

Accepted Manuscript

Research Paper

The optimization design and parametric study of thermoelectric radiant cooling and heating panel

Limei Shen, Zhilong Tu, Qiang Hu, Cheng Tao, Huanxin Chen

PII: S1359-4311(16)32412-7

DOI: <http://dx.doi.org/10.1016/j.applthermaleng.2016.10.094>

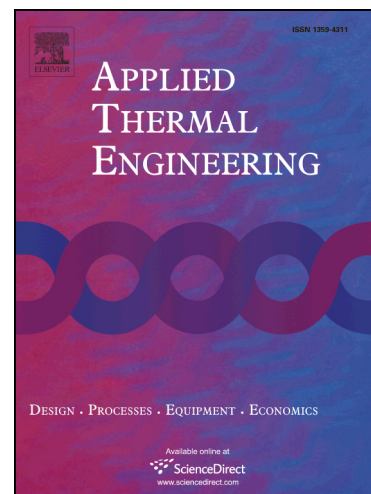
Reference: ATE 9296

To appear in: *Applied Thermal Engineering*

Received Date: 21 August 2016

Revised Date: 13 October 2016

Accepted Date: 14 October 2016



Please cite this article as: L. Shen, Z. Tu, Q. Hu, C. Tao, H. Chen, The optimization design and parametric study of thermoelectric radiant cooling and heating panel, *Applied Thermal Engineering* (2016), doi: <http://dx.doi.org/10.1016/j.applthermaleng.2016.10.094>

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.

The optimization design and parametric study of thermoelectric radiant cooling and heating panel

Limei Shen; Zhilong Tu; Qiang Hu; Cheng Tao; Huanxin Chen*

Department of Refrigeration and Cryogenics, Huazhong University of Science and Technology, Wuhan, China

*Corresponding author, E-mail: chenhuanxin@tsinghua.org.cn

ABSTRACT:

Thermoelectric radiant air-conditioning (TE-RAC) system is a promising approach to implement thermoelectric technology in large-scale refrigeration system applications in future. However, no standard exists for the in situ design and the performance evaluation of thermoelectric radiant heating/cooling panel. Thus, this study aims to not only clarify the design procedure but also to share our thermal physical model and design configurations of the thermoelectric radiant panel to serve as a reference for other similar design cases. In addition, a simplified representation approach for the thermal characterization of thermoelectric panels is also discussed. The main design variables are the number of thermoelectric modules and the size of radiant panels. The inner surface transient temperature distribution of thermoelectric radiant panels is discussed, and the approaches for improving the uniformity of the inner surface temperature are proposed. The influence of cooling/heating load on the uniformity of the inner surface temperature is a slight larger than the size of the panel,

Download English Version:

<https://daneshyari.com/en/article/4991742>

Download Persian Version:

<https://daneshyari.com/article/4991742>

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