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Brochure

Aspen GDOT™

for Olefins Manufacturers

Improve margins and achieve sustainability targets with a proven technology that vertically integrates planning, scheduling, and advanced process control in closed loop. Dynamically optimize multiple process units in real time, beat the plan, and make plants more capable.

Benefits

- Increases throughput
- Improves product yields
- Prevents overcracking
- Improves energy efficiency

Key Capabilities

- Optimizes the whole Olefins plant in real time
- Aligns planning and scheduling with APC
- Patented dynamic data reconciliation technology
- Preconfigured flowsheet-based modeling templates

Closing the Gaps Between Planning and Actual Operations

A key to AspenTech's production optimization solution is the unique and proven Aspen Generic Dynamic Optimization Technology (GDOT). Aspen GDOT aligns planning and scheduling objectives by dynamically optimizing and coordinating multiple process units in real time to ensure the best site-wide economic results consistently and on a minute-by-minute basis.

Chemical companies are continuously faced with the challenge of reducing margin leakage that occurs between various levels of production execution — from production planning and scheduling to actual operations. Aspen GDOT addresses these challenges by using an innovative modeling and optimization approach that combines fundamental planning models with dynamic APC models. This unique approach uses a model that is consistent in material and quality balances while incorporating dynamic models from the APC layer. This results in the ability to have consistent models, economics and objectives between offline planning and online optimization.

Aspen GDOT models include dynamics of the system enabling the optimizer to run at higher frequencies, manage inventories and take advantage of valuable frequent feedback from the plant. It also does not have to wait for units to be at a steady state to perform optimization.

Large Scope of Optimization

The innovative modeling approach in Aspen GDOT enables online optimization of broad envelopes covering multiple process units within entire ethylene plants. Typical optimization units for ethylene include but are not limited to feed system, hot section, cracked gas compressor, cold boxes, parallel trains, and downstream polymer units. Over the past two decades, Aspen GDOT has delivered significant benefits to numerous global companies through real-time, multi-unit optimization for complex refinery installations.

Consistency with Planning and APC Models

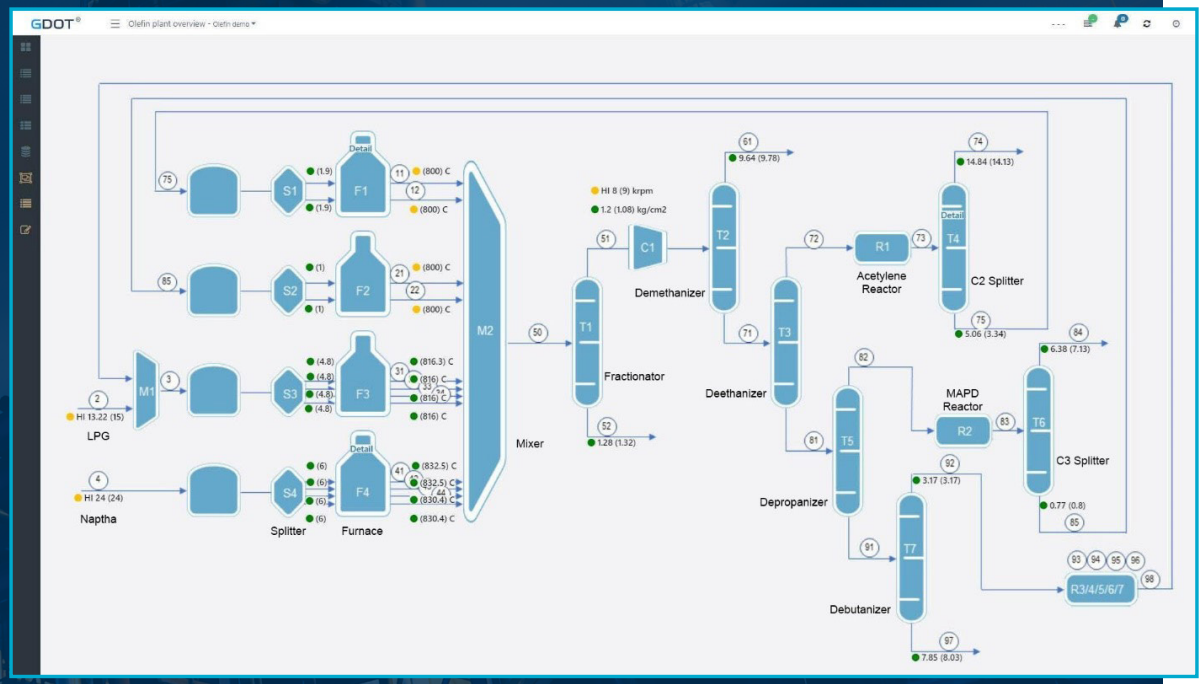
Aspen GDOT combines fundamental models from planning with empirical APC models, while preserving model consistency. This helps to close the gap between plan and actual by aligning planning/scheduling objectives and economics with actual operations.

Automatic Model Adaptation in Closed Loop

Aspen GDOT's patented dynamic data reconciliation technology continuously keeps models up to date and in line with actual performance of the units. One of the main benefits is low model maintenance requirements, which can be managed by an APC engineer.

Unified GDOT Builder: An Intuitive, Flowsheet-based Modeling Environment

Aspen Unified GDOT Builder's intuitive, web-based flowsheet environment simplifies model-building, deployment and maintenance. Benefits of this new environment include improved usability via simple drag-and-drop of blocks from a component library into the model flowsheet. This reduces the skillset required for building and maintaining models enabled by visual checks and balances in a flowsheet view. Standard templates cover an entire ethylene plant from cracking furnaces to the cold end.



Typical Aspen GDOT Olefins

Aspen Unified GDOT Builder also supports direct import of Aspen DMC3 APC models into the flowsheet environment making it easier to maintain consistent models and strategy between GDOT and APC layers. In addition, GDOT model maintenance is made easy during any updates to Aspen DMC3 models. Aspen Unified GDOT Builder enables online GDOT reconciled data to be available to Aspen Unified PIMS, providing planners with a more accurate view of current unit performance and actual constraints.

Aspen GDOT seamlessly integrates with SPYRO SRTO7 furnace model, both in offline configuration and the online environment. GDOT models can handle furnaces on/off during decoking operations, multiple feed swaps, co-cracking, and liquid feeds. For better management of furnace decoking schedules GDOT objective functions can include coking rate trade offs/constraints.

Sustainability

Most companies are actively working to lower their environmental footprint of their operations. The cracking furnaces in olefins production are energy intensive process units. Optimizing cracking temperatures present great opportunities to achieve sustainability targets. GDOT models can optimize tradeoffs between product yields, furnace run lengths and CO_2 emissions, thereby improving energy efficiency without additional CAPEX. Energy efficiency improvement is a key lever to reduce CO_2 emissions, operating costs & increase margins.

Advantages of Aspen GDOT Over Traditional Real-Time Optimization (RTO) Applications

While real-time optimization applications for ethylene have existed for a long time, sustaining benefits from these applications has been a challenge and required significant process simulation experience.

Aspen GDOT can provide a number of important advantages. These include:

- **Lower Cost of Deployment and Maintenance**: Aspen GDOT is designed to be run and maintained by APC engineers, making it significantly easier to deploy and sustain. This leads to higher uptimes of GDOT applications, and ultimately higher benefits and lower cost of ownership.
- **Dynamic vs Steady State Optimization**: Unlike RTOs, GDOT is a dynamic optimizer which does not need to wait for steady state. This enables GDOT to take advantage of valuable feedback and respond to dynamic changes at similar frequencies as APC.
- **Broader Scope**: GDOT's modeling approach allows a broader scope beyond a single ethylene train, including parallel interconnected trains, upstream naphtha blending and relevant downstream units.

Conclusion

Aspen GDOT is the key to production optimization, enabling companies to close the gap between planning, scheduling, and operations. By coordinating multiple process units in closed loop and optimizing broad envelopes in real time, Aspen GDOT helps plants run to the limits of performance 24x7, to deliver unparalleled value through increase in throughput and reduction in margin leakage.

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About AspenTech

Aspen Technology (AspenTech) is a leading software supplier for optimizing asset performance. Our products thrive in complex, industrial environments where it is critical to optimize the asset design, operation and maintenance lifecycle. AspenTech uniquely combines decades of process modeling expertise with machine learning. Our purpose-built software platform automates knowledge work and builds sustainable competitive advantage by delivering high returns over the entire asset lifecycle. As a result, companies in capital-intensive industries can maximize uptime and push the limits of performance, running their assets safer, greener, longer and faster.

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