gCRYSTAL:

Advanced process modelling for crystallisers & crystallisation processes

Process optimisation and scale-up are key challenges for companies operating crystallisation processes. An increasingly competitive market has intensified the need to improve the efficiency of existing processes, design new processes and quickly bring lab-scale processes to large scale whilst, at the same time, ensuring product quality.

PSE's gCRYSTAL® is a powerful yet user-friendly software tool developed in close co-operation with lead users in the Pharmaceutical, Chemicals and Food industries.

gCRYSTAL helps companies reduce capital cost through crystallisation design and operational analysis, including activities such as detailed kinetics modelling, scale-up and design, process optimisation and monitoring of product quality.

Broad scope of applicability

gCRYSTAL's crystalliser models feature:

- Cooling, flash-cooling, evaporative, reaction and anti-solvent modes
- Continuous, batch and semi-batch operation
- Multiple solid phases (e.g. polymorphs), any number of liquid phase species
- Primary and secondary nucleation, growth, dissolution, attrition, agglomeration
- Characterisation of PSD: number/volume densities, volume fractions, quantiles

General features

gCRYSTAL is available on Windows and Linux (64 bit) platforms and provides:

- Crystallisation model library (solution crystallisation and precipitation)
- Graphical interface with drag-and-drop flowsheeting and GUI model input
- Steady-state and dynamic (transient) modelling
- Advanced optimisation (steady-state, dynamic, MIO)
- Advanced parameter estimation (multiple experiments, steady-state and dynamic) and experiment design
- Integrated CFD interface through Hybrid Multizonal
- Powerful and optimised numerical solvers

Benefits

- Reduce batch-to-batch variability by optimising recipes for robustness
- Increase process efficiency through detailed process optimisation
- Reduce scale-up risk and time-to-market through detailed scale-up modelling with gCRYSTAL or our Hybrid Multizonal gCRYSTAL/CFD interface
- Monitoring product quality during plant operation
- Streamline organisational workflow by using one tool for all stages from lab-scale experiments to large scale manufacturing

gCRYSTAL

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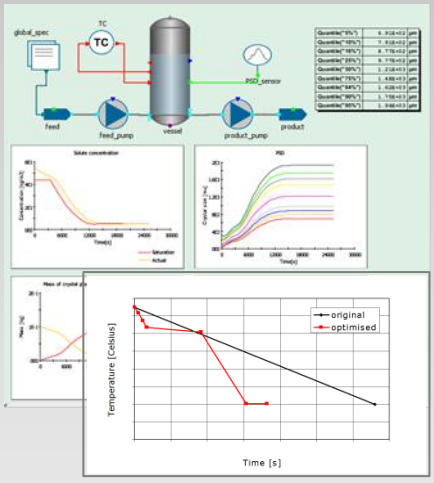
DOMO reduced batch time by 44%, increasing plant utilisation and process throughput for pharmaceutical grade lactose



gCRYSTAL applications ➔

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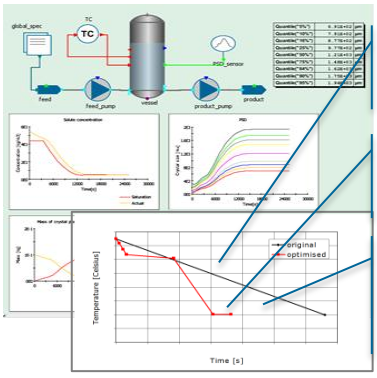
gCRYSTAL applications

Process optimisation

gCRYSTAL has unparalleled parameter estimation and optimisation capabilities to enable rigorous optimisation of new and existing processes.

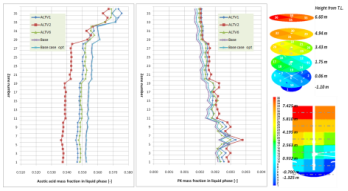
DOMO has successfully used gCRYSTAL to optimise its pharmaceutical grade lactose process. The batch time was reduced by 44%, whilst maintaining the same product quality, enabling DOMO to increase throughput and maximising return on assets.



Original cooling profile

Optimised cooling profile

Batch time reduced by 44%, product quality maintained

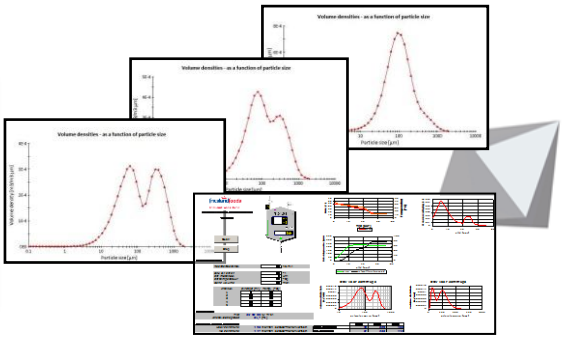


Scale-up and design

gCRYSTAL helps companies to reduce scale-up and design risk by reducing the number of experimental cycles required in scale-up and design processes.
Consequently process downtime, the use of expensive materials (such as the API) and staff costs are reduced, resulting in large savings on capital cost.

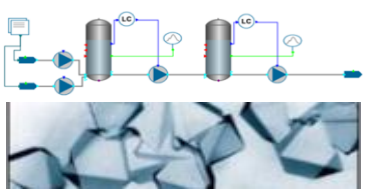
Improve and monitor product quality

gCRYSTAL can be used to monitor and improve product quality during the production process. By using inferred measurements product quality attributes, such as PSD and growth rates, which are typically not measured online can be monitored and the operating conditions adjusted accordingly to maintain on-spec product quality.



PSE Consulting

PSE Consulting provides a range of consulting and application services to help companies use modelling technology to create value rapidly and cost-effectively. PSE services include in realtion to gCRYSTAL are training, support, collaborative development and model-based solutions and reports.. These services are offered through the PSE ModelCare® and PSE Strategic Assessment programs.



Advanced process modelling