

PULPFRONT AND CHEMCAD/CC-DYNAMICS: UNIQUE PROCESS SIMULATION & OPTIMISATION FOR THE PULPING INDUSTRY IN STEADY STATE AND DYNAMICS

Release of PulpFront for CHEMCAD/CC-DYNAMICS

Company FrontWay of Norrköping (Sweden) and Nor-Par a.s (Norway), a technical software distributor/software developer for Scandinavia, East Europe and Russia have announced the release of PulpFront for **CHEMCAD/CC-DYNAMICS**.

The software brings the pulping market advanced process simulation tools based on integrated platforms of **CHEMCAD/CC-DYNAMICS** and PulpFront. CHEMCAD and CC-DYNAMICS are process simulators from Chemstations Inc that are solely marketed in the region by Nor-Par a.s

True dynamic "blue-print" model of your own pulp-mill performance that can be run in the PC

Using PulpFront working in the framework of CHEMCAD/CC-DYNAMICS you can have a dynamic model of the whole pulp mill that truly acts and reacts as the real pulp-mill would, and you can run the model in your PC.

- **Improve and optimize the production** with optimum use of energy, utilities and chemicals and with as low emissions as technically possible. Run "what-if" scenarios for different wood type for changing

demand for the product from the market. Improve the pulp quality and minimize losses. The Production Improvement and Optimisation System works on the dynamic "blue-print" model in PulpFront + CHEMCAD/CC-DYNAMICS

- **Operate the plant effectively and safely** by adequately training your personnel. Training Simulator works on the dynamic "blue-print" model in PulpFront + CHEMCAD/CC-DYNAMICS

CHEMCAD/CC-DYNAMICS: Steady state and dynamic process simulation

CHEMCAD is state-of-art process simulator distributed and supported by Nor-Par and currently used by hundreds of users in very different process industries. Several companies operating in the pulp business are users of CHEMCAD and CC-DYNAMICS today.

CHEMCAD is in the first place mass and heat balance (Flowsheeting) and equipment-sizing program. It is equipped with DIPPR databank of physical properties of media, DECHEMA thermodynamics databank and electrolyte subsystem as well as solid/fluid calculations. It allows calculation of psychical and chemical properties of mixtures. CHEMCAD includes about 40 unit operations covering needs of most of process industries, a non-linear solver, and reporting system. The program is genuine Windows ap-

plication with STEP compliance, open programming interface and strong interface with Microsoft Office.

Since most of technologies found in the pulp-mill operate dynamically, CHEMCAD and CC-DYNAMICS (the dynamic solver of CHEMCAD) are used together with PulpFront as the Engine

PulpFront

PulpFront is extensive library unit operations that describe performance of units found at the pulp-mill. Given input parameters and physical properties of media. Each of units of PulpFront precisely reflects the performance of processes.

PulpFront includes batch and continuous digesting, washing, screening, evaporation, recausticizing, calcining, bleaching and recovery boiling.

PulpFront covers the unique process parameters that are frequently used in the pulp mill, like for example consistency, kappa and alkalinity. Processes that are operated in batch mode are solved in dynamic process simulation. For purposes of using PulpFront, you need **CHEMCAD and CC-Dynamics**.

Integrated solution

The goals of integrating CHEMCAD/CC-DYNAMICS and PulpFront are:

- To meet the needs of the pulp market by adding the expertise of PulpFront to existing CHEMCAD/CC-DYNAMICS platform
- To meet the needs of the pulp market by enabling PulpFront run in the environment of state-of-art

CHEMCAD/CC-DYNAMICS process simulation including calculation of physical properties of media

- To run the model of entire pulp-mill in one simulation flowsheet for production improvement & optimisation purposes
- To let the pulp-mill operators and engineering companies working for the pulp business properly determine true

performance of the plant, and allow the pulp industry effective design and re-design for pulp-mills

- To allow the pulp-mill operators optimise the plant performance, reduce the energy consumption and decrease the amount of waste

Addressing the needs of the pulping industry and of the bleaching chemical business

Nor-Par's specialty is providing solutions for the processing industries in process simulation, piping stress analysis and fluid flow simulation.

Pulping technology simulation

The technologies of the pulping industry are based on processes of very complicated chemistry. They are characterised by dynamic (non-steady state) operation, high consumption of water and energy, heavy use of bleaching chemicals, needs of recovering the chemicals, solid handling as well as environmental problems.

The key-points for the pulp-mill are production improvement and optimisation to reduce the manufacturing cost and environmental loads while keeping high quality of produced fibers. Process simulation is the answer.

While CHEMCAD and CC-DYNAMICS have helped very well for many years our clients in the industries working for pulp mills, such as VTT, Andritz, Metso Power, and Pöyry Engineering, SWECO PIC and many other, Nor-

Par perceives the need of addressing very specific needs of the pulp-mill. There are several unit operation based simulation packages for pulp-mill in the market. Nor-Par's intention is to provide all the benefits of state-of-art simulation (CHEMCAD, CC-DYNAMICS, Blue-Print Model, Production Improvement & Optimisation as well as Training Simulator) to all companies working on pulp-mill optimisation. This is achieved by integration of the different pulping simulation packages with the software and solutions we deliver.

CAPE-OPEN standard present in CHEMCAD opens the door for easy integration of CHEMCAD with unique programs in pulping, pharma and other industries.

One of the best examples of integration of pulping and chemical simulation knowledge is PulpFront for **CHEMCAD/CC-DYNAMICS**

Bleaching chemicals manufacturing

CHEMCAD/CC-DYNAMICS is extremely well fit for simulation of bleaching manufacturing. First licenses were granted to the Nordic bleaching chemical industry as early as in late 1980's. Since early 1990's CHEMCAD got the electrolyte simulation capabilities and this feature has been developed and updated until now.

Today, CHEMCAD has one of the strongest electrolyte calculation capabilities found in the market, making it ideal for calculation complex salt systems, precipitation/crystallization, absorption, desorption and similar technologies found in inorganic industries.

Our qualified personnel will help you regress available data for your electrolytes/salts, so you can start working with the program as if it were "out of shelf" package for your industry needs

What is needed for pulp-mill simulation

PulpFront (all unit operations are dynamic)

E1OP - Bleaching
D0 - Bleaching
D ½ - Bleaching
P - Bleaching
Primary filter
Secondary filter
Wash filters and presses
Dewatering filters and presses
Pulp centri-cleaner and other screens/cyclons
Knot drainer/Knot screen

Chip bin
Impregnation
Different pulp and liquor components
Separate liquid phases
Diffusor
Digesters (continous and batch)
Special High consistency tower with dilution
Evaporation
Recovery boiler
Soap separator
Tall oil production

Precipitation filter after recovery boiler.
Economizer
Smelt tank
Green Liquor Filter
Causticizing
White Liqour filter
Lime Mud filter
Lime Kiln
Lime Tower
Lime transporter

CC-DYNAMICS

(all unit operations are dynamic)

Dynamic vessel
- simulates any type of tank
Vessel reactor
- any tank with heating/cooling, reactions or no reaction, detailed heat transfer model
- DIERS model of pressure relief valve built in
Control valve
- universal control and manual valve model, valve sizing included
PID controller
- model for controllers including cascade and split-range controllers. Industrial controller algorithms can be added by Nor-Par
Dynamic column
- absorption, desorption, distillation
Time delay
Electrolytes
Solids
Physical property databank and thermodynamics

CHEMCAD Steady State

(unit operations run in steady state and dynamics)

Solid-liquid unit operations
- 13 different types
Advanced pipe model
- single phase, two phase and slurry flow model
- heat transfer (detailed)
- property profiles along pipeline
- piping network solving capability
Heat exchangers
Pumps and compressors
Absorption and distillation including tray and packing hydraulics
Reactors
Electrolytes
Solids
Extensive physical property databank and thermodynamics
Environmental calculations
Sizing of vessels, orifices, control valves, pressure relief devices (DIERS)

CC-THERM

(models run in steady state and dynamics)

True performance of a physical heat exchanger inside the simulation
Shell & tube
Plate & frame
Double pipe
Finned tube heat exchangers
Air coolers

PulpFront, CHEMCAD, CC-DYNAMICS and CC-THERM work as an integrated solution and share data with one another

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