

**Wittmann**

[www.wittmann-group.com](http://www.wittmann-group.com)

# innovations

*Technics – Markets – Trends*

*Volume 6 – 4/2012*

*Creating  
Value*



**Battenfeld**

# Articles that appeared in *WITTMANN innovations* so far

## 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

## News From The Subsidiaries

- Australia 2/2008
- Austria 2+3/2008, 1/2010, 3/2011
- 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
- Finland 4/2008+1/2012
- France 2/2007, 3/2008
- Germany 1/2007, 3/2012
- Great Britain 2/2009, 2/2010
- 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
- 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

## 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 Microsystem 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 75<sup>th</sup> 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

## 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

## Granulation

- Inline recycling of sprues 1/2007
- Giant granulator MCP 100 2/2007
- The new MAS granulator 3/2007
- The challenging recycling process 1/2008
- The MC 70-80 granulator 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
- TMP CONVERT: Customized solutions 1/2011
- Inline recycling with Minor 2 3/2011
- Granulators under the press 2/2012

## 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

## 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

## 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 Technical Plastics, UK 4/2008
- The flexible automation cell as ABAPGT 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
- The automation of insert molding 1/2012
- The expert automation of lids 2/2012
- LSR parts at Silcotech, Switzerland: Quality through automation 3/2012

## WITTMANN innovations (Volume 6 – 4/2012)

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](mailto:bernhard.grabner@wittmann-group.com); <http://www.wittmann-group.com>  
Issue 1/2013 of "WITTMANN innovations" will appear at the beginning of the first quarter 2013.

# Editorial



**Michael Wittmann**

Dear Reader,

About the same time in the fall of every year, the most important European trade fair in our industry is staged. For two consecutive years the Fakuma in Friedrichshafen, which has a reputation of being “warm and friendly” and “laid back” is held, and in every third year, there is the K, which all market actors look forward to with great expectation. The buzzword “K-year”, which is then on everyone’s lips, needs no further explanation in the world of plastics, and whenever the word is mentioned, it often produces a few moments of extremely eloquent silence. Everyone involved is thoroughly familiar with the thoughts this catchword is able to provoke – they revolve around meetings and experiences that occurred during past K events, and the sometimes enormous workload in the preparatory phase, which must be coped with on top of daily business.

So is 2012 not a “K-year”, but just another “relaxed Fakuma year”? In the usual way, we turned up at the autumn trade fair this year and were faced with the recurring speculations and forecasts about the economic prospects of our industry. The Euro crisis is a topic of discussion everywhere as it affects all of Europe and also influences the entire global economy – but it has not yet shown any dramatic effect on the global plastics industry. The question of whether this is the result of a successful economic policy, or whether the plastics industry is to some extent protected by a measure of inherent independence probably cannot be answered with certainty. In any case, our customers’ injection molding machines are running just as incessantly as the printing presses of so many central banks currently producing bank notes. Whether or not the one depends on the other will probably remain a mystery for the time being.

At the Fakuma show, we presented a number of our new products. With a special application, we demonstrated our own CELLMOULD® structured foam injection molding technology, as well as the BFMOLD® variothermic mold tempering technology, micro injection molding and an IML application using the bioplastic material PLA. In the area of individual appliances, we had 10 new products on display. These included the new MacroPower XL 550 injection molding machine with extra wide platens and our new W822 robot specially designed for more complex applications on smaller injection molding machines. Further highlights at our booth were the temperature controller TEMPRO primus C120 with direct cooling, the GRAVIMAX B34 gravimetric blender with its 3 kg batch capacity and the ARS anti-blocking system for our granulators.

Sincerely, Michael Wittmann

# Content

## **Injection Molding**

### **LECHNER and the MacroPower**



**Gabriele Hopf** about LECHNER and their machines ...  
**Page 4**

### **Premium surface quality**



... and about the new combination of injection molding techniques.  
**Page 6**

## **Automation**

### **Zero-reject production**



**Walter Klaus** writes about the OECHSLER system for zero-reject production.  
**Page 8**

## **Drying**

### **Energy-saving drying**



**Markus Wolfram** on the energy saving Aton segment wheel dryer.  
**Page 10**

## **Tempering**

### **New: TEMPRO plus D Micro**



**Gerald Schodl** introduces the special micro-molding unit.  
**Page 12**

## **Series**

### **"My EcoPower" in Austria**



**Ing. Thomas Buchegger** answers interview questions.  
**Page 13**

## **Portrait**



**Our Russian subsidiary.**  
**Page 14**

## **News**



**Joint symposium by HASCO and WITTMANN BATTENFELD.**  
**Page 15**

# LECHNER and the *MacroPower*

*LECHNER Ges.m.b.H., based in Bad Vöslau, Lower Austria, relies entirely on injection molding machines from WITTMANN BATTENFELD for its investments, including their large machine sector. Their most recent acquisition is a MacroPower 650 – for LECHNER already their second MacroPower.*

**Gabriele Hopf**



*The LECHNER production hall no. 1 with 23 injection molding machines from WITTMANN BATTENFELD.*



*Owner-manager Christian Lechner with a plastic part for the driver's seat of a utility vehicle (picture on the left) in front of the MacroPower 800 in the new production hall built in 2011. Picture right: Mold servicing.*



**I**n 1996, Christian Lechner started his successful career as a plastics processor in Bad Vöslau with a metal-free “laundry clip which really works”. Today, LECHNER Ges.m.b.H. employs 30 associates and manufactures more than 1,500 different articles on a 4,000 m<sup>2</sup> production floor, including a variety of plastic components quite distinct from the famous polycarbonate clothes-pin such as parts for medical technology, the cosmetic, electronics and food industries, and automobile and aircraft construction. LECHNER currently supplies parts to 93 customers, among them such well-known

companies such as Alpla, Felix Austria, Frequentis, Hella, Braun, Mautner Markhof and Roche. The company offers all types of injection-molded parts with shot weights from 0.3 g to 3,000 g on machines with clamping forces ranging from 30 to 800 t. Their portfolio also includes multi-component injection molding and metal insert molding.

All common materials are processed. In addition, LECHNER handles downstream finishing of plastic parts, such as flat and rotary pad printing, laser marking and ultrasound welding. Partners are engaged for the mold

making process, but LECHNER takes care of the mold maintenance and servicing itself. The company has shown continuous, steady growth ever since its foundation. Even in 2009, the year of economic crisis, a 30% decline in sales in the automotive sector was compensated by a 45% increase in new orders.

LECHNER exports more than 50% of its production to other EU countries. With the construction of a new facility in 2011 and another 3,000 m<sup>2</sup> of building land available, the course is set for future growth.



### LECHNER's injection molding machines

A total of 24 injection molding machines are installed at LECHNER, all from WITTMANN BATTENFELD. Apart from a few all-electric models, most of these are hydraulic machines, one of which is equipped for multi-component injection molding so that products made of several different materials, such as baby pacifiers, can be manufactured on it.

Most recently, WITTMANN BATTENFELD delivered a large machine from the *PowerSeries* with 650 t clamping force, a *MacroPower* 650/5100.

Prior to that, LECHNER had already commissioned a *MacroPower* 800/5100 equipped with a WITTMANN W843 robot. The results achieved with that machine were so completely satisfactory that Christian Lechner very soon decided to purchase another *MacroPower* to further increase the company's capacity for large plastic parts. It was installed in September of this year.

This slightly smaller model from the *MacroPower* series is also equipped with a WITTMANN robot, which removes the finished parts from the mold and deposits them. This machine primarily manufactures housing parts for the automotive industry, such as headlamps, as well as parts for agricultural and construction machinery, for example parts of the driver's seat. Moreover, the *MacroPower* produces foamed parts and devices used in machine construction.

### Flexibility is the key to success

Injection molding machines have to meet many different requirements on LECHNER's production floor. The most important requirement is that the machines are fully controlled and have a facility for long-term recording, documentation and evaluation of a great variety of parameters, which means detailed analysis of the processes by means of actual value graphs, quality charts or envelope curves.

On the basis of such thorough statistical analysis, LECHNER can guarantee consistently high product quality to its customers, which has been confirmed by positive feedback in numerous cases.

The great number of different items LECHNER produces requires fast and effective convertibility of its machinery. And what is more, the machines must be capable of being fitted with a great variety of specialized equipment: core pulls, screw-on units, parts removal robots, hot runners, air valve controllers, moldmaster function or cooling equipment. In the area of maximum flexibility, WITTMANN BATTENFELD machines also have a significant edge over the equipment supplied by competitors.

### Trouble-free cooperation

Christian Lechner appreciates the excellent cooperation with WITTMANN BATTENFELD, saying: "The communication functions perfectly and our cooperation with the engineering, development, sales and service departments is excellent, which has proved extremely helpful in implementing customized solutions. Our geographical closeness to WITTMANN BATTENFELD is another major advantage for us."

WITTMANN robots are already in use, but several other products from the WITTMANN group's portfolio will also soon be introduced at LECHNER, such as material dryers, conveyors, metering devices, temperature controllers and cooling equipment. Christian Lechner concludes that, "The possibility to acquire machines, automation and peripheral equipment all from a single source is one of the strongest arguments in favor of WITTMANN BATTENFELD for us."

### The MacroPower from WITTMANN BATTENFELD

The *MacroPower*, WITTMANN BATTENFELD's large injection molding machine model, allows for a minimal footprint, high speed, modularity, ultimate precision and cleanness. Its modular concept enables its use for many different purposes. The linear guides of the moving platen ensure a clean mold space and maximum, high-precision mold protection. The *MacroPower* owes its rapidity to high movement speeds and minimal locking and pressure build-up times. The latter are due to the *QuickLock* locking system developed by WITTMANN BATTENFELD.

An outstanding feature is the facility for extremely simple mold insertion from the rear of the machine. An extended guardrail stroke on the non-operator side and the length of the tie-bars, which has been kept extremely short thanks to the locking system integrated in the moving platen, make it possible in most cases to insert bulky molds without using a tie-bar removal device. ♦

*Metal-free laundry clips – just two examples of the wide range of plastic parts produced by LECHNER (which include many complex technical parts).*

# Foamed injection-molded parts with high-quality surface

*The production of light-weight injection-molded parts with high-quality surfaces is a major concern of the plastics industry. By a combination of the variothermic BFMOLD® process with CELLMOULD® structured foam technology, WITTMANN BATTENFELD meets the most stringent demands – and they presented this solution at the Fakuma 2012.*

**Gabriele Hopf**



*High-quality desk telephone cover, produced with the BFMOLD® process in combination with the CELLMOULD® process.*

As one of the pioneers in the field of innovative process technologies, WITTMANN BATTENFELD has already been working intensively for many years on the production of light-weight parts with an impeccable surface quality as well. For instance, AIRMOULD® gas injection technology has already been in use for a considerable time in manufacturing hollow parts which are light and simultaneously meet high quality standards.

The process most recently developed by WITTMANN BATTENFELD is CELLMOULD®, a physical gassing process by which foamed parts can be produced with a compact shell and a cell structure at the core. WITTMANN BATTENFELD is the only machine manufacturer able to supply both the physical gassing equipment as well as the matching injection molding machine from a single source.

The use of CELLMOULD® enables the production of light-weight parts without sink marks or warpage, which have an outer shell consisting of closed cells. This shell, however, does not come out completely smooth, neither to the eye nor to the touch, without the simultaneous use of a process to improve the surface quality.

## *BFMOLD® for perfect surfaces*

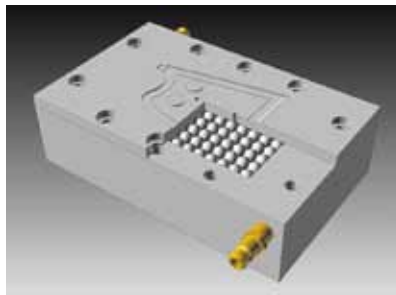
The aim was to produce foamed parts with a perfect surface and simultaneously preserve the advantages of a core with a cell structure.

Injection of foamed melt into a hot mold normally prevents the occurrence of silver-colored striation marks caused by the foam. The surface of such a part precisely matches the contour of the cavity. Following injection, the cavity is then cooled as rapidly as possible simultaneously with the melt inside it.

With BFMOLD® technology, WITTMANN BATTENFELD has a process at its disposal that, in contrast to molds with conventional tempering channels, utilizes the entire area directly behind the cavity for cooling. In this way, molded parts with minimal warpage and excellent surface attributes can be produced within an extremely short cycle time.

But rapid cooling is not the only purpose for which this cooling system arranged directly around the contour can be utilized. Heating of the cavity with pressurized hot water

also becomes possible within only a few seconds. BFMOLD® thus enables cyclical, variothermic heating and cooling of the mold cavity (using water as the temperature control medium). With this combined process of



variothermic mold tempering and BFMOLD®, it has now become possible to meet the most stringent requirements concerning the surface quality



**Advantages of the combined process**

Not only does the combined WITTMANN BATTENFELD CELLMOULD® and BFMOLD® process produce perfect surfaces without any necessity for costly downstream finishing, it also offers a number of other decisive benefits.

Compared to the production of compact molded parts, the cycle time is shortened here by more than 10%, since the long holding pressure phase required for compact injection molding is dispensed with.

The reduction in weight achieved through the foaming process also reduces material costs.

**Presentation at the Fakuma 2012**

At the Fakuma 2012, WITTMANN BATTENFELD will be demonstrat-

ing the advantages of this special process combination by the production of a desk telephone cover at booth 1204 in hall B1.

Thanks to the additional use of BFMOLD®, the CELLMOULD®-foamed part can be presented with a perfect surface in “piano black”. The surface of the molded part is a perfect match of the cavity surface, free of sink marks and visible joint lines. This part will be produced on an HM 110/350 injection molding machine with a single-cavity mold supplied by Kunststoffinstitut Lüdenscheid. The machine is equipped for CELLMOULD® with a 25 L/D barrel with a CELLMOULD® control system integrated in the machine’s UNILOG B6 control system, and also a CELLMOULD® gas flow regulator module for controlled nitrogen injection.

The injection molding machine is built as a turnkey solution. So, a WITTMANN robot for parts removal, a conveyor belt, as well as upstream and downstream peripheral equipment, are all integrated in the machine frame. The finished parts are removed and deposited on a conveyor belt by a W818 WITTMANN robot, which is also integrated in the machine’s control system. ♦

*Schematic diagram of BFMOLD® ball filling.*

*(Picture: KIMW)*

*WITTMANN BATTENFELD HM 110/350 injection molding machine with UNILOG B6 control system.*

*CELLMOULD® 25 L/D injection unit with gas injector (left) and CELLMOULD® gas flow regulator module installed on the injection molding machine (right).*



of the molded parts. WITTMANN specially developed its new series of TEMPRO plus D Vario temperature controllers to enable practical application of this innovative process technology.

Perfectly even and, above all, extremely rapid cooling of the relevant mold areas can be achieved with BFMOLD® technology, especially for flat parts. So, BFMOLD® is of interest not only for reducing cycle times, but also for minimizing tensile stress and thus preventing warpage. Moreover, the variothermic process virtually eliminates sink marks and visible joint lines, which is important primarily for parts with a visible surface or high-gloss components.

**CELLMOULD® for light-weight parts**

The CELLMOULD® structured foam process enables the production of extremely light components with a high rigidity and without any sink marks. The foaming agent is nitrogen, which is injected directly into the barrel. A gas flow regulator module ensures precise, repeatable regulation of the gas injection.

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

# Top-quality, zero-reject production is possible

*A classic example of seamless interaction between injection molding and quality management: OECHSLER AG in Ansbach, Germany, produces 1.2 million parts for diesel engine turbochargers per annum in a production cell from WITTMANN – 100% free of defects.*

**Walter Klaus**

*General view of the production cell at OECHSLER in Ansbach. This production cell produces 1.2 million high-precision parts per annum.*

In the production of automotive parts, plastics processors have always been faced with the most stringent requirements, and this is not likely to change in the future. Especially where such parts are relevant for safety, the choice of production methods and means of production must invariably correspond to the most advanced techniques, and the equipment must be maintained in that state for long-term, continuous operation.

## **Faultless production**

In a compact production cell, technically laid out for zero-reject production without compromise, OECHSLER AG manufactures an actuator for diesel engine turbochargers at its Ansbach facility. This highly advanced production line serves as an example for numerous others that take care of parts manufacturing at OECHLER in fully automatic production cells for a wide variety of customers.

The basic prerequisite for this fully automatic and partly autonomous production cell was the necessity to produce these top-quality parts 100% free of defects at competitive costs.

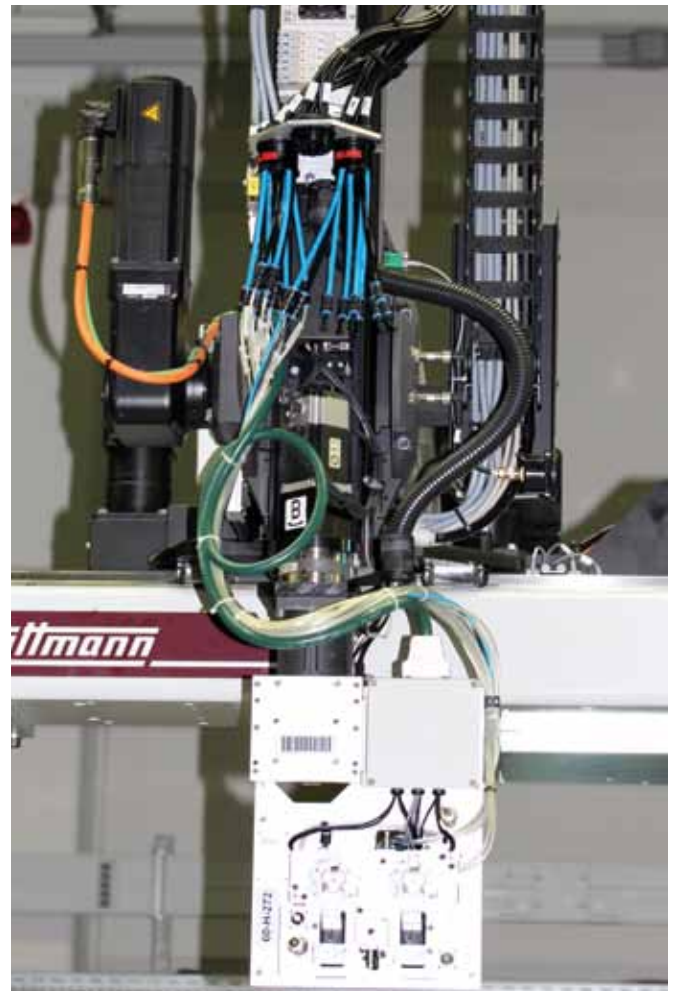
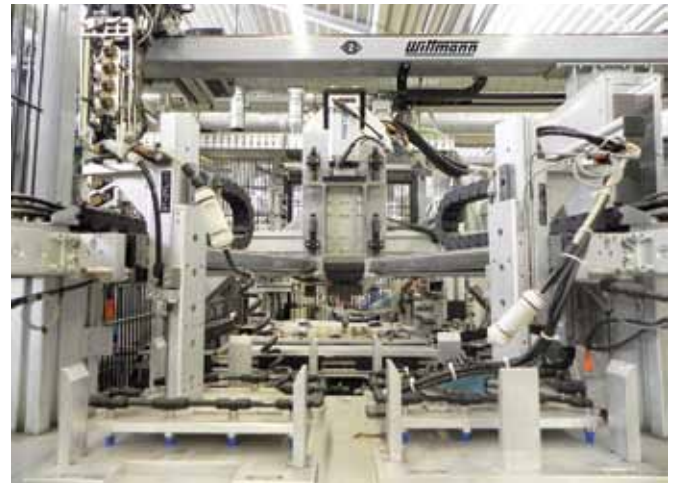
The automation components and matching overall control system supplied by WITTMANN Robot Systeme in Schwaig near Nuremberg form the common platform that incorporates all components and appliances used as parts of this production cell into a self-regulating production unit.

Regular monitoring of the individual production steps, quality inspection of the parts to be joined together by an injection molding process and inspection of the finished parts immediately following ejection all ensure that a perfect part leaves the production cell in every single case.

## **High-tech equipment**

Two linear 3-axis servo robots from WITTMANN, a W632 and a W631, work together in perfect coordination with numerous assembly, inspection and sorting devices and a KM 80 injection molding machine.

One of the production cell's special highlights is the punching of a printed circuit board and its handling. The original board with its 24 panels is placed on a table whose compound slide is driven by two servo mo-



*Gripper with circuit board.*





*View of reject separator.  
Picture right:  
Individual parts  
handled by the  
equipment.*



tors. These motors are similar to the models that normally enable a robot to carry out two additional axial movements at the end of its vertical arm. The exact positioning of the compound slide and the punching device is controlled via the robot's teachbox.

The handling of shafts made of magnetic stainless steel, which are allowed only minimal tolerance margins (8 mm in diameter minus 0.01 mm), proved a special challenge. Since the steel contains neither sulfur nor carbon, these parts are extremely soft by comparison and consequently they are extremely liable to being damaged.

Therefore, the 50 kg gripper system, which is mounted on the Y-arm of the robot with a rotary servo axis pivoting by 180°, docks onto the mold via two centering devices. In this way, a firm connection is created between the mold and the gripper, which subsequently inserts four shafts arranged in a vertical row all at once.

*WITTMANN four-fold gripper.*



### *Comprehensive quality inspection*

Quality inspection of the finished parts is carried out by a camera system which, following a throughput of 500 dummies, carries out a self-diagnosis to ascertain whether or not the system needs to be recalibrated. This step, which is typical for a top-class production cell, is vital in order to reach the set target of 100% good parts.

Another quality check takes place following demolding of the parts. At a temperature of 120 °C, the functionality of the circuit boards embedded in the finished part is tested, with defective parts being separated where necessary. The individual circuit boards had already been subjected to such a test the first time they had been punched out and separated.

Monitoring of the equipment by the control system also contributes to parts quality assurance. The control system was extended by adding a master computer, which continuously records all process steps including any faults or malfunctions and transmits them by SMS to the WITTMANN service team once every day.

This procedure also guarantees continuous further improvement of the equipment, since a thorough analysis of the records makes it possible to take appropriate preventive action before any malfunctions occur. ♦

*180° servo drive  
of the positioning  
axis.  
Bottom picture:  
Rear view of the  
gripper centering  
device.*



*Walter Klaus  
works as a consul-  
tant and scientific  
author, until 2008  
he was the CTO  
(Chief Technical  
Officer) of WIT-  
MANN Robot  
Systeme GmbH in  
Schwaig, Germany.*

# Saving energy in material drying

*In operation year round in all climate zones of our planet, DRYMAX Aton has established itself in the plastics processing industry. The segment wheel dryer stands out with its user-friendliness and high performance. Moreover, this appliance scores with energy-saving functions, which constitute genuine progress.*  
**Markus Wolfram**



**WITTMANN**  
**DRYMAX Aton**  
 BS/6 segment  
 wheel dryer with  
 draining function  
 for the material  
 pipeline to the  
 machine, dry-air  
 conveyance, demand-  
 controlled material  
 conveyance and  
 adjustable input  
 volume.

**T**he problem of ambient moisture starts with the storage of plastic materials. Where extremely large quantities of materials must be kept ready, outdoor silos are used in addition to octabins and bags. These massive units may be equipped with blanketing devices which prevent moisture penetration. However, not all plastics processors need such voluminous storage containers.

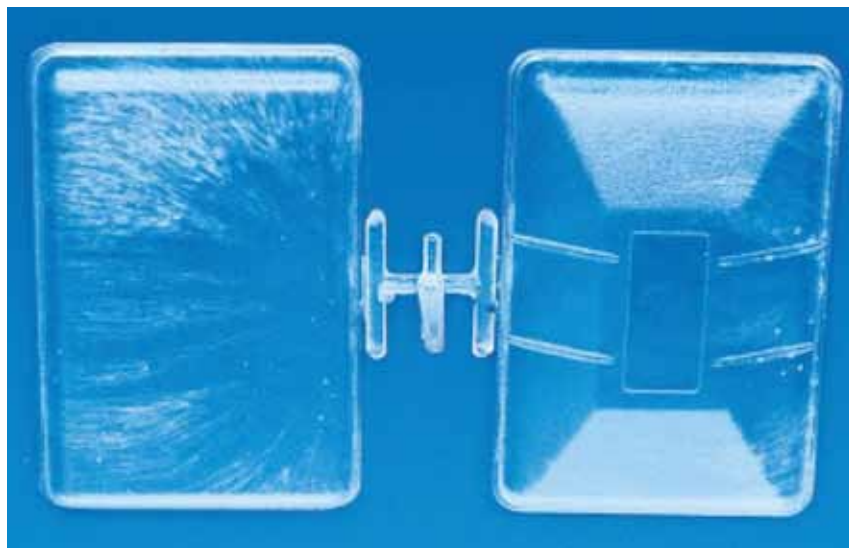
Materials stored in bags, mobile containers or octabins are constantly exposed to the risk of attracting moisture, especially where the containers remain open for any length of time for material feeding to the processing machines. Bags lined with aluminum foil can solve this problem to some extent, although the contents must still be processed as fast as possible once the bag is opened. For smaller throughputs, mobile dryers are used to cope with the moisture. For some materials, a special conveyor to take them to the processing

machine is also needed after the drying process to eliminate the risk of remoistening. To ensure an optimal material flow through the pipelines of such conveyors, an adequate proportion of air must accompany the material. Normally, environmental air is used for this purpose which allows for undesirable remoistening of the material during its transport through the pipelines.

In central conveying systems, this is prevented by means of dry air conveying. In this case, no ambient air is pumped into the suction box, but the material is transported through a closed-loop air circuit using a central blower. Here, the WITTMANN mobile dryers from the DRYMAX E series bearing the additional label "PDC" fulfill all relevant requirements. Accordingly, the segment wheel dryers from the Aton series are fitted with what is known as "integrated BS/6".

### Moist material produces scrap

How does moisture make itself felt in processing? Strongly hygroscopic materials (which attract water) must be dried in every case. Here, molded parts with clearly visible air bubbles and striations would be produced right away, and all such parts would have to be sorted out as defective. Unfortunately, this could also lead to defects which generally remain unnoticed at first, as they do not affect the visual attributes, but rather the mechanical properties of the part. If such a part breaks, a cycle of complaints and replace-



ments is set in motion, and extra material, production and transport costs are incurred. The possible consequence of damage to a manufacturer's good reputation should not be ignored either – especially when the part in question has been shipped to a prestigious customer, say, from the automotive industry. Such serious consequences may thus ensue from operating drying equipment which is unsuitable or of inferior quality.

### Material drying everywhere and at all times

In the hot season, the demand for dry air generators rises just like the demand for fans and air conditioners during the summer months. The higher moisture content of the air during that season makes itself felt in processing of strongly hygroscopic materials.

The cold season also presents some challenges of its own. For example, PP is dried more frequently than ever. This is happening even though most processors and material producers seem to agree that PP does not need to be dried. Experience shows that the opposite is common practice in most cases. When asked for the reason, the answer normally given is that consistent product quality can only be achieved by maintaining unchanging conditions. For instance, if the material is stored at low temperatures in an unheated environment, the conditions prevailing then are totally different from those at summer temperatures.

The change in conditions is even more extreme with outdoor storage, when the temperatures drop below 0 °C. In practice, PP and PA are therefore always dried, regardless of the season of the year. The DRYMAX Aton segment

wheel dryer from WITTMANN has very quickly established itself in all climatic zones of the world, in North and South America as well as in Asia, Australia and Europe. Processors appreciate the Aton in particular for its constant dew point behavior and excellent dry air quality that it delivers even under extreme environmental conditions, and which invariably improves the quality of the material.

As a global supplier, WITTMANN sees itself constantly challenged to demand optimal drying performance of its appliances, regardless of the climatic zone. DRYMAX Aton is particularly appreciated for its effectiveness in coping with high water loads in tropical countries, where the water is sometimes virtually “running down the walls” in molding plants.

### Saving energy with Aton

In temperate zones, the most important aspect of this dryer is Aton's energy efficiency. The correlation between material drying and energy consumption is easy to illustrate through a comparison with a motor vehicle's gas consumption.

A racing car will be the fastest to the finish line if driven at top speed, consuming a certain amount of fuel in the process. But it could also cover the same distance at a slower

speed, which would mean a reduction in gas consumption. And this is precisely the kind of choice DRYMAX Aton makes for the operator, between running at top speed and running more slowly. A simple push of a button will put the appliance into the so-called *EcoMode*, which provides automatic process control.

Whenever the water load is high, drying takes place in the wheel mode, using the rotating segment wheel. As soon as a decrease in the water load leads to an improvement in drying conditions, Aton automatically changes into the cartridge mode and the segmented wheel stops, thus reducing energy consumption.

In addition to the *EcoMode*, DRYMAX Aton has several other features designed to reduce its energy consumption. For example, the special 3-save process minimizes regeneration energy by way of multiple utilization. The heating element is also laid out for optimal heat and air exchange. Finally, DRYMAX Aton also applies the proven method of countercurrent regeneration already known from other models of WITTMANN dryers. To make this regeneration process as short and efficient as possible, a function called *SmartReg* takes care of appropriate temperature control and optimal timing of the entire cycle.

DRYMAX Aton can operate with drying silos of several different sizes. Here, also, a number of measures have been taken to reduce energy costs. The stainless steel silo is heat-insulated, and the heating element is mounted directly onto it to avoid heat loss. In mobile appliances with 2, 3 or more silos, the *SmartFlow* regulation of automatic air distribution is one of the standard features. Why should any more air than necessary be sucked in and heated up? ♦

*Ugly striations and dull marks caused by insufficiently dried material.*

**Markus Wolfram**  
is Sales Manager  
of the Bulk Materials  
Department  
at WITTMANN  
Kunststoffgeräte  
GmbH in Vienna.

# The compact temperature controller

*With the compact and efficient TEMPRO plus D Micro dual and single zone temperature controller, WITTMANN is setting new standards for the temperature range of 100–160 °C. The TEMPRO plus D Micro is perfect for the use with micro-molding and a mold weight of up to 600 kg.*

**Gerald Schodl**

**W**ITTMANN has developed the new TEMPRO plus D Micro temperature controller in close collaboration with the constructing engineers of the WITTMANN BATTENFELD MicroPower injection molding machines.

This new development is based upon the already proven technology of the TEMPRO plus D. It is widening the product range towards smaller injection molding machines, but also is suitable for molds weighing up to 600 kg.

*Compact, efficient and especially developed for the use with small injection molding machines and molds of up to 600 kg: the new TEMPRO plus D Micro temperature controller.*

This is made possible through the unit's dual zone construction, in which the heating capacity of 6,000 W – in combination with a maximum pump capacity of 30 lit./min and 5 bar (max.) – are carrying out the best possible heat transfer.

The TEMPRO plus D Micro features low dimensions of 584 × 265 × 607 mm (H × W × D) that allow for direct installation in the inside bottom of the *MicroPower* injection molding machine. This integration into the machine saves valuable floor space and reduces the overall footprint of the system.

## Seamless integration

Also with regard to its handling, the TEMPRO plus D Micro can be fully integrated into the *MicroPower* injection molding machine. Using an Ethernet port, the TEMPRO user interface can be completely mirrored on the machine's control panel. There, the setting and adjusting of the process parameters can be executed, as well as the presentation of the complete course of the process over any predefined time period.

## Three models

WITTMANN is offering the TEMPRO plus D Micro in three different designs, for process temperatures of up to 100 °C, 140 °C and 160 °C, the latter with a maintenance-free



magnetically coupled pump. All models are pressurized and pressure controlled versions – the system pressure is first measured, and then controlled above the saturation pressure that is subject to the water temperature. This approach guarantees the cavitation-free operation of the pump, thus contributing to a longer life cycle. The closed construction is leading to unlimited mold-discharging volume, because the mold water is not delivered into the heat exchanger, but into the return line.

## Minimized volume

The very small entire volume constitutes a further essential aspect of the new WITTMANN TEMPRO plus D Micro: due to the unit's overall size, the volume was reduced to only 1 liter!

The WITTMANN flow technology engineers managed to fully optimize the control of such a small volume. After having executed numerous elaborate tests, and after having developed a special vibration damper, the predefined control accuracy of  $\pm 0.2$  °C was realized – even at water temperatures of 160 °C and flow rates of 5 lit./min.

One more advantage: due to the small water volume that the temperature controller has to hold, the molds can be heated up and cooled down very quickly, because there is no need to heat/cool unnecessary masses. Through indirect cooling that is done by a cooling coil, the TEMPRO plus D Micro reaches cooling capacities that are matching the values of common size models!

Beyond that, the integrated standard direct cooling that can be switched on additionally is exponentially increasing the cooling capacity, thus much more rapidly cooling down the mold when a mold-change is impending.

Serial interface and flow measurement are optionally available, perfecting the TEMPRO's technical profile and guaranteeing highest process security – using a minimum of space. ♦

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

# Greiner Bio One and the *EcoPower* machine

*Austria and Thailand: Greiner Bio One, an internationally successful manufacturer of high-quality plastics parts, benefits from the EcoPower injection molding machine.*

- *What size and spec is your EcoPower machine?*

We have 2 *EcoPower* 110/350 machines – one machine in Kremsmünster and one in Thailand. We also have two *EcoPower* 120/350 machines in Kremsmünster.

- *How did you come to purchase it?*

We very much liked the concept, especially the compact design. The machine has a small footprint and does not need so much space as comparable machines.

- *How long have you been running it?*

Our first *EcoPower* was installed in Kremsmünster in 2010.

- *What products does your business make?*

We manufacture products for the medical industry. Our product range includes collection systems for blood and specimens under our VACUETTE® brand. We also make a variety of products for the biotechnology and diagnostics part of the medical industries.

- *What products are your EcoPower machines typically making?*

The machines are mainly making polystyrene based receptacles for liquids for analysis. They are also molding polypropylene-based ring pads for the VACUETTE® tubes.

- *How many molds/tools are you typically using on your EcoPower machines?*

Each machine has been specially ordered for the use of one specific mold product. We have only permanent molds in the

machines. We have also tested other products on the *EcoPower*.

- *What are your favorite design features on the machine?*

We very much like the compact

- *the workings of the EcoPower machine?*

The electric unit coupled with a hydraulic component provides advantages. The hydraulic ejector in our product application

## My *EcoPower*: Part 5

*Respondent:*  
Ing. Thomas Buchegger

*Position:*  
Head of Injection Molding Production Engineering

*Company:*  
Greiner Bio One

*Location:*  
Kremsmünster, Austria



Ing. Thomas Buchegger with one of the Greiner Bio One *EcoPower* injection molding machines in Kremsmünster.

and modern design which also fits with our operations.

- *What operational advantages have you noticed on the EcoPower?*

Above all we have noticed the low energy consumption in combination with the hydraulic ejector, cleanness and also the low noise level. An electric injection molding machine with a hydraulic ejector has a number of advantages when compared to an all-electric machine, especially with regard to the cycle time.

- *What changes in energy consumption have you noticed on the EcoPower?*

An *EcoPower* needs only 45–50% of the energy (KWh/kg) of a fully hydraulic machine.

- *What other energy savings and efficiencies have you noticed about*

leads to a further reduction of the cycle time und thus to a higher capacity.

- *Have any of your customers seen your new EcoPower?*

The *EcoPower* machines are always shown when people are shown our production facility.

- *Where next for your business?*

The last few business years have been characterized by strong growth and, as a consequence, high investment. Therefore, we have planned a year of consolidation for 2012.

- *Where next for you and the WITTMANN BATTENFELD EcoPower machine?*

Depending on the upcoming projects we will also consider the investment into an *EcoPower* from WITTMANN BATTENFELD in the future. ♦

# Russia: OOO BATTENFELD Injection Molding Russia

*The Moscow affiliated office of the WITTMANN Group was founded in 2006. Its field of activity includes the former Soviet Union countries, namely: Russia, Uzbekistan, Kazakhstan, Turkmenistan, Kyrgyzstan, Tadzhikistan, Azerbaijan, Georgia, and Armenia.*

Initially, the company office was located in the center of Moscow, which created inconveniences to clients because of the city's permanent traffic jams. After installing a new team at the end of 2009, the company moved to a bigger office close to the Moscow ring road, a real improvement from the point of accessibility. In 2009, only two people were working with OOO BATTENFELD Injection Molding Russia. Today, eight people are employed.

*Dmitry Maksimenko, General Manager of OOO BATTENFELD Injection Molding Russia (second from the right), and a part of his team in the Moscow office of the company.*

The new premises are presenting a permanent exhibition of the WITTMANN Group's different products: temperature controllers, hopper loaders, blenders, granulators, dryers, and water flow regulators. Close by the office resides the company's warehouse that holds all of the equipment and the spare parts.

## Market situation

Today the Russian market of plastic products is growing rapidly. Among the leaders in the plastics industry with regard to the production volumes of plastic parts are the automotive companies, with their plants in Kaluga, Saint Petersburg, Nizhny Novgorod, Samara, and Tolyatti. This is a result of the fact that most automotive companies have established car assembly lines in Russia. Today, Russia on the one hand, and all the other European countries on the other, are eager to come in first in the field of car sales in Europe.

At a lower speed, but an also significant one, is the growth of the number of companies that concentrate on



the production of quality thin-walled packaging using the IML technology. Some projects, partly as turnkey solutions consisting of an injection molding machine and the appropriate IML system, have already been implemented successfully by the WITTMANN Group in the regions of Nizhny Novgorod, Krasnodar, and Moscow. Apart from these markets, Russia still has many state-owned enterprises with insufficient processing equipment whose financial status is getting better every year, which also means increased potential for the future.

In addition, more and more Russian companies are drawing their attention to industrial automation. This results in good prospects for the respective WITTMANN products like robots and central material handling systems. One specific of doing business in Russia, unlike in Europe, is that it is necessary to spend a lot of time and effort to execute the import of various items. Service also often requires a substan-

tial amount of time due to the many flights that are becoming necessary to travel from Moscow to the customer's sites.

## Future perspectives

During the nineties, the BATTENFELD brand was well known in Russia, and it was recognized as one of the market leaders. However, this was followed by a downturn in the early 2000s. In the meantime, confidence has returned, and, again, the BATTENFELD brand is highly reputed. Today, the Russian plastics processors are supplied with the entire range of the WITTMANN Group's equipment. Existing older installations are also still serviced, thus allowing additional new business opportunities.

OOO BATTENFELD Injection Molding Russia is a regular participant of the "InterPlastika" exhibition, the local plastics trade fair taking place in Moscow. ♦

# Joint symposium staged by HASCO and WITTMANN BATTENFELD

*On 28 June 2012, a symposium on "Saving resources in injection molding – reducing energy consumption and costs" was held at the German headquarters of WITTMANN BATTENFELD in Meinerzhagen. The successful event was organized in close cooperation with HASCO Hasenclever.*



*View of the auditorium during the successful injection molding symposium held in Meinerzhagen in June of this year. In the foreground, sitting in the first row on the outside: Georg Tinschert, Managing Director of WITTMANN BATTENFELD in Kottlingbrunn, Lower Austria.*

**M**ore than 160 specialists working for plastics processing companies from all over Germany made the trip to Meinerzhagen. Experts from WITTMANN BATTENFELD and HASCO intentionally presented the top-class program on a high level and which covered all the relevant dimensions of this highly topical subject.

## *Focus on energy efficiency*

Seen from the aspect of energy efficiency, injection molding has already proved advantageous. In their presentations, the speakers emphasized additional potential that can be tapped by using resource-efficient technology. This includes machinery in all areas of injection molding: tooling and mold making, hot runner technology, automation and peripheral equipment.

The newly established Werkzeugbau-Institut Südwestfalen (Mold making Institute of South Westphalia) also gave an overview of its activities.



*Engineering experts exchanging views: in the course of the event, lively discussions developed in addition to the transferring of expert knowledge.*

## *The best in process technology*

During the first half of the day, visiting experts were given the choice of attending either the presentations or the machine demonstrations, which were running simultaneously. The afternoon was dedicated entirely to the demonstration of latest manufacturing techniques, which were presented in conjunction with innovative machine

concepts and special tooling solutions. Of course, this was also an opportunity to discuss the latest process technologies – CELLMOULD® and BFMOLD® – from every angle, with all of their advantages and practical possibilities.

Throughout the entire event, the associates of WITTMANN BATTENFELD and HASCO were at the disposal of interested participants for discussion and questions. ♦

**WITTMANN  
KUNSTSTOFFGERÄTE GMBH**  
1220 Vienna, AUSTRIA  
Lichtblaustrasse 10  
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**