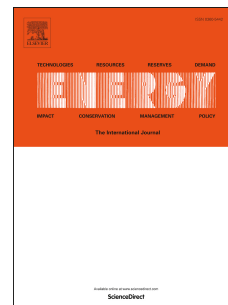


Accepted Manuscript

Numerical study of foulant-water separation using hydrocyclones enhanced by
ejection device: Effect of ejection velocity

Jinyi Tian, Long Ni, Tao Song, Chao Shen, Jianing Zhao



PII: S0360-5442(18)31444-0

DOI: [10.1016/j.energy.2018.07.151](https://doi.org/10.1016/j.energy.2018.07.151)

Reference: EGY 13416

To appear in: *Energy*

Received Date: 29 April 2018

Revised Date: 23 June 2018

Accepted Date: 22 July 2018

Please cite this article as: Tian J, Ni L, Song T, Shen C, Zhao J, Numerical study of foulant-water separation using hydrocyclones enhanced by ejection device: Effect of ejection velocity, *Energy* (2018), doi: 10.1016/j.energy.2018.07.151.

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.

**Numerical study of foulant-water separation using hydrocyclones enhanced by
ejection device: Effect of ejection velocity**

Jinyi Tian, Long Ni^{*}, Tao Song, Chao Shen^{*}, Jianing Zhao

School of Architecture, Harbin Institute of Technology, Harbin, PR China

*Heilongjiang Provincial Key Laboratory of Building Energy Efficiency and
Utilization, Harbin, PR China*

* Corresponding Author: Email: nilonggn@163.com (L. Ni); chaoshen@hit.edu.cn (C.
Shen) Tel.: +86 0451 86282123

Abstract: To solve the blockage and fouling issues of sewage heat exchangers in sewage source heat pump, a novel de-foulant hydrocyclone with ejection device was proposed and studied with FLUENT software. The pressure and velocity fields were coupled by the SIMPLEC algorithm, whereas the Reynolds Stress Model was used to predict the 3-D strong swirling turbulent flow due to its anisotropic nature. The Discrete Particle Method was employed to study the particle motion. Results showed that, compared with the variable underflow-pipe diameter, adjusting the ejection velocity could significantly enhance the separation performance by achieving the low split ratio without the risk of blocking the underflow pipe. Unlike the effects of conventional ejectors, the increasing ejection velocity increased the back pressure of the underflow and hence decreased the split ratio. Specifically, if the ejection velocity was higher than a certain value (e.g., 2.0 m/s in this paper), all the 3-D strong swirling

Download English Version:

<https://daneshyari.com/en/article/10136366>

Download Persian Version:

<https://daneshyari.com/article/10136366>

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