Saudi Kayan Leverages AspenTech Solutions to Optimize Batch Operations and Quality

20% Reduction
Batch Cycle Time

40% Reduction
Product Release Time

CHALLENGES

- Limited access to smart tools for visualization, monitoring and analytics
- Reliance on manual methods to execute orders/procedures and capture operational/historical data
- Difficulty visualizing, analyzing and monitoring material movements in batch operations
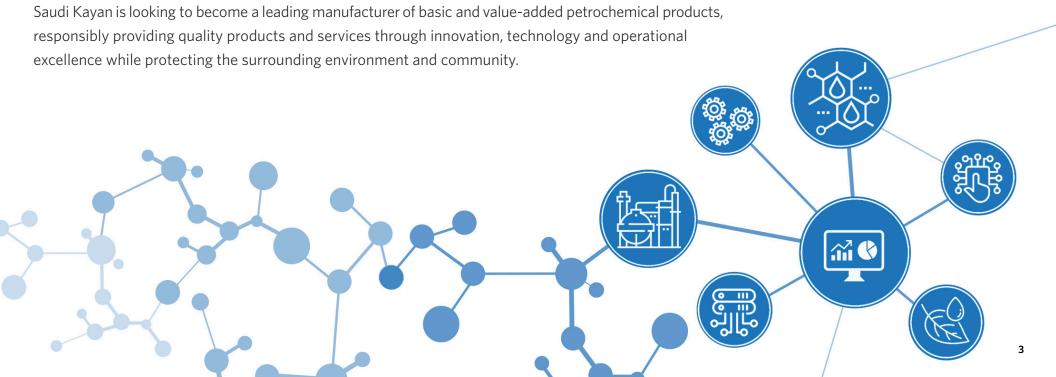
SOLUTION

Improved efficiency, productivity and visibility into plant operations and product quality with Aspen InfoPlus.21® (Aspen IP.21), aspenONE® Process Explorer™ (a1PE), Aspen Production Record Manager™ (APRM) and Aspen Production Execution Manager™ (APEM)

VALUE CREATED

- Enhanced operational data visualization and analytics across the enterprise
- Improved troubleshooting and decision-making resulting in optimized production costs
- Achieved paperless batch manufacturing by digitalizing procedures and records
- Increased profitability by reducing off-spec material production
- Gained full visibility of batch quality to predict and prevent deviations, and speed up release time

Saudi Kayan was established in 2007 as an outcome of a partnership agreement between Saudi Basic Industries Corp. (SABIC) and Al Kayan Petrochemical Company (Kayan). Based in Jubail Industrial City, Saudi Kayan is one of the largest petrochemical complexes in the world, specializing in the manufacture of ethanolamines, ethoxylates, polyolefins, polyethylenes, phenol, cumene and polycarbonate, with applications in automotive, healthcare, aircraft, packaging, tanks, pipes and electronics industries.

Saudi Kayan is looking to become a leading manufacturer of basic and value-added petrochemical products, responsibly providing quality products and services through innovation, technology and operational excellence while protecting the surrounding environment and community.

Digitalization Challenges in Manufacturing

The digitalization journey in manufacturing requires revamping, redesigning and often replacing existing processes, workflows and systems. A foundational element in this journey is a fully integrated plant-level data solution, which is key to improve operational efficiency, increase throughput and achieve consistent high product quality while reducing operational costs.

- Collecting, Visualizing and Analyzing Process Data: The manufacturing of high-value products involves collecting data from various plant instrumentation and control systems. The ability to automate the collection of such data and utilize smart tools for visualization, analysis and monitoring enables improved troubleshooting and decision-making as well as optimized production costs.

- Tracking and Tracing: In batch manufacturing, material tracking is extremely time consuming; errors and deviations can significantly impact product quality and operational costs. Without an integrated data solution, data acquisition required to track and trace batch operations can be slow, difficult and costly, making it hard for a business to identify and address production issues.

- Going Paperless: Using manual paper-based methods to execute procedures, capture operational data, or perform calculations, data cleaning, reporting or recipe management, can be very time consuming, prone to errors, and ultimately have an impact on the product quality and release time.

Achieving Operational Excellence in Batch

In order to achieve operational excellence, Saudi Kayan first needed to collect and store large volumes of process data for analysis and reporting. Aspen IP.21 enabled Saudi Kayan to have a robust data foundation to capture "stranded" operations and equipment data. Aspen IP.21 also provided the company with secured interfaces for data exchange with other applications such as aspenONE Process Explorer, which helped Saudi Kayan visualize the information about tags, events, and batch processes.

Saudi Kayan was seeking a solution to maintain high levels of consistency in its batch operations and to monitor batch quality to predict and prevent deviations in real time. APRM provided the ability to build production profiles to be compared against the ideal or best batch characteristics. Ideal profile envelopes were created automatically by identifying one or more ideal batches from historical data captured in Aspen IP.21 and APRM. This helped Saudi Kayan identify excursions from optimal profiles early in the manufacturing cycle, improve batch cycle times, and reduce costs and bad batches, thus sustaining batch quality.

Previously, Saudi Kayan was investing much time and effort into manually executing work orders and reviewing and approving batches for release. APEM enables Saudi Kayan to execute work orders faster, and more accurately and efficiently, by digitalizing workflows and records while following general Common Manufacturing Practices (gCMP). APEM orchestrates and guides the human interaction with the process for consistent, flawless execution.
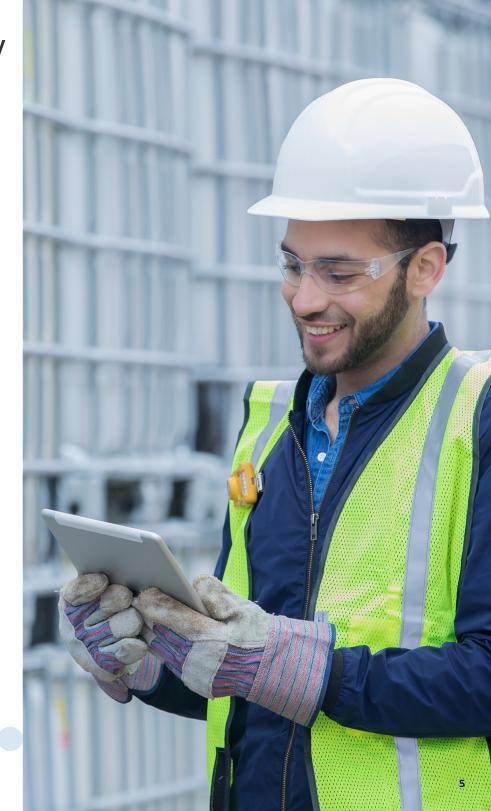
Accelerating Saudi Kayan's Digitalization Journey

Using AspenTech solutions, Saudi Kayan is able to track materials from a reactor and extruder, blending until finished goods; automate SAP posting; monitor Golden Batch Profiles; validate material selection for transfer and automate shift and batch summary reports. Capturing relevant information during batch production, Saudi Kayan obtains a benchmark that optimizes operations. The standard composition of raw materials is used to bring manufacturing consistency in prime products, and operations are optimized, efficient and cost-effective.

Using AspenTech's solutions, Saudi Kayan is able to:

- Achieve faster identification and resolution of operational issues by accessing real-time and historical data
- Gain comprehensive visibility into plant operations through a simplified and interactive dashboard presenting ongoing activities, raw material consumption and productivity of plant operations
- Increase cross-functional collaboration among various stakeholders within the plant by establishing an efficient method to monitor batches in real-time
- Execute work orders faster, efficiently accurately by digitalizing workflow and records

As a result, Saudi Kayan achieves 20% reductions in batch cycle time and 40% reductions in product release time.

About Aspen Technology

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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