

IFPRI Research Project Brief

Adhesion of Powders to Metal Surfaces During Compaction

The International Fine Particle Research Institute (IFPRI) wishes to fund a research project to develop fundamental understanding and predictive relationships between a powder's physical and chemical properties and its propensity to adhere to metal surfaces of compaction tooling. The project should include the following elements:

- Identification of appropriate test powders and characterization of their relevant physical and chemical properties. Note that IFPRI is comprised of member companies from many industry sectors, so the choice of powder should not be constrained to those of pharmaceutical interest. Powders of interest range in mean particle size from 5 to 500 microns.
- Establishment of a test method to quantify material adhesion on compaction tooling over an industrially relevant range of process and environmental conditions
- Identification of key factors affecting the amount and/or rate of powder adhesion on compaction tooling such as:
 - molecular, crystal, surface, and mechanical properties of the powder
 - surface finish and chemistry (including coated surfaces)
 - process conditions (e.g. pressure/stress)
 - environmental conditions (temperature, relative humidity)
- Establish predictive criteria for the propensity of adhesion given a set of molecular/crystal properties and process/environmental conditions