

Designing Built-to-Order Cutting Processes

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kaneka

Kaneka Corporation is a Japanese multinational chemical manufacturing company that produces chemical products including resins, pharmaceutical intermediaries, food supplements, synthetic fibers, and fine chemicals. Kaneka provides value to people's lives with products used in goods that are essential to daily living.

Industry: Chemicals
Location: Asia
Use Cases: Production
Website: www.kaneka.co.jp/en

Results

- Reduced planning time
- Optimized materials used and improved productivity and downtime
- Created human resources to focus on higher-value initiatives

The cutting process is a pivotal part of the operations of Japanese multinational chemical manufacturing giant Kaneka. Essentially, this is a built-to-order process through which film produced in the previous process can be turned into products tailored to specific customers by cutting it to the necessary width and length.

For the planning team at Kaneka's Shiga Plant, creating production plans was a challenging endeavor – as planners and managers typically had to spend the bulk of their time every day putting together these plans manually. This was a complicated task that involved selecting materials, deciding on production sequences, and determining how and in what order to perform the cutting process.

This process of producing cutting plans, in particular, was laborious and – when performed manually – often resulted in various issues including complicated and time-consuming inventory data checks and coordination, reduced productivity caused by unnecessary switching between product types, and the tendency

to select easily cuttable material (film) and leave other materials as long-term inventory.

The Solution: Optimal, Automated Production Planning with MathCutting

With the aim of boosting the efficiency of its cutting process, Kaneka decided to implement the MathCutting mathematical optimization solution – which is powered by the Gurobi Optimizer – at the chemical manufacturer's Shiga Plant.

MathCutting was deployed in the polyimide film-producing department at Kaneka's Shiga Plant to optimize the production planning process as well as the allocation of materials. Polyimide film is a material that is widely used in smartphones and tablets, and Kaneka has a wide-ranging lineup of different polyimide film grades.

Additionally, as Kaneka operates in a highly volatile market, reacting to fluctuations in customer demand is a huge challenge. To respond quickly to real-time changes in demand, Kaneka

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“ By using state-of-the-art mathematical optimization technologies such as the Gurobi Optimizer to enable optimal production planning and plant control, Kaneka has realized significant business benefits.”

The Kaneka Team



needed an agile, automated production planning process in order to increase the efficiency of manufacturing operations, ensure on-time delivery of goods, and effectively manage inventory levels and production bottlenecks. With MathCutting, Kaneka is able to achieve these objectives with optimal, automated production planning.

The Results: Superior Productivity and Performance

Kaneka's introduction of the MathCutting mathematical optimization solution has proved to be a very smart move – this AI technology has fundamentally changed the company's processes and practices and helped foster greater efficiency and optimization across the organization.

With MathCutting, Kaneka can rapidly and automatically generate optimal production and cutting plans – and this has resulted in improved data utilization, delivery performance, and workforce productivity.

Indeed, the introduction of MathCutting has delivered numerous business benefits including:

- A dramatic reduction in the amount of time spent planning the cutting process.
- More precise cutting plans, leading to optimal utilization of materials.
- Improved productivity and output

due to the reduction of unnecessary equipment downtime.

- Greater workforce efficiency, giving planners and other stakeholders the opportunity to focus on higher-value strategic initiatives rather than devoting their time to manual planning.

Future Opportunities for Optimization

To attain and maintain a competitive edge in today's volatile business world, manufacturing companies must leverage AI technologies to automate and optimize their production planning and manage their production operations – so that they can handle constant fluctuations in demand and production disruptions in the most effective manner possible.

Kaneka is one company that has embraced and adopted these AI technologies – in particular machine learning and mathematical optimization.

By using state-of-the-art mathematical optimization technologies such as the Gurobi Optimizer to enable optimal production planning and plant control, Kaneka has realized significant business benefits.

As advances are made with IoT, AI, and digitalization, Kaneka believes that mathematical optimization will

continue to be an essential technology for companies across different industries – as this AI technology empowers businesses to make optimal, data-driven decisions and improve the efficiency of their processes.

Kaneka also believes in the ongoing importance of humans and technology working together – as there's still a role for humans to play in deciding how to use the output generating by these AI solutions.

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