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Ying Wang, Kenneth Williams, Mark Jones, Bin Chen

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## CFD Simulation Methodology for Gas-solid Flow in Bypass

### Pneumatic Conveying - A Review

Ying Wang<sup>1,2,3\*</sup>, Kenneth Williams<sup>2</sup>, Mark Jones<sup>2</sup>, Bin Chen<sup>2</sup>

(1. School of Energy and Power Engineering, University of Shanghai for Science and Technology,  
Shanghai, China, 200093)

(2. Centre for Bulk Solids & Particulate Technologies, University of Newcastle, NSW, Australia, 2307)

(3. Shanghai Key Laboratory of power energy in multiphase flow and heat transfer, Shanghai, China,  
200093)

(Corresponding author. Tel.: +86 21 55276489 Email: wangying@usst.edu.cn)

#### Abstract

This paper presents a review of numerical models for simulation of gas-solid flow in bypass pneumatic conveying. The kinetic theory, conventional frictional-kinetic model and a new modified frictional-kinetic model are described in some detail. The experimental results for pressure drops based on a number of test cases are presented and compared with numerical results obtained with different numerical models. The convergences of the modified frictional-kinetic model with different values of constants are also illustrated. Moreover, the fluidisation charts of different materials with flow mode boundaries are presented to provide guidance on what frictional approach to use for Computational Fluid Dynamics (CFD) analysis of gas-solid flow in a bypass pneumatic conveying system. Furthermore, a flow chart for the CFD simulation methodology of bypass pneumatic conveying is demonstrated. These outcomes and the associated design guidelines could assist in choosing the most appropriate models for simulation of pneumatic conveying.

**Keywords:** pneumatic conveying; frictional-kinetic model; CFD simulation; review

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