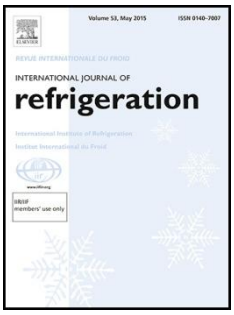
Accepted Manuscript



Title: Numerical model of particle deposition on fin surface of heat exchanger

Author: Feilong Zhan, Dawei Zhuang, Guoliang Ding, Jiajun Tang

PII: S0140-7007(16)30226-2
DOI: http://dx.doi.org/doi: 10.1016/j.ijrefrig.2016.07.015
Reference: JIJR 3388

To appear in: *International Journal of Refrigeration*

Received date: 6-5-2016
Revised date: 22-7-2016
Accepted date: 24-7-2016

Please cite this article as: Feilong Zhan, Dawei Zhuang, Guoliang Ding, Jiajun Tang, Numerical model of particle deposition on fin surface of heat exchanger, *International Journal of Refrigeration* (2016), http://dx.doi.org/doi: 10.1016/j.ijrefrig.2016.07.015.

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.

ACCEPTED MANUSCRIPT

Numerical model of particle deposition on fin surface of heat exchanger

Feilong Zhan, Dawei Zhuang, Guoliang Ding *, Jiajun Tang

(Institute of Refrigeration and Cryogenics, Shanghai Jiao Tong University, Shanghai 200240, China)

* Corresponding Author, Tel: 86-21-34206378; Fax: 86-21-34206814; E-mail: glding@sjtu.edu.cn

Highlights

- A numerical model of particle deposition was developed for predicting particle deposition rate on fin surface of heat exchanger.
- The transformation criterion was proposed to switch the impact type from particle-wall impact to particle-fouling layer impact.
- Both the sticking criterions and removal criterions were established for the incident particles and bed particles respectively.
- The particle distributions on fin surface predicted by the model agree well with the images captured in the visualization experiment.

Abstract: Dust particle deposition on fin surface has a significant influence on the performance of fin-and-tube heat exchangers, and the purpose of this study is to develop a numerical model for predicting the particle deposition rate on fin surface. In the model, the particle trajectories were calculated by the particle motion equation; the particle deposition on the fin surface was described based on the critical impact angle and the critical sticking velocity of incident particles; the particle deposition on the formed fouling layer was described based on the critical impact angle, the critical sticking velocity and the critical removal velocity of incident particles. The particle distributions on fin surface predicted by the model

Accepted Manuscript

Download English Version:

https://daneshyari.com/en/article/5017180

Download Persian Version:

https://daneshyari.com/article/5017180

Daneshyari.com