User report

Into the box at five-second intervals

Repetitive tasks, low productivity, a shortage of skilled workers – there are many factors that speak in favor of automation. Weighing and plant specialist Bizerba is well aware of this, which is why it installed a smart picking solution at a Spanish meat processing plant. Thanks to high-performance vacuum technology from Schmalz, up to 96 picks per minute are now possible.

Wrinkles are sometimes considered a beauty problem. In automated packaging processes, however, they can severely disrupt operations. This can happen, for example, with meat products that are packaged in plastic trays and sealed with plastic film. This plastic film is the point of contact for the vacuum suction cups during the subsequent picking process. However, it deforms and wrinkles under the weight of the packaging. The result: conventional gripping solutions reach their limits due to the folds. They do not sufficiently seal the irregularities despite soft sealing lips, and conventional vacuum generation does not maintain the vacuum.

Bizerba, a specialist in logistics and packaging systems, therefore sought a suitable solution to reliably automate the picking of these film-coated trays. The company, headquartered in the Swabian town of Balingen, was founded in 1866 and today produces scales, labeling and labeling systems, and food processing and inspection systems. The global Bizerba team currently consists of 4,500 specialists operating in 120 countries. The company generates an annual turnover of approximately 800 million euros.

High Pick Rate Around the Clock

A Spanish customer commissioned Bizerba to develop an end-of-line system for the automated picking of meat packages. Previously, employees stacked the food trays in transport crates after packaging, weighing and labeling. However, the speed of the manual work did not meet the requirements and thus limited output. Due to a shortage of skilled workers, additional personnel were not available for the meat processor. Therefore, automation was to ensure a higher pick rate and round-the-clock operation.

Together with Kilivations, Bizerba designed a new end-of-line system with two handling robots – the case packer. In Weil im Schönbuch, Kilivations specializes in lean and effective automation solutions that are

installed directly on the robot controller. The company integrated the individual components into the automation cell for the meat processor. Two cobots from Universal Robots (UR) are an important part of this, giving the grippers the necessary reach. For the end-of-arm effectors, Bizerba and Kilivations rely on the smart and powerful systems from vacuum expert Schmalz.

Reliable grip

Both identically constructed grippers, each of which is attached to a cobot arm, use an all-electric vacuum system from Schmalz. A Compact Pump of type GCPi is used in each of these units to supply the gripper on the robot arm with vacuum. The compact vacuum generator and the electric 3/2-way compact valves LQEi form a high-performance system that is just as powerful as pneumatic ejector solutions. The GCPi generates the necessary vacuum with the help of an efficient double-head diaphragm pump, which Schmalz has equipped with an integrated energy-saving control. This control adjusts the speed of the pump as needed. Process parameters can be transferred directly via an IO-Link interface.

The two compact valves LQEi are located decentrally on the gripper and control two separate suction circuits. They switch the vacuum on and off where it is needed and ensure rapid evacuation and venting of the vacuum system. This significantly speeds up pick-up and set-down times. A sensor integrated in the valve monitors the vacuum and guarantees a high level of process reliability. The LQEi's end position fixing and non-return valve ensure that the system maintains the vacuum even in the event of a power failure.

The PXT gripper is impressive due to its flexibility and modularity. Bizerba and Kilivations put together suitable end effectors from the standard components. If the geometry of the food trays should change later, the components can be recombined. “This is innovative and fits our open robot cell, which is protected only by light barriers,” emphasizes Oliver Deifel. He is Director Global Customer Solutions & Integration Business at Bizerba. Until now, food processors have relied on closed cells that were usually designed for only one workpiece format. “The system had to be converted at great expense for different package sizes,” Deifel recalls.

The PSPF bellows suction cups are in direct contact with the meat packaging. Six of them are controlled by an LQEi compact valve. In addition to a flexible and at the same time stable bellows, they have a particularly soft sealing lip. This enables the system to automatically handle the film packaging – despite the folds. So here, too, folds are purely a cosmetic problem. PSPF is made of FDA-compliant silicone and is suitable for contact

with food products.

Customized solution

But as is so often the case, the devil is in the details: with the GCPi compact pump, two separate vacuum circuits can be implemented per gripper via IO-Link. “The IO-Link communication allows us to evaluate all relevant process parameters such as evacuation time and leakage rate,” explains Jan Walter, head of Sales Germany and Field Service at Schmalz. ‘This enables us to detect gradual suction cup wear or leakages in the system.’ This predictive maintenance helps the food company avoid unplanned downtime.

The entire system is purely electrical, and optimized flow cross-sections and line lengths enable quick and reliable depositing of the gripped workpieces without compressed air. This lowers operating costs. Thanks to the decentralized installation of the LQEi on the gripper, Schmalz is able to achieve the extremely fast evacuation and depositing times necessary to reach the required 96 picks per minute.

A conveyor belt brings the packaged and labeled trays to the pick-up point of the Schmalz handling solution. Each of the two PXT grippers picks up four food packages and places them in the waiting loading crates – one layer after the other every five seconds. A roller conveyor then transports these crates to the shipping area. “It's like clockwork,” says Walter.

“The collaboration with Schmalz and Kilivations was very positive and together we were able to install an excellent system at our customer's site in Spain,” says Oliver Deifel. ”And our customer is also very satisfied. He is now running the system at a high throughput rate, saving on personnel costs, while maximizing process reliability through automation.” The case packer has been operating as planned in Spain since the end of 2023, and other customers have already shown interest in the solution. ‘The smart concept of this system forms the basis for further projects,’ reveals Deifel.

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Service for editorial teams

Meta title: Handling solution from Schmalz maximizes throughput in a food company

Meta description: At a Spanish meat processing company, the handling solution from Schmalz handles 96 picks per minute. Thanks to automated picking, the food company has been able to significantly increase its throughput and now works round the clock.

Social Media: Working 9 to 5 is out – at least when it comes to the automated picking of meat products. Thanks to a flexible and smart handling solution from Schmalz, a Spanish food company can now pack its products in transport boxes round the clock.

Pictures:

Image 1:

PXT grippers on two cobots reliably pick up shrink-wrapped meat packages at the end of their arms.

Image 2:

The automated gripper solution can handle 96 picks per minute – enabling the meat processor to significantly increase its output compared to manual labor.

Image 3:

The Compact Pump GCPi (top left) provides the required vacuum purely by means of electrical power.

Image 4:

The PSPF bellows suction cups grip even irregularly shaped surfaces and place them reliably at their destination.

Image 5:

The Compact Pump GCPi has a user-friendly LCD touch display for setting the most important process parameters.

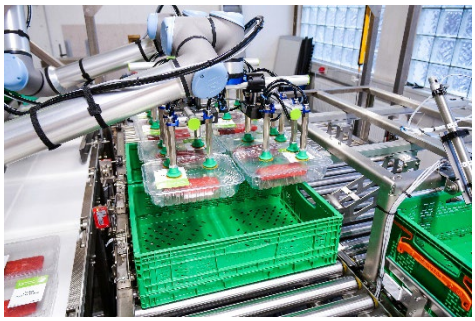

Image 6:

Each of the two grippers picks up four of the pre-packaged and labeled trays and places them in large transport boxes.

Images: J. Schmalz GmbH

Company

Schmalz is one of the market leaders in vacuum automation and ergonomic handling systems. Schmalz products are used all over the world, for example in applications in the logistics industry, the automotive industry, the electronics sector or in furniture production. The wide range of products in the Vacuum Automation unit includes individual components such as suction cups and vacuum generators, as well as complete gripping systems and clamping solutions for holding workpieces, for example in CNC machining centers. The Handling Systems unit offers innovative handling solutions with vacuum lifters and crane systems for industrial and handicraft applications. With the Energy Storage unit, Schmalz has created a new pillar in the field of stationary energy storage.

With comprehensive consulting, a focus on innovation and first-class quality, Schmalz offers its customers long-lasting benefits. Schmalz's intelligent solutions make production and logistics processes more flexible and efficient, while also preparing them for the increasing trend toward digitalization.

Schmalz is represented in all major markets with its own locations and trading partners in around 70 countries. The family-owned company, headquartered in Glatten in Germany, employs around 1,800 people at 31 locations worldwide.

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