



# WEST

## simulation of wastewater treatment plants

- For design, analysis, optimisation, automation and research
- Extensive model and process library
- Easy start for newcomers – full flexibility for experts
- Fastest WWTP simulation engine ever





## APPLICATIONS

WEST is a powerful and user-friendly software product for dynamic modelling and simulation of wastewater treatment plants (WWTP).

The redesigned WEST marks a significant milestone with a completely new GUI and simulation engine giving an easy start for newcomers to WWTP modelling as well as offering modelling experts and researchers the unprecedented flexibility and simulation speed, which is required for advanced applications.

WEST is designed for operators, engineers and researchers who want to simulate physical, biological or chemical processes in water, typically a WWTP.

The extensive state-of-the-art model and process library of WEST enables you to model and evaluate almost any kind of modern WWTP.

Typical WEST applications:

- Optimal design and operation of wastewater treatment plant
- Identification of problems and costs
- Scenario simulations with current and future influent flow rate profiles and wastewater composition
- Testing operation robustness and risk analysis
- Identification and removal of barriers
- Cost optimisation of plant operation
- Online modelling which integrates plant automation

## FEATURES

### Graphical user interface

WEST offers a user-friendly platform for dynamic modelling and simulation of water quality systems. The plant layout is set up in the graphical user interface, selecting the different units from a process library. Control strategies can very easily be implemented by selecting and placing sensor and controller units in the layout. No additional coding is required.

### Model library and editor

WEST has an extensive model library including the most recent mathematical models for simulating processes with individual temperature variation in activated sludge tanks (ASM1, ASM2, ASM2d, ASM3, ASM3 Bio-P) as well as models for SBR (sequenced batch reactor), bio filters, sand filters, settling tanks and fermentation reactors (ADM1).

The model editor, including a Gujer (Petersen) Matrix editor, facilitates modifying the default models or creating new models.



## FEATURES

### Icon editor

The various units of a WWTP are graphically represented by icons with handles for inflows and outflows. WEST offers an extensive library of icons covering the vast majority of all types of units found in WWTPs. However, special WWTP units may require creation of tailor made icons, which is facilitated by the unique icon editor.

### Simulation types and engine

For efficient model calibration, a number of additional modules are available to automate tasks such as local and global sensitivity analysis, parameter estimation, scenario analysis and uncertainty analysis (based on Monte Carlo and Latin Hypercube Sampling). The large number of model runs often required in such analyses is only possible thanks to the remarkable speed of the WEST simulation engine.

### Openness

WEST has an open structure that allows for integration with supervisory systems (SCADA) and data management systems on the WWTP. Using this approach one can implement an operator decision support system aiding in day-to-day plant management, while saving on operational costs and guaranteeing the required effluent quality.

The cost calculator included in WEST can determine the cost of almost any operation, including energy, sludge and chemicals.



# MODULES

**WESTforDESIGN** allows for validation of design options and evaluation of different plant layouts in dynamic conditions. This is done by running scenarios, eg for high load and low load conditions, and by evaluating the effect of complex control strategies. The design process is facilitated by an extensive process library: next to the common activated sludge processes and settlers, it also includes SBR, MBR, TF, IFAS and MBBR models.

**WESTforOPERATORS** facilitates short term (eg storm events) and long term (eg consistent nutrient removal) evaluations of wastewater treatment plants. This approach makes it possible for operators to reuse the modelling efforts of their consultants in a flexible and customisable tool. The evaluations are done for bottleneck identification, running scenarios for specific influent and operational conditions, and for evaluation of costs. The tool is most useful to improve understanding of the wastewater treatment plants and hence for operator training.



# MODULES

**WESTforOPTIMIZATION** allows consultants and engineers to optimise the wastewater treatment processes. The flexibility and the truly open model structure in combination with add-on modules for easier calibration (local and global sensitivity analysis, automatic parameter estimation, scenario analysis and uncertainty analysis) make **WESTforOPTIMIZATION** the most powerful tool available.

**WESTforAUTOMATION** is an extended toolkit featuring fast integration of modelling and simulation in custom applications by automation or software engineers. SDKs, containing comprehensive and extensive documentation and sample sets, facilitate linking **WEST** with SCADA systems or other modelling software such as MIKE URBAN, Matlab and CFD.

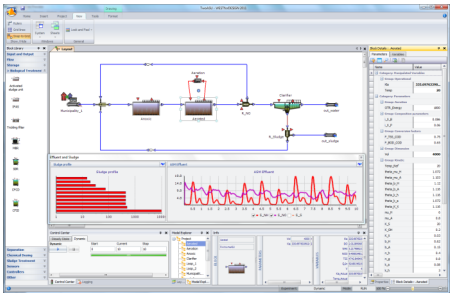


# BENEFITS

**WEST** enables you to model and evaluate almost any kind of wastewater treatment plant. You have the possibility to test and optimise any scenario of interest and to track the associated treatment efficiency as well as operational cost.

**WEST** offers the following benefits:

- Optimisation of costs and operations, including energy savings
- Online information exchange allowing for plant automation
- Easy implementation of control strategies
- Local and global sensitivity analysis, parameter estimation, scenario analysis and uncertainty analysis
- Unprecedented speed of simulations
- One software for all types of users and WWTP applications
- Open and flexible models





## Software for **WATER ENVIRONMENTS**



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