

IFPRI Review Brief

Confronting the Powder Flow Grand Challenge: Relating Particle Properties, Microstructure, and Bulk Powder Flow

The International Fine Particle Research Institute wishes to commission a comprehensive critical literature review of the relationships between particle properties, flow microstructure, and bulk flow dynamics in granular and cohesive powder flow. We are interested in the current state of understanding of the length and time scales of fluctuations in flow velocities, stress fields, and packing fraction and how system geometry and boundary conditions affect these. The review should cover both characterization and modeling, including:

- Direct measurement of tensile and compressive stresses between particles, in clusters, and in bulk isostatic systems
- Predictive models for small, high-intensity zones and “average” models for bulk behavior, including progress in multi-scale homogenization approaches for modeling.