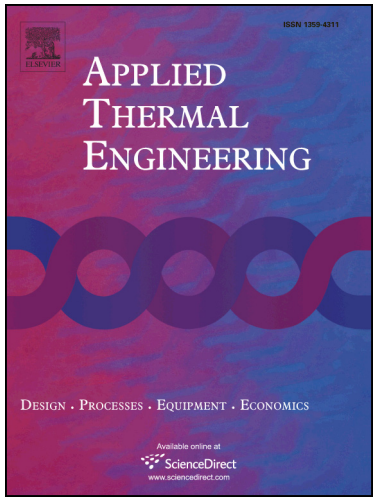

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Shen Tian, Yuping Gao, Shuangquan Shao, Hongbo Xu, Changqing Tian

PII: S1359-4311(16)34068-6
DOI: http://dx.doi.org/10.1016/j.applthermaleng.2017.04.075
Reference: ATE 10224

To appear in: *Applied Thermal Engineering*

Received Date: 12 December 2016
Revised Date: 24 February 2017
Accepted Date: 18 April 2017

Please cite this article as: S. Tian, Y. Gao, S. Shao, H. Xu, C. Tian, Numerical investigation on the buoyancy-driven infiltration airflow through the opening of the cold store, *Applied Thermal Engineering* (2017), doi: http://dx.doi.org/10.1016/j.applthermaleng.2017.04.075

Numerical investigation on the buoyancy-driven infiltration airflow through the opening of the cold store

Shen Tian[a,b,c], Yuping Gao[a,b,c], Shuangquan Shao[a,b,*], Hongbo Xu[a,b], Changqing Tian[a,b]

[a] CAS Key Laboratory of Cryogenics, Technical Institute of Physics and Chemistry, Beijing 100190, China

[b] Beijing Key Laboratory of Thermal Science and Technology, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, Beijing 100190, China

[c] University of Chinese Academy of Sciences, Beijing 100049, PR China

* Corresponding author. Tel.: +86 1082543433.

E-mail address: shaoshq@mail.ipc.ac.cn

Abstract: With the rapid growth of the total gross of the cold store, the energy consumption problem of the cold store is attracting increasing attentions. Infiltration through the door, which accounts for a very large part of the total heat load, has been highlighted in the previous simulation studies. However, the transient simulation of the infiltration in the cold store is not sufficient and the complex condition such as infiltration coupled with the cooling fans on is not covered. In this paper, a transient infiltration simulation model is established based on the unsteady RANS model. The model is validated by the experimental data of a cold store under conditions with different temperature differences, opening sizes and operation mode of the cooling fans. The results show that the predicted value and change trend of the infiltration air volume, local wind speed and temperature by the established model agree well with