

today

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IMPRESSUM

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Thick-walled lenses are used in automotive headlamps. Thanks to overmoulding technology, these can be produced in significantly reduced cycle times.

ARBURG



Dear Readers,

This issue of "today" demonstrates just how important the past can be when it comes to positioning oneself for future success. It's always worth taking a critical look at the existing situation and considering whether more efficient and better solutions might be found. This is precisely what the customers and partners that we will be presenting to you in this issue have done. The examples differ widely from one another. In the case of rigging blocks for sailing ships and bearing housings for water pumps, the previously employed materials have been substituted with plastics, significantly improving the product characteristics. The manufacture of complete yoghurt tubs using IML systems makes packaging easier, simplifies logistics and increases productivity. A new mould concept was developed for thick-walled lenses, reducing cycle times considera-

bly. The automated production of knives in numerous different versions proves that a turnkey solution can be both product-specific, as well as extremely flexible. The strategy of analysing the current situation in detail and developing something better or something completely new is deeply anchored at ARBURG. This is the means by which we have consistently positioned our company and our products successfully with a view to the future. You can experience this interactively at the completely redesigned "Evolution" exhibition at the Lossburg headquarters. Impressions of this new space, as well as many further exciting articles are also included in the present issue of "today".

I hope you enjoy reading our new issue.

Michael Hehl
Managing Partner

We're building for you!

Construction work: More space in Germany, Poland, Czech Republic and US

First-class, customer support is a top priority for ARBURG. For this reason, ongoing capital investments are being made at the parent company as well as at the subsidiaries worldwide. The largest construction projects are currently the new assembly hall at the parent factory in Lossburg, Germany, the new subsidiary buildings in Poland and the US, as well as the extension in the Czech Republic.

"Growth means preservation, means actively securing the future," explained Michael Hehl, who is responsible for plant development in his function as Managing Partner, on the occasion of the ground-breaking ceremony for the new assembly hall at the Lossburg parent factory.

Increased capacity for large machines and production cells

The reason behind the extension is increased demand for large ALLROUNDER injection moulding machines with a clamping force of up to 5,000 kN and complete turnkey systems. With the new two-storey building section, the total floorspace at the Lossburg parent company will be increased by 18,600 m² (13 percent) to just under 165,000 m².

More space for international customer support

The new building for our US headquarters in Connecticut will cover 2,500 m² and is being constructed at Rocky Hill, in

close proximity to the previous Newington site. The Polish subsidiary will receive its own building in Warsaw, with a useful floorspace of 800 m². At the heart of the building will be a showroom offering space for up to seven ALLROUNDER injection moulding machines, which will be available both for tests using customer moulds and training purposes. Moreover, there will be a spare parts store and rooms for training and technical seminars, etc.

Furthermore, there will be an extensive warehouse area for ALLROUNDERS in the US, which will merely require customer-specific adaptation on-site prior to their rapid delivery. Sufficient space will also be set aside for the area of turnkey systems, a field which is also experiencing strong growth in the US.

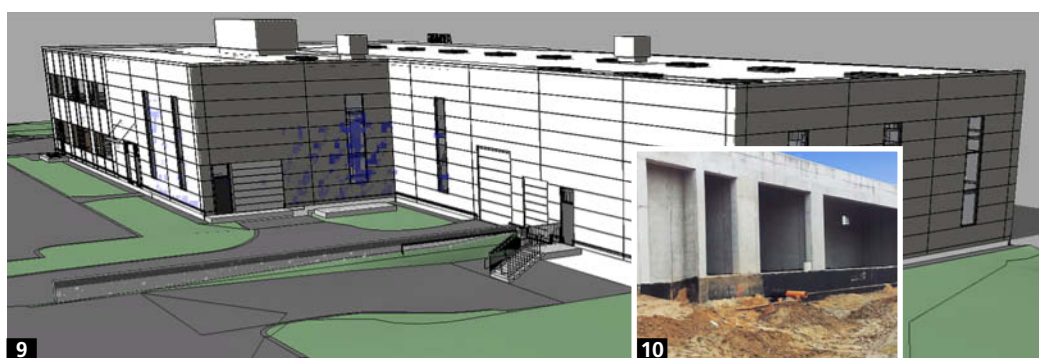
In the Czech Republic, demand for customer-specific production cells is also on the rise. In order to expand capacity for these, the existing ARBURG building in Brno is being extended by around 380 m² to more than 600 m².

Global focus on environmental protection

"During the further development of our company in terms of construction activities, we focus not only on functionality and aesthetics, but also environmental protection and the conservation of resources and energy," says Michael Hehl. "Accordingly, we will utilise waste heat and rainwater, for example, in the new building section in Lossburg. We will use the natural cold of the ambient air for air conditioning in the building and with the north-facing shed

roofs, we will reduce the thermal load and lower the need for electric lighting as far as possible. In addition, the extension of our photovoltaic plants by a further 340 kilowatt-peak is planned. With all these measures, we are implementing highly integrated facility management in the new building, which will reduce the primary energy requirements to a minimum. By these means, we are further expanding our environmental protection strategy." In this context, he emphasises that this approach extends beyond Germany, naming the new building in Warsaw, where the air conditioning of the building is achieved via geothermal energy and heat exchangers. The building will also feature an outdoor rainwater collection basin and an on-site wastewater treatment plant.

Managing Partner Michael Hehl and ARBURG architect Manfred Wolfer (photo 1, from left to right) inspect the site of the new assembly hall under construction in Lossburg (photo 2). Ground-breaking and start of construction (photos 3 and 4) took place in spring 2014, the moving-in date is planned for autumn 2015. The construction activities for the subsidiary building in Warsaw, Poland (photos 5 to 7) and Rocky Hill, USA, (photos 8 to 10) began in 2013 and should be completed in late 2014.





Easy to

HONASCO: Thermoset

With a share of around 70 percent, the automotive industry is the most important sales market for the products of HONASCO GmbH & Co. KG. Together with the supplier Mahle, the company, based in Bad Salzflen, Germany, has dedicated itself to the development and production of a bearing housing for a water pump. Instead of aluminium, the component for a German OEM (Original Equipment Manufacturer) was produced from thermoset.

The substitution of metal with plastic brings particular benefits with regard to weight and cost reductions. Moreover, greater design freedom and time savings are also achieved, as Marcus Boerger, Production Manager at HONASCO knows: "A conventional aluminium component has to be machined to size. With thermoset, we can dispense with the associated additional operations." In addition to its temperature resistance, this plastic also excels in terms of e.g. its mechanical and dimensional stability, resistance to abrasion and its attractive price/performance ratio.



The bearing housing for a water pump (photo, top right) is produced using a high-performance mould (photo, top left). Injection moulding is followed by automatic flash removal and sandblasting (photo, bottom).



handle

replaces aluminium in motor vehicles

At HONASCO, we process this material in two identical production cells. Each of these are built around a hydraulic ALLROUNDER 520 S with a clamping force of 1,500 kN.

ALLROUNDER with thermoset package

The machines are equipped with a thermoset package that includes a wear-resistant, liquid temperature-controlled cylinder module and a specially designed screw geometry for gentle material preparation, "During procurement of the two thermoset machines, the delivery times and the simple operation via the centralised SELOGICA control system were what convinced us," explains Marcus Boerger.



Production Manager
Marcus Boerger presents the
lightweight thermoset housing.

Production around the clock

The two cells are in production in three-shift operation, i.e. they operate around the clock on five or six days a week. In total, three identical moulds are available so that a replacement is immediately available in the event of maintenance or repair work.

Precise temperature control

This makes precise, material-appropriate temperature control particularly

important during processing. In contrast to thermoplastics, thermosets harden through cross-linking at high temperatures. In order to achieve the temperature of around 185 degrees centigrade necessary for this purpose, the high-performance mould is temperature controlled both electrically and by means of oil. A pressure sensor controls the switch-over point. In order to meet the stringent tolerance specifications, the bores in the mould are stamped.

Following the injection moulding process, a linear robotic system removes the finished component from the mould and, in the first step, inserts it into an automatic flash removal and stamping device. Here, the sprue and protruding flash are removed. Next, the bearing housing is placed onto an attachment that swivels into the appropriate blasting chamber. Here the remaining burrs are sand-blasted from the bores. In a third step, the robotic system sets the component down onto a conveyor belt for cooling. The processing steps described take place during the ongoing injection moulding cycle. The parts leaving the production cell are removed manually and placed onto a trolley. In order to subject the material to further thermal cross-linking, the bearing housings are heat-treated before being inspected and packaged in the next processing step.

INFOBOX

Founded: 1960 by Horst Nasilowski & Co., today a member of the Jörg-Schwarzlich Group

Location: Bad Salzflun (Germany), further production facilities in Poland

Production area: 12,000 m²

Turnover: around 26.4 million euros (2013)

Employees: around 160 in Germany

Machine fleet: around 75 injection moulding machines with clamping forces from 250 to 6,500 kN and up to three components, of which 22 ALLROUNDERS

Products: technically and visually high-quality plastic parts, hybrid components, assemblies and systems for the automotive and consumer products (white goods) industries

Contact: www.honasco.de



Data-integrated pr

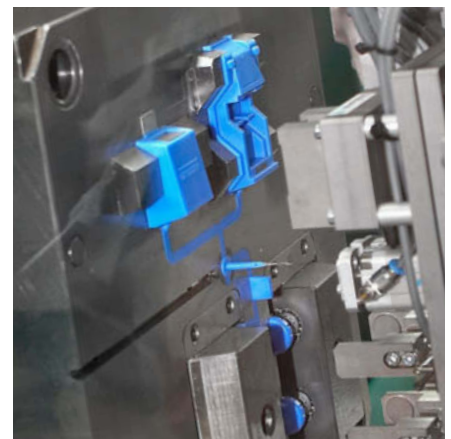
Industry 4.0: retrieving and archiving production data online

At the Technology Days 2014, ARBURG covered the topic of Industry 4.0 based on the practical example of a toy buggy, impressively demonstrating that the course towards the smart factory has already been set. The prerequisite for an individualised and 100 percent traceable component is the data integration of machines, order information and process data. Here, the ARBURG host computer system (ALS) plays a central role in networking the individual independent stations, recording all the parameters and transmitting them to a web server. In order to experience an example illustrating how this can be done, all the visitors to the Efficiency Arena could have their "own" buggy produced in five steps.



Entry and reading in of the ID

In the first step, the user enters a freely selectable name to be stored onto a chip card at a data processing terminal. This personalised card can then be read into the SELOGICA control system of the production cell at any time.



Production of the part

In the next cycle, a hydraulic ALLROUNDER 370 S produces the individual buggy components. A MULITILIFT V robotic system then inserts the roof into a laser printing station, which applies an individualised QR code. At the same time, the SELOGICA control system transfers the relevant production data to the Arburg host computer system (ALS). This allows the process parameters to be uniquely assigned at a later point, so that all process steps can be documented error-free on an end-to-end basis.





The printed QR code makes each component uniquely traceable. In this case, it leads to a website on which all the data for the particular buggy in question is stored.



Individual buggy data

roduction



Quality inspection

Assembly of the four individual parts is then performed manually. A downstream camera station determines and documents the correctness of the dimensions and whether or not the roof and front and rear axles have been mounted correctly on the chassis. For this purpose, the QR code is read into the station and the test results determined are recorded and archived by the ALS.



Functional testing

Finally, during a "test run", the maximum and average speeds achieved by the buggy as it rolls down a ramp are measured. The high-scores are also displayed on a screen. At this station, the ALS also records and archives the results before transmitting the data to a web server.



Data retrieval

The buggy's QR code can then be read out immediately or at a later date using an industrial hand-held scanner or a smartphone. The user accesses a part-specific web page showing all the process data for his unique moulded part. Details of e.g. the time, cycle counter, cycle time and various injection moulding parameters, as well as the ambient temperature, humidity, speed, dimensions and photos from the camera inspection can all be viewed online.

Sharp helpers reliably handled

Wüsthof: More than 100 different knife versions on a single prod

With a combination of manual dexterity and intelligent automation, numerous knife versions are produced to a high level of quality and with maximum precision at Ed. Wüsthof Dreizackwerk KG, Solingen. ARBURG has designed and built a fully automated production cell for production of the Gourmet knife series.

The world over, discerning professional and ambitious amateur chefs alike value the high-quality knives made by Wüsthof. The family-owned business with a long-standing tradition, which is celebrating its 200-year anniversary this year, produces more than 350 different versions of primarily forged knives. Each year, some two million knives bearing the famous trident logo are produced in more than 40 operating steps at the company's Solingen parent factory.

Made in Germany / Solingen

In order to continue operating in a high-cost location such as Germany, a sophisticated, streamlined production facility is essential. For Wüsthof, its Solingen location is also important for a further reason: the internationally protected designation of origin and registered label "Made in Germany / Solingen" can, as the appropriate regulations stipulate, "only be used for cutlery which has, during all the significant manufacturing stages, been pro-

cessed and finished within the Solingen industrial area."

Interface between cook and knife

The interface between the cook and the knife is the handle. This should be ergonomically shaped in order to enable effortless and safe use. Furthermore, the transition between the handle and blade must be seamless so that neither dirt, nor food residues can accumulate. Moreover, resistance of the material against the usual influences and media in the kitchen must of course be taken into account. For this reason, Wüsthof processes Luran S, POM Kepital F20 and the glass fibre-reinforced plastic PA6 GF15 for the knife handles.

Autonomous system

The handles for the Gourmet knife series are moulded directly onto the extension of the blade, the so-called "tang". Depending on the product, the handles feature two or three holes, in which rivets are inserted during a downstream manufacturing step. In accordance with the Wüsthof engineers' requirements, overmoulding of the handles must take place fully automatically in order to ensure autonomous multi-shift operation. Following a consultation phase and various attempts, ARBURG was tasked with developing a suitable production concept. For Wüsthof, in-house plastics processing was a complete novelty at the time. The



The flexible production cell can overmould around 35 different blade shapes with three different handle sizes.

cooperation between the two companies, whose production specialists jointly developed a customised system, only dates back to 2009.

SELOGICA impresses

The main components are a vertical ALLROUNDER 375 V with a clamping force of 500 kN, a 2-cavity rotary table mould and a six-axis robotic system from KUKA. The robotic system features the SELOGICA user interface and is fully integrated in the SELOGICA machine control system.

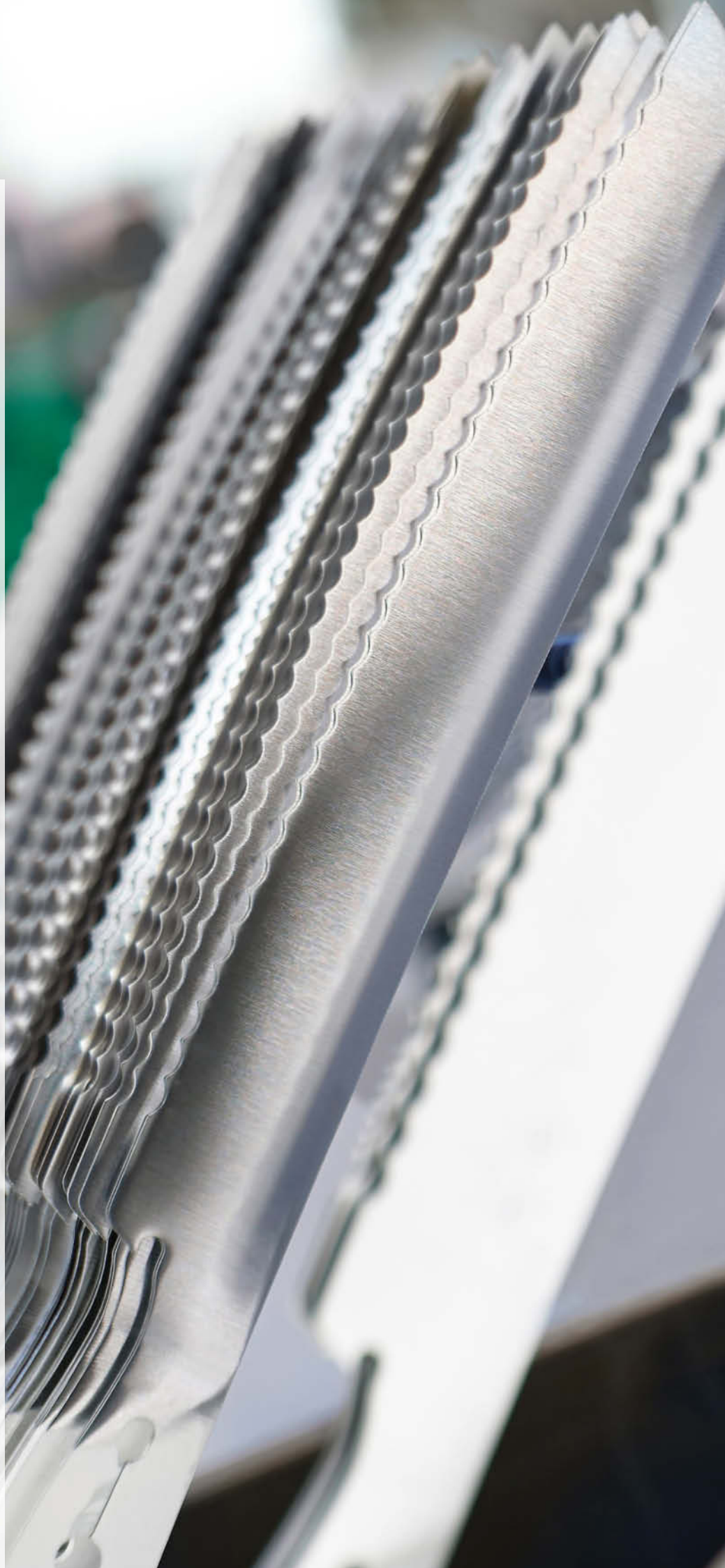
Production cell



Despite extensive experience with more than 100 six-axis robotic systems from KUKA and their programming, the Wüsthof specialists opted for the ARBURG solutions for this application. Central and simple preparation and control of the complete system was one decisive factor.

The production of the knives is fairly unspectacular. In a preliminary stage, the ground blades first have to be manually inserted into magazines. This step must be performed manually because automated separation would pose a risk of damaging the blades.

The loaded magazines are then transferred to the production cell. Next, the robot removes two blades at a time and sets them down onto the vacant rotary-table section of the lower mould half. Here, they are held in place via pins, as well as





Production employee Kerstin Beyer (top photo) shows a knife with an overmoulded handle (above) and the riveted end product (below). Following injection moulding, a pneumatic pincer removes the sprues (bottom photo).

by pneumatic clamps on the knife back. The table then rotates and the injection process begins. At the same time, the robot removes the finished, overmoulded knives from the second mould half and transfers them to a pneumatic pincer for sprue removal. The finished parts are then set down on a controlled conveyor belt. The next cycle begins with picking up and inserting new blades in the now vacant lower mould half. The cycle time is around one minute for two knives.

The hot-runner rotary table mould comprises a master mould with exchangeable 2-cavity mould inserts. Currently, 35 different blade shapes are overmoulded with three different handle sizes on the system.

Outside the production cell, the handles are fitted with rivets and the gating point is rounded off. In the final step, the blades are sharpened.

High quality requirements

One of Wüsthof's principles is to place quality above quantity. Consequently, extremely stringent quality control is performed after each production step.

If the specifications are not met, the knife is not sold. In terms of the handles, for example, sink holes on the overmoulded and relatively thick plastic elements are completely taboo. Should such sink holes nevertheless exceed the specified tolerances, the handles are removed and the blade is returned to the injection moulding process.

Prior to overmoulding, the blades are dipped in a soap solution to render the dull surface created by cleaning smoother for overmoulding.

Follow-up – forthcoming projects

Shortly after successful commissioning of this system, Wüsthof initiated two further projects. A further production cell for the Gourmet knives is planned. Furthermore, ARBURG has integrated an ALLROUNDER 370 S with a 4-cavity mould in a 20-metre long interlinked production line featuring several six-axis robotic systems. This system incorporates the complete knife manufacturing sequence, from grinding and polishing, through to overmoulding the handles.

INFOBOX

Founded: 1814 by Johann Abraham Wüsthof; today a traditional family-owned cutlery manufacturer in the seventh generation

Locations: Three production sites in Solingen, a number of sales subsidiaries in the US and Canada

Products: Cutlery for professional and amateur chefs, precision-forged knives

Production area: 12,000 m²

Employees: Around 300 in Solingen and 65 in the subsidiaries

Turnover: More than 48 million euros (2013)

Major sales markets: Germany and the US

Contact: www.wuesthof.com



Photos: fotolia

We set the tone

Football World Cup 2014: ALLROUNDER produces bate-bate

Like at every World Cup, the fans will provide the necessary background noise at the stadiums in 2014 in Brazil. Many of them will be bringing percussion instruments to celebrate their Brazilian rhythms at the matches. Some of these instruments are being produced on ALLROUNDER injection moulding machines.

Do you remember the last football World Cup four years ago in South Africa? And the deafening noise of the vuvuzelas, which ensured an "indescribable" soundscape at the stadiums there? At the time, ARBURG machines participated in the production of these originally traditional wind instruments. One of the manufacturers, Allit AG, a long-standing ARBURG customer from Bad Kreuznach produced some 4.5 million multi-piece vuvuzelas with a total of 13 injection moulds and several ALLROUNDERS.

Even if the rhythms will be different in 2014 and the background noise in the stadiums will sound

more like samba, some extremely loud instruments will again be on hand, e.g. the bate-bate ("bater" is the Portuguese word for beating or rattling).

In 2014, Aspro Plastic will be responsible for the noise

The green handle of the instrument ends in a flat, round central section with two yellow click-on plates bearing a football motif. When the fans shake the contraption, the plates beat from left to right against the central section, creating the characteristic rattling noise. The faster and harder, the louder.

The bate-bates are produced by ARBURG's Brazilian customer Aspro Plastic in Sorocaba near São Paulo. Seventeen of the company's 30 injection moulding machines are

cover a clamping force range

Moulded parts produced on ALLROUNDERS, such as vuvuzelas and bate-bates in national team colours (right and left photos below) provide the right soundscape at the World Cups.

from 400 to 5,000 kN. Aspro Plastic is mainly a supplier for the household goods industry, but today also has some of its own products in its portfolio. And because the unit volumes required for a major event such as the football World Cup in its home country are considerable, the company could well profit from this boom.

So, if you hear a loud rattling noise during the games, whether in the stadium or in front of your television set, Aspro Plastic could be to blame – as well as the ALLROUNDERS from ARBURG.



EVOLUTION

Time travel with ARBURG



Since March 2014, ARBURG customers and trade visitors to Lossburg have been able to interactively experience our company's history – from its founding in 1923 to the present – at the new "Evolution".

How did ARBURG become the worldwide leading manufacturer of injection moulding machines? Who are the heads of the family-owned company? Why was the first machine built from a bombed-out railway bridge? How has the ARBURG brand developed over the decades? How will an ALLROUNDER process plastics in 2040? You will find answers to these and countless more questions at the "Evolution" based on numerous exhibits and interactive touchscreen monitors.







Set for

FKD: Dutch innovator

Purmerend, a little town with the typical Dutch charms, to the north of Amsterdam. A placid location with small businesses which have moved to the local industrial estate. One of these is FKD International B.V.. Koos Bruinsma, the founder and owner, has modestly housed his company in a single production hall. And yet, this is where exceptional plastic parts and components of world renown are manufactured.

The products that Koos Bruinsma has developed and produces himself have a high market penetration. This is in keeping with his philosophy of always producing top quality and of concentrating on a few, own items. The company is a "family business" in the real sense of the word. Koos Bruinsma is the technical inventor and innovator at FKD, his son is in charge of sales and his daughter is responsible for the bookkeeping.

Three product lines



Photos: Bruinsma

The success of FKD is based on three product lines: plastic parts for horizontal conveyor belts (Flexway), chair connectors (Chairlink) and rigging blocks for sailing ships (Lazyblock). the latter are particularly interesting: The rigging blocks are predominantly used on historic sailing and tall ships. Originally, these were made

Success

produces rigging blocks for sailing ships



Innovator Koos Bruinsma (top right photo) and his family produce classic niche products such as rigging blocks for sailing ships (photos on left).

from wood, with all the disadvantages of wear, high friction and susceptibility to salt water. At FKD they are produced on a modular basis with one or several plastic rollers and assembled in a downstream operation. The new development requires less maintenance, has a lower tensile resistance, is salt-water resistant and can even be adapted to the ship's colour with the plastic. Considering that up to 50 such blocks are required on a two-master, it becomes clear that part production at FKD, just for the Lazyblock product, runs into the hundreds of thousands.

In-house mould shop

The multi-cavity moulds for all the moulded parts are produced in FKD's own mould shop, with a great deal of attention to detail. With the rigging blocks, for example, even the wood grain is imitated. The covers, rollers and ball bearings, as well as the through-shafts for the smaller

versions are produced from plastic or over-moulded. The free-falling parts are injected in the conventional manner through sprue runners and then assembled with further metal components before being screwed together with the shafts. The sprues are regranulated.

Special plastics provide advantages

During production, highly specialised plastics supplied by PolyOne are used in addition to WPC (Wood Plastic Composite). As well as speciality, long glass-fibre filled PA6 materials, a mineral-filled PA6 with two percent molybdenum sulphide is also used in order to achieve low friction resistance, dispensing with the need for conventional lubricants. Comprehensive consulting and test moulding were required in order to find the appropriate materials suitable for the Lazyblocks.

Uncompromising quality

Koos Bruinsma came to ARBURG rather by chance when he came into the possession of a machine at the start of his self-employment. Today, four hydraulic ALLROUNDERS are in operation at FKD. The clamping forces of the machines, which were integrated in the production facility between 2006 and 2009, are between 500 and 1,300 kN. In technical terms, Koos Bruinsma also remains pragmatic in this respect: "When purchasing machines, it's the specifications of the application at hand that matter above all. Only then do I look at the price. The hydraulic drives with single and dual-pump technology and the appropriate clamping forces from the modular ARBURG machine range were the deciding factors for me."

FKD produces mainly thick-walled parts or encapsulates inserts. Owing to their ease of operation and their high level of reliability, the ALLROUNDERS also tie in perfectly with FKD's uncompromising philosophy with regard to quality. Koos Bruinsma expressly highlights the advantages of the easy-to-operate SELOGICA control system and the excellent support and comprehensive service provided by ARBURG as positives. For FKD and its boss, the best is only just good enough. And this requirement is met to perfection by the ALLROUNDERS.

INFOBOX



Founded: 1982 in Edam, Holland, by the owner, Koos Bruinsma

Location: Purmerend, Holland

Employees: Ten

Products: Parts and components for conveyor belts, chair connectors and rigging blocks

Machine fleet: Four ALLROUNDERS from 500 to 1,500 kN clamping force

Contact: www.fkd.nl



Faster and m

INTEGRALPICKER V: Three servo-electric axes

A comparison of the action times impressively demonstrates the advantages of the electric INTEGRALPICKER V: its practice-oriented overall concept enables faster cycles compared to the pneumatic devices available on the market, as customers confirm. A further benefit is simpler set-up.

The INTEGRALPICKER V allows low-cost entry into the world of automated injection moulding production. Its special feature is the powerful and energy-efficient drive technology with three servo-electric movement axes, which, moreover, no longer require set-up during order changes. With an acceleration of 20 m/s², the dynamic vertical axis is extremely fast. Freely-programmable, simultaneous

and position-related movements with a high repeat accuracy are further benefits. The action times for sprue removal are therefore extremely short.

Convincing performance comparison

For a performance comparison, an electric INTEGRALPICKER V took on a pneumatic system in the production of chip holders. The result speaks for itself: With a cycle time of 15.55 seconds, the electric picker is approx. nine percent faster than a pneumatic one.

Extrapolated for average part production, this corresponds to an annual productivity increase of around 94,000 parts.

Also of interest is the integrated teach-in function, with which very short set-up times can be achieved by moving the picker to the desired position

and confirming this by pressing a button.

Customers confirm practical capabilities

The advantages of the electric INTEGRALPICKER V and therefore its practical capabilities have been confirmed by German and international customers.

Engelhard Fürst, Manager of the plastics injection moulding facility at Weisser Spulenkörper GmbH & Co. KG, Neresheim, Germany, reports on his experiences: "We currently have four INTEGRALPICKER V systems in operation, which we mainly use as sprue pickers, but also for part remov-



Film
Performance
comparison



Engelhard Fürst,
Head of the plastics injection
moulding facility at Weisser
Spulenkörper



With an acceleration of up to 20 m/s², the dynamic vertical axis of the electric INTEGRALPICKER V, which enters into the mould from above, is extremely fast.

ore precise

enhance efficiency

al and in some cases set-down according to cavity. The complete programming is performed simply and effectively by the SELOGICA control system; the mechanical design is extremely robust. The high dynamics of the devices with several vacuum circuits validate our investment decision. And all the more because the differences compared to other pneumatic pickers were immediately evident to us."

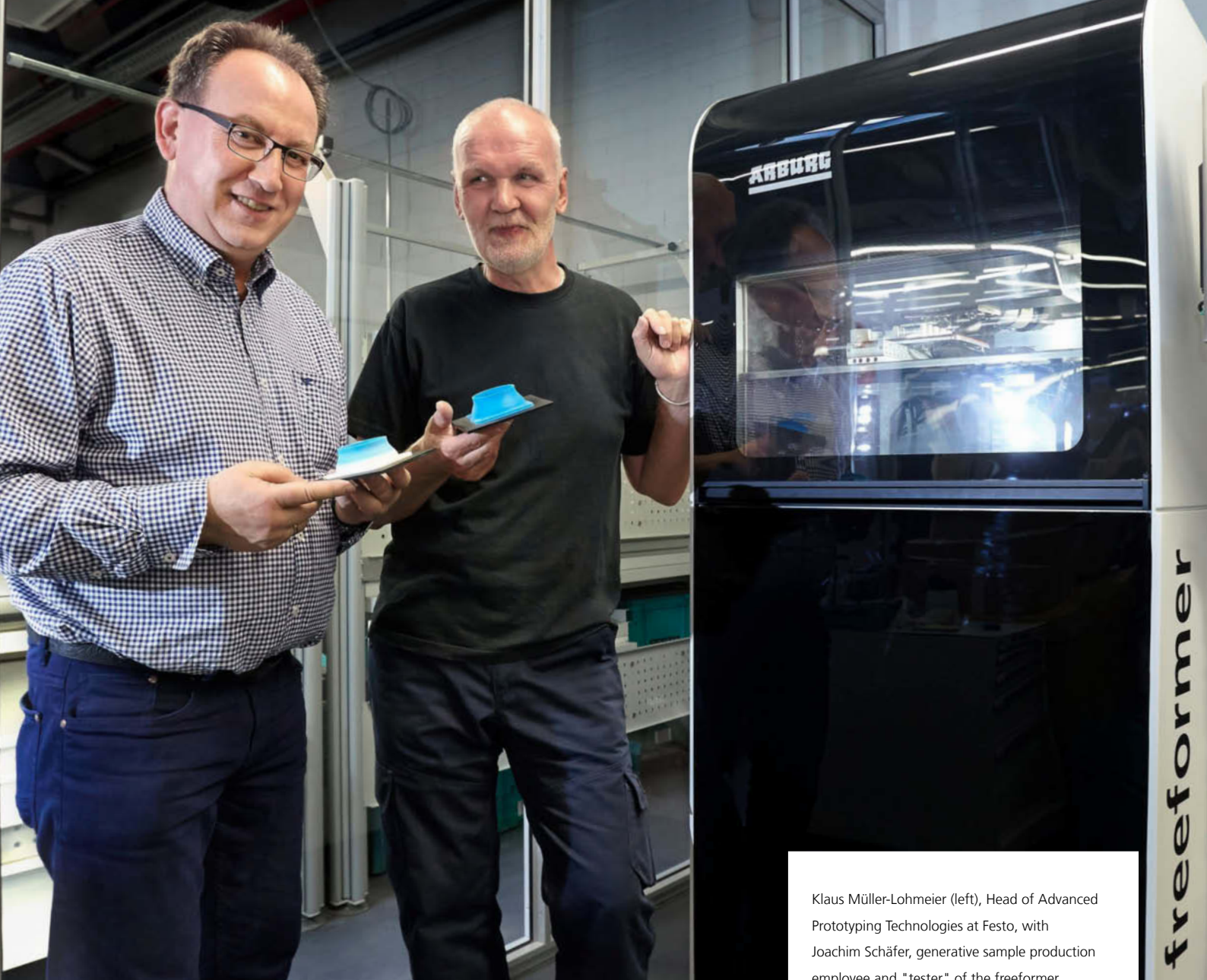
Andrzej Szwonek, Technical Director at DGS Poland Sp. z o.o., Mierzyn, Poland, explains: "Since September 2013, we have acquired three INTEGRALPICKER V systems. The servo-electric equipment makes the devices very effective compared to our pneumatic versions. The movements of the INTEGRALPICKER V are not only faster and more precise, their movement sequence is also always fluid. The programming options of the robotic systems via the SELOGICA is intuitive and simplifies work due to the

freely-selectable movements. In our case, this results in a reduction in the duration of standard removal sequences by up to two seconds. We are currently using the INTEGRALPICKER V for sprue removal.



Andrzej Szwonek,
Technical Director, DGS
Poland

However, the broad application possibilities of the devices have also prompted us to also use them for part removal with the relevant gripper systems. The ARBURG service personnel were extremely helpful during the installation and programming of our pickers. And the training was also so successful that we were able to begin operating the devices the very same day."



Klaus Müller-Lohmeier (left), Head of Advanced Prototyping Technologies at Festo, with Joachim Schäfer, generative sample production employee and "tester" of the freeformer.

Intensive testing

freeformer: Festo reports on its experiences

The specialist in automation technology, Festo, has decades of experience in additive manufacturing and is an important partner of ARBURG. The company received a freeformer at an early stage of its development in order to test it intensively under practical conditions. The "today" editorial team spoke to Klaus Müller-Lohmeier, Head of Advanced Prototyping Technologies at Festo, about this production sector and the

experiences with the freeformer and ARBURG Plastic Freeforming (AKF).

today: For how long has Festo been involved with additive manufacturing?

Müller-Lohmeier: We've been active in additive manufacturing since 1995 and have a number of systems at our plant. Our process spectrum includes Selective Laser Sintering (SLS), Selective Laser Melting (SLM), Fused Deposition Modelling (FDM) in

a number of forms, as well as Stereo Lithography (STL).

today: What products does Festo produce using additive manufacturing processes?

Müller-Lohmeier: Our spectrum ranges from design and customer samples through to functional prototypes and small production batches.

today: In early 2013, you received a

freeformer in order to test it under practical conditions. How did the testing go?

Müller-Lohmeier: We proceeded very pragmatically, step-by-step and always remained in close contact with the ARBURG development team. We began with simple prismatic parts made from a natural coloured standard granulate, followed by trials on parts with increasing geometrical complexity as well as dyeing the gran-



The granulate was dyed in order to produce parts in the typical Festo design colours.

ulate in the typical Festo design colours. Material inspections with micrographs and surface analyses accompanied the entire testing phase.

today: What parts have you produced?

Müller-Lohmeier: We've produced products from the existing portfolio, such as parts for industrial automation components or for teaching materials for our colleagues in the Festo Didactic training division. Subsequently, we also made direct process comparisons.

today: What were your experiences in terms the quality of the parts?

Müller-Lohmeier: Particularly the surface characteristics with the AKF process are remarkable, both in terms of the roughness values and the texture. In contrast to many of the other estab-

lished additive processes, a significant step forward has been made towards the quality achieved with injection moulding.

today: What improvements have been made based on your feedback?

Müller-Lohmeier: One of the things was the development of a different supporting material in order to implement even highly complex undercuts. A further idea of ours was to take into account commercial off-the-shelf software and the development of a guide for pragmatic user-side parameter determination for the use of customer-specific granulates.

today: Where do you see the potential for the freeformer for Festo and the market in general?

Müller-Lohmeier: The main USP of the freeformer compared to the systems commonly available on the market lies in the use of inexpensive and customer-specific standard granulates. Moreover, it operates dust and emissions-free so that no complicated infrastructure with extraction units are required. There is also potential in the option of processing several materials simultaneously and producing parts in two colours or as hard/soft combinations.

today: Were you convinced by the freeformer and will you use it permanently in your department?

Müller-Lohmeier: If all the suggestions are implemented in a positive manner, definitely!

You ask – we answer

Since the product launch of the freeformer at the leading international K trade fair in 2013, interest in our system for additive manufacturing has been consistently high. Customers, prospects and journalists approach us in order to find out more about the freeformer and ARBURG Plastic Freeforming (AKF). We would like to answer the most interesting and unusual questions regarding all aspects of the freeformer in the forthcoming issue of "today".

Please send your questions to "today_kundenmagazin@arburg.com". The best questions will be published together with the answers and the senders will be rewarded with a surprise.



A healthy partnersh

Jalplas: HIDRIVE produces complete IML containers, in which yog

Not all yoghurts are the same – they often contain acids, artificial sweeteners and gelatine. But not the yoghurt produced by the Australian company Jalna, who make it the traditional way without artificial additives or preservatives. This quality awareness also extends to the packaging. In order to produce the container efficiently, Jalna’s subsidiary company, Jalplas, invested in two in-mould labelling systems with hybrid HIDRIVE ALLROUNDER machines in packaging execution.

For more than 60 years Jalna has been making its popular yoghurt range using a traditional method. Today, it is still made only from pure milk and all-natural flavours such as fruit juice and probiotics. And once nestled in its pot, the yoghurt is left to mature naturally resulting in a light and creamy texture.

With consumers becoming increasingly health conscious, the demand for Jalna’s wholesome yoghurt is only set to increase. In the highly competitive market, players range from massive global businesses right

through to smaller, artisanal brands. Jalna is placed somewhere in the middle with a market share of approximately 12 percent. Since 1990, the company has been producing not only its traditional “pot set” yoghurt but also its own packaging.

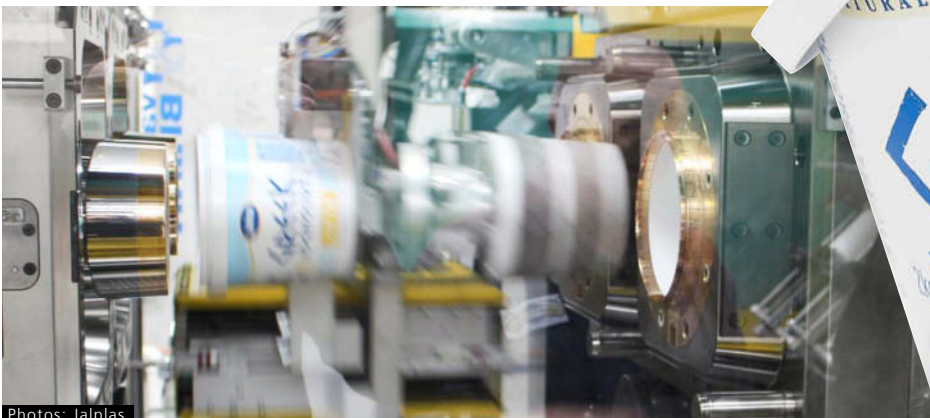
Contents and packaging from a single source

This task has been taken over by their subsidiary company Jalplas, which is managed by Howard Nurse. Founded 30 years ago and located close by, it produces both the pots and the lids solely for Jalna, using injection moulding and blow moulding technology. The machine fleet consists of ten injection-moulding machines with clamping forces rang-

ing from 1,600kN to 3,200kN, and eight multi-lane extrusion machines.

Two IML-systems for pot and lid

In July 2013, Jalplas invested in two fully automated production cells, which are able to produce the complete 2kg container and the lids using in-mould labelling technology in place of the



Photos: Jalplas

ip

hurt can mature naturally

conventional-type label application previously relied on during the filling process at Jalna.

Successful cooperation

The new production cells each comprise a hybrid injection moulding machine from the high performance HIDRIVE series with a 2-cavity mould and IML automation from Brink. System integration includes chillers, dehumidifiers and material handling systems from ARBURG's trading partner Comtec IPE.

Jalna procures its complete yoghurt packaging (centre picture) from its subsidiary company Jalplas. Two IML systems are used to decorate the pot with handle (picture left) and the lid (picture right).

Work on the production cells began in 2009: Comtec IPE worked closely with David Lucas, Plastics Production Manager at Jalplas, on the specifications to produce the 2kg container and lid with IML technology and the automated assembly of the handle.

The hybrid Allrounder 720 H in a "Packaging" version produces two containers and handles with a 2+2-cavity mould. The automation system inserts the IML labels into the mould, assembles the handle, and then stacks the parts onto an outfeed conveyor.

The matching lids are produced on a hybrid Allrounder 570 H in a "Packaging" version and a 2-cavity mould. The automation system inserts the IML labels and removes and stacks the finished lids.

25 percent less weight, 100 percent more output

For Jalplas, a complete solution was important – from the plastic pellets to the stacked parts on the conveyor.

"In injection moulding, the advantages of the high-performance HIDRIVE machines

in a 'Packaging' version, including IML features can be utilised to the full" remarks Michael Parrington, General Manager of Comtec IPE. Thanks to the high-tech components and the experience of the partners ARBURG, Comtec IPE and Brink, the weight of these sophisticated thin-wall parts was reduced by approximately 25 percent. Since Jalplas began producing the 2kg container in-house, production has approximately doubled in the six months since the machine cells were delivered, says Production Manager Jeff Bennett.



INFOBOX



Founded: Jalplas in 1990
Production area: 12,000 m²
Employees: 80
Products: yoghurt, sour cream
Certification: ISO 9000
Contact: www.jalna.com.au



Eight stations, one lens

Overmoulding technology: Efficient production of thick-walled

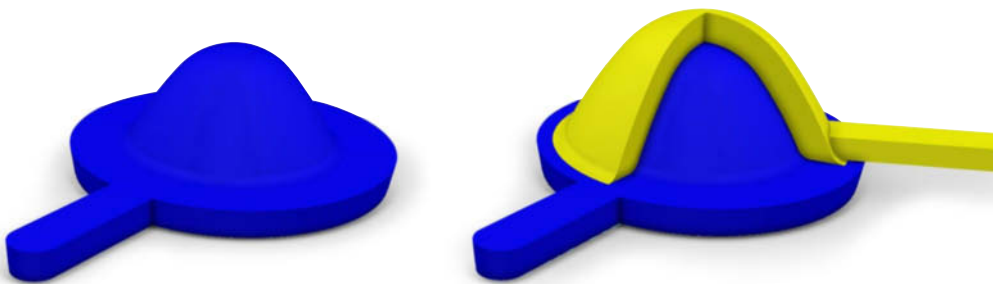
Substituting glass with plastic in lens production brings two principal advantages: significant weight reductions without loss of quality, as well as greater design options. Innovative mould technologies play their part in producing thick-walled parts of this kind at the required speed and in a single operation.

The overmoulding technology is used with an innovative multi-timed mould from Weber Esslingen, Germany – specialist for mould construction, moulded part production and rotary units – on an electric two-component ALLROUNDER. The automated production cell was developed as a demonstration application during a cooperation between Bayer Material Science, Iken GmbH, Weber and ARBURG.

Finished moulded parts in eight stations

The manner in which a thick-walled lens can be produced in a single-cavity mould with eight stations was demonstrated by ARBURG, for example during the Technology Days 2014. Optical items of this kind are used in the automotive sector for headlamps, for example. The finished lens has a thickness of 25 millimetres. It is created through several consecutive overmoulding and intermediate cooling steps.

The innovative multi-timed rotary mould features several injection and cooling stations as well as a removal station. The stations are moved to by means of an electric rotary unit from Weber in 45° steps. In the altogether eight mould stations, the vertical, size 70 injection unit and the horizontal, size 400 injection unit

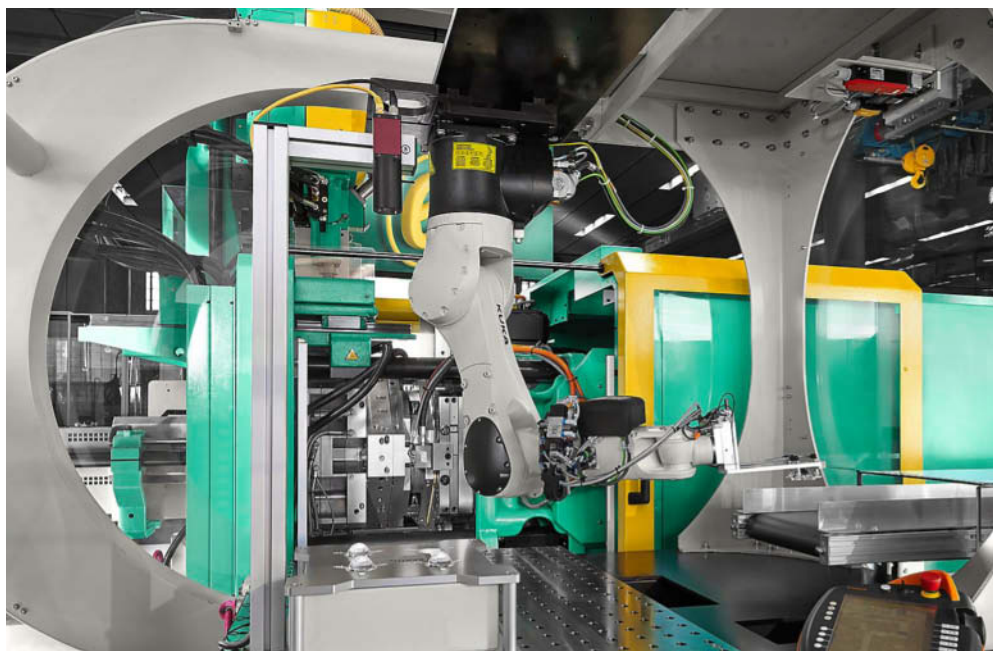


inject the material for the PC lens in several layers. These are then cooled in further, subsequent positions. The high-precision multi-layer lens is then removed at the eighth and final station while the mould is closed.

Production up to ten times faster

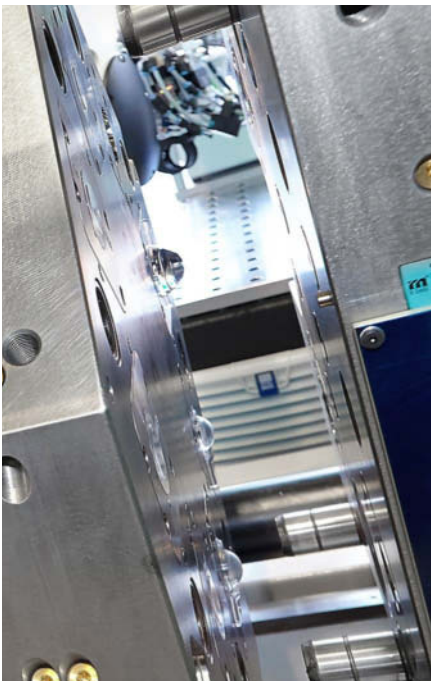
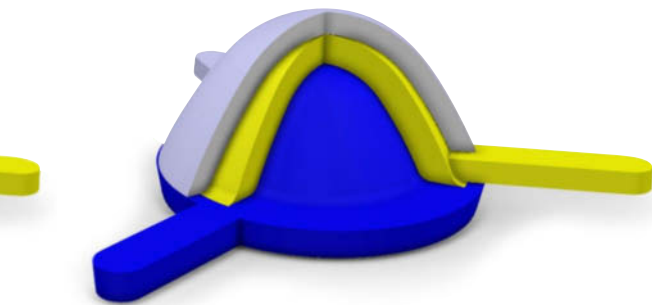
In the case of conventional production, the cycle time for a multi-layer

component is around 180 seconds. If the lens is produced in a single operation, a total cycle time of 600 seconds is even necessary. During multi-component production using the multi-timed mould, all the individual processes occur simultaneously in the mould. This enables a cycle time reduction to around only 60 seconds. The complete mould sequence, including the rotational movement, is fully integrated in



ens

lenses



Thick-walled lenses can be produced in three layers with the multi-station (top photos). The six-axis robotic system removes the finished parts and transfers them to an optical testing station (photo on left).

the SELOGICA control system on the ALLROUNDER.

Automated part removal and testing

The six-axis robotic system integrated in the system is also directly connected to the SELOGICA machine control system and can be independently programmed by the operator thanks to the implemented SELOGICA user interface on the manual control panel.

The robotic system first removes the finished moulded lens and transfers it to an optical inspection station prior to further transport and set-down. It is characterised by a high degree of flexibility, a compact design and a small footprint. This permits even highly-complex transport tasks such as, in this case, careful handling and inspection of sensitive moulded parts to be performed with ease. Integrated operation is ensured thanks to the shared data set for the machine and robotic system. Faster cycles and synchronous movements are achieved thanks to an extended real-time connection between the machine control system and the robotic system. This enables the necessary fast handling of the parts.

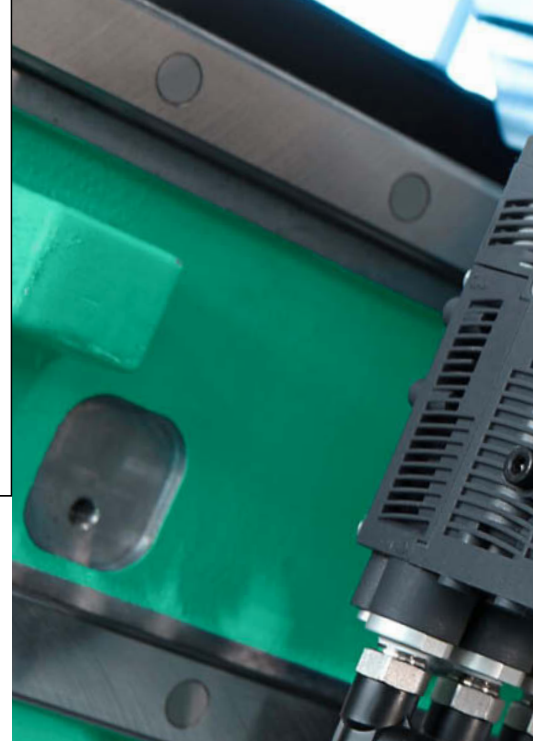
Overmoulding as an efficient solution for thick-walled parts

Those wishing to produce thick-walled parts such as lenses precisely, fast and reliably in a single operation can benefit from the overmoulding technology that the cooperation partners demonstrated at the ARBURG Technology Days. By means of repeated rotation of the electric Weber unit and therefore the multiple creation of the lens contour, the complete item is produced in a single operation. This in itself does not, however, make the automated injection moulding cell faster. Operation with two injection units as well as part removal at the eighth mould station via the six axis robotic system while the mould is closed and operating at the other stations, are also key features. All this ensures short cycles, even during use of single-cavity moulds.



TECH TALK

Oliver Schäfer, Technical Information



More real value

Benefits of real-time Ethernet in injection moulding machines

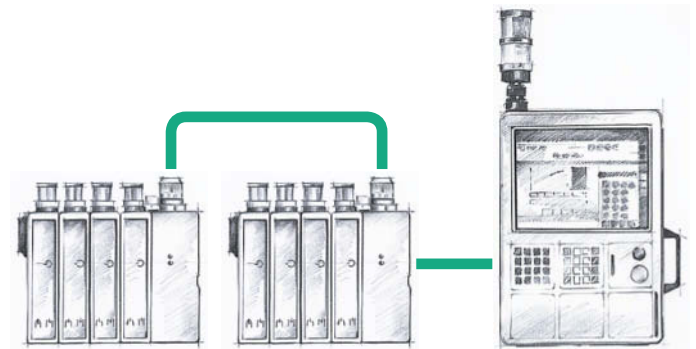
The use of modern technologies is a central requirement for development at ARBURG. Only in this way are customers able to produce more efficiently over the long term. The latest example of the continuous advancement in development is the use of a modern real-time Ethernet for communication between the SELOGICA control system and the components of an injection moulding machine – beginning with the drive and measurement systems through to automation and peripherals. The future potential that this enables is shown, for example, by the new generation of vacuum generators for MULTILIFT robotic systems.

The motivation for changing to a real-time network system was to enable simple connection of any of the technical components via a standardised open interface. Following extensive testing, ARBURG opted for VARAN real-time Ethernet. This network system guarantees cyclical data exchange and a high level of data security. For the measurement of internal mould pressures,

for example, VARAN enables extremely short response times of 250 microseconds, enabling even more precise switch-over to holding pressure. The wiring requirements are reduced significantly in practice. Whereas previously a separate line was needed for each charge amplifier, only one is sufficient today. Thanks to the network system, the devices can be connected in series without any problem. The connection is thus less expensive and less susceptible to interference.

Regulated vacuum generator

A real-time network system also offers a whole range of further advantages. This is illustrated by the new vacuum generators for MULTILIFT robotic systems. In comparison to the I/O connection used previously, the vacuum can be programmed using the SELOGICA control system with the VARAN interface. Manual, sometimes complex ad-



justment at the devices can be dispensed with. Furthermore, all settings are directly recorded in the data set. This not only enhances ease of use, but also significantly speeds up set-up times. The integrated vacuum regulation also ensures significantly more energy-saving operation. Vacuum generators no longer need to be switched on permanently, but can be switched on and off automatically in accordance with a specified threshold value. A further positive effect of this automatic "start/stop" system is that the noise level is reduced significantly.

Condition monitoring and more

Condition monitoring has also been implemented in the vacuum regulation.



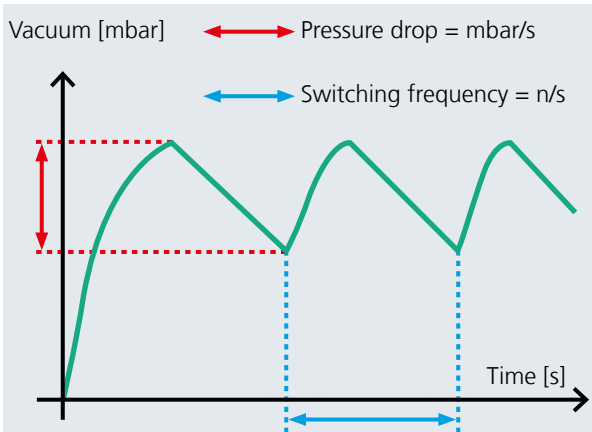
Through permanent recording of the operating hours, evacuation times, pressure drops and switching frequency, conclusions can be drawn regarding leaks, soiling and wear, for example of the suction pads. The SELOGICA control system can thus reliably detect malfunctions and inform the operating personnel of due maintenance in advance - and not only according to pre-defined intervals, but when replacement is in fact necessary. A further feature is an automatic function test of the vacuum system when it is switched on.

This also contributes to a fault-free sequence and therefore efficient production. Condition monitoring, however, only operates reliably if genuine vacuum generators are used. Each device therefore features an internal memory containing manufacturer information, on the basis of which the SELOGICA can identify genuine parts.

Fit for Industry 4.0

The example of vacuum generators impressively demonstrates the possibilities opened up to users and manufacturers through the use of a modern real-time Ethernet in injection moulding machines. Open, cyclic and reliable data exchange forms the basis for new control concepts which can simply be extended to incorporate condition monitoring. The freeformer already uses the real-time Ethernet

The new vacuum generators for the MULTILIFT robotic systems (photo above) are connected via real-time Ethernet. Series connection (diagram on left) reduces the wiring requirements significantly. Thanks to direct feedback of actual values, suction pad leakage can be reliably monitored (diagram on right).



for complete data exchange between sensors and actuators. The networking of machine components ultimately also forms the ideal basis for the future topic of Industry 4.0.



Production efficiency counts! A broad perspective is essential: every day, some 3.5 billion high-quality plastic parts are produced on ALLROUNDER machines – so the utmost production efficiency is required. If you are seeking to produce that efficiently, we are the right choice. We ensure your economic success. ARBURG for efficient injection moulding!



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