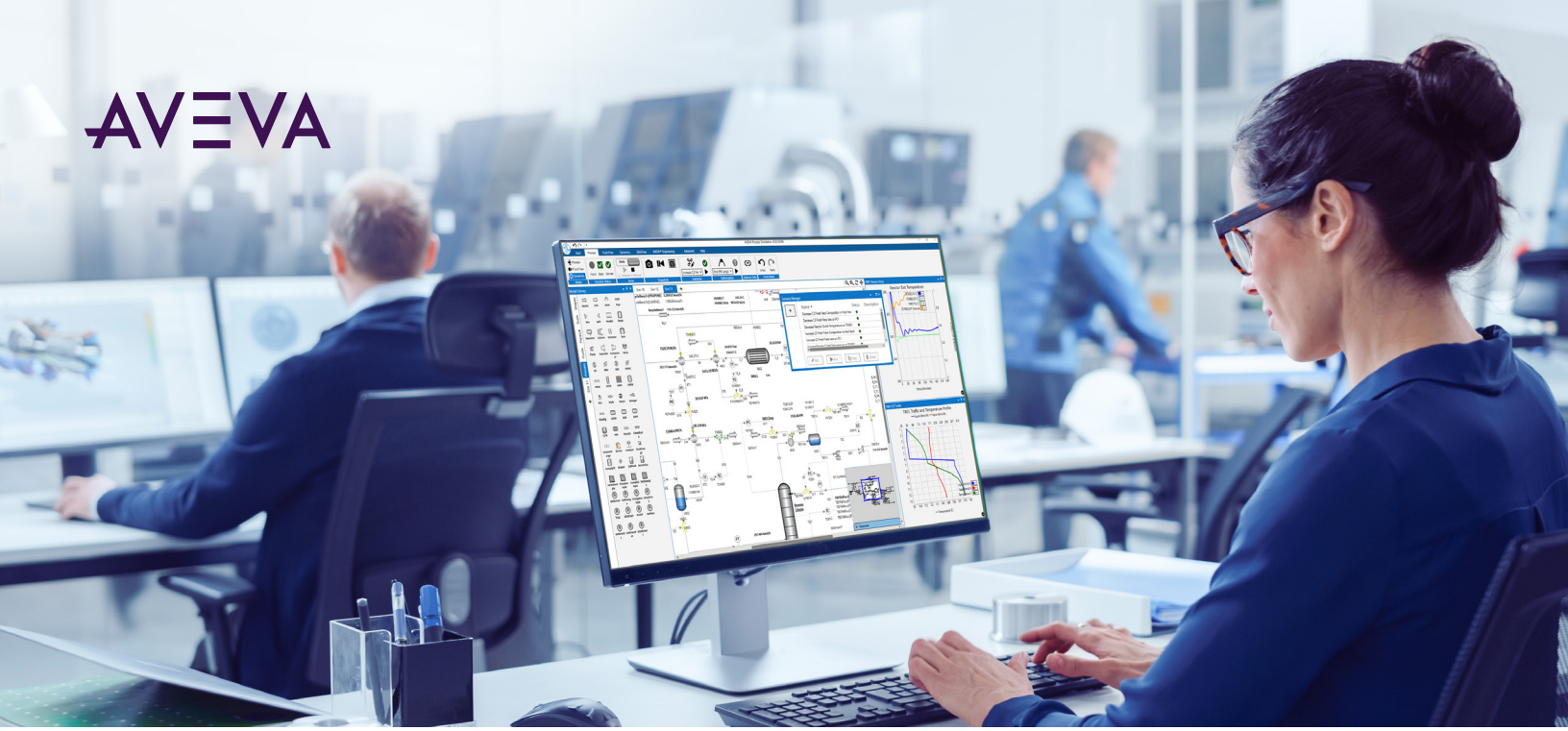


DATASHEET

AVEVA™ Process Simulation

Design sustainable processes at the speed of the market

AVEVA Process Simulation is an innovative, integrated platform that helps you develop the process side of your digital twin so your teams work smarter while designing a sustainable world. AVEVA Process Simulation helps engineers create value in every phase of the plant lifecycle, from conceptual design to operation support.

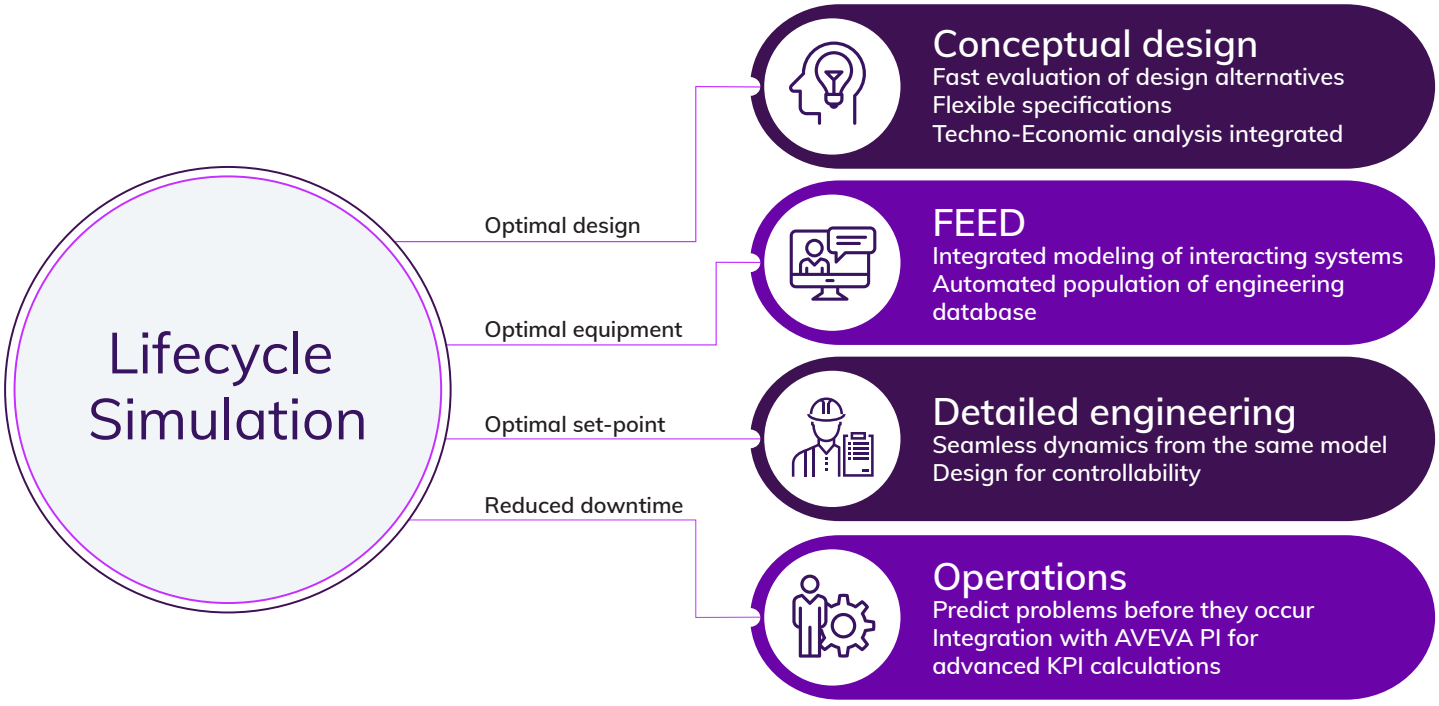
Overview

In chemical and energy organizations, public commitments to net zero emissions and circular economy goals are creating unprecedented demands for sustainable products, processes, and plants. Engineering teams span the globe and respond to changing conditions in markets and regulatory agencies. A new generation of engineers is entering the workforce. Plants are more complex and more tightly integrated. Legacy process simulators are ill-suited to these challenges.

AVEVA Process Simulation is designed to equip the next generation of engineers to create the process portion of the digital twin. It enables Process Engineers to collaborate and quantify the impact on sustainability, feasibility, and profitability. AVEVA Process Simulation is the first simulation platform to move beyond linear, wasteful workflows to enable a circular and sustainable world.

Business value

- **Digital transformation:** Integrate process engineering with the digital twin
- **Lifecyle simulation:** Reuse one simulation across the plant lifecycle
- **Faster adoption:** Replace dozens of point solutions with a single, easy-to-use interface
- **Multi-discipline collaboration:** Change the engineering workflow with concurrent use by process, utility, control, and mechanical engineers
- **Attract and retain talent:** Make engineering less about button pressing and more about creative problem solving



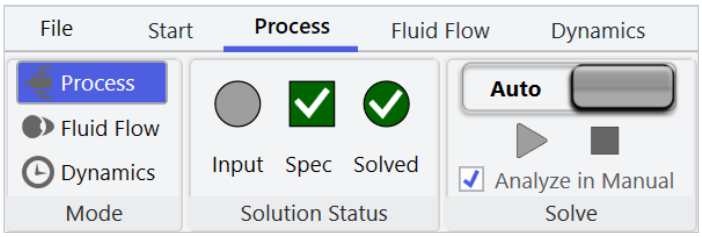
AVEVA Process Simulation features

With legacy tools, even small projects require multiple, specialized simulators. Engineers waste time learning interfaces and transferring data, introducing errors along the way.

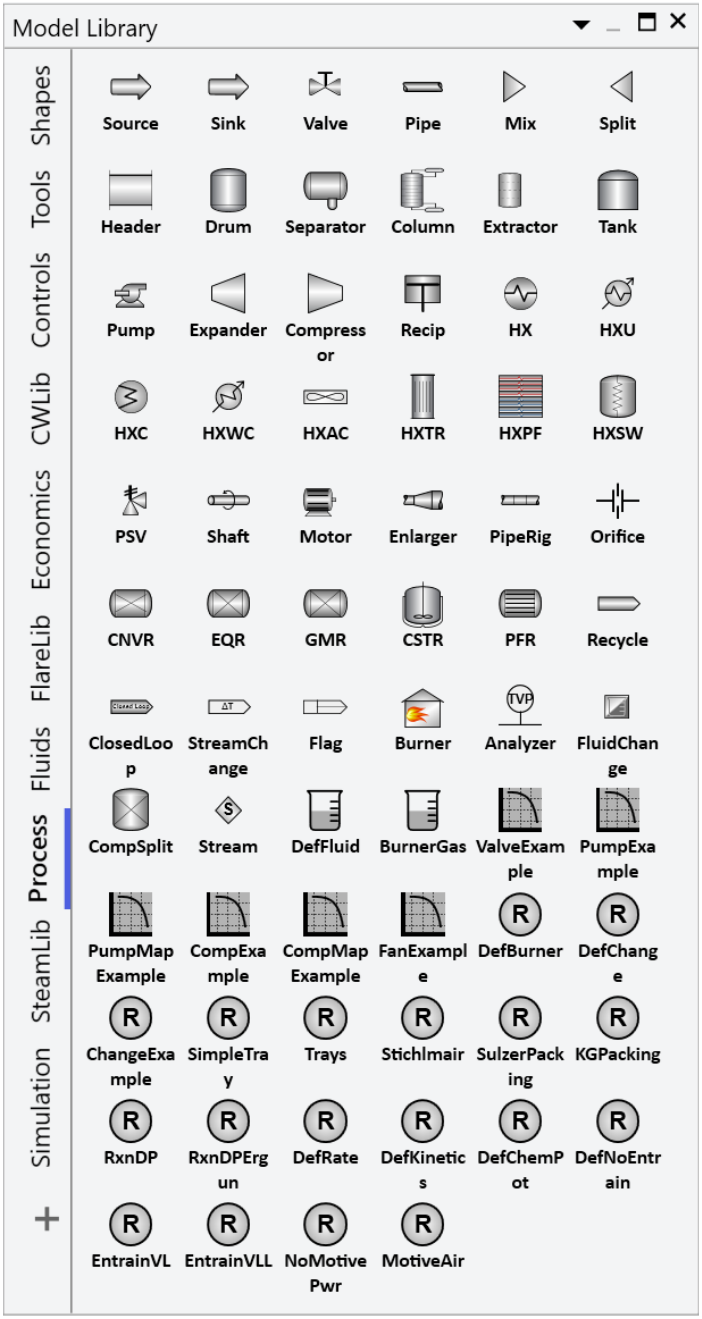
A unified modeling environment improves user experience, IT accessibility, cross-tool integration, and time to proficiency, combined with a lower cost of ownership. Like a smartphone for process engineers, AVEVA Process Simulation unifies many uses into a single, integrated platform to design and optimize a process plant.

AVEVA Process Simulation impacts the daily work of your entire team with a transformational approach to process simulation. AVEVA Process Simulation meets the needs of new engineers, process experts, and their managers with features and workflows built for three key qualities: ease of use, solution power, and adaptability.

- Steady state and dynamics
  - Change modes any time and in any direction between flow-driven steady state, pressure-driven rating, and dynamics
- Built for Tecno-Economic analysis
  - Supports levelized cost analysis, along with Scope 1 & 2 GHG emissions
- Open modeling
  - See, understand, and customize model equations. Write new models with no programming
- Enhanced equation-oriented
  - State-of-the-art numerics allow efficient calculation, especially when there are many recycles and design optimization
- Open platform
  - Expand into new areas of simulation and integrate with new technologies with built-in Python scripting
- Real-time data
  - Automatically input real-time data from operations through the native connection with the PI System



Switch modes at any time in any direction



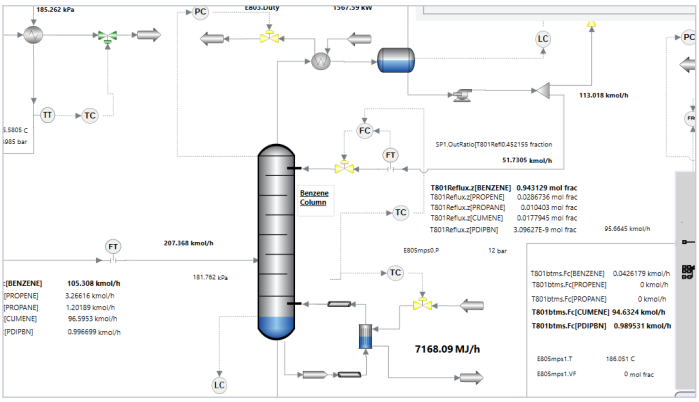
AVEVA Process Simulation has extensive standard model libraries

Application areas

Chemical processes

AVEVA Process Simulation is ideal for chemical process simulation, especially complex systems with many recycles, where conventional simulators perform poorly. Some of the features for chemical processes include:

- A process library with distillation columns, reactors, heat exchangers, compressors, and other common unit operations
- Fluid thermodynamics methods, including SRK, SRKM, Predictive SRK, PR, PRM, NRTL, electrolyte NRTL, UNIQUAC, UNIFAC, Wilson, Hayden O'Connell, IF97, and more added each release
- Interface with the thermodynamics data manager to define custom components
- Use simulation-independent fluid objects, which can be defined with custom components and reused throughout your organization
- Easy-to-use optimization tools improve process design and offer opportunities for sustainability enhancements, such as better cooling and heating systems to minimize greenhouse gas emissions
- Integrated dynamic simulations offer better distillation column relief load calculations

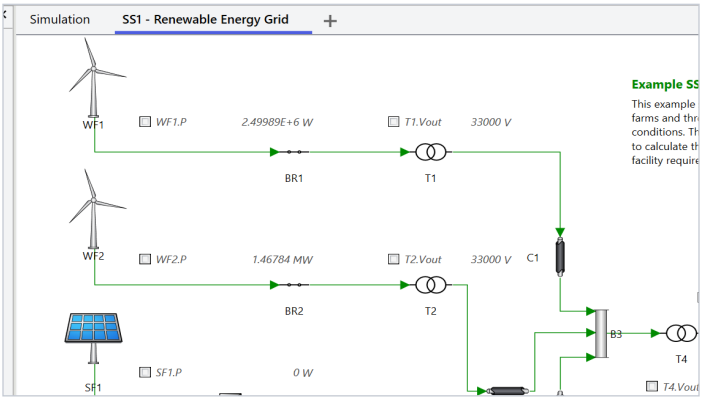


Optimize chemical processes for sustainability and performance

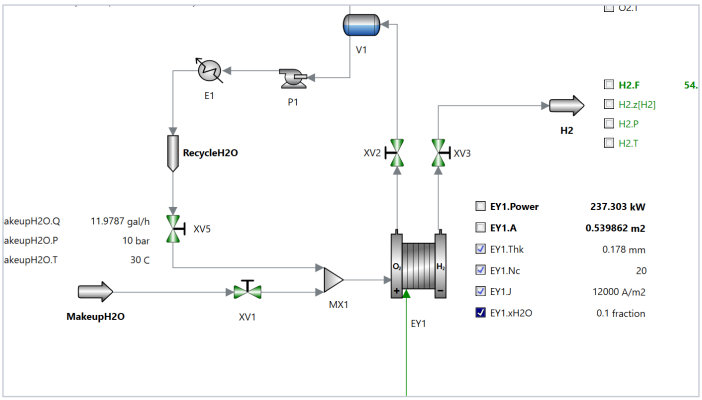
Renewables and sustainability

Incorporate intermittent renewable energy sources, such as wind and solar, into process design and analysis for emerging low-carbon industries, including green hydrogen, ammonia, and Power-to-X applications. AVEVA Process Simulation enables engineers to assess how fluctuating power availability impacts process performance, efficiency, and operability across the full lifecycle.

- Track greenhouse gas emissions from the earliest design stages using the same workflows applied to process optimization and economic analysis
- Evaluate the impact of green hydrogen production, electrified processes, and carbon capture technologies on heat and material balances in new or existing facilities
- Explore design alternatives for energy integration, storage, and process flexibility to support resilient and sustainable conceptual designs



Evaluate design options for renewable power generation networks

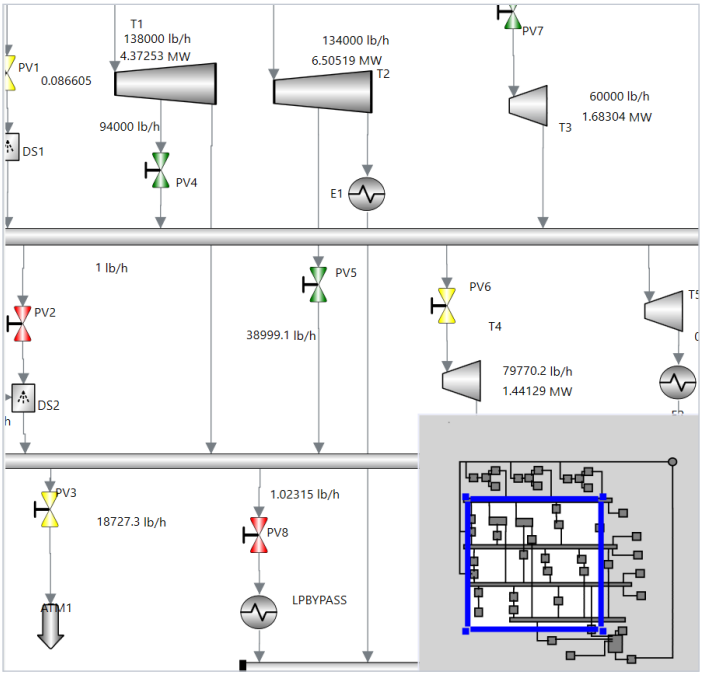


Explore green hydrogen processes within a larger facility

Process utilities

Process utility engineers can use a single simulation for cooling water or steam balances, then change mode to perform a piping flow network analysis and dynamic simulation. The capabilities include:

- A steam library with boilers, steam turbines, extraction turbines, desuperheaters, and condensers
- A cooling water library with supply, return, pipes, pumps, and exchangers
- A transient Flow library for water hammer and pressure surge analysis
- Fluid thermodynamics methods such as steam (IF97), cooling water, other heat transfer mediums

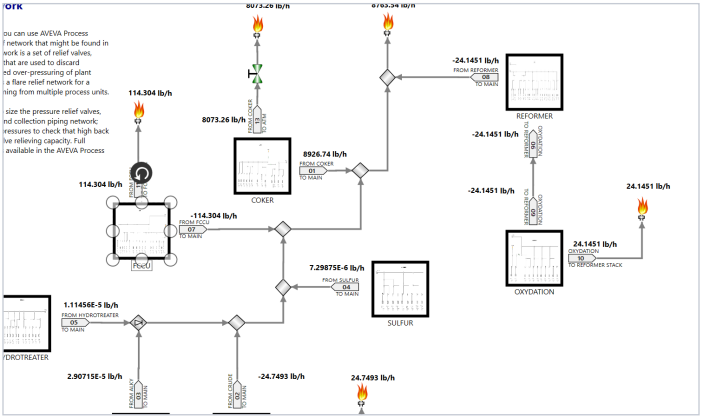


Integrate utilities analysis in a single simulation

Flare networks

AVEVA Process Simulation's flare library provides an easy way to evaluate multiple relief scenarios and immediately see back pressure predictions. Flare networks are evaluated in the same software environment as chemical processes and process utilities for easy coordination of engineering changes. The flare library includes:

- Relief valves, tail pipes, and flare stacks.
- Robust flare network solutions, especially with multiple stacks and crossovers.



Dynamic simulation of complex flare networks

The AVEVA advantage

Online simulation

Online modelling provides real-time insights into process behaviour by continuously updating models with live plant data, enabling proactive control, improved reliability, and faster decision-making.

CONNECT

CONNECT is our common cloud platform, providing a central location to securely access the broadest and deepest industrial software-as-a-service (SaaS) portfolio on the market. AVEVA software in the cloud powers sustainable growth, enabling you to transform faster, reduce costs, and easily scale.

Learn more: aveva.com/en/solutions/aveva-connect

Flex subscription program

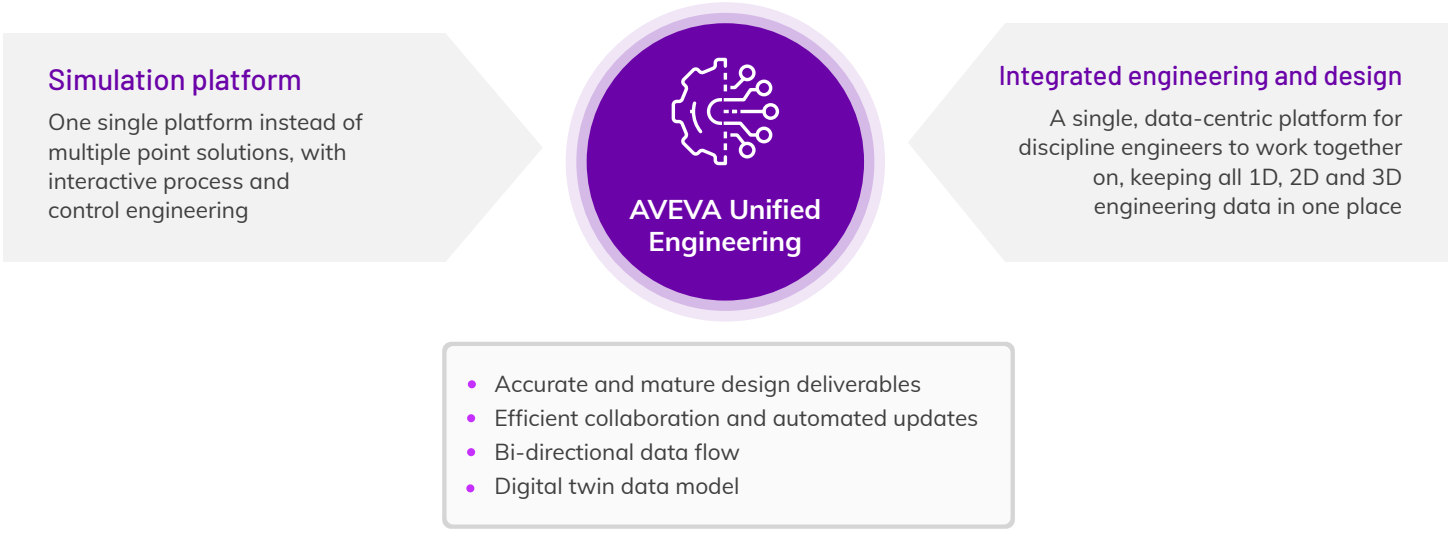
Achieve faster return-on-investment and remove traditional barriers to software adoption with a flexible subscription program. Flex subscription program spans any mix of cloud, hybrid, and on-premises solutions with simplicity in the license purchase, usage, and management.

Learn more: aveva.com/en/solutions/flex-subscription

AVEVA™ Unified Engineering

AVEVA Unified Engineering is the new standard for capital project engineering and design collaboration. It integrates all process simulation and engineering (1D, 2D, 3D) data in one single data-centric hub on AVEVA's secure cloud environment. Bi-directional information flow allows you to execute concurrent, multi-discipline engineering for greater control over change across the entire project.

Learn more: aveva.com/en/products/unified-engineering



AVEVA Process Simulation is a key element of Unified Engineering

Success stories

Covestro - Owner Operator / Chemicals

Pushing boundaries is a key theme at Covestro, one of the world's largest polymer companies. By standardizing one process design, engineering, and simulation tool, Covestro cuts cost and inefficiencies across its process lifecycle.

Learn more

Promon Engenharia - EPC / Oil & Gas, Power

Promon, an energy plant solutions provider in Brazil, needed flexible, scalable engineering and simulation tools to reduce time spent on engineering and installation. By implementing digital twins based on AVEVA Unified Engineering and AVEVA Process Simulation, it reduced engineering hours by 15% and implemented projects 60% faster.

Learn more

Dragon LNG & AtkinsRéalis - Owner operator/LNG

Dragon LNG used AVEVA Process Simulation together with AVEVA PI System and AVEVA PI Vision to deploy a real-time digital twin of its facility, enabling data-driven optimization rather than conservative, rule-based operation.

As a result, the terminal achieved about USD 1 million in energy savings per year through more efficient configuration of production, compression and logistics operations.

This improvement supports Dragon LNG's ambition to reach net-zero emissions by 2029 and demonstrates how real-time analytics and simulation can modernize LNG operations.

Learn more

Protium – Owner operator/Green hydrogen

Protium selected AVEVA to power its digital-industrial intelligence platform, enabling integrated data collection, simulation and digital twin capabilities to optimise its green hydrogen operations.

Thanks to AVEVA Process Simulation and other AVEVA's tools, Protium reports a ~ 30 % reduction in staff time spent on process simulation, a 15 % improvement in reliability, plus identification of maintenance-cost reductions of about 15 %.

Armed with this digital infrastructure, Protium aims to avoid some 256,000 tons of CO_2 annually, with further reductions of 5–10 % expected from improved process design and utility-use efficiency.

Learn more

Success stories

ISU Chemical - Chemicals

ISU Chemical, a leading chemical producer in South Korea, used AVEVA™ Process Simulation to overcome the limitations of traditional simulation models that were too slow and insufficiently accurate for complex reactor behavior.

By adopting a hybrid modeling approach that combines physics-based simulation with machine-learning models integrated via ONNX, the company achieved up to 99.7% accuracy in predicting reactor yield across varying operating conditions. This enabled faster decision-making, predictive catalyst management, and improved operational efficiency, while supporting cost reduction and sustainability goals.

Learn more

For more information on AVEVA Process Simulation, please visit: aveva.com/en/products/process-simulation