

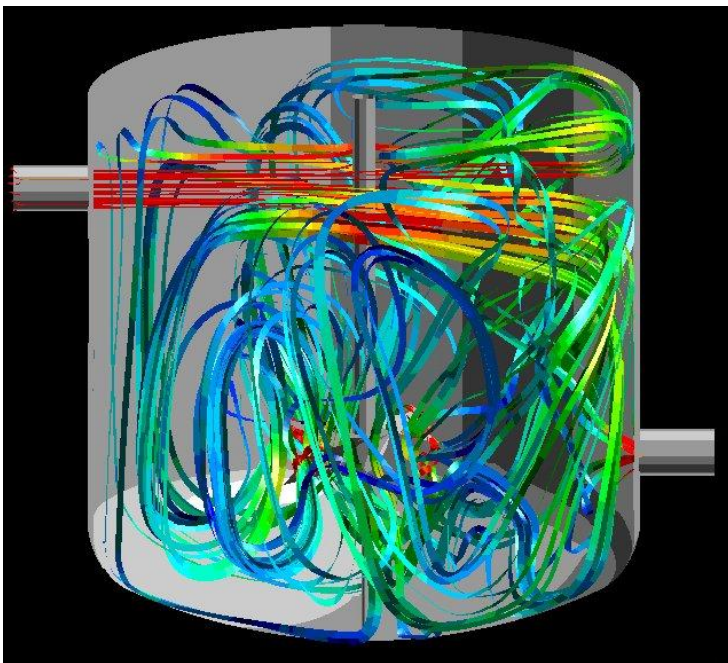


## Optimising Crystallisation

Crystalliser design and scale up for optimum product quality, time to market and capital expenditure

BHR Group is a world centre of fluid mixing expertise and know-how in the design, optimisation and scale up of chemical reactors for single-phase and multiphase processes.

Expertise in crystallisation is combined with unique, leading-edge CFD modelling capability, partnered by world-leading expertise in complex chemistry and measurement of nucleation growth, reaction, agglomeration, break-up and kinetics.

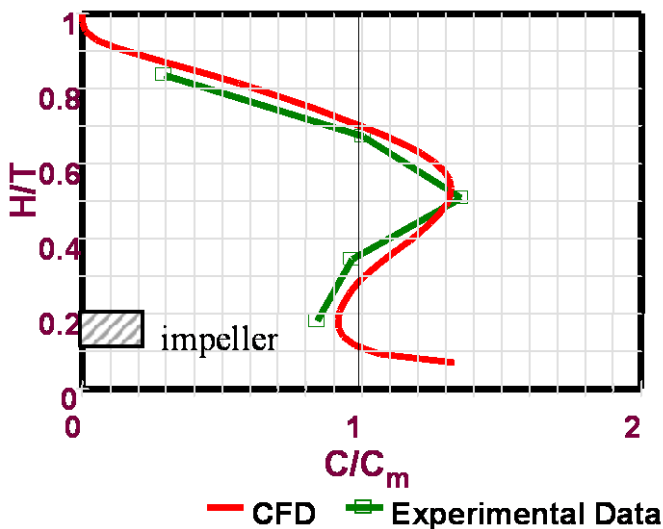


### Applications

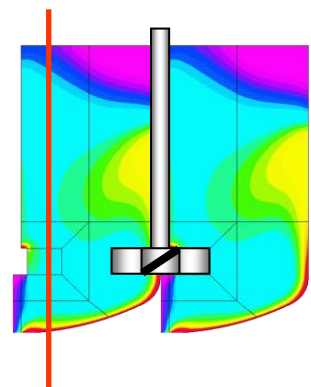
- Pharmaceuticals
- Fine & speciality chemicals
- Bulk chemicals
- Photographic materials
- Catalyst manufacture
- Nano particles

### Benefits

- Crystalliser design right first time
- Improved yields
- Higher purity and more consistent product quality
- Control of particle size and size distribution
- Shorter time to market
- Maintain product quality over scale-up

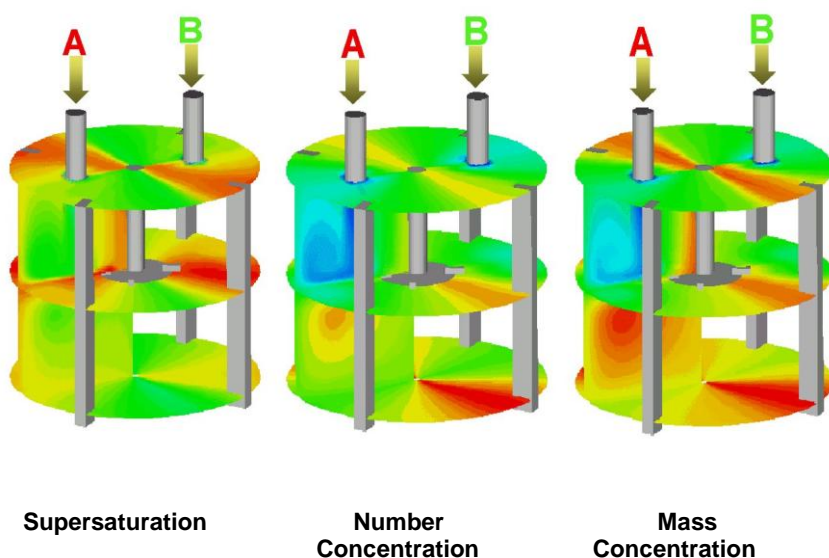


Sample  
Traverse  
→



# Crystallisation Modelling

Mixing is critical to product quality, owing to the interplay between the kinetics of chemical reaction, nucleation and crystal growth on the one hand and mixing rates on the other. Control of supersaturation levels and correct implementation of dosing/thermal regimes is vital. BHR Group provides design and optimisation through CFD modelling or stand-alone consultancy.



CFD model of BaSO<sub>4</sub> precipitation in a stirred tank

## Techniques

Novel integration of population balance into CFD solver enabling

- Exploration of flow details
- Interaction of mixing with crystallisation kinetics
- Visualisation of development of solid crystal phase

CFD models give:

- Velocity & turbulence fields
- Spatial distributions of species
- Supersaturation distribution
- Magma density
- Crystal number
- Crystal size and its variation

## Services

- **Audits** of existing crystallisers to provide clear recommendations for improvement
- **Measurement** of kinetic data in house and through links with partners
- **CFD model studies** for:
  - Crystalliser design optimisation & scale up
  - Parameter sensitivity studies
  - Feed stream control strategy
  - Cooling strategy optimisation
- **Physical model studies** for:
  - CFD validation
  - Crystalliser design, optimisation & scale-up
- **Equipment selection and design**
- **Simulation** of different crystalliser operating modes

• For more information, please contact us or view our website.

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