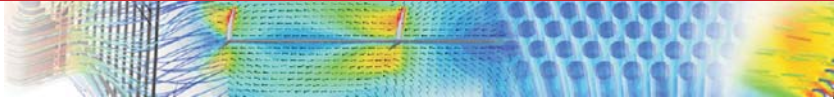


Summary



CFD Simulation of a Jet Mill: Development of a Discrete Particle Milling Model

The article proposes a particle milling model based on a Lagrangian formulation. The discrete particle model of the commercial CFD code Ansys-Fluent is extended to describe particle collisions. The milling model itself takes into account three different size reducing mechanisms:

- size reduction by particle-particle interaction
- size reduction by particle-wall impact
- size reduction by continuous phase strain.

The model approaches the very complex morphological process of solid particle breakup by use of the semi-empirical Rittinger comminution law that states a dependence of specific comminution energy and particle size. This value is compared with respective kinetic energies in case of velocity strain or particle impact on another particle or confining walls.

The new milling model is a compromise between physically motivated, detailed modeling and computationally efficient CFD-engineering. The use of the model is demonstrated in the simulation of a jet mill with injector and milling chamber to identify optimisation potential.

