Characterization of gas–solid fluidization in fluidized beds with different particle size distributions by analyzing pressure fluctuations in wind caps

Huawei Jiang, Hongwei Chen, Jianqiang Gao, Junfu Lu, Yang Wang, Cuiping Wang

PII: S1385-8947(18)30985-9
DOI: https://doi.org/10.1016/j.cej.2018.05.165
Reference: CEJ 19181

To appear in: *Chemical Engineering Journal*

Received Date: 31 January 2018
Revised Date: 23 May 2018
Accepted Date: 27 May 2018

Please cite this article as: H. Jiang, H. Chen, J. Gao, J. Lu, Y. Wang, C. Wang, Characterization of gas–solid fluidization in fluidized beds with different particle size distributions by analyzing pressure fluctuations in wind caps, *Chemical Engineering Journal* (2018), doi: https://doi.org/10.1016/j.cej.2018.05.165

Characterization of gas–solid fluidization in fluidized beds with different particle size distributions by analyzing pressure fluctuations in wind caps

Huawei Jiang[a,b,*], Hongwei Chen[b], Jianqiang Gao[b], Junfu Lu[c], Yang Wang[d], Cuiping Wang[a,*]

[a] *Institute of Energy Engineering, Qingdao University, Qingdao 266071, China*

[b] *Key Laboratory of Condition Monitoring and Control for Power Plant Equipment of Ministry of Education, North China Electric Power University, Baoding 071003, China*

[c] *Key Laboratory for Thermal Science and Power Engineering of Ministry of Education, Tsinghua University, Beijing 100084, China*

[d] *Xi'an Thermal Power Research Institute Co., Ltd., Xi'an 710054, China*

* Corresponding authors at: Institute of Energy Engineering, Qingdao University, Qingdao 266071, China (Cuiping Wang).

E-mail addresses: jianghwwh@ qdu.edu.cn (Huawei Jiang), cpw_qdu@qdu.edu.cn (Cuiping Wang).

Abstract: For the operation of a fluidized bed, solid particle size distribution is related to fluid dynamic behaviors, heat transfer efficiency, combustion efficiency, and desulfurization performance. Measurement of pressure fluctuations has a great advantage for detecting fluidization and combustion conditions, due to its flexible adaption to any operating conditions. In this study, the measurement and analysis of pressure fluctuations in the inlet of a wind cap of fluidized beds were carried out, to investigate the effects of particle size distribution on the gas–solid fluidization behaviors. Pressure fluctuations in the inlet of central wind cap were measured at different primary air velocities in cold circulating fluidized beds with different particle size distributions. In order to obtain the corresponding characteristic parameters, pressure fluctuations were