

Accepted Manuscript

An experimental investigation of heat transfer enhancement in minichannel:
Combination of nanofluid and micro fin structure techniques

Ji Zhang, Yanhua Diao, Yaohua Zhao, Yanni Zhang

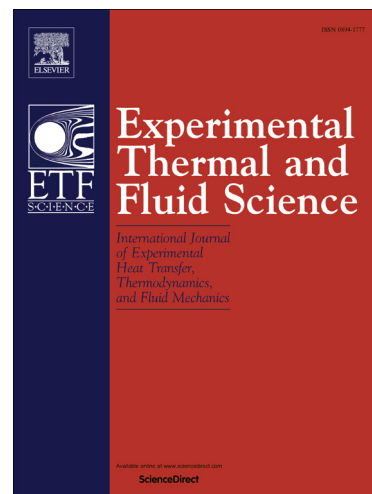
PII: S0894-1777(16)30273-4
DOI: <http://dx.doi.org/10.1016/j.expthermflusci.2016.10.001>
Reference: ETF 8887

To appear in: *Experimental Thermal and Fluid Science*

Received Date: 23 April 2016
Revised Date: 22 September 2016
Accepted Date: 2 October 2016

Please cite this article as: J. Zhang, Y. Diao, Y. Zhao, Y. Zhang, An experimental investigation of heat transfer enhancement in minichannel: Combination of nanofluid and micro fin structure techniques, *Experimental Thermal and Fluid Science* (2016), doi: <http://dx.doi.org/10.1016/j.expthermflusci.2016.10.001>

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.



An experimental investigation of heat transfer enhancement in minichannel: combination of nanofluid and micro fin structure techniques

Ji Zhang ^{a,b,c}, Yanhua Diao ^{b,*}, Yaohua Zhao ^b, Yanni Zhang ^b

^a Key Laboratory of Hydroelectric Machinery Design & Maintenance, China Three Gorges University, Yichang 443002, China

^b Department of Building Environment and Facility Engineering, Beijing University of Technology, No.100 Pingleyuan, Chaoyang District, Beijing 100124, China

^c Department of Mechanical Engineering, Technical University of Denmark, Nils Koppels Allé, Building 403, 2800 Kongens Lyngby, Denmark

Abstract

This work experimentally studied the single-phase heat transfer and pressure drop characteristics by using two heat transfer enhancement techniques (micro fin structure and nanofluids) in multiport minichannel flat tube (MMFT). MMFT consisted of numerous parallel rectangular minichannels and is widely used in industry as the heat transfer unit of a heat exchanger. Firstly, the enhanced heat transfer performances by individually using one enhancement technique were investigated by testing Nusselt number, friction factor and performance evaluation criterion (PEC). In this section, five MMFTs with different micro fin numbers ($N = 0, 1, 2, 3$ and 4) and nanofluids with three volume concentrations ($\varphi = 0.005\%, 0.01\%$ and 0.1%) were used as test sections and working fluids respectively. Secondly, the experiments using two

* Corresponding author. Tel.: +86 010 67391608-802; fax: +86 010 67391608-802

E-mail address: diaoyanhua@bjut.edu.cn (Y.H. Diao)

Download English Version:

<https://daneshyari.com/en/article/4992513>

Download Persian Version:

<https://daneshyari.com/article/4992513>

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