Research Project Brief

Selection of Flow Aids

The International Fine Particle Research Institute (IFPRI) wishes to fund a research project to develop a physically based model for selection of flow aids.   Poor flowability because of cohesion is one of the biggest problems in solids handling and processing. Perhaps the most common way of improving powder flow is dry coating of particles with a flow aid. While there are many flow aids to choose from, there is very minimal understanding of the relationship between the physical and morphological properties of the host and guest particles to guide flow-aid selection, the process by which to add it, and the amount that should be used. This is the objective of this project: to develop a model that can be used for flow-aid selection and minimize the number of experiments needed to optimize their use.

The project should:

- Address a variety of types of cohesion responsible for poor powder flow
- Identify the key surface and bulk properties of both host and guest particles that determine the selection of a flow aid
- Understand the interplay between particle properties and the coating (mixing) process on the flow aid effectiveness
- Develop and validate a quantitative model for the effectiveness of flow aids that can be used for selection and optimal use of flow aids

Two types of mixing/coating should be considered, one low-intensity such as a turbula mixer and one high intensity such as magnetically-assisted coating (MAIC). Improvement of flow of powders used in Pharma, Foods, Consumer products, and Chemicals are in scope.