The magazine for the injection molding world

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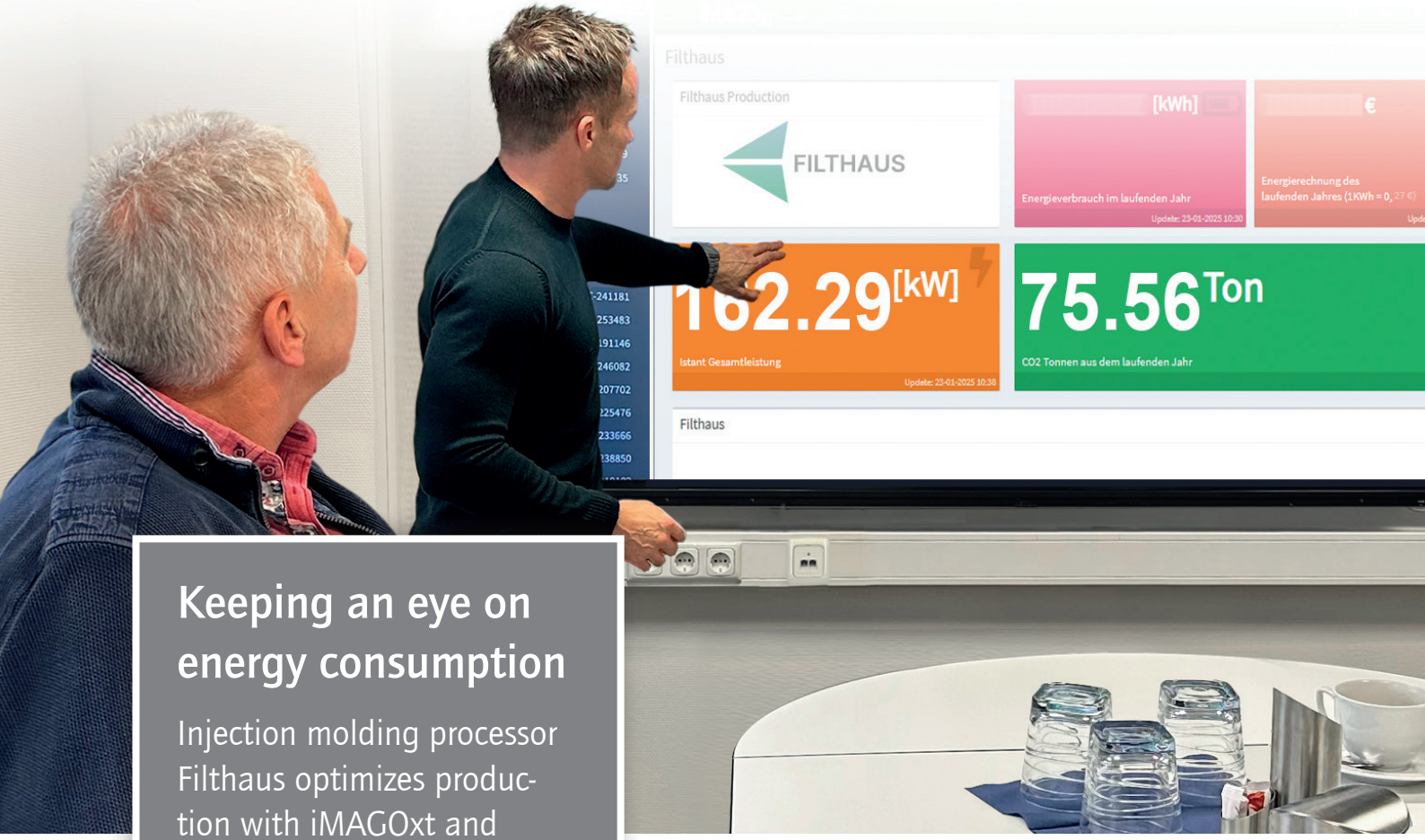

Keeping an eye on energy consumption

Injection molding processor Filthaus optimizes production with iMAGOxt and strengthens its competitive advantage.

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WITTMANN innovations – The magazine for the injection molding world
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Editorial

Dear Readers,

When reading this issue of innovations, you will notice how intensively worldwide injection molding projects already today are being influenced by aspects of sustainability. And here, the main target is not to stick green labels onto products, but rather to benefit from measurable economic and technological advantages.

The company Hesco Kunststoffverarbeitung in Germany, for example, uses the Cellmould foam injection molding process to achieve a higher level of mechanical rigidity, with the positive side effect of better material and energy efficiency (p. 18). Mayhew Basque Plastics in the US uses inline recycling to optimize its material consumption (p. 15), and at Yixin Precision in Singapore an all-electric MicroPower injection molding machine is helping to reduce their CO_2 footprint (p. 14). Plasnova in Brazil is breaking completely new ground. The irrigation systems manufacturer is one of the first plastics processors to use power derived from photovoltaics without transformation loss on the production floor, thus securing an uninterruptable power supply for the company. The key to this venture: a corporate local direct current network and a DC-compatible injection molding machine from WITTMANN (p. 16).

An important factor in all sustainability projects is transparency. For without knowing where how much energy is being consumed by the machinery, any optimization project remains mere guesswork, and potentials which are actually easy to exploit often remain untapped. This is impressively demonstrated by the example of our customer Filthaus. There, the iMAGOxt energy monitoring system is helping to keep consumption under control and to reduce energy costs (p. 7).

All of these examples show how targeted actions often pay off already within a short time. This is exactly what we

currently need in our globally active industry in view of the unpredictability of customs duties and trade restrictions.

Announcements and decisions by the new US Administration, which keep changing almost daily, make people feel insecure. In my last editorial, I wrote that the plastics industry is undergoing a transformation phase. Today, we need to realize that the entire world is going through an unforeseen transformation process. Perhaps the volatility of the decisions only serves to strengthen the negotiating position. But perhaps not, and we need to adjust, whether we like it or not.

In these challenging times, I wish you all good decision-making, so that you may be able to fully exploit the existing potentials.

See you soon,
Yours, Michael Wittmann

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Ansbach University invests in new micro capacity

Ansbach University has extended its technical lab by adding a MicroPower. The new injection molding machine is available for teaching, research and the further extension of its partner network.

We offer very well equipped labs to plastics processing companies and provide 'neutral ground' for sampling and development projects ", emphasizes Professor Dr.-Ing. Thomas Müller-Lenhardt, Head of the part-time degree program Applied Polymer Technology at the University of Ansbach. WITTMANN, too, will use this facility jointly with customers, since after all, the knowledge transfer with university researchers yields considerable benefits. "The cooperation is a win-win situation. Micro injection molding is developing dynamically. Important steps have been taken in recent years, for example in the direction of nanostructures. By a joint effort, we will be able to put new findings into practice more quickly", says Andreas Schramm, Managing Director of WITTMANN BATTENFELD Deutschland.

The technical faculties are delighted with the new MicroPower: Prof. Dr.-Ing. Thomas Müller-Lenhardt, Markus Bittrich, Georg Fischer and Prof. Dr.-Ing. Alexandru Sover (from left to right).

Photo: Ansbach University

Practice-oriented education and training

In research, the high-precision injection molding machine is being used to develop new materials and products for applications in areas such as medical technology, mechanical engineering and electronics. Under the direction of Professor Dr.-Ing. Alexandru Sover, research for doctorate theses is carried out, cooperations are supervised and projects in the area of micropart development and production are implemented. In this way, the Ansbach University's expertise in the field of application-oriented micro part manufacturing is continuously broadened and consolidated.

For the students, the new machine extends the portfolio of internships and student projects. "It is important to understand things not only with your head, but also with your hands. And that is only possible directly on the machine", says Müller-Lenhardt. Students of several different degree programs will work with the new MicroPower. "I am very pleased with the machine concept of the MicroPower from WITTMANN", says Müller-Lenhardt. "Thanks to the Euromap 77 interface included in the delivery, we will also be able to use the machine for digitalization projects. By using the MicroPower, we can demonstrate very clearly how injection molding processes can be intelligently monitored and controlled."

Students praise the equipment

Ansbach University ranks among the top ten German universities according to the current rating of the StudyCheck evaluation portal, and in Bavaria it takes even second place. Special points of particularly positive feedback from students are the university's courses and lectures, as well as its range of equipment, to which now an additional attraction has been added in the form of the new WITTMANN machine.

BZL: Sustainable injection molding technology

At the Lenzing Education Center (Bildungszentrum Lenzing, BZL) in Lenzing, Austria, course participants are trained on a new EcoPower 55/130 injection molding machine with Unilog B8X control system. The all-electric machine is characterized by a high degree of energy efficiency, precision and dynamics. Thomas Gutwein, Managing Director of the BZL, emphasizes how important it is to train on state-of-the-art machines and systems.

The BZL is one of the largest training and further education centers in Austria. It offers a range of courses in various fields and also develops customized courses for companies. On a training area of 4,000 m², 450 training courses take place every year. Among other things, foremen for plastics technology are trained.

Rainer Weingraber, CEO WITTMANN BATTENFELD, Sonja Zak, Managing Director BZL, Jochen Sassmann, Regional Sales Manager WITTMANN BATTENFELD, Thomas Gutwein, Managing Director BZL, Benjamin Haberl, Head of Technical Training BZL, Alexander Streicher, Team Coordinator Plastics, and Marcel Weinberger, Plastics Trainer (from left to right).

Skilled workers for the future

Max Rusch is a newly qualified service technician at WITTMANN in the Thuringia region of Germany. This is exactly where his training as a mechatronics technician took place – at the electronics company WAGO, with which the WITTMANN Group cooperates in technical vocational training. A win-win situation for everyone involved.

The continuously increasing skilled labor shortage calls for new, creative ideas. Here, the story of Max Rusch is a prime example. The prospective mechatronics engineer has his roots in his home region Thuringia in Germany. The WITTMANN Group with its German subsidiaries in Nuremberg and Meinerzhagen has offered him a training program close to home with the prospect of permanent employment as a service engineer in the Thuringian area following successful completion of his training in spring 2025.

This has become possible by way of a training cooperation deal between the WITTMANN Group and its customer WAGO. Max Rusch receives most of his training together with the WAGO apprentices at the training center of WAGO's production plant in Sondershausen, Thuringia. In between, he regularly spends some time with product training on the premises of his employer WITTMANN.

Cooperation to be expanded

As a service technician, Rusch now looks after customers including WAGO, where he is already very familiar with the machinery and the production managers from his training. "More practicality in training is not possible", states Michael Hinz, Site Manager of the Meinerzhagen facility and Head of Vocational Training of WITTMANN BATTENFELD Germany. "The apprenticeship cooperation is a win-win situation for all participants. We secure well-trained skilled staff for our company in areas where we cannot provide any local training facilities ourselves. At the same time, our cooperation partner benefits from the new service engineer working productively from the very first day."

The two partners WITTMANN and WAGO are now starting into their second round and extending their cooperation. For the beginning of the new training year, two new apprentices will be recruited. This time, the training will take place at the head-quarters of WAGO in Minden, Germany, in order to develop service engineers for the region of East Westphalia.

Max Rusch was the first graduate of the training cooperation between WITTMANN and WAGO. In spring, he started his career as a service technician at WITTMANN in Thuringia.

Corporate apprentice workshops at three locations

With this cooperation, WITTMANN targets the strengthening of its service organization in Germany. "Qualified service engineers are hard to find", says Hinz. And that in spite of this being a very diversified job with excellent remuneration plus attractive fringe benefits, such as a company car which can also be used privately.

Traditionally, technical training has a high priority within the WITTMANN Group. At the facilities in Nuremberg, Meinerzhagen (Germany) and Kottingbrunn (Austria), WITTMANN runs its own apprentice workshops to meet its demand for skilled personnel in the fields of mechatronics, electrical engineering, mechanical engineering, machining technology, IT technology and plastics technology.

At Career Friday at Fakuma 2024, Max Rusch joined Michael Wittmann to inspire schoolchildren about technical professions.

Quality under control

In the temperature control process, electronic monitoring and control ensure consistency and safety. With Expert MouldTemp, WITTMANN is now going one step further. In combination with the injection molding machine and temperature control units, a new assistance system is created that precisely adapts the temperature control to the respective application.

The stand-alone installation clearly illustrates the functionality. With Expert MouldTemp (right mold half), the heat distribution is very homogeneous. The faster heat-up can also be seen.

The basis for automatic optimization of the tempering process is the intelligent Flowcon plus flow controller. By way of wear-free flow measurement, it provides continuous flow monitoring of all cooling channels. The system recognizes disturbances such as blocked cooling channels or flow rate fluctuations and is able to compensate these automatically and accurately down to decimal figures during ongoing production, with the help of step motors and proportional valves. The individual cooling circuits are monitored and readjusted accordingly. The temperature is thus distributed evenly inside the mold. Users benefit from this in more ways than one. Firstly, the start-up time of the injection molding process is reduced, resulting in a significant increase in the injection molding machine's productive time, especially with the use of very large molds or with frequent set-up. Secondly, the energy consumption is already lowered during the heat-up phase by more than 70 per cent. Thirdly, the extremely stable tempering process yields a maximum output of good parts.

With manual control, this optimization potential could never be exploited as effectively, since fluctuations in the process conditions seldom show their visible effects immediately. Without intelligent regulation systems, quite a number of rejects are normally produced before machine operators can pinpoint the problem and re-adjust the process parameters.

Easy to operate even without specialized staff

For its market launch, Expert MouldTemp will be offered in attractive packages together with MacroPower injection molding machines. Packages for three clamping force sizes are available – 500, 850 and 1100 tons. Moreover, Expert MouldTemp is also available as a stand-alone unit. This model can be combined flexibly with different types of existing injection molding machines.

To exploit the full optimization potential, WITTMANN temperature controllers from the Tempro plus D series are integrated into the production cell. On the basis of the measurement readings calculated by Flowcon plus, the pump output of the temperature controllers can be adjusted precisely to the requirements of the application via frequency control. As a result, the energy consumption is significantly reduced, and the pump's service life is lengthened as well.

Central operation of the tempering process via the MacroPower injection molding machine's Unilog B8 system makes the use of Expert MouldTemp particularly easy. The intuitive user interface ensures that consistently high product quality can be achieved even without specialized staff.

Thanks to Wittmann 4.0 integration, the temperature control data can be saved and evaluated together with the machine parameters for seamless traceability and further process optimization.

CO_2 footprint permanently reduced

Expert MouldTemp makes a substantial contribution to permanent reduction of the CO_2 footprint. Scrap production is prevented pro-actively. This, in turn, lowers raw material and energy consumption. In addition, the demand-based regulation of the temperature controllers contributes significantly to increasing the temperature controllers' energy efficiency. All of these factors taken together will bring about a noticeable reduction in unit costs.

By automatically calculating and setting the optimal regulation parameters on setpoint value basis, the system reduces the error risk and simultaneously accelerates start-up. This increases the availability of the injection molding machine.

Thorough practical testing of potential

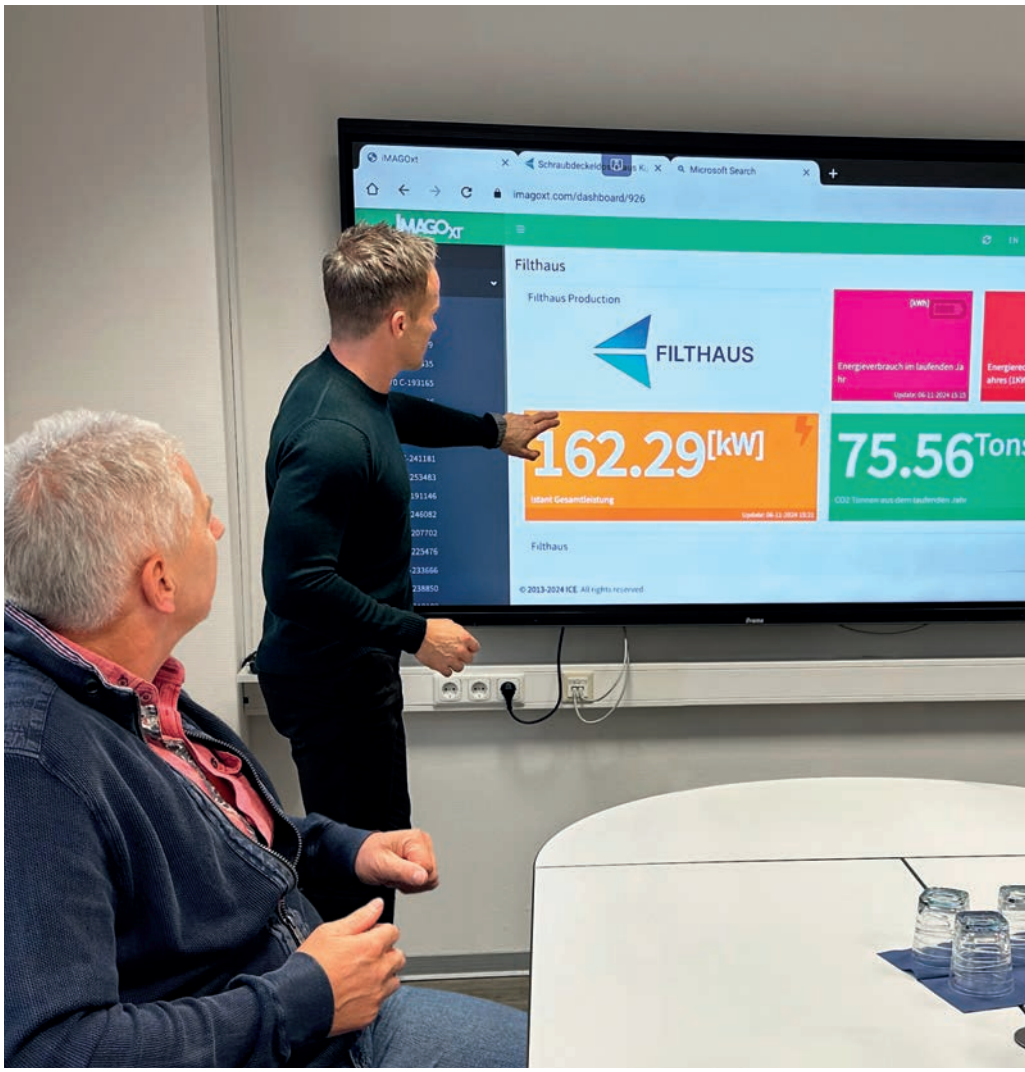
At both German WITTMANN locations – in Nuremberg and Meinerzhagen – technical center facilities are kept available for demonstrations and testing by customers. At the Meinerzhagen facility, detailed testing of the assistance system can be carried out live on a MacroPower injection molding machine. Appointments can be arranged via the WITTMANN sales team.

Opening of Nuremberg Technical Center on July 3

The best opportunity to experience Expert MouldTemp live and in action will be provided by the opening of WITTMANN's new technical center in Nuremberg, Germany, on July 3. "With the realignment of our technical center, we are expanding the possibilities for cooperation with our customers," emphasizes Andreas Schramm, Managing Director of WITTMANN BATTENFELD Germany. "There will be more machine and plant exhibits in the future and more capacity for injection molding trials with our customers." On the opening day, visitors can look forward to live exhibits and specialist presentations. Reducing the CO_2 footprint will be one of the main topics.

How smart energy monitoring enhances competitiveness

Energy efficiency involves more than sustainability. It has a noticeable effect on competitiveness especially in the packaging industry, where unit costs must be calculated with an extremely sharp pencil. At Filthaus, the iMAGOxt energy monitoring system from WITTMANN helps company staff to keep an eye on all power consumption points, resulting in continuous production process optimization.



Stefan Filthaus was impressed by the clarity right from the start. The dashboard makes the key sustainability figures transparent at a glance.

A 300 watt power consumption on standby – this is definitely too high for this production cell. But where does the current go? – Immediately after our arrival at Filthaus GmbH in the German town of Meinerzhagen, we are right in the middle of discussing this issue. Stefan Filthaus, Managing Partner of the company has just come from a meeting with the digital experts of the WITTMANN Group, who had just noticed by accident that this particular injection molding cell was consuming a lot of energy although currently not in action.

Only a few weeks before, Filthaus had started up the iMAGOxt energy management system from WITTMANN on its injection molding floor containing 26 machines, and the benefit has already proved enormous. "Without iMAGOxt, we would never have noticed the high no-load consumption of this work cell", says Stefan Filthaus. "Now we can address this issue, eliminate the hidden electricity consumption and thus save several thousand Euros per year." What is the practical benefit of iMAGOxt? We had arranged our meeting with Stefan Filthaus to find answers to this very question.

For ten years now, the plastics processor on Werner-Battenfeld-Strasse in Meinerzhagen has been a direct neighbor of WITTMANN BATTENFELD Deutschland, the German subsidiary of the Austrian WITTMANN Group. "And it's quite natural for us to look at what our neighbors are doing, and see what synergies can be found close by", reports Stefan Filthaus. "iMAGOxt caught our attention. Such a tool was previously unknown to us on the entire market."

iMAGOxt is a cloud-based energy management software which supports injection molding processors in analyzing, visualizing and optimizing energy consumption. To enable dynamic, real-time visualization of amounts and variations of energy consumption at all consumption points, iMAGOxt collects measurement data at certain consumption points, analyzes trends, calculates user-defined KPIs and visualizes all results in the form of very clear, self-explanatory graphs. "Energy transparency is not just an internal efficiency indicator, but a marketable asset that strengthens the company's positioning and credibility and thus enhances long-term business resilience," emphasizes Federico Colombo, sales expert at WITTMANN DIGITAL, the software house within the WITTMANN Group. "iMAGOxt is a perfect decision-making guide for actions to reduce energy consumption and the CO_2 footprint." Filthaus' customer base includes several major corporations requiring from all their suppliers evidence of the CO_2 footprints of the products delivered. >>

Clarity and easy operation meet with positive response

The Filthaus product portfolio consists of two major business segments of roughly equal size: packaging and technical parts.

In the packaging sector, products such as screw-top and slip-lid jars are being made, together with matching lids, as well as double-walled jars and measuring scoops for food products, cosmetics and chemicals among others. The materials processed are polypropylene in large quantities and various types of bio-based plastics, as well as recycled materials coming partly from in-house recycling of sprue and scrap parts.

The technical parts division caters to users in various sectors of industry, including medical technology and health care, as well as the building and furniture industries.

„Without iMAGOxt, we would not have noticed the high idle power of this system. Now we can investigate the issue, turn off the hidden power consumption and save several thousand euros a year."

Stefan Filthaus,
Managing Partner, Filthaus

Here over one hundred different types of plastic are being processed by single- and two-component injection molding and mono-sandwich processes.

What both these business segments have in common is that a high proportion of the total unit costs is incurred by energy consumption. "On average about 20 per cent", explains Stefan Filthaus. "In order to remain competitive, we must compensate the rising energy prices by reducing our energy consumption." What is more, the practice of mixed costing may quickly lead to a loss of orders from the particularly price-sensitive packaging market. "With iMAGOxt, we are now able to carry out more precise financial evaluations of each production process", says Filthaus.

Transparency for all consumption on the production floor – this is exactly the point, and in addition to the requirements of customers, this was the second motive for Filthaus to investigate the opportunities iMAGOxt had to offer. "I had this demonstrated to me at WITTMANN's technical center", says Stefan Filthaus. "The clarity and simple operability of the software dashboard convinced me at once. I could see at a single glance how the energy management system functions and what it can achieve", says Stefan Filthaus.

Monitoring of all energy consumption across all system brands

In addition to the software, the scope of delivery for iMAGOxt includes current measurement sensors, which transfer their readings to the software via a cloud. The sensors are installed on every energy consumption point. Whether these are machines and auxiliaries from the WITTMANN Group, or systems coming from other suppliers, is irrelevant. "iMAGOxt functions system-independently and just as reliably with machinery systems consisting of many different brands", explains Rainer Grießmann, design engineer at WITTMANN BATTENFELD Deutschland, who supports Filthaus in the implementation of iMAGOxt.

The measuring points may be individual systems or complete production cells. "Here, we offer a lot of flexibility", Grießmann continues. "Before the installation we evaluate jointly with our customers which measuring points will contribute most effectively to reaching their specific individual goals." In the case of Filthaus, it was decided to treat each injection molding production cell as a separate unit. For the calculation of the product carbon footprint must be based on the total consumption of the production cell.

In addition to the injection molding cells, two cooling systems and the two large air compressors were integrated into the energy monitoring system, and finally, the main connection was also defined as a separate measurement point. The thought behind this was that the power consumption of the administration and warehousing departments including lighting, IT infrastructure, heat pump and other consumption not directly involved in production processes could also be calculated from the difference between the total consumption inside the building and that of the production equipment. In total, this adds up to 30 measuring points which were installed and interconnected at Filthaus.

The individual consumption figures can be visualized by the software either in kilowatt hours or in tons of CO_2 emissions, in both cases per kilogram of material processed. These values are invariably lower on days with strong sunlight, since Filthaus had invested in a photovoltaic system in 2024. "In summer, there are days when our production is running completely independently of the public power network", says Stefan Filthaus. "This reduces the CO_2 footprint of the products and saves money." The CEO is convinced that all actions to increase sustainability must also pay off financially.

Mobile consumption monitoring

"The graphic displays on the dashboard of iMAGOxt have made it very easy for us to analyze our energy consumption rates and help us to make the right decisions", Filthaus emphasizes. Particularly exciting, for example, is a display in which the total energy flow is divided into graphic strips representing individual energy points, with the width of each strip representing each point's relative proportion of the total consumption. An individual color can also be defined for each point - taken over automatically into other graphic displays.

Jars with screw tops and slip-on lids are one of the specialties made by Filthaus. In the business segment of packaging, a mixed calculation can quickly lead to a loss of orders.

The energy consumption values can be visualized as required either per year, per week or per hour, or in the form of a progressive trend chart. On the basis of these values, Stefan Filthaus calculates his energy costs, CO_2 emissions and unit costs for each production cell in operation. Stefan Filthaus is especially pleased about the software's web-based functions. "I can also retrieve all of the data via my cellphone on any terminal of my choice without any need for a separate app", says Filthaus.

"iMAGOxt provides a distinctive advantage by offering precise, data-driven insights that directly impact strategic decision-making," says Edoardo Tettamanti, Head of Marketing at WITTMANN DIGITAL. "The platform enables businesses to transition from reactive energy management to a proactive approach, optimizing resource allocation and ensuring compliance with evolving sustainability regulations."

There is a lot of potential in this newly acquired transparency, which Filthaus is now exploiting step by step. "iMAGOxt helps us to optimize our processes in order to continuously increase the efficiency of our production", explains Stefan Filthaus. "We derive very specific actions from the analyses of iMAGOxt." The detection of energy losses like those in the production cell mentioned above, which consumes too much power while on standby, is only one of innumerable examples. "The energy management system also helps us to sensitize our workforce" is how Stefan Filthaus describes an aspect of particular importance to him. Is there any temperature controller or conveyor belt switched on although it is not needed at present? Has someone forgotten to switch off the light? The evaluations delivered by iMAGOxt reveal that even small actions contribute substantially to overall efficiency.

Elimination of power consumption peaks

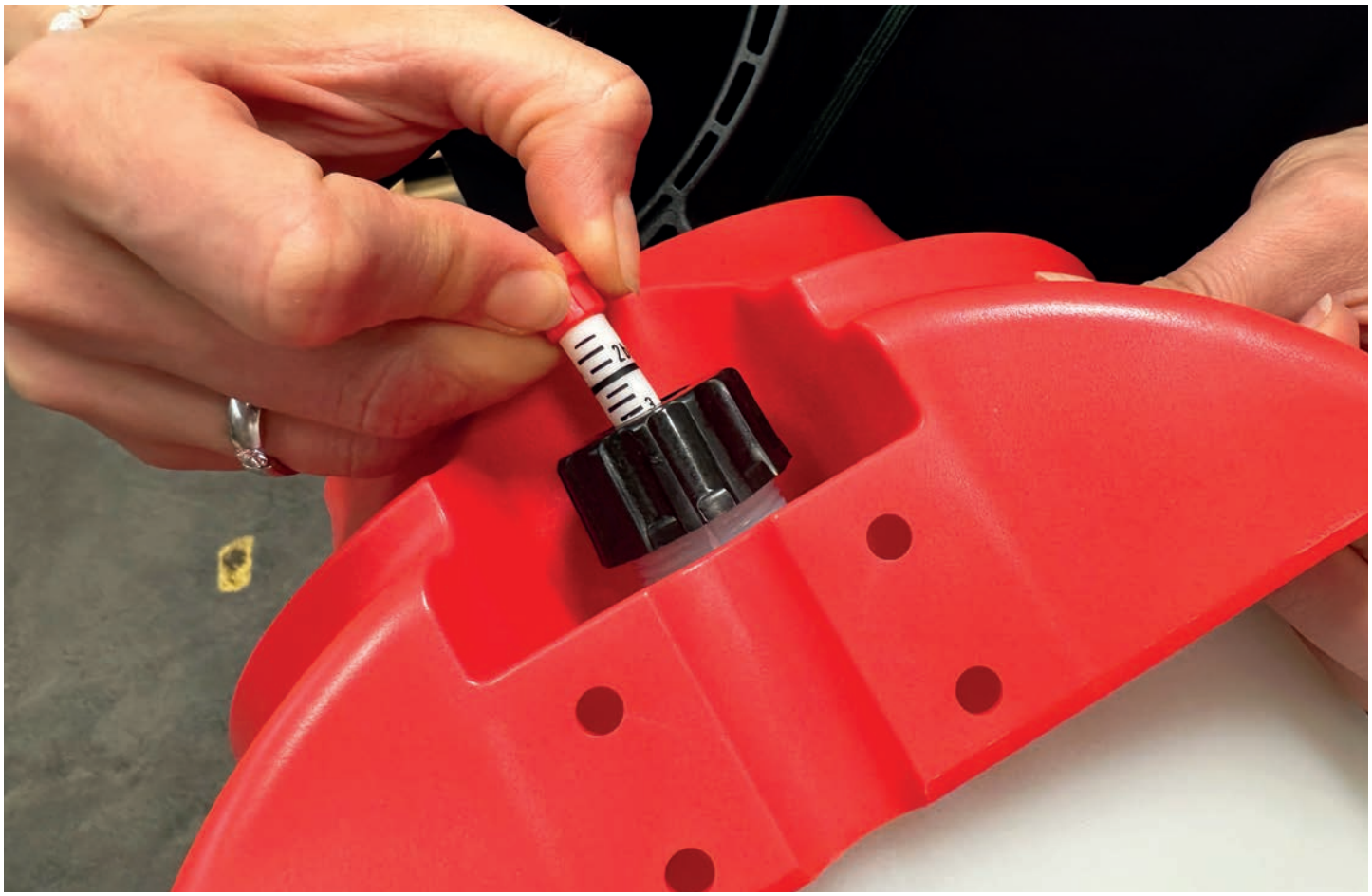
A current project at Filthaus addresses the analysis of power peaks – and here, too, iMAGOxt is able to help. "We can now clearly see the consumption flow and pinpoint exactly to the minute when power peaks have occurred. We evaluate these by investigating which special effects caused those peaks on that very day", explains Filthaus. For in spite of carefully planned start-up procedures performed after weekends or company vacations, it often happened in the past that the power consumption shot up briefly to excessive peak values. And the local power supplier providing the energy calculates and charges its overall electricity price for a whole year on the basis of such brief maximal consumption events. "Just because something got out of control once, we are paying extremely high provision fees for the entire year", says Filthaus. "This is precisely what we need to prevent in future".

In order to investigate further potentials, Stefan Filthaus and his team continue to cooperate closely with the experts from WITTMANN. Here, the fact that the two companies are located only a few meters apart is a definite advantage. "We can always arrange spontaneous personal meetings at short notice", says Grießmann. But for Stefan Filthaus, there is more to the excellent cooperation: "We talk to each other on equal terms, and all of our contact persons are quick and target-oriented in implementing projects. But what I appreciate most is our easy-going mutual interaction."

Jointly exploiting energy saving potentials: Rainer Grießmann from WITTMANN (left) and Stefan Filthaus from Filthaus (right).

Efficiency and flexibility under one roof

'Made in Germany' is an integral part of MESTO's brand promise. The entire value creation is produced at the corporate headquarters in Freiberg am Neckar in southern Germany, and this is to remain unchanged in future. For the production floor this means continuous increases in efficiency, integration of processes and as much automation as possible. The main challenge here: maintaining high flexibility. Together with its partner WITTMANN, MESTO develops manufacturing solutions made to measure to meet these complex requirements.



The piston manometer serves as a safety valve. Excess pressure can escape through the piston.

We have a particularly large product range", explains Élise Sellmayr, Head of Process Optimization, during our visit in Freiberg am Neckar. Economical distribution of liquids is MESTO's specialty. Here, the South German company with more than a century's corporate history ranks among the leading global suppliers. This unwieldy-sounding description is all about products everyone is familiar with: pressure sprayers, backpack sprayers, foam pressure sprayers, trigger sprayers and suction devices. These are found just as naturally in households and allotment gardens as in agriculture, professional horticulture, workshops, in the trades and on building sites, being used for cleaning, disinfecting and pest management, as well as in a great variety of different industries.

All products are available in different versions; major customers such as DIY stores and workshop chains can have their sprayers branded in their own corporate design. This diversity leads to small batch sizes and frequent setup processes. Therefore, flexibility is the main key to efficient production and competitive unit costs.

"We have no typical mass production here", says Élise Sellmayr and shows us an example. She holds up a small white piston made of a co-polyester, which serves as a pressure gauge in all pressure sprayers with a plastic housing and which has a great deal of functionality. "The piston pressure valve functions as a safety valve", explains Sellmayr.

Sprayers with housings made of plastic are approved with internal pressures of up to three bar. If more air than that is pumped in, the excess pressure is let out via the piston gauge. In the 'Primer' and 'Profi'

series of appliances for professional use, the pressure gauges are printed on and perform internal pressure control. Piston valves without print are used in the smaller devices of the "Pico' series destined for private households and gardens.

For a long time, injection molding and printing were two entirely separate production steps. What is new for MESTO: the printing unit now forms an integral part of the injection molding system.

The change happened after the injection molding machine previously used for making the pistons stopped working. This was taken as an opportunity to scrutinize the entire production process for overall efficiency.

"When walking through the production floor, I always keep my eyes open and think about which processes could be optimized effectively", Sellmayr emphasizes. Here, she gets many valuable hints from the WITTMANN Group, her supplier of injection molding machines, linear robots and integrated system solutions. The idea of having the printing process integrated into the injection molding cell was also raised during a joint factory tour, since the printing system used up to then had become somewhat obsolete as well. "We were immediately convinced that we could improve the efficiency and quality of the prints by optimizing the entire process and not just the injection molding side," says Sellmayr.

MESTO consistently relies on SmartPower injection molding machines from the WITTMANN Group. Their high energy efficiency was the key factor in favor of this decision.

„The more tasks the robot can take over inside the injection molding cell, the less work we have to do in assembly. We save a complete work step."

Élise Sellmayr, MESTO

Integrated on the smallest possible floor space

The main challenge in developing the new integrated production process was extreme time pressure. Here, MESTO was fortunate that there was just a used, but still very young Insider production cell available for immediate delivery. It consisted of a SmartPower 80/525 injection molding machine with a linear robot and conveyor belt, so it was predestined for producing the piston pressure gauges. MESTO seized the opportunity and commissioned WITTMANN to integrate a new printer solution.

WITTMANN's Insider concept is already designed from start to finish for minimal space requirements and maximum efficiency. The protective housing is mounted right next to the conveyor belt. Temperature controllers or other components can be easily placed underneath. Compared to conventional solutions, the required production floor space is reduced by up to 50 per cent. At MESTO, WITTMANN succeeded in integrating the new printing station in such a way that it takes up hardly any extra space. It connects to the rear of the conveyor belt, and its depth remains within the grid dimension of the protective housing.

A four-cavity mold is used for production. At the end of each cycle, the WITTMANN linear robot removes the four pistons and deposits them on the vertical domes of a small transport carriage, which takes them to the three print heads. The pressure gauges are printed on as they pass by. To this end, the domes rotate on the carriage so that the print heads can work all around them without changing their own position. Each piston is given two rings, one red and one black, plus a scale.

Following printing, the gripper of the linear robot picks up the parts again and places them on the conveyor belt. When pistons are manufactured for the 'Pico' series, which requires no marking, the printing station can be simply passed by. In that case, the robot places the pistons on the conveyor belt directly after demolding.

A complete work step saved by process integration

The injection molding process dictates the timing for printing on finished parts. The printing process must be fully completed within the cycle time. This is why the only feasible option was a direct print, requiring neither pretreatment nor a long drying time. The print must not be blurred when the gripper picks up the parts again immediately after printing.

WITTMANN evaluated many different printing methods, colorants and suppliers. Pad printing was ruled out due to the required pretreatment, and many colorants did not pass the stringent durability tests. Wipe and abrasion tests were carried out with various solvents. For later on, when used inside the sprayers, the piston pressure gauges can be exposed to aggressive media such as pesticides or detergents.

The final choice was an ink jet printer from Videojet, which not only delivered the best result in colorant durability, but also in terms of flexibility. "We are now able to print out very fine variations in the position of the scale", says Sellmayr.

The trend towards process integration is growing – a trend that the WITTMANN Group also observes among other injection molders. The aim in each case is optimal utilization >>

The WITTMANN linear robot integrated in the Insider production system removes the pistons from the 4-cavity mold.

WITTMANN developed a compact solution for efficient feeding of the various piston rods.

of each system component's capacities. Robots often have free capacity for handling additional tasks during the injection and cooling process, such as printing on finished parts as done at MESTO.

"The more tasks the robot can take over inside the injection molding cell, the less labor input we have in the assembly", says Élise Sellmayr. "The piston manometers leave the injection molding cell ready for mounting. By integrating the printer, we save a complete work step here." And that saves a lot of logistic expense, too, since the piston manometers were previously produced on stock first, and then printed later on.

Power consumption reduced by a third

SmartPower injection molding machines dominate the scene on MESTO's production floor. Ever since the company started a comprehensive project in 2017 to increase its energy efficiency, old injection molding machines are being consistently replaced by servo-hydraulic SmartPower models. The high energy efficiency of the WITTMANN machines tipped the balance. "With the changeover, we immediately saw some first savings", Élise Sellmayr reports. "Up to now, we have been able to reduce our power consumption by a third with the same number of machines."

A further benefit: focusing on just one brand of machinery makes daily work easier for machine setters and operators. "They all get along very well with the WITTMANN control system", says Sellmayr.

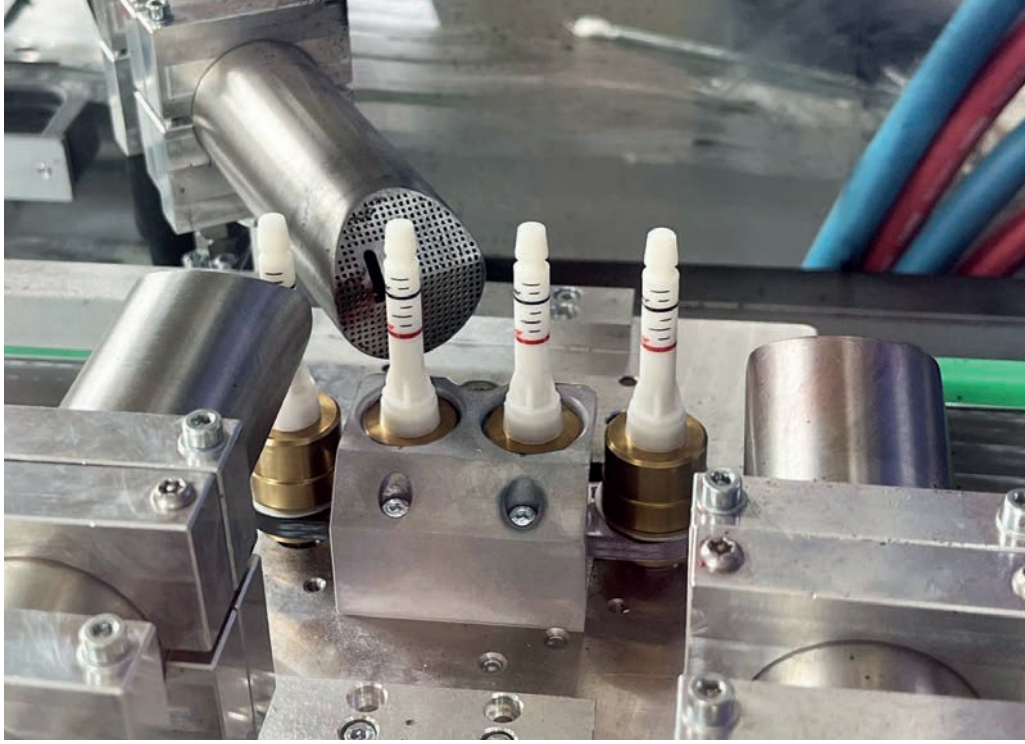
On our company tour, we have now arrived next to a SmartPower 180 injection molding machine. Pressure vessel tops are running off the conveyor belt, flat black discs with piston rods protruding from their centers. In a 2-cavity mold, the container lids are molded directly onto the piston rods. The material processed is a fiberglass-reinforced polypropylene.

An extremely compact arrangement of all components also catches the eye in this production cell. And here too, flexibility is an important issue. In this system, WITTMANN has integrated the feeding device for the metal rods to be insert-molded into the overall concept. The challenge for this system was to process various types of piston rods for different sprayer models, which were all to be fed in through the same magazine.

The piston rods come in varying lengths and diameters. There are rotationally symmetric rods and rod bars with wings and threaded sides, which must all be inserted precisely in a certain position. The material of the rods and consequently their magnetic behavior also varies.

All of these aspects had to be considered in planning the gripper concept. The task was further complicated by the fact that insertion of the metal rods and removal of the finished parts had to take place from the same side of the mold. Accordingly, all of the gripper's functions had to be united on only one side, and that very compactly, so that it could still operate safely inside the open mold.

In all considerations concerning the gripper layout, the size and complexity of the resulting gripper and its efficiency in production were weighed against each other. In this way, all requirements could be accommodated on two grippers, with a fully automatic gripper changeover.



The three ink jet print nozzles put a red and a black ring plus a scale on each piston. For efficient printing of the rings, the piston holders rotate on the transport carriage.

To produce the pressure vessel tops, the piston rods are directly over-molded. The material processed is fiberglass-reinforced polypropylene.

Made to messure for higher competitiveness

The ultimate goal in all projects is: "no overengineering please!" For this would counteract efficiency, flexibility and easy operation. "In every new project, I let people show me what is possible and what new ideas are available", Élise Sellmayr emphasizes. "Then we make up our minds about which innovation level makes sense. At the end of the day, these are all customized special machines that are only built once. Precisely that makes it so exciting. "

Always on the lookout for optimization potentials: Élise Sellmayr (right), here together with marketing specialist Janina Behn.

Small parts, big CO_2 savings

The company name says it all. Yixin Precision specializes in precision parts – with two business divisions: Mold making and injection molding production. "We are a full-service provider and often also a development partner for our customers," says Hon Ping Siow, Director of Yixin Precision. Customers come from the medical technology sector, among others, for which Yixin Precision operates its own class 100K cleanroom.

Happy about the new possibilities of the MicroPower machine: The two directors of Yixin Precision Wee Lian Teo (left) and Hon Ping Siow (right).

As part of a customer project, the decision was made to invest in a MicroPower injection molding machine for high-precision micro injection molding. "WITTMANN's expertise and advanced solutions as well as its good references in the field of micro injection molding were a perfect match for our requirements," emphasizes Siow. „In addition, we had already had good experience with WITTMANN with temperature control units and robots. The WITTMANN products are important building blocks for us to ensure the required high precision, repeatability and efficiency."

In addition to medical parts, optical components are also produced using the new MicroPower machine. "In both areas, there are no compromises when it comes to dimensional accuracy and repeatability," says Siow. In addition, Yixin has to make sure to precisely adjust the surface quality, which is often decisive for the functionality of the subsequent end product.

On a small footprint

Part weights of three grams and significantly less are standard for Yixin Precision, and customer requirements continue to increase. Components and tolerances are getting smaller and smaller, and geometries are becoming more complex. "This is where WITTMANN's technologies help us to become better and better and thus strengthen our competitiveness," says Marco Koh, Business Development Manager with Yixin Precision.

In addition to its high precision in the field of micro injection molding, the MicroPower injection molding machine impresses with its very compact design. The machine concept combines a rotary table, auxiliaries, automation, temperature control unit, quality assurance and other process units on a footprint of just two square meters.

„Together with WITTMANN, we are expanding the spectrum of what is possible for our customers."

Hon Ping Siow, Yixin Precision

Flexibility is another major strength of the MicroPower – including the integration of a laminar flow box if the machine is not already being operated in a cleanroom.

Energy efficiency included

Yixin Precision also emphasizes the low energy consumption of the MicroPower. „The machine helps us to reduce our CO_2 footprint. Sustainability is a key priority for us," says Wee Lian Teo, Director von Yixin Precision. The company has taken concrete measures to achieve carbon-neutral production by 2030. Customers expect this and it is a matter close to the heart of Yixin's management to actively contribute to climate protection. For example, investments are only made in energy-efficient technology and all processes are optimized, for example through waste reduction initiatives. In order nevertheless to maintain its strict quality requirements, Yixin Precision is taking advantage of the new opportunities offered by digitalization and AI.

WITTMANN also plays an important role in optimizing existing processes at Yixin Precision. The first all-electric EcoPower injection molding machines will soon be put into operation.

"WITTMANN is a very good partner for us," emphasizes Hon Ping Siow. "Together, we are expanding the spectrum of what is possible for our customers."

Inline recycling with maximum cost efficiency

For Mayhew Basque Plastics in the USA, inline recycling is an important contribution towards reaching its sustainability goals. The S-Max 3 screenless granulator from WITTMANN delivers uniform regrind with minimal fines content even from fiberglass-reinforced plastics.

For more than 160 years, the name Mayhew has been a synonym in the United States for high-grade tools, which are now being traded worldwide under the name of Mayhew Tools and several other proprietary brands. The name Mayhew has become a household word especially in car repair shops.

Mayhew Basque Plastics LLC specializes in product design, mold making and injection-molded parts as a separate business segment of Mayhew Steel Products Inc. Its fleet of injection molding machines in Westminster, Massachusetts consists of 25 machines ranging from 185 to 500 tons in clamping force.

Designed for high throughputs: At Mayhew in Massachusetts, the S-Max 3 screenless granulator grinds hot sprues into high-quality regrind.

Regrinding of fiberglass-reinforced materials while still hot

In order to give tooling a long service life in tough workshop conditions, fiber-glass reinforced thermoplastic materials are frequently used, such as PA 6, PA 66 and PP. Processing cycle times are kept short – consequently the sprue is still very hot when it reaches the conveyor belt.

The S-Max screenless granulators from WITTMANN are ideally suited to meet this challenge. After extensive granulation tests, Mayhew chose the largest model of the series, an S-Max 3. With a big grinding chamber size of 240 by 467 mm, a 12-liter regrind container, 2.2 kW motor capacity and three knives, size 3 is designed for extremely high throughput rates. Thanks to low motor speeds – 27 rev/min at 50 Hz – the S-Max granulators grind engineering plastics and fiberglass-reinforced materials extremely efficiently and at low cost – even when they are still warm or even hot. Lower motor speeds mean less wear, less servicing and reduced power consumption. And the result is a very even granulate with only a minimal content of fines. In this way, the S-Max 3 helps the company to reach its sustainability targets.

Designed for high throughput

In addition to the S-Max 3 screenless granulator, blade granulators from WITTMANN can be found in Mayhew's production plant in Westminster as well – also laid out for grinding large parts and high throughputs. They are used for soft and medium hard plastic materials, and here they are also required to grind parts that are still warm. The G-Max XL is equipped with an open rotor for this purpose, to use the air flow between the rotating knives for cooling the regrind. Here, too, the motor speed is kept low in order to combine a high quality standard for the regrind with effectiveness and cost efficiency.

The best Brazilian blends... With Plasnova and Gravimax

At the Louveira production plant located in São Paulo in Brazil, Plasnova combines extrusion with injection molding under one roof. In WITTMANN, the plastics processor found a partner early on that offers the most suitable peripherals for both processes and also has injection molding machines in its product range.

Visitors meet the products made by Plasnova immediately on arrival. The way from the parking to the entrance leads through a park-like garden. "This is our testing ground", explains Eder, owner and CEO of Plasnova. And indeed, a closer look reveals the water pipes and sprinklers laid between the trees and bushes.

Plasnova specializes in horticultural and agricultural irrigation systems. Whether it be pipes or hoses, distribution systems, couplings or valves, sprayers or sprinklers – all of these parts are manufactured in-house. Ever since its foundation almost 25 years ago, the company has seen continuous growth. Other sectors of industry, too, have already benefited for quite some time from the Plasnova team's extensive extrusion and injection molding experience.

The central materials handling system makes it easier for staff members to manufacture products with highest possible material efficiency and process consistency.

The new large Gravimax meters and mixes together up to six materials with extreme precision.

Simultaneous dosing of six materials

The range of different plastic materials processed on site grows with the increasing portfolio of components being produced. In addition to standard materials such as PE and ABS, some plastic materials harder to process, partly with a high fiberglass content, are also being used.

"Safe handling of all these different materials is our daily challenge", Eder reports while proudly presenting to us his most recent investment, which succeeds in coping with this challenge: a large gravimetric blender from WITTMANN's Gravimax series. It feeds the extrusion lines, simultaneously metering and blending up to six different materials. "The Gravimax provides a consistently high quality standard, together with maximum material efficiency and a reduction in personnel costs. This leads to a higher margin", says Eder, emphasizing that this is exactly what matters. For, as he says, the irrigation industry is a highly competitive market. Moreover, especially extrusion with extremely small die diameters requires

All extrusion lines, too, are equipped exclusively with material loaders, dryers and dosing systems from WITTMANN.

Sprayers and sprinklers come from the company's own injection molding shop.

extremely high-precision metering, in order to achieve the necessary product attributes.

As a further trend, more and more often a proportion of recycled material is mixed in with the basic material. "For some pipes, we can already blend in up to 70 percent of regrind." For example, PE waste is granulated on site and then reprocessed.

Before the decision was made to add a large Gravimax to the range of auxiliaries in the extrusion hall, the formulations were mixed manually. "This clearly involves the risk of occasional mistakes happening", says Eder. "Consequently, we wasted a lot of material in the past." This is why Eder is so enthusiastic about the particularly precise dosing technology offered by the Gravimax system.

Extremely high material efficiency

Many conventional blending systems operate with time-based dosing algorithms, which set certain limits on the efficient use of materials. For either the system blends in too large quantities right from the start, or the machine operator calculates a material buffer to prevent system-related underdosing, which ultimately leads to excessive consumption, too. "Even if this involves only smallest quantities in each case, it is still a noticeable cost factor when expensive materials are being processed", explains Marcos Cardenal from WITTMANN BATTENFELD do Brasil. "With the Gravimax, by contrast, it is possible to achieve extremely high levels of constancy in quality standards while keeping the set weight down to the required minimum. In this way, the Gravimax already amortizes itself after just a few months."

To achieve a highly accurate and consistent blend for every batch and simultaneously be able to feed in the material very quickly, the Gravimax operates with the RTLS (Real Time Live Scale) technology developed by WITTMANN. Here, the first step is to approach the target weight by an extremely fast release of material within a minimum of time. Then, as a second step, the dosing system switches over to controlled high-precision dosing until the exact target weight is reached.

Since all valves inside the Gravimax are made of stainless steel, the Gravimax reaches a long service life even where materials reinforced with a high proportion of fiberglass are blended in.

Following the excellent results obtained in the extrusion process, the injection molding department is now also getting a large Gravimax blender. "What has proven itself in extrusion, we adopt for injection molding", is how Eder explains his strategy, which has already been put into practice for the materials handling system. Whereas for a long time each injection molding machine had its own Drymax dryer, the injection molding hall has now been equipped with a central materials handling system. "Now we have a separate dryer for each material, so we can change over from one material to another much faster and more easily", says Eder.

Everything from a single source

For Plasnova, having both auxiliary equipment and processing machines from a single source means greater efficiency in planning new equipment and in after-sales service. "The responsibility lies in one hand, with the WITTMANN team", Eder points out. "The WITTMANN technicians know all the systems here as well as we do, and they are on site very quickly when service is required. This is very important for us. We cannot simply stop an extrusion line whenever there is a problem with auxiliaries. Those systems must always function reliably."

Plasnova and WITTMANN BATTENFELD do Brasil have now been cooperating for more than 20 years. "We meet regularly for lunch", Eder discloses. "Of course, we discuss the current projects there, and often the future, too. We are always on the lookout for innovative technologies for further optimization of our production."

DC pioneers: uninterruptible power supply for injection molding

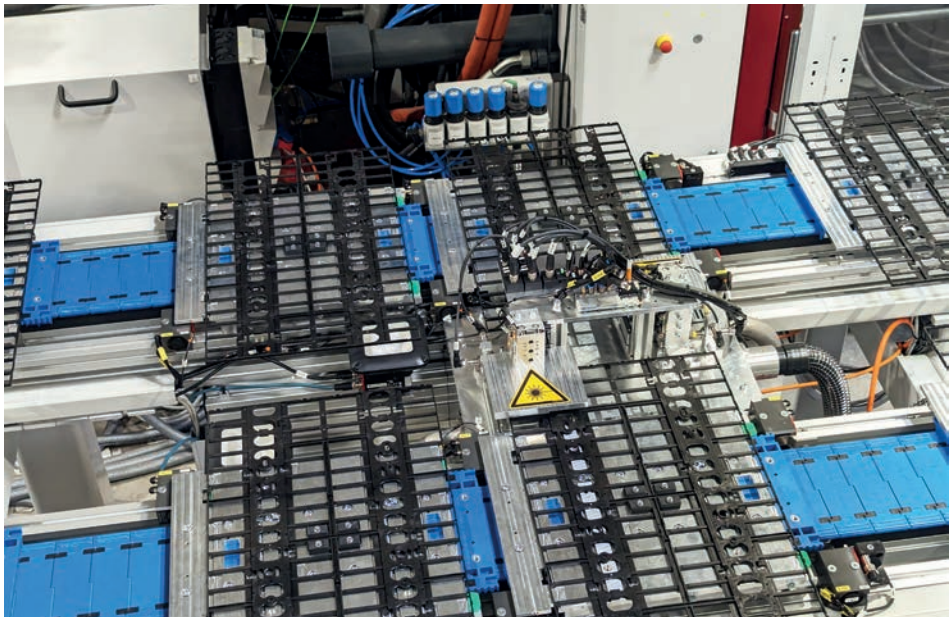
The topic of DC, the installation of a local DC grid in order to use energy obtained from photovoltaics directly for the operation of machines without conversion losses, was also discussed over lunch. When it comes to DC, WITTMANN is the pioneer in the injection molding world. WITTMANN is actually the first machine and equipment supplier to offer DC-compatible injection molding machines, robots and temperature controllers, and has already presented these new possibilities and opportunities at several trade fairs, jointly with its partner Inesco.

"We were immediately convinced by this idea", says Eder. Here, the company owner not only considers the energy that can be saved by eliminating the current conversion loss. "The decisive factor for us is that we are gaining a bit of independence from the public power supply network here in São Paulo. With the DC machine and the salt storage battery from Inesco, we can continue our production without interruption in spite of power failures." In October 2024, Eder ordered a first DC-compatible injection molding machine for his plant at the WITTMANN booth during his visit to the Fakuma show in Germany, thus writing industrial history in Brazil.

Cooperating in close partnership for 20 years: Eder, Owner-Manager of Plasnova, Cássio Luis Saltori and Marcos Cardenal from WITTMANN BATTENFELD do Brasil (from right to left).

Foam for future applications

Complex assembly boards for electric mobility illustrate the immense potential of foam injection molding. In the WITTMANN podcast series, Dr. Felix Reiche, Managing Director of the plastics processor Hesco Kunststoffverarbeitung, and Andreas Schramm, CEO of WITTMANN BATTENFELD Deutschland, are presenting this application as a starting point for taking a look at the future of gas-assisted injection molding, all the way to joint processing of recycled materials and bio plastics.



The assembly boards are manufactured at Hesco in Luckenwalde on a MacroPower injection molding machine from WITTMANN for a major German OEM.

The potential of gas-assisted injection molding processes is still far from being fully exploited, which quickly becomes clear in this podcast episode. For it is about much more than just light-weight structures. The issues involved are material and energy efficiency, new product designs where other processes have reached their limits, and also the recovery of industrial sites in Germany, for which it is necessary to come up with many such creative ideas.

Dr. Felix Reiche is managing Hesco in the third generation, a family-owned company headquartered in Luckenwalde, Germany. The company has accumulated more than 60 years of experience in plastics technology, from molded parts development and injection molding right up to sophisticated surface finishing. Innovative strength is essential for Reiche. "As a medium-sized business, we are often faster and more flexible than the big OEMs, which, in the end, often benefit from processes developed by us."

Mechanical rigidity tips the balance

So, the assembly boards, too, are destined for a major automobile manufacturer. Inside the vehicle, the battery cell covers form part of the cell contacting system. To this end, the extremely thin parts measuring about 40 by 60 centimeters with a wall thickness of just 1.5 mm will form a lattice structure with fine bridges between the openings. They are produced inside a 4-cavity mold on a MacroPower injection molding machine with 1,100 tons clamping force, using the Cellmould foam injection molding process developed by WITTMANN.

In choosing the manufacturing process, the lightweight effect was not the main consideration, Reiche reports. Instead, the convincing argument was the mechanical rigidity which can be achieved with Cellmould. "The foamed parts are torsion-proof – precisely this was important for our customer", says Reiche. "Dimensional accuracy was another point. For when produced inside a compact mold, the part will warp when cooling, which can be prevented by using Cellmould."

To illustrate this, Felix Reiche brought some parts into the podcast studio. On the one hand, produced by compact standard molding, on the other hand foam-molded, like those used inside the vehicle. The advantage of Cellmould was clearly visible.
How can Cellmould produce such a high rigidity? – Andreas Schramm answers this question as follows: "When the melt loaded with nitrogen gas expands inside the mold, even the most minute corners of the cavity will be completely filled. The material thus extends reliably to all the places most heavily subjected to mechanical loads, and the foam structure also enhances the stability. Similar to a human bone with a sponge-like structure inside."

However, the light-weight effect in the assembly board – 238 grams versus 250 grams – is not altogether negligible either. For less weight also means less material. With three and a half million parts per annum, this improves both the cost-efficiency and the CO_2 footprint. What is more, injection molding with Cellmould also reduces the clamping force requirements. "The expansion of the gas inside the cavity replaces the holding pressure. This makes a big difference in the CO_2 balance", says Reiche.

Could electric mobility be a driver towards foam injection molding? – Yes, certainly, but not the only one. "We clearly see an increase

„Three and a half million parts per annum – here every gram counts. This will save us a lot of CO_2."

in the demand for gas-assisted injection molding processes in industries such as automotive, white goods and engineering parts", Andreas Schramm points out. "Here, the main issues at stake are sustainability as well as greater efficiency and improvements in part attributes."

On several occasions, parts originally designed for standard injection molding are now also being foamed, Schramm reports. In many cases, that would be possible, but this potential can be exploited much more effectively by considering the foam injection process already at the product development stage. "This will provide much more scope for optimal wall thicknesses and transitions in part design", says Schramm.

Bio materials together with recyclates

A very interesting aspect of foam injection molding at Hesco are the materials used. For more than 20 years, Hesco has been cooperating closely with the Fraunhofer Institute for Applied Polymer Research (IAP) in Potsdam, Germany. The joint research work focuses on bio-based plastic materials, where Hesco is experimenting in order to process them together with recycled materials in foam injection molding. "The first tests are very promising", Reiche remarks with pleasure. Especially since the industry has already signaled keen interest. One development project to be completed in 2027, for example, deals with hydrogen cells for trucks. Here, post-industrial recyclate (PIR) is combined with bio plastics produced from agricultural and forestry waste. "An important point for us is to avoid entering into competition with food production", Reiche emphasizes.

Felix Reiche and Andreas Schramm are both convinced that new developments are precisely what will keep value chains inside Germany. "Innovations and technology leadership will open up new opportunities and contribute to the recovery of Germany as location for industry", says Reiche. Andreas Schramm confirms: "These assembly boards in particular show us how technical expertise can secure locations. Here, in Central Europe, we have the necessary expertise for stable, reliable and cost-efficient production of such sophisticated components."

Dr. Felix Reiche from Hesco (left) and Andreas Schramm from WITTMANN BATTENFELD Deutschland (right) with the podcast host Susanne Zinckgraf.

Cellmould

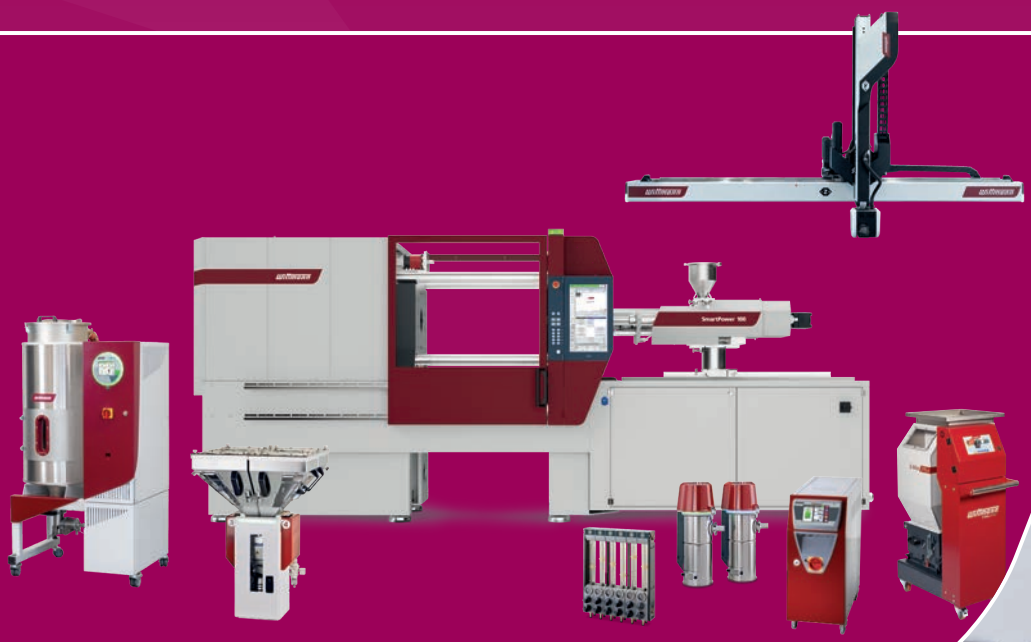
In Cellmould foam injection molding technology, the plastic melt is loaded with nitrogen gas, which after injection of the melt into the mold cavity diffuses from the melt, producing a fine cell bubble structure inside the molding compound. The advantages include a reduction in weight, significant lower material and energy consumptions, as well as improved part attributes in many applications.

My favorite injection-molded part

Not foamed this time, but still another novelty to enhance sustainability is reusable deposit tableware, which Felix Reich presents as his "favorite injection-molded parts" during the podcast episode.

The aim of this product development was to offer a simple, low-cost solution for compliance with the obligation to offer reusables at selling points and for the retail trade. The key to success: the forms and sizes of all containers are designed for compatibility with commonly used reverse vending machines for beverage bottles. "In more and more supermarkets, the new containers of the "Einfach Mehrweg" (simply reusable) brand are being offered, for example, at fresh food counters or salad buffets", says Felix Reiche. Hesco produces these containers and simultaneously functioned as the development partner of the Berlin-based start-up company Sykell, which won the German Sustainability Award 2025 for this innovation.

Listen to the full-length podcast episode (in German language):



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