

Accepted Manuscript

Design and performance analysis of the novel shell-and-tube heat exchangers with louver baffles

Yonggang Lei, Yazhi Li, Shenglan Jing, Chongfang Song, Yongkang Lyu, Fei Wang

PII: S1359-4311(17)32255-X
DOI: <http://dx.doi.org/10.1016/j.applthermaleng.2017.07.081>
Reference: ATE 10749

To appear in: *Applied Thermal Engineering*

Received Date: 5 April 2017
Revised Date: 12 June 2017
Accepted Date: 10 July 2017

Please cite this article as: Y. Lei, Y. Li, S. Jing, C. Song, Y. Lyu, F. Wang, Design and performance analysis of the novel shell-and-tube heat exchangers with louver baffles, *Applied Thermal Engineering* (2017), doi: <http://dx.doi.org/10.1016/j.applthermaleng.2017.07.081>

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.



Design and performance analysis of the novel shell-and-tube heat exchangers with louver baffles

Yonggang Lei^a, Yazhi Li^a, Shenglan Jing^a, Chongfang Song^a, Yongkang Lyu^b, Fei Wang^a

^aCollege of Environmental Science and Engineering, Taiyuan University of Technology,
Taiyuan, Shanxi 030024, China

^bKey Laboratory of Coal Science and Technology, Ministry of Education and Shanxi Province,
Taiyuan, Shanxi 030024, China

Abstract

Two novel shell-and-tube heat exchangers with louver baffles are invented and designed for energy conservation. A certain amount louver baffles at the inclination angle between shell side flow direction and louver baffle are equipped in shell side to support tube bundles. Numerical simulations are carried out to investigate the thermo-hydraulic performance of the two reformed shell-and-tube heat exchangers with louver baffles. For comparison, a shell-and-tube heat exchanger with conventional segmental baffles also studied in the paper. Fluid flow structures and temperature distributions are presented for the analysis of the physical behavior of fluid flow and heat transfer. Oblique flow is produced in the shell side of the shell-and-tube heat exchangers with louver baffles that decrease and eliminate the dead spaces and augment the local heat transfer. Compared with the shell-and-tube heat exchanger with segmental baffles, abrupt change of fluid flow is avoided that decrease the pressure drop in the shell side. The numerical results indicated that the heat transfer coefficient per pressure drop of both the shell-and-tube heat exchangers with louver baffles are higher than that of the shell-and-tube heat exchanger with segmental baffles. This implies that at the same heat transfer quantity, the pumping power of the shell-and-tube heat exchangers

Download English Version:

<https://daneshyari.com/en/article/4991236>

Download Persian Version:

<https://daneshyari.com/article/4991236>

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