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innovations

Techniques – Markets – Trends

Volume 9 – 3/2015

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Battenfeld

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WITTMANN innovations (Volume 9 - 3/2015)

Quarterly magazine of WITTMANN Kunststoffgeräte GmbH and WITTMANN BATTENFELD GmbH. Appears to meet the informational demands of staff and customers. Editorial office: WITTMANN Kunststoffgeräte GmbH, Lichtblaustrasse 10, 1220 Vienna; tel. +43-1 250 39-204, fax +43-1 250 39-439; bernhard.grabner@wittmann-group.com; <http://www.wittmann-group.com>
Issue 4/2015 of "WITTMANN innovations" will appear at the beginning of the fourth quarter 2015.

Editorial

Content



Michael Wittmann

Dear Reader,

It's actually very satisfying – though also a little spooky – to observe how the injection molding industry is so unerringly (and unfazed by the economic turmoil in certain countries) marching from one record to the next. At any rate, the WITTMANN Group can look back on a highly successful first half of 2015. Assuming the trend continues, we may soon be celebrating yet another record financial year – for the sixth year in a row. Admittedly, the level we started at following the recession year of 2009 was very low; and the first few years thereafter can be safely described as “crumb catching”. But in the meantime, our turnover has reached levels that cannot be marginalized simply by automatic repetition of what went before.

There are other contributory factors for our success besides the generally positive economic climate. On the one hand, there's a rising demand for automation; on the other, our new *PowerSeries* injection molding machines are proving very popular. The *MacroPower* in particular, with up to 1,600 tons of clamping force, is opening up new sales opportunities for us. And our international network of offices and subsidiaries means that we're well placed when it comes to the global distribution of our peripheral devices.

Increased construction activity is an unmistakable sign of economic boom times. We recently completed a further expansion of our production facilities for the *MacroPower* in Kottlingbrunn/Lower Austria, as well as the expansion of our Hungarian production lines in Mosonmagyaróvár and our Mexican subsidiary. Work is still ongoing, both on the new office building for our Taiwan subsidiary and on the new premises for the Materials Handling Department in Austria not far from Vienna, and an extension for the technical center in Kottlingbrunn is scheduled for this year too. Further projects are still in the planning phase. All in all, we'll create an additional 8,000 m² of factory and office space this year.

There is an interesting event on the topic of energy efficiency worth mentioning here. Our second *Energy Forum* in 2015 is taking place at our offices in Nuremberg on July 8 (the first one took place in Meinerzhagen/Germany on June 24). Exploring possibilities for saving energy in the plastics processing industry has lost none of its relevance. Even though experts and media pundits are currently devoting increasing amounts of time to their new favorite topic, *Industry 4.0*, we must not lose sight of the matter of energy efficiency. We'd love to see you at our office in Nuremberg.

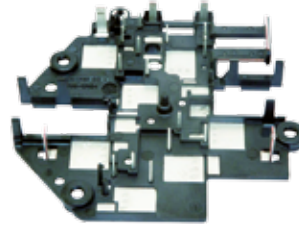
Yours cordially, Michael Wittmann

Automation Making home appliances



Dominique Colbrant on the famous brands of the SEB Group. **Page 4**

A highly complex solution



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Injection Molding

MicroPower saves \$ 1 million



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Entire Systems

High-tech allows for quality



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A leading household goods manufacturer chooses WITTMANN robots

The SEB Group has a major production facility in St. Jean de Bournay (France) that uses 33 WITTMANN robots. SEB, the world's leading manufacturer of small household appliances, recently purchased the first WITTMANN tandem robot.

Dominique Colbrant



The two simultaneously operating WITTMANN robots at SEB in St. Jean de Bournay (France).

Frédéric Carsana (WITTMANN BATTENFELD Sales Engineer), Jacky Gallois (responsible for methods and appliances for laundry care within the SEB Group), Thierry Petra (Managing Director of WITTMANN BATTENFELD France SAS).

As the owner of such well-known brands as Seb, Calor, Tefal, Moulinex, Rowenta, Krups and Supor, the SEB Group is one of those top manufacturers of irons and steam generators that without which one cannot imagine the market.

The SEB Group has two facilities in France that are dedicated to the manufacture of irons and steam generators. One of these factories produces the required plastic parts and the other produces the metal parts and assembles the appliances.

Some six million individual parts are needed each year for these two commodities alone. Irons and steam generators are manufactured for the worldwide well-known SEB brands, Calor, Tefal, Moulinex and Rowenta. These are sold on the Asian and European markets, including Russia and Turkey. The SEB Group continues to enjoy strong growth. Turnover in 2013 was 4,161 million euros, which amounts to a doubling since 2000.



The SEB Group is one of the world's leading manufacturers of small household appliances, and it is active in nearly 150 countries all over the world, where it markets its unique portfolio of absolute top brands (including Tefal, Rowenta, Moulinex, Krups, Lagostina, All-Clad, Supor) by a variety of methods. The company sells around 200 million units each year. The SEB Group has a long-term business strategy that is founded on premium quality and permanent innovation, international development, competitiveness and customer service. The internationally active company employs nearly 25,000 people worldwide.

SEB Group products

The SEB Group's products must meet absolute strict requirements with regard to their ergonomics, especially those that are dictated by the risk inherent to operating one of these appliances. The safety and ergonomic specifications are very carefully formulated. The combination of heat,

steam and electricity requires the implementation of specific technical features in order to comply with all the various standards.

The need for a watertight tank, for instance, is a feature that requires a specific method of production. Another less technical, more marketing-related consideration, concerns the customization of products with different color schemes and labeling (something that is demanded by the large retail chains). On top of this, of course, come reliability, functionality and design aspects. These are all important criteria that affect the choice of equipment used for manufacturing.

The plant in St. Jean de Bournay currently has 53 injection molding machines with a clamping force ranging from 22 to 800 tons that are capable of processing up to three different materials at the same time, plus around 45 linear and 16 six-axis robots. The machines produce housings for steam generators, water reservoirs for irons and various other parts (handles, caps etc.).

The numerous technical constraints require that the robots be integrated into a production environment that is very restricted in terms of space, with the primary objective

The acquisition of a tandem robot

Always on the look-out for new solutions, the SEB Group recently invested in a WITTMANN tandem robot. The final step of the manufacturing process of a tank made from three different materials involves two parts being overmolded. The decision to buy a tandem robot was the result of lessons learned from previous experiences.

In the past, the SEB Group used a single robot. It performed the necessary functions, but required a picker arm that was not precise enough, and most importantly, caused a significant delay in the mold area. The use of two classic robots was precluded due to the restricted amount of space available.

The tandem robot turned out to be the best solution in terms of both robustness (W832) and space requirement (the compact design of a WITTMANN robot). It makes a special mode of operation possible whereby two robots are able to enter the mold area of the machine simultaneously (in this case, a 3-component rotary mold). This solution is also a world first for WITTMANN.



Products manufactured by the SEB Group: Steam generators and irons.

of minimizing part removal time. (All of the above-mentioned aspects have a direct impact on the production cycle of the machine.)

In order to meet the growing demand, production operates in shifts, including over weekends, without the possibility of interruption.

An enduring partnership

A genuine relationship of trust has been built up with the WITTMANN BATTENFELD company over the years. One contributing aspect is the absolute confidence in WITTMANN BATTENFELD's sales department, which has time and again managed to come up with technical solutions that have fully met the needs of SEB and which has supported the on-site innovation process. Another factor that contributes to the smooth cooperation enjoyed is the excellent relationship between the technicians and engineers of each company.

These relationships have been further strengthened through a comprehensive training program that has provided both parties with an in-depth knowledge of one another's products.

- ◆ When the mold is opened, the first robot removes the tank that was overmolded during the previous injection process and places it onto a control station (external to the machine) where it gets checked for leaks and where the component is finalized before being packed manually in the packaging unit.
- ◆ The second robot removes the upper component of the tank and places it onto the lower component (the two parts are then ready to be overmolded).

The fact that the two operations could be separated from each other made it possible to achieve the targeted cycle time. The redesigned process has resulted in a highly efficient use of materials together with a rejection rate approaching zero.

The results after a few months in operation endorse the decision to employ exactly this piece of equipment. These positive results ultimately led SEB to purchase a second tandem solution from WITTMANN, which has already gone into operation. ◆

Dominique Colbrant
is Marketing and Sales Assistant of WITTMANN BATTENFELD France in Moirans.

High-end automation at Sacel, Italy

High quality and efficiency, achieved by stepping up the pace through automation. This is the mission of a Turin-based company specializing in the production of complex components for the automotive sector.

Stefano Troilo

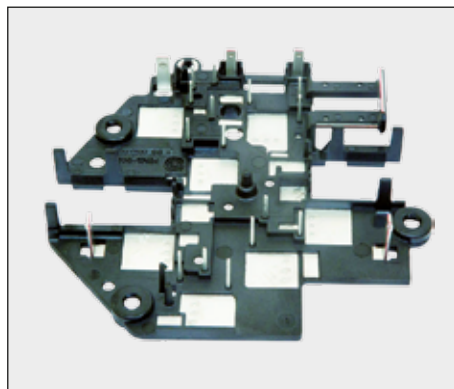
Initially founded as tool shop making molds for sheet metal working, Sacel srl (Ozegna, Turin area) is now a multifaceted enterprise, having expanded its core business to integrate its expertise in other areas including molds for plastic materials, progressive dies for sheet metal, injection molding of plastics, laser welding and assembly. "Thanks to the know-how we have developed in a range of sectors," says Sacel's Vice President Raffaella Caretto, "we can now develop production processes tailored to every specific requirement."

The cornerstone of all this is still automation, however, which allows us to guarantee quality production that is also highly competitive in terms of time and cost efficiency."

A special project

Eighty-five per cent of the turnover of this Piedmont-based group is generated in the automotive sector, through a clientele comprised largely of Tier One suppliers of the major automobile manufacturers. One of these, Magna Electronics, has entrusted Sacel with the production process design and subsequent manufacturing of a punching grid, a component that will be used in the starter motor of the radiator cooling system of several Volkswagen and BMW models. Made from galvanized copper and 40% glass fiber reinforced PPS, it is a two-material component. Thanks to intensive work on the design (in collaboration with the customer) and on the development, as well as the construction of the molds and a dedicated production line, the components were being mass produced within the span of just a year. In 2012, around 80,000 per month were being produced, and the launch of a new plant raised the production capacity further, to as much as 2.2 million per year by the end of 2013.

"The punching grid is composed of eight circuits, obtained through the punching and bending of two copper pieces, which differ in shape and size," explains Raffaella Caretto. "These circuits are assembled inside the mold into



which the PPS is injected." It is a complex component, whose production requires different processing stations, all fully designed and robotized by Sacel's technical staff. In automation terms, the process can be divided into two steps.

The first, the punching of the metal parts, is a discontinuous process since it involves a step that has to be outsourced; the second, the overmolding of the pieces with plastic, is fully automated.

The production line

"The process begins with the pre-punching of two copper coils," explains Raffaella Caretto, showing the production line. "These then undergo galvanic tin plating, a treatment carried out by a carefully selected subcontractor. Once it has been returned to us, the material is punched again, to obtain the two different metal pieces mentioned earlier. After this, the pieces are loaded onto a rotary table located at the entrance to the automated station. A controlled axis Cartesian robot, equipped with suction grippers, picks up a pair of pieces at a time – these are fed to it by the movement of the rotary table – which it then deposits on the carriage of the press. Here the pieces are bent and separated, one into five circuits and

the other into three. Thanks to the punching and bending of the pins on the machine it is possible to avoid piece deformation and damage, drawbacks that tend to arise with manual operations."

Overmolding with PPS

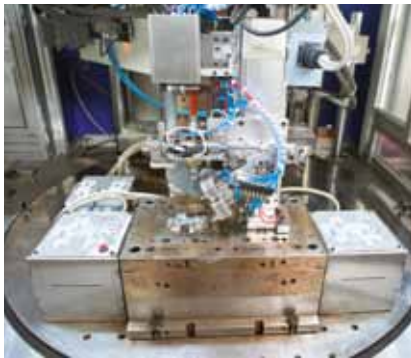
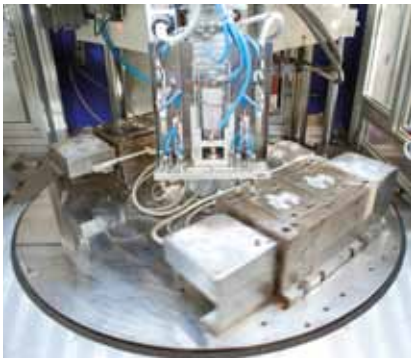
The separation and bending steps are followed by overmolding of the pieces with PPS. This is carried out by a 150-ton WITTMANN BATTENFELD VM 150/210 V 1280 R vertical injection molding machine, specially developed for the molding of engineering polymers and equipped with a two-station electric rotary table. Situated on the latter is a mold with 2+2 cavities. "The circuits are picked up by a lin-

View of the punching department. The process begins with the pre-punching of two copper coils. The resulting pieces undergo a galvanic tin plating treatment.

The punching grid is composed of eight circuits, obtained through the punching and bending of two copper pieces. These circuits are assembled inside the mold into which the PPS is injected.

ear translation device which inserts them into the mold. The table then rotates through 180 degrees, moving the mold to the second station, where the overmolding with PPS takes place. The correct positioning of the different circuits inside the mold is guaranteed both by sensors fitted in the cavities, which detect the presence of the pins, and by a control system which monitors the vacuum level of the robot's suction grippers. Any malfunctioning is signaled by an alarm, which stops the working cycle," says Raffaella Caretto.

Drawing attention to the critical aspects of the process, Raffaella Caretto remarks: "PPS is processed at higher temperatures than the other plastic materials that we generally work with: indeed, the polymer is injected at a temperature of 320 °C, while the mold is maintained at 145 °C. In order to avoid disrupting delicate balance of the whole cycle, we have installed a WITTMANN TEMPRO plus D pressurized water temperature controller set to 160 °C, complete with a control panel operated from the injection molding press.



Raw material conditioning before processing is also quite a critical stage, and for this purpose we use a WITTMANN DRYMAX E30/70 PDC dryer, in which the material is transported in a closed-loop circuit and the process temperature is increased to 180 °C."

Close monitoring

"The punching grid must meet some extremely critical requirements. Therefore, we have implemented an in-line control system, which accomplishes a subset of rapid operations. The piece is moved into four positions to allow evaluation, by a COGNEX viewing device, of a series of critical parameters, such as presence of flashes, completeness of the overmolded parts, holes in the right places, correct bending of the metal pins and integrity.

Once the check is complete, the pieces are carried out of the workstation on a conveyor belt and sent on to a cell for ultrasonic cleaning, a treatment that gets rid of any contaminations."

One very important aspect of the control procedure is its duration. Indeed, even though a large number of parameters are checked on every single piece, the Sacel technicians have nevertheless managed to make its duration match that of the injection mold phase, which is just under 40 seconds.

"Staying competitive in our market means optimizing every tiny detail. This explains why we have made complexity the basis of our business model. For us, complexity means the ability to concentrate various advanced technologies, within the company, and to integrate them into the development of plants for the production of high-tech components," Raffaella Caretto comments. ♦

The tin plated pieces are placed on a rotary table (left) which feeds them to the carriage of a press where they are bent and separated into smaller circuits (right).

A linear translation picks up the parts and inserts them into the mold on a rotary table. Correct positioning of the circuits is guaranteed by cavity sensors (left). The circuits are overmolded with reinforced PPS (right).

A viewing device ensures direct in-line punching grid quality control (left). Once the check is complete, the pieces are carried out of the workstation on a conveyor belt and sent on to an ultrasonic cleaning cell (right).

Sacel was founded in 1976 by Giuseppe Caretto, who is still its President. His daughter Raffaella is Vice President, while his other daughter Livia has an administrative and management role. Over 100 people are employed at the plants in Oze-gna and San Giorgio Canavese (both in the Turin area); of these, 50 work in the production department and around 30 in the tooling department. Then there are eight designers working in the technical department, six production engineers, and a team of maintenance workers. Production is carried out over three shifts, from Monday to Saturday, and it demands



Raffaella Caretto

experienced and well-trained personnel. "Even though the machines are highly automated," Raffaella Caretto explains, "it is crucial, in our view, that they be supervised by technicians. We train these in-house by having them work alongside more experienced colleagues." Completing the picture of the Sacel Group is SacelEst s.r.o., their Slovakian branch, founded in 2006, which employs 30 people. In 2011, the group recorded sales of around 17 million Euros, which reflected an increasing trend following the setting-up of new production processes. Sixty percent of the turnover is generated in Italy and the rest on the global market.

Stefano Troilo is a photographer and external consultant of the Italian PLASTIX magazine to which he also contributes.

MicroPower saves material costs of nearly \$ 1 million per year

Tessy Plastics pushes the limits of micro-molding technology with the help of five WITTMANN BATTENFELD MicroPower injection molding machines, automation and auxiliary equipment.
Sonny Morneault

Tessy Plastics, headquartered in Elbridge, NY, is a privately held global contract manufacturer with ISO 13485 certified FDA/GMP compliant facilities in New York, Virginia, and Shanghai, China. The company specializes in high speed, multi-shot and thin-wall injection molding, micro-molding, integrating molding with assembly, and a variety of added value technologies.

Tessy views itself as an engineering company that also injection molds and assembles parts. Over 60 engineers manage in-house R&D, prototyping, product design, tool design, and automation development utilizing the latest software and equipment. The company employs over 900 people and runs 225 molding machines at its three locations.

At a recent visit to the company's headquarters in scenic Elbridge, NY, Stafford Frearson, Tessy Project Engineer, provided a first-hand look at how Tessy is utilizing WITTMANN BATTENFELD's *MicroPower* machines and automation to produce highly technical surgical parts.

Meeting the challenges of molding micro parts

Tessy has five *MicroPower* machines at its facility in Elbridge; four of them are in use producing surgical parts. The WITTMANN BATTENFELD machines include integrated SCARA robots and inspection systems with cameras; Tessy also uses WITTMANN dryers, feeders, and temperature control units on their micro-molding applications. All of the machines run in Class 10,000 and Class 100,000 clean room environments.

One of the parts being produced is a laparoscopic staple for minimally invasive surgery; two of the WITTMANN BATTENFELD *MicroPower* machines are tied together to one piece of automation for this particular application. An-

other *MicroPower* is used to mold an insulator for a printed circuit board; the machine molds contacts into the insulator, which is then soldered onto the PCB. Ethicon Endosurgery, a division of Johnson & Johnson, is the customer for both devices. Finally, the newest *MicroPower* application is for molding a part for micro-eye surgery for a leading eye-care company. In both applications, the *MicroPower* machine overmolds the plastic onto the metal.

"There are many challenges to molding micro parts," says Stafford Frearson. "Micro parts and molds are highly specialized processes, and not everyone can do it." Molding such tiny parts is not easy – some of these parts are as small as 0.120" × 0.063" × 0.038", and weighing only 0.004 grams.



View of one of the Tessy Plastics clean rooms at their production plant in Elbridge, NY, USA. This clean room houses four of the company's five MicroPower injection molding machines from WITTMANN BATTENFELD.

A better way

Frearson described some of the history behind successfully producing the cartridge parts for Ethicon, which required a fair amount of research and development. "When we bid for and won the cartridge business, we looked at new ways to successfully produce these tiny parts," he says. "We started out producing the parts on a conventional molding machine with a 16-cavity hot runner system, molding 64 parts per shot. This worked, but not as well as we liked; the material we use for these parts, a thermoplastic polyetherimide (PEI), requires very high temperatures to process (720 °F), and it was a challenge producing consistent parts with the hot runner. Trying to maintain consistent heat and balance in the system without burning the material was difficult to do."

Considering the plastics material in question is rather expensive (averaging \$ 20.00/lb), and the parts required all virgin material, Tessy Plastics needed to reduce waste and improve shot-to-shot consistency, so they set out to find a

new way to produce the parts. They decided to purchase one *MicroPower* machine from WITTMANN BATTENFELD for test purposes, and equipped it with a mold built in-house. "When we first went looking for a micro-molding machine, we couldn't find one that could successfully run this special material," says Frearson.

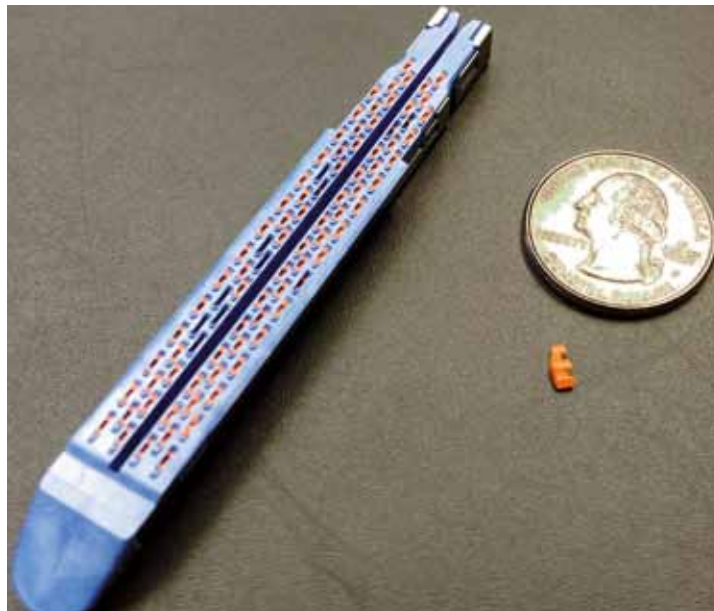
"We approached WITTMANN BATTENFELD and they were working on redesigning their *MicroPower* injection molding machine for overall better form, fit and function. We liked it that after purchasing BATTENFELD in 2007, Dr. Wittmann was committed to rebuilding the company and creating better machinery, so we decided to give the new *MicroPower* from WITTMANN BATTENFELD a try in practice."

The results were impressive; Tessy Plastics saw improvements in all key areas including shorter cycle times, less usage of material, less scrap, and also higher quality parts. When Tessy had the opportunity to redesign the cartridge line, they purchased two more *MicroPower* machines and created a new automated micro-molding line.

Growth in medical

Tessy Plastics continues to grow, as is evidenced by their recent purchase of a 112,000 square foot plant in nearby Skaneateles, NY. The plant, a former Honeywell factory, will be devoted to Tessy's medical molding business. "We have started the move there in autumn 2014, but it will be a 2-year process," says Eric Frearson, Tessy's VP of Engineering and China Operations. "All of the machines and equipment going there will support the same products."

The move includes 25 molding machines, 10 automation cells, toolmaking operations, and more all for the same product line. This includes the two *MicroPower* machines, automation and auxiliaries. When complete, the Skaneateles plant will be a state-of-the-art medical molding facility with Class 10,000 and Class 100,000 clean rooms. "We needed more space for the molding and assembly work for the cartridge devices for Ethicon," says Eric Frearson. About 100 medical production workers will staff the operation. There are up to 60 different components in the surgical device.



Cartridge (left) with a single staple (orange micro part). The staple is 0.0120" x 0.040" x 0.075", weight 0.004 grams.

The new cartridge parts are molded on smaller molds with 5 cavities, producing 20 parts per shot, but Tessy has seen almost 20% less material waste than when they were molding with the 16-cavity hot runner.

That translates into savings of almost \$ 1 million/year. Add to that the faster cycle times and better shot-to-shot consistency, which results in fewer rejected parts, and Tessy has realized significant overall cost savings.

Matt Willsey is the Senior Technician at Tessy Plastics in charge of running the *MicroPower* injection molding machines. He mentions WITTMANN BATTENFELD's Web-Service for the B6 control system on the machines as being invaluable. "We are able to contact WITTMANN BATTENFELD anytime we have a question or an issue, and they respond immediately," he says.

"On a couple of occasions they have connected remotely through their Web-Service and taken control of the machine so they can see exactly what's going on, and recommend solutions." On applications as critical as these, that kind of service is essential, he says.

A wealth of WITTMANN BATTENFELD machinery and equipment

Besides the five *MicroPower* machines, Tessy Plastics employs an impressive array of other WITTMANN BATTENFELD products including over 25 WITTMANN robots, numerous dryers, granulators and temperature control systems. They also use WITTMANN BATTENFELD's M7.3 central material handling system, which includes the largest CODEMAX RFID coupling station in the USA. The material handling system supplies a wide variety of material to the molding machines at rates up to 30,000 lbs/hr. The RFID system ensures that the correct materials and amounts are getting to the correct presses.

Of course, WITTMANN BATTENFELD is proud to partner with Tessy Plastics. The company knows they are one of the leading custom molders in the USA, and WITTMANN BATTENFELD looks forward to continuing to help Tessy improve their efficiency and productivity, to produce the highest quality parts. ♦

Sonny Morneault is National Sales Manager of WITTMANN BATTENFELD Inc. in Torrington, CT, USA.

WITTMANN BATTENFELD and Interplex China develop ABS control elements

Total customer satisfaction, this is the philosophy that is believed and followed by Interplex. Above all, quality is what the Interplex companies worldwide give to their customers – and also the reason why Interplex chooses WITTMANN BATTENFELD.

Sophia Xu

The Interplex Group, a transnational business group, is specialized in the production of precision molds and metallic stamping parts. Headquartered in New York, and founded in 1958, Interplex has established 25 subsidiaries in various parts of the world, including Mexico, Great Britain, France, Germany, Israel, India, Singapore, and China.

In 1996, and with a strategic insight, Interplex entered China and set up a wholly independent subsidiary. The company is situated in the Hangzhou Economic & Technological Development Area with a total investment of over 600 million Yuan.

Through more than a decade's unremitting efforts, the company has grown into a technology-based enterprise that is a leader in their market, with products that are used in many industries. It has also integrated its production lines and can provide one-stop service.

Outside view of Interplex Industries (Hangzhou) Co., Ltd.



Competition in equipment and service

In order to improve automobile safety, ABS has become a standard configuration of most vehicles. ABS technology effectively prevents locking of wheels during braking and reduces accidents. The importance of ABS is obvious. ABS control elements are among the numerous product categories of Interplex China – and also a category with extremely strict production requirements. It is a very important safety part for BMW cars for example, and of course many other top brands.

Its dimensional accuracy during installation needs to be high, ≤ 0.01 mm in all important dimensions. The injection repetition accuracy of the injection molding machines must be controlled at around 0.1%. As for selection of injection molding machines – a most critical device for the production of this part – Interplex contacted WITTMANN BATTENFELD after the recommendation of its German client (a vehicle plant of a top automobile brand).

After repeated tests on mold opening and closing accuracy and injection accuracy of short shot operation, the personnel of Interplex discovered with joy that the contactless design of the movable platen and of the pull rod of the WITTMANN BATTENFELD injection molding machine



ABS control element made of PBT.

reduces the friction between the platen and the pull rod and raises the cleanliness of the mold zone compared to other injection molding machines. Moreover, the platen slides on high-accuracy linear guides, and with all actions accurately controlled by limit switches, the mold is opened and closed much faster compared to traditional injection molding machines of other brands, and the position accuracy is held within 0.1 mm.

After the executives of Interplex read the test report of WITTMANN BATTENFELD injection molding machines, they were absolutely convinced. However, the injection molding machine is only one component of the complex ABS production unit. In addition, the production unit also has a sophisticated automation system. The machine in

question needs a 6-axis robot for the production of pin inserts. The mold adopts the design of two cavities, with 30 pins needing to be inserted in each cavity. That means 60 pins need to be embedded into the mold at once and the insertion of each pin has to reach an accuracy of 0.01 mm. The subsequent process steps include on-line air-tightness test, CCD detection, and some more tests.

The entire automation system is highly complex. Interplex had cooperated with another European injection molding machine manufacturer in the past, but many problems had appeared in regard to the automation, so while the Interplex executives gave high remarks on the quality of the

tegrated systems in the injection molding field. Automation systems are a strong point for WITTMANN, and the confidence of Interplex in the cooperation was greatly boosted. After the horizontal HM 240/1000 injection molding machine had arrived at Interplex, it took only one week to start up the device.

The WITTMANN BATTENFELD technicians completed the installation in the course of this week, including debugging, and they assisted in connecting the machine with the automation system. Resultingly, automatic production was realized very quickly. Interplex also submitted samples to its clients, leading to the receipt of the respective orders.

By relying on the excellent accuracy, the repeatability, the flexibility of the automation system and the efficient after-sales service, the WITTMANN BATTENFELD injection molding machine has become the top choice of Interplex China for the execution of high-end injection molding. Interplex has bought four injection molding machines including HM 240/1000 and VMR 150/350 R 1280 models.

Advanced production equipment makes for efficient production

The ABS control element produced by Interplex China adopts PBT + 30% glass fiber modified material, which sets very high requirements for the wear and corrosion resistance of injection molding machines. All the screws

used in WITT-MANN BATTENFELD injection molding machines are manufactured by WITTMANN BATTENFELD themselves. AK+ screw barrels have a brilliant performance in regard to wear and corrosion resistance. Interplex has tested the Rockwell Hardness (HRC values) of screws and WITTMANN BATTENFELD products outperformed the screws of other manufacturers.

After having continuously operated the WITTMANN BATTENFELD HM 240/1000 horizontal machine, it is obvious that this device not only fully met Interplex's requirements, but that this machine also realized the most accurate production with 99% continuity in a 45 second cycle. Everything was beyond expectation, thus significantly raising the production output, and also the parts quality.

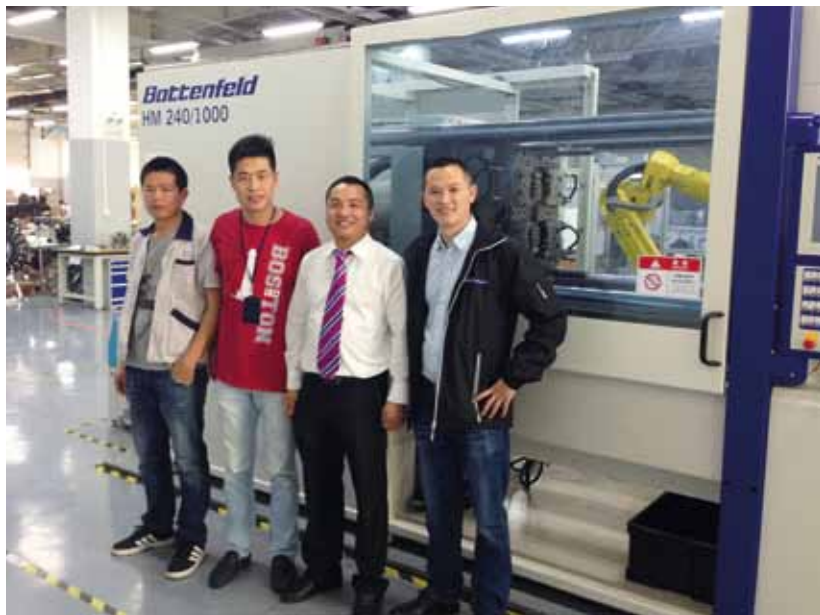
WITTMANN BATTENFELD: Leading in quality and service

The machinery market has entered an age of service competition. Service has become an overall trend of the engineering industry. It is an effective way to improve a brand's image and enhance the competitiveness. Purchasing Supervisor James Hu and Production Supervisor Jeff Chen of Interplex China speak with high esteem of WITTMANN BATTENFELD machinery, and they also give the best remarks on the service, being of the highest professional and technical level and efficiency – expressing their respect for the WITTMANN BATTENFELD service professionals. ♦

From left to right: Production Supervisor Jeff Chen and Purchasing Supervisor James Hu of Interplex China, with Sales Manager Mark Liu and After Sales Service Manager Tim Huang of WITTMANN BATTENFELD.

WITTMANN BATTENFELD VM 150/350 R 1280 vertical injection molding machine, producing plug connecting pieces.

Sophia Xu is Assistant to the General Manager and Marketing Executive at WITTMANN Robot (Kunshan) Co., Ltd. in Kunshan, China.

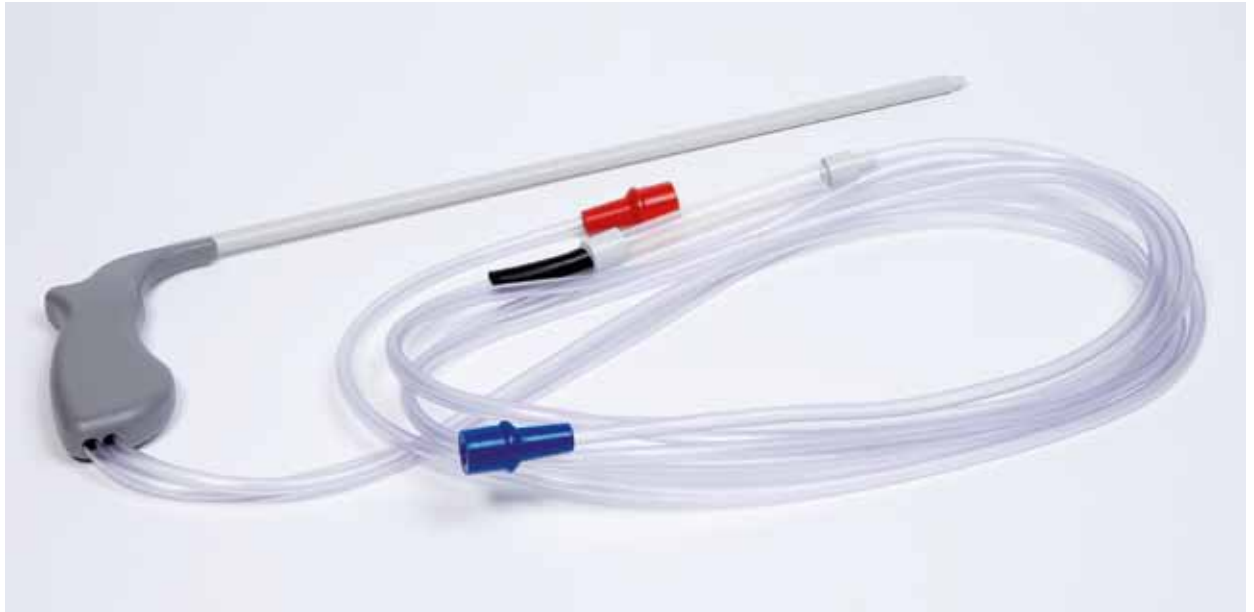


WITTMANN BATTENFELD injection molding machine, they also expressed their concerns about automation. Back in 2008, when WITTMANN bought the BATTENFELD company, and both merged into one company, the WITTMANN Group established itself as a supplier of wholly in-

High-tech for ultimate part quality

FRANK plastic AG in Waldachtal, Baden-Württemberg leads the way: Manufacturing plastic parts of the highest quality requires the systematic use of high-end equipment.

Walter Klaus (†)



A small selection of the high quality medical devices manufactured by the FRANK plastic company in Waldachtal, Baden-Württemberg, Germany: A probe and two flexible tubes for use in endoscopy (pictured above), plus a number of other parts for related applications (pictured on the right).

The company FRANK plastic in Waldachtal, Germany, has been around for more than seven decades and enjoys an excellent reputation as a manufacturer of injection-molded plastic parts.

Production has expanded several times over the years, and today, FRANK plastic processes around 2,500 tons of thermoplastic materials per year, using 70 injection molding machines.

When it comes to automating their injection molding processes, FRANK plastic employs no fewer than 40 robotic systems – sprue pickers and CNC robots – manufactured by WITTMANN Robot Systeme GmbH in Nuremberg, one of the German branches of the WITTMANN Group. Controlling the temperature of the dies in the injection molding machines is performed for the most part by TEMPRO temperature control devices from WITTMANN.

Measurement and control technology forms an important part of FRANK plastic's business, and the various different products are manufactured using a combination of mechanical means and extrusion or injection molding methods.

Among the numerous industries supplied by FRANK plastics, the medical industry is of particular importance and one in which the company has many decades of experience.



Clean room production for medical technology

FRANK plastic has made a name for itself in this business sector with numerous proprietary developments that are used both in the clinical field and in the laboratory, and, as a result, has become the preferred supplier of such companies as ASAHI/AMERICA, AESCULAP, BRAUN and DENTSPLY IMPLANTS.

When it comes to manufacturing medical parts, a clean room is an essential requirement. FRANK plastic manufactures such parts in two clean rooms that meet the ISO class 8 clean room standard. All of the injection molding machines used are fitted with parts removal robots whose arms are made from abrasion-resistant material so as to ensure that the production environment remains dust and particle-free.

Central drying and conveying system

A fully-automated central drying and conveying system from WITTMANN ensures that the correct dried pellets for the injection molding machines are supplied at the right time.

The drying plant, which is built on an elevated platform, consists of a DRYMAX 300 central dryer and twelve SILMAX drying hoppers. The central dryer is



equipped with a dew point sensor plus a return air cooler for high-temperature applications and a filter to ensure that certain parts have the expected visual characteristics. Two coupling stations ensure that materials are correctly allocated.

The drying hoppers are equipped with removable adapters with an integrated evacuation function, which enhances the visual appearance of the finished parts. Three vacuum systems are needed for the operation of the central unit, with an additional standby pump that automatically activates in the event of a malfunction. The first vacuum system serves the drying plant, while the two other systems are responsible for supplying material to each of the two clean rooms. In those cleanrooms are ten and 26 injection molding machines, respectively, that are in operation.

The system is controlled by a WITTMANN M7.2 IPC central control unit that is able to allocate the material required by the individual processing machines. The control unit's 15" touch screen allows all parameters to be input and managed in a user-friendly manner. The unit is also equipped with an Ethernet interface that allows the control panel – and thus all the functions of the drying and conveying system – to be accessed via the operator's existing network.

All conveying devices in the feed zones of the injection molding machines are equipped with two demand sensors that can also be activated on the devices themselves, if necessary. These sensors allow material pre-storage to be varied according to the current throughput of the processing machines. When working with high shot weights, it is common to choose a greater material pre-storage size and a correspondingly smaller one for low shot weights.

Parts handling

At FRANK plastic, the removal of parts and sprues following the injection molding process is carried out exclusively using suitably automated parts removal systems that place the finished parts onto a conveyor belt in a controlled fashion.

The constant use of the most up-to-date machinery and peripheral devices has been a mainstay of FRANK plastic's successful company policy for decades.

With the equipment they have supplied – which is being used for everything from drying the material, transporting and processing it, and finally removing the parts and processing them further – the companies of the WITTMANN Group have played a part in this success. ♦

One of the clean rooms dedicated to the production of medical technology parts at FRANK plastic.

Drying system: DRYMAX 300 and twelve drying hoppers – ten SILMAX 70 units and two SILMAX 100 units; pictured below: the coupling station installation.

Walter Klaus was CTO of WITTMANN Robot Systeme GmbH in Schwaig until 2008 (today in Nuremberg), Germany; he most recently worked as a consultant and technical writer, including for the WITTMANN Group. Walter Klaus passed away in February of 2015. Walter Klaus will always be remembered with affection and admiration within the WITTMANN Group – we have lost not only a colleague, but a friend too.

Orlando, Florida: The NPE 2015 was very successful

WITTMANN BATTENFELD generates nearly 1,600 leads and books over 11 million dollars in orders over the course of a supremely successful NPE show.



View of the WITTMANN BATTENFELD, INC. booth at the NPE 2015 show in Orlando, Florida.

Even with the potentially disastrous theft of one of their trucks, and the resulting last minute scramble to put the booth together, WITTMANN BATTENFELD had their most successful NPE in recent memory.

With their impressive lineup of six molding machine cells, their complete line of material handling and auxiliary units, various demonstrations of their connectivity capabilities, and an eye-catching, show stopping pit crew display run by their robots, WITTMANN BATTENFELD was able to grab the attention of almost everyone at the show. The booth tied together numerous themes that highlighted WITTMANN

BATTENFELD's one-stop-shop mentality. One was the "Internet of Things" showcasing their industry leading connectivity through various mobile apps, and their new *WITTMANN 4.0* integration technology. The other, in connection to the race car theme, was "Great People and Great Product! This Is the Winning Combination". Not only can WITTMANN BATTENFELD provide a company with all of the high quality products it needs, they have the people and the technology to connect them together and get a plant operating to its full potential. The equipment that was sold directly off of the show floor included injection molding machines

of different types, robots, and auxiliary equipment like dryers, feeders, and temperature controllers.

"We put a lot of time and effort into this show and it really paid off for us," says David Preusse, President of WITTMANN BATTENFELD USA. "The SPI (Society of the Plastics Industry) did a great job of getting people to Orlando, and our team did a great job of designing our booth and promoting what we have to offer. We are proud of what we accomplished this show and look forward to continuing the progress that was made there over the next three years so that NPE 2018 will be even more impressive." ♦

Those were the *MacroPower* Days in Kottlingbrunn

WITTMANN BATTENFELD demonstrated “power” in large machines at its *MacroPower* Days on April 22 and 23.

Under the motto “Power for the Future”, WITTMANN BATTENFELD presented its *MacroPower* series of injection molding machines in conjunction with interesting high-tech processes and applications to more than 500 visitors – most of them specially invited guests. Additionally, through the networking of machines, automation and peripheral equipment, the implementation of *Industry 4.0* in the WITTMANN Group was also demonstrated.

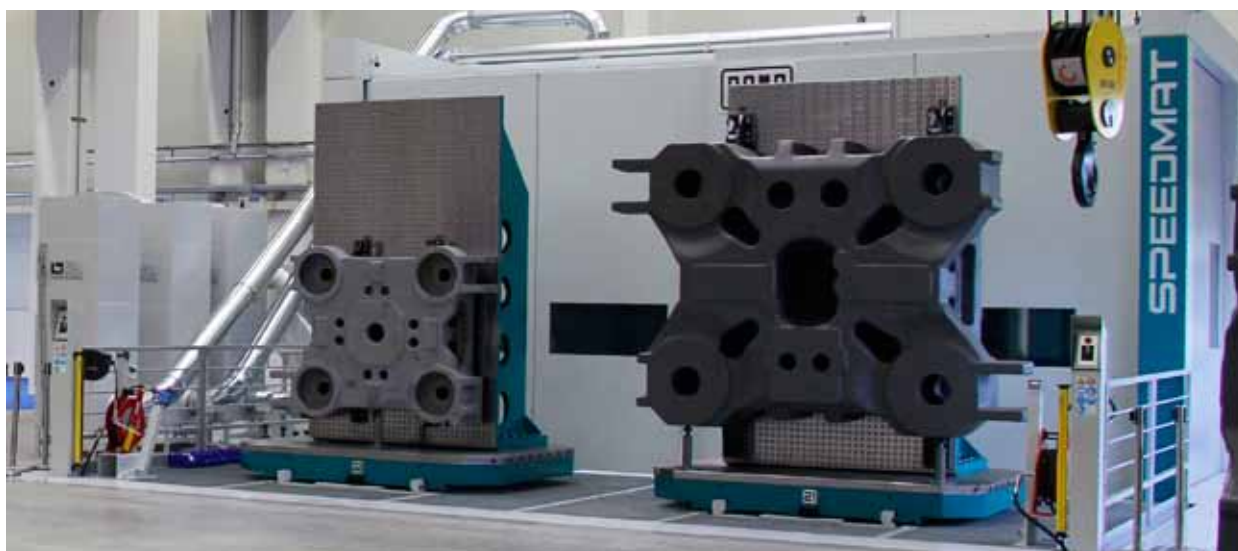
The numerous qualified lectures that were held garnered much attention and led to further discussions. It was – not least – this interchange of ideas that made the event a big success. ♦



Many expert visitors came to visit the MacroPower Days 2015 that were held at the WITTMANN BATTENFELD plant in Kottlingbrunn (Lower Austria) – and they drew much interest to the presentation.



Most of all, visitors were practitioners that were highly interested in the large machine sector.



View of the Kottlingbrunn machining center for large moving platens that are used with the MacroPower series.



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