

Accepted Manuscript

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PII: S1359-4311(17)30382-4

DOI: <http://dx.doi.org/10.1016/j.applthermaleng.2017.05.172>

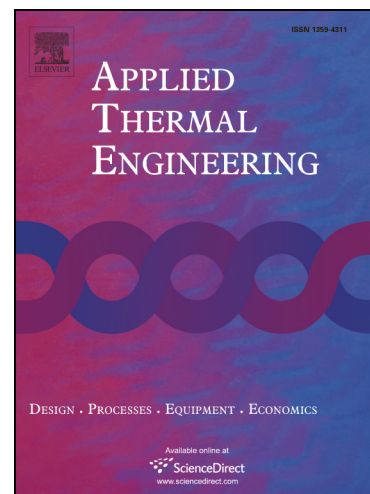
Reference: ATE 10487

To appear in: *Applied Thermal Engineering*

Received Date: 18 January 2017

Revised Date: 20 April 2017

Accepted Date: 27 May 2017



Please cite this article as: Y. Yao, Y. Sun, D. Sun, C. Sang, M. Sun, L. Shen, H. Chen, Optimization Design and Experimental Study of Thermoelectric Dehumidifier, *Applied Thermal Engineering* (2017), doi: <http://dx.doi.org/10.1016/j.applthermaleng.2017.05.172>

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Optimization Design and Experimental Study of Thermoelectric Dehumidifier**Yu Yao^a; Yongjun Sun^b; Dongfang Sun^a; Ce Sang^a; Miao Sun^a; Limei Shen^{a,*};****Huanxin Chen^a**^aDepartment of Refrigeration & Cryogenics, Huazhong University of Science and Technology, Wuhan 430074, China^bDivision of Building Science and Technology, City University of Hong Kong, Hong Kong

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ABSTRACT:

Small dehumidifiers are commonly used to reduce indoor relative humidity and provide comfortable conditions. Thermoelectric dehumidifier (TED) has drawn more attentions due to advantages of environmentally friendly, compact size and quiet. However, the practical application of TED is limited because of the low performance. In this study, we experimentally investigate the influences of structural parameters and operating conditions on the moisture removal rate of TED. A series of prototypes are designed and tested using the orthogonal experiment design method. The impacts of the layout of thermoelectric modules (TEMs), air duct size, heat sink size and the number of TEMs have been discussed. A novel prototype is proposed and investigated to enhance the moisture removal rate. This novel prototype with two cold-side heat sinks and two hot-side heat sinks ensures sufficient cooling capacity for dehumidification. It demonstrates that the moisture removal rate of this novel

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