

Accepted Manuscript

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PII: S0894-1777(16)30338-7

DOI: <http://dx.doi.org/10.1016/j.expthermflusci.2016.11.022>

Reference: ETF 8944

To appear in: *Experimental Thermal and Fluid Science*

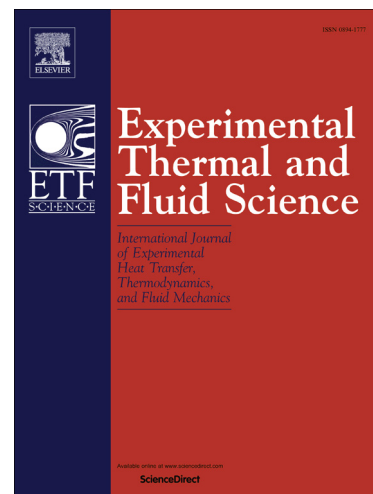
Received Date: 31 May 2016

Revised Date: 15 November 2016

Accepted Date: 20 November 2016

Please cite this article as: A. Swain, M. Kumar Das, Flow boiling of distilled water over plain tube bundle with uniform and varying heat flux along the height of the tube bundle, *Experimental Thermal and Fluid Science* (2016), doi: <http://dx.doi.org/10.1016/j.expthermflusci.2016.11.022>

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Flow boiling of distilled water over plain tube bundle with uniform and varying heat flux along the height of the tube bundle

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Abstract

The present article is focused on the study of saturated flow boiling heat transfer of distilled water over plain tube bundle under uniform and varying heat flux along the height. Each heat flux condition are studied with respect to different mass flux and pitch to diameter ratios at atmospheric pressure. The results of wall superheat and heat transfer coefficients of individual rows are compared for variable heat flux and uniform heat flux conditions. The bundle effect is found to exist for uniform as well as variable heat flux under all operating conditions. The bundle average heat transfer coefficients of runs with decreasing heat flux from bottom to top tube are higher than operating tube bundles with uniform heat flux. Whereas the bundle average heat transfer coefficients for uniform heat flux operation are higher than the runs with increasing heat flux from bottom to top tube. The range of wall superheat from bottom to top tube is found to be highest for decreasing heat flux from bottom to top and lowest for increasing heat flux from bottom to top.

Keywords: Flow boiling heat transfer, tube bundle, variable heat flux, shell and tube heat exchanger, heat transfer coefficient, wall superheats

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