



Mixing, Lab-DoE and 3D Scale-up support

Problem Statement

A pharmaceutical/chemical process like a crystallization, dispersion, vial filling etc. needs to be developed. It is sensitive to mixing and it is required to design a well-understood, robust process. Typical relevant quantities to the different processes can be mixing times at micro, meso and macro mixing scale, fluid shear rates in conjunction with precipitation or suspension homogeneity for a robust vial filling process.

Our approach

We setup Computational Fluid Dynamics (CFD) simulations at Lab-Scale and perform a general sensitivity analysis on the operating conditions to derive CFD-based DoE's. Lab experiments are carried under the defined design space to gain understanding about limitations of the process itself, but also about the involved equipment. This understanding allows to choose a robust set of process parameters for the scale-up and to select suitable industrial scale equipment under which the process can be operated safely.

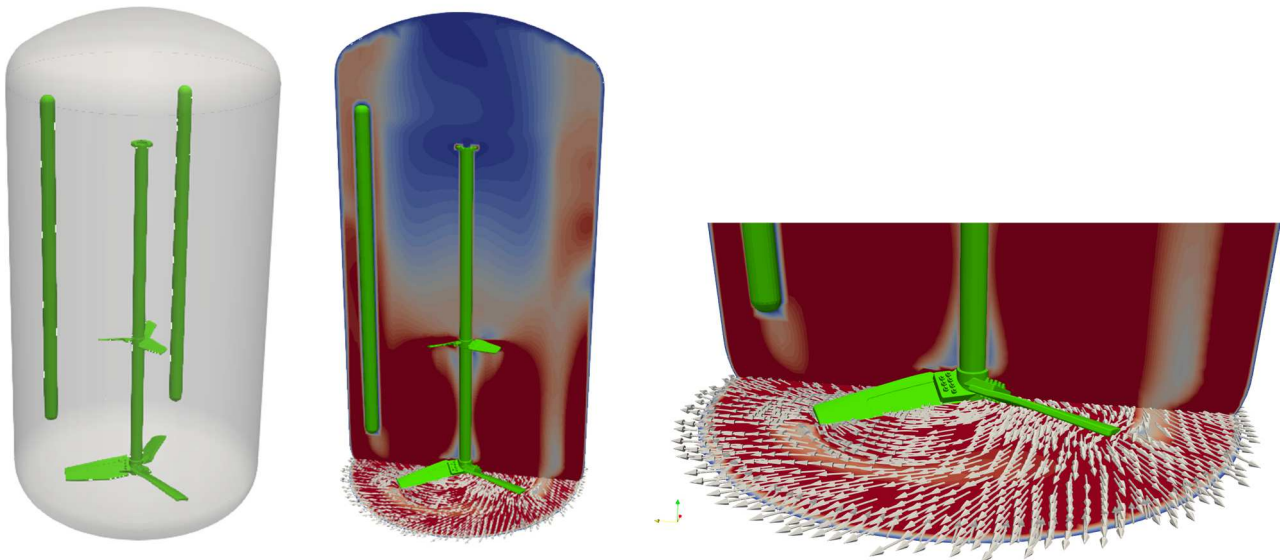


Figure 1: Mesh of a reactor with 2-phase calculated vortex as upper boundary condition (left) and slice through the reactor with velocity field (right).

Required information from customer

- Reactor, stirrer and internals geometries of both configurations (drawings)
- Operating conditions (stirring speed etc.)
- Fluid properties (viscosity etc.)

Sectors

- Pharma
- Chemical