



ALK-SIM™ Technical Datasheet

A Yokogawa Company

Benefits

Optimise unit performance

- Select operating targets by determining the effects of increasing the iC4/olefin ratio by changing recycle rate and the effects of changing reactor temperature
- Discover the effect of changing acid strength
- Evaluate the economic effects of recycling more iC4, increasing acid strength, or lowering reactor temperature and the economics of alternate reactor configurations

Maintain the refinery LP

- Find out what vectors are needed to model the incremental yields for different olefin feeds and operating conditions in the LP
- Allows rapid regeneration of data when model or LP structure changes

Understand unit behaviour

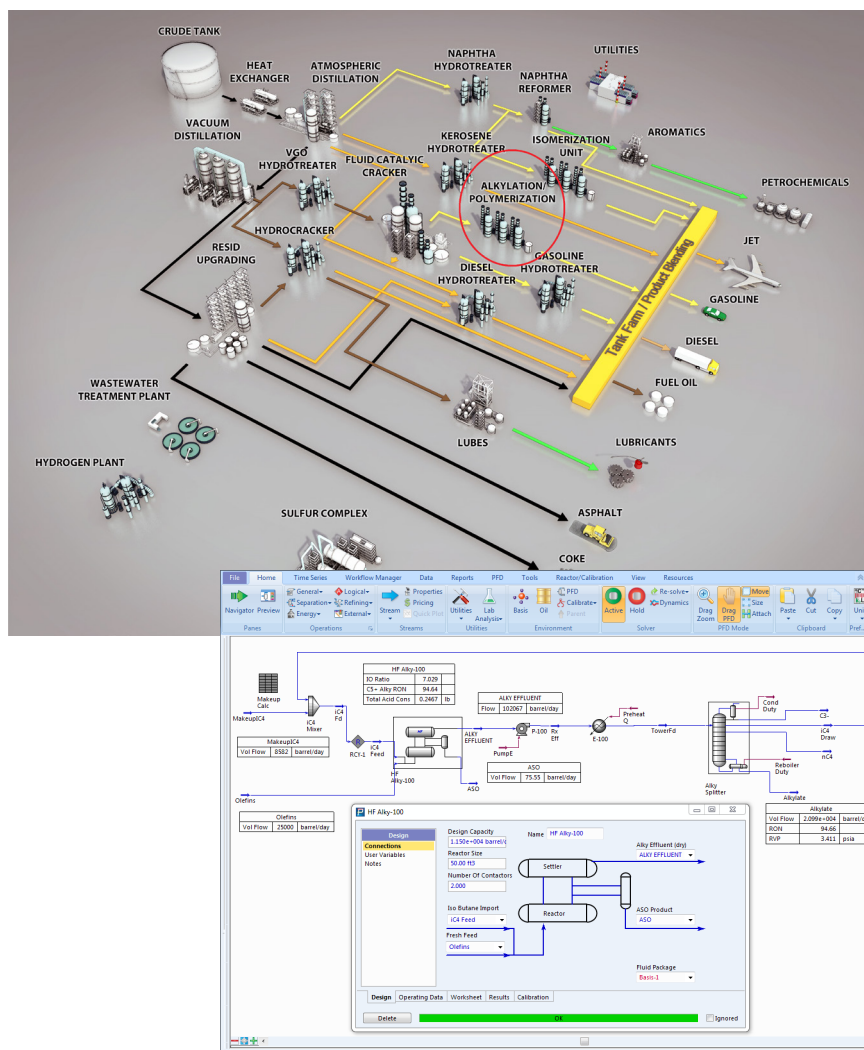
- Understand the effects of a new feed on alkylate product qualities and yields
- Evaluate the yields/properties for C3/C4/C5 olefin feeds
- Train engineers and operators new to alkylation operations through a series of simulation runs to evaluate cause-and-effect results

Monitor unit performance

- Track mass balance and other key process indicators
- Compare actual yields versus predicted versus normalised

Overview Summary

Alkylation is a key process that creates high-value products from intermediate refining streams. Use ALK-SIM, proven over decades of use within refineries worldwide, to evaluate alkylation of various C4 and C5 olefin isomer feeds under different scenarios of iC4/olefin ratio, reactor temperature and acid strength. For specified feeds, operating conditions, and constraints, the program determines resulting product flows and properties and overall unit operating economics.



ALK-SIM is a valuable tool that enables you to evaluate the impact that different feed compositions and operating conditions have on product yields and the overall operating costs for these important refinery units.

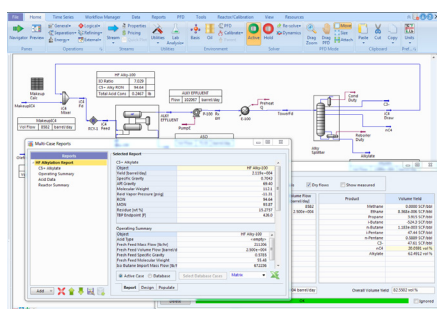
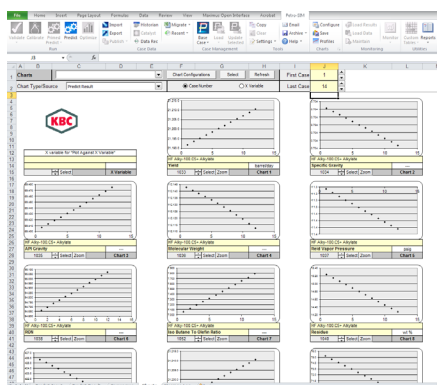
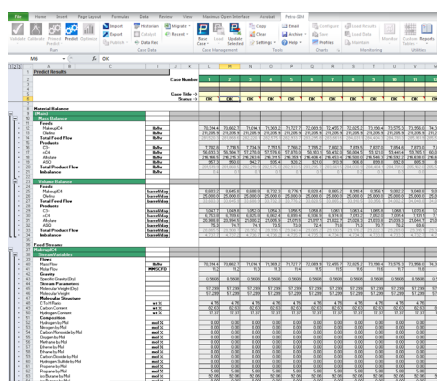


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Features

- A yields based model that generates predictions of product yields and isomer breakdowns based on the impact of feed composition and operating conditions
- Detailed product property predictions, including composition, densities, distillations, key properties such as RON and MON, and Reid Vapour Pressure
- Prediction of acid consumption, acid soluble oil (ASO) production, and other key operating parameters
- Detailed, rigorous models including distillation columns and auxiliary equipment including pumps, valves, and exchangers
- Predicted effects of iso-butane recycle, feed properties, and fractionator operation on reactor yields
- Integrated refrigeration circuits for H₂SO₄ units
- A built-in data reconciliation tool for reconciling mass and elemental balances
- A built-in optimiser allows you to identify the most profitable operation given feed/product pricing, operating costs, and unit constraints
- Direct access to process data historians
- Convenient and efficient platform for developing and maintaining LP vectors



Interface Options

ALK-SIM is a module that can be added on to an existing Petro-SIM simulation model with the same user-friendly look and feel as other unit operations within the Petro-SIM family of process simulators. Make configuration changes through simple drag and drop techniques on a process flowsheet diagram, compare plant data with results in a meter view, and perform case studies and optimisations all within a single environment.

ALK-SIM supports a real integration with Microsoft Excel® allowing you to readily create a customisable Excel application workbook for driving calibration, prediction, and even optimisation case runs. Analyse the results of several cases directly from within this Excel environment. Multiple charting options allow easy analysis of data and model predictions. Excel interfaces are automatically generated and can be customised to your specific needs.

ALK-SIM™ and Petro-SIM™

Because ALK-SIM is available within the Petro-SIM environment, users can build very detailed process unit models that take advantage of Petro-SIM's sophisticated analysis tools, such as the popular LP Utility for easy generation and maintenance of LP submodels. Generate detailed models using downstream separation and auxiliary unit operations, link with upstream units to investigate feedstock effects, or use ALK-SIM as part of a complete refinery wide model, at a level of detail unsurpassed by any other process simulation package.

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