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**WITTMANN innovations (Volume 3 – 2/2009)**
Dear Reader,

These days I too feel the need to express myself with some words in regards to “the crisis”. There is no point in discussing where it began or who caused it – the fact is that the plastics processing industry has it on their back and it will probably last for some time. In such a nearly apocalyptic atmosphere and above all, we also have to listen to the commentaries of self-proclaimed experts. Either they are arguing a total collapse or are trying to make believe that they are aware of the way to lead us out of it and of course, we will have grown stronger afterwards. Once again, it seems to make much more sense to have faith in one’s own feelings than listening to the calls from the “expert world”. This also means of course to consistently follow the path once chosen.

We are diligently working to further strengthen our position in the world market and are proud to announce the opening of a new WITTMANN subsidiary with its activities starting right now: WITTMANN BATTENFELD Romania. Our comprehensive product range combined with premium service will also set the pattern for the Romanian market.

Likewise, unrelieved we are advancing the development of our products. Once again we are counting on increased efficiency and capability. In this issue of innovations we introduce the new TEMPRO plus series water temperature controller that operates at a process temperature of 180ºC. Other articles relate to customer applications all over the world thus impressively showing the diverse capabilities of WITTMANN and WITTMANN BATTENFELD equipment. Read about the central material handling system at LISI COSMETICS in France and the new central granulator at Gibo Plast A/S in Denmark. Furthermore, we describe the manufacture of the VW Touran clutch pedal using water injection molding technology. And finally, we visit our long-time customer Krona Indústria in Brazil who has established itself as one of the leading plastics processors in South America.

For the first time we tried the concept of the road show as a way to visit our customers in the Benelux countries. Our guests in Gent, Utrecht and Eindhoven took the opportunity to obtain expert information about our products and to examine some of the equipment on the spot. As many business trips are cancelled these days due to the economy, it was our effort to sustain the exchange of ideas through this method of communication for which we received a lot of positive reaction. And it is this reaction that has encouraged us to organize more road shows in the future.

Sincerely, Michael Wittmann
A market that continues to grow for McConkey & Co. of Sumner, Washington, U.S.A., is their large disposable planter pots. The business started as a flower bulb farm in 1932 and has been making flower pots since the 1950’s. Their 72,000 sq.ft. facility produces over 300 million planter pots a year.

Bob Arsenault

Recently they were faced with the difficult decision of having to add another injection molding machine to meet demand. However, they recognized adding another machine may be hard to justify. McConkey typically operates 24/5 and increases to 24/7 when required to maximize capacity but, this was still not enough to fill new orders.

For McConkey, adding another injection molding machine would require an investment of about US$ 600,000. As Erind Condon, Maintenance Supervisor, noted “It is not only the cost of the machine but also the floor space and all the necessary services like electrical, water, air, etc. plus the cost of the operators and packers.”

For many molders, the cost of adding an injection molding machine is often not economically viable even though they need to increase capacity to increase business. McConkey was faced with the same challenge and turned to WITTMANN for a solution.

The process analysis

A call to WITTMANN resulted in a complete review of the process and McConkey’s specific needs. It was clear to all that the machine cycle was limited by the existing robots and not the part.

McConkey had several different molds running in two 550 U.S. ton machines, each equipped with a third party robot that had been operating only for a few years. One of the molds, a 4-cavity mold for planter pots, was running a 7.1 second cycle but was limited by the robot’s speed and ability to move into the mold and grab the parts. Often parts fell off the EOAT (end-of-arm-tooling) during removal so the robots had to be slowed down in an effort to hold the parts. The result, lower output than the molds and machines were capable of. McConkey’s goal to increase the output capacity without adding another machine resulted in a detailed analysis by WITTMANN who conservatively suggested their robots could provide a minimum cycle savings of 1 second each.

Or, as Erind explains “Since there are two injection molding machines we are actually gaining a total of 2 seconds of machine time every cycle and, when calculated over a week or a month, the savings would allow us to put off the purchase of another machine. Instead of spending $ 600,000 on an injection molding machine we simply bought two WITTMANN robots for $ 150,000 – that’s a quarter of the cost!”

Horticultural Planter Pot Molder Cultivates Growth with Robots
Installing the robot on the machine

WITTMANN proposed their W732 UHSS (Ultra High Speed Servo) robot with fast in/out times and recommended specialized EOAT from SAS suitable for high speed applications. “WITTMANN assisted us with the design objectives for the EOAT in order to fully utilize the speed of the robots,” said Condon. In addition, WITTMANN worked with McConkey in advance of the install to answer all their questions and even supplied them with the robot drawings and manuals. “Communication with their service people was outstanding and their CD manual was really informative and had a live to internet connection so we could print-off exactly what we needed,” adds Erind.

The robot was fully tested for 72 hours at WITTMANN in Connecticut before it was shipped. “It arrived 2 weeks ahead of schedule providing us the opportunity to install it without having to work overtime,” Erind points out. “The balance (center of gravity) was phenomenal and really simplified the installation. It took only 15 minutes to mount the robot on the machine and it was up and running in 8 hours! The next day we tested and fine-tuned everything with the WITTMANN service technician who also provided training and answered all our questions.” Erind advised.

Reduction of cycle time

Critical to the success was the speed of the robot and the ability of the EOAT to hold the parts during robot motion. The robot is primarily used for pick-and-place and part stacking. “The robot was equipped with WITTMANN’s high speed servo package and performed perfectly,” states Erind. “We haven’t even come close to taxing the robot and are looking at what other operations it might perform.” Erind notes. On another note, Erind said “The robot interfaced with the conveyor like a glove. We now control the conveyor with the robot teach pendant which is huge, as it eliminates the need for our operators to run around the machine to clear the conveyor.”

“It was exciting to see the effectiveness over the first month,” Erind states. A simple calculation shows the 1.85 sec. per cycle savings achieved with the WITTMANN robot for just one machine results in about 1,250 hours of extra machine time per year or, more than a 25% reduction in cycle time! One might ask why one robot outperformed another so substantially. Was it old? Was it a really fair comparison?

In this case, it was a combination of many factors including advanced, high speed technology, sophisticated overall design and a supplier capable of providing complete support from the initial review of the molding process through install and training and well beyond. The fact remains, the benefit and savings achieved replacing the old robot far outweighs the cost of a new injection molding machine.

Simple programming

Programming the robot was also very simple and straightforward as the WITTMANN color touch screen teach pendant is so simple to use. “You move the robot from point-to-point to generate the program which then appears either visually or by block. You can even watch it run line-by-line so it has been really easy to train our people,” Condon explains. “This will also be a benefit when we use the off-line programming feature since we can display the program exactly as our operators see it on the color TeachBox.” Condon adds.

Cycle Analysis at McConkey & Co.

<table>
<thead>
<tr>
<th></th>
<th>Cycle Time [s]</th>
<th>including [s]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous Robot</td>
<td>7.1</td>
<td>5.05</td>
</tr>
<tr>
<td>WITTMANN W732 UHSS</td>
<td>5.2–5.25</td>
<td>0.5</td>
</tr>
</tbody>
</table>

WITTMANN W732 UHSS: Said to be the “terminator” on the market

Condon comments “I have been in the industry 24 years and seen a lot of robots but this one is the ‘terminator’. It is most impressive how fast the robot will go in and out of the molding machine and hold the parts. WITTMANN is leading the industry – their robots are fast and streamlined.”

McConkey has since installed their second WITTMANN robot for an even more challenging part. Condon ends “We are willing to talk to anyone who wants to know how satisfied we are with WITTMANN.”
The LISI COSMETICS Central System

LISI COSMETICS, one of the most renowned suppliers of cosmetics packaging based not far from Chartres, France, decided to purchase a WITTMANN material handling system. The benefits of the M7.2 IPC control and the new B series FEEDMAX loaders convinced this customer to select WITTMANN as their supplier.

Régis Bihl

The French group LISI (Link Solution for Industry) is active in four important industry sectors: automotive, aeronautical, medical and cosmetic. The group employs a staff of more than 5,800 at 36 sites. The cosmetic branch has four production plants with a total of 490 employees. As an integral part of the group, LISI COSMETICS is one of the leading suppliers of packaging products for producers of perfumes and cosmetics. Last but not least, LISI COSMETICS is regarded as being highly skilled in the field of make-up.

The company excels in four industrial techniques that complement one another perfectly: deep-drawing of metal, plastics injection molding, surface treatment and parts assembly.

With every technique comes a wide choice of design possibilities for the customer and LISI COSMETICS continually strives to build bridges between industry and designers. They are in permanent contact with the fashion world and the design departments of their renowned clientele, including such great names as Shiseido, Procter & Gamble, Chanel, L’Oréal, and LVMH – just to mention a few.

Development of the central system

To further streamline their production facilities and increase capacity, the company invested in building a new plant dedicated specifically to plastics injection molding. The facility will eventually consist of a total of 40 injection molding machines with clamping forces from 25 to 420 tons. The installation of equipment has been split into several phases with the first phase being for the two vacuum conveying lines.

These will serve the two rows of machines that will eventually consist of 20 machines each. The second phase of the project will be the implementation of central material drying and conveying. The latest WITTMANN FEEDMAX B conveying units, with a capacity of 6 liters per loader, are planned for all 40 machines. Previous to installing this system the materials were stored beside the machines and conveyed by means of supply hoppers.

Material drying was also performed beside each machine. The WITTMANN M7.2 IPC TeachBox – which can be used remotely to control the entire system – now controls the two vacuum lines.

The vacuum suction for conveying the material is achieved using two blowers with a capacity of 5.5 kW each.

These are connected to two XM filter stations known for their easy maintenance and cleaning. Presently, the whole project is, for the most part, complete.

A total of 30 injection molding machines have been already installed and are supplied with materials via the WITTMANN central system.

Deciding on WITTMANN

Ultimately the decision was made to choose the WITTMANN solution for two good reasons: on one hand the M7.2 IPC control clearly made its point and on the other, the new FEEDMAX B generation of material loaders was absolutely convincing.

The WITTMANN systems control offers high user-friendliness and functionality (15” color touch screen, program configurations can be saved on a USB key, remote control operation, alarm signals via email, easy maintenance, access to commands and error messages for the previous 100 days, quickest troubleshooting and diagnosis).

The design of the FEEDMAX B series conveying units have been perfected and offer outstanding performance in terms of easy handling and cleaning, last but not least is their economic advantages. The excellent price-performance ratio and the acknowledged service definitely tipped the...
scales. The fully developed systems control allows the highest production flexibility. And, the added ability to integrate functions for drying and material storage, further supported the decision to choose the WITTMANN system.

A profitable solution

One very important aspect of this project was the need for quick and safe material changes because the entire production of LISI COSMETICS consists of a series of small to medium-sized parts which result in the need for frequent material changes.

The modular construction of the FEEDMAX B loader offers convenient access to the interior for easy cleaning, making material changes much faster and easier. And, the advanced M7.2 controls have reduced the time required for material changeovers for the various parts.

Gibo Plast Company Enforces Recycling

Gibo Plast A/S based in Skjern, Denmark – part of the publicly listed SP Group A/S –, counts itself among the leading companies in the field of vacuum thermoforming for the entire region of Northern Europe. Now, Gibo Plast has noticeably upgraded its material recycling department with the acquisition of a WITTMANN MC 70-100 granulator.

Adam Estrup

The constantly increasing output at Gibo Plast A/S in Skjern has led to the need for higher recycling capacity as well. At the company’s plant that specializes in vacuum thermoforming, 20–40% of the output is scrap and is completely recycled. “We are grinding any waste material and selling it back to our suppliers,” states Søren Jacobsen, Gibo Plast’s Production Manager.

The new grinding equipment from WITTMANN BATTENFELD in Fredensborg has now been installed and has already contributed to a remarkable improvement in our efficiency.

“The effortless functioning of the entire production process at Gibo Plast requires that every single link in the chain possesses the same strength. And of course this must also be true of all the equipment working at essentially what is the end of the whole production cycle,” says Søren Jacobsen.

A somewhat smaller grinding installation has been in operation at Gibo Plast for some time now without any major problems. “It is working fairly well but of course cannot offer the grinding capacity we are now in need of. And, it doesn’t fully meet our expectations in regards to changeover and cleaning time for the material changes. As a result, we are grinding nothing but white material with this equipment.”

Big parts of any kind

There are many vacuum thermoforming machines installed at Gibo Plast producing a great variety of technical plastic parts. Parts range from the very small up to those with dimensions of 2,000 × 3,000 × 900 mm. The parts are sold to the automotive industry, manufacturers of cooling and freezing devices, and companies working in the lighting and medical sectors.

“Our many production devices offer a very high degree of flexibility and, in combination with our long-lasting experience, places us in a position to advise customers in regards to any thinkable solution,” Søren Jacobsen explains.

Vacuum molded parts are made from different materials in many different colors and very often with frequently changing surface textures.

“It is our ambition to find the material ideally suited to the application.” says Søren Jacobsen.

“This means we will find the right material whatever the requirements may be – whether it be fire-resistant, electro-conductive, chemically inactive, or even highly shock-resistant.” The installation of the WITTMANN BATTENFELD MC 70-100 granulator is coming to grips with some of the most different plastics very well. And, as Søren Jacobsen states, it enabled Gibo Plast to put in place their recycling activities in a remarkable way.

The WITTMANN central system at LISI COSMETICS:

- 40 FEEDMAX B206-60 conveying units
- 2 blowers – 5.5 kW
- 1 M7.2 IPC central control, designed for the customer’s network
- 2 LS-B30T line server
- 23 BM 4/4 BUS modules
- 2 alarm groups (1 group for 20 machines)
- 300 m of aluminium tubing
- 260 m of BLIS cable
- 2 week install

Régis Bihl

is Project Engineer at WITTMANN France in Chassal.

Adam Estrup

is a contributor to the Danish “Teknovation” magazine. The article first appeared unabridged in the 3/09 issue of “Teknovation”.

ape@teknovation.dk
 TEMPRO plus C180: New Approved Standard of Quality

The new TEMPRO plus C temperature controller by WITTMANN for water up to 180 °C has arisen from the established TEMPRO plus C160 model. With this development WITTMANN has responded to numerous customer requests. The development of the new temperature controller has happened quickly, according to the motto of the company: “Progress through Innovation”. Zdravko Gavran

Water as a medium for temperature control is used predominantly in the range of 10°C to 160°C based on the recommended mold temperatures for processing thermoplastics.

However there are thermoplastics, i.e. PEI (polyetherimide), where the recommended processing temperatures exceed 160°C.

Generally, for such applications, temperature controllers use oil as the medium for heat transfer. To achieve these higher temperatures and at the same time minimize energy input, WITTMANN has developed the TEMPRO plus C180 unit.

Advantages of water as the carrier medium

Due to its comparatively trouble-free use and its rather high specific heat capacity (about 4.2 kJ/kgK), water amongst the various liquids, is perfectly suited to the requirements of heat transfer. In fact, all that is required is a simple experiment to clearly show the benefits of water versus thermo-oil: a 100 kg steel ingot was exposed to hot water as the carrier medium and afterwards to standardized heat carrier oil.

In order to rise the steel ingot’s temperature from 30°C to 100°C the water took only 18 minutes whereas the thermo-oil took 65 minutes for the same effect! Nowadays, most of the industrial companies of all kinds (and all over the world) not only have to watch their costs even more closely but they also need to be more aware of the constantly increasing environmental concerns. Using water in the industry as a carrier medium offers some striking ecologic advantages in comparison to using any standardized thermo-oil. Water is a natural resource available nearly everywhere in the world and its handling and disposal is straightforward. An added technical advantage is that water expands less than oil as the temperature rises.

<table>
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<th>Water</th>
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<tbody>
<tr>
<td>Heating Capacity</td>
<td>9 kW</td>
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<tr>
<td>Medium – Circulation Volume</td>
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<tr>
<td>Mass to Heat Up</td>
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</tr>
<tr>
<td>Flow Rate</td>
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</tr>
<tr>
<td>Heating Process</td>
<td>30 to 100°C</td>
</tr>
<tr>
<td>Heating Time</td>
<td>18 min</td>
</tr>
</tbody>
</table>
The alternative to thermo-oil units

The degree of system pressure required for heating up the 160°C unit versus the 180°C unit highlights an important difference between the two. The C160 unit requires a system pressure of 6.8 bar for safe operation and to avoid cavitation of the pump. The C180 unit however requires a system pressure of 11 bar.

As a result of the much higher pressure the new TEMPRO plus C180 unit had to be completely redesigned. The entire construction was strengthened using finite element analysis to meet the load capacity. The result is a true alternative to thermo-oil temperature control units.

TEMPRO plus C180 in use

The display and control functions for the TEMPRO plus C180 are the same as those used for the entire TEMPRO plus C series. The temperature is displayed with an accuracy of 0.1°C degree. It is also possible to display several process parameters at the same time:

- System pressure, pump pressure and flow pressure.
- Flow temperature, return temperature and external temperature.
- Preset tolerances for pressure and temperature.

The TEMPRO plus C units have freely programmable function keys for suction, cool down, control of the second set-point temperature and periodic change of the medium, just to mention a few of the numerous possibilities.

Despite the relatively large step from 160°C to 180°C, high control accuracy was still achieved. Also, for this model of the TEMPRO plus C series the deviation is no more than ± 0.2°C. The unit’s two pressure sensors provide the incoming signals to control the system and flow pressures respectively. The system pressure is set so that it always exceeds the required saturation pressure of the water (at 180°C) by at least 1 bar.

The maximum system pressure is 13 bar and when combined with the pump pressure, a flow pressure of up to 19 bar is possible. Thus, the hoses for the mold circuit should consist of PTFE Teflon and have an outer steel braiding. They should also be heat resistant up to 190°C at a pressure of 20 bar.

Application range of the TEMPRO plus C180

Outside of the typical injection molding process the TEMPRO plus C180 can be used for light metal die-casting. When producing die-cast parts from aluminum or zinc the heat balance of the die-casting mold plays an important role in part quality and cycle time.

Consistent temperature distribution within the mold cavities during the injection process ensures high quality of the molded part, minimum warpage and long mold life.

Using water as a heat carrier medium the mold heats up much quicker and can be better controlled.

This is particularly important for increased distances between the temperature controller and the mold – where a decrease in water pressure occurs due to the viscosity – as higher flow rates can be achieved for better heat transfer.

Again this offers improved control accuracy and shorter response times of the temperature controller.

A superior unit offering high potential

In particular for the American market the opportunities for the new TEMPRO plus C180 temperature controller seem very good.

In the American industry in the first instance, thermo-oil units are used for temperatures that exceed 100°C so processors are faced with the serious disadvantages of thermo-oil temperature controllers. For example thermal instability and the deterioration of the oil through oxidation, inhomogeneous viscosity and reduced thermal conductivity (about 2 kJ/kgK) as compared to water.

Additional advantages

Water is definitely more advantageous than oil for temperatures up to 180°C. The TEMPRO plus C180 with its low volume of about 3 liters and a maximum system pressure of 13 bar is not subject to the regulations for pressure devices because it does not exceed the critical values defined there.

The WITTMANN TEMPRO plus C180 temperature controller is particularly attractive because of its value for money. It is available in both single zone and dual zone units.

Zdravko Gavran, Technical Sales Support of the Temperature Controllers Department at WITTMANN Kunststoffgeräte GmbH in Vienna.
No Half Measures: Water Injection for All-Plastic Parts at VW

To reduce fuel consumption, cars have to be light-weighted wherever possible. In order to achieve this, Volkswagen (VW), for example, stopped making its pedal assemblies from metal in favor of a hybrid solution. A metal core was extrusion-coated with plastic. But this can now be performed more easily with the water injection technique where all-plastic parts with a cavity can be produced in only one operation and at lower cost.

Helmut Eckardt

Vehicle weight is becoming increasingly important. As a result of continually improved safety features, more comfort and higher expectations, the weight of vehicles has risen in recent decades. However, as the total weight has a direct influence on fuel consumption and emission characteristics, the automobile industry is making every attempt to reduce it.

One example is the pedal assembly which, for decades, was always made of metal. Strongly ribbed injection molded pedals are able to fulfill the desired mechanical requirements but have design limits.

Hybrid solution for lower weight

Here, the hybrid technology offers a good solution for the combination of mechanical properties and advanced design. Volkswagen in Wolfsburg, Germany, has been using this technology for some time for the manufacture of clutch pedals. A metal core is inserted in the injection mold and is extrusion-coated with plastic. In comparison with the metal version, the hybrid solution offers obvious weight savings. The objective however was the development of an all-plastic clutch pedal.

Ideal with regard to weight optimization and mechanical properties would be a closed hollow box profile. Such a profile is capable of transmitting large forces and torsion moments. The requirements to be realized in the new product were:

- A reduction in weight compared to the hybrid solution.
- Lower production costs.
- Manufacture in a single operation.
- Advanced design.
- Recyclability.

However, the manufacture of the clutch pedal with a hollow box profile in a single operation was not possible with conventional injection molding technology without corresponding design compromises. A process had to be found by which the pedal could be manufactured with a hollow profile and still maintain the required mechanical properties.

Molded parts with cavities

For many years gas injection technology has been successfully used for the manufacture of molded parts with one or more cavities. When the mold cavity has been partly filled with the measured amount of melt, the gas is injected into the center of the melt.

The gas then propels the melt outwards, resulting in the complete filling of the cavity while the inside of the part remains hollow. The gas forms a cavity and provides the necessary hold pressure in the molded part.

A disadvantage, especially in the case of molded parts with larger cross-sections, is that the gas has practically no cooling effect. This means that there are long cooling times for large cross-sections. The pattern of wall thickness dis-
Injection Molding

In the AQUAMOLD® process, injection of water takes place through regulation of the pressure. This technique has also proven itself for the clutch pedal, as the pressure build-up takes place quickly and reproducibly, so that high volume flows can be realized.

The units are also capable of supplying two injection molding machines simultaneously. For the control system, value has been placed on easy and uncomplicated touch screen operation.

The pressure regulation modules feature direct electrical control and can be mounted as small separate units near the mold. This results in a minimization of output pressure and volume losses.

The injection modules for the water injection represent a real challenge for the developers. Large injection cross-sections for the water in a rather small construction combined with an active open and close function for the blow pin, can only be achieved by highly sophisticated design solutions. But at the same time, there also has to be an absolute clear separation of the different sections that are filled with pressurized water and with hydraulic fluid.

Test of wall thickness formation

In addition to verification of the conventional quality criteria for injection molding, particular attention was paid to wall thickness formation. Here, it has to be established that the wall thickness of the molded parts meets or exceeds the required minimum value in the critical cross-section.

Using an ultrasonic measuring device, the wall thickness of the parts in the region concerned is measured inside the mold and documented online for every single molded part.

The final result of the water injection technique

The clutch pedal is now half the weight of the hybrid solution. Its manufacture takes place in only one operation – and this happens at lower cost. Using the closed outer profile of the clutch pedal, it has been possible to give it an overall attractive appearance.

At the end of its service life, the pedal is also suitable for simple, environmentally friendly recycling. Using the new AQUAMOLD® water injection technology by WITT-MANN BATTENFELD it was actually possible to exceed the requirements specified for the new clutch pedal for the Volkswagen Touran.

Partial filling process fulfills requirements

The engineers at VW first conducted basic tests with the AQUAMOLD® water injection technology from BATTENFELD in Kottingbrunn, Austria. Their objective was to gain preliminary experience of wall thickness distribution and the formation of the cavity.

It became apparent that the goal could be achieved with the partial filling process. Various polyamide types were used for the tests. The result: the requirements for a clutch pedal with the necessary construction using water injection technology can be fulfilled with PA 6 GF30. The plant technology has to meet various criteria for water injection:

- High water injection performance.
- Sufficiently high uniform pressures.
- Precise water pressure build-up.

The AQUAMOLD® WE series pressure generation units permit injection performances greater than 1,000 cm³/sec. The water can be injected either with volume or pressure regulation, there being a direct relationship between volume and pressure.

In the AQUAMOLD® process, injection of water takes place through regulation of the pressure. This technique has also proven itself for the clutch pedal, as the pressure build-up takes place quickly and reproducibly, so that high volume flows can be realized.

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Partial filling process fulfills requirements

The engineers at VW first conducted basic tests with the AQUAMOLD® water injection technology from BATTENFELD in Kottingbrunn, Austria. Their objective was to gain preliminary experience of wall thickness distribution and the formation of the cavity.

It became apparent that the goal could be achieved with the partial filling process. Various polyamide types were used for the tests. The result: the requirements for a clutch pedal with the necessary construction using water injection technology can be fulfilled with PA 6 GF30. The plant technology has to meet various criteria for water injection:

- High water injection performance.
- Sufficiently high uniform pressures.
- Precise water pressure build-up.

The AQUAMOLD® WE series pressure generation units permit injection performances greater than 1,000 cm³/sec. The water can be injected either with volume or pressure regulation, there being a direct relationship between volume and pressure.

In the AQUAMOLD® process, injection of water takes place through regulation of the pressure. This technique has also proven itself for the clutch pedal, as the pressure build-up takes place quickly and reproducibly, so that high volume flows can be realized.

The units are also capable of supplying two injection molding machines simultaneously. For the control system, value has been placed on easy and uncomplicated touch screen operation.

The pressure regulation modules feature direct electrical control and can be mounted as small separate units near the mold. This results in a minimization of output pressure and volume losses.

The injection modules for the water injection represent a real challenge for the developers. Large injection cross-sections for the water in a rather small construction combined with an active open and close function for the blow pin, can only be achieved by highly sophisticated design solutions. But at the same time, there also has to be an absolute clear separation of the different sections that are filled with pressurized water and with hydraulic fluid.

Test of wall thickness formation

In addition to verification of the conventional quality criteria for injection molding, particular attention was paid to wall thickness formation. Here, it has to be established that the wall thickness of the molded parts meets or exceeds the required minimum value in the critical cross-section.

Using an ultrasonic measuring device, the wall thickness of the parts in the region concerned is measured inside the mold and documented online for every single molded part.

The final result of the water injection technique

The clutch pedal is now half the weight of the hybrid solution. Its manufacture takes place in only one operation – and this happens at lower cost. Using the closed outer profile of the clutch pedal, it has been possible to give it an overall attractive appearance.

At the end of its service life, the pedal is also suitable for simple, environmentally friendly recycling. Using the new AQUAMOLD® water injection technology by WITT-MANN BATTENFELD it was actually possible to exceed the requirements specified for the new clutch pedal for the Volkswagen Touran.
South American Fittings Manufacturer Relies On WITTMANN BATTENFELD

Krona Indústria, a long standing WITTMANN BATTENFELD customer based in Joinville, Brazil, celebrates its 15th anniversary this year. Krona ranks among the leading suppliers of pipes and fittings in the South American market. Since its establishment in 1994, Krona has relied on cooperation with the Austrian injection molding machine manufacturer WITTMANN BATTENFELD.

Susanne Binner, Rudolf Pichler

Krona’s success story began in 1994 when it started with two extruders producing PVC pipes with an annual material throughput of roughly 150 tons. Three years later, the company extended its production capacity by adding three injection molding machines to manufacture PVC fittings. Since then Krona has experienced annual growth rates of between 25 and 33%. With targeted investments and uncompromisingly high quality standards, the company quickly achieved a position of market leadership.

Today, Krona ranks among the most important plastics processors in South America. On their 33,000 m² production floor, about 350 different PVC products are extruded, injection-molded, joined, assembled and packed. Their end markets are diversified and range from fresh water and waste water transport pipes to irrigation systems. Krona also has a product line for private sanitary installations containing more than 60 different parts. The company’s 350 employees process over 20,000 tons of PVC every year.

To keep pace with the company’s rapid expansion, Krona’s production facilities have been extended several times over the years. After three major construction phases in 1996, 2001 and 2005, another new hall with over 14,000 m² of production floor space was opened in May 2008. This ultra-modern production hall stands out by its unique logistics system design with streamlined production processes from material feeding to the integrated truck loading facility, which minimizes not only the transport distances for the production of pipes and fittings but also for material deliveries and guarantees removal of finished parts around the clock seven days a week.

Social responsibility as a success factor

Social responsibility towards its staff and the local population is a major concern for the company’s management. Krona continuously invests in training its employees and supports local schools, social service institutions, medical aid projects and sports events on a regular basis.

José Armecides Gonçalves relies on WITTMANN BATTENFELD.

Krona relies on WITTMANN BATTENFELD

Krona currently has 75 machines in its injection molding department with clamping forces ranging from 130 to 500 tons. Most of these machines were supplied by WITTMANN BATTENFELD. In conjunction with the opening of the new production hall, 12 additional machines were delivered to Krona.

“In WITTMANN BATTENFELD we have found a reliable partner to meet 100% of our stringent requirements.” José Armecides Gonçalves, proprietor of Krona, notes with satisfaction.

“WITTMANN BATTENFELD is more than just a supplier to us, they are fully integrated partners. The all important points are their cooperation and involvement prior to delivery of the equipment, continuous optimization of production processes and servicing of the machinery once in operation.

The ‘Krona equipment package’ for injection molding machines, which has been specially developed for our needs and for PVC processing, is a good example of the excellent cooperation which ensures maximum uptime for us. We appreciate our close partnership with the local service engineer as well as the South American headquarters of WITTMANN BATTENFELD in São Paulo and, of course, our direct cooperation with the development department and production plant in Austria.”
HM series with PVC equipment package

With its HM series WITTMANN BATTENFELD provides a high-performance solution to meet the demanding requirements of hard PVC processing. The extremely high precision of the machines’ hydraulic system and the generous space of the clamping units to accommodate molds are ideal prerequisites for the production of fittings.

The symmetrically positioned clamping cylinders and fast-stroke cylinders ensure fast, even clamp force build-up while providing a highly sensitive mold safety system. The fast-stroke cylinders with differential circuits allow high opening and closing speeds, thus increasing productivity in manufacturing. Precise platen parallelism is ensured by the generously dimensioned linear guides of the moving platen. The machines delivered to Krona come with an equipment package specially designed for PVC processing.

One special feature of this package is the external cooling of the screw and barrel. It ensures that the sensitive PVC material is not damaged through overheating. The screws offer a fixed L/D ratio of 22 which delivers maximum plasticizing performance with optimal melt quality. They are supplied with a special PVC melt geometry developed by WITTMANN BATTENFELD which functions without a non-return valve and with a compression rate adapted for PVC processing. The stringent demands on plasticizing this material are met with a specially developed material feeding drive concept which provides the necessary torque.

The plasticizing unit from WITTMANN BATTENFELD is also designed for easy maintenance. The machine is equipped with a separate service stroke, which is activated by the control system, for easy dismantling of the screw and barrel. The ceramic heater bands and sensors can be plugged in separately in each heating zone. All parts of the machine are highly corrosion-resistant to ensure trouble-free processing of the aggressive PVC material for many years.

WITTMANN BATTENFELD in South America

WITTMANN BATTENFELD has been taking care of its customers and partners in South America for over 40 years. In Brazil, WITTMANN BATTENFELD has maintained a service and spare parts center for many years to provide quick and efficient service support for customers throughout South America. The more than 6,500 machines installed speak for themselves.

The center near São Paulo is assisted by six local agencies in the most import regions of the country. In the company’s Osasco, São Paulo office a total of thirteen employees take care of WITTMANN BATTENFELD’s extensive service portfolio. In addition to a service hotline, spare parts and repair service, WITTMANN BATTENFELD also offers a technical lab to carry out pilot production, training seminars and test runs for customers.

WITTMANN Group Combines Resources in Great Britain

As of February 1, 2009 the two subsidiaries WITTMANN UK and BATTENFELD UK which had previously been separately managed, joined together to concentrate their efforts as the new sales and services company WITTMANN BATTENFELD UK. All sales and service activities for the whole of Great Britain will now be coordinated centrally from their head office in Wellingborough.

The company will have a dedicated showroom with equipment and auxiliaries for demonstrations, testing and training purposes. Machines will also be available in inventory for immediate delivery to customers when required. Barry Hill, previously Managing Director of WITTMANN UK, will head up the new subsidiary. Hill, who initially started his career as a service engineer at BATTENFELD, has been working for the WITTMANN Group for over 26 years.

He will be supported by a team of 19 people who are all experienced WITTMANN and BATTENFELD employees.

Hill is confident, “Merging the subsidiaries will make us stronger in the future and ensure that our customers receive prompt and expert advice on all matters – true to our commitment of providing everything for injection molding from a single source.”
Sweden and Norway: BATTENFELD Sverige AB

In 1978 BATTENFELD Maskiner AB was founded as a subsidiary of BATTENFELD GmbH, Germany and founder Kenneth Hiljemark was appointed Managing Director. A management buy-out occurred in 1988 establishing BATTENFELD Sverige AB. In 2005, Christian Hiljemark was appointed Managing Director, making him the second generation managing the company in Halmstad, Sweden.

As a result of the WITTMANN Group’s acquisition of BATTENFELD Injection Molding, the responsibility for all sales and service of WITTMANN products in Sweden and Norway was taken over by BATTENFELD Sverige AB.

Situated on the west coast of Sweden, Halmstad is a central location between the middle and south of Sweden with Norway, where the majority of the customers are located, in close range. In 2008 the company moved into a new 800 m² building containing offices, spare parts inventory, a workshop and showroom.

A complete product range

The company currently employs 12 people responsible for sales, service and spare parts for BATTENFELD injection molding equipment and WITTMANN auxiliaries. Additionally, BATTENFELD Sverige AB also represents equipment from BATTENFELD Extrusiontechnik, blown film equipment from Gloucester Engineering, blow molding machines from Kautex GmbH, and recycling machines from NGR GmbH, thereby covering the complete product range for the whole plastics industry.

The Scandinavian market

Due to the current global recession, the Swedish and Norwegian markets are struggling. Many of the Scandinavian customers are either directly or indirectly affected by the turbulent situation in the financial markets and automotive industry. Despite the current situation, we feel strongly towards the future and believe that it still offers a lot of opportunities for growth, for example, in the packaging and medical markets. Furthermore, the advantage of supplying the complete product range of machines and auxiliaries is of great value. Keeping this in mind, BATTENFELD Sverige AB is providing a combination of high-quality work and sophisticated service.

The future

The aim over the next few years is to concentrate on promoting the entire WITTMANN product portfolio to existing customers as well as developing new ones. More and more companies are implementing automation in their production which offers great potential for the WITTMANN robot program. The hiring of a new service technician and construction of an in-house training center will make it possible for smaller groups to attend courses and training. BATTENFELD Sverige AB is looking forward to the future with an established, motivated and very experienced organization, together with a strong product portfolio.

The Elmia Polymer trade fair

On May 5th to 8th, 2009 the Elmia Polymer, a trade fair for the plastics industry in Sweden, will take place. For the first time WITTMANN BATTENFELD and BATTENFELD Sverige AB will share one booth. This will be an excellent opportunity to interact with customers and present them with the latest technology, preparing them for the rising demands when the market picks up again.
In fact, most of the machines that were installed more than 20 years ago are still running entirely satisfactorily today to meet the needs of plastics processors. Which, is not in the least, one of the reasons for the great interest gained in BATTENFELD injection molding machines during the nineties, when the first private companies turned to plastics processing. Eventually, in 2002, the first Bulgarian BATTENFELD base was established from which Jueng BG GmbH, the first autonomous BATTENFELD agency in Bulgaria, emerged in 2004.

During the four years of its existence the company has won 80 loyal customers, equipping them with 65 injection molding machines having clamping forces ranging from 50 to 800 tons, robots and auxiliaries.

The market situation

In 2008 WITTMANN BATTENFELD Bulgaria EOOD was founded and its product range expanded considerably, including the entire WITTMANN auxiliaries program.

Even though some other manufacturers of injection molding machines have turned to the Eastern European market, the Bulgarian plastics industry is still somehow in its infancy. There's a deficit of big investors within the plastics sector and the absence of strong clients (e.g. automotive industry) is noticeable. Last but not least, there are not enough big expert injection molding companies and a lack of up-to-date technologies.

A challenge for the young team

For the Bulgarian team, these circumstances appear both as an opportunity and a challenge. Every single day they are working to enable their customers to be competitive with the high requirements of the European markets. The low cost of labor, low tax rates and the benefits granted by European Union funds will help to essentially increase the competitiveness of Bulgarian companies.

The young WITTMANN BATTENFELD Bulgarian team – with an average age of 30 years – consists of two sales representatives, two service technicians and two office clerks. They offer the best product quality supported by dedicated service and are continuously making efforts to share their knowledge about the latest developments with their customers.

The Benelux Road Show Attracts Many Visitors

The Benelux subsidiary of the WITTMANN Group attracted a number of guests to various stops in their road show held in Belgium and the Netherlands January 26–29, 2009. More than a total of 110 participants visited the information sessions in Gent, Utrecht and Eindhoven – not only just business partners and customers but also a lot of other interested people. WITTMANN General Manager, Michael Wittmann and WITTMANN BATTENFELD Managing Director, Georg Tinschert along with the head of the Benelux branch, Michel van der Motten, presented highlights of the complete product range at the various locations. The attendees were especially interested in the new WITTMANN W8 robot generation and the BATTENFELD high-speed TM Xpress series for IML applications. They were also very enthusiastic about learning firsthand about the time and cost saving advantages of WITTMANN BATTENFELD’s web services. After the presentations many attendees took the opportunity to have a closer look at the efficiency being demonstrated by the WITTMANN auxiliary equipment on display.