Honeywell
THE POWER OF CONNECTED | Connected Plant

UNISIM® DESIGN SUITE

Simple, Powerful, Flexible:
The Model Solution for Process Industries

Multi-Purpose Simulation

Design, monitor, troubleshoot and optimize your process with UniSim Design Suite. Intuitive, feature-rich and versatile, UniSim's industry-leading software suite enables faster, smoother, safer process designs and plant asset monitoring.

Why UniSim Design?

- *Field-proven, powerful steady state and dynamic modeling under the same environment*
- *Fast, accurate, and robust process simulation software*
- *Compliant with industry standards*
- *Modular and extensible*
- *Open architecture (ActiveX and CAPE-OPEN compliant)*
- *Integration with third-party specialist technologies*
- *Multi-purpose, for value across multiple applications and across the project and/or plant asset lifecycle*
- *Best-in-class aftermarket services with experienced support staff.*

Comprehensive, first principles thermodynamics and unit operation models bring benefits across project and/or asset lifecycle for the process industries. Users can quickly create robust, realistic process simulation models to use for offline and online (digital twin) applications.

- Create and visualize process flowsheets with an intuitive, easy-to-use graphical interface.
- Size, rate and select appropriate materials for equipment in accordance to industry standards.
- Accurately predict the impact of feed changes, upsets and alternate operations on safety, production, and profitability.
- Optimize designs to meet operational and business objectives.
- Leveraging UniSim models as the digital twin, monitor plant performance and equipment reliability.

With open architecture and integration with leading third-party solutions, UniSim Design Suite gives engineers the tools they need to solve complex problems and develop safer and optimized process designs and plants.

First-Principles & Extensible Simulation

UniSim Design accurately calculates physical, transport, separation, and reaction kinetic properties. Market-leading, it's field-proven to give realistic results in both steady-state and dynamic environments.

UniSim Design includes over fifty unit operations that represent process equipment (i.e. separators, heat exchangers, distillation columns, reactors), process controls (i.e. instrumentation, PID and multi-variable controllers, process switches) and logic functions (i.e. mathematical functions, boolean operations). In addition, users may build and use their own extensions in the UniSim simulation environment, leveraging and protecting their IP. UniSim Design also links seamlessly to specialist third-party software for unit operation design: HTRI Exchanger Suite for heat-exchanger design and rating; Schlumberger OLGAS-2P/3P, Pipesys, Pipesim, and OLGA for detailed pipeline design and simulation; Petex IPM Suite (GAP/RESOLVE) for well-head management; MySEP for separator design; and Pro-M for compressor design.

Extensive thermodynamic property databases can be extended, to add components or custom thermodynamic properties, or tuned, to account for binary interaction parameters, for example. UniSim Design also links seamlessly to specialist third-party thermodynamic and crude assay databases, such as OLI Electrolytes, Schlumberger AMSIM and BlackOil, CALSEP PVTSim Nova, Haverly H/CAMs, GERG 2008, Dortmund Databank (DDBSP) and those of the Design Institute of Physical Properties (DIPPR).

Size, Rate and Cost Equipment

Built-in tools for equipment sizing and rating and seamless integration with Cost Engineering's Cleopatra Enterprise for costing, enable you to setup and execute feasibility studies, with increased engineering efficiency. Sizing and rating calculations reflect industry standards and leverage Honeywell's expertise as process technologist. Costing calculations leverage Cost Engineering's expertise in this field. The seamless integration and cost reporting in the UniSim Design environment, allow process engineers to understand the economics of the process and to modify it, in order to meet feasibility and profitability criteria.

Develop and Improve Process Design

Use UniSim Design Suite to easily create or revise a model of your process, size and rate equipment, and optimize your design. Use the model to predict the impact of design decisions, so that you can reduce risks, cut costs and optimize operations. "What-if" scenarios and sensitivity analyses help engineers make informed, forward-looking choices and avoid costly on-site modifications during commissioning.

Lower Total Cost of Ownership

UniSim Design Suite delivers value throughout the lifecycle of a project and/or plant asset: from conceptual to detailed design, operations start, troubleshooting and revamps, UniSim Design models can be continuously re-used, refined and developed. Eliminating manual transfers, formatting and analysis of production and process data, and using embedded industry standards, the software reduces errors and cuts engineering time by up to 30%. Our multiple-purpose models also deliver value when building other advanced applications: from online operational monitoring systems (asset management, advanced process control, corrosion), to offline process design and operator training systems (Operator Training Simulators), UniSim features as the process model for all these solutions.

Designed for You

UniSim Design offers greater flexibility with a wide range of industry-specific modules, extensive support for third-party applications and open architecture. It gives users more choices to achieve the greatest design accuracy and highest fidelity models possible.

UniSim Design Options

UniSim's modules allow users to tailor the solution to meet their precise requirements:

UniSim Design: This is the core steady state flowsheeting environment. It provides an intuitive and interactive process modelling solution that enables engineers to create steady-state models through the appropriate selection of thermodynamics properties, feed compositions and conditions; unit, control, and logic operations.

UniSim Dynamics: Provides dynamic simulation capability and is fully integrated with the UniSim Design environment. A steady-state model can be easily converted into a dynamic model with the use of the dynamics assistant. The dynamics model offers rigorous and high-fidelity results with very fine level of equipment geometry and performance detail. Special features for dynamic modelling include pressure-flow dynamics, a rich set of control functionality to support process control and detailed process monitoring, cause and effect matrices, and an event scheduler.

UniSim EO (Equation Oriented): The new high-performance simulation platform, which enables simulation and optimization under the same environment. Equations are solved simultaneously to reach solutions faster with Honeywell's NOVA solver, the best available solver in the market for online, real-time optimization purposes. The NOVA solver is well suited for solving hundreds of thousands of equations with up to a thousand degrees of freedom, so it can be applied to solve problems for sizeable processes across all industries. Supporting real-time applications for operational monitoring, with UniSim EO users can now also use UniSim Design to optimize production and scheduling.

UniSim Refining Reactors: Built within the UniSim EO environment, the Refining Reactor modules provide kinetic, medium-high fidelity unit operations that reflect refinery conversion units. The following modules are currently available: hydrocracker, hydrotreater, catalytic reformer, isomerization and alkylation reactors. The refining reactor modules can be calibrated using engineering data or real plant data, leveraging the data reconciliation utility in UniSim Design. Also, in conjunction with the LP vector generation utility, the refining reactors may be used to generate LP vectors, for use and tuning of scheduling and planning tools.

UniSim EO Blowdown Utility: Accurately size and select the appropriate material for blowdown systems. Our equation-oriented blowdown utility helps reduce CAPEX without compromising on safety, by leveraging flowsheeting, blowdown scheduling, 2D heat-exchange in vessels, and non-equilibrium calculation capabilities.

UniSim PRS: Size the PSV/Rupture Disk and surrounding pipes based on calculated/specified relieving rate using different relief scenarios and generate datasheets and reports, with our Pressure Relief Sizing tool. This tool is capable of Preliminary API Design and Existing PRD Validation.

UniSim Flare: Design new flare and vent systems, or rate and debottleneck existing systems that no longer meet plant safety requirements.

UniSim SQP Optimizer: In addition to the optimizer included in UniSim Design, Honeywell offers the UniSim SQP Optimizer Option, which uses a sequential quadratic programming (SQP) optimization algorithm, allowing it to handle more complex optimization problems than the original optimizer.

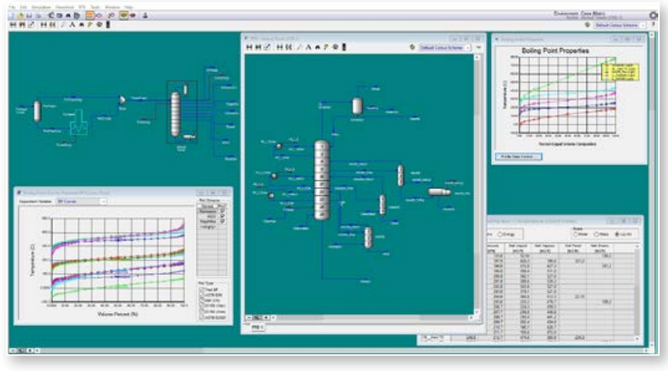
UniSim Spiral Wound Tube Bundle: Design accurately complex spiral wound tube bundles for LNG applications in dynamics.

UniSim Gasifier: UniSim Design Gasifier Option unlocks the gasifier operation block inside UniSim Design allowing the user to model these complex units in both steady state and dynamic modes.

UniSim Heat Exchangers: Our UHX suite of products for thermal specialists to design, check, simulate and rate heat exchange equipment, based on 35 years of industry collaboration and research. Integrated with UniSim Design, users can quickly identify opportunities for capital savings in the overall process design. Honeywell also offers the HTRI Xchanger Suite and HTRI XSimOp modules bundled together with the respective UHX modules, as an alternative to HTRI subscription.

UniSim ExchangerNet: Design and optimize heat exchanger networks, perform pinch analyses, and balance the capital and operating costs. The optional Exchanger Net Operations module may be used to monitor the plant operation of the heat-exchanger networks and understand the impact of different modes of operation on operating costs.

UniSim ThermoWorkbench: Regress parameters against laboratory data to create and analyze thermodynamic packages for use in UniSim Design and other applications.



Adapted to Your Needs

Harness your existing IP and tailor UniSim Design to your needs with open architecture. Compliant with CAPE-OPEN and Active X (OLE) Automation, UniSim Design lets users easily program their own interface or integrate existing models.

You can quickly import and use your own unit operations models, proprietary reaction kinetics and specialized property packages developed in programs such as Microsoft Excel* and Visual Studio.

Protect Your Investments in Third-party Software

We give you flexibility to choose the right software for your operation and gain maximum value from existing investments in modeling technology.

UniSim Design offers smooth, hassle-free integration of models and data from 20 specialist third-party technologies, now including **Haverly H/CAMs** for crude assays and **CALSEP PVTSim Nova** for PVT simulation.

The full list of specialist third-party software which is integrated with UniSim Design follows:

- **Amines and Blackoil** Options (Schlumberger) for amine treating process simulation and upstream fluid modeling, respectively.
- **AXSYS** (Bentley) engineering workflow tool.
- **Cleopatra (Cost Engineering)** cost engineering tool.
- **COMOS** (Siemens) engineering workflow tool.
- **DIPPR** (AIChE) properties of pure components.
- **Dortmund Databank** (DDBST) properties of pure components and mixtures.
- **GAP and Resolve** (Petroleum Experts) oil & gas field simulation.
- **H/CAMS** (Haverly) crude management database.
- **OLI Electrolytes** Option (OLI Systems) electrolyte system modeling.
- **Multiflash** (Infochem) for properties, black-oil translation, and as a PVT engine.
- **MySEP** (Kranji Solutions) separator and scrubber designs.
- **PIPESIM, PIPESYS, OLGA and OLGAS** Option (Schlumberger) pipeline simulations.
- **Predict SW** (Honeywell) corrosion prediction for refinery sour water environments.
- **Pro-M** (MSE) compressor designs.
- **PVTSim Nova** (CALSEP) petroleum fluid characterization and PVT simulation.
- **Xchanger Suite and XSimOp** (HTRI) heat exchanger design, rating, and simulation.

UniSim—Core of Other Advanced Applications

Honeywell's support engineers have in-depth product and domain expertise. With an average of more than nine years' experience supporting UniSim Design, and with solid backgrounds in process engineering, they'll get you answers faster.

A worldwide network provides the services you need wherever you are. We offer a range of standard and custom training courses and full consulting services and studies.

All UniSim Design Suite software also comes with our Benefits Guardianship Program, protecting your investment with a cost-effective path to the latest technology and on-going support. Whether it's telephone and online support, updates or upgrades, we ensure your software stays refreshed and keeps delivering value.

UniSim Design is at the core of a number of online and off-line process design, optimization, and operational monitoring and training applications.

Giving users the power to determine process work flows, equipment operation and implementation requirements, UniSim solutions help capture and share process knowledge, improve plant profitability and maximize returns on investments in simulation technology.

Speak to us to find out more about other solutions related to UniSim Design

- **UniSim Competency Suite** to plan, deploy and manage a structured program to develop and maintain operator competency.
- **UniSim Optimization Suite** to integrate Profit Suite, Honeywell's comprehensive advanced control and optimization technology, with UniSim Design models for APC design and pre-tuning.
- **Uniformance Sentinel** to monitor processes and equipment in real-time; enables industrial facilities to predict and prevent asset failures and poor operational performance.
- **Honeywell UOP CPS** to monitor, predict, and improve plant performance; this is a cloud-based service.

For more information

To learn more about Honeywell's UniSim Design R460, visit www.honeywellprocess.com or contact your Honeywell account manager.

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