

## From the robot's bag of tricks

Flexible gripper concepts multiply the possible uses of robots, making them all the more lucrative. This form of automation not only pleases the controllers on the store floor - more efficient processes and shorter supply chains also reduce the carbon footprint.

Robots are the movers and shakers of automation. And they are being used more and more frequently. The one-armed helpers are becoming increasingly affordable, easier to program and therefore quicker to integrate into their new working environment. Add to this the events of the past year: the sudden shutdown showed how fragile long supply chains are. The inhibition threshold to invest in robotic automation is falling - the prospect of shorter supply chains, relief for employees and a relatively short payback period are convincing even skeptics of the technological progress.

However, robot manufacturers are not the only ones making this possible. In order for robots to be worthwhile even for small series or to be able to take on tasks that previously required special eye-hand coordination, they have to be particularly flexible and clever. The key is the end-of-arm tool. J. Schmalz GmbH develops and manufactures vacuum grippers and generators that are particularly versatile, just as easy to implement and make processes more efficient. The vacuum expert also has solutions ready for difficult tasks such as gripping boxes. Schmalz is also expanding established products with digital services. With the help of the Schmalz ControlRoom app, grippers and vacuum generators can be installed and parameterized quickly. Users manage and monitor their intelligent devices with the tool - without interrupting the ongoing process.

### Overlooks the chaos

Separating chaotically arranged workpieces is easy - and monotonous - for humans. In order for a lightweight robot to be able to take on this job, it needs a gripper that reaches deep into each box and grips it securely. Schmalz has therefore given its bin picking gripper SBPG a long, 3D-printed housing that is both lightweight and compact. Narrow and without interfering contours, the SBPG eliminates the risk of getting caught in the chaos when diving in. The payload of the robot is only 500 to 700 grams - depending on the version. An integrated compact ejector generates the vacuum directly where it is needed. This not only makes the gripper independent of any compressed air line, but also particularly efficient thanks to the air-saving

function. The thin and flexible sealing lip of the suction cup SVE also reliably grips corners, edges and free-form parts with complex geometries. However, for the robot to know where to grip, it needs a 3D camera system. A projected grid helps the software to interpret the camera image and direct the arm to the right place. With the Vision & Handling Set 3D, Schmalz offers a complete package that contains all the components necessary for automated gripping of the crate, including suitable connection accessories for the robot.

### **With gentle fingers and for do-it-yourselfers**

If the handling process is not the actual challenge, but the objects to be gripped stand in the way of automation, Schmalz knows how to overcome this hurdle. Flexible grippers are needed that can cope with almost any geometry, that are individually configured, quickly available and cost-effective, or that the user can variably adapt on site. A particularly gentle representative is the OFG finger gripper. It grips gently and positively and also enables automation in the food processing industry. In this way, chocolate kisses and chicken thighs can be packaged hygienically and without damage.

Schmalz implements the "configure individually" principle both online with the additively manufactured lightweight gripper SLG and on-site with the vacuum end effector set VEE. The new PXT modular gripper system adopts this idea for handling heavier workpieces. Users can assemble their gripper quickly and easily from just a few standard components. While the maximum payload of the VEE is two kilograms, the PXT handles workpieces weighing up to 25 kilograms. The option to recombine or adjust the individual components again and again brings exactly the flexibility that lucrative automation of even smaller series requires.

### **Connects gripper worlds**

Schmalz also knows that it can't always be the one gripper for everything solution. Together with the Zimmer Group, the vacuum expert has developed a multifunctional end-of-arm platform. "MATCH" enables fast and automated switching between pneumatic and mechanical grippers. A control module knows how to communicate with both load receptors as well as the vacuum generator and the robot. Quick-change adapters and setup wizards simplify mechanical as well as control-side connection. MATCH is worthwhile in pick & place, machine loading and unloading, or picking and packing, among other applications. The system is so versatile that users can adapt it to new requirements quickly and easily.

To ensure that the robot is also ready for use independently of a compressed air supply, Schmalz develops electric vacuum generators such as the ECBPi and ECBPMi cobot pumps. In the MATCH platform, they are the first to enable the coexistence of mechanical and vacuum-based gripping, as they are flanged directly to the quick-change adapter and generate the vacuum where it is needed. But sometimes electronic pumps reach their limits. Handling porous workpieces or loads that weigh more than ten kilograms require higher suction power. Pneumatic vacuum generators such as the RECB provide this. Its suction capacity is almost five times that of the ECBPi without taking up much space. With it, users achieve short cycle and evacuation times in fully automated processes and can be sure of high leakage compensation.

### The winners

The right components bring flexibility and efficiency to production in equal measure. This strengthens the location as well as the sustainability balance: If automation makes economic sense, it is worth keeping production on site or bringing it back. Bringing production back shortens supply chains. At the same time, efficient systems conserve resources in the manufacturing process. Both aspects have a direct impact on the carbon footprint of the goods produced. In addition to the economic benefits, the entrepreneur thus also wins on the ecological side.



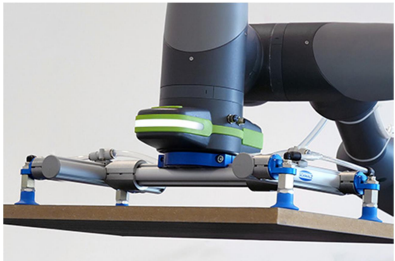
**Image 1:**

Camera-assisted Bin Picking: Schmalz Bin Picking Gripping System SBPG



**Image 2:**

Fingertip access: OFG finger grippers for direct food contact and pick-and-place applications



**Image 3:**

PXT modular gripper system: Modular system for a wide range of handling processes with lightweight robots



**Image 4:**

End-of-arm ecosystem MATCH from Schmalz and Zimmer Group



**Image 5:**

Mobile Vacuum for Cobots: Electric Vacuum Generator ECBPMi

### **About the company**

Schmalz is the market leader in automation with vacuum as well as for ergonomic handling systems. The products of the internationally positioned company are used in logistics applications as well as in the automotive industry, the electronics sector or furniture production. The broad spectrum in the Vacuum Automation business segment includes individual components such as suction pads or vacuum generators, complete gripping systems and clamping solutions for holding workpieces, for example on CNC machining centers. In the Handling business segment, Schmalz offers innovative handling solutions for industry and trade with vacuum lifters and crane systems. With the Energy Storage business field, the company is building up another mainstay in the area of stationary energy storage systems.

The combination of comprehensive consulting, high innovation orientation and first-class quality ensures sustainable added value for customers. Intelligent solutions from Schmalz make production and logistics processes more flexible and efficient - and at the same time fit for advancing digitalization.



Schmalz is represented in all important markets with its own locations and trading partners in more than 80 countries. The family-owned company employs around 1,500 people at its German headquarters (Glatten, Black Forest) and in 19 other companies worldwide.

**Contact for questions**

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