The magazine for the injection molding world

WITTMANN innovations

4 2025

K 2025: Great success for WITTMANN

„Smart Choices, Smart Savings" brings innovations to market faster

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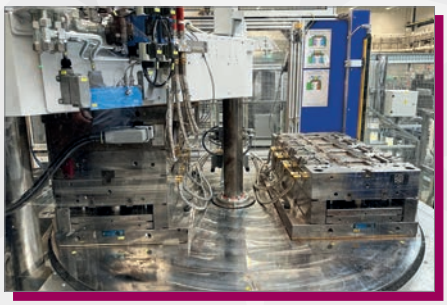

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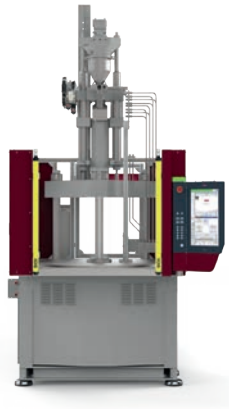


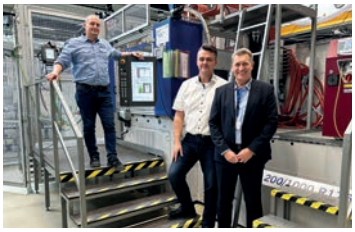


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Editorial

Dear Readers,

The year 2025 is drawing to a close – an eventful year which has demanded a great deal from all of us.

The main challenges were the general economic conditions – characterized by the uncertainties originating from the USA's customs policy and the new regulations imposed by the European Green Deal, as well as rising energy and production costs in Central Europe and the continuing economic weakness in China. The markets are volatile. For our industry, this means: more complexity, more pressure to adapt and the necessity to respond even more flexibly.

This makes us all the more pleased about how much we have achieved together in 2025. The lively interest shown by K 2025 trade fair visitors has confirmed that we are on the right track with our developments. So, how can we combine profitability with sustainability? How can we increase energy efficiency and production reliability? And how can we succeed in using digitalization and AI to make our products even more intuitive and user-friendly? The WITTMANN innovations at the K 2025 have given answers to precisely these basic questions of our time.

In all sectors – injection molding machines, automation and auxiliaries – our innovations combine highest precision and reliability with technologies which significantly reduce energy consumption, optimize material input and boost long-term profitability. This is how we support our customers in strengthening their competitiveness and simultaneously reaching their sustainability goals.

The success of the K 2025 has once again confirmed what really matters in times of change: innovative strength, reliability and the courage to break new ground.

The WITTMANN Group has continued to invest in the future throughout the challenges in recent years - in product development, as well as in expanding and modernizing our global organization. In every issue of our "innovations" magazine we give you insights into the activities in the WITTMANN world. Please see pages 6 and 7 of this issue.

We will all again have to face some more major challenges in the coming year. Unfortunately, the geopolitical tensions are not likely to be resolved overnight. We, however, are looking into the year 2026 with great confidence. With strong partners, highly motivated teams and an unshakably clear focus on innovation and reliability.

We thank you, our customers and partners, for your confidence, constructive cooperation and the successes we have achieved together during this turbulent year 2025. We also look forward to jointly thinking ahead, continuing with further developments and thus moving further ahead in 2026.

Yours, Michael Wittmann

News, insights, stories and more....
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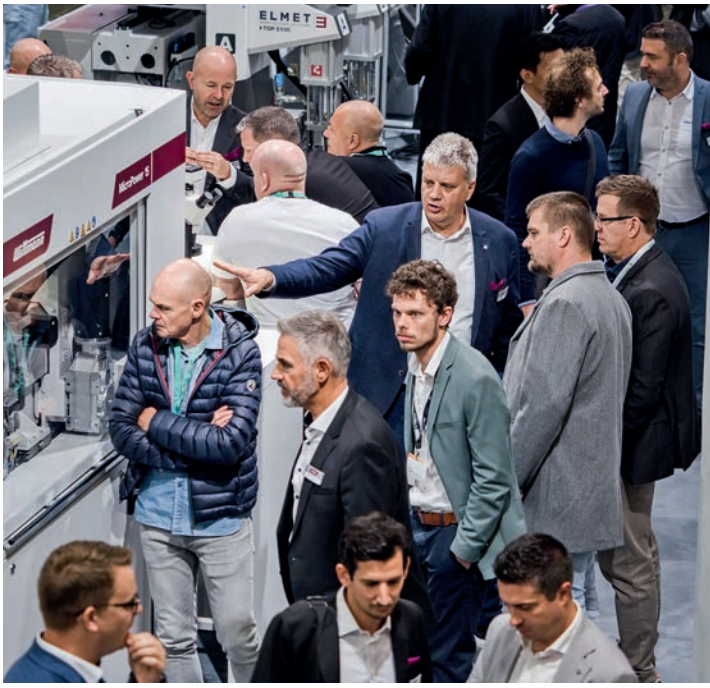
K 2025: Smart Choices, Smart Savings – Smart Success

K 2025 was a great success for the WITTMANN Group. Visitor traffic at the WITTMANN Group's stands was consistently high. We are delighted to have concluded several projects and received many orders. Once again, the trade fair lived up to its reputation as the leading international trade fair for plastics and rubber industry. Visitors came from all corners of the globe and were primarily interested in one thing: innovation. And the WITTMANN Group had plenty of that to offer, both at its main stand in hall 15 and at "The Power of Plastics" Forum in the outdoor area.

Sustainability implemented economically – that is precisely the key to strengthening competitiveness and supporting the goal of bringing innovations to market faster. "Smart Choices, Smart Savings" – that was the WITTMANN Group's motto at K 2025.

Read more about WITTMANN's exhibits and world premieres at K 2025 in issue 3:


innovations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NET-Zero 2050
Shape sustainably, save cleverly
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Substantial extension of technical center capacity in Poland

The WITTMANN subsidiary in Poland has moved into its new building. The location is Radziejowice, south-west of Warsaw, right next to the motorway between Warsaw and Katowice, and only 30 kilometers from Warsaw Airport. "Our customers can now reach us even more quickly and easily", emphasizes Bogdan Zabrzewski, Managing Director of WITTMANN BATTENFELD Polska.

The team in Poland is particularly glad about the larger, modern presentation and training rooms. Up to 40 persons fit comfortably into the new training room. The new technical center has been laid out to accommodate two injection molding machines and numerous exhibits from the range of automation and auxiliary equipment. The technical center and storage facilities take up an area of almost 500 square meters. An all-electric EcoPower 110/350 is already there, up and running – together with two robots. The latter have been deliberately equipped with two different control systems – one with R8 and one with R9 – to enable targeted adjustment of training programs and demonstrations to the conditions at the customers' facilities.

A servo-hydraulic SmartPower 350/2250 machine will be added shortly to complete the capacity. This machine will be equipped with Cellmould and Airmould technology packages for foam and internal gas pressure injection molding. In this way, WITTMANN BATTENFELD Polska is responding to the increasing demand for gas-assisted injection molding processes. Polish customers will be welcome to bring along their own molds for injection molding tests.

A partnership that makes a difference

For more than 15 years, WITTMANN BATTENFELD Germany and the Regnitz workshops in Erlangen have been working together successfully. These sheltered workshops belong to the German Federal Association of Life Assistance, which promotes equal rights and accessibility for people with mental disabilities. In the metal working department at Regnitz, important automation components for WITTMANN system solutions are being produced.

In order to show exactly where the automation components are used and why they are so important for a safe injection molding process, WITTMANN invited the workers and supervisors of the workshops to visit the new technical center at the Nuremberg subsidiary. There, the guests were even given a short robot training session, which made their day an exciting and moving experience.

They were all very happy about the donation from WITTMANN. Exclusively for the Regnitz workshops, small storage boxes were produced, which are now rendering good service in all departments of the workshops. In addition, there was a large number of Burger boxes for all staff members of Regnitz – manufactured in a mold supplied by elasto, a major customer and partner of WITTMANN.

A generational change at WITTMANN in Benelux

WITTMANN BATTENFELD Benelux N.V. based in Holsbeek, Belgium, will implement a generation change in its top management at the end of the year 2025. Michel van der Motten, Managing Director of the Austrian WITTMANN Group's sales and service subsidiary for 31 years, will go into retirement. His successor will be Mark Verveer.

„Michel van der Motten has firmly established the WITTMANN and WITTMANN BATTENFELD brands in the Benelux countries and is primarily responsible for the leading market positioning of our products in that area. For this, we owe him our most sincere gratitude", says Michael Wittmann, Owner and Managing Director of the WITTMANN Group. "With his outstanding expert knowledge, Mr. van der Motten was always a very valuable discussion partner and advisor for our customers – far beyond the products and technologies supplied by the WITTMANN Group. We extend to him our very best wishes for the new stage in his life."

To ensure a smooth transition for our customers in the Netherlands, Belgium and Luxembourg, Mark Verveer already joined the company on October 1 of this year. "We are glad to have recruited Mr. Verveer for this position of responsibility", Michael Wittmann emphasizes. "With his experience gathered over several decades, we have secured optimal continuity for our customers in Benelux." Mark Verveer studied mechanical engineering and has then been working in the injection molding industry and in plastics machinery manufacturing for more than 30 years. He is thoroughly familiar with both the markets in Benelux and the international network of the industry.

Along with the generation change, the sales team in Benelux has also been strengthened. Eric Claeyssens already started on 1 August 2025 as sales engineer. The graduate electrical engineer also contributes more than 20 years of experience to his new position – in technical customer support as well as in sales of plastics machinery.

Mark Verveer is the new Managing Director of WITTMANN BATTENFELD Benelux based in Belgium.

Equipment supply gives lift off to Danish training initiative

Peter Bay from Krebs & Co. (right) and Michael Juul-Andersen from Wiba Tech (left) are already planning the expansion of the new training academy at Krebs & Co.

The Jutland School of Crafts, Hillerød Municipality, the educational institution U/Nord, plastics processor Krebs & Co., and the WITTMANN Group have joined forces to establish a new training program for the injection molding industry on the Danish island of Zealand. The aim of this cooperation is to secure a supply of skilled young workers for plastics processing companies in Denmark. "We support people in acquiring the skills to use state-of-the-art plastics processing technologies. In this way, we are helping to secure the future of our industry," emphasizes Peter Bay, managing director and owner of Krebs & Co.

The course provides participants with basic knowledge of the injection molding process and practical skills in the use of modern machines and technologies. In addition, contacts with industry and educational institutions are promoted.

The training will take place at Krebs & Co. in Skævinge. WITTMANN has equipped the technical center there with an injection molding machine. Currently, a SmartPower 80/210 is available, equipped with extensive auxiliaries and technology packages. It is integrated into an energy monitoring system, as process optimization for a lower carbon footprint is an essential part of the training.

At the beginning of 2026, the new training academy at Krebs & Co. will be expanded to include a second production cell from WITTMANN and a stand-alone robot. The WX 138 with R9 controller will enable course participants to dive deeply into robot programming and control so that they can later fully exploit the possibilities in practice.

"We are delighted to be contributing to this initiative. Not only will it train the skilled workers of the future, it will also promote innovation in the plastics industry," emphasizes Jesper Skaarup, CEO of Wiba Tech, WITTMANN's representation in Denmark.

The course is part of a whole series of initiatives to promote cooperation between educational institutions and industry. "It is a great advantage when companies tackle this task together. Ensuring that we continue to have employees with the right qualifications is essential to keep pace with the demands of innovation, sustainability, and efficiency," says Thomas Drustrup, CEO of the Danish Plastics Association, Danish Plastindustri.

Linear-based automation helps deliver the goods

For Rauschert Steinbach, WITTMANN linear robots have almost completely replaced six-axis robots in the plastics processing shop. The new automation concept enables maximum flexibility. Here, the W828 model plays the essential part.

The plug components being passed around in the conference room during our visit to Paul Rauschert Steinbach GmbH, based in Steinbach am Wald in Southern Germany are quite complex. They consist of fiberglass-reinforced polyamide with contact pins pressed in. The parts are destined for use in automobile air suspension systems. In fact, there are two plug models involved, which are being produced inside a 1+1-cavity mold on a 100-ton injection molding machine. A total of 600,000 units leave the plant each year.

For a long time, these plugs were manufactured semi-automatically. "Between work steps, there was much idle time for the operating staff", reports Tobias Büchner, Rauschert's Production Manager. With the more stringent quality standards and pressure for more cost efficiency, this approach was no longer viable. "It became clear to us that we needed to introduce more automation", says Büchner.

Today, the plug housings are produced fully automatically. There is now less manual work, and the idle times have been completely eliminated. The production staff can now be employed much more efficiently. This successful move towards automation was part of a comprehensive standardization project, which Rauschert has implemented across its entire plastic parts sector to maximize flexibility and efficiency.

These plugs are used in automotive air suspension systems. Two different models are being produced.

Automation for a great variety of demands

As a family-run business with two facilities in Germany, as well as several international subsidiaries, Rauschert has been a leading developer and producer of ignition components, engineering ceramics and molded plastic parts for 125 years. "With our value chain across three interconnected production segments, including in-house tooling and plant manufacturing, we are unique worldwide", says Udo Jakob, Purchasing Manager at Rauschert, and emphasizes: "Plastic valve bodies with VOSS threading are one of our special strengths." Rauschert products are used in household, heating, electrical and high-temperature technologies, as well as in the automotive sector.

The injection molding equipment at the facility in Steinbach consists of 28 machines. Visitors immediately notice the equipment's

A total of 14 production cells are each equipped with a standardized automation cell.

clear-cut structure and uniform appearance. The 14 most recently acquired injection molding machines are all already equipped with a standardized automation cell. Its core in each case is a WITTMANN W828 linear robot. "We have designed and built the automation cells ourselves. Thanks to standardization we were able to install the automation very quickly. That is precisely the strength of this system", Jakob points out.

The automation cells all include the robot's working area, an automation station for insertion, assembly and inspection tasks, feeder units and the outfeed conveyor belt, which is laid out to accommodate boxes of different shapes and sizes, including even Euro pallets. "Everything is now possible from manual removal right up to complex, fully automatic insertion jobs", comments Alexander Förtsch, Maintenance Manager at Rauschert in Steinbach am Wald, with pleasure.

Robots as masters of the entire cell

The plugs for the air suspension systems in vehicles fully exploit the potential of the standardized automation cells. The manufacturing process starts with preparation of the pins and injection molding of the plug housings. The W828 linear robot then demolds the housings and passes them on to fully automatic downstream processing. Here, the pins are fused with the housings and then presented to a camera for 100 percent inspection.

"The crucial point of our new standard is total integration into the control system", emphasizes Büchner. "In each case, the WITTMANN linear robot is the master of the downstream work steps following injection molding." "The openness of the WITTMANN system is something special", underscores Manuel Rommel, CIP Manager for molded plastic parts at Rauschert. "We discussed this concept with various robot manufacturers. Only WITTMANN was able to offer this integrated solution without any additional control device."

With the new automation cells, the Rauschert team has managed to create a standardized automation system which covers a great variety of different requirements. This is necessary, for they have a total of more than 300 molds in active use, and their customer base is heterogeneous. "The numbers of units range from 500 up to 3 million", is how Büchner describes the challenge. "That requires great flexibility. We also find it important to have some backup options. In this way, we ensure continuous delivery capability. If one of our machines has an unplanned standstill, we can quickly transfer the mold and the automation system involved to another machine. Thanks to standardized automation, this is possible without any problems – similar to 'plug and play'."

Setup times minimized

In regular operation, too, short setup times make an important contribution to competitive overall efficiency. Four or five setups are carried out in every shift. "Since the startup of our standardized automation cells, we can also begin production of a new batch during the night shift, when there is only one machine setter on site. All the setter has to do is just load the program without hav-

Linear robots from WITTMANN play a vital part in the standardized automation cells at Rauschert.

ing to program anything himself", Förtsch emphasizes. "Previously, setups were only possible during the day, when the fixture construction team was present."

Six axis robots used to consume an inordinate amount of operator time before the standardization process. "Following setup, we were often still busy with teaching for a considerable time. With the linear robots, by contrast, many steps happen intuitively, and therefore much faster", reports Rommel.

The standardization project has significantly increased both flexibility and productivity of the injection molding production at the plant in Steinbach am Wald, and simultaneously improved the consistency of quality as well. An additional benefit is greater sustainability. "Through the optimization of setup times, we are now able to utilize our production cells more effectively, which has a positive effect on our energy balance", explains Tobias Büchner. The objective of a new project will be to calculate the CO_2 footprint for every plastics product. For this aspect, too, is becoming increasingly a decisive factor for competitiveness.

Some of the automation team discuss issues: (left to right) Alexander Förtsch, Manuel Rommel and Tobias Büchner from Rauschert and Wolfgang Prütting from WITTMANN BATTENFELD Deutschland. Unpictured: Frank Pöselt, Felix Neubauer, Jürgen Neubauer and Fabian Völk.

High-speed Sonic helps keep the supermarket shelves full

This is all about rectangular 200-ml containers. For the packaging manufacturer, in-mold-labeling (IML) to decorate these containers was a must right from the beginning of the project. But the particular request here was to combine the high efficiency of an automatic IML process with extensive flexibility and modularity. The key factor: integration of a high-speed robot of the Sonic series from WITTMANN.

Photo: Squirrel_photos/Pixabay

Continuously on the increase: the proportion of IML packages on cooling shelves.

The plastics processor had commissioned Matsim, based in Koszalin near the Polish Baltic Sea coast, to develop the production process. Matsim has specialized in developing customized processes. As Matsim had already cooperated in numerous previous projects with the Polish subsidiary of WITTMANN in Radziejowice, their specialists now also called in WITTMANN at an early stage for this new order, to help with developing a particularly flexible IML automation solution for producing the 200-ml containers.

After all, they were already familiar with the strengths of linear robots. These robots are reliable, flexible and cost-efficient. They are also easy to program and to operate. In view of the increasing skilled labor shortage, this particular aspect is becoming a strong incentive for more and more processors to choose linear robots.

Competitive with side-entry solutions

As the general manager responsible for this project, Matsim has coordinated the work of all participating companies and configured the technical parameters of the robot and the injection molding machine according to the processor's specifications. The Sonic robot from WITTMANN was integrated into the proprietary IML technology solution from Matsim.

The rectangular containers are produced inside a 4-cavity mold with cross-IML labels. The Sonic robot contributes substantially to the high overall efficiency of the production process. The entire production cycle amounts to no more than 6.2 seconds. This includes insertion of the IML labels, as well as removal of the finished parts and stacking of the containers on the output belt. With this efficiency, the linear robot-based automation system is competitive with side-entry solutions – and that with less complexity and significantly lower investment costs.

Flexibly convertible and extendable

The customer's wish for extremely high flexibility has also been fulfilled. To this, the modular concept from Matsim is contributing. Every system component has been designed to enable fast exchange. This makes it easy for the processor to manufacture different products using the same production cell. To achieve this, only a few individual modules need to be converted or exchanged in each case. This lowers both set-up times and set-up costs, which enables maximal utilization of the production cell.

With this new production system, the packaging manufacturer has also made its company fit for the future. For an extension of the system is also possible at any time and with only minor expense. In planning for the future are the addition of optical systems for quality inspection and integration of the entire equipment into an MES system.

Photo: Matsim

The Sonic high-speed robot contributes substantially to the high efficiency in the IML production of the rectangular 200-ml containers.

When speed is essential

Sonic is WITTMANN's answer to the demand for minimal cycle times in high-speed applications. Small moving masses ensure high acceleration and deceleration rates with cycle times around 4 seconds. This is why the Sonic linear robot is the first choice for applications requiring high dynamics with low loads.

The Sonic is equipped with the proven R9 robot control system from WITTMANN, which in integrated applications provides the communication platform for the entire range of auxiliary equipment. The TeachBox of the R9 control system scores with a touchscreen and extremely clear visualization including live 3D animations.

Sonic robots are frequently used in medical technology and in the packaging industry – with and without IML.

Support that sharpens the customer's competitive edge

Erwin Quarder, a precision molder based in Grand Rapids, Michigan, is investing in automation and expanding its U.S. facility to strengthen competitiveness in global automotive and medical markets.

The company, backed by patents in metal-plastic direct bonding and battery cooling technologies from its German parent, has acquired new production space that will increase its U.S. footprint from 82,500 to more than 130,000 square feet.

The investment aligns with a strategy of pairing smart injection molding machines with fully integrated automation to reduce human error, drive efficiency and enable knowledge-sharing across Erwin Quarder's worldwide operations.

Precision components for leading brands

Founded in Grand Rapids in 1998, Erwin Quarder initially focused on the traditional automotive sector. Today, it manufactures high-precision small and medium-sized parts with tight tolerances for customers including BMW and Stryker. Its portfolio includes connectors, electronic housings and covers, door-latch housings, pedals, fuel system components, surgical helmet visor frames with magnets and over-molded electrical terminals.

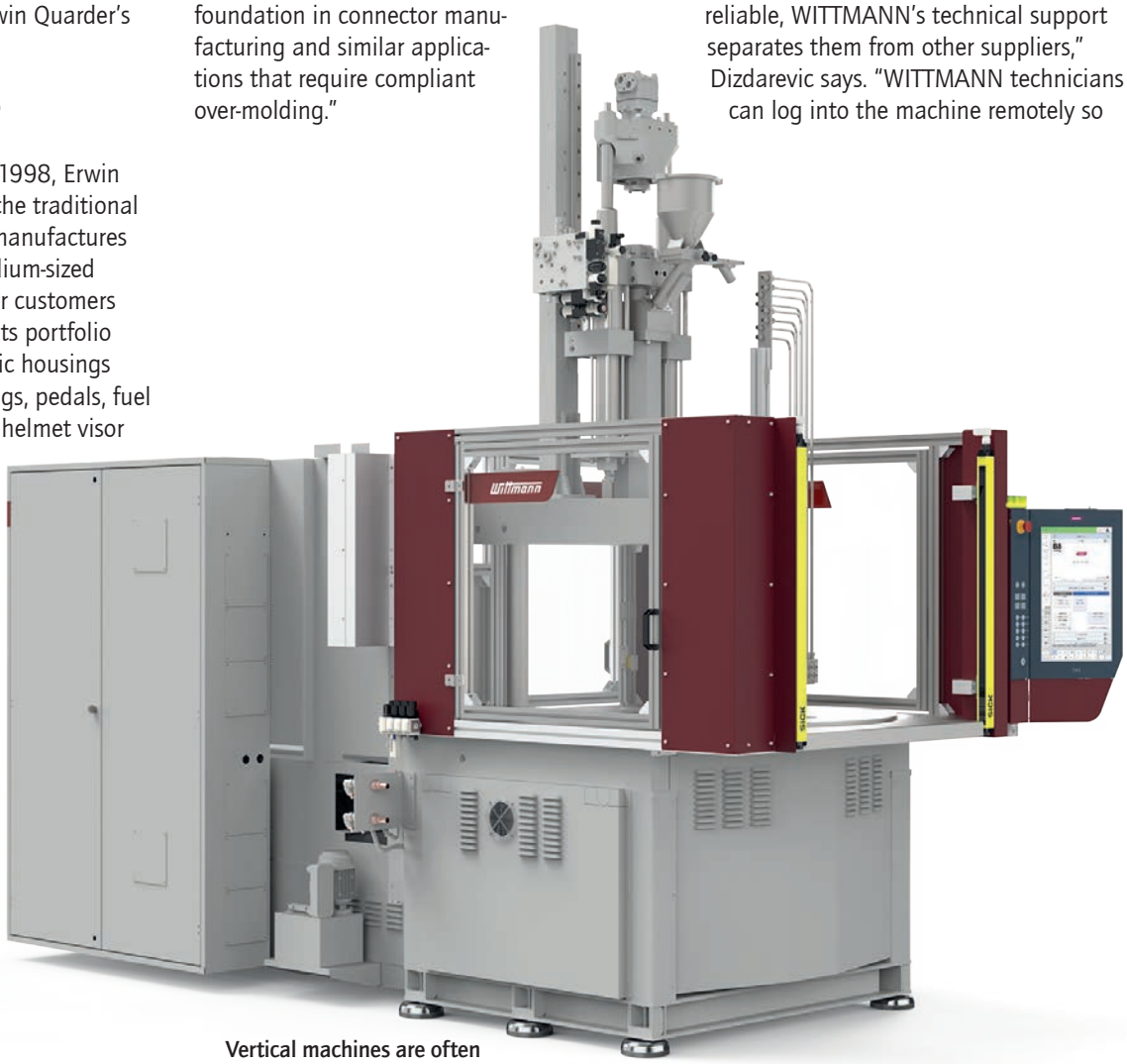
With global automotive supply chains shifting, the company is also preparing to support the growing electric vehicle market.

Growth through automation

The Grand Rapids plant operates 41 vertical and horizontal injection molding machines ranging from 6 to 650 tons. Forty of those lines are automated with at least one robot, and many use two or three. Eighty employees support the facility's production operations.

Automation has been a cornerstone of Erwin Quarder's growth since 2000, when the company first partnered with WITTMANN USA for temperature control units. Additional investments followed, including a robot in 2005 and an injection molding machine in 2014. Today, the site runs two WITTMANN vertical machines, two horizontal machines and more than a dozen WITTMANN robots.

"One of our core competencies is our integrated stamping operation for overmolding," says Adnan Dizdarevic, CEO of Erwin Quarder USA. "We have a strong technical foundation in connector manufacturing and similar applications that require compliant over-molding."



Vertical machines are often the first choice for overmolding insert parts. They enable particularly efficient automation, especially when punching and bending of the insert parts is integrated.

Reliability and support

The 2018 installation of a WITTMANN VM R 150/525 vertical injection molding machine integrated with temperature control units illustrates the company's automation strategy. With its 1.2-meter-diameter table and four-cavity tool, the system produces 2 million parts annually across 15 weekly shifts while maintaining 85 percent overall equipment effectiveness.

"While the machine is extraordinarily reliable, WITTMANN's technical support separates them from other suppliers," Dizdarevic says. "WITTMANN technicians can log into the machine remotely so they can walk us through the troubleshooting process and monitor the machines outputs, catching those little things we might not catch on our own — even on weekends."

Automation Manager Waldemar Boldt echoed the importance of support: "WITTMANN always leaves the impression they want to make our employees better. They give us access to parameters not obvious to end users, and they always try to help us take care of our own problems. Whether you call service or your salesperson, you will get connected to the right person within a short period of time. We don't need to get a service ticket or wait for someone to call us back. Every single person in the chain takes ownership of the problem."

Working together to implement Erwin Quarder's automation strategy in the US: Jake Powell (sales WITTMANN), Scott Wilks (Erwin Quarder process engineer), Brent Strawbridge (sales WITTMANN), Adnan Dizdarevic (Edwin Quarder CEO), Mike Meader (sales WITTMANN), Waldemar Bolt (Erwin Quarder automation department manager), and Colin Drewek (sales WITTMANN).

BMW fuel system component

Erwin Quarder's ability to integrate stamping, molding and automation is demonstrated in the production of a BMW fuel system component.

According to Boldt, the process begins with resin delivered via an automated feeder, drying system, and manifold. Two stamping strips on reels are pre-stamped and coated and passed through two trim and bend dies. The electrical terminals are then picked from the bend die with a robot, staged with the end-of-arm tool, and loaded into the injection molding machine along with melted resin.

"The previous shot is picked and rotated into place, and the two sets of terminals are overmolded," Boldt explains. "Molded parts are placed on a check fixture station for three tests: continuity, high voltage and pin position and height. Parts that pass inspection are marked good and placed on a conveyor for packaging."

Packaging remains the only manual step. One operator can manage four to five medium injection molding machines, with packing taking just two minutes every 20 minutes.

Notably, the WITTMANN machine's footprint is compact, occupying only about one-third of the process area. "It offers astonishing access to internal components," Dizdarevic says.

Building in-house expertise

WITTMANN robots are mounted with automation equipment designed and built by Erwin Quarder. The Grand Rapids team not only develops its own automation lines but also advises sister facilities in Mexico and the Czech Republic.

"WITTMANN equipment is so easily programmable, with such easy-to-understand interfaces, that our decision to stick with them is self-explanatory," Boldt says. "WITTMANN has kept the icons and main structure the same – so the WITTMANN robot I have from 2005 has almost the same interface as our newer robots. If I teach a technician on one of these robots, he will understand 80 to 85 percent of the others."

Competing globally

As supply chains shift, Erwin Quarder finds itself serving increasingly distant customers. "The majority of our customers are outside the U.S., which is a blessing and a risk," Dizdarevic says. "We came to the Midwest in the late 1990s to support Midwestern customers. I'm very passionate about growing business here. But the automotive industry decided differently, so our West Michigan location became very global. We're delivering parts to China and Europe, and a lot of the projects end up in Mexico. The physical distance to our customers has grown, and our ability to maintain high output and high quality without putting tons of parts and raw materials in our inventory to compensate for those risks is essential."

Automation helps manage those risks by reducing errors and scrap. "Investing in automation means having the peace of mind that we can achieve high efficiencies – that we will have a low amount of internal and especially external quality rejects because of how we have integrated our peripheral equipment with our machines," Dizdarevic says. "To be competitive, we have to be lean – and we have to offer our people less opportunity to make mistakes."

He noted that small errors can easily occur in a manual process. "If, for instance, a technician setting up a tool is momentarily pulled away to address another issue, the likelihood of a mistake like not turning off a temperature control unit multiplies. A production floor is a stressful environment, so having machines integrated and able to look for the proper signals that are in line with our process parameters is a huge confidence factor when we are quoting jobs. We can be very aggressive in promoting our efficiency and low scrap rates."

That confidence is reinforced by supplier collaboration. "WITTMANN puts in the time to help us understand what our actual challenges are and point out things we don't see," Boldt says. "They understand what the project is and that it can change. Even while our robot or machine is being built, WITTMANN has been very cooperative when it comes to short-term changes.

"The greatest chance we have to remain competitive is to get more efficient, more efficient, more efficient. That's the only parameter we have that isn't beyond our control."

Going vertical in composites helps to double capacity

With roughly 200 square meters of floor space, it is one of the largest and most complex production cells at this location. Millions of switchbox housing components are manufactured with this equipment every year. What makes the plant special is its high degree of automation.

The automation equipment with a sophisticated transfer system encloses the injection molding machine.

We are visiting Swoboda CZ in Jihlava, Czech Republic, 120 kilometers south-east of Prague. The plant, which is part of the global Swoboda Group, specializes in complex metal-plastic assemblies, as Václav Dostal, Managing Director of Swoboda CZ s.r.o., explains to us. For the local team, the switchbox housing components are not a new product, but the production process has changed entirely. "The cost pressure has risen enormously", says Dostal and explains: "That is why we decided to invest in a new, fully automatic production cell."

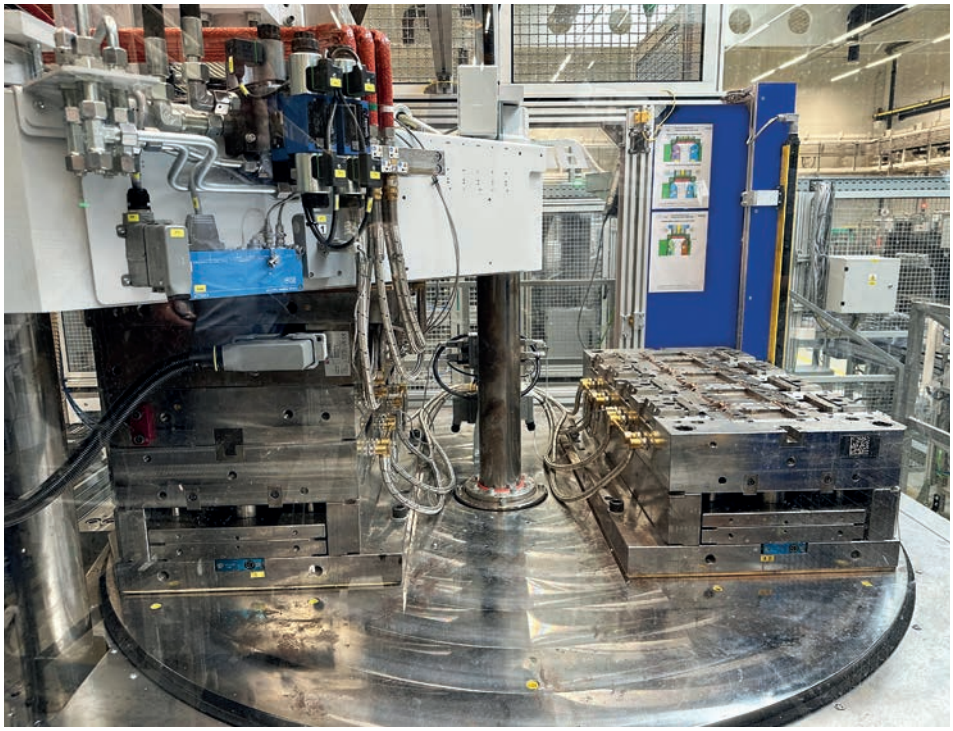
The development of this process can be clearly traced by us during our company tour. For the two previously installed production cells are still up and running. They work semi-automatically. "With the new process, we have doubled our capacity", says Dostal. With this product, Swoboda benefits from the global expansion of renewable energies. The Czech team is particularly proud of this project. Orders of this kind help them to reduce their dependency on the automobile industry.

Vertical machine from WITTMANN supports efficient automation

In the course of developing the new production process, the automation concept was completely redesigned. However, some tried and tested features were left unchanged, such as leaving a large WITTMANN vertical injection molding machine with 270 tons clamping force standing at the center of the production cell, equipped with a two-station rotary table, plus temperature controllers also supplied by WITTMANN.

"The vertical machine models from WITTMANN offer a particularly high degree of convenience for our production staff", says Production Manager Pavel Bohuněk, who then emphasizes that all the vertical machines on the shop floor have come exclusively from the WITTMANN Group. Some of these have already performed their reliable service for many years.

What does convenience mean for Swoboda? – Two things, Bohuněk explains. Firstly, it comes from the intuitive user interface of the WITTMANN machine control system,



The temperature control media connections come from above, so that the injection molding machine does not need a central rotary distributor. This ensures very comfortable access to the molds.

which enables even semi-skilled production staff with little experience to achieve a consistently high standard of parts quality, and to restart the process efficiently after a standstill. Secondly, the Production Manager points to a structural specialty of the vertical machines from WITTMANN, included in the delivery as standard for all models with a two-station rotary table. "This concerns the supply of the temperature control media", specifies Michal Slaba, Managing Director of WITTMANN BATTENFELD CZ: "The connections are placed above, so that a central rotary distributor can be dispensed with. This ensures exceptionally easy accessibility to the molds, which simplifies not only the automation, but also manual work, such as maintenance servicing."

Sophisticated transfer system coordinates production steps

The mold bottom halves are positioned on the rotary table to produce the switchbox housing components. The large six-axis robot removes the finished parts from the cavities and simultaneously refills them with new inserts. "The biggest challenge this part presents to us is the large number and diversity of the insert parts, which the automation system must handle safely", says Dostal.

Another robot assists the large six-axis robot. It is responsible for pre-positioning the insert parts in frames. The parts to be over-molded include several signal pins, power pins and sockets. Some inserts are presented to the robot in trays. Some of the pins are punched and bent in-line via reel-to-reel systems. The impressive feature though is the transfer system inside the production cell. Via a rail system, the frames are transported to the clamping unit, where the multi-axis robot takes over the complete insert sets and places the pins and sockets into the mold cavities. They are then over-molded with white, fiberglass-reinforced plastic material.

The freshly injection-molded components are transported away from the clamping unit by the transfer system. They are passed to camera inspection and DMC marking, deposited in trays and then leave the production cell. All empty frames and transport carriages are returned automatically to their starting points at the end of the cycle.

Setting benchmarks for other locations worldwide

The entire automation has been developed and built on site. Automation solutions from Jihlava are also in operation at other Swoboda locations around the world. The new production process for making switchbox housing components is exemplary. The complete automation of all process steps and the excellent repeatability of the WITTMANN injection molding machine have successfully increased the efficiency and made it possible to reduce the unit costs. Moreover, they ensure high process stability and consistency of quality standards.

In the Czech Republic, WITTMANN and Swoboda are living a genuine partnership. Effective assets here are the short distances and good facilities of the Czech WITTMANN subsidiary with its own spare parts depot, training center and technical center. "When it comes to optimizing processes by boosting their efficiency, we are an important sparring partner for many of our customers", Michal Slaba points out.

Working together for maximum efficiency: Pavel Bohuněk and Marek Hejl from Swoboda CZ together with Michal Slaba from WITTMANN BATTENFELD CZ (from left to right).

Seeking better granulation? Your guide - right here...

Many plastic processors attempting to reintegrate their scrap material find that having the wrong size granulator causes costly issues, including downtime.

Choosing the correct granulator begins with understanding cutting technologies, material type and hardness, desired regrind size and required throughput. Conventional blade granulators and screenless units are the two main cutting technologies.

A conventional granulator uses velocity and inertia to process scrap. It is the preferred choice for processing softer or flexible materials, as it effectively cuts and reduces them without excessive wear. It is also ideal for handling thin wall scrap such as bottles or even film. Conventional blade granulators produce regrind by utilizing slanted knives on the rotor. The slanted knives focus the cutting force on a smaller area ensuring efficient "scissor-action cutting." The regrind reaches its desired size by passing through a screen below the cutting chamber.

Alternatively, a screenless granulator uses low speed and high torque to process scrap. It is more robust and well-suited for processing hard materials or those containing fillers. In a screenless granulator, the process begins with the breaker knives that reduces scrap into smaller pieces. The scrap then passes between a set of rollers and cutters, where it is further broken down into uniform regrind. Ideally, the rollers in a screenless granulator offer a helical cutting design using the same principle as the conventional granulator. The helical design focuses the cutting force on a smaller area, making for more efficient cutting and lower energy consumption.

Inline recycling helps to save material, achieve sustainability goals, and reduce unit costs. WITTMANN offers both blade granulators—G-Max series—and screenless granulators—S-Max series—for the efficient processing of sprues and scrap parts.

Determine the desired regrind size

Each cutting technology can produce a range of regrind sizes. Screenless granulators offer a variety of roller and cutter sizes with square or trapezoidal geometries. Conventional blade granulators offer screens with a variety of hole apertures with straight, conical, or slanted geometries.

Choosing the correct configuration requires consideration of several factors. If processing scrap in a screenless granulator, the maximum thickness of the runner or part should closely match the roller and cutter size to ensure efficient processing. Similarly, if processing in a conventional granulator, the maximum thickness should closely match the hole aperture of the screen. This prevents overprocessing of the scrap and minimizes dust and fines.

Additionally, material composition is an important factor. When processing unfilled engineered materials, rollers with square teeth are the best choice; trapezoidal teeth are the preferred solution for excessively thick parts such as glass-filled or harder materials.

With a conventional granulator, screens with straight, radially drilled holes are often the standard option. They offer the advantage of being reversible, extending the longevity and lifespan of the screen, and are a great solution for average-sized runners made of somewhat flexible materials. But, if you are using very soft material, or have excessively long runners, there may be more optimal solutions for your process.

Conical screens are also reversible but are best for very soft material. Conical screens use holes in which the backside of the screen is counter-bored for faster evacuation. This allows for better quality regrind as the soft material is able to pass through the screen without being deformed or over processed.

Slanted screens use holes drilled at a shallow angle respective to the direction of the rotor knives. This configuration helps eliminate longs in regrind as the runners are sheared against the angled holes to prevent longs from passing through. This configuration is also best for thin elongated runners, or runners that contain variable thicknesses.

What is good regrind?

What makes good regrind, and why is it important?—Ideal regrind should be as close to pelletized material as possible. The regrind must be uniform and homogeneous, with minimal dust, fines and longs.

Quality can be determined through a sieve testing process, which uses a series of trays with meshes of increasingly smaller sizes. A sample of regrind is shaken, allowing the granulate to separate based on particle size. The material collected in each tray is then analyzed qualitatively. Finally, the percentage of ideal, usable, and poor-quality regrind is calculated, providing a clear representation of overall quality.

Inconsistent regrind hurts parts and equipment

Inconsistent regrind can cause many problems within a process, including fluctuations in part quality, equipment wear and less efficiency overall. Ideal regrind needs to be as close as possible to virgin material to mitigate variances in its performance.

Regrind that is consistent with virgin material allows for even melting and mixing within the barrel. Inconsistent particle sizes can lead to uneven melting and cooling rates. This increases the likelihood of internal stresses, which can cause part failure.

Inconsistent granulate size can also cause problems with pneumatic dilute phase conveying. If you're conveying a blend, consider that regrind has a lower bulk density than virgin material. You will see less separating during conveying with regrind that is homogeneous and uniform. Granulate that is too large can accumulate at the bottom of a pipe and cause a choked line, whereas granulate that is too fine can cause buildup around the edges. The result is the same: Inconsistent regrind restricts the flow of free- moving particles, causing blockages that disrupt production.

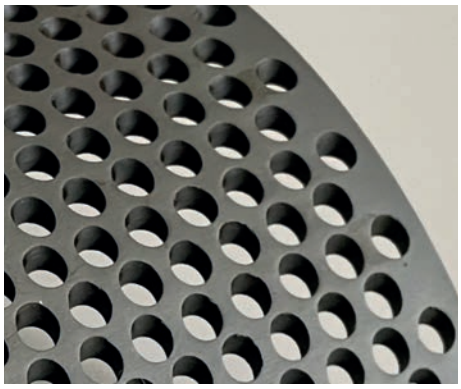
Granulate that is too large can also cause bridging at various intermediary points in the process, with material obstructing the hopper and disrupting production. Bridging can occur in any hopper, leading to costly downtime—but it is especially dangerous at the feed throat. When a blockage forms there, pressure can build up, potentially forcing plastic or even the hopper itself away from the throat, creating a hazardous situation.

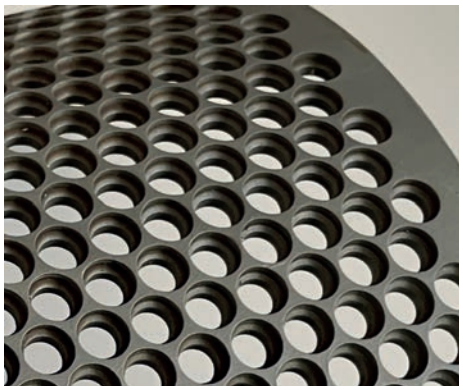
Best practices for handling regrind

To ensure consistent quality, consider the method of reintroducing regrind. Ideally the granulator requires as little operator intervention as possible.

1. Feeding the granulator

The best method for handling regrind starts with feeding the granulator, and the best method for this is metered feeding to ensure a steady material flow. Metered feeding can be accomplished with a robot, conveyor or by hand. One of the most effective ways to feed your granulator is with a conveyor, as there are additional ways to enhance its performance. Ideally, a system will monitor the granulator's motor amperage and automatically stops the conveyor if the load becomes too high, preventing jams and excessive wear. Once the motor amperage returns to a normal level, the conveyor can restart automatically.





Regrind reaches its desired size by passing through a screen below the cutting chamber. Conical screens are best for very soft material and use holes in which the backside of the screen is counter-bored for faster evacuation (left). Slanted screens use holes drilled at a shallow angle respective to the direction of the rotor knives to help eliminate longs in regrind (right).

2. Evacuating the collection bin

The recommended granulator evacuation method again involves no operator intervention. A lot of processors manually remove the collection bin once full and transport the regrind to a storage hopper. Ideally, the granulator can sense if the collection bin is full and empty itself. Loader integration with a bin high-level system ensures continuous operation without process interruptions. As the collection bin fills with regrind, it triggers a sensor, signaling the need for material transfer. The loader then pulls the regrind from the bin, preventing overflow and reducing manual handling.

3. Blending with virgin material

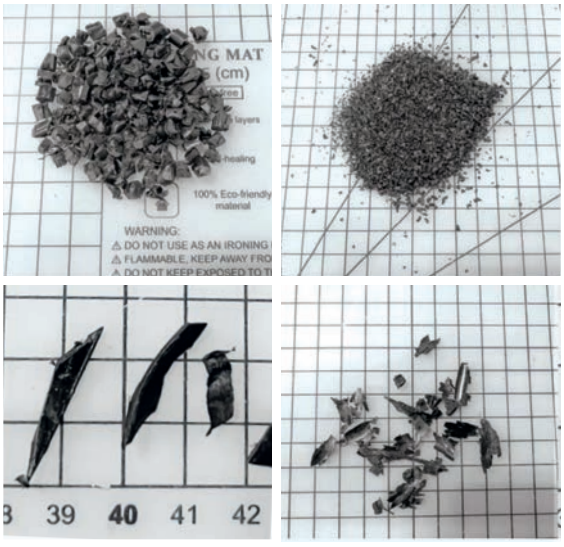
Once the granulator has been evacuated, the regrind should be directed into a blender to ensure that regrind is properly mixed with other materials for processing.

Most processors combine regrind with virgin material, additives, and colorants to maintain material properties and final product quality. Gravimetric blending is the preferred method, as it offers precise mixing of components by accurately measuring each material's weight.

Advanced dispensing algorithms further enhance accuracy, ensuring batch-to-batch consistency and optimal material performance in production. Using a gravimetric blender for regrind ensures precise material management, even when regrind availability fluctuates.

Ideally, the blender should automatically adjust for variations in regrind supply when metered feeding isn't possible. Each hopper should be assigned a specific component type, allowing the system to intelligently balance materials.

If there isn't enough regrind available, the blender should compensate by increasing the proportion of virgin material and colorant to maintain consistent blend quality. The blender should then wait for a set number of batches before attempting to dispense regrind again, giving the hopper time to refill and ensuring a steady and reliable process.



Ideal regrind should be as close to pelletized material as possible (top left). The regrind must be uniform and homogeneous, with minimal dust (top right), flakes and longs (bottom).

New materials frontier - Natural fiber meets plastic

Insights into one of the most exciting innovations at K 2025

Natural fibers are conquering lightweight construction, because they are sustainable and make it possible to create natural-looking surfaces, which are a current trend among consumers. The success formula consists of an efficient combination of natural fibers with polypropylene (NFPP) and the interdisciplinary cooperation of four partner companies: FRIMO Innovative Technologies, LEONHARD KURZ, the Polyvlies Group and WITTMANN presented at the K 2025 a highly integrated, fully automatic process in order to exploit the great potential for producing sophisticated visible components profitably. In "Wir sind Spritzguss.", Rainer Janotta, Johannes Romming and Björn Dünfelder gave an insight into the joint development project shortly before the start of the fair.

Guests of Susanne Zinckgraf in the Vienna podcast studio: Björn Dünfelder, Divisional Manager of Automation Technology & Project Engineering from WITTMANN BATTENFELD Deutschland, Rainer Janotta, CTO of FRIMO Innovative Technologies, and Johannes Romming, Project Manager Sustainability & Innovation of LEONHARD KURZ (from left to right).

Susanne Zinckgraf: What is the motivation for using natural fibers in light-weight construction?
Rainer Janotta: Natural fibers have already been in use for some time. The main reason is that they are sustainable and simultaneously inexpensive. We already presented an application at K 2022 three years ago – also jointly with WITTMANN. But then the components still had to be coated following overmolding. Today, we have come a step further. Thanks to the technology from LEONHARD KURZ, we are now able to get an attractive visible surface in just one step.
Johannes Romming: The issue of sustainability is transforming the entire industry. Here we have gathered a lot of input from customers and then set out on the journey together with our partners. In addition to FRIMO Innovative Technologies and WITTMANN, the Polyvlies Group is also taking part. It was clear to us that, if we want to create a new concept, we need to think holistically right from the start. Now, at the K 2025 we are presenting for the first time a turnkey industrial solution. When it comes to natural fibers, it is important to give users security. This means competent partners and a reliable network, where customers can get everything from a single source.

What are the details of this process?
Janotta: The process starts with NFPP mats produced by Polyvlies. These mats are covered with the decorative foil, immediately afterwards brought into their final shape inside the mold and then functionalized with PP. Screwed or welded domes, or a ribbed structure, are produced by overmolding.

Sustainable solutions have only got a chance if they pay off. What is the key to high profitability here? Is it process integration?
Janotta: Exactly. This is an important point. But another decisive factor here is that the entire process can also be run on a conventional injection molding machine and fully automatically as well. Previously, several steps were necessary, and additives such as adhesives were also required. The new process saves several complete process steps and reduces the material input as well.

Here, a vertical injection molding machine from the VPower series is used. Why this particular machine model?
Björn Dünfelder: With the VPower, we are able to insert the natural fiber mats along the gravity line. Thanks to the rotary platen, the insertion can be performed parallel to the injection molding process, which shortens the cycle time. What is more, the VPower works extremely accurately and allows particularly efficient automation concepts. Here, we have no central tie-bar. This means: free access to the mold and therefore also a narrow footprint.

Which has an effect on the machine's space requirements.
Dünfelder: Precisely. The robot is positioned on gantry supports and can be placed very close to the machine, since no interfering

contours need to be bypassed. After all, no processor has any room to spare.

The production cell at the K fair makes a sample part which, for example, could be a cover. For whom is this technology interesting?
Romming: Natural fiber materials are primarily used in the automobile industry, for mobility in the broader sense. The Caravan Sector, for example, is an important market. But other branches of industry are also becoming increasingly aware of alternative raw materials and resources. For example, consumer electronics, household appliances, or the furniture industry.

In all of these industries, there is a demand for attractive surfaces.
Romming: Many people have got tired of high-gloss piano black. We are noticing an increasing desire for using natural materials and making these visible. Natural fibers are being staged, for the fiber is what determines the appearance, and sometimes also the feel. We have made it our business to offer great aesthetic diversity in our foil systems. For example, color gradients, patterns and structures. Or a combination of color with transparent areas, where the basic structure of the fibers becomes visible.

In this way, every part is unique, isn't it?
Romming: At first glance, all of these parts look alike, but in fact, each part is different, even unique. And this in a highly efficient mass production. This is exactly the exciting point.

But what about sustainability beyond the aspect of light-weight construction? Due to the fiber content, we have no mono material.
Romming: That is correct. We actually have a composite material. But the important point is that we remain uniform in the thermoplastic component. Both the matrix material and the material of the foil are PP. And polypropylene is generally in line with the trend.

Because it is inexpensive and being recycled in large quantities. Are recyclates and possibly even PCR already being used here?
Romming: In theory, we can use up to 100% PCR here. But of course, the decisive point is always the availability of PCR materials of a suitable quality.

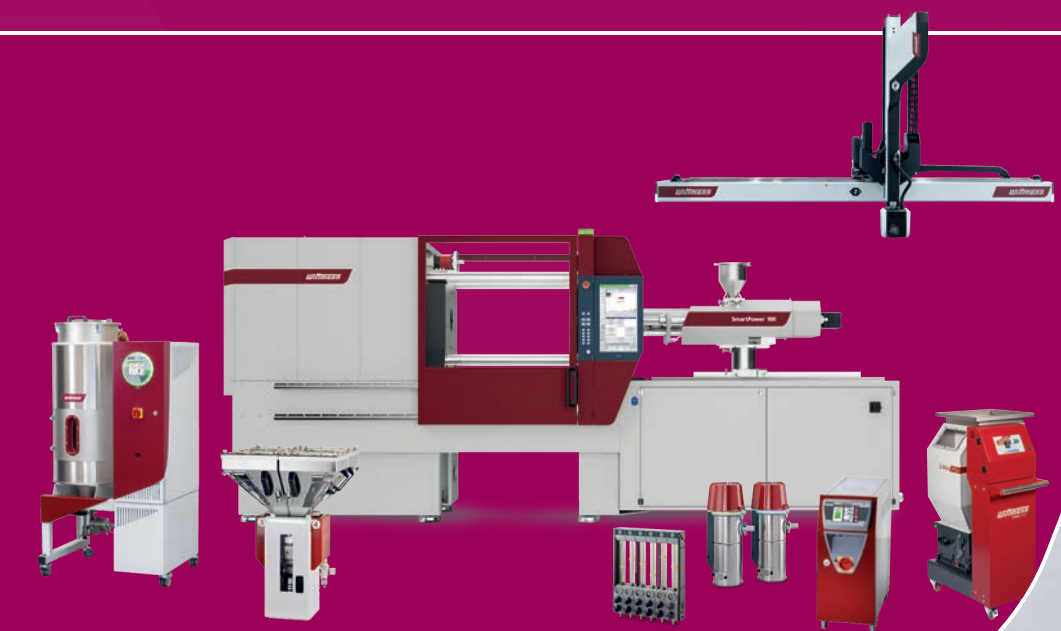
Well, the catch with composite parts is often that they cannot be so easily recycled.
Romming: Precisely this is one of the challenges we have had to master during the last three years. We could of course recycle this material mechanically in the traditional way, which means by shredding it and then re-compounding it with PP. But the result would be a short-fiber reinforced plastic material with different attributes. In fact, Polyvlies has found a way to return the recycled material to a new mat with the same attributes, using a special needling technique to blend it in at a specific ratio. So, we are really presenting a closed loop at this year's K.

Produced at the WITTMANN Group's stand at K 2025: sample parts that demonstrate the great potential of natural fiber-based lightweight construction.

The motto of the K 2025 is "green, smart, responsible". What is your personal interpretation of these keywords?
Romming: As a materials scientist, I am always interested in developing reliable scenarios where the materials are really sustainable, the equipment is efficient and the entire process is profitable. Sustainability is of no use if it cannot be implemented economically. So, I am glad that the solution we are showing at the K is fully in line with the motto of the K 2025.
Janotta: I agree. At the end of the day, the entire system must be affordable for the customer. It must pay off – especially since the requirements keep changing. In our technical labs we are constantly working on solutions to ensure high profitability in meeting the requirements of the present and of the future.
Dünfelder: For me, "green, smart, responsible" also means using the many advantages that plastics have to offer in a future-oriented way. Precisely wherever it makes sense – with high material efficiency. All in all, it must be both efficient and economical.

How will development continue after K?
Romming: What we are presenting at the fair is a blueprint. We are showing what is possible. We will continue to promote this development intensively. We already have some ideas, too, but above all, we are eagerly looking forward to the feedback from the market, to the ideas and requirements from potential users. From these, we will continue to learn.
Dünfelder: I think that we may also open up some totally new fields of application. For us, working with automation technology, this is particularly interesting. After all, our solutions are always adapted individually to the end product. We often integrate downstream process steps, such as quality inspection. Our task is to think ahead, to anticipate the requirements of tomorrow, in order to be prepared.
Janotta: During the development phase, we spoke to many OEMs. I am now curious to see how far the suppliers who will produce such parts can agree to this solution, what we still need to change and what new ideas will come our way. All of this I now find very exciting.

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



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