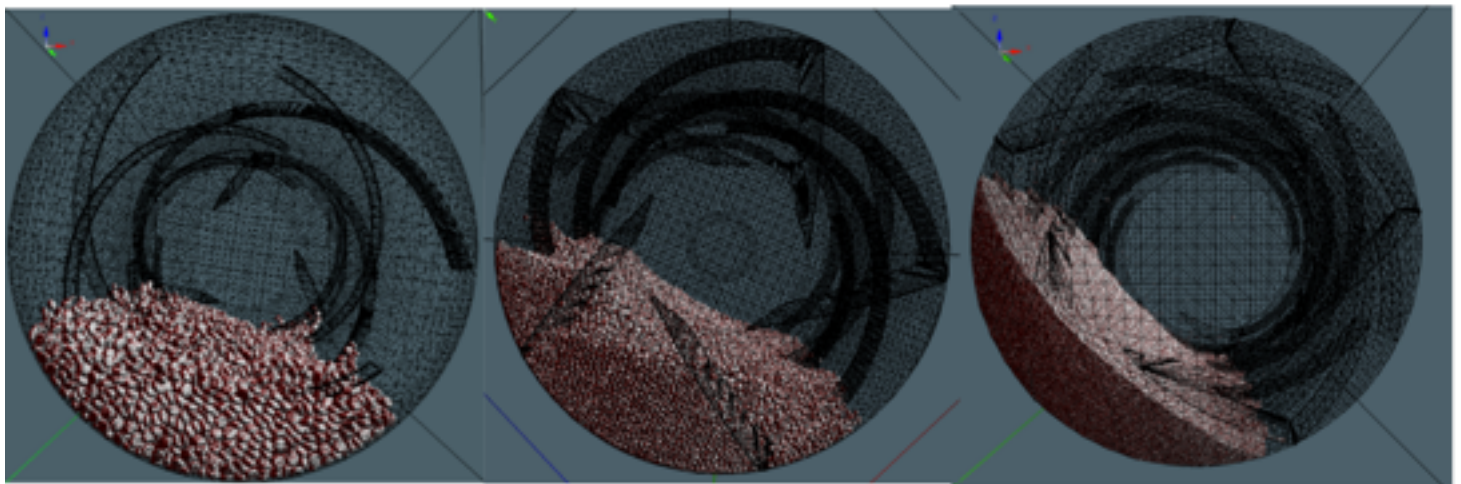


## DEM applied to business client requirements

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Scale up  
laboratory => pilot => industrial



~12k tablets  
~3.5 kg

~153k tablets  
~43 kg

~280 kg  
~1 million tablets

DEM is typically used to solve physical aspects in granular flows, such as mixing, segregation effects or mechanical loading on particles. In the academic community simple geometric boundaries and particles in vacuum are sufficient, in order to model a particle system in most cases. Compared with the requirements in the industry, an extension of DEM is important. Processes in pharmaceutical and chemical engineering applications often incorporate airflow, liquid spray and heat transfer in complex shaped equipment.

Moreover, tiny slits or gaps are dominating many unit operations, where particles have to pass through, which prevents the use of larger particles. Many processes are under investigation for the so called up-scaling. Here, large-scale simulations can help to prevent simplifications in terms of particle numbers, getting realistic models for comparisons at different scales.

