

WORLD CONGRESS ON SMART MATERIALS AND STRUCTURES

&

3rd International Conference on

POLYMER CHEMISTRY AND MATERIALS ENGINEERING

November 21-22, 2019 | Singapore

Application of the discrete element modelling in air drying of particulate solids

Jintang Li¹ and David J Mason²

¹University of Manchester Institute of Science and Technology, UK

²University of Brighton, UK

The Discrete Element Method (DEM) has been widely used as a mathematical tool for the study of flow characteristics involving particulate solids. One distinct advantage of this fast-developing technique is the ability to compute trajectories of discrete particles. This provides the opportunity to evaluate the interactions between particle, fluid and boundary at the microscopic level using local gas parameters and properties, which is difficult to achieve using a continuum model. To date, most of these applications focus on the flow behaviour. This paper provides an overview of the application of DEM in gas-solids flow systems and discusses further development

of this technique in the application of drying particulate solids. Several sub-models, including momentum, energy and mass transfer, have been evaluated to describe the various transport phenomena. A numerical model has been developed to calculate the heat transfer in a gas-solids pneumatic transport line. This implementation has shown advantages of this method over conventional continuum approaches. Future application of this technique in drying technology is possible but experimental validation is crucial.

e: jintang.li@umist.ac.uk



Notes: