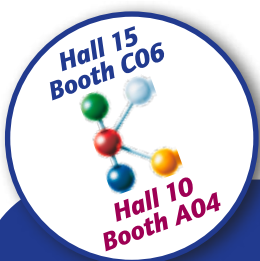


innovations

Techniques – Markets – Trends

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Editorial

Content



Michael Wittmann

Dear Reader,

Sustainability is THE topic this year at the world's biggest plastics trade fair, K, which runs from October 16th through 23rd in Düsseldorf, where the motto "Circular Economy" will highlight the closed-loop recycling of plastics. Though recycling, downcycling and upcycling cannot qualify as new concepts, public awareness and marketing imagery are currently fueling renewed interest in circular economy. In many cases, recyclate has already been fed back into production on a targeted and controlled basis for some time now. The main incentive was cost savings, and nobody made a big deal about it. With growing environmental awareness and public pressure to provide more sustainable products, companies now see opportunities and the need, not only to raise the advertising profile of recycling, but also to develop new applications and to identify new biodegradable or biogenic materials.

Is the general public truly ready for a serious examination of sustainability and circular economy at the level of technical detail that K 2019 will provide? That remains to be seen. The town hall where I live – a municipality with fewer than 5,000 residents – tells me, for example, that I'll be living in a "plastics-free community" starting from 2021. Anyone who believes that the use of toothbrushes, coffee machines, garden hoses, mobile phones, cars and many other objects from everyday life will then be prohibited is seriously mistaken, of course. The word "plastics" in the notice issued by those local officials is generally understood to mean only plastic cutlery and plastic bags. It's not clear, however, just what material people think comprises components of bicycle tires, insulation, residential piping and the outer shell of baby diapers.

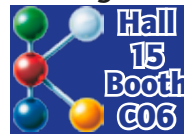
But getting back to K – which this year might already be more "plastics-free" than my town. We, too, will be using the K to present many sustainable solutions. As a full-service injection molding provider, we're also in a unique position to be able to offer complete inline recycling solutions. Our machines can also be equipped with our adaptive process technologies HiQ-Flow and HiQ-Melt, which make them ideally suited for processing recyclates and biomaterials. As a special trade fair highlight, we will be showing a cosmetics jar made entirely of biodegradable material produced from waste.

In addition, we will present again this year countless innovations from all product areas: machinery, automation and peripherals. Another focus of our trade fair exhibit will be dedicated to digitalization/*Industry 4.0*.

So be sure to visit us at our trade fair booths: hall 10/A04 and hall 15/C06.

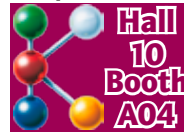
Yours cordially, Michael Wittmann

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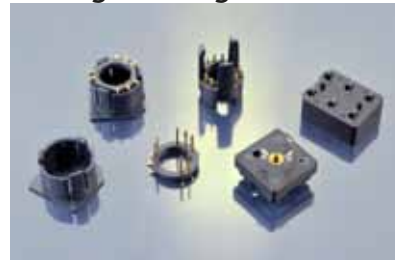
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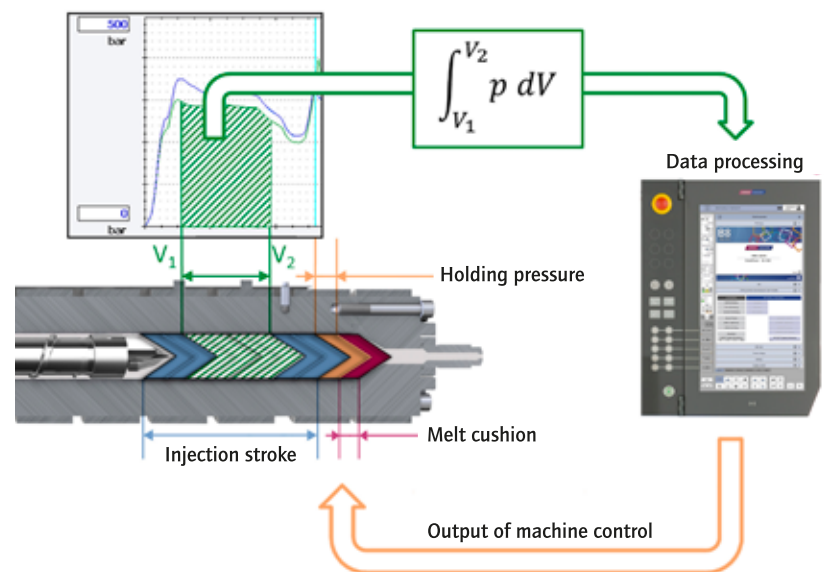
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WITTMANN BATTENFELD at the K 2019 for the first time in hall 15

At the K 2019 in Düsseldorf, WITTMANN BATTENFELD will exhibit its products and applications under the motto "Enjoy Innovation" for the first time in hall 15 at booth C06. WITTMANN BATTENFELD has thus an additional 120 m² of exhibition space at its disposal, and from 16 to 23 October the company will now be presenting its innovative injection molding technologies, processes and applications right next to its key competitors.

Innovation has always been a top priority at WITTMANN BATTENFELD. The company's product developments are designed to offer customers maximum benefit and simultaneously to protect the environment and preserve it for future generations in a sustainable way. Apart from further development and optimization of machinery and equipment, which are setting benchmarks in the market in terms of energy efficiency, this is achieved primarily through the development and continuous improvement of the adaptive HiQ application and process technologies and use of ultra-modern software systems and technologies to enable the integration of machines, robots, auxiliary appliances and MES systems via WITTMANN 4.0, plus sensor systems for machine condition monitoring, abbreviated CMS. Furthermore, the company is working together with partners on processing materials which at the end of their product life are 100% recyclable and/or completely degradable.

Schematic diagram of material viscosity-driven injection control.



EcoPower 55/350, polycarbonate clothes pegs will be manufactured with a 4-cavity mold supplied by Lechner, Austria. Using this fully integrated production cell, the advantages of integration via WITTMANN 4.0 and the TEMI+ MES system can be clearly seen. In a live demonstration, the product HiQ-Flow will compensate the effect of material viscosity fluctuations, thus ensuring stable quality and eliminating scrap. To avoid plastic waste, pieces of sprue and bad parts deliberately produced for demonstration purposes will be re-granulated in the new G-Max 9 granulator, and then directly returned to the machine hopper via the vacuum conveying device connected with the granulator.

New VPower COMBIMOULD with automation package

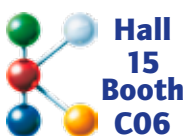
At the K 2019, WITTMANN BATTENFELD will show its latest further development of the vertical machine in *PowerSeries* design in the multi-component version. On a *VPower 120/130H/210V*, a plug made of PA and TPE for the automotive industry will be manufactured with a 2+2-cavity mold. The complete automation system for the machine is designed by WITTMANN BATTENFELD Deutschland in Nuremberg. In this application, a SCARA robot and a WX142 linear robot from WITTMANN are used, which insert the wrap pins, transfer the preforms, then remove and deposit the finished parts.

Intelligent machines with adaptive algorithms

The main theme of WITTMANN BATTENFELD's presentation at the K 2019 is to showcase intelligent machines with adaptive algorithms, which adjust themselves to the ambient conditions.

This will be demonstrated with an all-electric *EcoPower 55/350* equipped with the software packages HiQ-Flow, HiQ-Melt and HiQ-Metering. A W918 robot from WITTMANN and all auxiliary appliances connected with the machine, as well as the TEMI+ MES system, are integrated in the machine's UNILOG B8 control system via WITTMANN 4.0. The electronic mold data sheet will also be used on UNILOG B8. The production cell linked together via the WITTMANN 4.0 router is thus able to check whether the connected auxiliaries are sufficient for the selected product data set, or if additional equipment is needed.

At the WITTMANN BATTENFELD booth, this production cell will be used to present the HiQ functions in the form of specialist lectures and live demonstrations. On the





Introduction of new EcoPower Xpress in medical version

Another new product at this year's K will be a high-speed EcoPower Xpress 160/1100+ in a medical version. On this machine with 1,600 kN clamping force, PET blood tubes will be produced with a 48-cavity mold supplied by Pass Card, Taiwan. To meet the stringent requirements for PET plasticizing, this machine has been equipped with a modified high-performance screw. In addition, a special drying hopper has been mounted above the injection unit, where the granulate is dried by a frequency-controlled DRYMAX 300 dryer from WITTMANN. The tubes will be removed from the mold and deposited in transport boxes by the new WITTMANN high-speed robot. The robot controls a box exchange device, which removes every full box and replaces it immediately with one of the empty boxes held ready, to ensure uninterrupted production of the tubes.

Medical application on MicroPower 15/10 production cell

Another medical technology application will be demonstrated on a machine from the MicroPower series from WITTMANN BATTENFELD designed for the production of micro parts in the clean-room version. Using a MicroPower 15/10 with 150 kN clamping force, a micro retaining ring for medical miniature tubes will be produced from PC with an 8-cavity mold supplied by Wittner, Austria. This product has a part weight of only 2 mg.

The machine comes with a rotary unit, an integrated WITTMANN W8VS2 robot and a camera for complete parts inspection. Following removal and camera inspection, the parts are transferred to transport containers, separated according to individual cavities. A novelty in the MicroPower is a further improved, 2-step screw-and-plunger injection unit now able to process shot volumes of up to 6 cm³.

Lightweight technology for the automotive industry

With an example from the automotive industry, WITTMANN BATTENFELD will demonstrate at the K 2019 its competence in CELLMOULD® structured foam technology, which enables the production of extremely light-weight

parts as are required primarily in the automotive industry to reduce fuel consumption and/or increase the battery range. On a MacroPower 1100/12800 with an energy-efficient servo drive, a seat bench support for a German sports car will be manufactured from PP with a single-cavity mold supplied by Frimo, Germany. The machine is equipped with the SEDE combined nitrogen and pressure generator unit developed and manufactured by WITTMANN BATTENFELD. The nitrogen required for this technology is taken from the ambient air and compressed to the working pressure of up to 330 bar. The material processed will be a type of PP suitable for automotive applications supplied by Borealis. It is the type ME225SY, which contains 25% post-consumer recycling material and 25% talcum. With the use of recycling material in passenger car interiors, WITTMANN BATTENFELD makes a significant contribution to promoting the recycling economy in the automotive industry. The parts will be removed and deposited by a WX152 robot from WITTMANN.

On this machine, the CMS condition monitoring system from WITTMANN BATTENFELD has been installed, too, which ensures continuous condition monitoring of the most important machine parameters. The current condition of the MacroPower 1100 can be read out from a CMS info and



Mold for blood tubes, manufactured on an EcoPower Xpress 160, in medical version.

CELLMOULD® module on a MacroPower 1100.

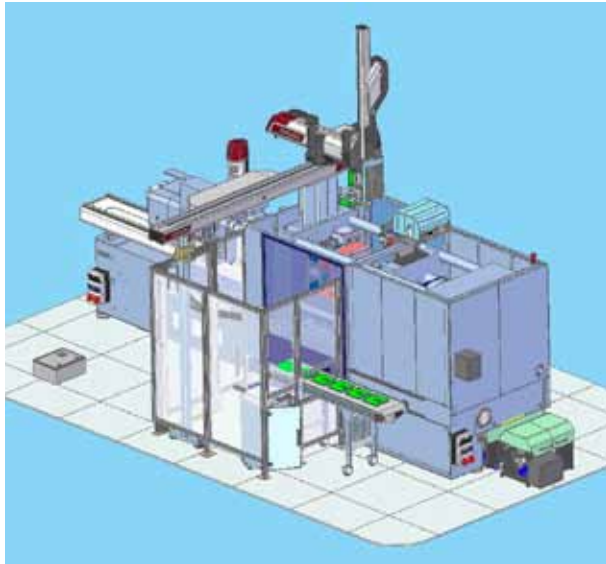
control station placed directly next to the machine. Beside this machine, there is also an AIRMOULD®/CELLMOULD® info stand, where visitors can get detailed information about the processes being demonstrated.

High-tech sheet for the automotive industry

A second application for the automotive industry will be presented on a machine from the SmartPower series in XL configuration. With a SmartPower 240 XL, a module for a car headliner with a functional surface will be produced with a single-cavity mold supplied by Georg Kaufmann, Switzerland. The module consists of an operating section mounted at the center and lighting sections on each side. For the production of this module, the IMD VARIOFORM process developed by LEONHARD KURZ (hall 5, booth A19 – E09) is used. In this process, a partially translucent decoration sheet is combined with a functional sheet with a printed-on sensor structure on the inside of the molded part. The poly TC sensor demonstrates the touch operation of light on/off and dimming functions as well as setting of

Hall 15 Booth C06

SmartPower 240 XL with automation from WITTMANN BATTENFELD Deutschland, Nuremberg, to produce sensor sheet.



the color of the LED light source behind it. The machine is equipped with an automation system from WITTMANN BATTENFELD Deutschland in Nuremberg. It consists of a WX142 robot from WITTMANN with a C axis and an infrared radiation heater on the Y-axis to heat the continuous sheet used for this application. The WX142 inserts the functional sheet with sensor structure into the mold. The next step is to pull the IMD VARIOFORM sheet through, heat it and then thermoform it using a vacuum. During the same production step, both sheets are overmolded. In this application, the sensor sheet can be optionally selected via a touch button. In this way, it is possible to injection-mold parts either with or without sensor sheet.

LSR application on EcoPower 160

Cosmetic jars made of a compound 100% based on natural materials.

One of WITTMANN BATTENFELD's main application technology themes at the K 2019 will be silicone injection molding. WITTMANN BATTENFELD will demonstrate its expertise in this area at its booth in hall 15 by producing a valve for medical technology from an LSR formulation on a machine of its all-electric EcoPower series, an EcoPower 160/350, with a 16-cavity mold supplied by Nexus, Austria (hall 12, booth E49-01). The injection unit in open design



Medical LSR valve.

enables easy integration of the LSR metering unit. The Nexus Highline metering unit comes with a new servomix metering system with OPC-UA integration. In the mold, latest cold runner technology is used including TIMESHOT needle shut-off control. Parts removal and depositing will be handled by a WX142 robot from WITTMANN.

Recycling economy with a product from the packaging industry

“Circular economy” is not only a modern buzzword, but also a strategic focus of WITTMANN BATTENFELD. At the K 2019, WITTMANN BATTENFELD will present one of its current projects jointly with a partner company. Here, cosmetic jars with lids will be manufactured from a material completely based on natural ingredients on an EcoPower 240/1100H/130L COMBIMOULD using a 4+4-cavity mold. This material can be recycled without any loss of its functional properties.

The jar is injected by the machine's main aggregate, the lid by the L aggregate. The machine is equipped with a fully integrated W842 pro robot from WITTMANN, which takes a round paper label from a magazine and inserts it on the clamping side for the bottom of the jar. Next, the W842 pro removes the parts from the nozzle side and passes the jars on to a W818 robot, which inserts them into a screwing station. The W842 pro then transfers the lids for the jars to the screwing station, where they are screwed onto the jars and deposited.

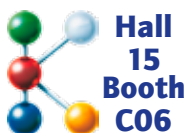


TEMI+

In addition to the AIRMOULD®, CELLMOULD® and condition monitoring system info stands, there will also be an info corner presenting the TEMI+ MES package at the WITTMANN BATTENFELD booth. TEMI+ is able to work with injection molding machines as well as robots and auxiliary appliances around the machines. This makes it possible to obtain complete, comprehensive data acquisition and analysis of the quality parameters from all appliances involved in the production of a part.

Info point for plasticizing systems

The plasticizing system of an injection molding machine is the central unit determining the quality of a plastic component. WITTMANN BATTENFELD supports its customers with tailor-made solutions in terms of geometries, materials and surface finish. At the K 2019, visitors will have an opportunity to gather information about the latest developments at a separate info point. ♦



WITTMANN at the K show 2019

The WITTMANN Group is once more using the K in Düsseldorf to present its numerous new product developments in many different areas. From 16 to 23 October, the company will showcase its latest innovations in the fields of automation and auxiliaries on its booth A04 in hall 10.

Inline recycling solutions from WITTMANN

As a complete system supplier of automation and auxiliary equipment – and in particular as a manufacturer of granulators – WITTMANN is in the unique position to be able to offer functionally optimized work cells for recycling and immediate re-use of plastic materials: inline recycling



fully in line with the principles of a circular economy, which is the main theme of this year's K in Düsseldorf. Here, users can choose from a wide range of possible equipment and model variants for effective sorting and regrinding of sprue and rejects, and returning them to the production process in a targeted way.

The basic version of a WITTMANN inline recycling cell consists of the WP80 pneumatic sprue picker from WITTMANN, the new G-Max 9 granulator and a FEEDMAX S3 standalone loader with a metering valve.

For grinding harder and fiberglass-reinforced plastics, a screenless granulator from the WITTMANN's S-Max series is used. Depending on the required degree of accuracy for the dosage of regrind, the WITTMANN inline recycling cell can be extended by adding a GRAVIMAX blender. Using a WITTMANN GRAVIMAX ensures that the machine is not fed an excessive amount of regrind at any time. Another option is using a servo picker instead of the WP80 sprue picker equipped with pneumatic cylinders as standard – for example a WITTMANN WS80, or the small servo-driven PRIMUS 10 machine.

A WITTMANN BATTENFELD injection molding machine from the PowerSeries will compensate any fluctuations in process behavior during metering and injection with the help of the HiQ-Melt and HiQ-Flow process technolo-

gies. One of WITTMANN's exhibition highlights at this year's K will be the presentation of the numerous options offered by the inline recycling cells.

The new G-Max 9

The G-Max 9 granulator is suitable for inline recycling of soft to medium-hard rejects and sprue consisting of TPU, PP or PE – to be used on injection molding machines with clamping forces of up to 90 tons.

Depending on the type of application, there are three material hoppers of different heights to choose from for the G-Max 9. This modular design concept enables adjustment of the beside-the-press granulator to the varying process technology requirements it has to meet. G-Max 9 material hoppers and their applications:

- Low material hopper for use below a chute connected to the machine. The granulator is fed directly from the machine; no further handling is required here.
- Medium-height material hopper for use below a conveyor belt or drum separator. For small to medium-sized sprue.
- Standard-height material hopper for a beside-the-press application with a sprue picker or robot.

Drawing of an inline recycling cell with sprue picker, granulator and material loader.



G-Max 9 granulator with low, medium-height and standard-height material hopper.

For optimal cutting performance and maximum efficiency, the cutting rotor of the G-Max 9 comes with 3 × 3 knives arranged in a staggered position, which produce a clean, uniform granulate. Changing knives is extremely easy and comfortable.

The material sifters of the G-Max 9 are available with holes in different sizes, that is, with diameters of 4, 5, 6 or 8 mm. This ensures suitability for varying materials and

Hall 10 Booth A04

throughput rates. The tiltable material hopper facilitates cleaning and servicing of the appliance enormously. So, changing a sifter can be carried out without tools, and the maintenance periods are shortened to a minimum.

The new G-Max 9 can handle a material throughput of up to 20 kg/h (depending on the form of parts, pieces of sprue, sifter size and quality of material); it operates with a low noise level and is extremely energy-efficient.

ATON H1000
battery dryer.

New GRAVIMAX gravimetric blender

At the K 2019, WITTMANN will demonstrate the latest new development of its gravimetric blenders from the GRAVIMAX series. At the beginning, material throughputs of up to about 60 kg/h could be achieved, but the latest models of the G series are now designed for applications requiring material throughputs of more than 700 kg per hour. While the two smaller appliances can process metering quantities of 1 kg and 3 kg respectively, which



GRAVIMAX G76
blender.

may consist of up to four different components, the new GRAVIMAX G76 material blender is able to handle 7 kg per dosing cycle and to blend in up to six different components.

In spite of the large quantity of material, RTLS real-time weigh-

ing technology makes it possible to reach a reproducible dosing accuracy of 0.05% in the ratio of virgin material to additive.

The material containers of the GRAVIMAX G76 from WITTMANN are virtually free of interfering edges, so that they do not obstruct the free flow of the material. From these specially designed material containers, each component is metered into a weighing container by pneumatic dosing sliders.

Depending on the material, the dosing sliders can either be opened for a set period of time to let the material flow freely, or they are opened in pulsed intervals until the desired quantity of material has been reached, which particularly favors constant dosing results. After weighing, the materials flow into a spherical mixing container, where they are mixed into a homogeneous blend by a spiral-shaped device.

Thanks to the *GraviLog* software developed in close cooperation with WITTMANN customers, various different material quantities and dosing deviations can be documented, and compound formulations can be administered. GRAVIMAX G76 is also capable of bidirectional data exchange via OPC-UA.

Front of the ATON H1000, close-up view.



Extension of the ATON segmented wheel dryer series

WITTMANN has been successful for more than ten years in the field of material drying with its segmented wheel technology, a technology continuously refined over time in order to adjust it to changing needs and requirements on the market. While the original overriding goal was to achieve a constant dew point behavior even under the



most difficult conditions, users very soon started to demand particularly energy-efficient solutions. To cater to the increasing trend towards production equipment integration, an interface solution was created for WITTMANN 4.0, and the

WITTMANN dryers were also equipped with larger touch screens. WITTMANN ATON segmented wheel dryers were laid out as compact beside-the-press appliances which could handle a dry air volume ranging from 30 to 120 m³/h.

The experience gathered over the last ten years has now led to the development of a battery dryer model with a segmented wheel, which will be presented for the first time at this year's K. The ATON H1000 battery dryer, already frequency-controlled in the standard version, is the first segmented wheel dryer for central plants. It can handle a dry air volume of 1,000 m³/h, which is capable of drying 500 to 600 kg of plastic granulate per hour.

The ECO wheel drying wheel, consisting of numerous segments, is loosely filled with a desiccant. Similar to the compact appliances, it is rotated via a low-maintenance chain drive. In this way, a molecular sieve which is always fresh is available for the air to be dried, in order to maintain a constant, low dew point. The ATON H1000 comes with several different adjustment options, including dew



point-controlled drying. The different ambiLED light colors inform operators in the simplest way and at a glance about the current status of the dryer. The appliance is extremely easy to operate via its plain text touch screen user interface, where the temperatures and the dew point are displayed clearly and easy to read.

New TEMPRO plus D100 temperature controller

Industry – and especially the injection molding sector – is very strongly influenced in this age of digitization by the fact that most industrial customers require from their suppliers not only absolute high quality but also thorough documentation.

Due to continuous further improvement, the high-end temperature controllers of the TEMPRO plus D series from WITTMANN, with an excellent reputation worldwide, have been able to satisfy all of these requirements. Here, the 16,000 TEMPRO plus D temperature controllers shipped to all parts of the world so far speak for themselves.

Requirements analyses in a great variety of production sectors have pointed to a demand for pressurized temperature controllers for a maximum temperature of 100 °C. To meet this demand, WITTMANN will introduce the new temperature controller model TEMPRO plus D100 at this year's K in Düsseldorf. With this appliance, WITTMANN underscores once more the significance of this series and its expertise in product development.



The new TEMPRO plus D100 belongs to the range of temperature controllers recommended for use as components of WITTMANN 4.0 production cells. WITTMANN 4.0 is the name of the solution from the WITTMANN Group, which leads into the world of Industry 4.0. Consequently, TEMPRO plus D100 can be fully integrated in the control system of a WITTMANN BATTENFELD injection molding machine.

The new temperature controller is capable of 9 kW heat output and stands out by its magnet-coupled stainless steel pump, which ensures sufficient flow quantities. The pump capacity is 0.5 kW, with a maximum flow quantity of 40 l/min and a maximum pressure of 4.5 bars.

The TEMPRO plus D100 is equipped with a wear-resistant, maintenance-free flow quantity measurement device as standard. Like all other WITTMANN temperature controllers, TEMPRO plus D100 also offers an extensive choice of additional equipment options in order to configure the absolutely perfect temperature controller tailored to fit every conceivable application.

Extension of the PRIMUS robot series

PRIMUS 16T: In addition to various other novelties in the robot sector, WITTMANN will roll out two new appliances of the PRIMUS series at this year's K. The smaller of the two appliances from this series is called PRIMUS 16T. The Z and X axes of this appliance are based on the already



well-known PRIMUS 16, what makes the difference is the Y axis, which is telescopic. This is why the PRIMUS 16T is specially recommended for use in confined surroundings. Thanks to its telescopic system, it is possible in

PRIMUS 16T robot.

most cases to dispense with external protection of cranes, which saves costs. With its nominal load capacity of 5 kg, the PRIMUS 16T enables safe handling of heavy grippers for six or eight cavities.

PRIMUS 48/48T: In 2018, WITTMANN presented for the first time a PRIMUS robot with a movable X axis. The PRIMUS 26/26T introduced then combined the advantages of two appliances and made it possible to install PRIMUS solutions on injection molding machines with up to 900 t clamping force. Now the series is being extended once more. With the start of the K 2019, the PRIMUS 48/48T will be released for sale. This appliance is laid out for injection molding machines ranging from 20 to 900 t in clamping force. Its horizontal strokes can reach a maximum of 6 m, which means that several pallet bays can be arranged beside the injection molding machine, or a place for parts depositing can be positioned behind the machine's clamping unit. To further enhance its flexibility, the robot comes with a continuous drilling pattern as standard. The demolding axis

TEMPRO plus D100 temperature controller.

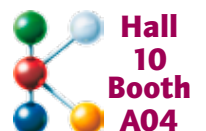


offers a maximum stroke of 1,200 mm, the vertical range is from 1,600 to 2,000 mm, with the vertical axis made telescopic from a stroke of 1,200 mm upwards to

PRIMUS 48T robot.

provide a further increase in stability. Customers can choose between the PRIMUS 48 single axis and the PRIMUS 48T telescopic version.

Both versions have the same load capacity of 20 kg. The PRIMUS 48/48T comes with a completely re-designed vertical tube, whose rigidity values are comparable to those of the WX appliances. On the vertical tube of PRIMUS 48/48T, only the quick couplers for vacuum, compressed air and gripper feedback are visible, the hosing is concealed inside. ♦



Energy-efficient machines for a renowned automotive supplier

For more than 20 years, Karl Etzel GmbH in Mühlacker, Baden-Württemberg/Germany, has been producing high-quality parts for the automotive industry with injection molding machines from WITTMANN BATTENFELD. The new PowerSeries machines score at Etzel primarily with their high energy efficiency.

Gabriele Hopf

Etzel's Hall 7 equipped with machines from the MacroPower and SmartPower series from WITTMANN BATTENFELD.

Karl Etzel GmbH was established by Karl Etzel in 1976. In 1995, Andreas Schürhle and Rainer Bauer took over the company; Andreas Schürhle has been the sole proprietor of Karl Etzel GmbH since 2000. At its location in Mühlacker, the company manufactures parts from all common thermoplastic materials with about 300 employees on 30,000 m² of production space with currently 128 injection molding machines ranging from 150 to 20,000 kN in clamping force. Between 50 and 60 tons of granulate are processed daily, in part with up to 50% fiberglass content. More than two thirds of the products are parts for the automotive industry, primarily components for vehicle interiors. The remainder goes to the medical industry, the electronics industry and building construction. The company's customer base includes famous brands such as Daimler, Lear, Greiner, Johnson Controls and Kärcher.

The company is certified according to the IATF 1949:2016 automobile standard and supports its customers from the initial idea to series production. In addition to conventional injection molding, it offers 2-component injection molding, lightweight technology, component assembly, direct lasering of plastics surfaces as well as painting, flocking and chrome plating in long-standing cooperation with partners.

According to the company's proprietor and CEO Andreas Schürhle, the success of Karl Etzel GmbH is based on the high quality of its products and service, as well as on the good cooperation with its customers. As Andreas Schürhle explains: "The entire package must be a perfect fit, from the products and logistics all the way to personal customer support." Stability and reliability of deliveries are vital success factors above all in the automotive industry. Consequently,



Etzel's most important requirement for an injection molding machine is stable and trouble-free operation. In addition, Andreas Schürhle attaches very great importance to environmentally compatible production and saving resources.

Etzel and WITTMANN BATTENFELD

Of the 128 injection molding machines currently installed at Karl Etzel GmbH, just under 90 are from WITTMANN BATTENFELD. The most recently constructed Hall 7 is equipped exclusively with large machines from the MacroPower series and machines from the servo-hydraulic SmartPower series with clamping forces ranging from 3,500 to 20,000 kN, some of which are multi-component models. The first large multi-component machine from the MacroPower series with 20,000 kN clamping force manufactured by WITTMANN BATTENFELD, a MacroPower 2000/12800H/350L, was delivered to Karl Etzel GmbH at



*Picture left:
Servo-electric
screw drive on a
MacroPower 2000.
Picture right:
Loading sill cover.*



*Support for a pas-
senger car center
console.*



*Picture left:
Removal and de-
positing of a wheel
arch liner by a
WX173 robot from
WITTMANN.
Picture right:
Storage compart-
ment for passen-
ger car.*

the beginning of 2018. Meanwhile, Karl Etzel GmbH has installed a second machine with 20,000 kN clamping force from WITTMANN BATTENFELD as well.

Besides multi-component technology, the CELLMOULD® foam injection molding process to make light-weight parts is also used at Etzel. This technology is a process developed by WITTMANN BATTENFELD for the production of structured foam parts by direct gas injection with a physical foaming agent. Structured foam parts feature a compact shell and a foamed core. With CELLMOULD® light-weight technology, extremely light molded parts can be produced with high rigidity and without sink marks. This makes these parts interesting above all for the automotive industry, where both quality standards and weight play an important part. The entire machine technology for this process, including the plasticizing barrel unit, injectors, gas regulator and gas generator, has been developed and produced by WITTMANN BATTENFELD.

A perfect partnership

What Andreas Schürle appreciates about the compact injection molding machines from WITTMANN BATTENFELD apart from their high quality is primarily their low energy consumption. Comparative energy consumption measurements carried out at Etzel on machines of other brands have confirmed that in this respect the machines from WITTMANN BATTENFELD are on a high level and distinguish themselves from competitors' products.

Andreas Schürle shows himself just as much satisfied with the cooperation with WITTMANN BATTENFELD, which has now lasted for more than 20 years, as with the company's machines and technologies, saying: "Just like to our customers, the overall package is important to us, too, and here we have found a partner in WITTMANN BATTENFELD where this package meets our requirements in every respect." ♦

Gabriele Hopf
is the Marketing
Manager of WIT-
MANN BATTEN-
FELD in Kottig-
brunn, Lower
Austria.

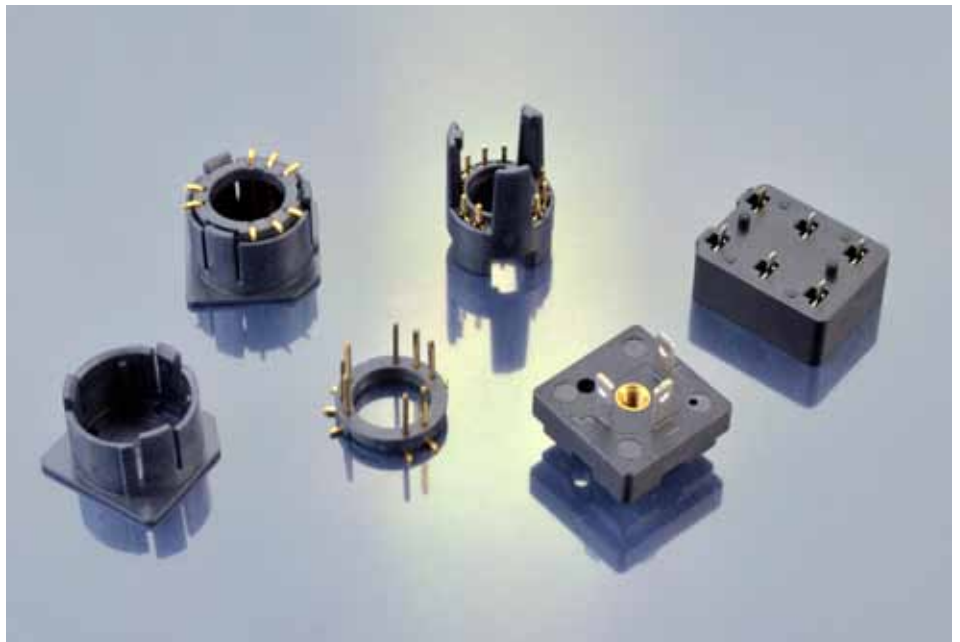
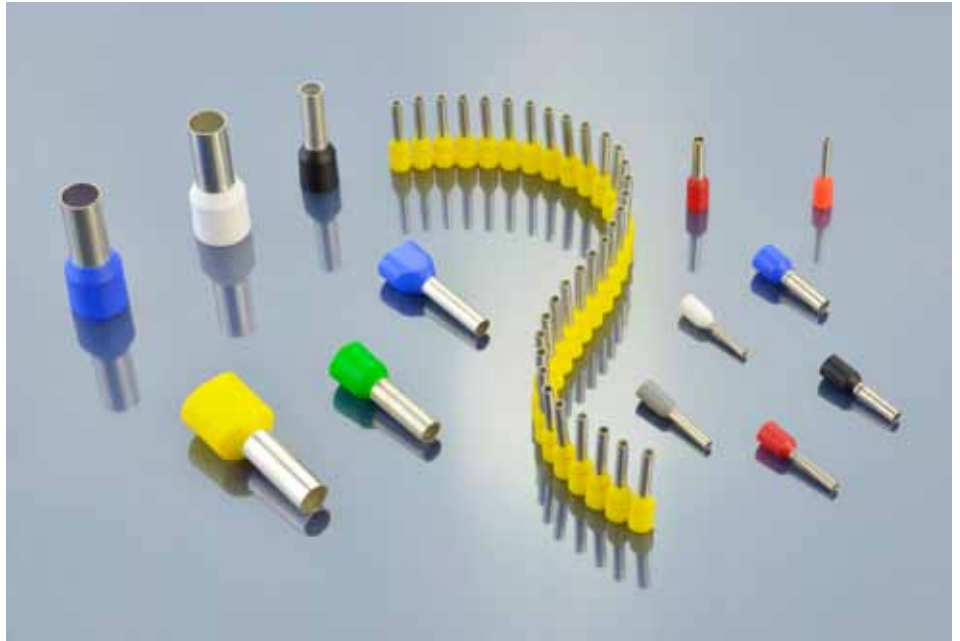
Injection molding machines for tens of thousands of contacts

Headquartered in Lostorf in the Swiss canton of Solothurn, Vogt AG develops, produces and markets contact elements for electromechanical applications. To manage its vast product range and keep cost pressure in high-wage Switzerland in check, this family-run business pursues tailor-made strategies focusing on the customer on the one hand and on the employees on the other.

Thomas Robers

Thomas Vogt, CEO of Vogt AG, heads the family-run business in its second generation. His customers are always the center of attention. "We want to supply our customers with the full spectrum of our products, from simple contacts installed millions of times over to special connectors for small-scale production series." A tour of the company quickly reveals the other mainstays of his successful business management: solid technical knowledge of the company's own products and a friendly, highly motivated rapport with the employees. Typical of family-run businesses, these strengths – customer focus, technical expertise and a motivated workforce – constitute decisive advantages and underpin the success of such companies. Vogt is no exception to that rule.

Solid technical knowledge and enthusiasm for the company's own products also characterizes Jürgen Sohn, Production Manager and Member of the Executive Board. He, too, is very enthusiastic about the breadth of Vogt's product portfolio. From standard contacts to special solutions, no wish goes unanswered. That also explains why customers are so loyal to the company: By the time a customer asks where he can obtain a certain product, Vogt already provides him with the corresponding sample or has the project sketches for a new development available.



Vogt's product range includes cable connector contacts manufactured by the millions ...

... as well as an extremely wide range of special connectors.

Vogt's customer base includes well-known companies in the electronics industry, automotive and measurement technology industries such as Huber+Suhner, Endress+Hauser, Leica Geosystems and Diehl Aerospace. The latter uses a contact component from Vogt in the door system for the

world's largest passenger aircraft, the Airbus A380. About 75% of the entire production is exported outside of Switzerland. Of course, no company could carry such a challenging portfolio without extremely efficient and innovative production resources. The following example illustrates this very well.

With a bundle of wire-end ferrules manufactured by Vogt, the individual ferrules are arranged next to one another in a line (the serpentine draped part shown here with yellow plastic components).

The manufacture of this mass-produced item is subject to particularly high cost pressure. About 20 years ago already, Vogt developed – specifically for this part – a mold with 400 (!)

cavities, including the system to handle the fully automated feed of the 400 metal sleeves that are overmolded on a vertical BATTENFELD injection molding machine.

Vogt and the WITTMANN Group

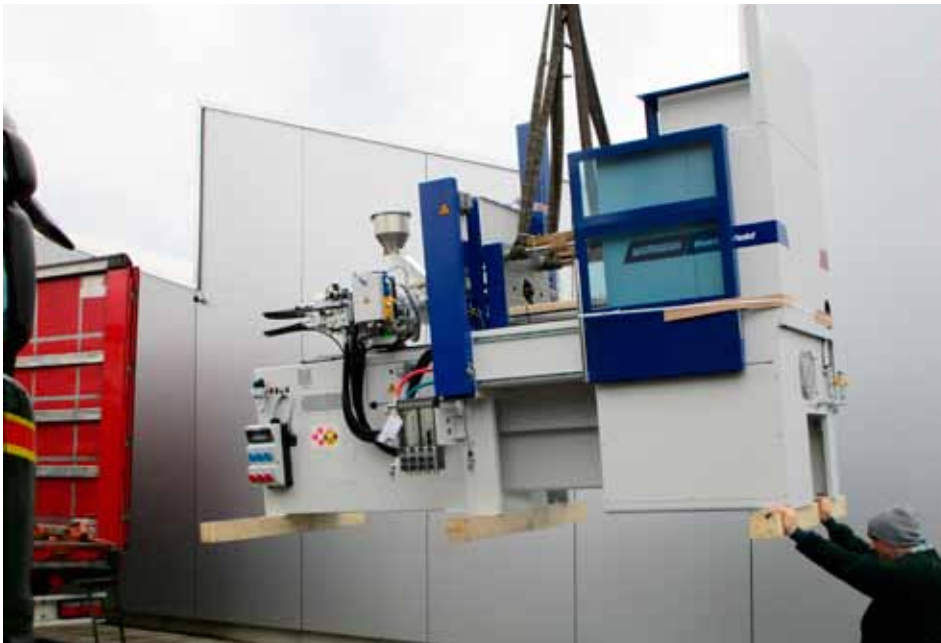
All the more remarkable, considering the fact that Vogt started out without any production at all. Established in 1962 by Peter Vogt, the company was strictly a trading company at first. Through his customer focus, which was already part of his everyday routine back then, and extensive product knowledge, Peter Vogt realized almost immediately that the products customers actually needed in prac-

tice were not available anywhere. Driven by the requisite entrepreneurial spirit, he built his own manufacturing operation, which has since grown to a considerable size and currently includes about 100 production machines. Most of them are metal processing machines, such as pipe bending machines and punches.

Peter Vogt recognized the benefits of using plastic-metal bonds to produce electrical contacts, and began to concentrate on establishing injection molding operations to manufacture plastic overmolded contacts. Those production operations have been expanded continuously, and in March of this year the 25th injection molding machine was put into service – a *SmartPower 50/130*. Of the 25 existing injection molding machines, 23 are from BATTENFELD or WITTMANN BATTENFELD – and more than a few of them have been running since the early days of the company. As a result, today Vogt's injection molding production features nearly every model that BATTENFELD and WITTMANN BATTENFELD has produced over the years. The oldest models here are more than 30 years old – and still in operation. >>

March 2019: A SmartPower 50/130 injection molding machine is delivered to Vogt AG in Lostorf.

Jürgen Sohn, Head of Production at Vogt AG, Thomas Robers, Managing Director of BATTENFELD (Schweiz) AG, and Thomas Vogt, CEO of Vogt AG (from left to right) in front of the recently delivered SmartPower 50/130 injection molding machine from WITTMANN BATTENFELD with a WP80 sprue picker from WITTMANN.



Injection Molding

Four generations of WITTMANN BATTENFELD injection molding machines in one of the Vogt production halls. Pictured at the lower right is a model from the HM series from 2013; on the left is the SmartPower delivered in 2019; at the center to the right are models from the BA series from 1986; and behind them are two models from the CDC series from the 1990s. In the background on the left are 4-station vertical machines, indispensable for manufacturing contacts.

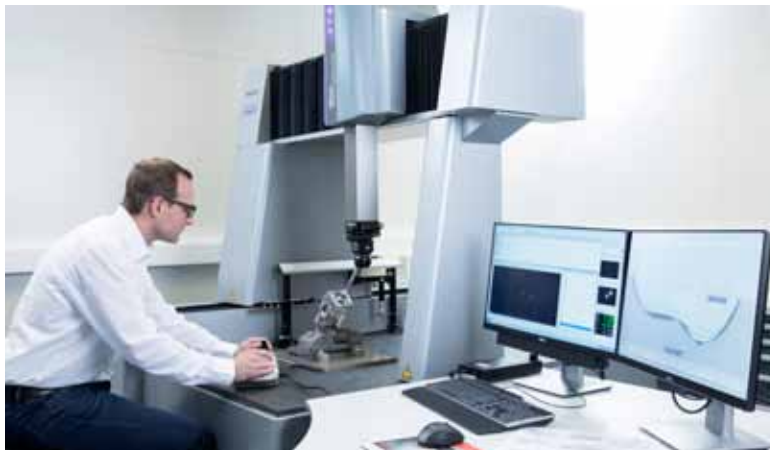


The logistics center that was newly constructed in 2007 ...

... and the parts warehouse dubbed "Manhattan" in the basement. The 20,000 different parts stored there are shipped the world over practically at the touch of a button.



The Vogt 3D measurement laboratory with 3D coordinate measuring machine.



Thomas Robers is the Managing Director of BATTENFELD (Schweiz) AG in Effretikon in Switzerland.

Sophisticated logistics are required

Vogt's success hinges directly on tailor-made logistics that ensure the efficient organization of the entire flow of goods. Given the often very small dimensions of the parts produced at Vogt – many are only a few millimeters long – perhaps the expression "stream of goods" would be more fitting. Even the package units themselves are very special. A bag about the size of a DIN A5 sheet can hold as much as 20,000 pieces or more of a special product. With goods reception and dispatch as core logistical elements, Vogt's entire logistics system was recently restructured. Under the leadership of Daniel Kessler, Supply Chain Manager and Member of the Executive Board, it was the employees most familiar with the requirements of the company's fast-paced day-to-day business operations who contributed most to the reorganization.

Building expansions played a decisive role in the development of Vogt to its current size. Expansions and new construction have been carried out time and again. (This clearly parallels development that the WITTMANN Group has undertaken, by the way.) Some altogether new, rather unconventional trails were also blazed along the way – including the establishment of a business park, for example, which Vogt shares with other companies.

3D measurement laboratory

Another major entrepreneurial step was the construction of a 3D measurement laboratory with its own 3D coordinate measuring machine. In the context of the company's own quality assurance program, the 3D measurement of components had become increasingly important. The measurements conducted by Vogt for its own purposes did not utilize the full capacity of the acquired measurement system, however, so the "Vogt 3D-Messlabor" (Vogt 3D Measurement Lab) was established. The latter operates as a profit center with Vogt AG and acquires measurement contracts from other companies, which ensure full utilization of the measurement lab's capacity.

Keen entrepreneurial spirit, carefully crafted strategies and effective technology partnerships (like the one with the WITTMANN Group) each do their part to ensure the sustainable future of Vogt AG on the fiercely competitive global market for contact elements. ♦

Güçsan Plastics evolves using WITTMANN Group equipment

For many years now, the Turkish Güçsan company excels in toolmaking, injection molding, and part assembly. The Turkish WITTMANN Group subsidiary based in Maltepe/Istanbul is one of Güçsan's important suppliers of auxiliaries and automation.

Muzaffer Engin

In 1967, Güçsan Plastics was founded as a toolmaker. In 1976, the family-owned company started the production of plastic parts. During the eighties and nineties, Güçsan's main customers were local OEMs that were active in die fields of automotive, white goods, and the electrical components industry.

In 2003, Güçsan moved to the current location in Gebze, an industrial city located in the Koaceli province at the Sea of Marmara, where the premises covered an area of 12,000 m² at the time.

Perpetually, Güçsan worked on increasing the company's capacity. Eventually, an elaborated quality management system was established, and in the aftermath of this development, Güçsan achieved several official ISO industry standards: IATF 16949, ISO 14001, ISO 18001 and Q1. The company adapted to different OEM cultures and became a global supplier to the automotive industry, exporting automotive plastic components to the European Union, but also to Brazil, Russia, South Africa, Morocco, Thailand, Japan, the United States of America, and China.

Güçsan's most important activities lie in the production of interior, exterior, welded, assembled and cleanroom plastic parts for the automotive industry. The company has an own in-house tool making department with more than 50 years of experience in tool design and construction. The strong points of the Güçsan company – highly esteemed by its customers – are the following: good project management, close communication with the client, proactive approach to

working and – last but not least – the advantages that result from being a family-owned company. The second expansion stage happened in 2013, increasing the shop floor area up to 20,000 m².

Today, Güçsan has 75 injection molding machines ranging from 60–1,500 tons of clamping force, and is working for such famous brands like Toyota, Ford, Mercedes-Benz, Otocar, and MAN. Among famous Tier 1 companies, one

can also find a lot of Güçsan customers: Mann+Hummel, Yazaki, TI Automotive, Cummins Filtration, Boshoku, Valeo, etc.).

Güçsan reverts to the WITTMANN Group

Constantly, Güçsan is working to improve production processes to get the best results. Since 2012, the company invests in automation and error diagnostics, as well as material drying systems – with the objective of producing the best quality parts.

Güçsan uses robots and central material drying and conveying systems from the WITTMANN Group to increase efficiency and to standardize production processes. So far, Güçsan has installed 45 WITTMANN robots and two central material handling systems.

The next development to come will be taking bigger steps towards “smart production” or “smart factory” respectively: the integration of machines and peripheral equipment including comprehensive data evaluation. In the first instance, the implementation of an integrated MAS/ERP system has been put into effect.

The Güçsan company keeps on evolving. In 2015, the tool shop moved to a new building that was erected on a newly acquired 13,000 m² property. In November 2018, the construction of this forth production facility was completed, and mass production was started. The idea of this facility was not only to increase production capacity, but to be able to offer the company's customers the latest technologies – as a reliable partner for strong solutions. ♦



Two examples of the 45 WITTMANN robots at Güçsan: W818T (picture above) and W833.

View of a WITTMANN central drying system at Güçsan.

Muzaffer Engin is General Manager of WITTMANN BATTENFELD Plastik Makineleri Ltd. Sti., the Turkish subsidiary of the WITTMANN Group, based in Maltepe/Istanbul.

Multi-component technologies and flexible automation solutions for Plastika Skaza

Plastika Skaza, Slovenia, highlights some recent production successes with WITTMANN Group technology. One of the biggest plastic processors in Velenje, Slovenia, Plastika Skaza has more than 40 years of experience in the sector. ROBOS d.o.o. in Ljubljana is the official WITTMANN Group representative in the region and has facilitated the outstanding supply and technical partnership for many years.

Peter Zajx

The cornerstone of such good cooperation consists in providing first class technical and sales support in all of Plastika Skaza's specialist areas of plastics processing. The Plastika Skaza company story began in 1977 – in a single garage. Within a few decades, Plastika Skaza's premises have increased 44-fold – from a 350 m² factory footprint to today's ground floor of more than 15,400 m².

With the passage of time, the number of employees has increased 50-fold. Plastika Skaza uses state-of-the-art production machinery, much of which is sourced from the WITTMANN Group.

Plastika Skaza offers its customers integrated solutions in product development and manufacturing – first sketches to finished product and shipping. Product development activities accompany each and every product during the entire manufacturing process. Today, Plastika Skaza can present a really impressive product portfolio, including its own branded products such for electronic and automotive parts. Skaza is well-known for carrying out the most challenging orders in the field of injection molding, including final fully automated assembly for globally active clients – and in many cases applying multi-component technologies.

From left to right: Marko Jeza, ROBOS d.o.o. Sales Manager, Željko Banović and Klemen Repenšek, Plastika Skaza, in front of the automated work cell with the PRIMUS 16 robot from WITTMANN.

More equipment from the WITTMANN Group at Plastika Skaza in Velenje, Slovenia: DRYMAX dryers and temperature controllers (picture left), MacroPower 400 multi-component injection molding machine.



An automation solution for the insertion of bushings

In one of the company's latest projects, ROBOS helped Plastika Skaza automate the thermal insertion of bushings into a plastic housing. This objective was successfully realized by using a WITTMANN PRIMUS 16 robot within an automation cell. This project was also developed together with the BZK company, one of ROBOS d.o.o.'s partners.



The process removed the need for a worker to insert the bushings manually, and also reduced the human involvement in checking the quality of the finished parts. In operating the WITTMANN PRIMUS 16 robot removes the housing from the 2-cavity mold, placing the part on the rotary table.

The rotary table starts to rotate, and the bushings are then thermally inserted into the housing – the bushings being positioned before by using a vibrating drum. Afterwards, the part is taken from the rotary table and placed on a conveyor belt. Any reject parts at this stage are then separated from the other parts for further inspection. Two of these automated cells have now been installed at Plastika Skaza.

Before the insertion of the bushings, they are aligned using a vibrating drum.



Plastika Skaza techniques and materials

In addition to conventional injection molding, Plastika Skaza also deploys multi-component injection molding technologies. The company is expert in these specialist applications where elements made of different materials have to be inserted into the mold. Among other technologies,

Plastika Skaza also offers laser engraving, ultrasonic welding, pad printing and thermal clamping. The constant theme at the company is the development of complete assembly lines for assembling multiple parts into a functional whole.

Plastika Skaza uses injection molding machines with clamping forces from 50 to 1,000 tons. The full range of thermoplastic materials is processed (polyolefin, styrene, polycarbonate, polyamides, linear polymers), also master batch materials with various additives (glass fiber, additives for UV resistance and temperature resistance, etc.)

Recently acquired equipment from the WITTMANN Group includes: one *MacroPower* 1000 and two WITTMANN BATTENFELD *MacroPower* 400 multi-component injection molding machines (in use for the 3-component-process), together with in-line compact material drying equipment.

Plastika Skaza also bought the latest model from the WITTMANN BATTENFELD *SmartPower* machine series: one *SmartPower* 350/2250. In addition, a number of WITTMANN robots from the PRIMUS series and W8 series were ordered. Mold temperatures control is achieved using many WITTMANN temperature controllers, such as TEMPRO plus D, TEMPRO basic C140, and TEMPRO basic C120 models.

Rotary table, holding the housings.



Housing, dropped on the conveyor belt.

Housings, collected from the conveyor belt.



Environmental responsibility

Plastika Skaza is highly aware of the importance of preserving the natural environment and continually introduces recycled, organic and biodegradable materials into its production.

This policy also applies when it comes to acquiring new processing machines: newly bought machines have to be of the utmost energy efficiency and in accordance with the highest international standards. ♦

Peter Zajc
is Managing Director of ROBOS d.o.o. in Ljubljana-Črnuče, Slovenia, the WITTMANN Group Agent for Slovenia and Croatia.

New WITTMANN Group agent for Serbia

As a subsidiary of ROBOS d.o.o. in Slovenia (the Slovenian WITTMANN Group agent for Slovenia and Croatia), the company ROBOS WIBA d.o.o. was established in January 2019 in the town of Ruma in the plastics industry epicenter of Serbia. ROBOS WIBA d.o.o. is the new WITTMANN Group agent in Serbia, and also responsible for Bosnia and Herzegovina, North Macedonia, and Montenegro.

The plastics industry market in Serbia is comprised of small local companies and big regional and international companies. Serbia's free trade agreements with other countries are designed to promote lower taxes, low energy costs, affordable property investments and tax-free imports and exports.

During the last ten years, it has been observed that there has been an increase of global manufacturers entering into the Serbian market.

Due to the country's location, the market is attractive for many machine suppliers from Europe and Asia. It is estimated officially that the combined annual turnover

of privately owned plastics processors in Serbia is approximately 800 million EUR (not including international companies such as Grundfos, Sigit, Greiner, Magneti Marelli, Panasonic, Teknia, MPE etc.).

These statistics show that the Serbian market has great potential for WITTMANN Group machinery and auxiliary equipment.

An experienced Serbian team

The team of ROBOS WIBA consists currently of two very experienced industrial practitioners – Tomislav Kantuđer as Technical Manager and Dejan Rogić, Service Technician. Both have many years of experience in the injection molding industry.

Both are highly motivated in organizing the strong technical support for existing WITTMANN Group customers and in actively finding new opportunities for new business.



The ROBOS WIBA team: Dejan Rogić, Service Technician (left), and Tomislav Kantuđer, Technical Manager, in front of a SmartPower 160/750 injection molding machine from WITTMANN BATTENFELD, installed at the Serbian company FREZAL.

Tomislav Kantuđer and Dejan Rogić are well-known in the region as reliable specialists. This experience will significantly shorten the transition period for the newly established company. Close cooperation with ROBOS in Slovenia is crucial, since ex-Yugoslavia (Slovenia, Croatia, Bosnia and Herzegovina, Serbia, North Macedonia and Montenegro) represents a vast territory with a population of around 20 million people.

The first signs of success are already materializing with involvement in many new molding-machine-based and peripheral equipment projects. Some of these projects have already been successfully won, since WITTMANN BATTENFELD really is a well-known supplier in the region for many years.

However, competent local support is of the highest importance, an absolute imperative for customers – and the only way to succeed.

Showcasing, exhibiting, recruiting

At nearby FREZAL, a SmartPower 160/750 B8 injection molding machine with peripheral equipment was installed in the company's show room. FREZAL is a well-known regional mold maker, also located in Ruma, only three minutes away from the ROBOS WIBA premises. Many prospective customers have already visited and inspected the injection molding machine with the assistance of ROBOS representatives.

In May of next year, the newly established agent will exhibit at the Belgrade "International Fair of Technics and Technical Achievements", this being the most important economical and technological event not only in Serbia, but in South East Europe. The company's medium-term plan is to employ at least two additional staff by the middle of next year, strengthening after sales support and service. ♦

New management for WITTMANN BATTENFELD in Germany

Following the retirement of Klaus Ehlig from active service, the graduated engineers Dipl.-Ing. Andreas Schramm and Dipl.-Ing. Michael Tolz will jointly succeed him as Managing Directors of WITTMANN BATTENFELD Deutschland.

Andreas Schramm will take up the position of Managing Director of WITTMANN BATTENFELD Deutschland on 1 October 2019. Until the end of this year, he will work together with Klaus Ehlig in this capacity. When Klaus Ehlig finally goes into retirement, Michael Tolz will also be appointed Managing Director effective 1 January 2020. From the beginning of January 2020, Andreas Schramm will take on the position of Management Spokesman as well.

Andreas Schramm studied mechanical engineering at the TU Dresden. He worked for many years at Sumitomo (SHI) Demag Plastics Machinery in Schwaig in various executive positions. As Product Manager and Project Leader, Andreas Schramm cooperated closely with customers and other business partners and thus acquired profound expertise in the industry. As



CTO he was also responsible for technical product development.

Michael Tolz graduated in Production Technology from the University of Applied Sciences Gießen-Friedberg, and has been employed at WITTMANN since July 2011 as CTO and Plant Manager of the Nuremberg facility.

Andreas Schramm with his many years of experience in injection molding technology and Michael Tolz with his extensive expertise in automation technology both see the focus of their cooperation among other things in the intelligent combination of latest automation technology with the mod-

ern injection molding machines from WITTMANN BATTENFELD. The expertise of the WITTMANN Group in the area of injection molding machines with complex automation systems, as will be shown on the WITTMANN BATTENFELD booth at the K, is to be developed still further in future.

Dr. Werner Wittmann, Managing Partner of the WITTMANN Group, is pleased to have secured the services of Andreas Schramm for the responsible position of a Managing Director at WITTMANN BATTENFELD Deutschland: "I am confident that Andreas Schramm with his valuable experience in executive positions in the injection molding industry will, together with Michael Tolz, further advance the WITTMANN Group in Germany, its main market."

Werner Wittmann thanks Klaus Ehlig for his dedicated service to WITTMANN BATTENFELD Deutschland and especially its Meinerzhagen facility, where Klaus Ehlig has served as Managing Director since 2006, and he wishes him all the best for his well-deserved retirement after 53 years of employment at BATTENFELD. ♦

From the left: Klaus Ehlig, Andreas Schramm, Michael Tolz.

New management in the UK subsidiary

Barry Hill, Managing Director of WITTMANN BATTENFELD UK Ltd will retire from his role on January 1, 2020. Hill has been instrumental for WITTMANN Group business in the UK for well over thirty years. He began his working life with GKN Kent Alloys. His next position was as a service engineer for Battenfeld UK. Barry was thus very well placed to integrate the two businesses when WITTMANN acquired the Battenfeld business in 2008.

Michael Wittmann, WITTMANN Group General Manager, said that "Barry will be sorely missed within the WITTMANN family. No anniversary celebration, trade exhibition or conference will be the same without him. However, we realize that we cannot hold Barry back from a very well earned retirement. Europe's ski slopes and mo-



tor biking highways will surely benefit from our loss!" Come the new year, WITTMANN BATTENFELD UK will be jointly run by Daniel Williams and Tracy Cadman, responsible for sales and finance respectively. Michael Wittmann adds that "we are delighted with the WITTMANN BATTENFELD UK

succession plan and we give Daniel and Tracy every support. The UK and Irish markets are significant for us – not least for their manufacturing creativity and their capacity to enjoy innovation – our current theme and slogan for K 2019 and beyond."

Barry adds that "I have every confidence in passing the baton on to Daniel and Tracy. Like myself, Dan has come up through manufacturing via the apprentice route and therefore has a solid grounding in the issues and principles of industrial life. Our customers are in very good hands. It has been a pleasure and privilege to serve the WITTMANN Group through my career. Over the transition period of the next months I am looking forward to steadily handing over the UK reins and to seeing many old friends and customers on site." ♦

From the left: Barry Hill, Daniel Williams, Tracy Cadman.

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