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Mass flow rate of fine and cohesive powders under differential air pressure

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Abstract

Air-powder interactions are of practical importance in the production of pharmaceuticals, food and high value added chemicals manufactured using powders. For examples, air-powder effects enable consistent and effective dosing of fine cohesive powders into dies on high productivity rotary presses due to the suction fill effect.

A purpose built experimental testing rig was developed and calibrated in order to develop a basic understanding of effect of air pressure on the mass flow rate of fine and cohesive powders. The powder materials were selected to enable the study of the effect of particle properties, such as size and density, and processing conditions such as differential air pressure, on the mass flow rate of powders.

The models available in the literature developed for coarse free flowing sands under differential pressure were found inadequate to describe the experimental observations and to predict the flow

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