

Nuremberg, April 11, 2017

Hannover Messe 2017, Hall 9, Booth D35

30 percent more engineering efficiency for mechanical engineering due to digitalization

- **Bausch + Ströbel is exhibiting a high-performance filling and sealing machine at the Siemens booth for disposable syringes, vials and cartridges**
- **Digitalization along the entire value-added chain is expected to increase engineering efficiency by 30 percent by 2020**
- **With the digital twin, the virtual and real production worlds converge, with advantages ranging from product design to service**

Bausch + Ströbel Maschinenfabrik Ilshofen GmbH+Co. KG shows how the engineering efficiency can be increased by 30 percent in mechanical engineering. at the Siemens booth at the Hannover Messe 2017. On the basis of a high-performance filling and sealing machine for the processing of disposable syringes, vials or cartridges in nests, visitors to the trade fair will learn about the advantages of digitalization along the entire value-added chain and how the virtual and real production worlds converge. Bausch + Ströbel wants to increase its engineering efficiency by 30 percent by 2020 with integrated hardware and software solutions from Siemens and is relying on the consistent digitalization of the entire value-added chain – from design and layout, simulation and optimization in the in-house virtualization center, all the way to commissioning and service.

Integrated digitalization enables Bausch + Ströbel to more flexibly adjust to changing market requirements. Traditionally, customers from the pharmaceutical industry require highly specialized systems and intensive support. The trend is moving toward standardized machines with a high degree of flexibility and short delivery times. A digital twin depicts the future real machine in the form of a virtual model that is accurate in every detail. This saves considerably more time and is more flexible than the 1:1 scale wooden models that were used previously. The

filling and packaging machines from Bausch + Ströbel for the pharmaceutical industry are now available more quickly and the quality is top-notch.

The Siemens NX CAD software is used for creating the 3D model, which is simultaneously used to create the first version of the digital twin. This virtual model is given all of the features of the planned machine and is continuously further developed. Using the Mechatronics Concept Designer, the engineers simulate the motion sequences within the machine, define the kinematic and dynamic properties, program cam disks, and dimension the drives. In the virtualization center of Bausch + Ströbel, the digital model of the new machine is depicted with virtual reality on a large screen in its original size. Customers and engineers can thus try out the design and functions of a machine in realistic conditions and clarify questions early on: whether the operating personnel can effortlessly reach all of the relevant areas or how the machine is integrated into the existing plant. Changes are made exclusively to the digital twin, which is optimized until the engineers and customers are satisfied.

Bausch + Ströbel relies on Siemens Teamcenter as a consistent data world, from 3D models and circuit diagrams to programming code. Engineering is thus paperless. To improve efficiency, Bausch + Ströbel has set up the mechatronic work steps in parallel. The design, electrical engineering, mechanics and programming departments work simultaneously and together on a project – with considerable time advantages compared to a conventional sequential workflow. Actual commissioning is also significantly quicker than previously: The digital twin is put into virtual operation beforehand, which allows errors to be reliably detected and eliminated. Only then does the real construction of the machine begin. Necessary adaptations in the construction and during the acceptance inspection by the customer flow through the consistent data management in Teamcenter and back again into the digital twin. This represents an always up-to-date depiction of the real machine.

Bausch + Ströbel also has advantages in terms of service: The customer's machine is at hand at the mechanical engineer's end in the form of an identical, virtual representation. This allows quick, targeted services and preventive maintenance to be performed. In addition, the customer's experiences flow back to Teamcenter and are used there to improve future machines. Thus Bausch + Ströbel covers the entire

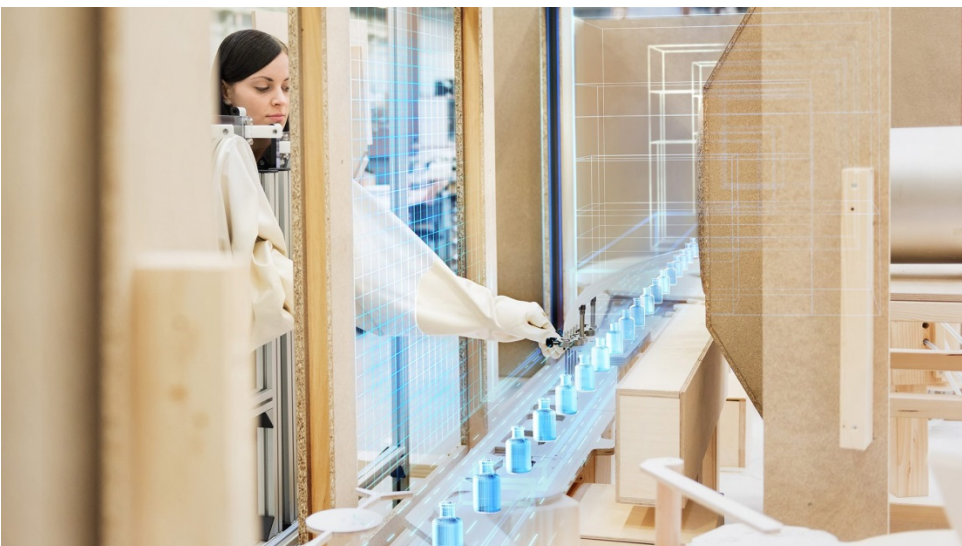
lifecycle of the product: from design to production planning and engineering all the way to production and automation and the service after the machine is delivered. All of the findings gained improve the current phase of development, the subsequent steps and, over the long term, the new developments and customer service. Bausch + Ströbel can also reduce downtimes thanks to the available machine data, for example during retrofitting, and increase the degree of utilization of the machines. In addition, a constantly up-to-date digital twin also reduces on-site visits. This represents another advantage for Bausch + Ströbel, which exports around 90% of its machines.

Bausch + Ströbel and Siemens are working on further optimizing the existing interfaces between the disciplines. At the end, all of the necessary tools are to be provided in one single tool so that there are no longer any isolated solutions. Using a pilot machine, Bausch + Ströbel and Siemens are showing the interaction of hardware and software at the Hannover Messe - from conception all the way to production. The engineering framework TIA Portal (Totally Integrated Automation) integrates the hardware components – from the Simatic S7-1500 T-CPU controllers with safety functionality and the Sinamics S210 drive system and the Simatic ET 200SP distributed I/O to the Simatic HMI (Human Machine Interfaces) devices for operator control and monitoring.

For additional information on digitalization in mechanical engineering, please visit

www.siemens.com/digima

This Background Information is available at www.siemens.com/press/hm17



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