

Fully automated filling and hygienic packaging

Complex, but not complicated

For machine builders and operators, handling bulk materials can often be full of surprises. This isn't the case at Burgener AG. The Swiss company created a complex dosing and packaging line for automatically filling pharmaceutical additives. Automation technology from Festo, such as hygienic design cylinders, pneumatic axes, valve terminals, service units and sensors, make for a straightforward system.



Greater productivity in fully automatic filling and hygienic packaging: the complete line developed by Burgener for pharmaceutical additives in powder form performs complex processes in a straightforward way. Components from Festo play an important role here.

“The fully automated system is a good example of how we have been able to efficiently combine our expertise in dosing and pulse sealing with other tasks.”



Simon Brantschen, Member of the Management Board,
Burgener AG

Correctly assessing the characteristics of bulk materials requires a lot of experience. “We have demonstrated this in more than 50 years of developing and designing dosing and packaging sealing technology,” says Simon Brantschen, Member of the Management Board of Burgener AG. “This experience secured us the contract from a global manufacturer of chemical additives for a tailored, fully automatic packaging line.” The requirements for the system were fully automatic linking of the individual stations, fast throughput times of one to two boxes per minute and hygienic design. “The components from Festo play an important role in the successful system concept,” says Brantschen. “They are an essential part of a number of handling units and support the hygienic design of the system thanks to the use of stainless steel at critical points.”



Bag in a box: a handling system uses a vacuum gripper to remove the bags from a feed magazine, which are then inflated before being inserted in a pre-prepared box.



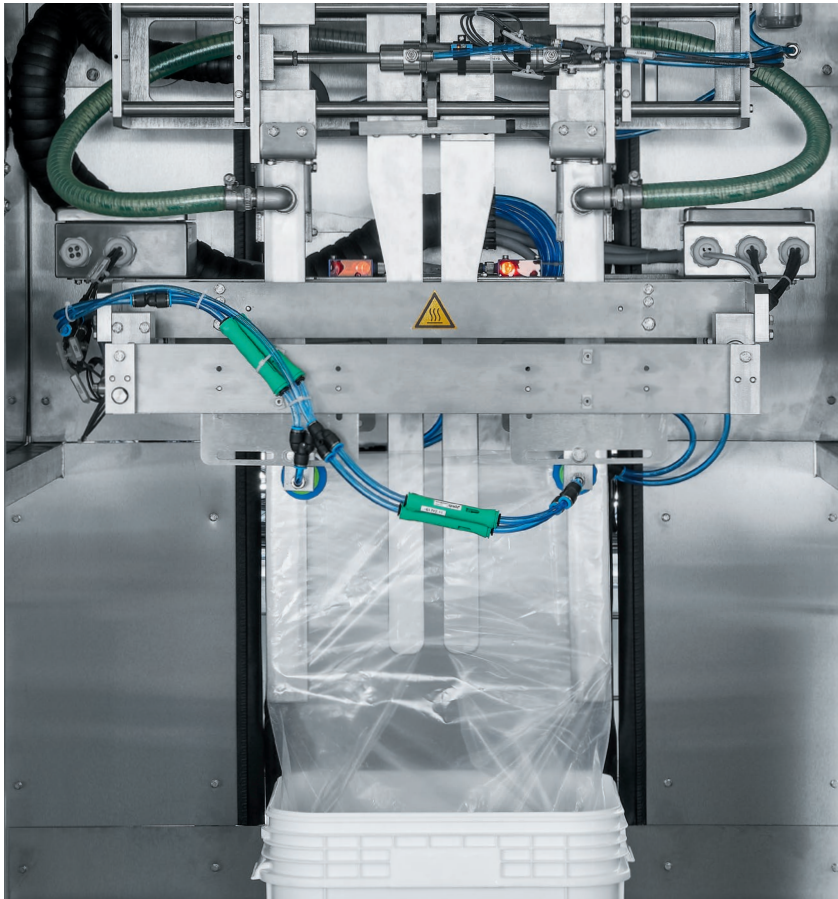
Festo pressure sensor SPAU with IO-Link® measures the required volume of air for inflating the bags.

Plastic bags in boxes

The first station separates the stacked boxes. In the second station the individual boxes are prepared for subsequent filling. “The inside of each box must be lined with a plastic bag,” explains Brantschen. A handling system with parallel and vacuum grippers removes the bags from a feed magazine. The bags are then inflated and inserted in a pre-prepared box, with the top of the bag being folded over the edge of the box. To swivel the gripper system to the plastic bags, the handling system is equipped with a semi-rotary drive DRRD as well as rodless drives DGC-K and compact cylinders ADN and ADNGF. The required volume of air for inflating the bags is measured by a pressure sensor SPAU. The pressure sensor is equipped with IO-Link®, which ensures a secure connection between the analogue, binary and serial communication devices.

Avoiding reverse contamination

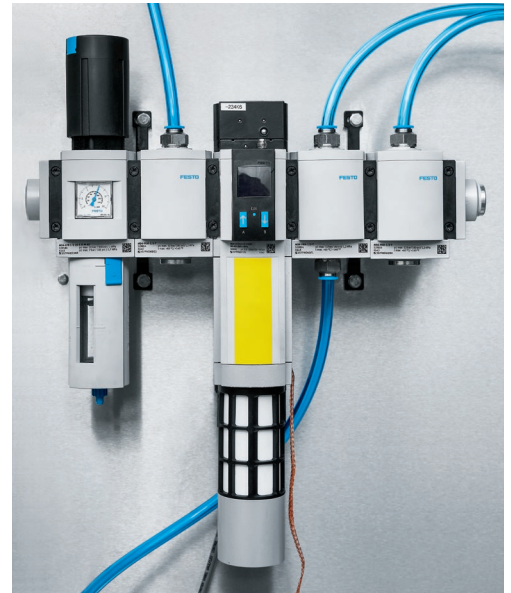
The operation to insert and fold over the top of the bag adds a level of complexity to the system that does not seem necessary at first glance. Brantschen adds: “Unfortunately, this inserting and folding station is vital, as this is the only way we can prevent the bag, once inserted in the box, from being reverse contaminated with the chemical additive from the plastic boxes, which will get used several times.” Conveyor technology is used to transfer the box with the folded plastic bag to the dosing station, where the chemical additive is added to the bag in the box in a two-stage filling process. The coarse flow ensures fast filling of the powder. After a specific target volume has been reached, the coarse flow stops and the subsequent fine flow doses the required filling quantity with a precision of ± 20 grams.



Hygienic filling: before a bag is sealed, suction lances remove the residual air from the bag. The spreading and pressing operations are performed by stainless steel round cylinders CRDSNU.

Hygiene as the top priority

The fourth station seals the filled bag. Burgener uses pulse sealing for this process. However, before a bag is sealed, suction lances remove the residual air from the bags, thereby reducing the bag volume. The top edges of the bag can then be shaped using a complex spreader system and pressed together. The spreading and pressing operations are performed by stainless steel round cylinders CRDSNU in a clean design. Additional laminar flow ventilation units along the entire production line ensure hygienic process management. After the sealing process, a handling system in the fifth station closes the box with a lid and seals it by using appropriate pressure. This handling system also includes drives of type DGSC as well as DGC, which execute their functions reliably, safely and simply.



Safety first: the safety valve on the service unit MS6-SV exhausts and switches off safety-critical system components as quickly as possible in the event of a sudden emergency stop.

Playing it safe

With such a complex system, machine safety cannot be overlooked. Burgener has therefore equipped the individual system modules with service units that are fitted with the safety valve MS6-SV. They exhaust and switch off safety-critical system components and bring them into a safe state, thus providing protection for people and machines in the event of a sudden emergency stop. The valves MS6-SV also have an integrated pressure build-up function, which can be used to start up systems from the de-energised state in a safe and controlled manner. "With the system and the integrated automation components from Festo we have managed to solve a complex task without any fuss," says Brantschen, adding: "The automation components supplied by Festo also help us. They are innovative, durable, robust and available worldwide and that gives us peace of mind as a global plant manufacturer."

**About Festo:**

Festo SE & Co. KG is a global player and an independent family-owned company with headquarters in Esslingen am Neckar, Germany. The company supplies pneumatic and electrical automation technology to 300,000 customers of factory and process automation in over 35 industries. The products and services are available in 176 countries.

With about 21,200 employees in over 250 branch offices in 61 countries worldwide, Festo achieved a turnover of around €3.2 billion in 2019. Each year around 8% of this turnover is invested in research and development. In this learning company, 1.6% of turnover is invested in basic and further training. Yet training services are not only provided for Festo's own staff – Festo Didactic SE also supplies basic and further training programmes in the field of automation technology for customers, students and trainees.