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Abhilas Swain, Rajiva Lochan Mohanty, Mihir Kumar Das

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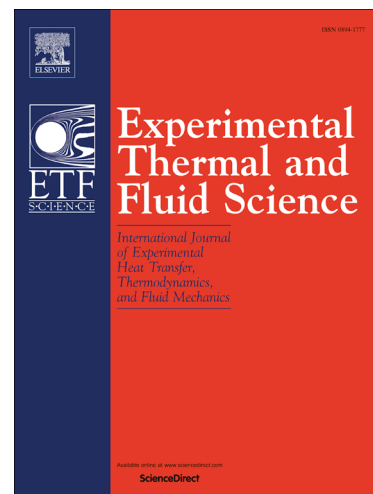
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## Flow boiling under variable heat flux along the height over coated tube bundle

Abhilas Swain<sup>a\*</sup>, Rajiva Lochan Mohanty<sup>b</sup>, Mihir Kumar Das<sup>b</sup>

<sup>a</sup>Kalinga Institute of Industrial Technology, Bhubaneswar, Odisha, India-751024

e-mail: abhilas.swain@gmail.com

<sup>b</sup>Indian Institute of Technology Bhubaneswar, Odisha, India-752050

rajivamohanty@gmail.com, mihirdas@iitbbs.ac.in

### \*Corresponding Author Details

Abhilas Swain  
SMS, IIT Bhubaneswar  
Samantapuri (Rear Side Swosti Premium)  
Bhubaneswar  
Odisha, India-751013

### Abstract

The present article is focused on saturated flow boiling heat transfer of distilled water over plasma sprayed copper coated tube bundle under the condition of varying heat flux along the height. The results obtained from experiments in terms of wall superheat and heat transfer coefficients are discussed with respect to different heat flux arrangements, mass fluxes and pitch to diameter ratios. The comparisons of wall superheat and row wise average heat transfer coefficients under variable heat flux and uniform heat flux conditions are presented. The results from the investigation reflects that 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 found to be highest for increasing heat flux from top to bottom and lowest for decreasing heat flux from top to bottom. The effects are similar to those obtained for plain tube bundle but the effects are magnified due to the modified surface structure.

**Keywords:** Boiling heat transfer, tube bundle, variable heat flux, shell and tube heat exchanger, heat transfer coefficient, wall superheats, plasma spray coating

### Nomenclature

HTC	Heat transfer coefficient
P/D	Pitch to diameter ratio of a bundle
q	Heat Flux applied to tubes
G	Mass flux through the tube bundle

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