Petro-SIM, enhanced with unique industry-specific technology, is a platform for hydrocarbon process simulation that provides the ultimate simulation experience for the refining and petrochemical industries. Developed by engineers, for engineers, Petro-SIM demonstrates a balance between rigorous process technology and a user-friendly environment that empowers organisations to maximise asset value by strengthening decision confidence, improving plant performance, and driving organisational excellence.
Petro-SIM provides innovative technology for the refining and petrochemical industries in an advanced process simulation platform.

**Petro-SIM’s Core Capabilities for the Refining and Petrochemical Industries**

**Superior Stream Characterisation and Assay Synthesis**

Petro-SIM provides an extensive set of refining and petrochemical stream properties, in addition to the standard thermodynamic and physical properties, that can be assigned to relevant streams and tracked throughout the simulation. You can select unique definitions for these properties using KBC proprietary methods, industry-standard methods, or even your own supplied methods for calculation.

The Petro-SIM Oils environment enables you to supply assay data that is synthesised to create assay property matrices across the entire set of pseudocomponents to provide an accurate and detailed characterisation of oils for use within the simulation. You can store these Petro-SIM assays in the Petro-SIM database, which has version control mechanisms for assays using a check out protocol. In the Simulation environment, Petro-SIM dynamically blends assay properties for similar boiling pseudocomponents allowing property propagation without propagating pseudocomponents. This technique is critical for enabling multi-unit simulation models.

In addition to allowing you to create your own assays directly in the Oils environment, Petro-SIM also has functionality for importing assays directly from Haverly HCAMS and through specific XML export options available in Spiral CrudeSuite.

In the Simulation environment, you can synthesise single-stream assays using pure component data, laboratory information, or a combination of both. This convenient, simplified stream set-up uses the same underlying synthesis technology as in the Oils environment, enabling you to create simulation cases by using and blending a combination of streams created from any of these techniques.

This same synthesis technique is used throughout the entire simulation to cover other types of streams which can include reactor effluents that are either predicted from a reactor model or recreated using product information. The extensive set of refining and petrochemical stream properties combined with superior assay synthesis technology for stream characterisation is at the foundation of each Petro-SIM simulation case increasing your confidence in the oil characterisation of each stream through efficient techniques that are tailored to your objectives.
Reactor Model Integration and Refinery Wide Modelling

Petro-SIM’s refining and petrochemical capabilities are enhanced through native integration of the SIM Reactor Suite, the industry standard in kinetic reactor simulation. This integration enables you to create comprehensive unit models for evaluating the impact of changes upstream of the reactor, in the reactor, and even downstream of the reactor. These reactor unit models provide a rigorous, non-linear simulation of the entire unit and let you look at the unit in whichever level of detail is necessary to evaluate changes and maximise its performance.

Petro-SIM’s consistent methodology for characterising reactor effluents and dynamically blending properties for pseudocomponents provides the framework for multi-unit models through refinery-wide models to integrated refinery petrochemical models from within a single platform. Use the integrated plant models to perform strategic plant-wide studies to assess the impacts of changes in processed crudes, operating units, and final product specifications across the entire processing facility. By gaining this holistic view, you can understand the overall impact and devise a new operating strategy to plan unit turnarounds, new units or unit reconfigurations. Maximise your facility performance for changes in product demands and qualities. This underlying platform provides the unique ability to understand complex interactions between different units with a level of granularity that is unmatched in process simulation.

LP Data Generation and Validation

Building on its superior assay characterisation, kinetic reactor model native integration, and complete unit modelling capabilities, Petro-SIM facilitates the generation, validation, and maintenance of LP data and vectors.

HX Monitor

Petro-SIM’s HX monitor analyses the performance of a heat exchanger network, calculates fouling, and quantifies the benefit of cleaning so you can effectively and economically manage your preheat train. Heat exchanger fouling in preheat trains can cause increased energy cost, lost production, and increased pressure drop. HX Monitor addresses this challenge, helping you to achieve lower energy costs and increased throughput as a result of better analysis and decision-making capabilities.
Unit Performance Monitoring

Petro-SIM provides an enriched, comprehensive approach to unit performance monitoring through its core capabilities enhanced by integration with other KBC software products. Building on Petro-SIM’s native integration to data historians, industry-first relational database integration, purpose-built utilities, and superior reporting capabilities, Petro-SIM unit performance monitoring provides the complete, integrated solution to maintain improved performance. In addition to covering a comprehensive set of refinery and petrochemical units, Petro-SIM’s solution stages several levels of performance monitoring that subsequently adds even more value to your processing facility.

By using Petro-SIM’s platform technology or enhancing it with the integration of a SIM Reactor Suite kinetic reactor model, you can develop engineering calculation-based unit performance monitoring applications that go beyond simply monitoring individual measurements to attain a much more holistic picture of the unit performance. You can create a process model that is representative of your process unit and link it directly to your lab and process historians. Perform material balances and data quality checks using a standardised approach that is based on KBC’s best practices. Automatically calculate key performance indicators on a routine basis, storing results in a Petro-SIM database. Validate the performance of unit models and LP submodels routinely building confidence in those models to be used for improving unit performance. Track unit, kinetic model, LP submodel performances over time, and monitor trends. Use Petro-SIM reporting to produce standard reports that help you focus more time on analysing information and acting on that information rather than on data mining and manual calculations.