

UniSim® Design Suite R370

UniSim® Design Suite R370 Now Available – On March 30, 2007, Honeywell unveiled UniSim Design Suite R370, the latest release of Honeywell's steady-state and dynamic process simulation offering. The UniSim Design Suite is part of Honeywell's family of simulation software and engineering services for process simulation, design, performance monitoring, optimization and business planning for the oil and gas production, gas processing, petroleum, refining and chemical industries.

Based on the intellectual properties of HYSYS® and the associated software products acquired from Aspen Technology, Honeywell's continued investment in this product line has resulted in the addition of significant new features and enhancements that provide customers with the **best simulation lifecycle technology** available in the marketplace.

Key New Features and Enhancements in UniSim Design Suite R370

Thermodynamic Models and Physical Properties Enhancements

- A newly developed pure compound database loader system which provides users with direct access to external compound property databases, such as DIPPR® (Design Institute for Physical Properties)
- A new vapor phase association model for HF (Hydrogen Fluoride) modeling
- Access to PVTsim from Calsep through the PVT Environment in UniSim Design
- Volume Translation option was extended to calculate for enthalpy, entropy and heat capacity, in addition to liquid density, using the Peng-Robinson equation of state model

Enhancements for Steady-State Modeling

- Carryover correlations for realistic modeling of separators
- Link to PIPESIM software from Schlumberger for pipeline simulation
- Access to Predict®-SourWater from Intercorr for corrosion prediction of sour water systems in refinery applications
- Audit Tool to check for material and energy balances across the entire flowsheet
- Enhanced scenario management feature which allows multiple "cases" to be run with a single file
- New pressure drop correlation for slurry flow in pipelines
- Added flexibility for setting up variables programmatically in the Derivative Utility
- Automation access to pure component properties
- Particle Size Distribution (PSD) throughout the flowsheet which supports the PSD changing unit operations
- New solids handling unit operations including Crusher/Rotary Breaker; Vibrating Screen; Slurry pump; and Centrifuge
- Enhanced compressor model to collapse compressor curves into a single representation
- Addition of a new template for steady-state modeling of gas turbine
- Enhanced pump module to deal with multi-phase systems including oil, gas, water, and sand
- Enhancement that allows external programs to define and run Data Reconciliation models for real-time steady-state optimization.

Enhancements for Dynamic Simulation

- Improved run-time performance
- Enhanced compressor model based on a novel technique to collapse a set of manufacturer-provided curves for Head vs. Flow vs. Speed at varying inlet conditions into a single curve
- Extended UniSim-OLGA link to support composition-based OLGA pipeline modeling and modeling of Dead Oil

- Addition of a new gas turbine model template
- Enhanced pump module to deal with multi-phase systems including oil, gas, water, and sand
- ASCII snapshot/Case Management functionality for scenario management in dynamic simulation to ensure a bumpless start of the simulation
- Enhanced valve unit operation to include bypass valves, block valves and restriction orifices within a single valve object
- Physical property efficiency enhancements to speed up dynamic simulation

Enhancements for Electrolyte Modeling

- User-defined hypothetical components can now be used with the OLI Electrolyte package
- Integration of the rate-based OLI distillation solver for column simulation

New UniSim Heat Exchangers

- The addition of two new products (**UniSim FeedWater Heater Modeler** and **UniSim Process Pipeline Modeler**) completes the product portfolio for accurate modeling of heat transfer equipment
- Improved usability and robustness, Process Simulator File (PSF) Generation and links to UniSim Design

Customer Benefits of UniSim Design Suite R370

- Effective and powerful tools enable improved process design and reduced total project cost
- Optimized process conditions and equipment performance are monitored and sustained
- Reduced engineering cost can be achieved throughout the plant lifecycle, from conceptual design, to detailed design, rating, training and optimization
- New features allow customers to enjoy improved benefits for more applications.

UniSim Design Suite R370, along with Honeywell's UniSim Operations Suite R300 released in December 2006, is presented as a comprehensive solution that fully engages Honeywell's 25 years of simulation experience in all process industries, from oil & gas, refining and chemicals to power generation and mining.

In addition, Honeywell's UniSim engineering and product development organizations have grown to over 250 engineers driven by global acceptance of our innovative solutions. Honeywell continues to invest in UniSim technology, utilizing both the experienced development team that joined Honeywell from AspenTech and Honeywell's unparalleled process industry knowledge. Honeywell is also uniquely positioned to provide customers with superior support for their simulation investment through its UniSim support group, which is comprised of engineers who have supported HYSYS® for many years.

Support for Aspen HYSYS® Simulation Cases

UniSim Design R370 supports the reading of any simulation case saved in Aspen HYSYS® 2006 or older versions. It also supports writing out a UniSim Design simulation case in HYSYS® 2006 format so simulation cases may be shared between UniSim Design and HYSYS® in both directions. The UniSim Heat Exchanger cases are similarly compatible with Aspen HTFS® 2006 cases.

For more information: Please contact Laurie Wang by e-mail at laurie.wang@honeywell.com or by phone at 1-403-503-1347. Also see the [UniSim Design Suite Web Page](#).

Training is available and can be arranged either at your site or at a Honeywell office. Please contact us for more information: E-mail unisim.support@honeywell.com or call 1-866-392-8748 (toll-free North America) or 1-403-509-1379 (International).

Appendix

An overview of all the products offered in UniSim® Design Suite R370 as of April 2007

- **UniSim® Design** is an intuitive and interactive process modeling offering that enables engineers to create steady-state and dynamic models for plant design, performance monitoring, troubleshooting, operational improvement, business planning, and asset management. Based on the intellectual properties of HYSYS® acquired from AspenTech, Honeywell has added significant new features and enhancements to the product, making it the most valuable simulation tool available in the market.
- **UniSim ExchangerNet** is an advanced tool for the design and optimization of heat exchanger networks. Utilizing advanced optimization technologies, ExchangerNet allows customers to perform pinch analyses as part of capital expenditure projects and ongoing operational optimization work. This leads to optimal process economics between capital and operating costs.
- **UniSim ThermoWorkbench** provides users with the ability to create and analyze thermodynamic packages by regressing parameters against laboratory data and for analyzing the resulting predicted phase equilibria behavior. These packages may then be used in UniSim Design or any other application using UniSim Thermo. UniSim ThermoWorkbench also allows users to perform azeotropic calculations for multiple compound systems, and to view results using a number of different graphical tools such as Txy and ternary phase equilibria diagrams.
- **UniSim Heat Exchangers** is a family of heat exchanger simulation tools, based on the intellectual properties of HTFS® acquired from AspenTech. The products are based on over 30 years of research and collaboration with industry.
 - **UniSim Shell-Tube Exchanger Modeler** provides thermal design, checking, or simulation of shell & tube heat exchangers and can be used standalone by the thermal specialist for exchanger design or as an integrated product with UniSim Design. When used as a stand-alone program in design mode the modeler can determine the optimum heat exchanger configuration that satisfies the specified heat duty, allowable pressure drop, and / or maximum velocity. In addition, this program allows the designer to rigorously check or rate a configured exchanger for specified duty.

When integrated with UniSim Design, the modeler provides engineers with the ability to rigorously model heat exchanger operation and identify opportunities for capital savings in the overall process configuration. Bottlenecks can be identified, process improvements modeled for various process operating scenarios, and costly maintenance schedules optimized.
 - **UniSim Crossflow Exchanger Modeler** provides thermal design, checking, or simulation of cross-flow heat exchangers including process air-cooled heat exchangers, economizers, and the convection sections of fired heaters. The modeler can be used standalone by the thermal specialist for exchanger design or integrated with UniSim Design. When used stand-alone the modeler can determine the optimum heat exchanger configuration that satisfies the specified heat duty, allowable pressure drop, and/or maximum velocity. The program can also be used to check and rate heat exchangers for required process duties.

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improvements modeled for various process operating scenarios, and costly maintenance schedules optimized.

- **UniSim Plate-Fin Exchanger Modeler** performs detailed simulation of multi-stream plate-fin heat exchangers made from brazed aluminum, stainless steel or titanium. It can be used standalone by the thermal specialist for exchanger design or integrated with UniSim Design. When used standalone the modeler can be used for both 'first pass' calculations and detailed layer-by-layer analysis to evaluate new uses, revamps, process conditions and fouling cases. It can also perform full thermosyphon modeling, where one or more exchanger streams are subject to natural circulation, as well as crossflow streams.

When integrated with UniSim Design, the modeler provides engineers with the ability to rigorously model processes that use multi-stream plate-fin heat exchangers, such as LNG, ethylene, or air separation. It can be used to identify opportunities for capital savings in the overall process configuration. Bottlenecks can be identified and process improvements modeled for various process operating scenarios. UniSim Plate-Fin Exchanger Modeler is based on models and methods for plate-fin thermal-hydraulic performance that have been derived from over 35 years of collaboration with industrial users encompassing process operators, engineering contractors and plate-fin exchanger fabricators. This depth of experience brings unique accuracy, acceptance of prediction, and validation of results.

- **UniSim Fired Process Heater Modeler** provides calculations for the simulation, troubleshooting and operations of gas or oil-fired process heaters, dealing with both the firebox and convection sections. In simulation mode, it can be used for troubleshooting, for example identification of tube burnout and operation, to identify the best operating conditions given changes in feedstock or product specifications. Key performance variables, such as product and metal temperatures are presented graphically, to enable rapid evaluation of operational changes, including the effect of flame shape and heat release.
- **UniSim Plate Exchanger Modeler** provides design, rating and performance simulation of plate and frame heat exchangers, either gasketed plate and frame or welded or brazed plate. In design mode, it can determine the optimum heat exchanger configuration. It can also check or simulate heat exchangers where the geometry is specified, allowing users to troubleshoot or de-bottleneck operating units. The characteristics common to many commercially available plate and frame heat exchangers are handled.
- **UniSim FeedWater Heater Modeler** provides customers with the facility to estimate the thermal performance of conventional closed shell-and-tube type feedwater heaters used in power plants. In this equipment, feedwater flowing inside tubes is heated by means of steam, extracted from the turbine, on the shell-side.
- **UniSim Process Pipeline Modeler** provides users with the facility to estimate the steady-state performance of an un-branched pipeline system carrying single phase or two-phase flows.

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