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innovations

Techniques – Markets – Trends

Volume 12 – 4/2018

Taking on the right colors

Battenfeld

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Editorial

Michael Wittmann

Dear Reader

WITTMANN 4.0 goes MES! – For many years now, we have kept ourselves busy with the issue of the integration of injection molding machine, robot, and peripherals into one working cell. Our solution for the flexible working cell that automatically recognizes and integrates all the connected devices correctly is called WITTMANN 4.0. The operator of a WITTMANN 4.0 working cell benefits from centralized data management; from a quick and safe adjustment of the settings when it comes to changes of the mold, and also from a correct collection of all process data that are needed for product traceability. Thus far, we could offer this functionality on the B8 control level of our injection molding machine.

However, a machine control is no proper data base server, and of course is not properly meant to perform this task. Thus, on the one hand, there exists a relatively tight limitation of the recorded data volume, and on the other hand, no strategy in case of data redundancy. To put things right, a so-called MES (Manufacturing Execution System) – as an independent program or as a module of an ERP system – could be used. But so far, all the MES providers have stopped short of real communication at the level of the machine. This made it possible to store all machine-dependent process data and values coming from peripherals that were directly integrated into the machine (literally only from temperature controllers). But it was not possible to achieve this for all the other data from other peripherals. But now there's an end of it! I'm very glad to announce that we have succeeded in transferring the unique functionality of WITTMANN 4.0 onto the MES level.

For some time we have been in close contact with the Italian start-up ICE-flex. With its program TEMI, the ICE-flex team has developed a very innovative MES that meets all the requirements of our industry. The latest high point of our collaboration with ICE-flex is a joint venture agreement that we have sealed in the middle of September. Based on the capital we brought into the partnership, we intend to advance further developments as fast as possible.

At the upcoming Fakuma 2018 show you can catch up on all the fascinating new possibilities concerning data collection and traceability of products. Furthermore, we present numerous product novelties: for example our new vertical *VPower* injection molding machine and the new WX robot series. We shall be pleased to welcome and to thrill you October 16–20 in Friedrichshafen, Germany!

Yours cordially, Michael Wittmann

Content

WITTMANN BATTENFELD molding technology at the Fakuma 2018

At this year's Fakuma in Friedrichshafen/Germany from 16 to 20 October, WITTMANN BATTENFELD will present – under the motto "be smart" – its new, vertical VPower. With this machine model, WITTMANN BATTENFELD is now also offering its vertical machine series in the PowerSeries design.

The WITTMANN BATTENFELD Fakuma highlight: – the new VPower vertical machine.

The molding technology highlight: VPower 160

At this year's Fakuma, the new *VPower* will be introduced for the first time to the general public. Following its integration into the WITTMANN Group 10 years ago, WITTMANN BATTENFELD started to redesign its entire portfolio of machinery. The range of machinery known by the name of *PowerSeries* is now well established in the market. With the development of the *VPower*, the company's vertical machine models are now also being remodeled to fit the *PowerSeries* design.

The new *VPower* stands out primarily by its high energy efficiency, compactness and user-friendliness. The machine's generously dimensioned rotary table is powered by a servo-electric drive as standard and laid out for short rotation times. The injection unit can be converted from vertical to horizontal and vice versa even after commissioning. Moreover, the absence of a central tie-bar enables central media supply from below through the rotary table or the installation of a compact rotary manifold. Thanks to its open design, the machine is ideally suited for the integration of automation systems with insert feeding and finished part removal functions.

At the Fakuma, the functionality of the new *VPower* will be demonstrated with a *VPower* 160/750 featuring a rotary table 1,600 mm in diameter.

EcoPower Xpress for the packaging industry

Another novelty presented at the Fakuma will be the *EcoPower* Xpress 160/1100+. Following the successful launch of the all-electric high-speed model in the 400 to 500 t clamping force range, the *EcoPower* Xpress series is now being extended by adding the machines in the lower clamping force segment. The *EcoPower* Xpress is a high-speed, all-electric high-performance machine, which is of interest mainly for thin-walled applications in the packaging industry.

At the Fakuma, the smallest machine of this series will be shown producing a lid made of PP (Borealis, Austria) with a 4-cavity mold, using IML technology from WITTMANN. The IML system is a high-speed model with a W837 side-entry robot. With the help of anticipatory signal exchange transmitted in real time between the machine and the robot, the mold opening time can be limited to an absolute minimum. The lids are produced within a cycle time of roughly three seconds. The machine will be equipped with the CMS (Condition Monitoring System) from WITTMANN BATTENFELD, which ensures continuous condition monitoring of its most important parameters.

Multi-component technology: SmartPower and MicroPower

Furthermore, the COMBIMOULD technology will be shown to visitors at the Fakuma on a machine from the servo-hydraulic *SmartPower* series. On a *SmartPower* 240/750H/210S, the housing of the WITTMANN R9 TeachBox will be produced from ABS and TPU with a single-cavity mold. A WX142 robot from WITTMANN with a transfer and removal gripper will be used to remove the finished parts. It will transfer the preforms into the second cavity for insert molding. Subsequently, an inkjet printer will print a QR code on the parts to secure traceability of the production data. Next, the parts will be sorted and deposited on a conveyor belt.

In the second COMBIMOULD application, a sensor component for a medical measuring instrument will be produced. It will be manufactured on a 2-component machine from the *MicroPower* series designed for injection

MicroPower 15/10H/10H COMBIMOULD.

molding of micro parts, a *MicroPower* 15/10H/10H, with a 4-cavity mold supplied by Wittner, Austria. The razor-thin, spherical membrane injection-molded from PP and EVA9 serves to measure a specific pressure inside the measuring device.

The parts will be processed in a clean-room environment which is created by using a laminar flow box inside the machine. They will be removed by a W8VS4 SCARA robot from WITTMANN specially designed for this machine, inspected by a camera system integrated in the machine and then deposited on a conveyor belt.

WITTMANN 4.0 demonstration cell, equipped with special HiQ software.

WITTMANN 4.0 cell with HiQ software packages

The full extent of WITTMANN 4.0 integration will be demonstrated on an *EcoPower* 90/350, in whose UNILOG B8 control the robot is integrated, together with all connected peripheral appliances, such as TEMPRO temperature controllers, GRAVIMAX blenders, DRYMAX dryers and FLOWCON electronic flow controllers. As a novelty, the electronic data sheet will be used in the UNILOG B8 control. This data sheet serves to configure a production cell integrated via the WITTMANN 4.0 Router in accordance with the selected mold dataset, including all necessary appliances such as robots, temperature controllers, blenders, dryers and flow controllers. Via the "Plug & Produce" mode, the cell is ready for start-up in next to no time.

All required data for quality management from the machine and the peripherals are available for documentation via WITTMANN 4.0. Moreover, the WITTMANN 4.0 Router allows secure access by a single IP address (single point entry) to all modules of the production cell for servicing by the Web-Service.

The machine will also be equipped with the WITTMANN BATTENFELD software packages HiQ-Flow, HiQ-Melt and HiQ-Metering, whose functionalities will be shown.

HiQ-Flow is a material viscosity-controlled injection control system, which compensates the effect of temperature and batch influences on material viscosity and thus ensures reliable, consistent good quality of the injection-molded parts.

HiQ-Melt is a method of monitoring material quality, which enables easy detection of deviations in material quality by measuring the energy consumed in the plasticizing process.

HiQ-Metering designates active closing of the check valve to ensure that precisely the necessary quantity of material is injected with every shot to achieve extreme consistency in part weights. Moreover, this machine is also equipped with the CMS (Condition Monitoring System) from WITTMANN BATTENFELD.

WITTMANN 4.0 Expert Corner and Service Center

At hourly intervals, presentations will be held to provide visitors to the Fakuma with detailed information about integration, HiQ-software packages and the CMS. The Service Center will also offer advice concerning the MES solutions provided by WITTMANN BATTENFELD, as well as Web-Service and remote servicing and process technology issues.

At the expert corner for plasticizing units, the latest solutions for screws and check valves will be shown, demonstrating their advantages to trade visitors. Here, customized solutions can also be discussed with the relevant experts. ◆

Fakuma
Hall B1
Booth 1204

Automation and peripheral equipment at the Fakuma 2018

This year, WITTMANN is again taking the opportunity to present its most recent product developments in a great variety of different areas at the Fakuma in Friedrichshafen. The company will showcase its latest innovations in automation and peripherals from 16 to 20 October at its booth No. 1204 in hall B1.

Extension of the PRIMUS robot series

WITTMANN PRIMUS 10.

At the Fakuma, WITTMANN presents the latest models of the PRIMUS robot series: PRIMUS 10 and PRIMUS 26. PRIMUS 10 extends the PRIMUS series once more with a smaller model: It is designed for removing sprues and comes with sprue pincers as standard. The compact dimensions of the PRIMUS 10 with a horizontal axis length of 1,000 to 1,500 mm equip it for operation inside the safety enclosure of an injection molding machine. This reduces the costs incurred for the safety enclosure – and also ensures CE-compliant operation. The robot can also integrate a vacuum circuit in order to carry out parts removal as well as sprue picking. The PRIMUS 26 robot extends the range even further. These are the first models in the series able to operate on injection molding machines with

PRIMUS 26 robot.

clamping forces of up to 400 t, and also the first PRIMUS robots with a moveable demolding axis. With its 10 kg load capacity, PRIMUS 26 can control even more complex grippers, and in addition to the highest load capacity among the PRIMUS models, it also has the greatest variety of strokes. The horizontal axis has a maximum stroke length of 6,000 mm. This makes applications with parts depositing behind the clamping unit of a machine possible. The maximum demolding stroke is 800 mm. Vertically, strokes of up to 1,400 mm can be realized. The robot is also available as PRIMUS 26T – with a telescopic axis.

The new WX robots

The design of the pro series robots provides the backbone for the new WX robots. This new series also stands out by consistent use of lightweight technology – combined with the partitioned drive concept developed for linear robots. This combination gives the WX robots maximum dynamism with minimal energy consumption, and the reduced lengths of power supply and connection cables increases the service life. Moreover, the WX robots are equipped with a special vacuum function, by which process cost savings can

Representing the new WX series: WITTMANN WX143 robot.

be achieved. A special valve prevents pressure loss inside the system, thus minimizing the activation period of the vacuum generator, which in turn reduces the air consumption.

The Y-axis of the WX robots has been completely redesigned compared to the robots from the pro series. It now allows access to the gripper and vacuum circuits from the sides of the vertical profile. The gripper plugs for signal feedback are also connected there. To simplify maintenance of the appliance even further, the guide carriages of the vertical axis are now greased from a central lubrication point, and option for lubricating the drive system has been created: The axis can be fitted with a special lubrication wheel, which ensures a continuous supply of lubricant to the gear rack. In combination with easier access to the lubrication points, this reduces the time spent on maintenance.

The new highlights set by the design make the WX models unique. The first attribute to catch the eye is their distinctive coloring. The robots are painted in two colors to underscore their design vocabulary in a special way. The cover for the valves and E/A cards now comes in one piece and merges seamlessly with the newly designed cover plate of the Y-profile.

The new A-C-Slim servo axis

Simultaneously with the new WX robots, WITTMANN is launching a new rotational A-C servo axis specially laid out for applications with small residual mold openings.

Compared to the already existing larger model with 30 kg load capacity, the new, Slim variant of the combination axis is about 25% shorter, and its width has been narrowed by approximately 20%.

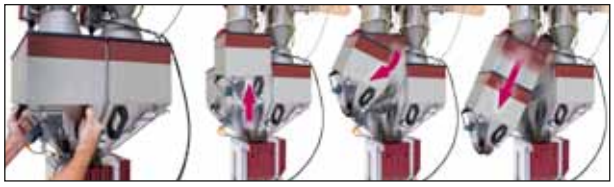
WITTMANN sees the main field of application for this combination of axes in the 150 to 500 t clamping force range. For efficient operation within this range, the axis can carry loads of up to 15 kg.

GRAVIMAX blenders with new functions

GRAVIMAX blenders are available for a wide range of throughput rates and come with touch screen controls. The luminous *ambiLED* signal mounted on the front visualizes the appliance's status.

The control allows to save the formulations of compounds together with the appropriate blending processes. These formulations can be passed on to other appliances either by USB stick or by special *GraviLog* software. Moreover, a GRAVIMAX operating in the *SmartRegrind* mode automatically adjusts the formulation – depending on the available quantity of granulate.

RTLS (Real Time Live Scale) weighing enables a consistently reliable blending result. This is a metering process



SL, "Stationary Lid" – simple and easy removal of the material hoppers: No tilting, no risk of injury, simple and easy to clean.

carried out in two steps, progressively becoming more and more accurate until the target weight has been reached. Inside the GRAVIMAX material hoppers, the material can flow freely. The hoppers can be equipped with fold-back lids to allow for material loaders mounted on top to be tilted back, which facilitates cleaning of the material loader and the hopper. The designation SL Design stands for "Stationary Lid". This structure allows the GRAVIMAX material hopper to be removed without having to detach the material loader.

Every GRAVIMAX is equipped for easy connection to a computer Ethernet interface. In this way, data transmission can also be effected by OPC UA via a licence acquired later. If no reporting system is already in place, WITTMANN offers its GraviLog software as a solution for data recording. This software package enables the acquisition and administration of all data from every GRAVIMAX blender present in a production facility.

Every new GRAVIMAX model is also prepared for WITTMANN 4.0, i.e. the standardized communication system for all appliances in an injection molding production cell. In this way, the GRAVIMAX can be connected with the processing machine and operated from there as well.

WITTMANN A-C standard servo axis (left) and the new A-C-Slim servo axis.

TEMPRO plus D300 oil device

WITTMANN TEMPRO plus D300 oil temperature controller.

Following the successful launch of the TEMPRO plus D250 oil temperature controller, which was already equipped to meet all requirements for WITTMANN 4.0 integration, WITTMANN has now gone even a step further by presenting the TEMPRO plus D300, the thermal oil temperature controller for highest demands up to 300 °C.

The TEMPRO plus D300 offers 16 kW heat output. The 1 kW pump generates a maximum pressure of 6 bar and a flow quantity of 55 l/min.

At this year's Fakuma, WITTMANN is also presenting for the first time a flow measuring device for oil temperature controllers, for both the TEMPRO plus D250 model and for new TEMPRO plus D300.

Moreover, WITTMANN will launch a frequency-controlled, high-performance *SpeedDrive* pump for oil appliances to provide even greater process reliability and a further improvement in energy efficiency. *SpeedDrive* offers the possibility to set one of four process variables (motor speed,

Throughputs ranging from 60 to 200 kg/h: WITTMANN GRAVIMAX G14 and GRAVIMAX G34 in the new design.

pump pressure, differential temperature or flow quantity) as an additional control parameter, which enables energy-optimized operation without jeopardizing the process.

The new TEMPRO plus D120/1-L ("L" = "Large")

The latest development is the TEMPRO plus D120/1-L, a generously dimensioned single zone temperature controller with water as a tempering medium. It is designed for a temperature range of up to 120 °C.

The "L" in the product name stands for "large" – in reference to this model's large heating and pump capacities. The pump is rated for 4 kW with a maximum pressure of 5.9 bar and a flow rate of 280 l/min.

The heating capacity is 36 kW. This unit can be used wherever large machine tools are operated, i.e. especially where production runs initially require high heat output followed by high cooling. The options that are available for the TEMPRO plus D120/1-L are in principle the same as for the other models of the D range of temperature controllers. The new model is also equipped with a 5,7" user-friendly touch-display. Via this display, the unit can be controlled, and all the different parameters can be read out. Many differing interfaces can be realized. This temperature controller can also be integrated into the control of the processing machine, following the WITTMANN 4.0 concept.

TEMPRO plus D120/1-L temperature controller is for example used with large molds.

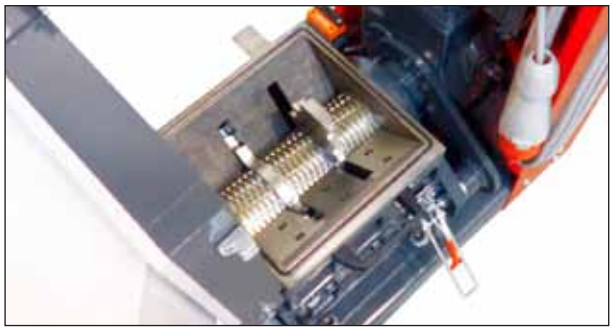
The new S-Max screenless granulators series

WITTMANN granulators produce less noise, save energy, have a compact footprint, need less maintenance, are equipped with hardened cutting tools, provide for easy cleaning and maintenance, and have excellent safety features.

As of now, the new WITTMANN granulators are available for delivery: S-Max 2, S-Max 2 Plus, and S-Max 3. These are low speed granulators for the inline-recycling of sprues made of hard and brittle engineering resins.

The S-Max series models are designed for the closed-loop recycling of sprues/runners from machines with up to 300 tons of clamping force. The S-Max is portable, allowing for great versatility.

An interface enables full communication with the injection molding machine. Optionally, a shutdown-function is available. When the injection molding machine is "off", the granulator stops automatically, helping saving energy. Many more interesting and advantageous features of the new S-Max series come as a standard. A high level sensor is located underneath the cutting chamber, thus avoiding the overfilling of the bin, and also keeping the cutting chamber free from regrind.



S-Max 2, opened: view of the cutting chamber.

This position of the sensor brings about some additional advantages: direct wiring to the electrical cabinet, the sensor's head not being amidst the material, and full inlet capacity of the bin.

The swivel outlet pipe can take different positions, making it easier to connect the flexible hose to the hopper loader. The slanted, front cut outlet pipe with adjustable airflow evacuates the regrind more efficiently and also avoids the blocking of the flexible hose. A good access to the cutting chamber is given from above via the 90° tilting hopper to allow an easy perfect cleaning.

New FLOWCON plus options

FLOWCON plus is the state-of-the-art flow controller automatically regulating the flow to maintain the set values. The FLOWCON plus stand-alone flow controller version now offers various new options which WITTMANN has developed in response to wishes expressed by users. In addition to the extensive range of standard features, the following extras are now available:

- Pneumatic main shut-off valves at the flow and return ends.
- Blow-out function – mold emptying with compressed air.
- An individual shut-off valve for each circuit at the flow end. ◆

Picture left: Low-speed screenless granulator S-Max 2, one of the three new models of the S-Max series. Picture right: FLOWCON plus stand-alone flow control solution from WITTMANN.

Fakuma Hall B1 Booth 1204

WITTMANN BATTENFELD accompanies Stiplastics in its development

Stiplastics, a French specialist in the production of innovative packaging and medical devices, has been growing steadily since its foundation in 1985. For nearly 20 years now, the company has been working with the WITTMANN Group.

Julie Filliere

The 2017 sales of Stiplastics have reached 21 million euros and is growing by 7 to 10% every year. Stiplastics, a subsidiary company of SGH Healthcaring, aims to be even more present in Europe and the USA – thanks to the many developments around Connected Health (use of new technologies to improve the health of patients).

The company's new premises in Saint-Marcellin (Isère) has more than 10,000 m² of floor space and is staffed with nearly 100 employees.

Stiplastics and the WITTMANN Group

Medical device manufacturer Stiplastics and WITTMANN BATTENFELD are connected to each other in a very special way. CEO Jérôme Empereur, before working with Stiplastics, had been working with the French branch of the WITTMANN Group for more than 20 years.

Along with this personal connection, Stiplastics relies on the WITTMANN Group because of their ability to provide complete turnkey applications – including injection molding machines, robots, and a wide range of peripheral equipment (granulators, dryers, blenders, temperature controllers, conveying equipment).

Today, Stiplastics runs more than 20 injection molding machines, all of them equipped with WITTMANN robots. The Stiplastics machinery in operation include two all-electric *EcoPower* injection molding machines from WITTMANN BATTENFELD with clamping forces of 110 and 180 t.

Recently, the company bought a hydraulic *SmartPower* machine with 300 t of clamping force. This *SmartPower* from WITTMANN BATTENFELD is part of a complete IML workcell that represents a perfect example of the close collaboration between WITTMANN BATTENFELD and Stiplastics.

The system uses camera control and is equipped with a WITTMANN W832 pro linear robot, the label magazine being developed by Stiplastics themselves.

Jérôme Empereur, upon being asked about the advantages of working with WITTMANN BATTENFELD, states: "Proximity, good professional relations, very good price/performance ratio, highly productive equipment, reliability, and especially excellent support when it comes to realizing a project. It is one of the priorities of WITTMANN BATTENFELD that they really long for supporting the projects of their customers from the beginning to the end, and they have a great ability to adapt to new situations that may arise." The long-term strategy of Stiplastics is to reach the turnover target of 35 million euros by 2035. The company continuously works on the development of new projects, and still counts on the assistance of WITTMANN BATTENFELD with the implementation of complete solutions. ◆

Complete workcell installation at Stiplastics Healthcaring in Saint-Marcellin, France: WITTMANN BATTENFELD SmartPower injection molding machine with 300 t of clamping force, WITTMANN W832 pro robot, and IML system.

From left to right: Fabien Chambon, CEO of WITTMANN BATTENFELD France; Jérôme Empereur, CEO of SGH Healthcaring; Werner Wittmann, founder and CEO of the WITTMANN Group.

Produced by Stiplastics on the SmartPower 300 for the pharmaceutical industry: shaker for a dietary supplement.

***Julie Filliere** is the Assistant to the Management, and is in charge of the marketing activities at WITTMANN BATTENFELD France SAS in Moirans.*

DAIGLER: from the idea to series production, with WITTMANN Group equipment

Expert knowledge, high quality, a good product mix and a focus on the customers' needs – this is what the success of the German company DAIGLER Kunststofftechnik GmbH, domiciled in Trochtelfingen, Baden-Württemberg is based on. To provide the best possible service to its customers, DAIGLER relies on injection molding technology from WITTMANN BATTENFELD.

Gabriele Hopf

About 80% of all machines running at DAIGLER are from WITTMANN BATTENFELD.

DAIGLER Kunststofftechnik GmbH was established by Matthias Daigler in 1977. The family-owned company was taken over by the next generation, Michael Daigler and Simone Acker, in 2014, and currently employs 45 workers. In a production facility of about 5,000 m², DAIGLER uses two-component technology to make products for the automotive industry, such as parts for vehicle interiors and roof rack systems. It also supplies parts to manufacturers of special commercial vehicles, to the electronics industry, the furniture industry and companies making articles for the nursing care and recreational sectors. In 2016, the company extended its capacity by 1,800 m² with a new building, which is used primarily as a warehouse and logistics hall and has thus provided extra space for production in the original building. The company's main markets are Germany, Austria and Switzerland; automotive parts are also shipped to Hungary, the Czech Republic and France.

Removal of a 2-component part by a WITTMANN robot.

DAIGLER supports its customers all the way from the product idea and prototyping to the finished part, including assembly of individual parts into complex components, a step which is gaining more and more significance. To this end, an in-house mold making shop is affiliated to the company as an independent entity, and a separate assembly department has also been created.

Apart from good customer support and its good product mix, DAIGLER sees its success factors largely in the expertise the company has acquired in the area of thick-walled plastic parts. Here, DAIGLER can draw on many years of experience as a manufacturer of bowling pins. Multi-component injection molding is another area in which the company is specializing.

Peripheral equipment from WITTMANN operating at DAIGLER: a GRAVIMAX gravimetric blender, ATON segmented wheel dryers and FEEDMAX material loaders.

Optimally equipped

Of the 21 injection molding machines installed on the corporate premises, 16 are from WITTMANN BATTENFELD. Robots, dryers, granulators and a central material conveying system from WITT-

MANN are used. Michael Daigler expresses complete satisfaction with the equipment from the WITTMANN Group. What he appreciates about the injection molding machines apart from user-friendliness and the integrative control system is primarily their high energy efficiency. All newer WITTMANN BATTENFELD machine models come with servo drives, including the machines from the hydraulic HM series as well as the most recently delivered *MacroPower* injection molding machines with clamping forces ranging from 450 to 700 tons.

Michael Daigler comments: "For us, responsible handling of our resources is not just a cost factor, but also an obligation towards our environment and towards society. In 2010, we acquired our first WITTMANN BATTENFELD HM *ServoPower*. We were immediately so impressed by the outstanding efficiency of its drive system that we decided to choose the *ServoPower* package for all other hydraulic machines we purchased from then on." The *MacroPower* 700/5100H/350L installed at DAIGLER, a 2-component machine delivered in 2015, is also equipped with a servo drive.

The company's equipment includes two machines from the energy-efficient, all-electric *EcoPower* series as well. These injection molding machines with a KERS system (Kinetic Energy Recovery System) make it possible to recover the released deceleration energy for use within the machine.

Where the peripheral appliances on the production floor of DAIGLER are concerned, the energy saving potential of WITTMANN peripherals is emphasized, for example that of the material dryers used here. In 2014, WITTMANN converted the then existing material conveying equipment into a modern central material conveyor system, to which now all processing machines are connected. Michael Daigler describes the way this ambitious project was realized as follows: "The conversion of the system – actually during ongoing production – worked really well and was handled extremely professionally by WITTMANN."

A small selection of parts manufactured at DAIGLER (from top to bottom): base of a passenger car roof rack, cover for a forklift truck, 3-component manual operating device.

A long-standing partnership

The cooperation between DAIGLER Kunststofftechnik and the WITTMANN Group has now existed for more than 20 years. Michael DAIGLER feels well cared for in this successful partnership, as he puts it.

What is appreciated apart from essentials like quality, user-friendliness, high precision and energy efficiency is the excellent support provided by the sales team, the integrity and long-term perspective, which all characterize WITTMANN BATTENFELD, a family-owned business still managed by its owners today. After all, the acquisition of production equipment invariably involves a major investment and requires long-term planning. Finally, as a customer of the WITTMANN Group, Michael Daigler specially appreciates the opportunity to purchase processing machines and peripherals from a single source. A fact with the invaluable advantage of having just one partner for all pieces of equipment. Michael Daigler: "This has definitely had a very positive effect on the realization of our projects." ◆

Michael Daigler, Managing Director of DAIGLER Kunststofftechnik (right), and Manfred Nerz, WITTMANN BATTENFELD salesperson, discussing a plastic part produced on the MacroPower.

From a 5-axis micro injection molding machine to a 6-axis high-tech cell

mikrotechnik HIRT (abbreviated MTH), based in Schramberg, Germany, is establishing itself increasingly as a specialist in small components, micro parts and hybrid parts. In close partnership with its customers, HIRT develops highly complex products and components which it produces with advanced technology and process reliability. HIRT manufactures these parts on a MicroPower 15/10 from WITTMANN BATTENFELD.

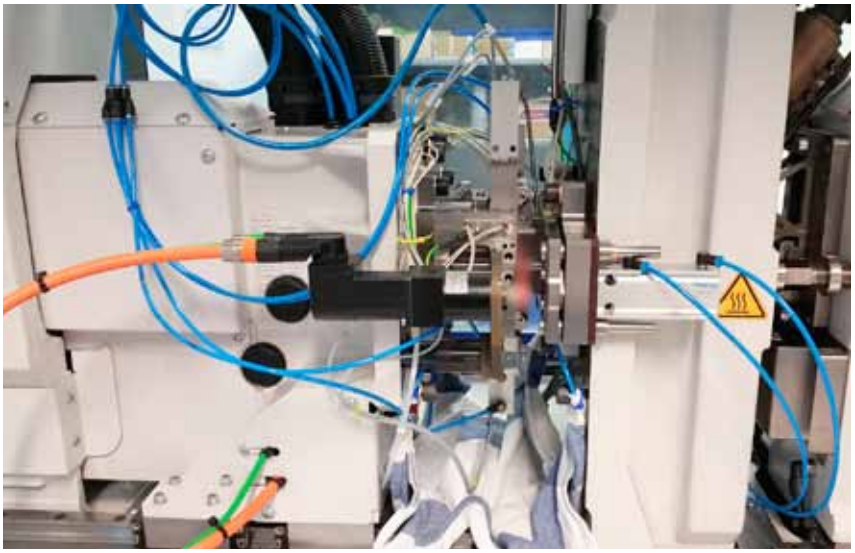
Gabriele Hopf

From the left: Philipp Zedelmair and Maximilian Birk from REINZ-Dichtungs-GmbH, Franz Hirt from mikrotechnik HIRT, Wolfgang Straubinger and Martin Philipp-Pichler from WITTMANN BATTENFELD, in front of the MicroPower 15/10.

Founded by Franz Hirt, mikrotechnik HIRT is a young, innovative company located in the central Black Forest. Its specialty is the development, design and production of micro parts consisting of plastics combined with metal, as well as complete systems. In this area, HIRT has been cooperating closely with WITTMANN BATTENFELD for a number of years. For Franz Hirt, owner-manager, close cooperation with his partners is a vital success factor. "Optimal results can only be achieved by an honest technological partnership based on mutual trust", says Hirt.

At mikrotechnik HIRT, a machine from WITTMANN BATTENFELD's *MicroPower* series with 150 kN clamping force has been installed, specially designed for injection molding of micro parts. This machine offers the utmost in terms of precision and cost efficiency, made possible primarily by its two-step screw-and-plunger injection unit with shot volumes ranging from 0.05 to 4 cm³.

Thermally homogeneous melt is injected via this aggregate. This enables the production of top-quality parts with absolutely stable manufacturing processes and short cycle times.



Mold and integrated unscrewing unit. Photo: mikrotechnik HIRT

Upgrading to a 6-axis production system

Working together in close partnership, mikrotechnik HIRT and WITTMANN BATTENFELD have jointly developed the 5-axis *MicroPower* into a 6-axis production cell. With this equipment, parts with unscrewing functions, helical micro cogwheels and shafts with inclination profiles can now be manufactured with high precision. Following mold opening, the cavity element inside the mold is driven by a toothed belt installed on the side of the mold to release the molded part for ejection. The ejector subsequently demolds the part with a servo-electric drive, and a new cycle starts as soon as the contour element has been returned to its original position.

The entire operation of the unscrewing unit is integrated completely into the machine's UNILOG B6 control system and operated from there. This makes it very easy for the user to address any conceivable unscrewing position with high precision. This function also makes it possible to drive thread cores inside the mold, for example to produce

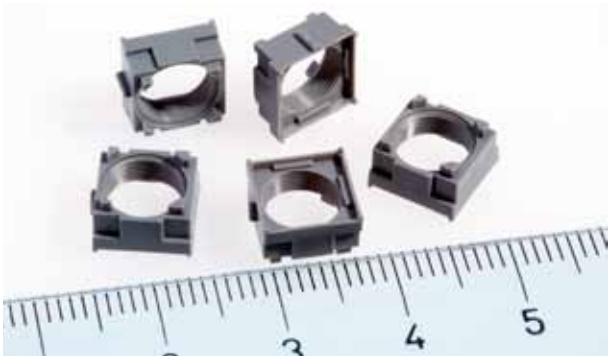
high-precision internal threads on molded parts. One outstanding example of an industrially produced part with such prefabricated internal threads is a focusing device used mainly in cameras to hold lenses in place and/or focus them, or in medical measuring devices to focus optical measurement systems.

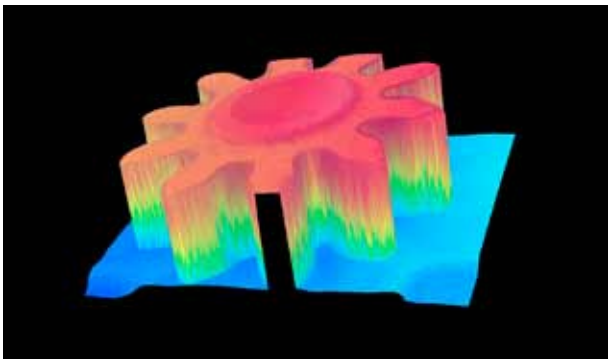
Different techniques plus tool engineering

mikrotechnik HIRT processes all types of thermoplastics. This also includes MIM injection molding. As a next step, micro thermoset processing is in planning. In its product development, HIRT cooperates closely with renowned institutes and technology centers, in particular with KISW in Villingen, a partnership greatly appreciated by Franz Hirt: "To put it simply, we know and trust each other, and sometimes one look is enough to understand what the other person thinks and would like to have realized. This is the way to master even projects with a difficult start."

More than 40 years of experience in injection molding and stamping of parts as well as assembly of components in international companies have enabled Franz Hirt to develop his molds in-house and design them in 3D.

His designs are developed with zero tolerance and high precision down to at least three decimal places. To achieve optimal manufacturing conditions, MTH cooperates with carefully selected suppliers in business relations developed over several years. These partners produce the mold components according to CAD and CAM specifications with a precision below +/- 5 µm for all stages and parts. Ejectors and drillings with a diameter of 200 µm alone present a special challenge in terms of manufacturing processes and accuracy. Only few manufacturers are able to fulfill the stringent requirements imposed by Franz Hirt. For example, the suppliers, which are selected according to strict criteria use 100 µm tools for cutting.





Nevertheless, the success rate for the new molds is no more than 70% in the first step. Manufacturing of the tools developed at MTH is only possible with the best high-tech 5-axis machines and experienced staff.

For example, drills bore holes into hard mold components with a 65 µm drill at about 60,000 to 80,000 revolutions per minute. Moreover, micro wire cutters with 0.03 mm wire diameter are used to cut extremely fine geometries, inclined parts produced in pairs and subsequently assembled into functional groups using special technologies.

A sought after partner

One prominent customer of mikrotechnik HIRT is the German REINZ-Dichtungs-GmbH, domiciled in Neu-Ulm, a well-known automotive supplier.

Maximilian Birk, project leader for application technology projects in the area of plastics systems at REINZ, and his colleague Philipp Zedelmair, who are for developing such systems, are both impressed by the products coming from mikrotechnik HIRT.

"Micro parts such as those we develop and produce with HIRT are hardly available anywhere else on the market. For us, MTH is exactly the partner we need for new developments in the micro parts segment", says Maximilian Birk.

Over the year 2017, mikrotechnik HIRT has strengthened the company's position of being a relevant specialist.

MTH is working on projects which, from today's point of view, are expected to provide work for several machines. There is no doubt that the micro sector will continue to grow due to the trend towards miniaturization, and the next step will be nanotechnology.

Franz Hirt is certain that the hybrid micro sector is still in its infancy and has enormous potential, especially in medical technology, electronics, communication and satellite technology, as well as in the automotive industry. ◆

Focusing device – example of a part with an internal thread produced industrially on a MicroPower.

From above: 3D scan of a component. Cogwheel compared with other objects to illustrate its size. Drain tube compared with other objects.

Photos: mikrotechnik HIRT

***Gabriele Hopf** is the Marketing Manager of WITTMANN BATTENFELD in Kottingbrunn, Lower Austria.*

LEIFHEIT uses advanced automation from WITTMANN

For almost 60 years, LEIFHEIT has been one of the leading providers of household products in Europe when it comes to cleaning, laundry care, kitchen goods and wellbeing. The Czech LEIFHEIT branch works with the WITTMANN Group.

Michal Slaba

The German LEIFHEIT Group is headquartered in Nassau/Lahn, and has a staff of about 1,000 employees.

LEIFHEITs products are sold in more than 80 countries all over the world, with Central Europe and Eastern Europe, the United States, and Asia as the key markets.

LEIFHEIT has more than 15 of its own sites and branch offices, including five logistics and production sites located in Germany, France and the Czech Republic.

Strong brands

With *Leifheit* and *Soehnle* – two of the best-known brands in Germany – the group offers high quality and innovative products with great utility and functional design. In addition to the Brand Business, LEIFHEIT operates in the service-oriented Volume Business with the French subsidiaries Birambeau and Herby.

A part of the LEIFHEIT Group, LEIFHEIT s.r.o. in Blatná has been in the Czech Republic since 1995. The Czech branch currently uses 39 injection molding machines from various suppliers with clamping forces ranging from 80 to 800 t.

As far as WITTMANN automation is concerned, LEIFHEIT s.r.o. makes use of five CNC robots of the W8 series and twelve sprue pickers from the WITTMANN Group. ◆

Production floor of LEIFHEIT s.r.o. in Blatná, Czech Republic: view of the WITTMANN W821 robot with customized multi-functional gripper ...

... and view of the insert preparation station.

Twist cleaning bucket handle/holder

Robot: WITTMANN W821

Preparation station/gripper: WITTMANN BATTENFELD CZ

Cycle time – manual handling: 78 seconds

Cycle time – with automation: 40 seconds

Commissioning: June, 2016

1
The production of the components is done in a double injection mold. First, the operator loads two metal arched handles into the insert preparation station, each with two mounted plastic hinges.

2
After loading, the station puts together the arched handles and the hinges by pressing.

3
After having connected the parts to each other, the components are lifted, and taken by the insertion mechanism of the robot's gripper.

4
When the mold opens, the gripper removes the two finished parts with molded holders from the moving mold half (left), and loads the two other parts without holders into the fixed half (right).

5
The gripper takes out the finished parts and one sprue from the mold area. The three parts are placed on a conveyor belt between the back side of the machine and the insert preparation station.

6
From the belt conveyor, the components slip down a special chute, driven by their own weight. The operator collects the parts from the chute.

7
At the beginning of the chute – at the end of the conveyor belt – a cut-out is located, through which the sprues fall into a prepared container under the chute.

8
The finished part with the overmolded holder in the foreground.

Michal Slaba *is General Director of WITTMANN BATTENFELD CZ spol. s.r.o., the Czech subsidiary of the WITTMANN Group, located in Písek.*

New WITTMANN material conveying system at WAREMA in Hungary

Located in Gyál, near the city of Budapest, WAREMA Plastic Technology Hungary Kft. (WAREMA PT) primarily manufactures injection molded parts for the automotive industry. Some years ago, the Hungarian branch of the WITTMANN Group installed the first configuration of a material handling system at WAREMA PT. Now, a two-stage expansion of the system has been executed, with the second phase to be completed in 2019.

Imre Bocskor

WITTMANN battery dryer and SILMAX drying hoppers with FEEDMAX material loaders, mounted on a platform in the WAREMA PT production plant in Gyál, Hungary.

Over the course of the expansion of the WAREMA PT material handling system, the construction of the entire installation had to be revised. The final outcome, however, will undoubtedly be impressive. Altogether, in the end, the conveying system will consist of 22 drying hoppers, plus two outdoor material silos. It will include the installation of six vacuum circuits, conducting both the loading of the hoppers and the material supply to up to 40 injection molding machines with clamping forces ranging from 35 to 1,500 tons. A new RFID-coded coupling station guarantees the faultless distribution of plastic material.

Vacuum pumps and filter stations.

Two stages of expansion

During the first phase of the expansion that already took place, the piping system of WAREMA PT's production was fully developed. In addition, the existing material drying system was relocated on a new platform and then completed with additional drying hoppers, the additional vacuum

Views of the piping of WAREMA PT's material conveying system.

Picture left: Close-up view of the RFID-coded coupling station. Picture right: The system's "brain": bus modules, line server, and the WITTMANN touchscreen network control.

circuits, and the new coupling station. The construction process turned out to be very challenging, as the old vacuum and material pipes – as well as some drying equipment – had to be integrated into the new system while the existing material handling installation was still operating. Despite the challenges, however, the switch from the prior system to the new system was accomplished within four working days.

In 2019, during the second stage of expansion, another six drying hoppers and one more dryer will be installed on the platform, and two outside storage silos with a capacity of 53 m3 will be integrated into the system.

Highly satisfying solution

Michael Schäflein, the Technical Director of WAREMA PT, is highly satisfied with the process of the implementation and the overall performance of the system. He commented on it as follows: "Due to our growth and the associated sharp increase in material consumption, the expansion of our existing material handling system became necessary. After a longer period of preparation and technical planning, the first phase of expansion took place between March 15th and 19th, 2018.

Technicians from both WITTMANN Austria and WITTMANN BATTENFELD Hungary were involved, as well as WAREMA PT's maintenance team. After an additional one or two days of optimization, the system reached failure-free operation, thus the first of two configuration levels was accomplished.

The effectiveness of the new material handling system has a remarkable impact on daily operations within the production, and the RFID-monitored coupling station made a positive impression on customers and the certifying company.

Upon completion of the second level of configuration in 2019 with another six drying hoppers and the integration of two outside material storage silos, we are well-positioned for the coming years to follow our strategy and to reach future objectives." ◆

***Imre Bocskor** is Managing Director of WITTMANN BATTENFELD Kft. in Budaörs, Hungary.*

WITTMANN BATTENFELD France on the road to success

For WITTMANN BATTENFELD France SAS, the French subsidiary of the WITTMANN Group, 2017 was the most successful year so far in its entire corporate history. The sales increased by 14% compared to the previous year, and the growth in order volume was even more dramatic. Increases occurred across all product segments, with substantial growth being realized especially in the sectors of granulators, robots and automation systems, with a corresponding increase in market shares in France.

View of the WITTMANN Group's new French headquarters in Moirans. Completion of the new building is expected in spring 2019.

Fabien Chambon, CEO of WITTMANN BATTENFELD France SAS.

As an appropriate response to this positive trend, a piece of land situated in the immediate vicinity of the existing company site has been acquired in Moirans, which will now serve as the basis for an extension of the existing production floor space. Planning for the new facilities to be constructed there is in full swing. The planned new factory and office building will have more than 5,000 m² of usable floor space. The total amount of investment for this project will be more than 5 million euros. Groundbreaking for the new French headquarters is expected to take place at the end of June this year. Completion of and relocation to the new building are planned for March 2019.

The roots of WITTMANN BATTENFELD France SAS in Moirans date back to the year 2002, when the French company Albora was taken over to 100% by WITTMANN. Today, the French subsidiary holds an important strategic position within the Austrian WITTMANN Group. The subsidiary develops and manufactures standard and screenless granulators for worldwide sale. The French branch within the group of companies has also developed into a competence center for the production of IML systems and special automation solutions for packaging systems – equipment which is sold by all subsidiaries of the group.

Following completion of the new office and production facility, the French subsidiary will be able to present to its customers the group's range of injection molding machines, robots and peripherals in a 400-m² showroom, combined with appropriate training facilities.

New General Manager

Effective 1 May 2018, Fabien Chambon has taken over the general management of WITTMANN BATTENFELD France SAS from his successful predecessor Thierry Pétra. Fabien Chambon comments: "Managing the French WITTMANN subsidiary is not only a challenge, but also a great pleasure – largely thanks to the excellent general conditions. The new building we expect to move into next year will enable us to perform our work even more efficiently and even closer to our customers. We are really looking forward to that!" ◆

Sweden: BATTENFELD Sverige AB celebrating 40 years

On September 5–6, leading equipment supplier BATTENFELD Sverige invited customers and suppliers to celebrate the company's 40 year anniversary. More than 100 guests were welcomed, and invited to review the complete program of the Swedish WITTMANN Group agent: machines in operation and all kind of peripheral equipment.

In 1978, BATTENFELD Maskiner AB was founded as a subsidiary of BATTENFELD GmbH, Germany, and founder Kenneth Hiljemark was appointed Managing Director. A management buy-out occurred in 1988 establishing BATTENFELD Sverige AB. In 2006, Christian Hiljemark was appointed Managing Director, making him the second generation managing the company from Halmstad, Sweden. Today, BATTENFELD Sverige supplies and services both the Swedish and Norwegian markets, covering all the needs of plastics processors there. Among other things, visitors of the anniversary celebration had the chance to see a *SmartPower* 240 in operation that

Impressions of the anniversary celebrations and open house event held at BATTENFELD Sverige AB in Halmstad, Sweden.

From left to right: Michael Hiljemark; Kenneth Hiljemark, BATTENFELD Sverige founder; Yvonne Hiljemark; Managing Director Christian Hiljemark.

was equipped with a W833 pro robot. Furthermore, WITTMANN Group auxiliaries from all sectors were presented, including the respective control panels. The showroom exhibition was accompanied and completed by papers and presentations dealing with the latest developments in plastics.

BATTENFELD Sverige AB thanks all customers and suppliers for making these two days a success and the company is looking forward to the challenging years to come in the industry. ◆

Czech Republic: 15 years of WITTMANN BATTENFELD

The Czech subsidiary of the WITTMANN Group celebrated 15 years of existence on September 6 this year.

One more reason for the open house event in Písek was the grand opening of the second extension of the subsidiary – completed in August of this year. Many Czech and Slovak customers and the management of the WITTMANN Group attended the event. Public figures such as Christian Miller, the Commercial Attaché of the Austrian Embassy, and Jaroslava Strnadová, the Mayoress of Písek also attended the event.

The 2nd factory extension now raises the footprint of the building from 874 to 1,601 m². During this second extension phase, the premises was completed with a restroom, a new two-storied administration building for the Service and Construction Department, a hall for the production and mounting of automation solutions, and also a safety fence and a new parking lot. It goes without saying that the continued extension

Lectures and lively debates at the open house event of WITTMANN BATTENFELD CZ on September 6.

of the subsidiary also created additional jobs – in particular for design, mechanical and electrical engineers.

Juraj Majerský, Managing Director of WITTMANN BATTENFELD Slovakia, on the mountain peak of the Kriváň in the High Tatras, „showing his colors".

WITTMANN BATTENFELD in Písek shares its anniversary date with WITTMANN BATTENFELD Sweden. Like Sweden, special injection molding and peripheral solutions were presented to the visitors.

The most noticed exhibits were a servo-hydraulic SmartPower 120 with energy-saving drive, equipped with a W818 robot, as well as an AIRMOULD® application that was running on an electric *EcoPower* 160. The lectures that were held also contributed to the success of the event, discussing several complex solutions realized by WITTMANN BATTENFELD CZ, and attracting many visitors. ◆

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