

I insight

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Im Fokus: Siemens **Xcelerator**

Frischer Wind
Neue Antriebstechnik
im Windkanal

Simulation As-a-service
Optimierte
Kaffee kapselproduktion

The digital twin **optimizes coffee capsule production**

Datwyler, a specialist for system-critical elastomer components, simulates its logistics during coffee capsule production using the Siemens Plant Simulation software. In this way, production can be optimized, and future scenarios can be put through their paces.

Every second, the systems at Datwyler punch coffee capsules at the Uri plant in Schattdorf. The process is called "deep drawing". Circles are cut out of wafer-thin aluminum foils and punched into the capsule shape. What sounds simple is a complex process. It begins with the delivery of heavy film rolls, which come in countless design variants from monochrome to elaborately floral patterned. The rolls must be stored for 24 hours so that they are at the right temperature when the forklift brings them to the machine and the film is clamped. This is the only way to guarantee that the die-cutting process delivers perfectly shaped capsules. After the capsules have been punched out and brought into their shape, the machine places a small round filter paper in them. After that, the rim of each capsule receives a silicone ring. It later serves as a seal in the coffee machine and is baked in a large oven. Datwyler has developed both the special material and the complex process and is a leader in this field.

From rubber and wire to syringe components and coffee capsules

The Datwyler Group, whose history began more than 100 years ago in Altdorf with Adolf Datwyler's wire and rubber factory, is one of the world's leading developers of high-quality, system-critical elastomer components. The company is strong in the areas of health-care, mobility, connectivity, general industry, and food & beverage. Customers in the Food & Beverage sector include well-known food companies that have a large proportion of their coffee capsules manufactured by Datwyler.

In order to optimize today's production in this important line of business, to uncover bottlenecks in internal logistics and to simulate future scenarios, Datwyler relies on the Tecnomatix Plant Simulation material flow simulation software from Siemens. This allows all internal logistical processes – from delivery, production and internal transport routes to plannable maintenance and removal of the finished capsules – to be mapped in a digital twin.



Simulation as a Service

Is there enough storage space? How much more could we produce with two other plants? Will we be able to produce the quantity required next year? Jörg Geiselhart, Head of Operations, Business Unit Food & Beverage at Datwyler, recalls that these and many other questions were decisive for dealing with the topic of logistics simulation: "Logistics plays a central role in the delivery of raw materials, the necessary interim storage of production and the removal of finished products. If the system gets out of balance at one point, the problems quickly continue throughout the chain." In the search for simulation software, it soon became apparent that Plant Simulation would be chosen, reveals Andrea Rapetti, Head of Smart Factory at Datwyler: "The market for this type of simulation is relatively thin. Plant Simulation has the right altitude for us and best covers Datwyler's needs. The scaling capabilities of the software allow us to run through future production scenarios in detail."



Plant Simulation has the right level of detail for us and meets exactly Daetwyler's needs.

Andrea Rapetti
Leiter Smart Factory bei Dätwyler

During the entire six-month project, Datwyler was supported by plant simulation experts Yann Ulrich and Lars Becker from Siemens, among others. They each entered the data received from Datwyler into the model. In retrospect, this "as a service" solution proved to be indispensable, Geiselhart and Rapetti confirm: "We looked at the software and found that you must kneel down a lot, especially at the beginning, and then use the program regularly. The application of the software is indeed complex", admits Yann Ulrich, Senior Consultant Digital Enterprise at Siemens: "For this reason, we offer the software "as-a-service", because (still) only a few large companies employ plant simulation experts. As helpful as the models are, they quickly lose their usefulness if they are not kept up to date and further developed.

A simulation with future potential

Mr Geiselhart and his team were impressed by how quickly Siemens simulated new scenarios or made adjustments: "After we had delivered our data – mostly as Excel spreadsheets – Yann and his team often ran the simulation the following night and we received the results the next morning."

Datwyler is already in the process of implementing initial findings from the simulation: "We have already been able to optimise the use of the goods lift, which we share with other departments," says Geiselhart. "Plant Simulation has also shown that our storage capacity is sufficient for the time being – an important finding for us."



With the Siemens Industrie software Plant Simulation, Datwyler can optimize production and digitally run through various scenarios.

A major advantage of the simulation is that it can be operated over an arbitrarily long period of weeks or months and thus relentlessly shows even those weak points that do not come to light in the first few days. However, experts are still needed to interpret the results and concrete optimization measures, adds Ulrich. The simulation can suggest simple solutions such as adjusting the batch size.

Datwyler is convinced of Plant Simulation, the software is not only in use in Schattdorf, but also in a plant in Italy. And there is no shortage of ideas for further applications: "It would be brilliant if we could tap the data from our systems in real time and the simulation could thus make an even better contribution to optimizing ongoing operations," Rapetti envisions the future.

Technology in brief

With Plant Simulation, logistics systems and their processes can be modeled, simulated, examined and optimized. Long before production is carried out, the material flow or the use of resources can be analyzed and planned from global to local. Graphically appealing visualizations, diagrams and detailed reports serve as a decision-making aid in the intralogistics of a company.

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Customers

Dätwyler

Dätwyler, headquartered in Altdorf UR, focuses on high-quality, system-critical elastomer components and holds leading positions in attractive global markets such as healthcare, mobility, connectivity, general industry and food & beverage. With more than 25 operating companies, sales in over 100 countries and over 8000 employees, Datwyler generates an annual turnover of over CHF 1000 million. The company looks back on more than 100 years of company history and has been listed on the SIX Swiss Exchange since 1986.

datwyler.com