

INJECT

Sumitomo (SHI) Demag – Magazine 02/2012



Screw stuffer for BMC:
How Siemens manufactures circuit breakers from thermosetting plastic

Successfully getting to grips with Romania:
What Stewo is doing successfully in Transylvania

Precision with 15,000 kN clamping force:
How Autotest is meeting Porsche's exacting requirements

Resource efficiency through retrofitting:
Why BIA is reducing energy consumption by around 50 % with smartDrive



Dear Readers,

Recently, I reported that Sumitomo Heavy Industries had undertaken a worldwide merger of its branches, Sumitomo (SHI) Demag and Plastics Machinery Division, under the global brand of "Sumitomo (SHI) Demag". Now, we are working intensively to achieve the common goal of becoming the global market leader. Sumitomo (SHI) Demag has already nudged its overall sales close to the leading position. Our goal is to achieve and secure the number one position with technological leadership, and then go on to build on it.

We have put the necessary prerequisites in place to achieve this ambitious goal: We have a global network that is strong not only in technical aspects but also in terms of its organization. As a result, injection moulding companies in all kinds of industries with all kinds of different requirements can look to us to deliver excellent technical support. After all, our machines offer production performance, availability, energy efficiency, durability and production quality. This is the only way you can achieve optimum production efficiency.

In this INJECT, you can read how our service partner in Romania is supporting its customer Stewo (page 4), how the smartDrive retrofit drive concept is reducing energy consumption at BIA (page 14) and how our screw stuffer is proving its effectiveness in BMC processing at Siemens (page 19). On page 12, we report on the expansion to our activePlus programme, which now covers 16 modules.

I wish you a pleasant end to the year, a Merry Christmas and a successful New Year in 2013.

Dr. Tetsuya Okamura
Senior Vice President, Sumitomo Heavy Industries (SHI) Ltd. Japan
CEO, Sumitomo (SHI) Demag Plastics Machinery GmbH

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Successful blood donation campaign in Schwaig

Employees and people living adjacent to Sumitomo (SHI) Demag took part in an inaugural blood donation campaign on 29 November 2012. The blood donation service of the Bavarian Red Cross had set up ten blood donation beds in the training rooms. Works employees were allowed to take time off work for their

blood donation. Thanks to their commitment, 85 employees and nearby residents demonstrated their particular social responsibility towards sick people and victims of accidents. ■

[Employees and nearby residents of the Schwaig works became blood donors](#)



Thiele & Kor look after customers in Benelux

Since mid-September, Sumitomo (SHI) Demag has had a new local partner in the Benelux markets. Thiele & Kor Plastics Machinery B.V. based in Nieuwegein/ Netherlands is seamlessly taking over all sales and service tasks in Belgium, the Netherlands and Luxembourg. As the managing directors of Thiele & Kor, Riekus Thiele and Jan Eiko Kor have decades of experience in sales, service and mainte-

nance. "With Thiele & Kor, we have an ideal partner who is extremely well known to the processing companies in the Benelux countries, and who possesses all the necessary technical expertise," explains Rolf Zimmermann, General Manager Sales at Sumitomo (SHI) Demag. ■



(from l.) COO Shaun Dean, Sumitomo (SHI) Demag, Jan Eiko Kor, Riekus Thiele, both Thiele & Kor, Rolf Zimmermann, Christian Renners, Arthur Kramer from Sumitomo (SHI) Demag

EUR 20 million for new production systems

The Japanese parent company, Sumitomo Heavy Industries (SHI) Ltd., has once again invested EUR 20 million in Sumitomo (SHI) Demag Plastics Machinery GmbH.

The objectives are to maintain and expand technological leadership. The major

item in the most recent investments concerns the buy-back of property and buildings at the Schwaig, location, which had been sold to the Segro property company by former owners in a sale-and-lease-back model. Furthermore, investments were made in new processing

machines as well as modernisation of fixtures. In this way, SHI is acknowledging the growing market shares of Sumitomo (SHI) Demag over recent quarters, and underlining its confidence in Germany as a location for development and production. ■

Prize for Bavaria's best "film apprentices" comes to Schwaig



Apprentices from Sumitomo (SHI) Demag won the professional film competition, "Apprenticeship ready? Camera action!" organised by the Bavarian Apprenticeship Campaign (Ausbildungsoffensive Bayern, AOB). The film depicting the job of a mechatronics technician convinced the jury both because of its accessibility to young

people as well as for providing an authentic insight into the career environment. In addition, the topic of "Girls in technical apprenticeships" was picked up.

Sumitomo (SHI) Demag won the prize in the electro category, worth EUR 500. Since September 2012, 52 young people have been trained at the Schwaig site alone in eleven technical/industrial, commercial and IT careers as well as in four dual study courses. ■

The first Bavarian M+E film prize comes to Schwaig: (from l.) Bertram Brossardt, Principal Managing Director of bayme vbm, Thomas Pförtsch, trainer, Thomas Scheibe, Kerstin Tinka and Robert Kirch, apprentices at Sumitomo (SHI) Demag

New managers in the USA



Jim Mitchell, Executive Officer – Global Key Accounts and Business Development



John F. Martich III, COO

John F. Martich III is the new Chief Operating Officer of the two Sumitomo sites in the USA, Sumitomo (SHI) Plastics Machinery (America) LLC in Norcross GA and Van Dorn Demag Corp. in Strongsville OH. During his 25-year career at Van Dorn Demag, Martich has occupied various positions, including Director of Quality Systems & Reliability Engineering, Director of Technical Service, VP of Aftersales and, most recently, VP of Operations. Jim Mitchell is taking over the newly created

position of Executive Officer – Global Key Accounts and Business Development. In this function, he will look after global key-account customers in consultation with all other company sites, and push ahead with business development. Mitchell has been active in the plastics industry since 1983. After carrying out tasks at Tupperware, in plastics machinery construction and as a representative of Sumitomo Plastics Machinery, he began working at the current Sumitomo (SHI) Demag in 2000. ■

Challenge successfully mastered in Romania

Stewo is reinforcing its parent plant with an additional expansion of production capacity

For a medium-sized company, establishing production in Romania takes courage. The ability to run the site successfully for almost ten years while deep-pocketed groups turned tail after only a short time speaks for itself. At the turn of the year 2011/12, the Romanian plant of Stewo Kunststoffverarbeitung GmbH & Co. KG, Helmbrechts, actually multiplied its capacity in a new production facility. Managing Director Michael Stelzer has been able to deal with the particular conditions in Romania and seize the opportunities presented. For maintenance and servicing of his injection moulding machines, he uses the service of the Sumitomo (SHI) Demag agency, Chorus Engineering SRL from Bucharest.

The automotive and electronics industries' policy of transferring production to low-wage Eastern European countries also drew Stewo eastward in 2003. The medium-sized plastics processor from the Upper Franconian town of Helmbrechts took account of the demands of its customers from this industrial segment and founded Stewo Plastic Prod. S.R.L. in Nasaud, in the Transylvania region of

Romania, as a 100 % subsidiary. "Our choice of Romania was rather down to chance. A partner company from the electronics industry offered us the opportunity to share a building with them, a former dairy factory," reports Managing Director Michael Stelzer, describing the beginnings. He continues, "We started very modestly with two hot embossing machines, one pad printing machine and some manual assembly activities in the rented rooms – without major start-up capital or sponsorship funds. An employee of long-standing from Helmbrechts took over the task of training the few workers on-site in Romania. Shortly after that, we set up a mechanical workshop in order to be able to service moulds for injection moulding, which we wanted to establish in parallel in Romania."

Romanian plant supports the German patent

Only shortly after in 2004, the first injection moulding machines began operation. Michael Stelzer took the risk of starting with a 2-component application, involving injection moulding around a manually inserted leadframe. Together

with the circuit board produced by the adjacent electronics company, this resulted in a complete steering angle sensor module produced in Romania. "This order is exemplary for our Romanian site. After all, it is not run-of-the-mill parts that we are producing here, but rather high-technology articles and modules which require a high level of manual input," says managing director Stelzer, explaining the profile. Production in the low-wage company does not mean cheap parts – he places great emphasis on this.

As a rule, Stewo achieves advantages with this Romanian subsidiary when it comes to components or modules that involve time-consuming manual activities in assembly, surface design or moulding inserts, or else are ordered in small batch sizes or annual quantities. Thus, Michael Stelzer is convinced that money can still be made with high-volume orders, even in Germany: "In Germany, we have a chance if we produce highly technical parts with a very high level of automation." Nevertheless, the level of competition and pressure on costs are great.

"With our plant in Romania, we have found an opportunity to set ourselves apart from other competitors here in Germany. The fact that we produce in Romania was and is the foot-in-the-door for our German plant in many orders. At the Fakuma and K trade shows, the Romanian plant is our magnet to attract new potential customers," explains Michael Stelzer, emphasising that: "Hardly any more marketing is required." As a result, it remains a declared strategic objective of the entrepreneur to secure and strengthen the German parent plant, currently employing about 100 people, through further expansion of the Romanian plant.

Stewo's Managing Director Michael Stelzer built up the Romanian site step-by-step.





Photo: Rahner

The major order from Audi to produce these steering wheel lever modules meant that a new production facility had to be established in Romania.



Photo: Stewo

The turn indicator, windscreen wiper and cruise control levers are injection-moulded in Romania, pad-printed and assembled with outsourced parts to make a complete steering wheel lever set.

The figures add up. With growing demand for low-cost components, the Romanian site grew steadily from when it was founded in 2003, until finally there was no longer any space left in the rented premises housing the pad printing shop, the assembly department and 20 injection moulding machines – most of which are from Sumitomo (SHI) Demag.

Major order from Audi requires expansion of capacity

It became necessary to find a new production facility in 2010 when the existing production capacity was no longer

sufficient to cope with a major order from Audi. There was not enough time to construct a new building, therefore Michael Stelzer looked for alternatives and found one only 1 km away in an empty but ramshackle and dilapidated former weaving mill. Only one year was available to find a new site and convert it into a modern production facility. This was an ambitious project, particularly since the official mills of bureaucracy in Romania grind exceedingly slowly and in their own particular way. Michael Stelzer took the deliberate decision not to claim EU sponsorship funding: “We

wanted to be completely independent, and thus we purchased and converted the building using our own funds. Over recent years, we had saved all of the profits earned from the Romanian plant, and we invested them in this project.” Michael Stelzer places particular value on the infrastructure, and therefore cooperated with German companies to install the electricity, cooling water and compressed air supplies, indeed he did some of the work himself. He invested a great deal of thought into the aspect of energy efficiency. Together with IKS Industrielle KühlSysteme GmbH, Schwarzhofen, he designed the system and now uses the waste heat from the injection moulding machines to heat almost all areas of the plant.

Chorus is a reliable service partner

The relocation from the rented facility to the new, company-owned plant took place at the end of 2011. Stewo first transferred the assembly line in October, with the injection moulding activities following at the turn of the year. Stewo works closely with Chorus Engineering SRL from Bucharest, the Romanian agen-

The German-speaking Romanian, Daniela Leonte, is the managing director in charge of Stewo’s plant in Nasaud; Head of Production Christian Schuller is a German with Romanian roots, and also speaks both languages.



Photo: Stewo



Photo: Stewo

Capacities have been multiplied since the turn of the year 2011/12: In the new plant, Stewo is now working with a total of 28 injection moulding machines with a clamping force up to 2,000 kN.

cy of Sumitomo (SHI) Demag. "Here in Romania, it is particularly important to have a reliable partner for customer service. We have to adapt ourselves to the available qualification level. For example, in Helmbrechts we maintain and service our machines ourselves, whereas in Nasaud these tasks are carried out by a technician from Chorus," reports Michael Stelzer, continuing: "The service employee visits us about three times a month to do this. In addition, he expertly carried out the commissioning of the twenty machines that were relocated."

New production facility opens numerous opportunities

In the new plant, Stewo is now working with a total of 28 injection moulding machines from Sumitomo (SHI) Demag with a clamping force of up to 2000 kN, exclusively operated with the NC4 control version and connected to a PDA system. To date, Stewo has been investing in new injection moulding machines for production in Germany and transferring machines of about five years old from Helmbrechts to the Romanian machine fleet. "This has the advantage that we

can initially continue to use the NC4 control version in Nasaud. The technological leap from the NC4 to NC5 controller is something that we will overcome with our Romanian employees as soon as we no longer have any NC4 machines left in Helmbrechts," says Michael Stelzer. Installation of a new production facility not only created work, but also opened up a series of opportunities. With currently 6000 m², the production area has been more than doubled compared to the former 2500 m². The greater space available and the new layout afforded



Photo: Stewo

A highly qualified 100 % check is performed in the newly introduced "QualityGate". As well as a visual check, the employees also carry out a tactile test, for example on the switching function.



Photo: Stewo

Shift leader Francisc Eles explaining a business order and the setting sheet to the new employee, Ioan Ferestean. The intention is for a double mould to be set up for the turn indicator lever on a 1,500 kN machine.



Photo: Stewo

A linear robot removes the lever and places it on a conveyor belt. After a defined cooling line, the employees fit a pin and a greased spring on the levers; they perform a visual check and place the parts in the grey trays.

Stewo the opportunity of further optimising the workflow and structuring procedures in an optimum way. “Amongst other things, we now have fixed warehouse locations for each product. We have also introduced a new, centralised function for identifying scrap. This creates a more systematic approach to detecting and eliminating faults,” explains Michael Stelzer, continuing, “About ten employees in each shift work in what we call the quality gate. Each is responsible for one product group, notifies the corresponding department about faults

that are detected, and then works out potential solutions together with those colleagues. In this way, we have been able to reduce the scrap proportion significantly once again. We now have a very closely meshed production system which guarantees total traceability.”

Steering wheel lever set as a complete module

About half of the entire production in Romania is for the major order from Audi. Stewo produces a complete steering wheel lever set for the Ingolstadt au-

tomobile manufacturer. The injection-moulded turn indicator, windscreen wiper and cruise control levers are pad-printed on the spot, and assembled with outsourced parts to make the module. Stewo built all of the injection moulds and printing systems for this itself. A goods carrier transport system is used for semi-automatic assembly of the levers. A robot injects the lubricating grease into the steering wheel lever set. In addition to a visual inspection, the feel of the modules is now also evaluated. Furthermore, Stewo has introduced artificial



Photo: Stewo

The first article out of Romania in 2004 was a 2-component application in which a manually inserted leadframe is enclosed by injected plastic.



Photo: Stewo

Core business in the parent plant at Helmbrechts: Stewo is the largest supplier of contactor bodies to Siemens



Photo: Stewo

The dictaphone housing produced for Grundig-Business Systems reflects Stewo’s key competence in surface technology

aging in the new plant by means of temperature control. "This allows us to detect faults which might only become possible after three or four years in the form of clicking noises, for example," says Michael Stelzer with satisfaction. As in each order, all processes were first established at the headquarters before being transferred to Romania. "A process has first got to work one hundred percent correctly in Germany before we transfer it to Nasaud along with a setter from

Helmbrechts who inspects the moulds on the ground and trains the local employees," reports the managing director.

Focus on new surface technologies

And what plans is Michael Stelzer now pursuing following the startup of the new Romanian production facility? "We are now concentrating on diversifying our company by replacing some of the orders that are being phased out with projects that are unrelated to the au-

tomotive industry. We have been the largest supplier of contactor bodies to Siemens for some time now, we have developed some innovative packaging systems for medical technology, and we are at home as far as safety technology is concerned, and in the electrical equipment industry. Here, we are going to invest increasingly not only in traditional pad printing but also in surface technologies such as painting, galvanising and laser technology, and thus open up new areas of activity," reveals Michael Stelzer at the end of the conversation. ■

Brief portrait: Stewo Kunststoffverarbeitung

Founded in 1967 by Wolfgang Stelzer, Stewo Kunststoffverarbeitung GmbH & Co. KG, Helmbrechts, is now in the hands of the second generation of the same family, and has been managed by Michael Stelzer since 1999. Since the change of generations, the parent plant has grown from 36 employees and 16 injection moulding machines to about 100 employees and 45 injection moulding machines. Furthermore, the Romanian subsidiary founded in Nasaud in 2003 has recorded steady growth, resulting in a new production facility coming on stream at the turn of the year 2011/2012 with several times the original production capacity. Whereas the plant used to employ 50 people in 2008, this figure had already risen to about 180 at the start of 2012. With 28 injection moulding machines, Stewo produces high-quality technical plastic parts in Romania for the automobile and electronics industries.

www.stewo.de

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Cooling water flow regulator

Flow regulators on the injection moulding machine make sure that an optimum cooling water quantity is achieved. Reliable and constant mould temperatures provide a reproducible moulded part quality. Flow regulators from Sumitomo (SHI) Demag are products with the highest quality for cooling circuits on injection moulding machines.

The standard equipment includes high-quality valves and connections made from brass; these inhibit corrosion and have a long service life. Viewing tubes made from transparent polyamide with floats for high temperatures guarantee that a precise reading can be taken.

Detailed information and orders at the responsible service team. ■



2-8-way flow regulators for flow rates from 0-8 l/min per circuit



2-12-way flow regulators for flow rates from 0-30 l/min per circuit

Think big

Autotest relies on a System 1500 machine for injection moulding of rear spoiler modules



The front bumpers of the Porsche Panamera Sport Design package are produced at Autotest Eisenach.

The holding frames for the bumpers of the Porsche Panamera with Sport Design package weigh about 700 grams. Only a fraction of the weight of the bumper. However, the holding frames impose exacting requirements on injection moulding production; they make a significant contribution to the rigidity of the complete component and, what is more, must be visually perfect. The components supplier Autotest Eisenach achieves this using a high-performance injection moulding machine from Sumitomo (SHI) Demag.

Autotest is not a company that thinks in small dimensions: The company with its headquarters in the Italian town of Lana is a tier 1 supplier to the major brands in the automotive industry: any of the big names from Audi, BMW, Daimler, Lamborghini, VW through to Porsche. Nowadays, they all decorate their vehicles with interior and exterior parts from the Autotest's Eisenach plant: fuel tank flaps, front spoilers, rear spoilers, instrument panels, door trims ... anything that can be made from plastic. Autotest has established itself on the market above all as a system supplier of complete modules. The Development and Project Management departments for these are located in South Tyrol, from where they operate centrally for all sites. As well as Eisenach and Lana, these are located in Bratislava (Slovak Republic) and Fortezza (Italy). "We undoubtedly focus on innovative applica-

tions. We regard ourselves as the partner to OEMs, and we work with them to develop ground-breaking solutions," explains Karl Menrad, the CEO of Autotest Eisenach GmbH. By way of example, he refers to a new rear spoiler module for the Porsche 991 SDP / Aerokit. In the past, this had traditionally been a composite part. Autotest then suggested a combination of injection moulding and polyurethane (PUR) to the Stuttgart-based luxury car maker. Menrad: "Although this means the rear spoiler is slightly heavier, it does cost about a third less." In July 2012, Autotest Eisenach was awarded the Porsche Supplier Award 2011 as a reward for this and other innovative ideas.

Eisenach as a site for large injection moulding machines

The example shows that injection moulding production at Autotest goes hand-in-hand with PUR processing. Due to its history – as a site of AKTec Automobil- und Kunststofftechnik belonging to the Edag Group – the company in Eisenach initially concentrated entirely on PUR processing. However, Menrad above all thought there was potential to use large injection-moulded components in the exterior area, such as rear and front spoilers. Consequently, the top floor quickly decided to establish injection moulding production in Eisenach with machines from 10,000 kN clamping force and up. The principle was as follows: small and medium-sized components come from injection moulding production in Fortezza – Think big in Eisenach. With equal alacrity, the plan was put into practice because new orders were already being received: a new hall for injection moulding was set up and employees hired within a matter of weeks. These personnel were furnished with the necessary company knowhow by the injection moulding experts from Fortezza. All that was missing was an injection moulding machine with high clamping forces that could be delivered quickly. Menrad found the



Large machine for large components: The holding frames of the bumpers of the Porsche Panamera are produced on the System 1500 injection moulding machine from Sumitomo (SHI) Demag with 15,000 kN clamping force.



Karl Menrad, CEO of Autotest Eisenach GmbH, won a series of new orders from German automobile manufacturers in early 2011.



Karl Menrad inspecting a rear spoiler. Autotest Eisenach combines injection moulding technology and polyurethane processing for such components.



After the bumper parts have been painted at an external partner, they are quality-checked at Autotest and then glued together.

answer at Sumitomo (SHI) Demag, and chose a System Large 1500 with 15,000 kN clamping force. "In the past, I always had good experiences with machines from Sumitomo (SHI) Demag. Also, our partner companies confirmed to us that the machines operate very reliably," says Menrad. For him, reliability and excellent, reproducible results are the decisive factors in injection moulding. "We produce within tight timeframes, according to our orders from automobile manufacturers. We don't have a large back-up warehouse. This means nothing is allowed to go wrong with our production. As a result, we need reliable injection moulding machines with reliable processes and high availability," says Menrad. He makes this clear by taking the example of a holding frame for the front bumpers of the Porsche Panamera Sport Design package. With the Sport Design package, Porsche offers Panamera customers an opportunity to give their vehicle a more individual look. It comprises a special front-end part painted in body colour, with enlarged black air inlet grilles, characteristic sill trims as well as the rear-end underside painted as standard in body colour, including a diffuser with fins. Autotest produces this bumper in Lana. The sill as well as the trims are made from PUR-RIM, whereas the holding frame and the air guides are injection-moulded from thermoplastics. A holding frame of this kind weighs between 700 and 800 grams; it makes a significant contribution to the rigidity and stability of the entire

module. Therefore, ASA/PC material was selected instead of PP. As well as this safety aspect, it is above all the look of the injection-moulded part that is important.

Optical component with exacting surface requirements

Menrad: "This is a component with what we refer to as a 'zero-kilometre look' which does not receive any subsequent surface treatment. As a result, it is extremely important that no surface defects or dents to be visible after the injection moulding. Post-shrinkages have to be ruled out, therefore." For this reason, Autotest has selected a cycle time of 70 seconds. One issue with this large component concerns the long flow distances. As a result, it was important for Autotest to find out during the development and in the startup: Where will we put the moulding gates? Where is the optimum reversing point? How powerful should the squeezing be? How can the flow lines be transferred into the non-visible area? All of these parameters should then be presented for the follow-on time as a reliable process, stored and able to be recalled at any time.

Wanted: an injection moulding machine with many options

"For this reason, we need a machine that offers many options right from the start, in order to achieve the optimum injection moulding result," says Menrad. "It is better to sort out a certain quantity of faulty parts during startup, rather than having

to do so later on in series production. That's less painful – and later on, we simply no longer have the time to optimise the process." The batch sizes in injection moulding of the holding frame for the Porsche Panamera are between 1,000 and 2,000. This means the mould remains on the machine for between four and six shifts. The specification from the CEO is unequivocal: the machine has got to deliver reproducible results very quickly after startup – after a maximum of five to ten scrap parts. "We can achieve this without problems using the machine from Sumitomo (SHI) Demag. This is because the machine monitors all parameters throughout the entire production, and it activates an alarm if the actual values deviate from the nominal values. To this extent, we can fully rely on the machine."

To obtain optimum results from the injection moulding process, Autotest safeguards it using simulation software. This is used right from the development phase in order to carry out verifications. Later, the supplier undertakes the comparison with the actual injection moulding parameters on the machine. This is in order to find out where and which distortions are to be expected, for example. Only then is the mould built. During startup, the software helps to tap the optimisation potential to the full – parameters that the setter on the machine does not know. The insights gained are then put to use in the machine controller.



Delighted with the successful start to injection moulding production at Autotest Eisenach (from r.): CEO Karl Menrad, Autotest founder and owner Josef Unterholzner as well as Wolfgang Zill, sales employee at Sumitomo (SHI) Demag.



Josef Unterholzner (right) receiving the Porsche Supplier Award 2011 in the Production Material Category from Porsche CEO Matthias Müller. This means Autotest is one of the ten best suppliers of the previous year.

Menrad also knew precisely what he wanted when deciding which peripheral devices to use: for example, he insisted on an A and B axis to be integrated in the production unit for handling purposes. In this way, the sprues can be cut off whilst still in the gripper directly after removal from the mould, before the parts are placed on a belt. This saves about 30 seconds processing time per holding frame.

At Sumitomo (SHI) Demag's recommendation, the machine was also equipped with a material feed system featuring two containers from Werner Koch Maschinenfabrik GmbH, Ispringen. As a result, two standard granulates are always available. The system was integrated directly into the machine controller in order to achieve the greatest possible level of security in material selection. "The experts from Sumitomo (SHI) Demag are our partners who respond quickly and flexibly to our requirements," says Menrad with satisfaction. At the present time, Autotest Eisenach produces twelve different components on the injection moulding machine – and the next major order has already winged its way to the company: a multi-piece rear spoiler for the Audi A3. Autotest is the sole supplier. The upper and lower shells are produced in Eisenach, while the aerodynamic corners made from PMMA are supplied from Autotest's plant in Fortezza. In addition, all parts are connected together on a gluing machine in Eisenach, before being delivered directly to Audi. Following the

startup ramp, output should plateau at 550 rear spoilers a day.

A sequential valve gate controller is on the shopping list

In order to cope with these quantities reliably, Autotest has already ordered a second System 1500 machine from Sumitomo (SHI) Demag. To a large extent, this will have the same functions as the first machine – but with a few additional items by means of which Menrad intends to crank up the production efficiency even further: for example, it is his absolute requirement for there to be a sequential valve gate controller for staggered con-

trol of sealing nozzles. In this way, it will be possible to influence the flow paths more effectively. Furthermore, he is considering how the setup times can be minimised such as by bringing the moulds to the required temperatures in advance. The switch-on program of the NC5 controller should help to achieve this: it allows oil preheating, cylinder heating, mould temperature control or socket combinations to be started without operator intervention. All procedures can also be started up in a staggered procedure, thereby facilitating the automatic startup of the machine by programming the date, day and time. ■

Autotest on course for growth

Think big also applies to the company development of Autotest AG. Up to spring 2011, the South Tyrol component supplier had only been represented by one sales team in Germany. When, in 2010, the Edag Group company AKTec Automobil- und Kunststofftechnik in Eisenach – or more precisely Hörselberg-Hainich – was put up for sale, it quickly became clear to the Autotest founder and owner Josef Unterholzner that he wanted to take over the site in the middle of Germany lock, stock and barrel with its 160 employees, machines and orders, so as to be closer to German customers. In doing so, Autotest doubled its workforce at a stroke. The number of customers also increased: VW and Audi were already on the order books, and Autotest now also works for Daimler and Porsche. The company can also look to its sales figures with pride: for example, Autotest Eisenach GmbH planned to achieve sales of EUR 9 m in 2011. In fact, Autotest Eisenach GmbH finished the year with EUR 11.5 m. Further increases are indicated. As a result, the Autotest Group expects to report more than EUR 48 m sales in 2012, and to break the EUR 55 m barrier by the end of 2014. Above all, growth at the Eisenach site is to be promoted through a further expansion of capacity. Thus, a new logistics hall covering 4,000 m² will be completed in 2012/2013, as well as the covering over of a 3,000 m² yard area.

New building blocks for greater production efficiency

Successful activePlus programme grows to encompass 16 elements

activeRemote, activeColourChange and smartDrive are the three latest building blocks in the activePlus programme from Sumitomo (SHI) Demag.

activeRemote facilitates the monitoring of even complicated machine concepts through visual integration of robots, systems for process control or production planning as well as all kinds of peripheral

devices into the new NC5 plus controller. With activeColour-Change, it is possible to change the colours for a product at a previously unparalleled speed during on-going production. smartDrive is a variable-speed pump drive that increases efficiency as a retrofit for injection moulding machines in the Ergotech series and permits energy savings of up to 40 %.

Fully integrated peripheral technology: activeRemote

activeRemote facilitates monitoring even of complex machine concepts through the visual integration of peripheral technology of all kinds into the new NC5 plus controller. This means that robots, systems for process control, production planning systems or peripheral devices, for example, can be integrated and their procedures can be visualised. This is based on the many interfaces of the NC5 controller that serve as a host for integrating useful functions and an extremely wide range of partner systems.

The control interfaces of many peripheral devices and partner systems are integrated into the NC5 controller of the injection moulding machines by virtual network computing (VNC), and can be operated from there just like the controller itself. Recently, Sumitomo (SHI) Demag has developed corresponding solutions with Wittmann Kunststoffgeräte, Sepro Robotique, Wemo, Priamus System Technologies, GWK, Kistler, ONI Wärmetrafo and T.I.G. Technische Informationssysteme. Implementation of additional systems is under preparation together with partner companies.

The recording, processing and visualisation of all production and process data using activeRemote permits comprehensive monitoring and control in every single phase of production. Disruptions in the production sequence are immediately visible and can be rectified before unnecessary scrap results. Sumitomo (SHI) Demag has demonstrated this many times, and also presented it at trade-

activeRemote facilitates monitoring even of complex machine concepts through the visual integration of peripheral technology of all kinds into the new NC5 plus controller.





shows, for example with all machines on a system by T.I.G. Technische Informationssysteme GmbH.

Fastest colour change: activeColourChange

With activeColourChange, it is possible to change the colours for a product at a previously unparalleled speed during ongoing production. The highly efficient colour change makes it possible to have a liquid colour system that permits significant cost savings to be achieved compared to masterbatches, while also significantly cutting the amount of wastage.

Saving energy with variable-speed pump drive: smartDrive

smartDrive is a variable-speed pump drive that increases the efficiency of

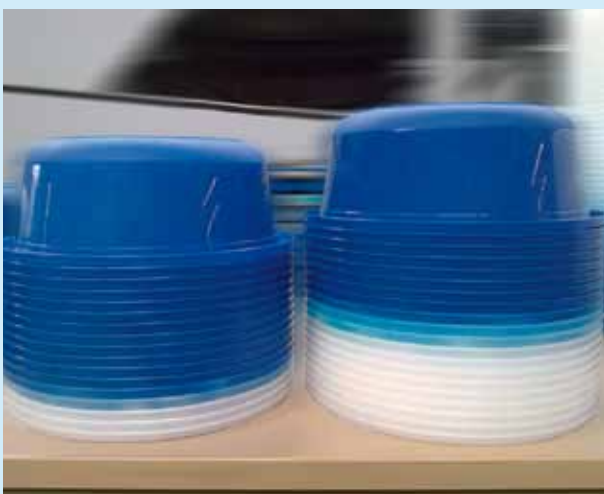
hydraulic injection moulding machines and permits energy savings of up to 40 %. smartDrive is available for the hydraulic Ergotech series as part of retrofits. This is because smartDrive allows the performance to be adjusted dynamically in response to all cyclical requirements, including for machines with NC4 controllers. Intelligent evaluation of the pump system allows the pump motor speed to be controlled via an additional inverter according to the process requirements.

Operation is completely integrated into the NC4 machine controller, and is performed using a simple screen structure. The existing process data and other individual settings allow a consistent level of quality to be achieved. Provision of the necessary energy required in each

phase of the process additionally ensures that a highly stable process is achieved. You can read about the customer BIA's experience with smartDrive in the article starting on page 14.

Extensive information on the web

With three new offerings, the successful activePlus concept is growing to encompass 16 building blocks for greater production efficiency. Integration of the building blocks is promoted by the NC5 plus controller that has been designed for intuitive operation and which, due to its structure, offers the optimum basis for future expansions. For more information about the activePlus building blocks, refer to the Internet at www.sumitomo-shi-demag.eu/de/produkte/produktions-effizienz ■



Dyeing with activeColourChange (left column in each case) and masterbatch (right column in each case: from white to blue (left) or from blue to white (right))

Resource efficiency through retrofitting

BIA reduces the energy consumption of older injection moulding machines by about 50 %



BIA currently operates a total of 43 injection moulding machines for 1-, 2- and 3-component technologies, most of which are from Sumitomo (SHI) Demag.

14001 since 2007. The long-term goal is now to achieve ISO 50001 certification for the energy management system. It is the declared philosophy of BIA to take account of the ecological consequences of all its processes and measures all the time. For example, attention is paid in the galvanising process to recovery and processing of rinsing water as well as the reusability of the resulting mono-sludges in the course of wastewater treatment. In this way, the use of nickel salts has been reduced by more than 30 %, and the use of chromium salts by more than 50 %.

Energy-efficient injection moulding is also possible with older hydraulic injection moulding machines, as proven by the example of BIA: The Solingen components supplier saves about € 12,000 in electricity costs annually simply because it has retrofitted four older hydraulic injection moulding machines from Sumitomo (SHI) Demag with the smartDrive variable-speed pump drive. It achieves a further 300 % energy saving by retrofitting sleeves for cylinder insulation.

ponent machines are available for injection moulding. All come from Sumitomo (SHI) Demag, with only a few exceptions.

Resource and energy efficiency is a major topic for BIA. The entire company is concerned with ecological aspects. For example, the environmental management system at BIA has been certified to ISO

Injection moulding is also subject to ecological considerations. For instance, the hall has been equipped with energy-efficient lighting. Scrap from production is recycled – and the material obtained is

“BIA is the surface,” observes Dr. Markus Dahlhaus, CEO of BIA Kunststoff- und Galvanotechnik GmbH & Co. KG. Today, starting from the surface, the company develops complete, galvanised plastic components – predominantly for the automotive industry. “Our strategy over recent years of situating ourselves in innovative areas of injection moulding and surface technology has proven to be correct,” says Dahlhaus. “Expertise in multi-component injection moulding and the night design processes that we have developed are in great demand on the market. In addition, there is a generally high demand for chromium-plated plastic parts.” We currently have four plastic galvanising systems in operation at Solingen. A total of 43 1-, 2- and 3-com-



Four machines from Sumitomo (SHI) Demag are now equipped with smartDrive – and are saving BIA lots of money. Sasa Grbesa (l.), deputy head of department for injection moulding at BIA, as well as Hans-Joachim Fuchs, service fitter at Sumitomo (SHI) Demag are delighted by this.

used for manufacturing shielding strips for the galvanising process. As a rule, new injection moulding machines are energy-efficient electrical ones.

“However, it was also important to us to make the older hydraulic machines more energy efficient – only we didn’t know how. There was no question of replacing the machines, after all they were running without problems,” says Thorsten Steffen, head of Mould Technology Development. Ultimately, he and his colleagues came up with the idea during a visit to the Sumitomo (SHI) Demag stand at the K 2010

show in Düsseldorf, when the sales employees of the injection moulding machine manufacturer drew their attention to the possibility of retrofitting machines with the variable-speed pump drive, smartDrive.

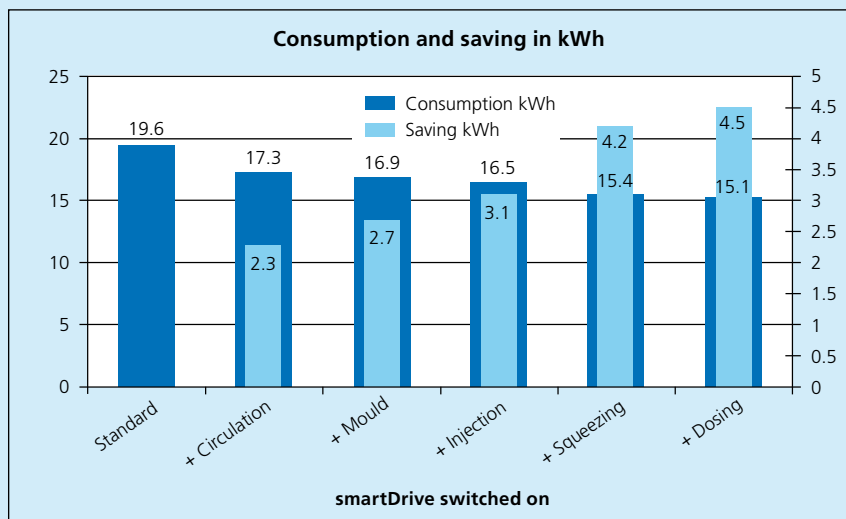
In smartDrive, a frequency inverter is installed before the asynchronous pump drive motor and is used for controlling the speed. The power of the pump drive motor can be adjusted dynamically for each individual phase of the cycle. According to the particular setting on the operable inverter controller, smartDrive

automatically adjusts the motor speed to the requirements of the particular cycle, and provides only the power that the machine actually needs in each cycle sequence.

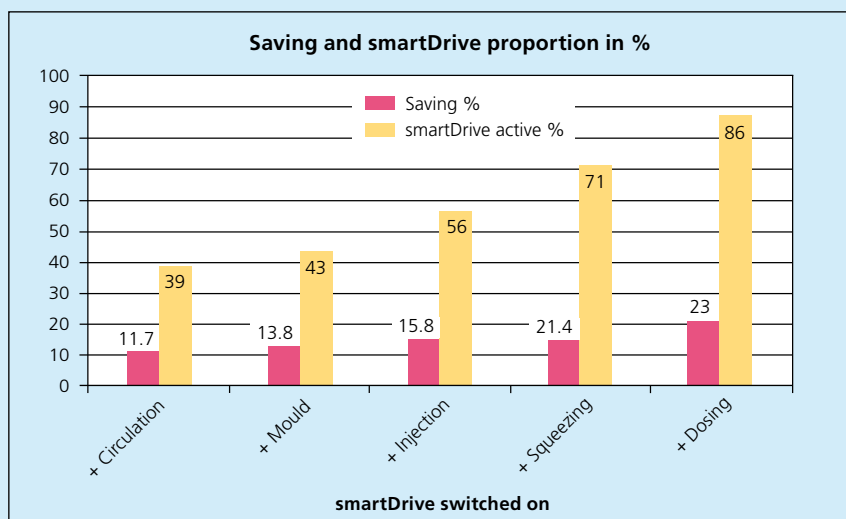
Long cycle time means major savings potential

The experts at Sumitomo (SHI) Demag quickly realised that smartDrive offers BIA major savings potential. After all, the components supplier has very long cycle times with long cooling phases during some of its injection moulding operations – phases during which smartDrive ensures that the pump drive is running at reduced speed, thus wasting little energy. “Any textbook would suggest much shorter cycle times for our components. However, galvanising means we face particular requirements in terms of injection moulding; the galvanising process is totally unforgiving with regard to surface defects resulting during injection moulding,” explains Dahlhaus. “We have observed that we reduce the level of scrap significantly with these long cycle times. This pays off for us twice over, because otherwise we would first galvanise many parts and then cast them aside after the 100 % quality check. This is just one of the reasons why the process is the most favourable one for us, including with regard to resource efficiency.” Moreover: An exceptional connection between the plastic and metal is required in the components – and this can only be achieved if the injection-moulded component has an optimum surface. As a result, BIA places great value on a long squeezing phase.

To be on the safe side, a service employee from Sumitomo (SHI) Demag came to Solingen before the project in order to measure the actual values on the machines. This EnergyCheck was conducted during operation on the largest machine, an Ergotech 650-3300 System built in 1997, in order to find out how much energy really could be saved. At the time, the machine was being used for producing trim strips using a family of moulds for the spoiler of the Mercedes-Benz GLK, with a cycle time of 55 seconds.



BIA saved 4.5 kWh per working hour on trim strips. The greatest savings resulted during squeezing and dosing for this component. The savings quota is thus 23 %. With an annual operating time of about 5,500 hours and an electricity price of € 0.12/kWh, this adds up to just under € 3,000 per year for this machine.



Evaluations at BIA show that smartDrive is principally active during squeezing and dosing: Namely 71 or 86 % respectively, all figures: Sumitomo (SHI) Demag



The proof of the pudding came in the EnergyCheck during production of these trim strips for the Mercedes-Benz GLK: How much energy would be saved by retrofitting the smartDrive? The calculations from Sumitomo (SHI) Demag indicated 20 %, whereas in reality it was 23 %.

It was agreed which parameters should be switched on in the smartDrive – and which should not. After all, each machine axis or each process phase can be switched on or off flexibly by the operator in the energy saving function of the smartDrive. For example, the injection phase can be carried out in standard mode during the injection moulding process, whereas the squeezing phase is performed in energy saving mode. The “high dynamics” function makes it possible to increase the speed of the pump drive dynamically in good time before a

machine axis actually starts. The displayed time values of the idle and active smartDrive phases, in relation to the entire cycle time, enable the operator to conduct a precise energy cycle analysis.

Individual adaptation of the smartDrive

smartDrive is switched on at BIA during squeezing as well as circulation pressure – with the result that the pump drive only operates at an extremely reduced speed during the long cooling time of about 30 seconds. “We can adapt the

smartDrive individually to our requirements, and this is done very conveniently using the machine’s NC4 controller. In addition, during production we can see exactly where we are saving electricity and when smartDrive is active,” says Sasa Grbesa, deputy head of department at BIA, with satisfaction.

The EnergyCheck delivered certainty: In the specific application, a saving potential of about 20 % of energy consumption could be achieved on the machine, corresponding to 3.73 kWh per working hour. “The calculations showed us in black and white that the purchase pays off for us. As a result, we did not hesitate to order the retrofit kit for initially one machine at first. And we have no regrets, because the measurements subsequently showed that we are saving even more electricity than originally thought,” says Grbesa.

Investment pays off within four years

In fact, BIA saved on average 4.5 kWh of power. The greatest savings resulted during squeezing and dosing for this component. The savings quota is thus 23 %. With an annual running time of about 5,500 hours and an electricity price of €0.12/kWh, this adds up to just under €3,000 per year for this machine. “To this extent, the investment in smartDrive will have paid for itself in just under four years,” says Dahlhaus.

After one year, it was clear to BIA: smartDrive helps to save energy and costs – without any reduction in the quality of the components. As a result, the company has since retrofitted smartDrive to three other older machines with clamping forces from 2,500 kN and up. BIA now



Sasa Grbesa with one of the chrome strips, standing in front of an Ergotech 650 system on which the components were produced.

Smart solution

In the variable-speed smartDrive pump drive, an optional inverter controls the pump motor speed according to the process requirements by “intelligent” evaluation of the pump signal. As a result, significantly less energy is consumed during the idle and part-load phases as well as during setup and adjustment phases. The process stability is assured in each phase of the process, because the necessary energy is provided.

makes sure that new machines from Sumitomo (SHI) Demag come factory-fitted with the comparable technology, activeDrive.

“smartDrive contributes to a further reduction in energy consumption per square metre of manufactured surface – which is the yardstick we use,” says Dahlhaus. A welcome side effect for BIA, also in line with resource efficiency, is that the smartDrive package can be removed from one machine and used for other machines. For example, BIA had this fitted to one machine from 1997. “When the time comes for us to pension-off this machine, we can use the smartDrive for other machines,” says Grbesa.

BIA is reducing the energy consumption of its older machines even further using cylinder insulating sleeves. These reduce energy losses due to heat radiation from the plasticising cylinder. The insulating sleeves are simply mounted under the standard guard plate of the plasticising cylinder, and are adapted to its heating zones. If the process requires it, BIA can remove the insulation from individual zones at any time.

“With the insulating sleeves, we achieve a further energy saving of about 30 %,” says Grbesa. Dahlhaus adds: “As a result,

Detailed EnergyCheck

Using the EnergyCheck service offered by Sumitomo (SHI) Demag, it is possible to measure the energy consumption of an injection moulding process and its cycle phases before making a decision about smartDrive. The result for the user is information regarding the actual energy consumption for its individual production parts. Furthermore, the user can obtain results in advance regarding how much energy would be saved by installing the variable-speed pump drive.

this investment pays off within only a few months. In addition, it means the machines are ready to operate much faster on a Monday morning – which means we can start production earlier. Furthermore, we now no longer heat up the hall

so much, so we have greater control over the heating energy.” This comparatively simple measure has such a great effect that BIA is already operating half of all its machines from Sumitomo (SHI) Demag with cylinder insulating sleeves. ■

Support & Engineering

smartDrive was developed in the Support & Engineering department of Sumitomo (SHI) Demag. This area, part of customer service, is concerned with handling or producing retrofits for existing machines and robots, providing technical support for special customer requirements and developing new retrofit solutions. The Support & Engineering department comprises two teams, one focussing on hydraulic machines and the other on electric ones. Retrofit solutions can be directly produced and developed for specific customers thanks to many years of experience and expertise, including in the software field. This offers the opportunity of responding quickly and flexibly to customers’ wishes, even when it comes to older machines.

Russia loves its “DEMAGi”

More than 3200 injection moulding machines have been installed since 1990



Alexander Votinov,
Managing Director
of CJSC Sumitomo
(SHI) Demag Plastics
Machinery



Leonid Simonjan,
Sales and Market-
ing Director for
Russia

Sumitomo (SHI) Demag has a presence in Russia and the Commonwealth of Independent States (CIS) in the form of its subsidiary, CJSC Sumitomo (SHI) Demag Plastics Machinery, based in Moscow. The branch upholds traditionally excellent business relationships with Russian plastics processors. It has looked after customers’ sales requirements for more than 22 years, as well as providing a wide range of services. These include not only application engineering consulting and project planning services, but also a 24-hour hotline and comprehen-

sive spare parts supply from its Moscow warehouse.

CJSC Sumitomo (SHI) Demag has installed more than 3,200 injection moulding machines in the Russian market since 1990. These successes quickly brought Sumitomo (SHI) Demag into a market-leading position. Both national and globally active customers with branches and production sites in Russia have long since used injection moulding technology from Schwaig and Wiehe. Every year, the team from CJSC Sumitomo (SHI) Demag

attracts new customers to join them. CJSC Sumitomo (SHI) Demag not only has a presence in Moscow with its central sales organisation, but also its own personnel and agencies in all major economic regions such as St. Petersburg, Nizhny Novgorod and Ufa, as well as in Minsk (Belarus). Also, the activities of the agencies in Kyiv (Ukraine) and Tashkent (Uzbekistan) are managed from Moscow. Dipl.-Ing. Alexander Votinov has been the managing director there since summer 2010.

From its international production sites, Sumitomo (SHI) Demag meets the requirements of the Russian market, which are in some cases very diverse, with exceedingly individual solutions. The application areas for injection moulding machines are as diverse as plastics processing in Russia. Manufacturers of plastic packaging, vehicle components, electrical engineering products and equipment, hygiene articles, stationery, medical parts and consumer goods rely on standard and special machines from Germany. The machines delivered to Russia are adapted

to local conditions, and are all certified according to the gosudarstvenny standard (GOST), the prescribed Russian standard.

CJSC Sumitomo (SHI) Demag addresses the specific requirements of individual industries with focussed system solutions. To equip the imported machines, the agency cooperates with leading European manufacturers of injection moulds, robots and IML automation technology. As a result, a complete range of peripheral devices is available for Russian customers – including for complex installations and projects.

Since 2009, Sumitomo (SHI) Demag has engaged in a partnership with Sepro Robotique, the largest European manufacturer of unloading robots that operates independently from injection moulding machine manufacturers. Via CJSC Sumitomo (SHI) Demag, Russian customers have access to whichever are the optimum robot models for accomplishing the automation task in hand. A showroom in Moscow is permanently provid-

ed with up-to-date injection moulding machines, allowing customers to perform mould tests and sample inspections. Training courses familiarise operators with the machine and process technology.

The high reputation of the technology, wide range of services and, last but not least, personal customer care have even resulted in the situation that Demag injection moulding machines from Germany are referred to by many plastics processors using the proprietary term of endearment: "DEMAGi". ■

Contact

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[The sales and service team from CJSC Sumitomo \(SHI\) Demag at the Interplastica 2012 show in Moscow](#)



Siemens is investing in BMC injection moulding

Thermosetting plastic processing: Sumitomo (SHI) Demag is an expert partner for BMC

Shortly before the turn of the millennium, Siemens began setting up its own BMC production at its Regensburg site for housing parts used in electrical installation technology. Initially, their first choice was the Fahr-Bucher brand, at the time regarded as the leader in thermosetting plastic machine technology. However, this supplier went bankrupt and, when faced with the need to expand capacity in 2006 and 2011, Siemens found the perfect alternative in the form of Sumitomo (SHI) Demag. The latter was able to offer the same technology from the material feed through to the injection nozzle, meaning that already established processing could be transferred directly to the new machines.

The main production at the Siemens plant in Regensburg, which is also the international headquarters of the Siemens Low Voltage business unit, focuses on residual-current circuit breakers (RCCBs) as well as circuit breakers. Both in buildings and in industrial applications such as machine switch cabinets, these electrical installation devices protect human lives, prevent electrically induced fires or protect cables against damage due to overloads or short circuits. The highest standards of safety in manufacture ensure reliable breaking of the circuits.

The interior of the circuit breaker principally comprises punched and folded metal components made from steel and copper, as well as plastic parts made from PBT, PC or PES. A perfectly matched safety system is created, embedded in a housing shell made from highly temperature resistant and dimensionally stable thermosetting plastics or thermoplastics. "We buy in some of the necessary components for our products," reports Plant Director Stephan Schluß, continuing: "In plastics processing, we produce about 50 % of our articles in-house. At the same time, we outsource more thermoplastic injection moulded parts compared to

thermosetting plastic parts. After all, there are only a few companies on the market which specialise in processing thermosetting plastics."

In spite of reworking, usually the more economical alternative

Herbert Schneeberger, production planner for plastics part production in the Regensburg plant, explains the applications for the interlaced materials: "We chiefly use thermosetting plastic materials for the covers and housing shells of our circuit breakers. It is true that we do use thermoplastics in some case, but these have to be thermally stable, which makes the materials correspondingly expensive. As a result, we often prefer to use thermosetting plastics, even if these require a certain amount of reworking."

As well as processing the pourable thermosetting plastic compounds, the company in Regensburg has specifically invested in BMC (bulk moulding compound) technology, and its BMC injection moulding machines currently annually process about 800 tonnes of these unsaturated polyester resins which are highly filled with glass fibres and aluminium hydroxide. "We regard the major advantage of BMC to be its dimensional stability. Our material supplier achieves the requirements defined by us in product development by means of tailor-made BMC compounds. The material does not absorb any moisture, which means the articles retain their dimensional stability on a permanent basis, and do not change their mechanical or electrical properties either. All in all, BMC compounds are appealing because of their good price/performance ratio," says Herbert Schneeberger.

Effortless changeover to Demag machines

In 1998, outstanding dimensional stability was one of the decisive arguments for embarking on BMC technology. When



The Siemens plant in Regensburg further increased its production capacity in 2011 with two BMC machines based on the Systec series.



Herbert Schneeberger, production planner for plastic parts production at the Siemens plant in Regensburg: "With the mould technologies available today, we can keep flash formation at a low level. This significantly influences the amount of flash removal work."



The poly-stuffer for loading the material (right) as well as the large extraction systems above the stuffer and mould area are the most striking differentiating features compared to the thermoplastic injection moulding machine.

the first capacity expansion was required in 2006, Siemens had to switch from its former machine supplier, because that



The loading capacity of the poly-stuffer is three BMC bales which are loaded manually.

manufacturer had since ceased machine production, and had to search for a new partner. "It was especially important to us for the compound supply for inputting the paste-like material to be configured similarly to the system that we were already familiar with," reports production planner Herbert Schneeberger. "We found out about the Demag machines from one of our suppliers who was very satisfied with the machines, and we decided to use them as well." Ultimately, the company, then still operating under the name Demag Plastics Group, supplied a system to Siemens that, according to Herbert Schneeberger, was "directly comparable". For example, not only the familiar poly-stuffer technology but also the geometry and size of the BMC feed screw and the nozzle geometry of the injection nozzle could be adapted to the previous concept. "In the end, we had the same conditions as in the existing machines, from the material loading through



A production employee takes samples of the parts for visual inspection before they are transported to the flash removal system.



In the poly-stuffer, the BMC compounds with the consistency of pickled cabbage are transported into the plasticising unit.

to the injection nozzle. That was a great advantage for us, because we could transfer the processes and processing parameters that we had trialed to date directly over to the new 2,000 kN machine without major adaptation work," says the production planner. As a result, it was clear that Siemens would once again turn to Sumitomo (SHI) Demag when it came to a further expansion of production capacity in 2011. The new machines are based on the hydraulic Systec series, and work with a clamping force of 1,600 kN. "For one thing, we were taking a product that had previously been pressed from pourable thermo-setting plastic and changing over to BMC injection moulding. For another, we needed the new machines to provide reserve capacity for downtimes of the older machines due to service requirements," explains Herbert Schneeberger, commenting on the motivation for the new investment. Using 6-cavity injection moulds, both the Systec 160 machines produce covers and housings for circuit breakers in three-shift operation on up to six days a week. Both machines are equipped with linear handling devices which remove articles from the mould and place them on a conveyor belt. From there, the covers and housings are taken directly to a continuous-flow peening machine in which the flash is removed by blasting with PA granulate.

Flash formation is the yardstick for mould quality

"Our finely tuned process means we keep flash formation within limits. We



The extraction system removes not only the reaction products but also other gases which would interfere with filling.

inject into the closed mould, build up a vacuum and vent at the end of the injection process by briefly removing only the holding force. After this, we return the holding force and fill the remainder of the mould by squeezing," says production planner Herbert Schneeberger, describing the production details, continuing: "This method keeps the flash thickness low. The thinner the flash, the less effort and expense is required for reworking. Mould quality plays a decisive role here. This is why we build practically all of the moulds required for thermo-setting plastic processing ourselves, and we invest accordingly in their care and maintenance," emphasises Herbert Schneeberger. When building moulds for new articles, Siemens also integrates internal pressure sensors in the moulds. Knowledge of the process gained from the internal mould pressure profile can then be transferred to subsequent moulds built for these articles. "As soon as we know what settings need to be maintained, we can dispense with the internal pressure sensors on subsequent moulds, without limitations on the parts quality," says the production planner. Siemens benefits from the entire value creation chain in BMC processing. Starting with the development, design and construction of moulds through to injection moulding and assembly, the articles go through all working steps directly at the plant in Regensburg.

Peculiarities of BMC: Stuffing, cooling, venting and extracting

At the same time, processing BMC ma-

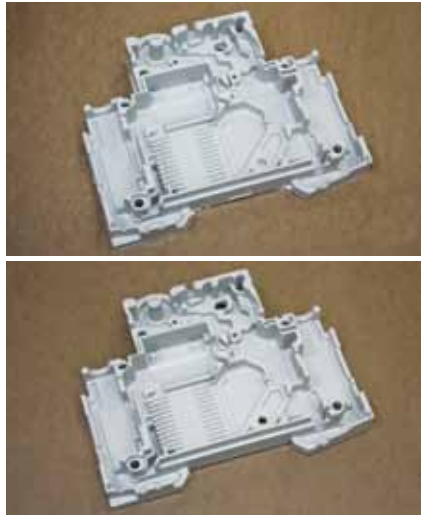
materials differs significantly from injection moulding of thermoplastic materials in various aspects. The special material supply unit for the compound supplied in bale form, which has the consistency of pickled cabbage, is only one of the peculiarities of a BMC injection moulding machine. The hydraulically driven Poly 100 screw stuffers built by Sumitomo (SHI) Demag supply the paste-like BMC compounds to the transport and injection screw. The 100 litre reservoir container is easily accessible to the operating personnel after opening a cover. At Siemens, an operator loads approx. three BMC bales by hand in each loading operation, corresponding to a quantity of about 36 kg. Injection moulding production does not have to be interrupted to do this. Optical sensors monitor the reserve of material.

As soon as the injection moulding machine requests material for dosing, the stuffing screw starts to rotate. In this way, a defined stuffing pressure is built up in front of the screw, which is measured by a sensor and controlled by means of the screw speed. The BMC moist polyester material is transported by a swivelling conveyor arm through a filling chute on the side and into the cooled cylinder with the BMC transport screw. To ensure that interlacing only takes place in the injection moulding tool, it is necessary to keep both the cylinder and the nozzle area at a temperature of about 35 to 40 °C.

The injection moulds themselves are electrically heated by heating cartridges or heating rings to about 160 to 170 °C. The BMC compound only becomes fluid on contact with the hot surface of the mould, after which it spreads within the mould, reacts and cures whilst still in the mould. The relatively short curing times of the BMC resin means that the cycle times are in the region of less than half a minute.

Mission accomplished: Low-styrene and low-dust production

Another striking feature of BMC machine technology concerns the extraction systems above the material feed and above



Housing component of a circuit breaker injection-moulded from BMC before (top) and after (bottom) flash removal.



Works Director Stephan Schlauß: "In plastics processing, we produce about 50 % of our articles in-house. We outsource more thermoplastic injection-moulded parts than thermosetting plastic parts."

the mould area. The raw BMW compound contains styrene which functions firstly as a component carrier and thus contributes to the dispersibility and processability of the compound, and secondly takes part in the interlacing as a copolymer. Siemens has installed large ventilation systems in order to reduce the pollution of the working environment by outgassing styrene. "We extract both from above the stuffer and above the mould, and regularly measure the styrene content in the hall, which is always significantly below the limit values," reports Herbert Schneeberger. The previously described evacuation and ventilation of the cavities, and thus extraction above the mould, are important because the interlacing produces gaseous reaction products. In addition, other gases such as air impurities or an advancing styrene gas front can impair complete filling of the cavity.

In this way, Siemens meets its exacting requirements both with regard to parts quality and the production systems. "Achieving consistently high quality is our greatest challenge. This is because the interplay between man, machine and mould is even more sensitive in the BMC area than with thermoplastics," says the production planner, summing up the complexity of this material group. ■

Author

Dipl.-Ing. Sabine Rahner
Freelance technical journalist

Background to BMC machines

The Fahr-Bucher brand was regarded as synonymous with high-quality thermosetting plastic injection moulding machines up to the 1990s. In 1999, Krauss Maffei took over the BMC technology of the insolvent machine builder, and four years later HW.Tech GmbH & Co. KG purchased Fahr-Bucher Service GmbH from Krauss Maffei. Following the bankruptcy of HW.Tech in 2009, Sumitomo (SHI) Demag took over the familiar poly-stuffer technology from HW.Tech. Sumitomo (SHI) Demag has further developed the technology based on Fahr-Bucher concepts, and integrated it into its injection moulding machines. For example, the stuffer control is integrated into the NC5 machine controller, permitting control of the stuffing pressure for a constant material feed. In addition, the BMC machines from Sumitomo (SHI) Demag have integrated electric mould heating.



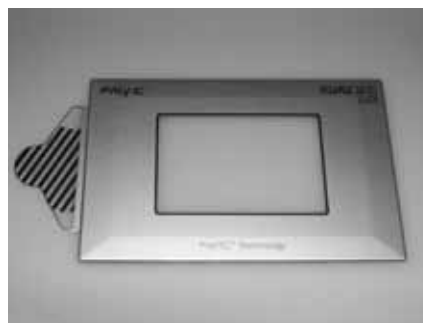
Fakuma success

Sumitomo (SHI) Demag achieved a magnificent response to its appearance at the Fakuma 2012 in Friedrichshafen back in October. The highlight of the exhibits was a production unit for a multitouch display (photo bottom middle) with a Systec 210. It combines IMD and IML technology, and opens up new possibilities for the design and production of operating elements. IML was used for applying a transparent and conductive function foil,

while the surface of the 3.5-inch display was decorated using IMD. The IntElect is now also available as a multi-component IntElect multi machine with all the performance features of electric drives (bottom left).

At the show, an IntElect multi 350-1700h/250v with 3,500 kN clamping force used a 16-cavity mould to produce a two-colour 2-component flip-top closure from

PP. At the Sepro Robotique stand, a fast-running El-Exis SP 250-1600 machine equipped with a 2-cavity mould produced 1 litre buckets with IML labels in less than 4.5 seconds (bottom right). The highlight of this application was a side-entry Speed Entry 350 MP robot which Sepro developed with Machines Pagès for machine sizes up to 5,000 kN clamping force as well as travel distances up to 2,200 mm. ■





Sumitomo (SHI) Demag at trade shows in 2013

Arabplast

- › Dubai, UAE
- › 07.-10.01.2013

Interplastica

- › Moscow, Russia
- › 29.01.-01.02.2013

MD&M West

- › Anaheim CA, USA
- › 12.-14.02.2013

Pharmapack

- › Paris, France
- › 13.-14.02.2013

Plastimagen

- › Mexico City
- › 12.-15.03.2013

Brasilplast

- › São Paulo, Brazil
- › 08.-12.04.2013

Plasttechnik

- › Malmö, Sweden
- › 10.-11.04.2013

PLASTPOL

- › Kielce, Poland
- › 07.-10.05.2013

CHINAPLAS

- › Guangzhou, China
- › 20.-23.05.2013

Forum de la Plasturgie

- › Paris, France
- › 30.-31.05.2013

PDM

- › Birmingham, UK
- › 18.-19.06.2013

Kunststoffen

- › Veldhoven, Netherlands
- › 25.-26.09.2013

Expoplast

- › Bucarest, Romania
- › 02.-05.10.2013

K 2013

- › Düsseldorf, Germany
- › 16.-23.10.2013

MD&M Minneapolis

- › Minneapolis MI, USA
- › 29.-30.10.2013

Dongguan DMP

- › Dongguan, China
- › 13.-16.11.2013

PlastEurasia

- › Istanbul, Turkey
- › 05.-08.12.2013

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We can provide the perfect technology
that will make a big impact on your production capabilities

For us, progress is exhausting all possibilities in order to increase your production output to the maximum, using energy and material efficiently, and ensuring your production quality is at its highest level. That's our goal every day.

Learn more about our "16 technology components"
for production efficiency at:
www.sumitomo-shi-demag.eu/products/production_efficiency

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