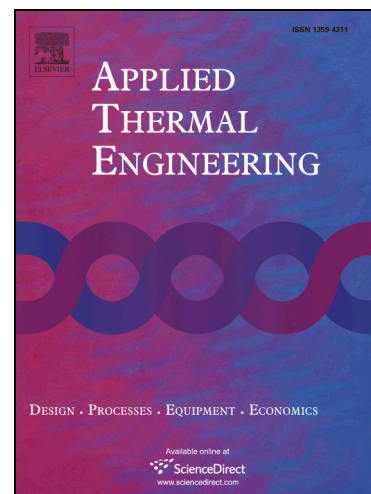
Reference: ATE 9099

To appear in: *Applied Thermal Engineering*

Received Date: 30 April 2016

Revised Date: 25 August 2016

Accepted Date: 14 September 2016



Please cite this article as: K. Balaji, S. Iniyan, V. Muthusamyswami, Experimental investigation on heat transfer and pumping power of forced circulation flat plate solar collector using heat transfer enhancer in absorber tube, *Applied Thermal Engineering* (2016), doi: <http://dx.doi.org/10.1016/j.applthermaleng.2016.09.074>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Experimental investigation on heat transfer and pumping power of forced circulation flat plate solar collector using heat transfer enhancer in absorber tube

K. Balaji^a, S. Iniyan^{a*}, V. Muthusamyswami^b,

^amr.kbalaj@gmail.com, ^{a*}iniyan777@hotmail.com, ^bswami@fsec.ucf.edu

^a Dept. of Mechanical Engineering, Anna University, Chennai 600 025, India

^b Florida Solar Energy Center, University of Central Florida, Cocoa, FL-32922, USA

Abstract

This paper experimentally investigates the performance of an absorber tube with heat transfer enhancer in solar flat plate water heater. The objective of the work is to increase the convective heat transfer by reducing the cross sectional area between the absorbing fluid and inner wall of the tube. The heat transfer enhancers are frictionally engaged with the inner side of the tube wall, and it is kept in the axial flow direction of the fluid flow path. Two types of heat transfer enhancers, namely, rod heat transfer enhancer and tube heat transfer enhancer, are used herein and compared with each other. The efficiency, heat transfer coefficient and pumping power for flat plate solar collector were analyzed, and it was found that, the rod heat transfer enhancer provides higher heat transfer with a small increase in pumping power than tube heat transfer enhancer and plain tube flat plate solar collector. The maximum increase in pumping power is 1.081 and 1.044 times higher for rod and tube heat transfer enhancers respectively, compared to plain tube solar collector.

Keywords: Flat plate solar collector, absorber tube, heat transfer enhancer, thermal performance

Download English Version:

<https://daneshyari.com/en/article/4991701>

Download Persian Version:

<https://daneshyari.com/article/4991701>

[Daneshyari.com](https://daneshyari.com)