



# BETTER SOLIDS PROCESSES

- Batch and continuous
- Dynamic and steady-state
- Solids, liquid and vapour systems
- Scale-up and tech transfer
- Flexible and reliable continuous processes
- Troubleshooting and debottlenecking

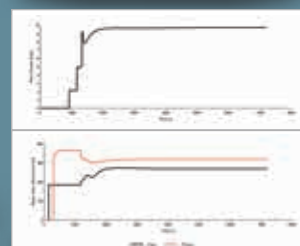
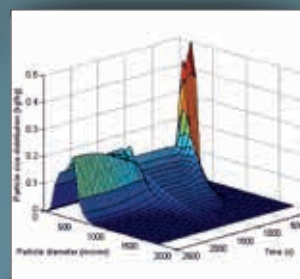
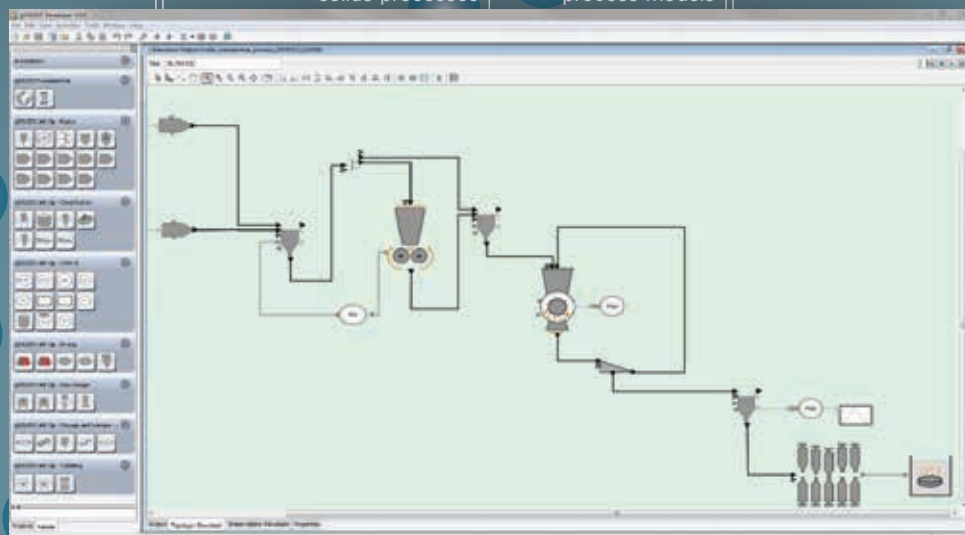
Steady-state and dynamic simulation and optimisation

Drag-and-drop flowsheeting

Library of common unit operations for solids processes

Integration with upstream gCRYSTAL and gas-liquid process models

Parameter estimation facilities for fitting models to lab or plant data



Stream structure with particle size distributions and chemical compositions

Tracking of multiple solids phases

Ability to add custom models of proprietary equipment or processes

Food & Consumer

Businesses use gSOLIDS® advanced process models, validated against lab or plant data, to make better, faster and safer design and operating decisions for their solids processes.

gSOLIDS is developed in close co-operation with lead users in the pharma, chemicals and food industries to combine the power of Advanced Process Modelling with a user-friendly interface for scientists and engineers.



The Advanced Process Modelling Company

[psenterprise.com](http://psenterprise.com)

Operations in UK, Switzerland, USA, Japan, Korea, China, Taiwan, Malaysia and Saudi Arabia.

UK Head Office  
t: +44 20 8563 0888  
e: [info@psenterprise.com](mailto:info@psenterprise.com)

THE POWER TO BE CERTAIN

# gSOLIDS APPLICATIONS & BENEFITS

## Extract better information from fewer experiments

Use gSOLIDS' integrated model validation capabilities to estimate model parameters and their accuracy (confidence intervals) from multiple steady-state and dynamic experiments.

## Quantify the risk associated with imperfect knowledge of your process

gSOLIDS allows you to understand how imperfect process knowledge, captured by the parameters' confidence intervals, translates to uncertainty in model predictions for process optimisation and scale-up.

## Design information rich experiments

Sometimes the business risk associated with uncertainty in model predictions is considered too large and additional experimentation is required to reduce the uncertainty. With gSOLIDS you can design the minimum number of experiments required to obtain sufficient parameter accuracy.

## Robust and efficient batch processes

Reduce batch-to-batch variability by designing robust recipes that ensure high asset

utilisation and on-spec product quality (PSD and composition). gSOLIDS can simultaneously consider decision variables related to equipment design as well as the operation of that equipment.

## Batch to continuous

Transfer your manufacturing process from batch to continuous operation without having to change your R&D set-up and techniques. Use gSOLIDS to capture knowledge from lab-scale batch experiments and apply that knowledge to the optimal design and operation of a continuous, manufacturing scale process.

## Flexible and reliable continuous processes

Use gSOLIDS' steady-state and dynamic optimisation capabilities to determine the optimum configuration in terms of type and size of equipment, recycle structures, optimal operating conditions as well as start-up and shutdown procedures. This approach results in an economically optimal process subject to product quality, operability and safety constraints.

# SCOPE

gSOLIDS delivers a step-increase in capability to engineers and scientists responsible for the design and operation of industrial solids processes.

- full steady-state and dynamic modelling
- ability to robustly handle large numbers of recycles
- rigorous optimisation taking into account many flowsheet and equipment design variables simultaneously

- estimation of kinetic parameters using multiple data sets simultaneously
- intuitive handling of complex operating procedures for batch and semi-continuous processes
- integration with existing proprietary models
- custom modelling facilities to develop new models
- upstream integration with gCRYSTAL and gas-liquid process models for integrated design.

## UNIT OPERATIONS

### Basics

- Feeder
- Heater
- Junction
- Mixing tank
- Reactor
- Sink
- Source

### Classification

- Baghouse
- Centrifuge
- Cyclone
- Electrostatic precipitator
- Hydrocyclone
- Screen (steady-state, dynamic)

### Control

- Holdup sensor
- Level control
- LIW control
- Moisture content sensor
- PID controller
- PSD comparison
- PSD monitor
- Roll gap control
- Sieve analyser
- Stream sensor
- Vapour analyser

### Drying

- Dryer
- Dryer agglomerator
- Fluid bed dryer
- Fluid bed dryer agglomerator
- Spray dryer

### Size change

- Agglomerator
- Agglomerator with breakage
- Mill
- Roller compactor

### Storage & transportation

- Belt conveyor
- Bucket conveyor
- Hopper
- Pneumatic conveyor
- Screw conveyor

### Tableting

- Tablet coater
- Tablet dissolver
- Tablet press



Find out how PSE can  
make your solids  
processes better at

[pseenterprise.com](https://pseenterprise.com)