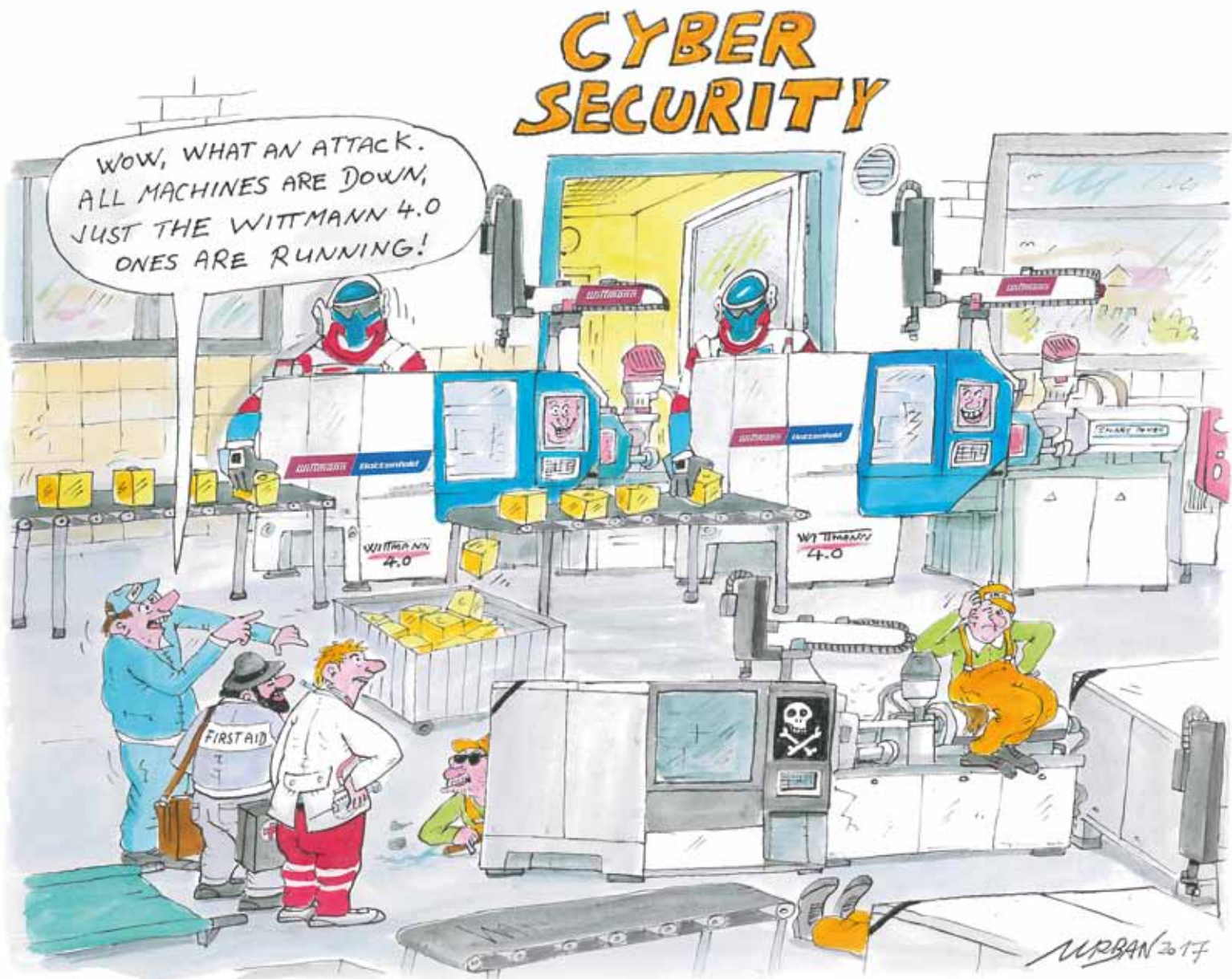


innovations

Techniques – Markets – Trends

Volume 11 – 4/2017



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Address: WITTMANN Kunststoffgeräte GmbH, Lichtblaustrasse 10, 1220 Vienna - Editorial office, layout, graphic production:

Bernhard Grabner - tel.: +43-1 250 39-204, fax: +43-1 250 39-439 - e-mail: bernhard.grabner@wittmann-group.com

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Michael Wittmann

Dear Reader,

In the field of machine construction, nothing happens today without software technology and attractive screen displays. Thus, the triumphal procession of flat screens of all types also affects plastics processing. And with regard to molding machines, we are now used to experiencing generous screen sizes for decades, with more and more peripheral devices also equipped with wonderful color displays. In the course of the ongoing *Industry 4.0* developments, screens are even used with MES systems. And of course, the screen size increases continuously, and goes hand in hand with the evolving technology.

Increasingly, the eye-level space of the machine operator (and also the space around the machine control) has become of special interest, even targeted, to a degree. As a consequence, many injection molding machines (perhaps also equipped with ancillary equipment, external hot runners and MES systems) can now often resemble a stock broker's workplace. Many screens are present; displaying charts and quantity values, giving information about the devices' status. These are screens that can be taken note of or deliberately ignored. Bulking together so many different displays, of course, is counterproductive to rendering real service in terms of accessibility and overview. The WITTMANN Group has accordingly addressed this problem. We have equipped our UNILOG B8 machine control to open up a central view for all peripheral equipment and to the highest degree possible. As an analogy, let's compare this to a television set: the operator no longer needs a dedicated display for every "channel".

The solution instead is our *WITTMANN 4.0 Plugin*. After having connected a suitable auxiliary device to the injection molding working cell, the graphical user interface of the respective device can be operated from the machine's UNILOG B8 terminal – even factoring in the authorization settings of particular operators. The user interface of the now connected device that is displayed on the machine control may be compared to an app installed on a smartphone. Everything is displayed without any difficulty: browsing through lists, altering the display of diagrams or three-dimensional simulations (e.g. of the R9 control's digital robot twin).

This is but one of many innovations that will be featured in the WITTMANN Group exhibits at this year's Fakuma show in Friedrichshafen, Germany; October 17–21. We look forward to sharing new plastics processing technology from all our product divisions, as well as from our Process Technology Department. Please visit us at booth 1204 in hall B1!

Yours cordially, Michael Wittmann



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Injection molding technology



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Injection Molding

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Greg and Mitch Hannoosh visited the plastics processor in Connecticut. **Page 16**

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Water as tempering medium



Kasper Hagemann on HN in Billund, Denmark. **Page 20**

WITTMANN BATTENFELD at the Fakuma: sophisticated injection molding technology

Under the motto "be smart", WITTMANN BATTENFELD will present to interested trade visitors top-level injection molding technology from 17 to 24 October at this year's Fakuma in Friedrichshafen.

Gabriele Hopf

The WITTMANN BATTENFELD highlight at the Fakuma 2017: the new EcoPower Xpress injection molding machine.



The highlight: EcoPower Xpress 400, all-electric high-speed injection molding machine

The new *EcoPower Xpress* – shown for the first time as a prototype at the K 2016 – was developed to series production level in the course of this fiscal year and will be available on the market in the clamping force sizes of 400 t and 500 t from the autumn of this year. The new *EcoPower Xpress* is a high-speed, all-electric machine model primarily geared to the requirements of the packaging and thin-wall industry. The highly dynamic drive axes for injection as well as closing and opening of the *EcoPower Xpress* are designed for fast movements and ultimate control accuracy. Moreover, extremely high energy efficiency is achieved by using servo drives.

At the Fakuma, WITTMANN BATTENFELD will demonstrate the functionality of this machine model on an *EcoPower Xpress 400/3300+* manufacturing HDPE closing caps within a cycle time of 2.7 seconds in a 96-cavity mold supplied by Plasticsud (France). The caps will be cooled with the cap cooler from Eisbär (Austria) and then deposited in boxes.

The main theme: smart multi-component technology for complex applications

The main focus of WITTMANN BATTENFELD's exhibition program this year lies on COMBIMOULD machines from the *PowerSeries*. The actual exhibits will include two machines from the servo-hydraulic *SmartPower* series and one machine designed for injection molding of micro parts from the all-electric *MicroPower* series with compactly integrated multi-component technology.

On a *SmartPower 120/525H/130L*, a 2-component application will be presented, in which one component is a thermoplastic material, the other liquid silicone. The parts will be manufactured with a 4+4-cavity mold supplied by

Silital (Oldrati group/Italy), produced by Linea Stampi Srl. The parts will be removed and deposited on a conveyor belt by a W831 robot from WITTMANN equipped with the new R9 control system.

A 3-component application will be shown on a new *SmartPower 60/210H/210S/210V*. With a 6-cavity mold from Geobra Brandstätter (Germany), PPT, POM and PA will be processed into a Playmobil chimpanzee. The open



Injection units of the MicroPower COMBIMOULD application.

design of the *SmartPower* with its generous dimensions and excellent accessibility is particularly well suited for multi-component applications, with simultaneous optimal energy efficiency.

The third COMBIMOULD application will be the production of a 2-component plug inside the recording head of a vinyl record player. The parts made of PC and electro conductive PC will be produced with a single-cavity mold from Ortofon (Denmark) on a *MicroPower* 15/10H/10H equipped with two parallel injection units and a rotary disk. Parts removal and depositing will be handled by a WITTMANN W8VS4 SCARA robot specially designed for this machine. Moreover, a built-in camera system inside the machine will provide fully automatic quality inspection of the parts.

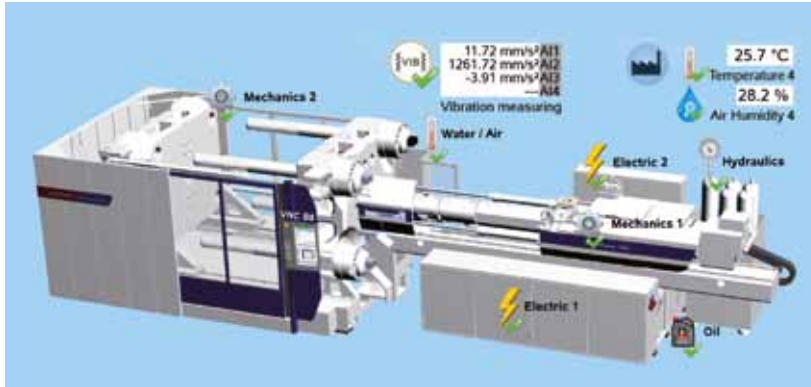
Full integration of robots and peripherals via WITTMANN 4.0, combined with the AIRMOULD® internal gas pressure process

On all exhibits shown at the Fakuma, the integration of the machines and peripherals into a network under WITTMANN 4.0 will be implemented and demonstrated. For the first time, the integration of WITTMANN ATON material dryers into the UNILOG B8 machine control system has also become possible in addition to the integration of robots, TEMPRO temperature controllers, GRAVIMAX gravimetric blenders FLOWCON flow controllers.

In particular, integration into the UNILOG B8 machine control system via WITTMANN 4.0 will be demonstrated on an all-electric machine from the *EcoPower* series with an Insider cell. On this machine, an *EcoPower* 160/750 with 1,600 kN clamping force, a coat hanger will be manufactured with a single-cavity mold from Haidlmair (Austria), using the WITTMANN BATTENFELD AIRMOULD® internal gas pressure process. The AIRMOULD® interface is also integrated in the UNILOG B8 control system. The combined compressor and nitrogen generator unit used has been developed and manufactured by WITTMANN BATTENFELD. The parts will be removed and deposited on the conveyor belt integrated in the production cell by a W818 robot from WITTMANN

MANN with the new R9 robot control system. An “AIRMOULD® Center” next to the machine will offer visitors an opportunity to examine the WITTMANN BATTENFELD AIRMOULD® process in detail.

To give visitors an even better understanding of WITTMANN 4.0 – the *Industry 4.0* solution provided by the WITTMANN Group –, an interactive display board will show a clear, easy-to-understand presentation of the integration of WITTMANN peripherals into the UNILOG B8 machine control system.



Our services: MES and CMS – smart and efficient

WITTMANN BATTENFELD’s exhibition program at the Fakuma 2017 will be rounded off with a presentation of our services.

This will include the presentation of the MES (Manufacturing Execution System) from our new MES partner, MPDV Mikrolab (Germany), for integrating injection molding machines into a corporate network and thus into the world of *Industry 4.0*. A special highlight is the WIBA-MPDV SmartMonitoring module, which can be integrated on every B8 monitor screen. In this way, the status of all machines in the network can be viewed from every injection molding machine.

For the first time, the integration of an injection molding machine via the EUROMAP 77/83 protocol based on OPC/UA will be shown, which will become available in the near future. EUROMAP plans to release the new EM 77/83 version in February 2018.

Visitors will also have an opportunity to gather information about the functionality of CMS (Condition Monitoring System), our modern machine condition monitoring system.

The CMS system measures important machine condition data with sensors, analyses the readings in the machine’s control system and transfers the data to the corporate MES system to enable optimal planning of maintenance schedules.

And finally, our WebService 24/7 system, WITTMANN BATTENFELD’s online service available round the clock on 7 days a week, will be presented at this year’s Fakuma show. ♦

Survey of the CMS (Condition Monitoring System).

Integration of the WIBA-MPDV SmartMonitoring module in the UNILOG B8 control system.

(Courtesy of: WITTMANN BATTENFELD, MPDV Mikrolab GmbH)



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



The unsurpassed tempering solution: TEMPRO plus D, *SpeedDrive*, FLOWCON plus

Water flow controllers and temperature controllers have established WITTMANN's good reputation. Today, they are essential for the plastics processing industry. At the Fakuma 2017, WITTMANN presents the current highlight of the company's long-time development work.

Zdravko Gavran

SpeedDrive option for even more efficient temperature control

Although injection molding is one of the most efficient modern mass production processes, the plastics processing industry still strives to increase efficiency even further. Here, processors' attention has increasingly been focusing in recent years on temperature control. WITTMANN has now taken another important step in this area with the new *SpeedDrive* option for its TEMPRO plus D temperature controllers. This option is now available for pressurized appliances up to 180 °C.

It consists of a motor speed-controlled pump, which offers users several additional options to make the injection molding process even more efficient. To start with, TEMPRO plus D controller offers extremely accurate temperature control inside the mold inlet (with deviations of no more than ± 0.2 °C), as well as continuous, parallel system pressure control based on the inlet temperature, which ensures cavitation-free running of the pump (140–180 °C). But with *SpeedDrive*, the motor speed or pump pressure, or the differential temperature are additional parameters which can be preset without having to purchase any additional optional equipment for the temperature controller. (With the acquisition of an optional, maintenance-free flow meter – vortex up to 100 °C, ultrasound up to 180 °C – it is also possible to set the flow quantity, which will then be maintained automatically.)

With every one of these additional parameter settings provided by *SpeedDrive*, process reliability can be increased and, depending on the application, it also becomes possible to save energy – and consequently costs.

Motor speed, pump pressure and also differential temperature have a decisive influence on the injection molding process.

Motor speed

Determining a constant motor speed, which can be set between 1,200 and 4,000 rpm, is the easiest way to influence the process. However, this method does not allow for any changes in the process which may occur.

If, for example, the pump pressure rises due to blockage of a dirt trap in the circuit, the motor speed of the pump is not adjusted automatically. Process monitoring with the motor speed as control parameter is still possible though, if



the pump pressure derived from the set motor speed is controlled by setting tolerance limits. In such cases, the motor speed can be adjusted manually.

Pump pressure

With this control parameter, the progressive wear of the pump impeller can be taken into account. This is effected by increasing the motor speed of the pump with reference to the pump pressure set-point to counteract the progressive wear of the impeller, until the maximum speed of 4,000 rpm is reached.

By targeted setting of tolerance limits in steps of 0.1 bar, an alarm signal is triggered as soon as the actual pump pressure is outside the tolerance limits with reference to the set-point value. This signal indicates a worn-out impeller that needs to be replaced.

TEMPRO plus D160 temperature controller, now with the new SpeedDrive.

Differential temperature

Depending on the application, mold design and connections installed by the processor, a temperature difference occurs between the mold inlet and the mold outlet. The differential temperature is the control parameter which should be preferred. The differential temperature says a lot about the thermal balance inside a mold, in particular about the more or less homogeneous temperature distribution inside the cavities. Once the differential temperature has been calculated for a particular application, it can become a set parameter and be monitored by defining tolerance margins. If any change occurs in the process parameters of the injection molding machine with an effect on the cycle time, the set differential temperature is restored by increasing or reducing the pump speed in response to the change.

Flow quantity

Controlling the flow quantity requires in addition to the *SpeedDrive* option a flow meter, which also increases process reliability as well as lengthening the maintenance intervals. The high accuracy of the maintenance-free flow measurement (vortex $\pm 1.5\%$ of the maximum value in l/min) enables high-precision setting and monitoring of flow quantities down to a tenth of a liter.

In the event of deviations, the motor speed of the pump is adjusted via a frequency converter, so that it continues to operate within the set tolerances. While it was necessary to alter, i.e. enlarge the dimensions of competitors' products, WITTMANN has succeeded in keeping the dimensions of TEMPRO plus D temperature controllers unchanged in spite of adding a frequency converter, which of course also has a positive effect on the price at which the *SpeedDrive* option can be offered.

Regardless of which parameters have been set: a TEMPRO plus D equipped with *SpeedDrive* gives processors a decisive head start in terms of process accuracy over appliances with conventional pumps, since the variable speed makes it possible to adjust the operating point of the pump to the process

The important question of energy consumption

Improved process reliability is one important aspect; but in order to save energy as well, the entire temperature control circuit should be examined more closely. Some savings can already be achieved by better insulation of the molds and tubes, which makes a particularly large difference with temperatures above 100 °C. In pumps, savings can be realized by using more efficient motors. (Since the beginning of

this year, only motors with the efficiency class IE3 are used in pumps – their degree of efficiency at 1.1 kW is 84.1%.) Lowering the operating pressure of the pump by altering the motor speed brings about further savings. This reduces the power input of the pump and consequently its electricity consumption.

However, it also reduces the flow quantity, which causes a higher differential temperature and disruption of the thermal balance, and consequently uneven temperature distribution inside the cavities. But how could both objectives be achieved? A reduction in the operating pressure of the pump while keeping the total flow quantity unchanged?

FLOWCON plus

FLOWCON plus is WITTMANN's answer to the question of how a lower operating pressure can be achieved for the pump without changing the total flow volume through the pump.

FLOWCON plus is a compact, fully automatic medium distributor which can be placed close to the mold and enables parallel distribution of the total flow volume among the individual temperature control channels. In this way, the total pressure loss can be reduced, and it becomes possible to control and monitor the flow quantity and outlet temperature in every individual temperature control circuit.

FLOWCON plus, previously only available in combination with a WITTMANN BATTENFELD injection molding machine, is now also on offer as a compact, space-saving stand-alone system, which can be connected to an injection molding machine of any brand: either via an alarm bus bar and an external on/off device, or via OPC UA. A TTY (20 mA) temperature controller data transfer interface is now also available for this appliance, which makes it possible to connect the FLOWCON plus system to injection molding machines with older control systems as well.

Finally, there is an optional temperature sensor available for the FLOWCON plus, positioned in the inlet, enabling control via differential temperature. The new FLOWCON Masterbox provides the visual operating system for the stand-alone solution and, unlike the version integrated in a machine, also houses the power connection.

Perfect tempering solution

All in all, WITTMANN currently supplies the perfect, unrivalled temperature control solutions for the injection molding process. It consists of a TEMPRO plus D temperature controller with the *SpeedDrive* option, connected to a FLOWCON plus system with up to 48 circuits. ♦



FLOWCON control unit, Masterbox, FLOWCON plus (from above).

Zdravko Gavran is Head of the Temperature Controller Construction Department at WITTMANN Kunststoffgeräte GmbH in Vienna.



WITTMANN's digital robot twin

With the introduction of the new R9 robot control system, WITTMANN impressively demonstrates the potential which can be realized by the use of latest hardware and software technologies in the form of increased efficiency and operational safety. A significant functionality which has thus become possible is the digital robot twin, which is now available as standard with the R9 control system and enables virtual validation of the sequences to be carried out by the robot at any time – and consequently without any risk for the processing machine or the robot.

Martin Stammhammer

The R9 control system, already shown at the K 2016, offers an enlarged display screen of 10.1" in portrait format (compared to 8.4" on the manual input terminal of R8) and has a capacitive touch surface in line with the current tablet trend. This surface now also supports gesture commands (wiping for page change and zooming with two fingers), which makes the operation of the appliance even more intuitive. R9 is also equipped with several multi-core processors for improved performance through optimal division of tasks. Time- and safety-relevant processes can now be completely detached from the visualization level to ensure top-quality operational safety and fastest possible response to critical incidents.

In consideration of these innovations, WITTMANN has developed some new approaches to provide even better support for machine operators. The new possibilities include visualization of the programmed sequence.

Virtual display of real processes

Based on its programming, the control system generates a virtual production cell, parts of whose visualization can be zoomed with freely selectable perspectives, which can be altered at any time. In this way, a digital copy (twin) of the actual production cell and/or the robot is present in the control system. This twin has the same attributes and characteristics as the equipment existing in reality and thus enables simulation of the application-specific processes.

As soon as the relevant parts of a robot program have been created, it is possible to enter the simulation mode via the test menu of the control system. To distinguish



A real production cell. On the opposite page: the corresponding visualization as a digital twin, on the R9 robot control terminal.

the virtual twin unmistakably from the real equipment, a luminous frame appears on the screen of the R9 TeachBox in this mode, and the virtual robot is shown in the form of a schematic image.

This mode also enables simulation of the injection molding machine based on recorded key parameters. The simulation mode thus enables the operator to detect any serious faults in the robot program very quickly without having to take the risk involved in a real test run. Highly complex sequences consisting of up to six simultaneous

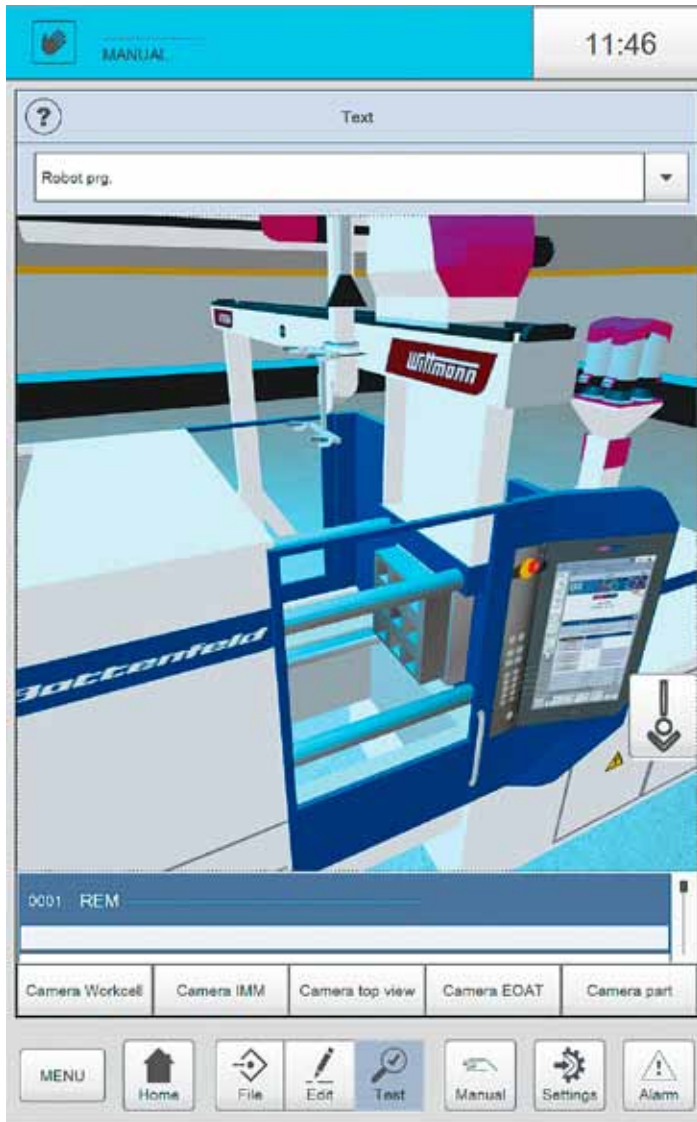
movements – such as movements of all robot axes together with additional rotational axes – which could cause the robot to collide with the protective frame or the tie-bars of the injection molding machine, are no longer such “terrifying” programming tasks.

Especially since errors in the sequencing logic and potential synchronization problems with overlapping and simultaneous functions can be detected. (For instance, the exact position of a pneumatic axis is only known when it is in its end position, therefore here the issue of a movement command should always be followed by checking whether the end position has been reached before a new command is given. – By contrast, a servo axis signals its position automatically at extremely short intervals.)

entered into the robot, and possible sequencing errors are detected at an early stage. In such cases, the digital twin minimizes the unproductive time which must be spent on machine setup in a production cell. For the logic sequence of the robot program has already been tested on the PC beforehand – only the real positions of the robot still need to be “taught” following data transfer.

The R9 control system offers yet another safety feature which goes beyond using the digital twin. In manual operation and during dry cycles, the R9 control system activates its anti-collision control.

The latter continuously monitors the power input of every single drive system. In the event of excessive deviations from the standard value – and consequently an acute



The digital twin is available for the entire process in every operating mode, including “dry operation”, manual operation or step operation.

Running on a PC

In addition to using the digital twin on the R9 control system from WITTMANN, it can also be started on a PC. If the relevant device definitions are available there, a simulation run can already be carried out before the program is



R9 robot control with start screen.



R9 robot control, the screen displaying the digital twin of a working cell.

danger of the robot colliding with other components inside the production cell – the drive systems are shut off immediately.

“With the detached visualization of the digital twin, we aim to achieve shorter setup times and ensure trouble-free operation by means of preventive action. We are very much looking forward to the pleasure of presenting all of this for the first time to our customers at the Fakuma 2017”, says Martin Stammhammer, International Sales Manager Robots and Automation Systems of the WITTMANN Group. ♦

Martin Stammhammer
is International Sales Manager Robots and Automation Systems of the WITTMANN Group in Vienna.

Fakuma
Hall B1 Booth 1204

WITTMANN Group equipment for maximum cyber security

In the Industry 4.0 era – or more generally speaking, in the midst of the “digital transformation” currently taking place in the world – the networking of injection molding machines, robots and peripheral equipment is proceeding apace. We now have to meet the challenges faced in the field of plant security.
Johannes Rella



*Integration chart
of the WITTMANN
4.0 Router.*

Reports of attacks involving the WannaCry ransomware and similar malware really woke up plastics processors to the issue of security when it comes to cyber-physical systems and facilities.

After all, the WannaCry case resulted in numerous very well-known companies suffering the worst case scenario for a manufacturing operation, namely an unplanned production shutdown for an unforeseeable period of time. Like other malware before it, WannaCry worked by exploiting a security vulnerability in the Windows™ operating system.

The WITTMANN 4.0 security concept

It is common knowledge that the most fundamental aspect of any security concept is regularly performing software updates so that above all the operating system is kept up to date. While doing this does not afford complete protection, it is nevertheless an important basic step. Performing updates automatically is not, however, feasible for production systems, since an update can have unforeseeable consequences for the functionality of the

connected machinery or device. In the worst case scenario, an automatic update may end up causing a machine to shut down, leading to the dreaded loss of production. As such, production systems in an Industry 4.0 environment remain especially at risk and susceptible to any vulnerabilities in the operating systems in use being exploited.

WITTMANN BATTENFELD injection molding machines with B6 and B8 controls as well as robots with the latest R9 control from WITTMANN prevent the operating system from being permanently compromised by viruses due to the fact that changes that affect the system are saved to an internal RAM disk via a Unified Write Filter mechanism. This makes it possible to restore the device's operating system to its factory defaults each time the system is booted up.

Because of this, viruses cannot become "embedded" in the system and affect it permanently.

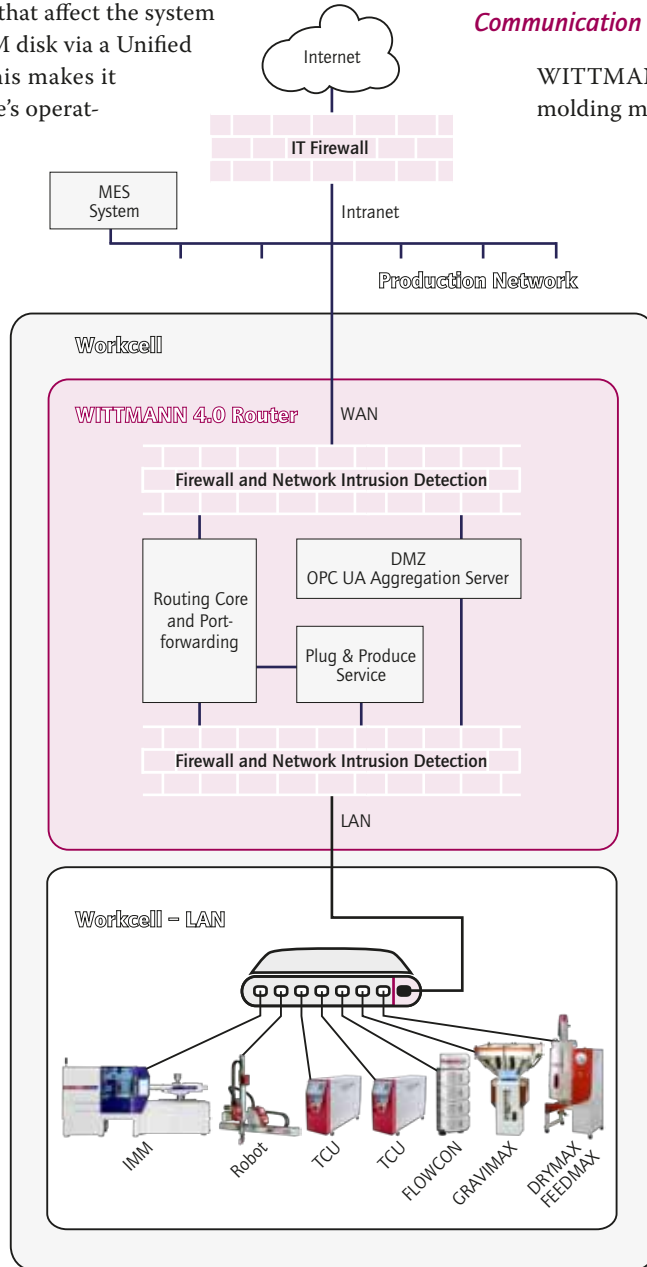
WITTMANN BATTENFELD has nevertheless tackled the wider issue of security and, in close cooperation with one of the leading cyber security companies in the industry, developed a security concept for networked WITTMANN 4.0 workcells that has already been implemented in the field. The development work was based on the assumption that the production network outside a WITTMANN 4.0 workcell could be compromised in terms of security even though the operator is naturally sitting behind a firewall. This is why the system architecture of a WITTMANN 4.0 workcell is designed according to the onion principle.

The firewall of the customer's network forms the outermost layer surrounding the WITTMANN 4.0 workcell. Because the security mechanisms and settings there are unknown to the manufacturing cells, this layer must be regarded as being "unsafe". The next security layer is formed by a restrictively configured WITTMANN 4.0 firewall that is installed in a router specially developed for the purpose by WITTMANN.

The software on the router is digitally signed and every step of the router's boot routine is designed to be "secure". This precludes an attack being made via a software update. In contrast to conventional off-the-shelf firewalls,

the WITTMANN 4.0 firewall is tailored to the specific purpose of each device and function that may be expected to be a component of the workcell.

The configuration of the firewall is therefore especially restrictive. With the exception of the OPC protocol, which is used for communication with an MES or ERP system via OPC UA, all communication ports are closed by default and can only be opened from within the workcell, and only by the operator performing specific, intentional steps.



Communication with "the outside world"

WITTMANN BATTENFELD injection molding machines with B8 controllers, for example, can create an external connection via TeamViewer in order to make remote servicing functionality available, if desired.

Having established a session, remote servicing allows a WITTMANN BATTENFELD office direct access to the authorized injection molding machine for the purpose of analysis.

Manual authorization can likewise be issued for the WITTMANN Group's QuickLook App. This allows an Android or iOS mobile device within the company's network to view the machine status of WITTMANN BATTENFELD injection molding machines with B6 and B8 controls and WITTMANN robots with R8.3 or R9 controls. In this case, the WITTMANN 4.0 router tells the QuickLook App on which ports which machines and robots can be found.

Every opening of an additional communication port does, of course,

create another loophole and thus increases the potential risk of cyber attacks. Opening a port is, however, a deliberate act performed by the operator and the port only stays open for the duration of intended use.

Protection against DoS attacks

Another advantage of the WITTMANN 4.0 system architecture is that it protects production systems against so-called DoS (Denial of Service) attacks. These typically >>

WITTMANN 4.0
cyber security
data flow.

attempt to bombard the remote station with such an immense flood of requests that it may no longer be able to cope with its communications tasks and shuts down.

If this flood of communications packets reached a production machine directly, it could well result in the machine shutting down completely. Within the WITTMANN 4.0 architecture, however, the only thing that may possibly shut down would be the router and thus only the communications with the MES/ERP system, though it may be assumed that this system would no longer be active at the time either due to network overload. The processing machines and other equipment within the affected WITTMANN 4.0 workcell are able to continue working unhindered, however.

Over and above this, there is a basic protective mechanism in place intended to prevent the WITTMANN 4.0 router from shutting down in the case of a DoS attack. A special feature of the WITTMANN 4.0 router is that it is able to “estimate” the volume of communication traffic the internally networked devices typically have with an external MES/ERP system.

The communication frequency of production equipment is known within certain bounds and can be predicted by dint of the OPC UA protocol used here and the coming EUROMAP standards based on it.

Should this frequency vary atypically over the medium term, it must be assumed that there is an anomaly, such as a DoS attack. As a counter measure, the WITTMANN 4.0 router closes the socket being used for communication in order to prevent the socket being attacked. The functionality of the router is thereby maintained.

WITTMANN 4.0: “Plug & Produce”

At the core of a WITTMANN 4.0 workcell is a WITTMANN BATTENFELD machine with B8 controller, WITTMANN robot with R8.3 or R9 controller and the various WITTMANN peripheral devices.

This zone is shielded from the outside world, thus allowing for secure operation with the operating system version supplied with the equipment. The latest peripheral devices from WITTMANN can be plugged in and out of a WIT-

MANN 4.0 workcell according to the “Plug & Produce” principle at will. After a newly attached peripheral device has been server authenticated by means of SSL/TLS protocol and key exchange via certificate, device identification is performed.

The newly attached device identifies itself and is registered in the device list of the WITTMANN 4.0 router with the corresponding identifiers. The device list acts as a

database that is used by the B8 controller of the WITTMANN BATTENFELD injection molding machine to configure the newly attached device.

The peripheral devices have their own passwords that are used for logging in. Each device is supplied with a default password that can, and indeed should, be changed by

the operator. The responsibility for password security lies with the respective operator, particularly as there are no factory default master passwords. The login process takes place using the previously established secure SSL connection.

The actual data exchange between the various attached devices and ultimately to an MES or ERP system takes place via the standard OPC UA protocol. Communication between the injection molding machine and the MES system will in future be updated to use the EUROMAP 77 standard as soon as it is released – probably in September 2017. Various EUROMAP standards for the peripheral device communication via OPC UA are already in the standardization phase and will be implemented immediately they become available.

Every WITTMANN 4.0 workcell is equipped with the aforementioned components and security mechanisms as standard so as to provide the operator with the best possible cyber protection and maximum machine and device availability.

Over the course of numerous tests conducted by the cyber security company commissioned by WITTMANN, simulated attacks using a variety of different threat scenarios were acted out and tested by “white-hat” hackers. WITTMANN 4.0 proved itself to be robust in all scenarios and enabled production to continue uninterrupted within the entire workcell. ♦



View of the router installed in the control cabinet of the injection molding machine.

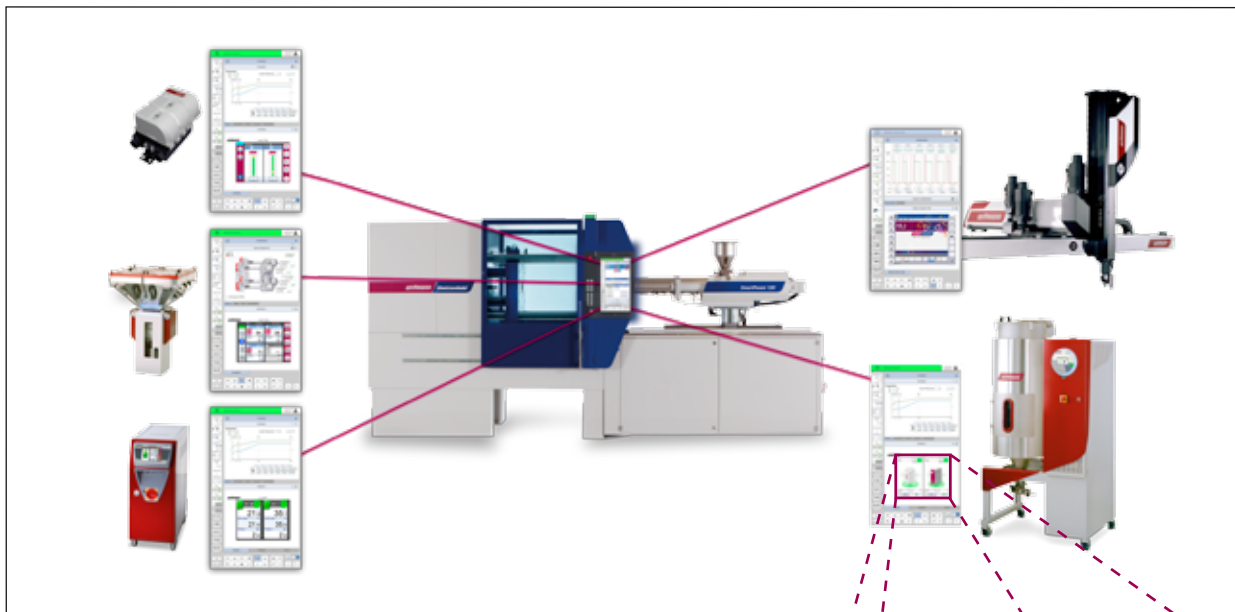
Johannes Rella
is Head of the
Software Development
Department
at WITTMANN
Kunststoffgeräte
GmbH in Vienna.

Fakuma
Hall
B1
Booth
1204

WITTMANN 4.0 for the ATON plus H

After the robots, the flow controller, the temperature control and materials handling equipment from the WITTMANN Group, the WITTMANN ATON plus H material dryer now also supports the WITTMANN 4.0 concept. This new generation of segmented wheel dryers will be showcased at this year's FAKUMA show in Friedrichshafen (Germany) for the first time.

Markus Wolfram



The new ATON plus H segmented wheel dryer can be connected with a WITTMANN BATTENFELD injection molding machine via a router and subsequently operated from the machine's control system without any restrictions. However, in order to ensure a uniform image on the machine's control system at all times, the display of the dryer's control system has been adjusted accordingly.

The integration of this appliance into the machine's control system now makes it possible to set and/or alter the dryer parameters (e.g. the drying temperature) simply on the machine. The status of the dryer and the current dew point can also be checked from there. Even dryers equipped with several drying hoppers can be accessed from the processing machine.

The dryer functions

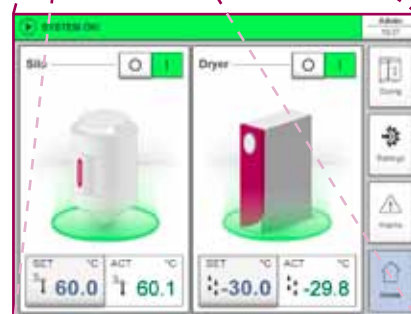
The new ATON plus H dryer as such now features a touch screen enlarged by almost 50%, with a 7" diagonal. The ATON plus is also a top-class product in terms of energy saving potential.

Normally, a material dryer requires most of its energy for desiccant regeneration. The ATON plus comes with the 3-Save process as standard, a function for thermal energy recovery, which enables the dryer to run more efficiently. The hot air required for regeneration is first pre-heated inside a specially designed heating tube, then directly heated

up further by a heater element. The hot air is then blown onto the desiccant in the direction opposite to that of moisturization, to accelerate the demoisturization of the desiccant even more. The temperature of the regeneration air is adjusted to the drying temperature required for the material. The ATON plus is thus able to select the optimal temperature range for the regeneration automatically and to raise or lower the regeneration temperature where necessary.

In combination with a dew point sensor, the ATON plus can be operated in the *EcoMode*. This function enables the dryer to select an ideal regeneration process for the respective material.

If it is not necessary for the segmented wheel loosely filled with desiccant to keep rotating without interruption, so that continuous regeneration is needed, the dryer will switch over automatically to the *EcoMode*, thus reducing the number of regeneration cycles. This lowers its energy consumption even further, while still promoting an excellent drying air performance with a low dew point. ♦



The touch screen display of the ATON plus H is shown on the screen of the injection molding machine's control system under WITTMANN 4.0.

Markus Wolfram
is Sales Manager of the Material Handling Equipment Department at WITTMANN Kunststoffgeräte GmbH in Vienna.



Hybrid technology for the production of high-precision optical parts

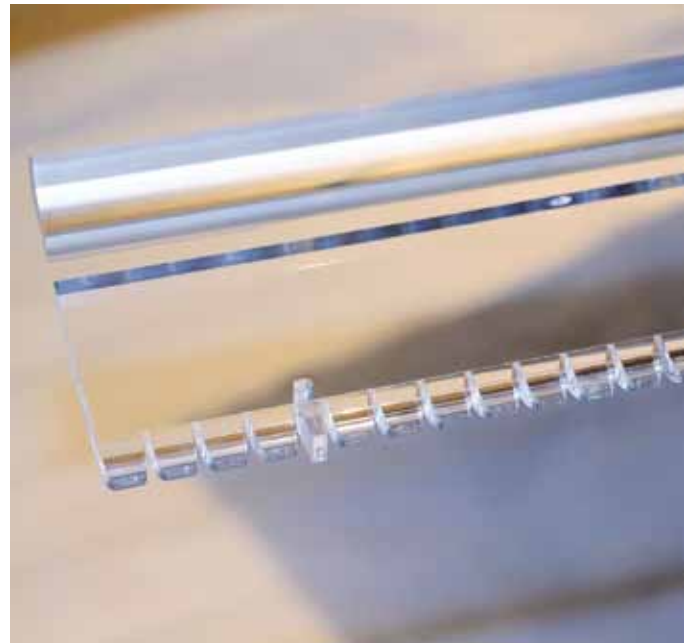
Manufacturing premium-quality optical components requires machines and tooling which meet the highest standards of precision and repeatability.

To produce large-size parts in this segment, UPT-Optik Wodak GmbH based in Nuremberg, Germany has been using a hybrid machine from WITTMANN BATTENFELD's MacroPower series since the beginning of this year.

Gabriele Hopf



Picture left: Optical lens, one of the many high-class products manufactured by UPT-Optik Wodak. Picture right: Illumination optics for the building industry – produced on the MacroPower E from WITTMANN BATTENFELD.



Horst Wodak, owner-manager of UPT-Optik Wodak GmbH, was already able to draw on 25 years of experience in optical mold making, when he established his own company with two employees in 2005, about 300 m from its present location.

Seven years later, the ambitious entrepreneur moved to the present location – by then with a workforce of 54 and an inventory of 11 injection molding machines. Today, the company counts 125 staff members, and plans to add another 20 employees in the course of this year. The number of injection molding machines has now been increased to 27, with clamping forces ranging from 300 to 8,500 kN.

High-class optical parts

UPT-Optik Wodak GmbH specializes in premium-quality optical parts and holds a position of global market leadership in this product segment.

The company's range of products and services starts with the calculation of the optical functions and their implementation in terms of geometry, and goes all the way from prototyping, production of sample and series production tooling in its own mold-making shop to measurement, testing and series production of high-grade optical parts, including gold, silver and aluminum coatings, and the assembly of complex components. The company's

product range comprises illumination optics for buildings, streets, airfields, tunnels, operation theaters, traffic lights, train signals, light barriers, as well as light conductors for the automotive industry, object lenses for projectors, night-vision glasses, reflectors, headlight inserts, plug-in connectors for the telecommunications industry, beam focusing lenses for solar technology, mirrors in satellites or disposals for optometrists and much more. These products are supplied to customers in Europe, America, Russia and Australia. The customer base also includes competitors for which UPT-Optik Wodak makes optical inserts and prototypes.

The products of UPT-Optik Wodak are optical plastic parts in the high-end segment, whose precision and accuracy can only be surpassed by optical equipment made of glass. Manufacturing these products requires specific expert knowledge across the entire range of goods and services, but above all in mold making.

Six ultra-precision machines are used in production, which are capable of milling and turning with an accuracy down to the sub- μm range. The company's measuring and testing equipment is also laid out for detecting the most minute deviations, in order to meet the required high quality standard for the products. All machines operate in air-conditioned halls to ensure the high standard of precision for the parts produced.

The MacroPower E hybrid machine

Six of the company's 27 injection molding machines operate in a class 10,000 clean room according to FED standard. In its injection molding department, UPT-Optik Wodak uses almost exclusively all-electric machines, since these offer the standard of precision, repeatability and cleanliness the company requires for manufacturing its high-end products. According to Horst Wodak, the lower energy consumption of electric machines compared to hydraulic models and their lower sound level are also arguments in favor of using these machines. Since November 2016, a hybrid machine model with 8,500 kN clamping force, a *MacroPower*

ules. Thanks to its combination of a servo-hydraulic clamping unit with a servo-electric injection unit, the *MacroPower E* is the ideal equipment for a highly accurate injection process. To improve the closing function of the check valve for the long cycle times of up to 25 minutes, the machine is equipped with an active closing function for the check valve following dosing. Moreover, the optional EXPERT-Coining high-precision coining system offered by WITTMANN BATTENFELD is used on this *MacroPower E*. This system can actuate each pressure box individually to regulate platen parallelism, and thus achieve an even higher degree of precision. Moreover, the facility to inject melt in several places during a single injection process enables UPT-Optik Wodak



Picture left: *MacroPower E* 850/5000 with WITTMANN robot and parts deposit belt.

Picture right: Removal of an optical light conductor produced on the *MacroPower E* from the mold.



Marcus Otto (left), WITTMANN BATTENFELD salesman, and Horst Wodak, Owner-Manager of UPT-Optik Wodak GmbH in Nuremberg.

E 850/5000 from WITTMANN BATTENFELD, has been operating at UPT-Optik Wodak to make large-sized, thick-walled optical parts. The production of these parts requires a machine which offers ultimate precision and repeatability on the one hand, on the other hand long holding pressure times must be ensured without overloading the drive mod-

to put on an extra layer with a second set of injection parameters, or to inject melt into two cavities.

Parts removal and depositing of parts on a conveyor belt is handled by a W843 pro robot from WITTMANN. Thanks to its reinforced profiles, this robot comes with a high load capacity, which is required not so much by the part weight, but rather in order to remove the parts safely from the mold with their very solid piece of sprue.

Best results

Following on-site tests at his company, Horst Wodak is very satisfied with the performance of the *MacroPower E*. "The *MacroPower E* meets our stringent requirements in terms of precision and

repeatability and shows excellent performance in handling the required holding times," he comments. Furthermore, Wodak appreciates the machine's low energy consumption, its smooth, quiet running and last, but not least, the compact design of this large machine as well as its easy, uncomplicated operation via the UNILOG B6 control system. ♦

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

EPC (USA) fuels their growth with WITTMANN BATTENFELD

Based in Putnam, CT, USA, Ensinger Precision Components (EPC), a division of Ensinger GmbH (Germany), is a custom molder of engineering and high-performance thermoplastic components for the aerospace, defense, oil and gas, and medical markets, amongst others. The company recently embarked on an effort to modernize its plant and replace some older molding machinery and equipment – with WITTMANN BATTENFELD devices.

Greg and Mitch Hannoosh



Matt McKenney, Ensinger Precision Components General Manager (left) and Charlie Middelaer stand in front of a WITTMANN BATTENFELD EcoPower 110 injection molding machine, installed at EPC's workflow in Putnam, CT.

EPC assembled a team and embarked on an exhaustive, global search for new machinery that would best meet its needs. In the end, the answer was only 70 miles away in Connecticut – and the decision of the team was unanimous. The team chose WITTMANN BATTENFELD, and purchased three turnkey workcells.

"Proud of this partnership" – aggressive growth plans

In a recent interview at WITTMANN BATTENFELD's US headquarters in Torrington, CT, Matt McKenney, General Manager of EPC, spoke about the reasons his team chose WITTMANN BATTENFELD as their molding machine and equipment supplier.

"We're proud of this partnership," he says as he inspects his company's three new molding cells, which were fully assembled and ready for operation on the floor of WITTMANN BATTENFELD's IMM training center. WITTMANN BATTENFELD provided all of the machinery and equipment for the turnkey molding cells, except for the molds. "This was not about buying three new machines – it was about establishing a mutually beneficial, long-term partnership with a supplier to help our company get to the next level."

Business is good at EPC but the company is not standing still; they have aggressive growth plans over the next five years, plans that include obtaining advanced ISO certification, winning additional business, and doubling their annual sales. An essential part of this growth plan involves updating

older machinery; the new WITTMANN BATTENFELD workcells will be replacing molding machines that are 20 years old.

“It’s important for us to modernize our equipment, not only for better performance, but to show customers that we’re investing in our business”, says McKenney. “Molding machine technology has come a long way in the past 20 years.” EPC’s plan is to continue to upgrade its machinery, so the average age of their machines will be 10 years old or less.

One-stop shopping – and much more

When EPC’s team was doing its research on new molding machine suppliers, WITTMANN BATTENFELD’s “one-stop shopping” aspect was unique and attractive, according to McKenney – the ability to source all of the machinery and equipment from one supplier, with one point of contact. But a lot more factored into their decision.

“There were three or four elements that tipped the scales in favor of WITTMANN BATTENFELD, and one-stop shopping was one”, says McKenney. “We were able to purchase all of the machinery from them; they are the only supplier that was able to provide the IMM, robot, granulator, dryers, temperature control units, and feeders. It’s a big advantage for us to have them not only supply all of the equipment, but to take single-source responsibility for it all as well. Another was their location, being so close to our facility in Putnam, CT – we can drive here when we need anything.” Beyond that he mentioned the availability of spare parts, the company’s web connectivity services, and very importantly, WITTMANN BATTENFELD’s training capabilities.

WITTMANN BATTENFELD’s ability to integrate all of the molding parameters into the machine control provides another big advantage, according to Markus Klaus, IMM Division Manager for WITTMANN BATTENFELD. “Whether it’s the robot programming, the mold settings, or the auxiliary equipment parameters, all of this can be accessed in one place”, he says.

“EPC’s operators will be trained on the new machinery and equipment right here at our IMM training center in Torrington”, said Klaus. “Christian Glück will lead this effort, and they will be trained on the use of the machines, robots, and auxiliaries.” Once the training is complete, the workcells will be disassembled and shipped to EPC where WITTMANN BATTENFELD will oversee their reassembly and start-up.

Challenging materials

The three new WITTMANN BATTENFELD workcells are all *EcoPower* machines, and are the first all-electric machines at EPC. “This was a good decision for the parts being molded”, says McKenney.

“We needed the advantages provided by electric machines – clean, fast, repeatable.” Aerospace and defense are the biggest markets served by EPC, followed by business

equipment and industrial, and high temperature materials are used for many of these parts. The specialty molding done by EPC is highly precise.

Ensinger GmbH is a global leader in processing materials such as PEEK, PPS, PI, as well as a wide variety of filled resins. In fact, Ensinger is the world’s largest user of Victrex/PEEK.

“These materials can be a challenge to process successfully, so we needed to make sure our new machinery supplier could work with us to design the best possible systems”, says McKenney. “We’re confident our new machinery and equipment will do the job, but we value the support we receive from WITTMANN BATTENFELD even more.”

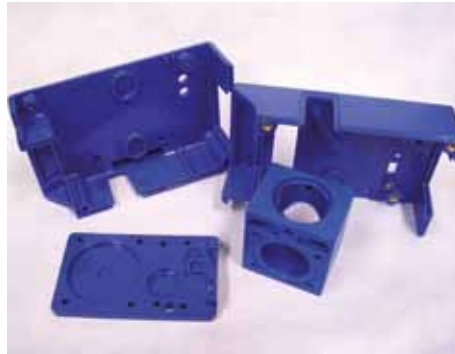
Unanimous decision

Prior to their purchase of the three new workcells, EPC’s only previous purchase of WITTMANN BATTENFELD equipment was a high temperature water unit. So when the 7-person team went to work researching molding machine suppliers, it had very little knowledge of what the WITTMANN BATTENFELD company could offer.

The team used EPC’s unique needs as a baseline:

- ◆ The need to process challenging high temperature, high value materials.
- ◆ Short molding runs with fast changeovers necessary, as many as 6-10 mold changes a day (multiple machines).
- ◆ The need for frequent material purges, as well as screw & barrel replacement.

EPC’s team included machine operators and management. They researched eight suppliers and in the end, the decision was unanimous to choose WITTMANN BATTENFELD. “We will continue to modernize our equipment, and we think we have the right partner”, says McKenney. “We’re looking ahead to next year, and want to replace at least two more machines – and we know who we’ll be working with.” ◆



Housings and components for air sampling pumps.

Parts for plasma cutting systems.

Housing for analytical instruments and sensors.

Greg and Mitch Hannoosh are running the Next Step Communications Inc. marketing agency in Kittery Point in Maine, USA.

The 3A Plastics (France) central material handling system

In 2014, Laurent Lacharme founded 3A Plastics in the Vercors Regional Nature Park in La Baume-d'Hostun in France. Since its creation, the 3A Plastics company has relied on a fully automated installation for greater comfort and safety. In particular it has installed injection molding machines, robots and peripheral equipment from the WITTMANN Group. We met Laurent Lacharme to discuss his central material handling system that was installed at the end of 2014.

Julie Filliere

The 3A Plastics company is a specialist in thermoplastic injection molding with high mechanical properties. The company focuses on the manufacturing of technical parts for the leisure sector, particularly in the manufacturing of substitution solutions for non-ferrous steel and non-ferrous parts.



The 3A Plastics plant in La Baume-d'Hostun, France.

The central system components

The WITTMANN system installed is equipped with stainless steel containers that allow for a better and more economic storage of materials. The conveying devices guarantee a simple, secure and smooth conveying process. Basically, the system consists of a WITTMANN DRYMAX E180 battery dry air dryer and a WITTMANN SILMAX E drying hopper system together with five hopper loaders.



From left to right: Dominique Griat (3A Plastics Workshop Manager), Laurent Lacharme (3A Plastics Manager), Grégory Maron (WITTMANN BATTENFELD France Salesman).

The battery dryer is configured as a high temperature system; offering increased process temperature capability up to 180 °C for the efficient drying of materials at higher temperatures. The SILMAX drying hoppers are all equipped with the SmartFlow function, the intelligent

air distribution from WITTMANN. SmartFlow adjusts automatically to different materials that are dried within the hoppers, and to fluctuating material demands. In addition, the special DRYMAX material saver function prevents

over-drying and thermal degradation of plastic resin during periods of reduced throughput by automatically lowering the drying temperature. The CODEMAX coupling station is equipped with glass elbows that are perfectly suited to the conveying of abrasive materials. The RFID coded coupling station ensures the correct distribution of the plastic granules to the injection molding machines.

3A Plastics is handling a wide range of different materials

When asked about his reasons to invest in a centralized material handling system, Laurent Lacharme refers to the huge advantage of thus getting a workshop that is entirely clean, safe, and functional. The 3A Plastics central material

also avoids additional noise development in the workshop. This strategic choice is clearly understood when giving consideration to the large number of different kinds of materials that are processed by 3A Plastics: PEEK, PSU, PAA, PPS, PTFE, PEI, TPU, PET, PPA, LCP, BLEND, PPO, PPE, TPE, PBT, and some very specific materials like PA12 HYBRID FCL/FVL and other materials that are filled with glass fiber, carbon, Teflon, tungsten and molybdenum disulphide. 3A Plastics is subject to strict specifications, thus the decision in favor of a central system becomes perfectly clear.

Beneficial Virtual Network Computing

In regard to the recently installed access facilities via VNC (Virtual Network Computing), Laurent Lacharme states his total satisfaction. He points out the many benefits, especially the possibility of being able to control the entire central material handling system from just one workstation and computer.

It is possible for him to work with the system from his office, or even from home, controlling all the material handling system's parameters, starting and stopping the loaders, visualizing drying hopper processes, adjusting material conveying times and so forth.

At 3A Plastics, management and staff always are constantly getting involved with facilitating the daily production processes, automating and securing these processes, and collecting manufacturing data. As the installed WITTMANN material handling system is not used to full capacity at the moment, it comes as no surprise that 3A

Plastics announces to expand the production plant in La Baume-d'Huston at the beginning of 2018. Instead of 1,000 m² of production floor, the manufacturing space there will expand to 1,500 m². ♦



WITTMANN BATTENFELD EcoPower 110 injection molding machine at 3A Plastics in La Baume d'Hostun.



View of a part of the 3A Plastics central material handling system.

handling system allows for the centralization and the entire management of all processed materials all in one certain place – completely isolated from the rest of the workshop. Such an arrangement offers perfect process security, and

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

HN Group benefits from water as a high-temperature medium

The HN Group A/S company is one of the leading sub-contractor manufacturers in the field of plastics in Denmark. It is based in Billund which somehow is known as the Danish plastics industry's "Silicon Valley", also being home to the Lego Group headquarters. For some time now, the company has used WITTMANN equipment, including TEMPRO plus D temperature controllers.

Kasper Hagemann

The HN Group was formed out of three previously independent companies by mergers and acquisitions, the oldest of them dating back to 1941. Today, the HN Group is a privately owned limited company. Today's owner and Chief Executive Henrik Nicolaisen had founded one of the previously independent companies in 1991.

One of HN Group's new TEMPRO plus D180 high temperature water controllers (right, in the background), connected to a WITTMANN BATTENFELD injection molding machine. This production cell also comprises a WITTMANN CNC robot on the machine and a WITTMANN material dryer (in the foreground).

WITTMANN BATTENFELD has been a supplier since 1986. At present, the oldest BATTENFELD injection molding machine still in use dates from 1994, driven by drive-on-demand hydraulic technology, which, over the past 23 years has saved the company a lot of energy.

Over the years, HN Group has purchased a comprehensive number of WITTMANN BATTENFELD injection molding machines, as well as CNC robots, temperature controllers, material dryers, and material blenders from WITTMANN.

Today, the HN Group's injection molding department consists of more than 50 highly automated production cells. The finished parts – high-volume, low-volume, prototype series, and zero series – are sold to the Danish industry, and are exported to other European countries. HN manufactures many complex parts, including 2-component, 3-component, and insert-molded parts. The customers are located in the medical and electronics sector, in the automotive, food, and toy industries, as well as in the energy business (wind, solar, gas, water). Many of these rely on just-in-time delivery.



Partnership with the WITTMANN Group

In Denmark, the WITTMANN Group is represented by Wiba Tech ApS in Fredensborg. Lately, HN has purchased a large number of TEMPRO plus D180 mold temperature controllers from Wiba Tech. These temperature controllers enable mold temperatures of up to 180 °C, using water as heating medium. We met Allan Hansen, the HN Group's Sales and Marketing Manager, and the Purchasing Manager, Kim Sørensen. We asked them about their WITTMANN TEMPRO devices, and why they use now water temperature controllers instead of units using oil as the tempering medium – apparently a major change that had been made.

Why is high temperature necessary?

Allan Hansen:

Processing advanced raw materials like Ultrason, Fortron, and Peak, you need mold temperatures above the water boiling point. Formerly, this was possible only by using

thermo-oil as heating medium. Using hot oil has some obvious disadvantages – using hot pressurized water instead is much better. Just take the fact that the specific heating capacity of water is more than twice the heating capacity of oil. Reaching the appropriate temperature, and changing it, can happen much quicker and with more accuracy when using TEMPRO plus D180 water temperature controllers.

Which challenges do you see, using hot water under pressure?

Kim Sørensen:

There are two of them. Let's talk about the safety first. Our staff is well-trained, and they know how to deal with pressurized water. In regard to this, we have never had any problems. The second point is rather complex, but is solved

that is executed every ten minutes for a short term of half a second only. A magnet valve opens and adds a small amount of fresh water, and the same amount of water is discharged via the cooling water outlet simultaneously. Thus, in the course of ten hours, the water is changed completely, without disturbing the process.

How does HN Group see WITTMANN BATTENFELD as a supplier?

Allan Hansen:

The reason for our long-term mutual customer/supplier relationship with WITTMANN BATTENFELD is from our point of view simply based on positive experience. We see WITTMANN BATTENFELD as a decent and trustworthy partner and supplier of quality products.

Kim Sørensen:

We know that WITTMANN BATTENFELD supports us professionally in regard to sales counseling, spare parts supply, or preventive and ad hoc service respectively. WITTMANN BATTENFELD understands that we are in need of quick response at any time.

For the future, HN Group considers the WITTMANN BATTENFELD *SmartPower* injection molding machine.

This machine completely covers their needs. Due to its servo drive and unique KERS technology, it offers a lot of additional advantages: innovative design, durability, minimal need for maintenance, and low energy consumption.

Above that, every WITTMANN BATTENFELD machine comes with the advanced, user-friendly and highly integrative UNILOG B8 machine control.

Allan Hansen and Kim Sørensen also mention the WITTMANN BATTENFELD "one-stop shop" concept, providing everything an injection molder needs from only one source.

Finally, they refer to the machines' control as a major advantage, being able to control the injection molding machine as well as all the peripheral devices, using only the UNILOG B8 machine control. It is even possible to supervise a complete production cell using a smartphone, or a tablet, from anywhere in the company premises.

These advantages when taken together may tip the scales for the WITTMANN BATTENFELD *SmartPower* technology in the future. ♦

Purchase Manager Kim Sørensen in the HN Group's injection molding department.

Insert-molded part, produced at the HN Group's plant in Billund, Denmark.

Kasper Hagemann is Engineer at Wiba Tech ApS in Fredensborg, Denmark.



by the cyclic medium exchange function of WITTMANN TEMPRO temperature controllers. Higher temperatures and increasing pressure lead to water extractives that tend to damage the technical components. Cyclic medium exchange counters this effect. A successive water exchange takes place

Celebrating WITTMANN BATTENFELD Slovakia's first anniversary

On June 8, 2017 the celebration of the first anniversary of the Slovakian WITTMANN BATTENFELD subsidiary took place in the bastion of Trenčín castle. More than 70 participants were welcomed by Michal Slaba and Juraj Majerský, the WITTMANN Group Managing Directors in the Czech Republic and Slovakia.

Many important customers attended the birthday party: Reutter SK, Magna Slovteca, Veeser Plastic, ESOX, J.P. PLAST, Sartech, CEIT, Ulstrup Plast, and JMP Plast – just to name a few.

Trenčín castle was chosen as the venue for the birthday party, celebrating the first successful year of WITTMANN BATTENFELD SK spol. s r.o., the Slovakian branch of the WITTMANN Group.

After having welcomed the guests, Juraj Majerský introduced the WITTMANN Group product range and highlighted the most important occurrences that had happened in the course of the Slovakian subsidiary's first year of existence. WITTMANN BATTENFELD Slovakia has taken over the local market management from WITTMANN BATTENFELD CZ successfully and the new team were accepted immediately.

From left to right: Michal Slaba, Managing Director of WITTMANN BATTENFELD CZ spol. S.r.o. (Czech Republic), and Juraj Majerský, Managing Director of WITTMANN BATTENFELD SK spol. s r.o. (Slovakia), welcoming customers and guests.

Intensified activities

The new Slovakian branch has renewed its activities in the fields of product sales, spare parts delivery, and service.

For example – and with a view to the growing Slovakian market – the stockholding volume of spare parts has increased considerably.

This was especially appreciated, because the measure has caused an additional saving of time for the company's customers. Slovakian customers will once again benefit from WITTMANN BATTENFELD's future efforts to further strengthen these activities. WITTMANN BATTENFELD Slovakia



is also well on the way to set a new local benchmark in regard to quality and innovation.

The framework program of this particular birthday party also included light entertainment: actors dressed in historical costumes, staged sword fights, and the performance of medi-

eval dances. After the show, everybody was invited to visit Trenčín castle. WITTMANN BATTENFELD Slovakia received very positive reactions from all of their guests for the celebration – and for their renewed marketing activities. Exciting years lie ahead for the new enterprise. ♦

Supplier Excellence Award for 2016

The USA branch of the WITTMANN Group, WITTMANN BATTENFELD, INC. in Torrington, CT, has won MANN+HUMMEL USA, INC.'s NAFTA 2016 Supplier Excellence Award for 'Customer Service and Reliability'.

The award honors the supplier who has been most exemplary in their performance, support, and dedication to MANN+HUMMEL. WITTMANN BATTENFELD was noted in particular for its stellar response time, its transparency, its conviction towards resolving any issues, and the general quality of its injection molding machines and robots. WITTMANN BATTENFELD was also a winner of the MANN+HUMMEL 'Supplier of the Year' award in 2013 and 2014.

MANN+HUMMEL, a strong WITTMANN BATTENFELD customer worldwide, has been using BATTENFELD injection molding machines in North America since 1998/99 for molding automotive intake manifolds and numerous other parts. Over the years, more WITTMANN BATTENFELD machines have been put to work at MANN+HUMMEL including HM 500, HM 650, *MacroPower* 800, *MacroPower* 1000, and *MacroPower* 1300 machines, all with accompany-

ing, integrated WITTMANN robots. There have been 15 new WITTMANN BATTENFELD machines purchased by MANN+HUMMEL since 2010, as well as many WIT-

tributes that truly sets them apart from their competitors. We very much value and appreciate the relationship we have with WITTMANN BATTENFELD and we are looking forward to



Left to right: Benjamin Piercy, MANN+HUMMEL; Tom Betts, WITTMANN BATTENFELD; Markus Klaus, WITTMANN BATTENFELD; Brad Roberts, MANN+HUMMEL; and Kurk Wilks, MANN+HUMMEL.

MANN robots (ranging from W711 up to W843 models), as the partnership between the two companies continues to grow.

What differentiates WITTMANN BATTENFELD from other suppliers in particular is its customer support. Brad Roberts, MANN+HUMMEL USA, INC.'s Purchasing Manager, said: "WITTMANN BATTENFELD's customer focus is one of the key at-

a positive future of continued growth together."

"We see this award as one of the higher honors we as a company can achieve", said David Preusse, President of WITTMANN BATTENFELD, INC. "When we have our customers making note of and honoring our success and the difference that our effort makes, it really makes us proud of the work we've done." ♦

Flex Preferred Supplier Award 2017

On May 31, 2017, Flex honored the recipients of its 2017 Preferred Supplier Awards at this year's Global Supplier Summit, hosted at the Flex Customer Innovation Center in Milpitas, California, in the heart of the Silicon Valley.

The WITTMANN Group was one of this year's recipients. 160 guests attended the award ceremony, where the award was handed over to Domenik Nikollaj, International Key Account Manager of the WITTMANN Group.

The Flex Preferred Supplier Awards recognize outstanding performance, strategic value-add, excellent service,



innovation and collaboration. Suppliers selected for the awards were nominated by Flex procurement and supply chain professionals and employees in various business groups.

"Flex recognizes and applauds the contributions of our preferred suppliers for their unwavering dedication and commitment to providing operational excellence," said Tom Linton, Chief Procurement and Supply Chain Officer at Flex. "We are pleased to honor these great companies with our 2017 Preferred Supplier Award."

With approximately 200,000 professionals across 30 countries, Flex provides innovative design, engineering, manufacturing, real-time supply chain insight and logistics services to companies of all sizes in various industries and end-markets. ♦

Domenik Nikollaj, WITTMANN International Key Account Manager (links) und Tom Linton, Flex Chief Procurement and Supply Chain Officer.

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

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

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