IFPRI BRIEF TEMPLATE

Check One: ☐**Project** ☒**Review** ☐**Collaboration**
☐**Workshop** ☐**Other**

Descriptive Title	Model horses for courses; what powder flow model to use when and how?
Working Title[1]	Decision tree for modelling of powder flow problems
Technical Area[2]	Dry systems
Date	13/6/23
Short Description	A wide range of modelling methods are available within the area of dry powder flow; these include DEM, DEM-CFD, Continuum Models. Within each method, there is substantial complexity due to the ever-increasing number of models that can be applied to specific problems. Furthermore, different model types often can be used in combination. To less experienced users, it is an enormous challenge to identify *"the right model"* for modelling a specific situation for a given type of powder in a given geometry and under given process conditions. It is desired to develop a guidance document for modelling of powder flows. This overview should summarize what type of model, with which assumptions, which limitations and which mechano-physical terms should be applied in a specific situation. It is equally important to outline the pitfalls of applying a model in a wrong way.
Objectives	• A summary review of the types of models available for powder flow, the types of mechano-physical parameters which can be included in them and the circumstances in which they are best used. • The above summarised in a decision tree or table to aid the selection of model type and scope based on a powder type and geometry to be used. • Highlight any gaps in the field where no modelling approach is suitable.
Scope	In scope is any combination of: • Dry powder or granule • Cohesive powders • Polydispersity in size, density or shape • Powder mixtures

[1] Title used in meeting agendas and file archives
[2] One or more from the following list: W = wet systems; D = dry systems; F = particle formation; SR = size reduction; M = modeling; SE = systems engineering

	• Process geometries including drums, hoppers, screw feeders, pneumatic transport, fluid beds, spray driers, mills. Out of scope: • Chemical reactions

Recommended Contractors (2 or 3)		
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