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Story

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Automation: Basic technology for the transition

The packaging industry is undergoing a genuine transformation. That includes a change to processes, which are becoming increasingly flexible and efficient thanks to automation solutions such as those from Beckhoff.

The basis for progress in the packaging sector lies not only in new materials but also in automation components. Beckhoff specializes in solutions of this nature, and can confidently claim that there is hardly any major packaging machine manufacturer that does not make use of its inventions. “The products we manufacture support automation in many sectors – IPCs, displays and servo motors are used both in packaging machines and in countless other machines and systems,” says Frank Würthner, Industry Management Packaging Technology, Beckhoff Automation. At the heart of developments for the packaging industry are new processes that ensure systems are made faster and more energy-efficient, flexible and intelligent. “Those are the major challenges facing the packaging machine construction industry – and we have developed the right answers for those specific questions,” says Würthner.

Some of Beckhoff’s solutions work out of sight, behind the processes in the background, and assume important control tasks in control cabinets or in the form of software packages. In turn, experts can recognise other technologies at first glance as being Beckhoff developments. That includes the XTS transport system, for example, and another new development in the product transport segment, as Würthner explains: “The XPlanar smart transport system and XTS, which is now considered the standard on the market, make entirely new machine concepts possible. Using these transport modules, you can move production from a clocked process to a continuous one, and

**Veranstalter
Organizer**
NürnbergMesse GmbH
Messezentrum
90471 Nürnberg
Germany
T +49 9 11 86 06-0
F +49 9 11 86 06-82 28
fachpack@nuernbergmesse.de
www.fachpack.de

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optimize product transport within the machines.” The XPlanar transport system uses magnetic levitation technology to glide contactlessly through the machines. That substantially improves the ease of product transportation within the packaging machines. Contactless transportation reduces wear and noise, and prevents the transmission of contamination via the machine, which is a benefit in the pharmaceutical industry in particular. How this works in practice is one of the things the company will demonstrate at FACHPACK in September.

How processes become smart

But without the necessary intelligence, implementing systems such as these would be almost impossible. That is why Beckhoff is also well prepared in the software field. Twincat, the company’s own software solution, thus controls and automates the processes at a central level. Special functional modules have been developed in order to be able to meet packaging industry demands. And of course, Beckhoff has also recognised the potential offered by artificial intelligence. XPlanar thus uses a neural algorithm to calculate the paths taken by these floating tiles.

This is supported by the MX system, introduced only recently, which enables machine builders to incorporate cabinet-free or hybrid systems in the machine. That opens up new opportunities in product handling, to improve plant throughput or minimize the machine footprint, while significantly reducing the power requirement.

According to Würthner, the ideas for solutions such as these come from the strong market expertise on the part of his company and its employees, almost a third of whom are engineers: “We aim to grasp the customer’s problems and respond to them with the appropriate products.” That can involve things like increasing production rates, making machines more compact, or improving energy efficiency. Würthner also notes that the market is demanding smaller batch sizes, and that can only work with the necessary

degree of flexibility. "We are pleased to work with customers to turn the required intelligence into reality," he comments.

Beckhoff can also help customers to make progress with their sustainability efforts, for example in individually cutting boxes to size in order to avoid including quantities of air in their shipments. That makes use of cameras and programs that recognise the product and calculate the amount of packaging material required.

Machines are becoming more energy-efficient

The energy efficiency of machines is also an effective lever in making packaging processes more environmentally friendly. As Würthner puts it, servo motors have often proven to be good alternatives to compressed air in this regard. The versatile servo motors are used everywhere in packaging machines. For example, they ensure the delta robots can move quickly and smoothly; they are essential in film transport and for punching and labelling. Using the Motion Designer design tool, Beckhoff can accurately plan the motor power and size needed for individual tasks, which ensures only the amount of space and energy that is absolutely necessary is used.

The motors can also exercise their advantages to the full when processing paper and plastic film, where they ensure more accurate cutting and faster movement, and thus improved performance. The more precise cutting process also helps to ensure that less waste is produced. One example of the alternative materials that can be processed by the state-of-the-art sensors is stone paper, which consists mainly of ground stone as a way of saving resources. This paper is, however, more sensitive than traditional materials. Thanks to its controllers, Beckhoff can offer machine manufacturers a solution that monitors forces precisely and prevents the paper from tearing. "It's important to develop new materials with an improved sustainability profile," says Würthner. "Our technologies enable the industry to do exactly that."



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As with its other products, the family-owned company places great value on having the motors themselves manufactured in Germany. That is something the customers appreciate. In terms of supply chain reliability, Würthner considers this a major advantage compared to motors manufactured in Asia.

“Automation technology will play an even greater role in the future in terms of sustainability,” Würthner notes confidently. He chuckles: “In line with the slogan that ‘engineers have to save the world!’”

Contact for press and media

Katja Feess, Christina Freund

T +49 9 11 86 06-83 55

christina.freund@nuernbergmesse.de

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