

Accepted Manuscript

Influences of Corrugation Profiles on Entropy Generation, Heat Transfer, Pressure Drop, and Performance in a Wavy Channel

M. Akbarzadeh, S. Rashidi, J.A. Esfahani

PII: S1359-4311(16)31960-3
DOI: <http://dx.doi.org/10.1016/j.applthermaleng.2017.01.076>
Reference: ATE 9840

To appear in: *Applied Thermal Engineering*

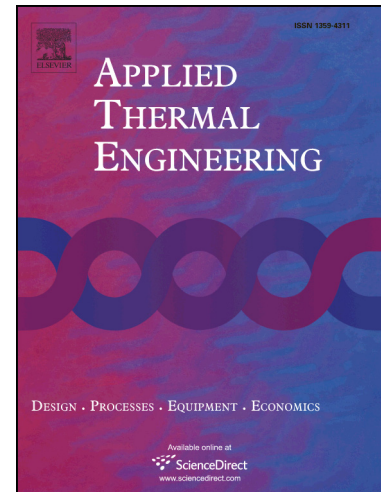
Received Date: 27 September 2016

Revised Date: 26 December 2016

Accepted Date: 21 January 2017

Please cite this article as: M. Akbarzadeh, S. Rashidi, J.A. Esfahani, Influences of Corrugation Profiles on Entropy Generation, Heat Transfer, Pressure Drop, and Performance in a Wavy Channel, *Applied Thermal Engineering* (2017), doi: <http://dx.doi.org/10.1016/j.applthermaleng.2017.01.076>

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.



Influences of Corrugation Profiles on Entropy Generation, Heat Transfer, Pressure Drop, and Performance in a Wavy Channel

M. Akbarzadeh, S. Rashidi and J.A. Esfahani*

Department of Mechanical Engineering, Ferdowsi University of Mashhad, Mashhad 91775-1111, Iran

*corresponding author e-mail: abolfazl@um.ac.ir

Abstract:

A numerical simulation is performed on entropy generation and thermo-hydraulic performance of a wavy channel with three corrugation profiles. Sinusoidal, trapezoidal, and triangular shapes are considered as corrugation profiles for wavy walls of channel. The influences of these profiles and Reynolds numbers on entropy generation and thermo-hydraulic performance of a wavy channel are discussed in details. Moreover, the results of wavy channel are compared with straight one. Simulations are performed for the Reynolds numbers in the range of 400–1400. Governing equations are discretized by using a finite volume method (FVM) and SIMPLE algorithm. It was found that among wavy channels, the triangular channel provides the highest thermal entropy generation and follows by the sinusoidal and trapezoidal channels. There are 111%, 100%, and 116% decrements in thermal entropy generation for sinusoidal, trapezoidal, and triangular channels, respectively at Reynolds number between 400 to 1400. Finally, it is recommended to use a sinusoidal wall in a channel due to the high performance and low entropy generations.

Keywords: Wavy wall; Sinusoidal wall; trapezoidal wall; triangular wall; Entropy generation; Performance

Nomenclature

Download English Version:

<https://daneshyari.com/en/article/4991440>

Download Persian Version:

<https://daneshyari.com/article/4991440>

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