PMP *FB Sim*

Simulation of Comminution- and Classification Systems

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supports the steady state calculation of comminution- and classification systems. In general, mathematical models are required which describe the process behaviour with a sufficient accuracy. The models can be established by empirical knowledge and by the evaluation of experimental investigations. The application of the modules PMP MILL and PMP CLASS can be helpful for performing the corresponding preparation steps.

RUNNING THE SIMULATION

PMP flowsheet projects are required to perform the calculations for specific classification- and comminution systems. These projects carry all necessary information for linking the individual elements with their specific properties. The complete calculation will be initialised by menu command Flowsheet | Simulation.

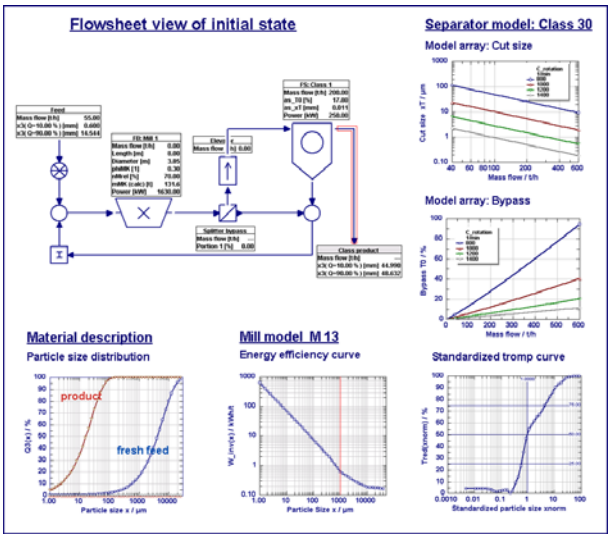

Fig 1: Initial information required for simulation

In order to simulate a grinding circuit with a two-compartment tumbling mill and a down streamed classifier, the input data of the feed material, the comminution and of the classifier will be required. Real conditions are reflected well in cases where the model considers the mass flow influence (MILL 12, CLASS 30).

The calculation comprises:

- verifying the input conditions
- pre-calculating all particle size distributions and mass flows on all individual process units in a fixed order
- checking the validity ranges of the model
- a steady state check for each iteration step
- the option to record values of selected characteristics

After finishing the simulation calculations, the complete mass balances with all resulting particle size distributions and the corresponding characteristic curves with respect to the actual steady state of the system are documented by the saved flowsheet project file.

APPLICATIONS

The simulation module supports the solution of quite different problems:

- checking and evaluating different plant states
- investigating the plant behaviour (case studies)
- plant optimisation
- comparison of different plant configurations

Within the plant evaluation the models and experimental data are compared and adapted so that significant contradictions in the data sets can be eliminated.

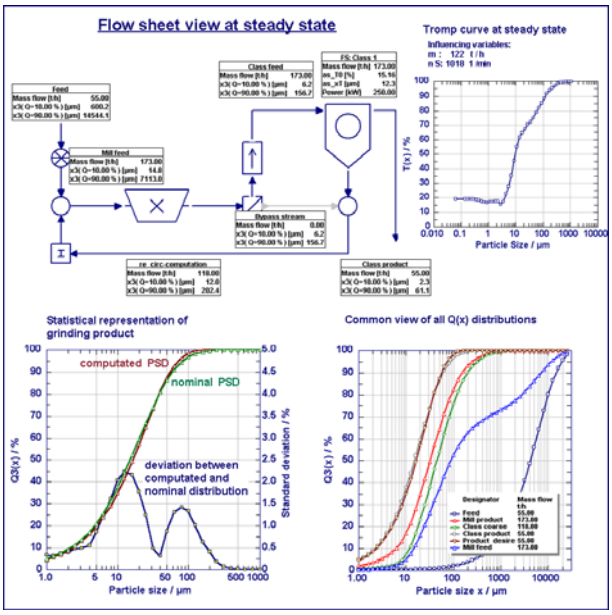

Fig 2: Steady state of a computed grinding circuit

Feed rate	55	t/h
Classifier speed:	1018	1/min

The left graphic shows, that the required particle size distribution of the product can be reproduced with a maximum deviation < 2.5 %.

PLANT BEHAVIOUR AND OPTIMISATION

Both, the plant state (optimum) and its behaviour (transition, stability) can be studied by means of simple calculations.

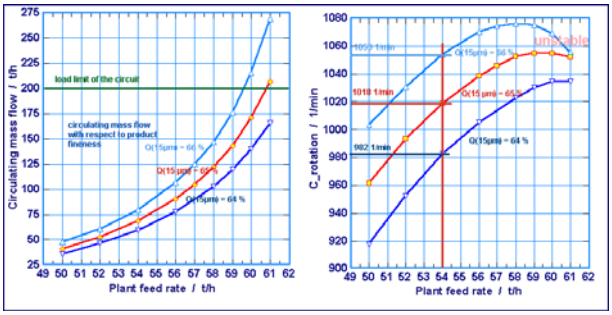

Fig 3. In order to study the stability of the grinding circuit (Fig. 1) the circulating mass flows (left) and the required classifier speed (right) are considered for three levels of the product fineness via the plant feed rate. No system stability is given with feed rates higher than 60 t/h !

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