

Wittmann

www.wittmann-group.com

innovations

Technics – Markets – Trends

Volume 7 – 4/2013

**Power
for the
Future**



Battenfeld



WITTMANN innovations (Volume 7 – 4/2013)

Quarterly magazine of WITTMANN Kunststoffgeräte GmbH and WITTMANN BATTENFELD GmbH. Appears to meet the informational demands of staff and customers. Editorial office: WITTMANN Kunststoffgeräte GmbH, Lichtblaustrasse 10, 1220 Vienna; tel. +43-1 250 39-204, fax +43-1 250 39-439; bernhard.grabner@wittmann-group.com; <http://www.wittmann-group.com>
Issue 1/2014 of "WITTMANN innovations" will appear at the end of the year 2013.

Editorial



Michael Wittmann

Dear Reader,

Power for the Future – this is our slogan for the K 2013, it stands for the enthusiasm we have invested over the years in order to now exhibit our best-ever range of machinery and equipment. Our aim is to help you make the most competitive products on the market – and enable you to make a powerful start into the future now.

Once again, the WITTMANN Group is going to be attending this year's K show in Düsseldorf from October 16 to 23, with two stands and a total of 1,200 square meters of exhibition space: in Hall 10/A04 and Hall 16/D22. We'll be exhibiting over 125 products, including 12 world firsts, of which we are especially proud.

We keep getting asked why we have two stands at K. The exhibition is so vast that in order to best accommodate the specific interests of the visitors, closely related products tend to be concentrated in particular exhibition halls. For us, this means we have to present our full product range in two separate halls. Although this increases the logistical effort involved, it means that both our injection molding machines and peripheral devices can be shown in the areas where they are expected to be in terms of the thematic.

For the first time ever, we'll have a mascot at this year's K. Not an obvious decision, we know. But having received encouragement to do so on a number of occasions now, we've finally decided to have our *PowerMan* represent us at K. *PowerMan* is an anthropomorphic robot with a handsome physique, who will be helping to distribute our *Power Bars*, high-energy muesli bars to help the public cope with the exertions they undergo at the K.

None other of our units better symbolizes the *Power for the Future* efforts we are making than the new *MacroPower* 1500. At the 2010 K we showcased our largest machine to date in the form of the *MacroPower* 1000. This year we're again expanding our range in the higher clamping force segment with the *MacroPower* 1500. The *MacroPower* heavy-duty series is now available with clamping forces ranging from 400 to 1,600 tons. Check out the new models for yourself on stand D22 in Hall 16.

You can take a closer look at our robots and peripheral devices on stand A04 in Hall 10. This is where we're presenting the new W8pro robot series and the DRYMAX Aton₂ F30 segmented wheel dryer for the smaller segment alongside many other innovative products.

Pay us a visit and experience *Power for the Future* for yourself. I very much look forward to meeting you in person.

Sincerely, Michael WITTMANN

Content

Injection Molding

The Backhaus success



Gabriele Hopf on the German automotive supplier. **Page 4**

Clean and safe incapsulation



Adrian Lunney writes about the IMIW process and its user Barkley Plastics. **Page 6**

IML

A multifaceted process



Michael Wittmann on pros and cons of the IML production. **Page 8**

Dosing

Precision for safe rail traffic



Christoph Schweinberger describes the Semperit blending solution. **Page 10**

Temperature Control

News from the "Waterworld"



Walter Lichtenberger and **Gerald Schodl** introducing the new units. **Page 12**

Porträt/News



Robomatik GmbH, Germany, as a supplier of complete solutions. **Page 14**



The WITTMANN Group's growth in North America. **Page 14**

Backhaus is on the road to success

The Kunststofftechnik Backhaus company in Kierspe, Germany, a major producer of plastic parts for the automotive industry, relies on top-quality and highly innovative technology. With its future-oriented injection molding machines and processes, WITTMANN BATTENFELD contributes substantially to the company's success.

Gabriele Hopf

Since the return of Kunststofftechnik Backhaus to being a family-owned company a little more than a year ago, the well-known German automotive supplier has seen dramatic growth. Full order books, rising sales figures and numbers of associates clearly speak for themselves. An increase in the workforce is planned from today's 146 to 200 by the end of this year. In 2013, Backhaus was even nominated for the award "Großer Preis des Mittelstandes" (High Award for Medium-sized Companies) of the Oskar Patzelt Foundation. The company, which was established by Ernst Backhaus in 1925, and became a member of the American Key Plastics Group 2004 top 2011, was taken over on 10 May 2012 by Manfred Gante, its long-standing Chief Technology Officer. It has been clearly on the road to success again ever since, largely thanks to an excellent team, as Manfred Gante emphasizes, as well as to reliable partners who have already stood by Gante for many years. To meet the growing demand, a building site of 7,000 m² has been purchased, on which construction of a warehouse facility with 1,000 m² of floor space will begin before the end of this year.

Backhaus stands for highest quality

On an 8.000 m² production floor, Backhaus manufactures high-quality, innovative plastic parts made of thermoplastic and thermoset materials, of which about 70% are delivered to renowned customers from the automobile industry such as Audi, VW, BMW, Daimler, Bentley, Maybach, and other OEMs. The product portfolio includes fans, air ducts, cold air intake systems, door frames, belt pulleys, housings, holding fixtures, claddings, and other complex parts and assemblies. The main segment consists of all kinds of innovative air conduction systems for passenger cars and increasingly also for commercial vehicles. The range includes, for example, elaborate 2-component parts, in which materials



Backhaus production facility: HM 650 multi-component machine from WITTMANN BATTENFELD using CELLMOULD® structured foam technology. Parts depositing is handled by a W832 WITTMANN robot.

of different hardness are combined. But Backhaus can also expand more and more into the non-automotive sector thanks to its innovative technologies. One representative example is the medical industry, whose requirements in terms of quality standards and reliability make Backhaus an interesting supplier.

The company's innovative strength, boosted by in-house part development, its top-class quality standards, absolute reliability and customer-specific know-how – new products are developed and system solutions found jointly with the customers – are the cornerstones of success at Backhaus. To keep up these high standards on a long-term basis, Manfred Gante invests not only in state-of-the-art machinery and equipment, but also in basic and advanced training of his associates. So apprentices have been in training at Backhaus in all areas relevant for the company since May 2012.

WITTMANN BATTENFELD – the injection molding technology partner

When investing in their injection molding machinery and equipment, Manfred Gante and his Chief Technology Officer, Uwe Möller, pay special attention to seeking reliability, easy machine setting and user-friendliness and, in particular, energy efficiency. According to Gante, energy-optimized equipment is a decisive factor for competitiveness on the

market, and this factor is becoming more and more significant. This is why Backhaus also invests in several technologies to reduce energy consumption and to control the temperature recovery system in the mold, which substantially contributes to reducing cycle times.

Backhaus currently operates a total of 64 injection molding machines ranging from 15 to 1,300 t in clamping force. Further investment is in planning, in both 2-component and single-component machines, and here especially in large-scale machines with clamping forces between 1,300 and 1,600 t, and this has already been implemented to



some extent. About one third of the company's injection molding machines come from WITTMANN BATTENFELD. The most recently delivered machines are hydraulic 2-component models with 650 t clamping force, on which materials of different hardnesses, in particular PP and TPE, are injection-molded in a single production process. The HM 650 machine models are equipped with WITTMANN automation for parts removal and depositing. CELLMOULD® technology is used on one of the two machines in addition to multi-component technology. CELLMOULD® is a process for manufacturing structured foam parts, with

nitrogen being added directly in the barrel during plasticizing. The entire machine technology, including the plasticizing barrel unit, injectors, gas flow regulator and gas generator, has been developed and manufactured by WITTMANN BATTENFELD. This process offers several advantages. For instance, significant reductions in material consumption with simultaneous high dimensional stability can be achieved in this way. The process also brings about considerable reductions in weight, required clamping force and cycle times. This results in attractively de-

signed, high-quality, lightweight parts – significant factors especially in the automotive industry.

Comprehensive professional service

Manfred Gante and Uwe Möller appreciate WITTMANN BATTENFELD as a competent, reliable partner capable of achieving intelligent, energy-efficient solutions jointly with Backhaus.

The experience with the machines delivered so far was consistently positive. In addition to the high quality of the machines and their outstanding process technology, however, decisive arguments in favor of investing in WITTMANN BATTENFELD machinery and equipment are the reliability, fast response and competence of local customer support.

Manfred Gante comments: "Quality, flexibility, innovation and reliability are vital for our success. This is why we need flexible, reliable, innovative partners able to supply us with high-quality, energy-efficient products. In this respect, WITTMANN BATTENFELD is exactly what we are looking for." Uwe Möller is also more than satisfied with this cooperation: "Our partnership with BATTENFELD has stood the test of time for many decades. In fact, it has existed as long as both Backhaus and BATTENFELD have been in existence themselves." ♦

Uwe Möller, Chief Technology Officer, Manfred Gante, Managing Partner of Kunststofftechnik Backhaus, and Frank Höher in front of an HM 650 multi-component machine equipped with CELLMOULD® technology (from left to right).

Air conduction systems for the automotive industry are the main segment of the Backhaus product range. Picture below: Housing component for the automotive industry.

(Photos: Backhaus)

Gabriele Hopf is the Marketing Manager at WITTMANN BATTENFELD in Kottlingbrunn, Lower Austria.

Encapsulating Excellence

Leading trade molder Barkley Plastics has developed the IMIW process (In-Mould Internal Welding); a new injection molding production technique which provides molders with a convenient and fault-free method of ensuring flawless products without having to engage in post-molding welding operations. Barkley Plastics is a valued and close partner of WITTMANN BATTENFELD.

Adrian Lunney

IMIW provides flawless in-mold encapsulation of critical components without the need for post-molding operations. The picture shows the handling of a component right before the mold-insertion.

By means of this new process inserts can be fully encapsulated by injection molding and thus protected (gas-and-water-proof) against any damage. The new process is particularly suitable for insert molding electronic parts for RFID components (RFID = Radio Frequency Identification). The new process also offers a large field of further applications. For example, it can be used for all those plastic parts which need to be perfectly connected without post-molding operations.

Birmingham-based Barkley Plastics has been helped in bringing IMIW to market by leading equipment supplier WITTMANN BATTENFELD in Austria. The Warwick Manufacturing Group (WMG) has also been instrumental in validating key parts of the IMIW process, using optical microscopy to investigate weld integrity, interface conditions, material homogeneity and MEK attack.

The new process successfully premiered at the WITTMANN BATTENFELD Competence Days in Kottlingbrunn, Lower Austria (April 24/25). The process was demonstrated on a servo-electric *EcoPower* 110/350 injection molding machine with a mold tool supplied by Barkley Plastics. The WITTMANN BATTENFELD machine was specially programmed for the IMIW process and the tool was demonstrated with a sliding core. The WITTMANN Group developed the production cell automation systems, including the insertion of electronics, the demolding of the finished products and the placing of final product onto a conveyer belt.

The IMIW production cell provides yet another proof of the WITTMANN BATTENFELD capability to deliver all production needs from just one supplier. Not long after this first presentation, at the PLASTPOL exhibition in Kielce, Poland in May 2013, the IMIW technology was awarded first prize, both for the molding technology and for the innovative machine array. Barkley Plastics Owner and Managing Director Mark Harwood says that “the time has now

come to share IMIW expertise with the rest of the industry. The technology is fully ready for the marketplace and for other molders to use it on a ‘first come first served’ basis. Needless to say, we at Barkley Plastics are also preparing to mold IMIW-based products to client specifications.”

The IMIW process

Encapsulation is a large part of the IMIW appeal and is also key to providing a number of failsafe molding solutions for any number of industries, including critical applications in electronics, medical, healthcare and other sectors.



A view of the Barkley Plastics IMIW mold in action.

In essence, In-Mould Internal Welding (IMIW) allows the simultaneous molding of two parts within a mold tool; one on the fixed half and one on the moving half.

Alignment methods of the two halves after first-stage molding can be achieved by either radial, linear or angular movement. The parts are then internally welded together, achieving a hermetic seal and negating any need for post molding welding operations.

Prior to welding, the product/insert can be loaded into either side of the component. The great simplicity of this production process creates very significant cost and convenience advantages. A smaller manufacturing footprint also



saves on factory space and pre-empts any need (and cost) for assembly or post molding operations. IMIW also cuts out the need for further parts or materials, as the manufacturing process needs no seals or fixings in order to achieve a hermetic seal.

The integrity of the weld is also measured internally via means of a self-calibrating pressure transducer. Any faults thus identified in the mold tool are automatically removed from the production line as part of the manufacturing process. In this way a 100% production quality assurance is automatically achieved, again negating any need for further production equipment and assessment.

Advantages and applicability

Barkley Plastics points out that the IMIW process is there to help product designers to imagine new manufacturing and new products. Design imagination can be stretched since the IMIW process facilitates almost any internal shape desired together with a more consistent wall thickness.

IMIW has been successfully trialed in a number of commodity and engineering plastics, including PC, PC/ABS, Polyamides, PPSU and glass-filled plastics. Barkley Plastics technical director Maurice Cassidy says that “on all counts the IMIW technique passes with flying colors. We are therefore very excited about our new process – both for our clients and for the industry. In my view IMIW will now greatly reduce design constraints for future plastic enclosures. It will also give the processor options – simplifying and streamlining production and helping to reduce costs. IMIW enables the whole molding and assembly process to be completed in one step.”

The Barkley Plastics success and WITTMANN BATTENFELD

Barkley Plastics is the molding partner in the Midlands Assembly Network (MAN), a ten company organization created in 2006 and responsible for boosting sales and marketing for its members in the region. Over the past couple of months the MAN network connection has led to Barkley Plastics enjoying some prime time spells on BBC Midlands TV, taking part in coverage that shows successful Midlands-based manufacturers in the region, increasing output and exports.

Matt Powell, Barkley Plastics Business Development Manager has hosted the TV cameras and says that “IMIW has arrived at a great time for our company and now provides great new string to our bow, for designers, for other molders and clients and in the service of our exports which now stand at nearly 20%.” Recent Barkley Plastics successes relayed on BBC Midlands

TV have included the “re-shoring” of M&S-based molding work from China and a number of significant orders for German automotive group BMW.

The WITTMANN BATTENFELD association with Barkley Plastics stretches back many years and involves exclusive sales rights partnership of the IMIW process. The WITTMANN Group can supply single IMM machines or complete IMIW production cells, including sensors, automation and conveying equipment, all for the client need/specification. WITTMANN BATTENFELD in partnership with Barkley Plastics is able to supply the advanced IMIW technology as a turnkey production plant system. ♦

The finished injection molded IMIW part.

The Barkley Plastics IMIW launch team: Mark Harwood, Managing Director, Matt Powell, Business Development Manager, Maurice Cassidy, Technical Director, Daniel Williams, WITTMANN BATTENFELD Area Sales Manager (from left to right).

Adrian Lunney is a press and public relations agent specialized in media work for companies in plastics, chemicals, packaging, recycling, and general manufacturing sectors.

In-Mold Labeling: The multi-faceted production concept

The adoption of a new technology usually happens in small increments. The decision to get involved with in-mold labeling (IML) needs to be carefully considered too, and most of the time starts with applications for smaller piece counts or systems with a greater degree of flexibility. What's certain is that while IML systems can differ fundamentally in terms of design, a suitable solution can be found for the each particular requirement.

Antonio Jurado

When setting up to produce IML parts, many injection molders find themselves faced with the realization that instead of being able to produce umpteen million identical parts, the market is only able to support runs in the six-figure range.

It's also frequently the case that many IML parts which are large or which hold large volumes get commissioned and these are required in even smaller quantities. A typical example of this would be paint buckets; hardly ever are as many as a million produced in a particular size.

The choice of robot

The choice of the correct robot for the job from WITTMANN's wide range of servo robots allows IML systems to be custom-designed for virtually any conceivable requirement.

Classic IML systems use side-entry high speed robots. They have differentiated automation with discrete labeling and palletizing, and usually have devices for assuring quality control too. These systems are designed for single or stacked molds and intended for cycle times of less than seven seconds. Such systems are typically designed for round-the-clock production or plants for the production of very large batches, since the effort required for reconfiguring from one part to the next can be quite considerable, depending on the customer's requirements and label geometry. In contrast, IML systems are designed for smaller quantities



A view into the mold: IML bucket made from polypropylene with 14 liters capacity.



MacroPower E 450/2250 from WITTMANN BATTENFELD.

but must demonstrate a high level of flexibility and ease of refitting. These types of system are preferentially designed with top-entry standard robots which have much more freedom of movement, are easier to retool and can be used for other tasks. Obviously, the investment costs for smaller production are going to be proportionally higher than for

larger ones. For this reason, one of the requirements of such systems, in addition to the high degree of flexibility, is the desire for similarly low investment costs.

Both of these criteria are met by the classic W8 series standard robots from WITTMANN. The W822 and W832 models, as well as the new W842 with reinforced vertical axes and payloads of up to 25 kg, are particularly well suited for these types of applications.

A typical WITTMANN IML system

An example of this type of system was installed for demonstration purposes on the WITTMANN BATTENFELD booth at K 2013, designed to manufacture an IML-decorated bucket made from polypropylene with a volume of 14 liters, a sidewall thickness of 1.4 mm and a weight of 420 g – a set-up using a single cavity mold with pre-chamber injection and 24 cooling circuits.

This IML system involves a WITTMANN W842 HS top-entry unit designed for rapid loading of the mold that removes and stacks the finished buckets. The IML robot is equipped with high speed servo motors and removes banderole labels from a vertically-mounted label magazine before inserting them, with the help of a dummy core, into the cavity of the fixed half of the mold. In order to minimize the cycle time, removal of the finished bucket and label insertion are both performed simultaneously. In addition to this, the special WITTMANN real-time *SmartRemoval* function which already starts accelerating the robot axes during the mold-opening action of the machine is implemented. Even though numerous movements are performed in and around the mold, the entire time that the mold is open can be kept to under 2.5 seconds.

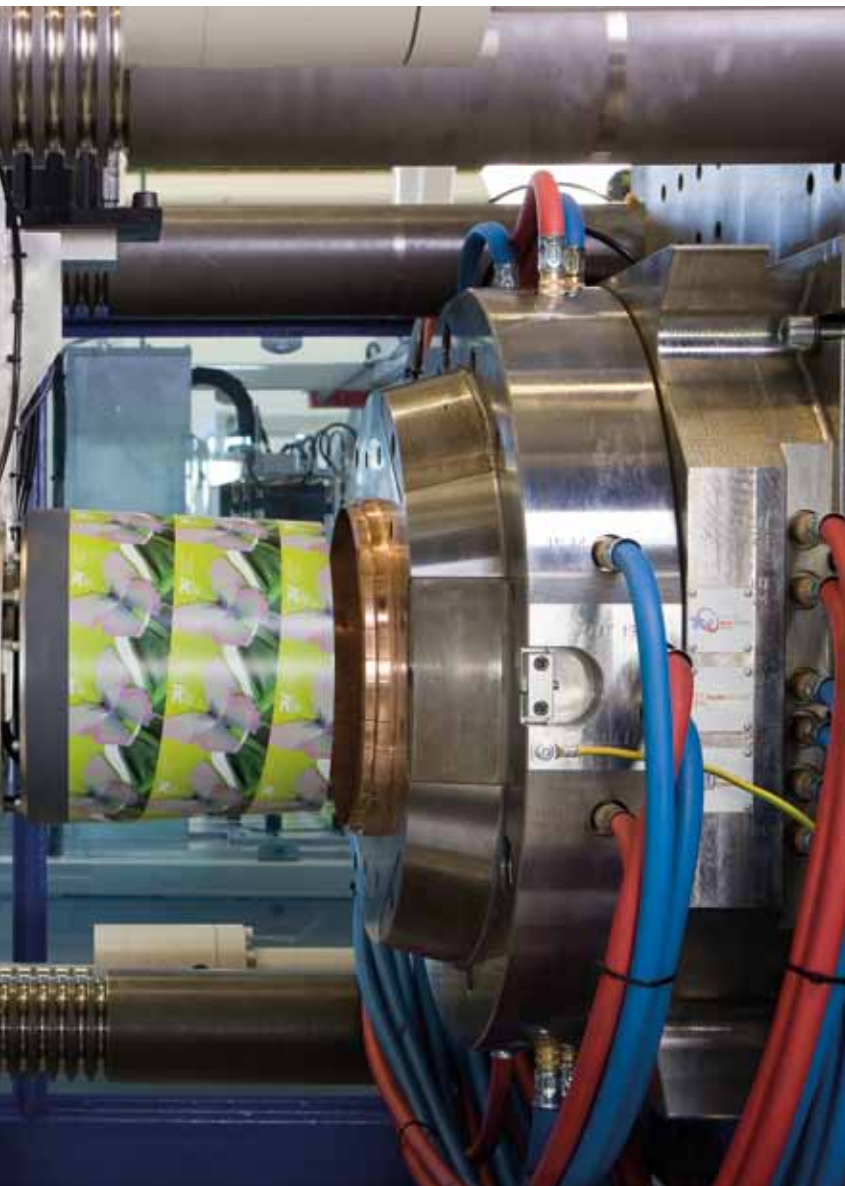
The benefits of this automation concept are, on the one hand, optimum value for money, and on the other, short delivery times thanks to fact that the majority of the components being used are tried-and-tested standard items from WITTMANN's automation range.

The label magazine is designed to take labels from 800 × 200 mm up to 1000 × 350 mm in size. This means that the magazine is flexible enough to be used for other bucket sizes too.

Cost of investment related to the plastic part itself is reduced to that for the insert core. And of course the WITTMANN W842 HS robot, with its payload of 25 kg, can also be used for the removal of other parts as necessary. ♦

The WITTMANN IML system.

Antonio Jurado
is International
Sales Manager IML
of the WITTMANN
Group.



Semperit relies on WITTMANN

Founded nearly 190 years ago, the exchange-listed Semperit Group is now one of the world's leading suppliers of rubber and plastic products. The international industrial group headquartered in Vienna develops, produces and sells highly specialized medical equipment and various other industrial products: examination and surgical gloves, hydraulic and industrial hoses, conveyor belts, escalator handrails, construction profiles and products for railroad track construction industry. Semperit employs over 10,000 employees at 22 production sites and sales subsidiaries worldwide, including 7,000 in Asia and more than 700 in Austria.

Christoph Schweinberger

Passenger safety is of the utmost importance in the passenger transportation sector and, as a consequence, underlay slabs produced with WITTMANN equipment have to meet the highest of standards with regard to manufacturing accuracy.



Semperit places great importance on continuous product development. The research and development center in the Lower Austrian town of Wimpassing acts as a think tank for all production areas, including the Semperform division.

As part of the Semperit Group, Semperform is a leading European manufacturer of molded and extruded articles made from rubber and plastic.

Semperform works in close cooperation with customers to develop customized solutions for profiles, handrails, cable car sheaves and other molded parts which are then manufactured.

Precise dosing is required

This constant quest for improvement and optimization has prompted Semperit AG to optimize both the quality and production costs for an ongoing project in the railroad track sector. The parts in question are high-precision underlay slabs for rail support systems.

Passenger safety is of the utmost importance in the passenger transportation sector and, as a consequence, these parts have to meet the highest of standards with regard to manufacturing accuracy. In the past, such underlay slabs were manufactured using a conventional dosing device

with chamber dosing wheel and downstream homogenizing mixer for feeding the masterbatch. With this technology, however, elaborate control systems were required in order to ensure that the quality of the moldings remained consistent over long periods. In times of strong competition and increasing price pressure, an effective solution had to be found quickly.

Semperit had been impressed with WITTMANN as a partner during the preparation phase of the project, and initiated preliminary talks without further hesitation.

After establishing the process data and performing a comparative trial with a dosing unit from another supplier, the decision was made to use the WITTMANN GRAVIMAX B34 gravimetric dosing unit. Its unique real-time weighing technique, the so-called RTLS (Real Time Live Scale), achieves highly-accurate dosing results and its automatic batch logging system ensures the highest level of process reliability. The WITTMANN GRAVIMAX's advanced technology was the crucial factor for deciding in its favor.

Trial operation of the GRAVIMAX

For the comparison test, both dosing units – the GRAVIMAX and a competitor's product with chamber dosing wheel – were subjected to identical operating conditions, and the dosing accuracy of the two devices was compared based on the dosing results. The results showed a significant improvement potential for the process if a WITTMANN GRAVIMAX was used as the dosing unit. Variations in the masterbatch dosing could be almost entirely eliminated. The main reason for this high dosing accuracy lies in the real-time weighing system, whereby the GRAVIMAX is able to actively regulate the dosing process, thus ensuring the exact repeatability of the dosing process. The results of this comparative test paved the way for a trial production run using the GRAVIMAX.

In addition to high dosing accuracy, consistent, optimal mixing of the different materials is also of great importance. The GRAVIMAX was also able to demonstrate its impressive precision mixing performance during trial operation.

Thanks to the special geometry of the mixing chamber, so-called "dead corners" (areas within the mixing chamber in which material could accumulate) are completely eliminated. The components within the chamber are homogeneously mixed using specially-developed mixing blades. As it was necessary to eliminate any impact on production stemming from the composition of the masterbatch, the carbon black content of the masterbatch itself was raised during the trial.

And this test showed that it can be assumed to remain constant with a maximum variation of $\pm 0.21\%$

The GRAVIMAX was fed with new material by a central feeder unit, and the masterbatch fed via a stand-alone feeder unit.

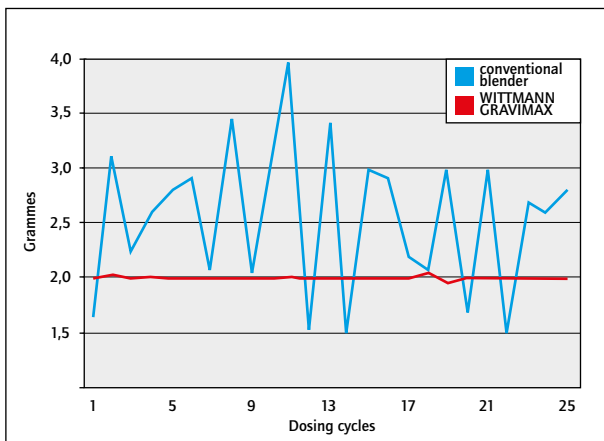
To ensure that the system was operated correctly, Semperit operators were given instruction during the course of the commissioning phase. Thanks to the pretty much self-explanatory design of the user interface, operation of the dosing unit proved to be straight forward.

Lessons learned from the test series

Compared to other device configurations, the trial operation using the WITTMANN GRAVIMAX showed significant improvements in process reliability, material consumption and part quality. Semperit carried out special analytic tests in order to determine how the masterbatch was distributed in the finished product. These tests confirmed the consistent dosing accuracy and material mixing capability. By using the GRAVIMAX, the carbon black content in the finished product could be kept nearly constant with a standard deviation of

0.052%. The test series clearly demonstrates that fluctuations that were quite normal when using conventional dosing units are definitely a thing of the past with the GRAVIMAX. As a future-oriented company, continuous product improvement remains one of Semperit's most important objectives.

The company is not only looking to work with WITTMANN with regards to material dosing, but in other peripheral technology fields too. ♦



GRAVIMAX B34 blender from WITTMANN, mounted on an injection molding machine at Semperit.

"Lessons", learned from the test series with the GRAVIMAX blender.

Christoph Schweinberger is Sales Manager Austria for Peripheral Equipment at WITTMANN Kunststoffgeräte GmbH in Vienna.

K 2013: News from the "Waterworld"

At this year's K show in Düsseldorf, WITTMANN presents at booth A04 in hall 10 several brand new tempering units that are working with water as a flow or tempering medium: the latest models from the widely known FLOWCON and TEMPRO series.

Walter Lichtenberger – Gerald Schodl

Again, the latest models from the FLOWCON and TEMPRO series are representing the avant-garde in this field – and they have what it takes to become the industry standard.

FLOWCON plus

With its proportionally controlled stepper motor and wear-free flow meter, the FLOWCON plus is the latest model from the series of WITTMANN water flow controllers. He is replacing the solenoid valves of the previous model, allowing for a significant improvement in temperature control. The valves of the FLOWCON plus can be used both as simple control valves with flow monitoring and in combination with a temperature probe to regulate mold temperature.

Process data such as flow and temperature values can be entered either on the touch screen of the teach box or directly on the control panel screen of the processing unit, because it is connected to the flow regulator via an interface.

The key advantage of this type of flow regulator over a manually adjustable one is that it permits continuous electronic monitoring of the preset flow and temperature values. All data are logged and can be automatically adjusted proportionally via control valves. Already proven in service many times over, the WITTMANN fine regulating valve of the 301 Series performs the flow regulation function here.

Generously dimensioned channels in the casing blocks guarantee a low pressure loss and high flow rates. Additional options for the FLOWCON plus are currently under development: the ability to connect directly all the injection molding machine models from WITTMANN BATTENFELD, for example, as well as the ability to blow mold channels out with compressed air and the ability to switch from cold water regulation to the operation of a temperature control device. The maximum equipment configuration of the FLOWCON plus features 4 × 12 cooling circuits, which are connected to one another via a data cable.

Temperature controller TEMPRO plus D180-2-L

With this temperature controller (the "L" stands for "large"), WITTMANN is presenting a large unit in dual zone configuration. The TEMPRO plus D180-2-L represents a completely new development.

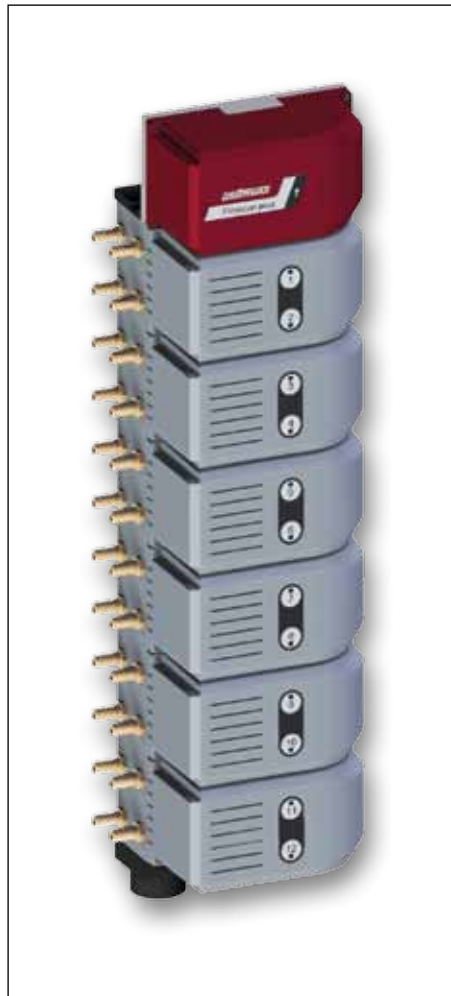
It has two heat exchangers for each circuit. Every heat exchanger can deliver 18 kW of heating and up to 40 kW of cooling capacity. Through this configuration, it is possible to offer this unit with a heating capacity of up to 36 kW and 80 kW cooling capacity per circuit.

For the optimal transmission of heating and cooling to the consumer, the system can be fitted with one of two different pumps. In the standard version, the TEMPRO plus D-2-L is equipped with a 2.2 kW peripheral impeller pump, which has a maximum pump capacity of 90 l/min (at max. 6 bar). A 4 kW peripheral impeller pump with a pump capacity of 200 l/min (max. 6.5 bar) is also available as an option.

The TEMPRO plus D-2-L features a new cold water valve block with a modular arrangement, which can be expanded indefinitely depending on the equipment variant. This makes it possible to incorporate customer-specific solutions – such as a cold water bypass

for cooling the return line, or emptying the mold by means of compressed air – easily and inexpensively. Moreover, the standard package includes important equipment features such as automatic filling, emptying the mold by reversal of the pump rotation, system pressure regulation, leak monitoring, and much more.

At K 2013 in Düsseldorf, the brand new WITTMANN TEMPRO plus D-2-L temperature controller is being presented in the 180 °C dual circuit version. But versions for 140 °C and 160 °C are also available. WITTMANN also plans to produce a single-circuit unit and a 90 °C version in an open configuration. The new TEMPRO plus D-2-L is suitable for applications with variotherm temperature



Presented at the K 2013 for the first time: WITTMANN FLOWCON plus (here shown with 12 cooling circuits).

control. The special variotherm tempering process was presented for the first time at the FAKUMA in Friedrichshafen in 2008.

Over the course of the past five years the process design has been extensively refined in terms of operability, control precision and process optimization. The area of extrusion opens up further possibilities for the TEMPRO plus D-2-L.

But ultimately a temperature controller with significantly larger dimensions was mainly needed in order to be able to offer a temperature control system which is also suitable for large machines – not least as part of any operating environment which includes also *MacroPower* injection molding machines from WITTMANN BATTENFELD.

equipped with direct cooling and suitable high performance pumps. And they had to provide heating capacities for specific applications and also be able to deliver correspondingly high cooling capacities. The demand for such high performance led to the development of the TEMPRO basic C120.

Just as with the TEMPRO primus C120, the appeal of the systems in the TEMPRO basic C120 line lies in their compact construction and the versatile choice of primary technical components: the pump (0.75 kW – 200 l/min – 2.35 bar or 1.5 kW – 200 l/min – 3.65 bar), the heating capacity (12 kW or 18 kW) and the cooling valves ($\frac{3}{8}$ " or $\frac{1}{2}$ "). TEMPRO basic C120 temperature controllers are also available in a somewhat larger version. In that case the pump size can be configured in the same way as the TEMPRO direct C120, whereby the pump capacities then range from 0.75 kW to



Picture left:
The new TEMPRO plus D180-2-L temperature controller.

Picture right:
The smaller version of the TEMPRO basic C120 with a heating capacity of 12 kW or 18 kW.



Picture left:
Larger version of the TEMPRO basic C120 with a heating capacity of either 12 kW, 18 kW, 36 kW or 46 kW.

Picture right:
The same unit, opened.

Temperature controllers series TEMPRO basic C120

The success story of the directly cooled temperature controller began in 2009 when a system perfectly matched to the needs of the plastics industry, the TEMPRO direct C120, made its debut at the US trade fair NPE. And then with the TEMPRO primus C120, WITTMANN was able to extend the temperature controller line for large systems downward, while setting the bar on the market in terms of quality and technical features. Thereafter, the industry demanded temperature controllers which had to meet various demanding requirements: The devices had to be as compact as possible, but also offer versatile configuration options and be

4 kW. The standard heating capacity of 12 kW can also be increased to 18 kW as an option. And the available choice of cooling valves ($\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{3}{4}$ ") makes it possible to adjust cooling capacities in fine increments.

WITTMANN very clearly stands out among its competitors in this equipment sector once again, because as a special highlight – besides pumps with capacities of 2.2 kW and 4 kW – it ultimately offers equipment options which enable heating capacities of 36 kW and even 46 kW.

These configuration options with the standardized temperature limit of 120 °C guarantee trouble-free and optimized processes wherever application-based high cooling capacities are needed in combination high feed rates. ♦

Walter Lichtenberger is Temperature Control Department Manager of WITTMANN Kunststoffgeräte. **Gerald Schodl** is Sales Director of the Temperature Control Technology Department of WITTMANN Kunststoffgeräte GmbH in Vienna.

Robomatik in Lüdenscheid offers the full range

The Robomatik GmbH team (formerly Schröer Kunststofftechnik) in Lüdenscheid: Frank Seifert, Anita Neher, Jörg Schröer, Gabriele Schröer, Matthias Klima (from left to right).

For 20 years now, Robomatik GmbH in Lüdenscheid, Germany, has been working with WITTMANN as their regional representative for robots and peripheral equipment. Today, the company markets the entire range of WITTMANN Group products in North Rhine-Westphalia, including with immediate effect, the range of injection molding machines.

The company began as a one-man operation and traded under the company name "Schröer Kunststofftechnik". Business activities included the sale of robotic systems, temperature control devices and flow regulators. The product range gradually expanded over the years to eventually include WITTMANN's other product lines: material handling (dryers, conveyors) and granulators.

Robomatik GmbH was founded in Lüdenscheid in 2005 as the successor to Schröer Kunststofftechnik, and took over the sale of all WITTMANN



products for the North Rhine-Westphalia territory. Robomatik has its own service workshop with inspection, maintenance and repair department, including an extensive spare parts warehouse for temperature control devices and flow regulators as well as a new equipment warehouse for these two product segments.

Robomatik's customers benefit from their 20 years of experience in the system design and sale of WITTMANN robotic systems and peripherals. As of September 1, 2013, Robomatik has additionally taken over the sale of injection molding machines from WITTMANN BATTENFELD. True to the old WITTMANN Group company motto – "One stop shopping" – with immediate effect, all solutions up to and including entire injection molding work cells that incorporate the processing machinery can now be designed and delivered in addition to stand-alone devices and peripheral systems.

Their close proximity to WITTMANN BATTENFELD's branch office in Meinerzhagen allows Robomatik to demonstrate the entire WITTMANN Group range to its customers "live", including carrying out test series that take into account the individual customer's requirements. ♦

WITTMANN Group growing rapidly in North America

Due to the continuing rapid growth of the WITTMANN Group in North America, the headquarters of its US subsidiary – WITTMANN BATTENFELD Inc. in Torrington, CT – is being extended for the second time since it was built in 2000.

The extension of the facility – that will be ready for use in January 2014 – consists of a further addition of 1,850 m² to the existing building. It involves 2.4 million US \$ in capital investment. The addition to the building will provide WITTMANN BATTENFELD Inc. with additional space to accommodate the larger machines from the MacroPower series with up to 1,600 t clamping force, and for commissioning more turnkey lines consisting of machines, automation systems and peripheral equipment. The extension's height of more than 10 m permits unimpeded assembly and testing of the large MacroPower models.

With this extension, the US subsidiary of the WITTMANN Group will now be able to further strengthen its position as a system supplier of machines, robots, automation equipment

and peripheral appliances for the plastics industry. David Preusse, President and CEO of WITTMANN BATTENFELD, Inc., comments: "WITTMANN BATTENFELD has been the market leader in robots for injection molding



plants for many years, largely due to local robot production. The latest addition to the building will now give us even more opportunities for turnkey systems. With it, we will be able to offer complete packages, in the range above 500 t in addition to our existing capacity for smaller systems, which are delivered from here in Torrington, CT as well as from our Mid-West Tech Center in South Elgin, IL. Such integrated injection molding production

cells can be proven here with molds, process and with downstream automation systems. We add complete project management to our multi-line projects with customers to work through more efficient product launches. And we back each of our three product lines with instant remote web servicing with our technical staff all seven days per week."

WITTMANN has already been in Torrington, CT for 24 years and has developed over the last 10 years, thanks to its growing product portfolio, from a well-known maker of automation equipment for the plastics industry with its own robot development and production facility into a system supplier of solutions for the American plastics market. At the US headquarters in Torrington 130 associates are currently employed. But due to successful expansion and constantly increasing demand for the products, their numbers are also continuing to grow.

Since 2010, WITTMANN BATTENFELD Inc. has succeeded in raising its sales figures by 140%! ♦

Sketch of the currently built extension of the building in Torrington, CT.

Articles that appeared in *WITTMANN innovations* so far

In-Mold Labeling

- WITTMANN IML stack mold systems 3/2007
- The WITTMANN 2 + 2 stack mold 1/2008
- ATM d.o.o. in Serbia grows with WITTMANN systems 3/2009
- Quadrangular IML design at PLASTIPAK in Canada 4/2010
- Tea Plast in Albania wants to become the Number One in IML 3/2012
- EcoPower: fourfold IML 1/2013

Temperature Control

- The advantages of pulsed cooling 1/2007
- Comparing water to oil 2/2007
- The new temperature controllers of the TEMPRO plus C series 3/2007
- The new COOLMAX compact cooling units 2/2008
- Temperature controller "guarding" injection molding machines 3/2008
- Temperature controllers with DUO cooling 4/2008
- Variothermal tempering 1/2009
- The new TEMPRO plus C180 2/2009
- The new TEMPRO direct C120 [C250] 3/2009
- WFC: WITTMANN Water Flow Control functionality 4/2009
- TEMPRO plus C180 water temperature controller 1/2010
- WITTMANN TEMPRO: The universal benchmark 2/2010
- BFMOLD™ mold cooling system 3/2010
- The new TEMPRO plus D temperature controllers 4/2010
- Online-thermography 1/2011
- Tempering and injection molding at Fuchs & Sohn 2/2011
- TEMPRO plus D in the automotive sector 1/2012
- Oscilloscope function 2/2012
- Compact temperature controller 4/2012
- Quality assurance through the optimal tempering process 1/2013
- The Starlinger special solution 2/2013

News From The Subsidiaries

- Australia 2/2008, 2/2013
- Austria 2+3/2008, 1/2010, 3/2011, 4/2012, 3/2013
- Benelux 3/2008, 2/2009
- Brazil 3/2007, 1/2009
- Bulgaria 2/2009
- Canada 1/2007, 1+2/2008, 3/2009
- China 2/2010
- Colombia 2/2012
- Czech Republic/Slovakia 4/2009
- Denmark 1/2009, 1/2013
- Finland 4/2008+1/2012
- France 2/2007, 3/2008
- Germany 1/2007, 3/2012
- Great Britain 2/2009, 2/2010
- Guatemala 1/2013
- Hungary 1/2008
- India 2/2008, 3/2010, 2/2012
- Israel 1/2012
- Italy 4/2008, 1/2010, 4/2011
- Mexico 3/2007, 3/2009, 1+2/2011
- Poland 2/2013, 3/2013
- Russia 4/2012
- Slovenia/Croatia 1/2010
- Southeast Asia 2/2007
- South Korea 3/2010
- Spain 3/2007
- Sweden 2/2009
- Switzerland 1/2008, 2/2012
- Taiwan 4/2009
- Turkey 3/2008, 2+4/2011
- USA 2/2008, 3/2009, 1/2011

Conveying/Drying

- Central drying and conveying at Robert BOSCH 1/2007
- Quality control of the WITTMANN dryers 1/2007
- Drying and conveying system at Kromberg & Schubert 2/2007
- Cost efficient material drying 2/2007
- FEEDMAX conveying units fit for the clean room 3/2007
- The new DRYMAX ED80 material dryer 3/2007
- Focus on material feeding 1/2008
- The WITTMANN network control at Arge2000 2/2008
- Changing parameters when conveying different materials 2/2008
- Optimizing a material conveying system 3/2008
- DRYMAX dryers complete with energy rating 3/2008
- Metchem central material handling system 4/2008
- Auxiliaries at Delphi in China 1/2009
- The LISI COSMETICS central system 2/2009
- Perfect planning of central systems avoids downtime 3/2009
- Testing the WITTMANN energy claims at FKT 4/2009
- The new FEEDMAX B 100 1/2010
- Greiner is saving energy by using WITTMANN dryers 2/2010
- The A.C.S. conveying system 3/2010
- The new FEEDMAX Primus material conveyor 4/2010
- The new DRYMAX Aton 2/2011
- The BKF conveying system 2/2011
- WD Kunststofftechnik and its central system 4/2011
- PET processor uses a WITTMANN conveying system 1/2012
- The PLASTICOM system 2/2012
- The NICOMATIC system 3/2012
- Saving energy in material drying 4/2012
- The Bepack material handling 2/2013
- Vision Technical Molding: Prescription for efficiency 3/2013

Automation

- Production and quality control in medical engineering 1/2007
- The handling of large structural foam parts 2/2007
- The new R8 robot control 3/2007
- High-end: The production of seat adjustment rods 1/2008
- Drive engineering for robots 1/2008
- Automating the production of transponder pins 2/2008
- Automated production of remote control keys 3/2008
- Automation at Carclo, UK 4/2008
- The flexible automation cell as ABA-PGT 1/2009
- The cultivation of growth with WITTMANN robots 2/2009
- Bruder toy wheel production 4/2009
- Production of pallets at Georg Utz in Poland 1/2010
- EcoMode helps getting energy efficient robots 2/2010
- Automated production of oil level sensors 2/2010
- Automating rotation welding 3/2010
- The new R8.2 robot control 4/2010
- Linear robots in the clean room 1/2011
- Super-fast part removal 2/2011
- Automation of cups and lids 3/2011
- Superior multi-component molding 4/2011
- Automating insert molding 1/2012
- The expert automation of lids 2/2012
- LSR parts at Silcotech, Switzerland: Quality through automation 3/2012
- Zero-reject production 4/2012
- JENOPTIK: Handling of smallest parts 2/2013
- Schramberg: Most consistent automation 3/2013

Injection Molding

- WITTMANN BATTENFELD: One stop shopping for injection molding 4/2008
- Metal injection molding at Indo-US MIM 4/2008
- Cost optimization: EcoPower by BATTENFELD 1/2009
- IT assisted services 1/2009
- Water injection for all-plastic parts 2/2009
- Krona Indústria and WITTMANN BATTENFELD 2/2009
- Molding micro-parts with the Micro-system 50 3/2009
- Multi-component process at wolcraft 4/2009
- Process data acquisition: partnership with Wille System 4/2009
- The new all-electric EcoPower injection molding machine 4/2009
- Thomas Dudley and WITTMANN BATTENFELD 1/2010
- IML with TM Xpress 1/2010
- AIRMOULD® and AQUAMOULD® Mobile 1/2010
- Design Molded Plastics and their molding machines 2/2010
- Stadelmann relies on Wille and WITTMANN BATTENFELD 2/2010
- The new MicroPower molding machine 3/2010
- AQUAMOULD® and projectile injection technology 3/2010
- New benchmark in large machines: MacroPower 4/2010
- STELLA relies on WITTMANN BATTENFELD machines 4/2010
- The ServoDrive technology 1/2011
- The 75th machine for Krona 1/2011
- Packaging specialist TM Xpress 2/2011
- WAVIN (Czech Rep.) and WITTMANN BATTENFELD 3/2011
- SANIT molding a success 3/2011
- WEPPLER Filter using BATTENFELD machines 4/2011
- MacroPower for the production of cable ties 1/2012
- The CELLMOULD® process 2/2012
- ESMIN produces cases for cosmetics with 43 WITTMANN BATTENFELD machines 3/2012
- Remote connectivity 3/2012
- Foamed high-quality parts 4/2012
- LECHNER and the MacroPower 4/2012
- MacroPower at GT LINE 1/2013
- Praise for the standard machine! 1/2013
- Vertical rotary table machines at Electricfil 2/2013
- BECK's molding technology 2/2013
- ESCHA using HM machines 3/2013
- Hoffer Plastics uses HM machines for "focused factories" 3/2013
- Guppy using the EcoPower 3/2013

Blending

- The new WITTMANN blenders of the GRAVIMAX series 2/2007
- The truth about blender economics 3/2007
- The new GRAVIMAX 14V blender 3/2009
- The art of blending regrind 3/2011
- Dosing on the highest level 1/2013

Granulation

- Inline recycling of sprues 1/2007
- Giant granulator MCP 100 2/2007
- The new MAS granulator 3/2007
- Challenging recycling process 1/2008
- The MC 70-80 at Centrex 2/2008
- Gibo Plast enforces recycling 2/2009
- The new AF auger feed for MC central granulators 4/2009
- Grinding of ferrite 1/2010
- Grinding critical material 3/2010
- The TMP CONVERT solution 1/2011
- Inline recycling with Minor 2 3/2011
- Granulators under the press 2/2012
- Large solutions for large parts 1/2013

WITTMANN
KUNSTSTOFFGERÄTE GMBH
Lichtblaustrasse 10
1220 Vienna, AUSTRIA
tel.: +43 1 250 39-0
fax: +43 1 259 71-70
info.at@wittmann-group.com
www.wittmann-group.com

WITTMANN
BATTENFELD INC.
1 Technology Park Drive
Torrington, CT 06790, USA
tel.: +1 860 496 9603
fax: +1 860 482 2069
info.us@wittmann-group.com
www.wittmann-group.com

WITTMANN ROBOT
(KUNSHAN) CO. LTD.
No. 1 Wittmann Rd.
DianShanHu Town
Kunshan City, Jiangsu Province
215245 CHINA
tel.: +86 512 5748 3388
fax: +86 512 5749 3199
info@wittmann-group.cn
www.wittmann-group.com

WITTMANN
BATTENFELD GMBH
Wiener Neustädter Strasse 81
2542 Kottlingbrunn, AUSTRIA
Tel : +43 2252 404-0
Fax: +43 2252 404-1062
info@wittmann-group.com
www.wittmann-group.com

Wittmann

Wittmann **Battenfeld**