The magazine for the injection molding world

WITTMANN

innovations

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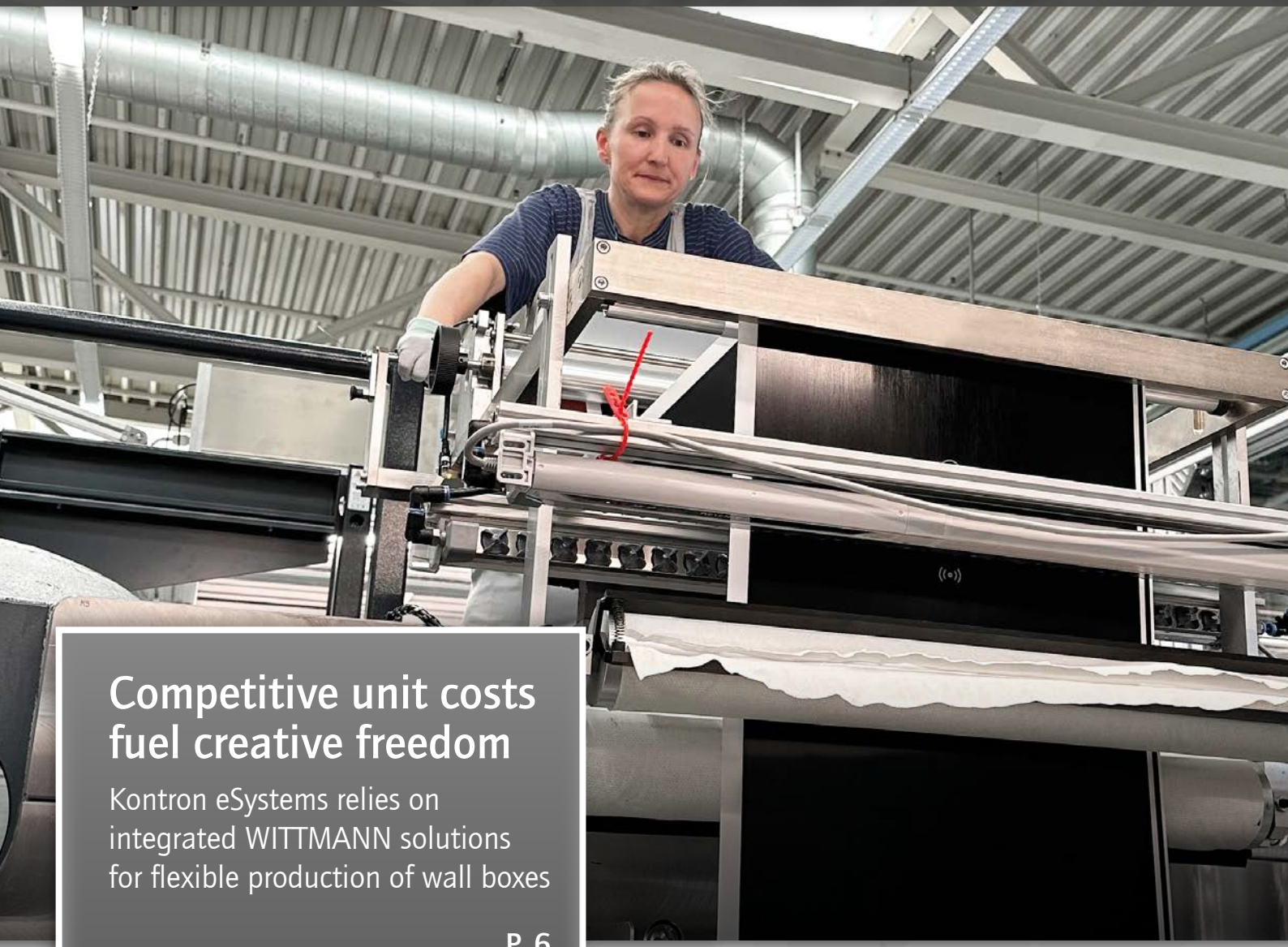

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Editorial

Dear Readers,

No matter how fit we are, mastering a split is no easy feat. And yet it's the least we expect from our products. Our R9 robot control manages this easily. With up to twelve servo axes, it performs even the most complex automation tasks and still offers a level of user friendliness which is setting benchmarks. In practice, the R9 increases productivity and machine availability, and it accelerates training of new staff members as well (p. 10).

Production on multiple continents, on the other hand, is no longer a balancing act, but an integral part of our customer promise: competitive prices, short delivery times and products optimally adapted to local requirements. So, the official opening of our extended production plant in Kunshan last December was an important milestone for our customers and partners, as well as for our teams. With lots of color, music and a pleasant atmosphere, a total of three events were celebrated simultaneously (p.4): the 20th anniversary of the plant, the inauguration of the extension and the start of injection molding machine production in China. From now on, we are able to offer our customers in Asia integrated system solutions from a single source, all produced locally. A competitive edge which strengthens our market position worldwide.

Technology shapes our future—and this requires diversity. Diversity develops wherever people with different backgrounds, perspectives and talents are working together.

Where women in machine and equipment manufacturing are concerned, we clearly need to catch up. This is why I am glad to present to you Selina Maget in this issue (p. 5). She completed her apprenticeship to become a technical product designer with a state award, and has now joined our engineering department at the Nuremberg facility. We congratulate her wholeheartedly and we encourage many more such role models!

To you all, I wish profitable reading
and lots of new ideas,

Yours, Michael Wittmann

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WITTMANN celebrates expanded production in China

WITTMANN's expanded production facility in Kunshan has opened. The expansion was completed just in time for the site's 20th anniversary. Both events were celebrated with 250 customers and partners.

With this investment, the group is setting the course for the future. In addition to robots and auxiliaries, injection molding machines will now also be produced locally in China. "Our new plant represents WITTMANN's transformation from a component supplier to a full-service systems solution provider," emphasizes Kevin Wang, General Manager of WITTMANN Kunshan and WITTMANN BATTENFELD Shanghai. "We can now offer our customers here in China and Asia integrated systems solutions from a single source that are produced entirely locally. Our customers benefit from shorter delivery times and the cost advantages of local production."

The guests were impressed by the modern production plant and large technical center, which was equipped with the first injection molding machine exhibits for the opening ceremony. The technical center and the new modern training area will be used more intensively for events and interdisciplinary project work in the future.

Initially, machine production in China will focus on the all-electric EcoPrimus injection molding machine with a clamping force of 100 tons, which was presented for the first time at K 2025. "The goal is to build 100 EcoPrimus 100 machines in China next year," said Dr. Werner Wittmann, founder and owner of the WITTMANN Group, in his welcoming speech during the opening ceremony.

Production capacity doubled

The robotics and auxiliary divisions are also benefiting from the plant expansion. Overall, production capacity has been doubled. The expansion adds more than 10,000 square meters of additional floor space, 6,500 square meters for production and 3,500 square meters in the new office building. A total of 13,000 square meters of production space is now available. It is not just the floor space that has been increased. All processes and workflows have been optimized with a view to greater efficiency. The various production areas, such as mechanical processing, assembly and painting, are networked.

With the founding of WITTMANN Kunshan 20 years ago, WITTMANN initially brought robot production to China. "Today, we are one of the leading European robot suppliers in the Chinese plastics industry," says Dr. Wittmann. "This success is the result of leading technology that is produced locally in Asia at competitive costs. We are now pursuing this strategy with the EcoPrimus injection molding machines."

Respond more flexibly and quickly

In the future, China will be not only a production location for WITTMANN, but also a development location. Guests at the opening ceremony were given a preview of the new R&D Center. "With our own development, we can respond more flexibly and quickly to the specific requirements here in China and Asia," says Wang, who has his sights set on various target markets, including packaging, medical devices, automotive, and home appliances.

Award-winning apprenticeship

Technical vocational training has traditionally been a high priority at WITTMANN. In Germany and Austria, WITTMANN provides training itself. In January, Selina Maget completed her apprenticeship to become a technical product designer. She received the Bavarian State Award for her outstanding achievements. Now she is working as a permanent employee in the design department at the Nuremberg facility.

Selina Maget together with her Nuremberg colleagues Suse Müller and Björn Dünfelder.

innovations: Selina, what does it mean for you to have won this State Award?
Selina Maget: I am very glad to see that all the effort and hard work I have invested in my apprenticeship are being appreciated. This is a confirmation to me that I have achieved something and can now be happy about my performance.

There are still too few women choosing technical careers. Why would you recommend a technical profession to other young women?
Technical product design, in particular, offers a good combination of technical activities with office work. The team work is excellent. I create CAD models and CAD assemblies, from which I then derive technical drawings. For this work, I need lots of information about material attributes and production methods, which I get from colleagues. Especially at the beginning it is necessary to ask many questions, since not all facts and their contexts are clear at once.

What is the reason why technical careers are so seldom chosen by women?
We need much more exchange of information between schools and companies. For example, via information events, company visits or career fairs, where WITTMANN is also present. Another excellent opportunity is the VDMA Young Talents Initiative.

There you are a member yourself. What exactly does that involve?
We are now a large group of young people working in plastics machinery construction and plant engineering. Together, we develop formats to specifically reach a very young target group with our topics. At the K show, we organized a full hour every day at the VDMA pavilion with activities such as interviews, that were then published on social media. Our aim is to get more young people interested in plastics technology.

What makes you so enthusiastic about it?
Whenever I have designed an assembly with the help of a CAD program, and everything functions just as I imagined when it is subsequently put together in the assembly plant—this inspires me. And also, the 3D printing processes we are using at this company.

What motivates you in your daily work?
Friendly colleagues, diversified work, a good working atmosphere and the daily table soccer games during breaks.

What characteristics do people working in the plastics industry need today more than ever?
The ability to think "out of the box". Plastic materials have so many attributes, can be used in many different fields of application and are often indispensable, for example in medical technology or sustainable mobility. This is why it is so important to discover and promote the opportunities for recyclates in both PIR and PCR. We need creativity for the courage to make changes.

Kevin Wang and Dr. Werner Wittmann jointly unveil the new all-electric EcoPrimus injection molding machine, which will now be produced locally in China.

The expanded WITTMANN production facility in Kunshan was officially opened in mid-December by Dr. Werner Wittmann (4th from left) and Kevin Wang (2nd from right), together with guests and colleagues.

Live at the opening ceremony in Kunshan.

Competitive unit costs fuel creative freedom

Kontron eSystems ranks among the leading suppliers of IoT-capable AC wall boxes. In addition to a charging station model of their own, the company manufactures wall boxes for electric vehicles for numerous well-known automobile manufacturers at its Leipzig facility—all branded and made to measure to fit each OEM's individual specifications. With five new injection molding production cells from WITTMANN—two of them with automatic IMD lines—Kontron eSystems combines high efficiency in production with ample flexibility in design.

They impress with their attractive design and high-quality surfaces: the wall box housings running off the assembly line on the day of our visit to Leipzig. They are destined for an OEM. The brand of the vehicle can be read on the front cover. When the wall box has been installed and connected later on, the logo will be backlit. "A total of eight injection-molded parts have been combined to form this wall box housing. These have all been produced right here, at this facility", explains Lars Böhme, Manager of Plastics Operations at the Kontron plant in Leipzig, not without some pride. This scale of manufacturing is new to the local team. For a long time, many plastic parts, primarily larger ones, had been bought from an external contractor. With the acquisition of a new customer, this strategy has changed, resulting in the largest injection project at the facility for more than 30 years. The central part of this investment: highly integrated automatic injection molding production lines—all planned and delivered from a single source by WITTMANN.

Photo: GmbH website "OEM Charging Solutions" – esystems.de

Kontron eSystems and WITTMANN are together implementing a groundbreaking project for electric mobility.

Perfect visible surfaces with high scratch resistance

Wall boxes must withstand all kinds of weather conditions and function reliably for many years under both severe frost and direct sunlight. Accordingly, the requirements for the plastic housings are stringent, even though most of the wall boxes sold by Kontron eSystems are installed under a carport or inside a garage. Another vital point is the scratch resistance of the surfaces, for the RFID or NFC loading cards are simply held against the surface or wiped across it, and objects such as rings or a bunch of keys held by the same hand quite often interfere with the operating terminal.

To combine high functionality with attractive design, robust surfaces and ample flexibility for different variants, Kontron decided to produce the front cover using an IMD injection molding process. As a result, decoration of visible and functional surfaces with a foil is normally more efficient, more flexible and more robust than painting of injection-molded parts. Jointly with the partner company Leonhard Kurz, a foil system was developed. It is a capacitive foil which contains the entire electronic operating system. This has made it possible to create a completely closed user interface without control panels or switches mounted on top. The foil systems are multi-layered. This also makes it easy to integrate backlit design elements such as the vehicle logo. With the IMD process, Kontron eSystems offers product designers ample creative scope and simultaneously yields competitive unit costs.

The clamping units of the injection molding machines are encapsulated as a clean room. For exchanging the IMD rolls, this clean room can be very easily pushed open.

Precise machine movements with dynamic temperature control

The second largest of the wall box's eight injection-molded components after the basic housings—which weigh 2 kilograms—are the front covers. Depending on the model, they come with shot weights ranging from 500 to 800 grams and are produced on a MacroPower injection molding machine. For this purpose, single-frame decorations are fed from roll to roll onto the clamping

Two WITTMANN linear robots ensure a smooth and efficient process.

The individual picture frames are fed into the mold cavity while demolding the finished injection-molded part.

unit. Once the decoration is positioned correctly, the injection molding machine's control system receives a signal from the foil feeding system and starts the mold closing process. The material processed is crystal-clear polycarbonate, for the entire decoration including its color scheme is generated via the foil.

As the front covers are large parts with a smooth visible surface, sequential injection molding is used. The cascade process offers the advantage of filling the cavity extremely evenly with plastic melt, thus minimizing the risk of visible binding seams. "The foil is highly sensitive", explains Böhme. "Even the smallest unevenness shows up even more distinctively in the decoration of the foil." Here, the MacroPower plays off one of its strengths in the form of extremely accurate movements. Equally important is the high dynamism of the Tempro plus D temperature controllers. For a fast cooling process improves the parts quality and simultaneously contributes to high cost-efficiency. "The cycle time remains below one minute in spite of the high shot weights", says Böhme.

A multi-axis robot removes the finished front cover from the mold, while a new decor frame is simultaneously fed into the cavity.

Automation with seamless integration of third-party systems

Following demolding, the front cover is passed via a sophisticated transport system first to quality inspection and then directly to packaging. The visual inspection prescribed by the OEMs is the only manual operation. All other tasks are carried out by linear robots from WITTMANN—right up to stacking inside the transport boxes. The camera integrated in the robot's gripper is responsible for ensuring correct positioning, so that the parts can be packaged fully automatically. As part of this process, the robot not only deposits the finished parts, but also places the interlayers. Autonomous transport systems remove the boxes as soon as they are completely filled and simultaneously replace them with new, empty boxes. The entire automation system—including control connection with the existing autonomous transport equipment, also including the box changer—was developed by the WITTMANN automation specialists at the Nuremberg facility. Every handling movement was designed with the objective of maximizing overall efficiency. While linear robots from WITTMANN were chosen for quality inspection and packaging, a multi-axis robot is used for demolding. This is required by the low height of the production hall and the dust-free enclosure system. "In this particular arrangement, the multi-axis robot helps us above all to save space at the top", says Maximilian Töpfl, Production Manager of WITTMANN BATTENFELD Deutschland. "We have developed this multi-axis robot in-house and integrated it seamlessly into the overall system. This is just another one of WITTMANN's strengths: our ability for flexible adjustment to our customers' needs and the conditions on site." >>

Easy access clean room

The injection molding cell is encapsulated as a clean room, since every grain of dust would become visible under the foil decoration. To prevent this from happening, a laminar flow box installed above the clamping unit generates a downward airflow, which captures any particles present in the air and pushes them out.

A special challenge in planning this production cell was the exchange of IMD rolls and the opening and entering of the clean room required for this action. "The roll weighs 30 kilograms and must be lifted to the top of the machine. But here, we have no room for a conventional platform", explains Ludwig Pander, responsible for plastics technology and assembly at Kontron eSystems. "Here WITTMANN came up with a brilliant idea, which was very easy for us to implement." It was to use the space behind the clamping unit to install a small platform integrated into the machine, onto which the operator can climb comfortably in order to insert the roll after it has been positioned correctly by the indoor crane. To shorten the setup time, WITTMANN designed yet another customized solution: the laminar flow box can be very easily pushed back across the entire top of the system. "With this solution, we save a lot of time", says Pander. "The roll change takes us only half an hour, not half a day as is usual for conventional systems."

This visual inspection is now the only manual operation required at the company.

During the complete restructuring of the injection molding production, the autonomous transport system was preserved and integrated into the automation of the production equipment by WITTMANN.

Everything from a single source for a fast production startup

"With this investment in process-integrated and automatic production lines, we have created an ultra-modern, competitive manufacturing system for making technologically sophisticated visible parts", sums up Stefan Salesch, Automotive Sales and Marketing Manager at Kontron eSystems. That the production startup proceeded so smoothly was certainly not a matter of course for the entire team. For in addition to its numerous technological challenges, this project was subject to enormous time pressure. The new customer set the date for the production start. The production lines had to be planned and the first parts of the equipment installed and started up within less than six months. And all of this while existing production orders continued to be processed. So, the new systems were installed parallel to the old equipment being dismantled.

"The time schedule was the most critical part of the project", confirms Töpfl. Especially since at that time the effects of the supply chain crisis could still be felt, and the clamping forces of two injection molding machines already ordered had to be further increased retrospectively, because the wall box sizes were finally decided on only very late in the process.

With these machines, the complete layout of the facility and the originally planned positioning of the equipment inside the rather confined production hall had to be reviewed once more. "We almost had to cut open the wall of the hall", Töpfl reports. "We had less than five centimeters of space left. That was real high-precision work made to measure. Here, the space-saving design of our machines was a real help."

Kontron had negotiated this major project with several different suppliers. "WITTMANN offered us the shortest go-to-production time and has actually delivered on schedule ", says Pander. Maximilian Töpfl claims that this was primarily due to WITTMANN assuming the overall responsibility as a system supplier. "We did not have to wait for external partners, but could finish everything in-house in Nuremberg, which saved us a lot of time."

WITTMANN's ability to supply everything from a single source, including the injection molding machine as well as temperature control, materials handling and automation, finally tipped the balance for Kontron in favor of choosing WITTMANN as its partner

The Tempro plus D temperature controllers contribute to short cycle times thanks to their high cooling performance.

WITTMANN ingenuity created a solution for roll changes that now only takes half an hour.

for this challenging project. "After all, we did not only need the injection molding machines, but the equipment around them as well. So, we relied completely on WITTMANN's expertise", says Salesch and emphasizes: "We are very proud of this completely newly designed injection molding production. It has triggered a spirit of optimism at this location. The colleagues here can see that we are going further ahead."

Central materials handling system for increasing diversity in materials

The location of today's Kontron eSystems plant in Leipzig has a long history—primarily shaped by Siemens. 30 million business telephones were produced here for the global markets. Siemens here already combined electronics manufacturing with plastics expertise. Kontron benefits from this, since some former Siemens staff members are still employed at this location today. "IMD technology was already introduced here in 2003", Salesch reports. At that time the business made decorative strips for telephone housings.

The wall boxes currently make up about 50 percent of Kontron eSystems' sales in Leipzig. The other half is generated by contract manufacturing. "We are optimally positioned for technologically sophisticated visible parts with shot weights ranging from 20 grams to two kilograms", says Salesch. For contract manufacturing, too, many customers come from the automotive and E-mobility sectors. The electronics industry also increasingly relies on the production capacities of Kontron in Leipzig.

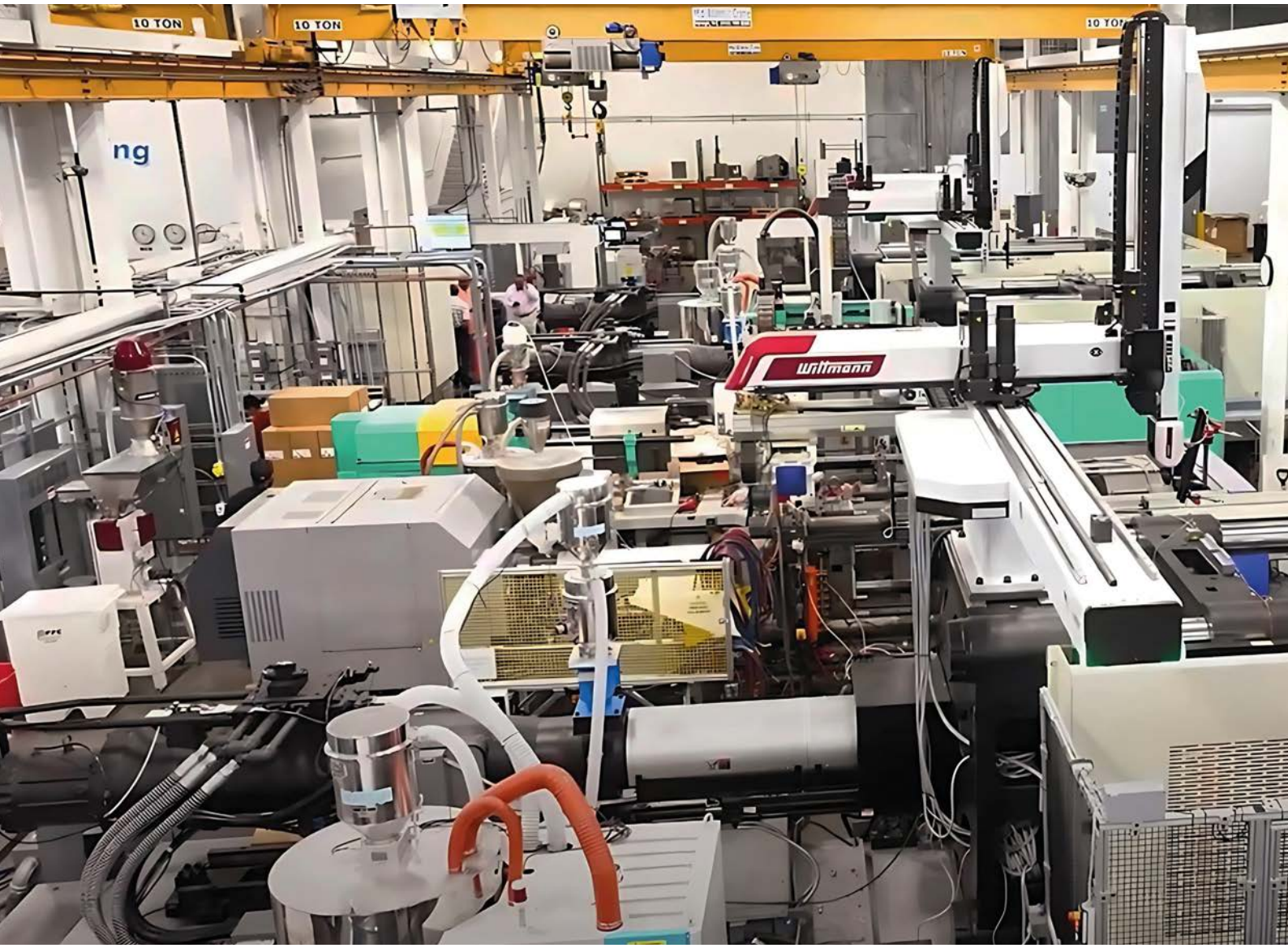
With the ongoing diversification of the product portfolio, the range of materials being processed in the completely redesigned injection molding hall is also increasing. This is why Kontron eSystems initiated a further project directly following the successful startup of the injection molding production lines. Most recently, all machines are now being supplied with granulate by a large central material supply system from WITTMANN.

Kontron eSystems and WITTMANN are jointly enjoying the success of this major project. On the upper step, from left to right: Stefan Salesch (Kontron eSystems), Maximilian Töpfl (WITTMANN Group) and Ludwig Pander (Kontron eSystems). On the lower step from left to right: Oliver Liebscher (Service Engineer at WITTMANN) and Lars Böhme (Kontron eSystems). Oliver Liebscher assisted the local Kontron team on site throughout the entire startup process.

Time-lapse video of the injection molding plant renovation.

WITTMANN robotic control serves all Core purposes

Core Technology Molding in Greensboro, North Carolina, focuses on the medical and automotive industries—and this is currently bringing the injection molding company more orders than ever before. With the expansion of the site, investments are therefore also being made in automation.



The degree of automation is increasing. Thirteen injection molding machines from different brands work with WITTMANN linear robots.

Core began 20 years ago as a Tier 2 supplier in the automotive electronics sector. Customers from the life sciences, pharmaceutical, industrial, and household sectors quickly followed. "There weren't many medical molders in the Southeast at the time, so we invested in a clean room," reports Geoff Foster, company founder and CEO.

With 13 injection molding machines ranging in capacity from 50 to 1,000 tons, Core has significantly augmented its capabilities with an inventory of eight WITTMANN linear robots. Initial preparations for the move to the new building, which is scheduled for completion by the end of this year.

Programming made easy

"The W9 series robot, WITTMANN's newest, has been more beneficial than expected," Foster enthused. "We have gained quick wins from these robots." Features like the quick new programming generator help us develop new processes quickly—a key aspect of being a custom injection molder. Also, the ability to monitor force throughout the process has helped us tremendously on pick-and-place applications where a significant force is required." In particular, Foster emphasizes programming. With the R9 TeachBox, the animated program editor displays even complex applications very sim-

WITTMANN supports Core's STEM initiative

Five years ago, Core Technology launched its own initiative to support students in science, technology, engineering, and mathematics. "Molding Kids for Success" offers factory tours and workshops for children between the ages of 11 and 14. More than 1,500 students now attend the annual summer camp. Interest is growing so rapidly that a separate student technical center is now being planned for the new building. WITTMANN is contributing to the equipment with a generous donation. "Students might think they're never going to use geometry. We'll take them into our tool shop and show them how we use geometry every day," explains Brandon Frederick, who heads the program. "We think it's really cool that the students tell their parents, grandparents, and friends at home what they've learned here with us."

ply and clearly, while offering experienced programmers plenty of freedom. "Features such as these help us develop new processes quickly—a key aspect of being a custom injection molder," says Foster. Added to this is the force monitoring during insertion and removal, which comes as standard with W9 robots. "This helped us tremendously on pick-and-place applications where a significant force is required."

Since the new robots went into operation, the throughput of the production cells has increased significantly. In addition, modern automation successfully supports the onboarding of new employees. "Part of our onboarding process is to get new talent integrated and adding value in the quickest and safest way possible," explains Engineering Manager Brandon Frederick.

Process Engineer Tyler Barbour has been particularly adept at integrating Core's robots into automation lines, Frederick notes. The ease of use of WITTMANN's robots has helped the young mechanical talent quickly pick up on installation, and he has performed several startups of Core automation lines. WITTMANN provided support in integrating custom end-of-arm tools, bowl feeders, conveyors and vision systems into Core's processes, which also feature WITTMANN press-side blenders and granulators.

Overall Equipment Effectiveness (OEE) has been optimised

Tyler Barbour also received training at WITTMANN in Connecticut and has now created training materials to ensure operators know how to set up their equipment so it runs efficiently. Core's production only shuts down 10 days a year and runs about 6 million pounds of material annually, mostly ABS, as well as 30% glass-filled nylon 6 and 15% glass-filled nylon 6.

"We have been able to maximize uptime and overall equipment effectiveness through automation," Foster says. The automation of production processes is an essential part of Core's growth strategy.

"Helping nimble young companies like Core Technology is particularly gratifying," says WITTMANN USA President Sonny Morneault. "Molders who embrace cutting-edge technology are clearly at an advantage in the market."

Robot control becomes a communication platform

The R9 robot controller makes things particularly easy for users. It combines maximum performance with ease of use that sets new standards. With up to twelve servo axes, the R9 can handle even the most complex automation tasks and, thanks to its ControlRoom function, takes over complete control of all auxiliary devices in integrated work cells.

The R9 offers numerous expansion options—from analog and digital inputs and outputs to additional servo axes. The R9 Teachbox runs on Windows, making it easy to connect to other platforms.

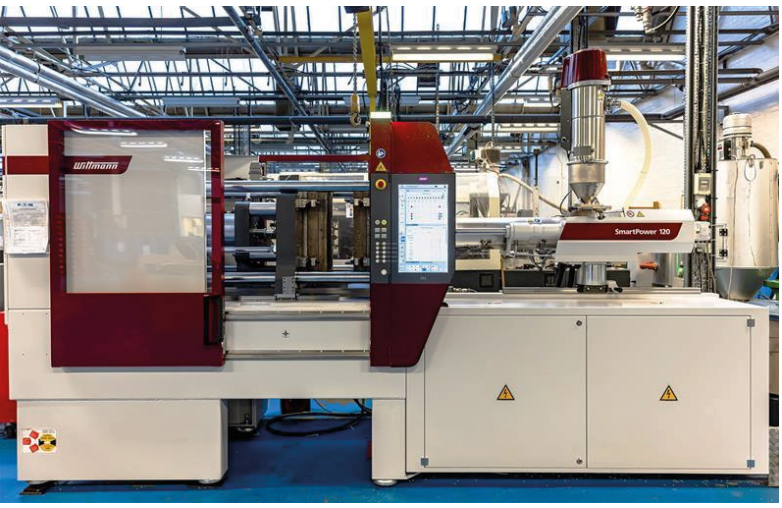
Whether you are a beginner or an experienced user, the R9 adapts to your needs: Sequence programs can be freely programmed or intuitively compiled using a graphically guided selection of sequence options. The TeachBox interface can be transferred in its entirety for convenient programming on a stationary PC.

The R9 comes with a force monitoring function for inserting and demolding as well as automatic ACD collision monitoring as standard. The control system also keeps track of maintenance intervals.

The TeachBox scores with a touchscreen and a very clear display with live 3D animations. Additional buttons with tactile feedback are available for very precise control of movements and for programming.

Slashing power usage by sixty percent

Kempston Controls Manufacturing produces electronic components such as high quality MEM classic low voltage devices as well as components for low voltage switchgear. Many parts are produced using injection molding—on machines from the WITTMANN Group. The high energy efficiency of WITTMANN servo hydraulics was the deciding factor in this choice.



In order to respond flexibly to rising demand, Kempston Controls, Holyhead, has invested in production cells that are based on WITTMANN SmartPower technology.

Holyhead is famous for its port, which connects Great Britain with Ireland. Here, in the far northwest of Wales, Kempston Controls Manufacturing has a production plant. In order to meet rising demand, investments were made in injection molding production at the site. The WITTMANN Group was awarded the contract—much to the delight of David Rees, Group Operations Director at Kempston Controls Manufacturing: "We have had a fleet of BATTENFELD injection molding machines on site here for over 30 years. We therefore know the machines pretty well." BATTENFELD is now part of the WITTMANN Group. According to Rees, the quality of the machines continues to speak for itself.

WITTMANN UK supplied a SmartPower 120/525 injection molding machine and the total production cell package included a Dosimax metering unit, Feedmax S3 hopper loader and Tempro Primus C90 temperature control unit.

Top ratings in all areas

"With so much competition on this project it was great to come out on top and help keep our thirty-year relationship going," says Orrin Smith, WITTMANN UK Area Sales Manager. The WITTMANN SmartPower 120 machine topped the ratings in all key areas: lowest energy usage, smallest footprint, shortest cycle time—all at a very competitive price.

As befits a key supplier to the energy markets, Kempston Controls were extremely aware of a very particular bonus in store by sourcing WITTMANN, namely the dramatic energy-savings made possible via the new WITTMANN injection molding machine designs. Rees notes that "energy use is a big deal for us. Low running costs for our plant are very important particularly with the high energy costs being charged in the UK. Since the machine replacement we have closely monitored the changes in energy usage. I am very happy to note that the new SmartPower 120 runs on 60 percent less electricity than previously—thanks to the WITTMANN improvements in the machine design."

For a minimum carbon footprint

Energy efficiency has always been a key development focus at the WITTMANN Group. The servo-hydraulic SmartPower machines have been consistently refined with a view to maximizing resource conservation. They combine responsive servo motors with powerful constant pumps as standard, combining maximum dynamics and speed with highly precise machine movements and minimal energy consumption. Thanks to Drive-on-Demand, energy losses are consistently avoided. Drive-on-Demand means that the drives are only activated when movements and pressure generation require it. At the same time, braking energy is recovered. KERS is responsible for this. The Kinetic Energy Recovery System—KERS for short—converts kinetic energy into electrical energy during braking processes. This amount of electricity is then available within the machine—for example, for cylinder heating. The patented system further reduces energy consumption by up to five percent and makes the machine more resistant to short-term power fluctuations or power failures, which increases availability.

The space requirements of machines and production cells have long been an important efficiency indicator. The current generations of WITTMANN injection molding machines are correspondingly compact. The design of the SmartPower series has been further optimized while retaining a large mold mounting space and excellent accessibility to all important machine components.

Working hand in hand
WITTMANN UK and Kempston Controls are a well-coordinated team. This was demonstrated once again during delivery of the production cell. "Everything went absolutely smoothly. We were literally operational the very next day—producing components already, with a real buzz on the shopfloor," reports Rees. He adds: "The training on the new control system was good, and easy to follow on the HMI screen, which included a very user-friendly manual as integral. Our injection molding team picked it up in no time at all."

Clear – intuitive – flexible

With SmartPower, Dosimax, Feedmax S3, and Tempro Primus C90, Kempston Controls opted for a complete solution from a single source. This was another argument in favor of choosing WITTMANN as a partner for this project. From material preparation and conveying to injection molding, mold temperature control, and automation to inline recycling and digitalization of the production process, the WITTMANN Group offers all components of the production cell from its own development and manufacturing.

The advantages are:
- Compatibility of all components
- Efficiency and quality-optimized processes because all components interact perfectly
- Central control and monitoring of the entire process
- A uniform look and feel across all devices
- Plug & Produce for safe setup and a quick start to production
- Simplified procurement and quick commissioning
- Efficient service calls

A Dosimax volumetric dosing system, a Feedmax S3 vacuum conveyor, and a Tempro Primus C90 temperature control unit complete the production cell.

Cutting-edge robotics drives automotive supply chains

Very well structured, clean and bright: The molding shop of this automotive supplier in the Czech Republic is impressive. Together with the move to a completely new production facility, several new suppliers were engaged. For example, all new linear robots have now come from WITTMANN. With their high flexibility and dynamism, they support the current trend towards process integration. The automotive supplier has set itself the goal of fully exploiting the potential of WITTMANN's W and WX robot models.

The new injection molding production operates with highly automated systems. All injection molding machines are equipped with linear robots from WITTMANN's W and WX series.

Short distances and efficient logistics were decisive factors in planning the new injection molding production plant. Functionally, the molding shop is divided into two halves. On one side, are the injection molding machines, all standing precisely in a row side by side, and each equipped with a linear robot from WITTMANN. Their conveyor belts all run towards the center of the hall. At their ends, the various workplaces for manual jobs are installed, such as visual quality inspection and simple assembly steps. This area is the transition point towards logistics, to which the second half of the hall is dedicated. There, both raw materials and finished parts can be moved on very quickly.

The entire injection molding production facility was virtually rebuilt on a greenfield site. With the new building, the chance was taken not only to enlarge the molding shop, but to optimize all workflows and processes as well. In some areas, new suppliers were selected, for example for linear robots. These have now come exclusively from WITTMANN. The most recent delivery included 30 robots from the W and WX series, mainly large models up to the WX183, which is designed for handling payloads of up to 110 kilograms.

"The enlargement and modernization of our injection molding production met with a very positive response from our customers", reports the Production Manager. Soon after the move, the company won supplier awards from several major automotive customers.

Positive experiences within the group tipped the scales

The Czech plant specializes in large structural and visible parts as well as motor components. The largest of its more than 30 injection molding machines comes with clamping forces of 2,300 tons. The parts manufactured on these machines include A columns and fenders.

The W and WX linear robots remove the injection molded parts from the molds. In most cases, the robots deposit the parts directly on the conveyor belt. At the end of the belt, a staff member takes over, carries out the visual quality inspection and then packs the parts safely into the crates provided by the automobile manufacturers.

What led to the decision to choose WITTMANN as robot supplier?—"We target more standardization", is the answer given by the Purchasing Manager. "We have already been working with WITTMANN robots at other locations, and our experiences there have been very positive. Our aim is to focus on only one supplier per product. One of the advantages is that we need to train our staff members on just one operating logic. We believe that this increases our chance to exploit the technological potential of the robots to the fullest possible extent."

R9 control system simplifies programming

Linear robots from WITTMANN stand out by their high dynamism and simultaneously very precise movements in performing removal and insertion tasks. A special feature is the wide range of servo-rotary axes available, which can be combined very compactly and very finely adjusted. "We can transfer program sequences very simply from one combination of rotary axes to another", reports a Team Leader. He claims that the robots' R9 control system makes data transfer very easy.

With the QuickNew wizard, the linear robots from WITTMANN offer an animated program editor, which makes efficient teaching possible for workers without much experience even with complex applications. "The graphic display on the operating terminal

is very clear and easy to understand", the Team Leader points out. Another feature he particularly likes is the function of "blowing out while depositing", which WITTMANN provides for large robot models as standard. "With this function we save a lot of time and gain greater process reliability, because the parts cannot get stuck", he says. "To achieve this is more complicated with other robot brands."

Robots support process integration

One target of continuous process optimization is utilizing the robots more fully, which means giving them additional tasks to demolding and depositing the injection molded parts. One example that has already been successfully implemented is the production of motor components in a family mold. Immediately following demolding, the end-of-arm tooling passes the parts on to a laser station integrated above the conveyor belt inside the protective machine housing. There, each molded part receives an individual laser code which reveals on which day, at what time and in which cavity the part has been produced. From these data, every part issuing from the family mold can be assigned precisely and traced back seamlessly in the event of an incident.

Directly after coding, the robot passes the parts on to automatic inspection by a camera. The visual control system then informs the robot whether the coding is correct and easy to read. Only thereafter does the robot deposit on the conveyor belt all molded parts which have been passed by the inspection station as good parts. "The exciting point here is the integration", explains the Team Leader in the production department. "The communication between the machine, the robot, the laser station and the visual control system. Here, the WITTMANN robots with their Euromap 67 interface and the modularly expandable I/O interfaces make the job really easy for machine setters."

150 molds from about 40 customers are currently in active use. Set-ups take place 16 times in 24 hours. "Here we must be quick", the Team Leader points out. "WITTMANN robots help us to increase the productive time of the injection molding machines."

With the start of production, the automotive supplier is strengthening its partnership with WITTMANN. For it was also decided to have WITTMANN as their supplier of granulators for regrinding sprue and rejects. Consistent targeting of a waste-free injection molding production is an integral part of the Group of companies' sustainability strategy. From now on, all injection molding machines will be equipped one by one with their own beside-the-press granulators, not only in the Czech Republic, but also in other production plants worldwide.

The aim is to utilize the robots' capacity more and more fully. In this production cell, they take the finished parts first to the laser coding and camera inspection stations—integrated on the left-hand side—and only then do they deposit the parts on the conveyor belt.

The largest injection molding machines on site have clamping forces of 2300 tons. Here the large WX183 robots are used, which are designed to handle payloads of up to 110 kilograms.

Training made to measure for local teams

"From zero to one hundred"—this is how the Production Manager describes the move of the injection molding production to the new location. "In greenfield projects, people normally begin with two or three machines. But we started here immediately with full capacity." For the team, too, this meant a major challenge. It was necessary to train very many new staff members simultaneously as part of the production ramp-up.

WITTMANN still supports the team now with training sessions made to measure, taking place partly on site at the automotive supplier, but frequently also at the modern training center of WITTMANN BATTENFELD CZ in Pisek, Southern Bohemia.

The Czech subsidiary is an important center of excellence for automation technology within the WITTMANN Group. Not only in the areas of training and sales, but also in product development. In Pisek, customized automation solutions are being developed and marketed in close cooperation with the automation WITTMANN specialists from Austria and Germany. Accordingly, extensive automation expertise is concentrated at this location, from which the customers in the Czech Republic can benefit.

"I have made a clear request to all WITTMANN salespeople and engineers", says the Purchasing Manager. "Please contact us and let us know, whenever you notice anything we could do better or differently to other companies in order to become even more competitive." And the WITTMANN team takes its customer at his word. "We talk very openly about challenges, possibilities and potentials and are making a lot of progress that way", points out Frédéric Carsana, who, as International Key Account Manager from WITTMANN, looks after the customer together with the WITTMANN subsidiary in Pisek.

The benefits of retrofit—new controls for new challenges

More efficiency, more process reliability, more digitalization—constantly more and more stringent requirements often present existing machinery with new challenges. This mostly affects the control systems. For the injection molding machines which have produced reliably for 20, 30 or even 40 years are often still in good mechanical condition. This is exactly where the control system retrofit comes into play. With a comparatively low investment, older machines from WITTMANN and BATTENFELD brands can thus be equipped for modern production.

Older control systems are prone to increase the risk of standstills, to push up the energy consumption, and are often unable to meet the modern integration requirements", says Jürgen Gerster, service engineer at WITTMANN BATTENFELD Deutschland. He is familiar with this issue from his daily experience. Together with his colleague Oliver Pabst, he has developed within the WITTMANN Group into a specialist for control system retrofits.

As a first step, the control system retrofits are offered in Central Europe. One example from Germany illustrates a typical retrofit order. A manufacturer of large containers operates 20 injection molding machines with clamping forces of up to 3000 tons—all of the BATTENFELD brand, which today is part of the WITTMANN Group. All of these machines have been operating for 30 to 40 years. "Reliable workhorses", says Gerster. "They have been serviced regularly and are mechanically in excellent condition." But here is the problem: there are no more replacement screens available for the old Unilog 9000 control systems. To prevent unplanned machine standstills, the company therefore commissioned the WITTMANN service team to install modern Unilog B8 control systems on seven machines as a first step.

"80 percent of the retrofit projects are carried out on large machine models", explains Oliver Pabst. And this for a simple reason: since large machines have an extremely high acquisition value, a retrofit is considerably more cost-efficient than purchasing a new machine.

The WITTMANN service engineers Markus Walus (left) and Reiner Schäl (right) installing a retrofit on an injection molding machine. Here, the old Unilog 9000 control system has already been replaced by a Unilog B8 system. In this way, the machine is now optimally prepared for compliance with present and future production requirements.

Points to consider

New purchase or retrofit?—To decide what is best in each case requires thorough evaluation. WITTMANN supports its customers with counselling. Among others, the following aspects are analyzed:

- What kinds of products, materials and molds are to be run on this machine in the future?
- What is the condition of the machine's mechanical components?
- How carefully has the machine been serviced?
- What kind of automation is planned?
- How high are the machine's energy consumption and its share of unit costs?
- What new demands are being made by the customers? For example, what proofs or data do they require?
- What is the company's medium- to long-term digitalization strategy?

Based on the answers to these questions, the cost efficiency and future viability of a retrofit are compared by reliable key figures with the cost of a new machine. "A retrofit often amounts to only a fraction of the cost for a new investment", says Pabst. This is a great opportunity for processors who are unable to get any budget share for new investments.

And what is more, the workload for a retrofit is significantly lower than that for a machine replacement. "Our teams carry out most of the machine upgrades directly on site", explains Gerster. "We plan two weeks for this type of job, but we normally finish it much faster." Including restart, for this is part of the service package.

The time is used to exchange the operating panel and to upgrade the existing control cabinet. The new control system takes up less space inside the control cabinet than the old one. This provides an opportunity to retrofit additional options, or to integrate external systems without requiring any additional production floor space.

Planning for future requirements

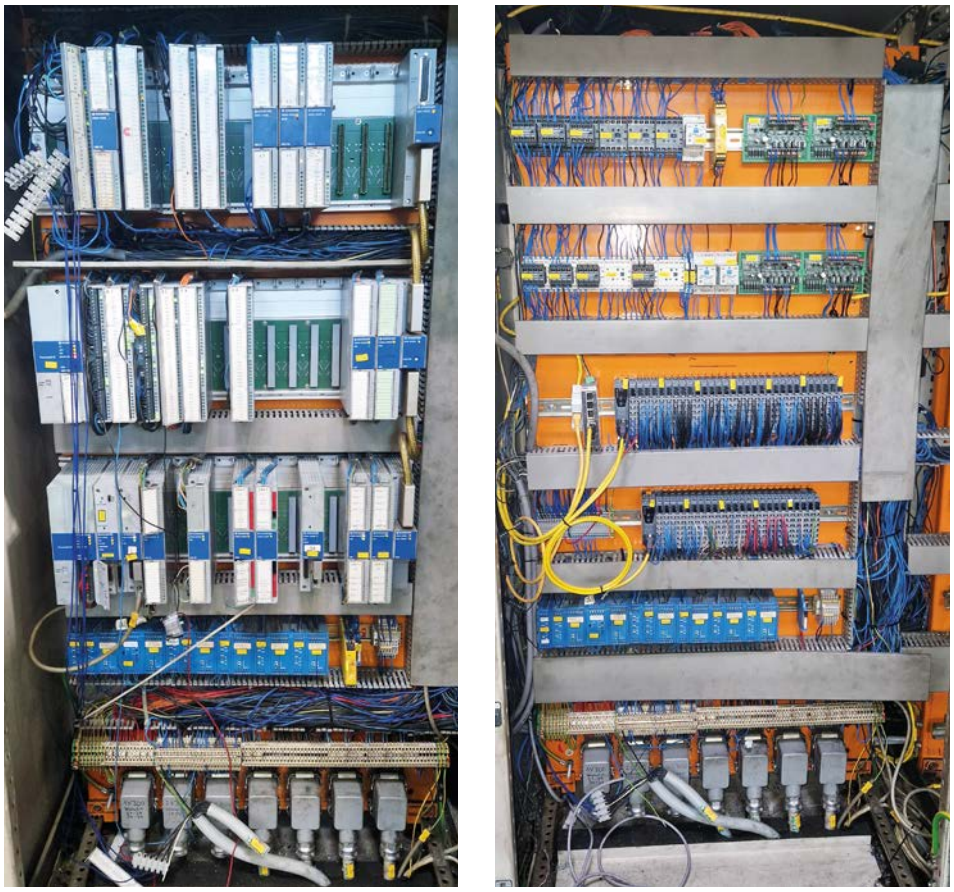
For the German container manufacturer, the investment in the new control systems has paid off. The risk of unplanned machine standstills has been eliminated. Another major advantage is that the processor is now able to use WITTMANN's online support. That will reduce service expenses substantially.

The Unilog B8 control system has a 21.5-inch, full-HD multitouch display with gesture control, which enhances user friendliness. Simultaneously, the processor benefits from the system's higher performance. This results, for example, in more precise regulation and higher repeatability.

"An important point for any retrofit project is always to plan for the future, too", emphasizes Gerster. For digitalization is moving ahead quickly. The upgraded machines now have modern interfaces for linking up with various external systems, such as in-line quality inspection or integration of the production cell into a mainframe system. Even if only part of this is needed immediately, the machines are still already prepared to meet future requirements.

The Unilog B8 control system supports the integration of the entire production cell via OPC UA and provides a uniform operating platform which includes not only the injection molding machine, but the auxiliaries and the automation system as well. In this way it is also possible for an old injection molding machine to become a communication hub with a plug-and-produce function inside a production cell integrated via Wittmann 4.0.

"The availability of spare parts and the need for digitalization are the most frequent reasons for requesting a retrofit", reports Gerster. "But safety issues, too, are often the driver. For example, additional light barriers cannot be integrated into all previous generations of controllers." In one project, even structural conditions had to be taken into account. "An exchange of machines would have been far too costly, because it would have been necessary to remove a wall", says Gerster.



The control cabinet of a large injection molding machine built in 1989 before (left) and after the integration (right) of a Unilog B8 control system. The new control system components require considerably less space. This leaves room for additional options without taking up any extra production floor space.

A control system retrofit lengthens the service life of injection molding machines by at least ten years. Over that period, WITTMANN also guarantees the availability of spare parts.

Check-list for considering a control system retrofit

The more statements given below you can confirm with "YES", the more sense it makes to install a retrofit of the machine's control system.

- ☐ The mechanical parts of the machine are in good condition.
- ☐ The machine has been serviced regularly.
- ☐ Molds to be used in the future require more stable processes, more precision and higher repeatability.
- ☐ Customers demand process and quality data, which the existing control system is unable to deliver efficiently.
- ☐ Customers require extensive documentation and traceability, which the existing control system is unable to supply.
- ☐ Interfaces for digitalization and networking are lacking.
- ☐ The existing control system is not adequately prepared for compliance with the latest occupational safety regulations.
- ☐ The machine consumes more energy than necessary due to obsolete regulation mechanisms.
- ☐ The rejection rates are rising.
- ☐ Investment in a new machine is not approved or not feasible for economic reasons.

Smart Recycling: How to use recycled materials efficiently and safely in automobiles

The new EU End-of-Life Vehicles Directive prescribes certain proportions of recyclates for new vehicles. This makes recycling no longer optional, but compulsory for automotive suppliers, in order to combine quality with sustainability and cost-efficiency. A first step for many is in-house recycling of sprue and reject parts. Brose Fahrzeugteile addressed this issue at a very early stage and pioneered by installing the new Smart Recycling concept from WITTMANN. In WITTMANN's podcast "Wir sind Spritzguss.", Vladimir Babajlov, in charge of production and mold planning at Brose in Coburg, reports about experiences, new options and future challenges jointly with Alexander Paech, Sales Manager for Automation and Auxiliaries from WITTMANN in Nuremberg.

Guests of Susanne Zinckgraf in the Vienna podcast studio: Vladimir Babajlov from Brose Fahrzeugteile (left) and Alexander Paech from WITTMANN (right).

Susanne Zinckgraf: Here we are discussing an exciting topic: Smart Recycling, a new offer from WITTMANN. What does this actually involve?
Alexander Paech: The aim is to produce a top-quality recyclate with maximal efficiency. For this purpose, each Smart Recycling package consists of a granulator, a mobile dryer, a blender and a Feedmax Clean material loader. All system components are selected and adapted to each other according to the individual requirements of the material, the application and the operational conditions.

So, this is about in-line recycling of sprue and rejects.
Paech: Precisely, recycling of all pieces of scrap generated during production. These are returned to the process without having to re-adjust process parameters, without losing any cycle time and, above all, without any impairment of process or product quality standards.

Which means, consulting service is an important part of this package.
Paech: That is correct, since every application is different. In Smart Recycling, we cooperate very closely with our customers and accompany them on their journey.

Vladimir, you have embarked on that journey—figuratively speaking?
Vladimir Babajlov: We were looking for an innovation to increase and proactively drive our sustainability. As a first step, we focused on output shafts for tailgate drives, which we are producing from polyamide.

Why are these particular components well suited?
Babajlov: Before we suggest using recyclate to our customers, we examine very carefully all possibilities, opportunities and risks involved. Our analysis showed some potential for the output shafts. We can use up to 25 percent regrind and still preserve maximum consistency of the parts' quality and technical attributes.

How has the cooperation between Brose and WITTMANN actually developed?
Paech: Let me begin by saying that Vladimir and I have known each other for quite some time and already successfully completed many projects together. What we have always had in common was technology and the future challenges facing us. When he

called me and confronted me with the task of producing and using regrind in-house, I was at first perplexed. Up to then, it was very unusual for an automotive supplier to address this issue. For I also knew how high Brose's quality standards are and with what ultimate precision they operate. But precisely this was also a challenge for me. I felt that here we could set a milestone together.

Using regrind in the automobile industry has long been a no-go!
Paech: This is why we highly respect Brose for saying they wanted to be a pioneer in this field. And—this has actually turned out to be a success.

Vladimir, was this really your motivation, to be a pioneer? Or is this topic now also being driven by the OEMs and automobile companies?

Babajlov: Of course there are some requirements for using certain proportions of regrind. But in this particular case we approached our customer proactively, because our technical analyses and endurance tests delivered excellent results, and we saw that we could achieve a stable process with regrind. With WITTMANN, we also have a very competent partner and supporter.

What is the result?
Babajlov: The equipment now operates in series production with regrind, and the process is perfectly stable. Of course, I continuously check everything with great curiosity, especially the dedusting process and the way everything is linked together. Although we are also regrinding prototype parts, the system keeps running smoothly and efficiently.

The EU regulations now also prescribe the use of recyclates.
Babajlov: Correct, and we are in full agreement to this. We are now well prepared and ready to test more components for using regrind.

Which components are particularly well suited?
Babajlov: Wheelrims, underbody protection, tailgate covers—these are typical parts already being produced today with a proportion of recyclate. Adding percentages of regrind to technical components is more difficult. But with a Smart Recycling solution, such as we have now, we are also ready for this kind of task. We are getting a consistent output of top-quality material and are

able to produce the granulate ourselves. This is precisely the point. For the future, it is vital to have recyclates ready in large quantities and consistently high quality.

Does this mean that politicians should impose even more stringent regulations?
Babajlov: That's a difficult issue. I'm not sure whether this should really be decided by public authorities. I think that the suppliers, OEMs and politicians should combine their efforts and work together to find a sound solution.

After all, sustainability always has to add up financially, too. Vladimir, does in-house recycling reduce the unit costs at your company?
Babajlov: Yes, of course, this also reduces the costs. Thanks to the granulate we produce ourselves, we have lower inventory levels and space requirements, and less expenditure for services. But the main focus is still on ecological operation. Simultaneous pursuit of sustainability and cost-efficiency—this is what we, as a company, are working on very intensively.

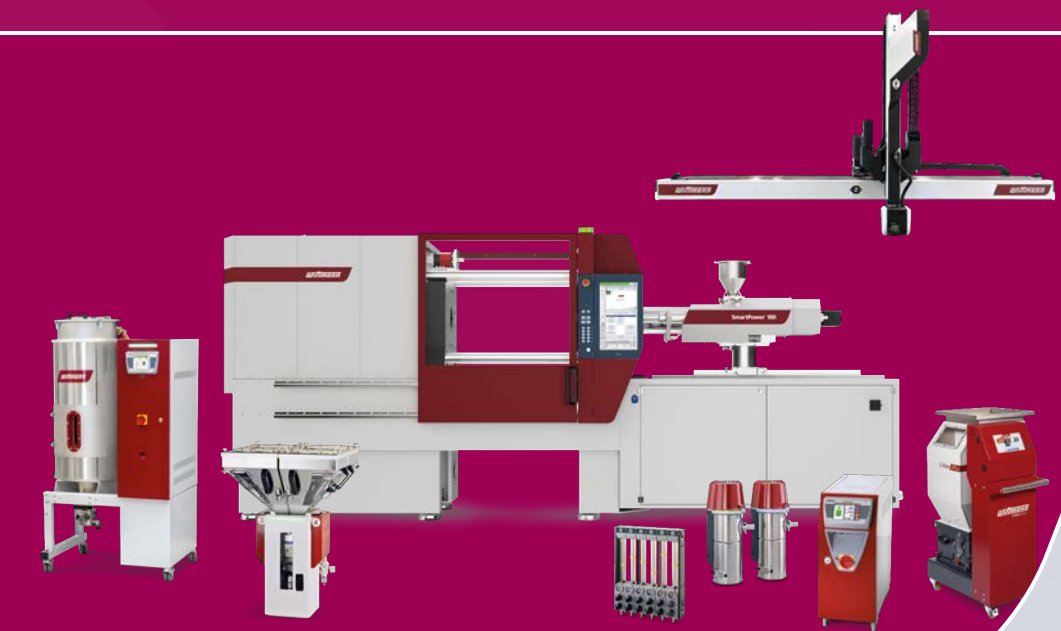
Up to now, we have been talking exclusively about PIR, that is, post-industrial recyclates. What is the current position concerning PCR, post-consumer recyclates?
Babajlov: We have some experts at our company who are thoroughly investigating this issue—of course, jointly with the OEMs. That is a very exciting issue. It involves us all as consumers, too. How are we handling packaging waste? Here, we need to change not only in Germany, but all over the world. The mixtures of different materials, the various additives and the environmental impact are a great challenge.

Alexander, are there any Smart Recycling users already working with PCR?
Paech: First pilot projects are under way. This is still in its infancy, but we are optimistic here. More and more companies are getting interested in this topic and contacting us proactively.

A Smart Recycling system is installed at WITTMANN's technical center in Nuremberg. Can interested parties simply drop by?
Paech: They are welcome to do so at any time! The new center of technology is open to everyone. There we have complete production cells which can be used for tests together with Smart Recycling. This means, our customers can bring their own products, which we then granulate, purify and then directly reprocess by injection molding. We have facilities for analyzing the grain size and dust content to demonstrate on a data sheet the advantages of Smart Recycling.

What does it take to extend the range of uses for granulates produced in-house?
Paech: I think it's a question of mentality. Often, people simply lack the courage to say, "Let's give it a try".

To hear the podcast in its full length (in German language):



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