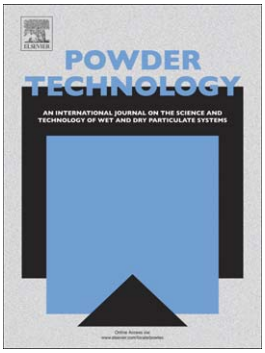

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An alternative DEM parameter identification procedure based on experimental investigation: a case study of a ring shear cell

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1. Introduction

The storage and flow behavior of granular materials plays an important role in many industrial fields, such as in the chemical, food, or pharmaceutical industry, or in mining and agriculture [1–4]. Thereby, the mixing of different granular materials and the process of discharging silos is of particular interest. To optimize the particle flow and the handling of granular materials during processing, discrete element (DE) models are widely used and show very good results of the overall behavior of particles and their interaction with a structure [5–8].

To use the discrete element method (DEM), it is most essential to identify the material parameters. Widely-used experimental approaches include shear and compression tests for the determination of the materials stiffness and the internal friction angle, drop tests which give the coefficient of restitution, or sliding tests to determine the coefficient of friction. Often, only a small number of measured parameters are used to calibrate the DE model or to directly use

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