

today

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ALLROUNDER 1120 H





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IMPRESSUM

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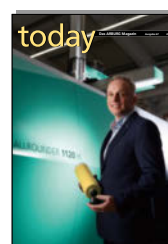
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The company Leweku purchased one of the first ALLROUNDER 1120 H machines to produce colour cartridges for offset printers. Managing Director Helmut Lehner is delighted with the machine's performance, design and GESTICA control system in equal measure.

ARBURG



Dear readers,

“Industry 4.0” and “digital transformation” are on everyone’s lips today. For us, however, these topics are not new at all. This is because we have more than 30 years of experience in automated and IT-networked production as an industry pioneer – in terms of our products and services, as well as our own production.

We have already presented our strategy with regard to “digitalisation” in detail with the interview “Top priority 4.0” in the previous issue of “today”. In this edition, the focus is more on practice. The article on the Efficiency Arena, provides an overview of this highlight of the Technology Days 2018. The six new digital assistance packages, the complex topic of interfaces and the potential of Augmented Reality (AR) and Virtual Reality (VR) for the plastics industry are also covered.

The Tech Talk describes our Industry 4.0 example of

“tension straps”. In this issue, you will also find out how our customers are implementing “Industry 4.0”: e.g. with turnkey systems where each moulded part can be traced at any time thanks to an individual code applied automatically by laser. Customer examples from Australia and Mexico also show how the ARBURG host computer system (ALS) is being used worldwide as a central Industry 4.0 component.

Together with articles on global events and the successful uses of our large ALLROUNDER 1120 H and the former, we again offer a diverse mix of topics in the current issue.

We wish you much enjoyment in reading our “today”.

Michael Hehl
Managing Partner



New large ma

Leweku: ALLROUNDER 1120 H combines high functionality and

One of the first customers to own an ALLROUNDER 1120 H is Leweku, based in Hallerndorf, Germany. For this small but distinguished company, the large machine in a new design and with the new GESTICA control system came at just the right time – and it has impressed both the company’s boss and the employees during day-to-day injection moulding operation from day one.

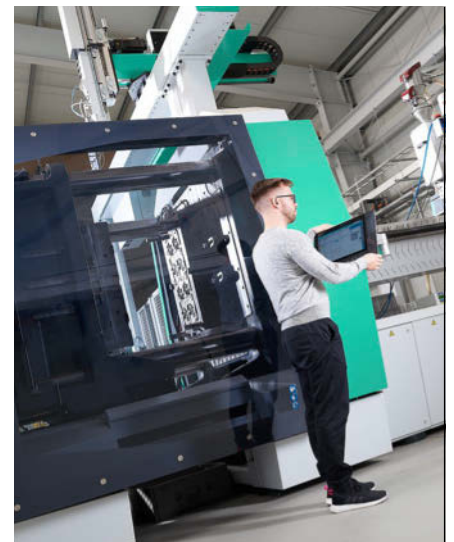
“We were looking for a new large machine to produce our in-house developed colour cartridges just when ARBURG was presenting its new flagship ALLROUNDER 1120 H with a clamping force of 6,500 kN. I’m extremely proud that we were one of the first companies to purchase and use this innovative machine in practice. In fact, it prevented us from ‘being unfaithful’ to ARBURG,” reports Leweku Managing Director Helmut Lehner with a wink and a smile.

At the well thought-out high-tech production facility, 16 automated ALLROUNDERS were already in operation

before the purchase of the large ARBURG machine. The order information, production plans and drawings are displayed in paperless form via a touchscreen at every machine and the process data is documented in the dedicated MES system. In future the ARBURG host computer system (ALS) will be used in order to utilise additional features. Production takes place in 16 shifts per week, primarily for the automotive, electrical engineering and toy industries. Around five or six mould changes are performed each day.

Product-specific design

The new large machine has been designed for the production of the new colour cartridges with regard to the hot runner control points, cooling water circuits and peripherals such as temperature-control and colour-mixing units, and features an interface for connection to the ARBURG host computer system (ALS). The 2-litre “DK2” colour cartridges for offset printing consist of six individual parts. They are characterised by a patented closure system, which



For Leweku Managing Director Helmut Lehner, the ALLROUNDER 1120 H is the highlight of his production facility (top). Moreover, the employees really enjoy operating the machine thanks to the GESTICA control system (centre). The large machine is configured for the injection moulding of colour cartridges (bottom).



chine convinces

pioneering design

opens and closes reliably at operating pressure. The ALLROUNDER 1120 H produces the cartridge body with a shot weight of 1,000 grams. Handling is performed by a vertical MULTILIFT V 40.

Performance impresses unanimously

“I was surprised that the new large machine ran very smoothly from the outset. I am particularly impressed with the interaction between design, ergonomics and functionality. It really shows that ARBURG approached the topic of design in just the right way,” says a convinced Helmut Lehner. The mould space, he goes on to say, is easily accessible via steps, the connections are easy to reach through the service doors and

use of the GESTICA control system and the EASYslider for fast set-up is simply fun. The operators are proud to be able to work with the smart new large machine.

Because the new ALLROUNDER 1120 H has completely convinced Helmut Lehner, the next machine is already being planned: a hybrid ALLROUNDER 920 H, also in the new design and with the GESTICA control system, which will produce housings for the automotive industry in future.

INFOBOX

Name: Leweku Kunststofftechnik GmbH

Founded: 2012 by Helmut Lehner

Location: Hallerndorf, Germany

Turnover: 3.6 million euros (2017)

Production area: around 1,000 square metres

Employees: 24

Industries: Automotive, electrical engineering, toys, printing, cosmetics

Products: Patented colour cartridges, moulded parts weighing from 0.05 to 1,000 grams, incl. assembly

Machine fleet: 17 ALLROUNDERS with clamping forces from 400 to 6,500 kN

Contact: www.leweku.de



Photo: Leweku

New features impress

freeformer User Day: Exchange of user experiences

Around 40 European experts in additive manufacturing met at the freeformer User Day in Lossburg in April 2018. The main focus was on the new hardware and software features for ARBURG Plastic Freeforming (APF) and the sharing of experiences within the user group. During the afternoon, the participants discovered the finer points of material qualification for themselves.

During four specialist presentations, the APF experts within the user group explained the progress they have achieved with the freeformer. The slicing software, for example, which is now available for update to all freeformer customers free-of-charge, was revised.

New features enhance part quality

The new features include the “smart” automatic generation of a support structure adapted to the part, an adjusted filling speed and a pressure-regulated strategy to improve adhesion of the first layer to the base plate. Further innovations include a more user-friendly control system interface and new or revised material profiles. These improvements result in greater process stability and part quality. “Today, we have standard profiles for some materials which allow the production of parts with 100 percent the same mechanical properties

as injection moulded parts in the horizontal build direction,” explains Dr. Agnes Kloke, Team Manager Plastic Freeforming Technology Development at ARBURG, adding that



the open system of course also allows for the customer-specific adaptation of process parameters.

Material qualification in practice

In the afternoon, the participants jointly put what they had learned into practice together with the APF experts. The task was to prepare the machine and materials, determine the optimum temperature and droplet geometry and then manufacture and analyse test parts. As part of the final discussions to round off the event, Dr. Eberhard Duffner, Divisional Manager



During the User Day 2018, the ARBURG experts presented current further developments directly at the freeformer and during specialist presentations (top). During workshops, the participants learned tips and tricks for material qualification (left).

Development and Plastic Freeforming at ARBURG, provided insights on the innovations that his development team is currently working on. The participants were highly impressed with the current and planned further developments in hardware and software and took away a host of tips and recommendations from the event.

For digitalisation

Efficiency Arena: Focus on digital transformation

The main focus at the Technology Days 2018 Efficiency Arena was on digital transformation. The slogan “for digitalisation” covered three areas: Under the header “for assistance”, the six new assistance packages were introduced. The “for visions” area ventured a glimpse into the future by demonstrating Augmented Reality (AR) and Virtual Reality (VR). Finally, under “for connection”, ARBURG provided information on topics relating to OPC UA and EUROMAP.

“Wir sind da, also in terms of digitalisation,” says Gerhard Böhm, Managing Director Sales at ARBURG, describing the highlight of the Efficiency Arena 2018. In

the “for assistance” area, completely new digital products were introduced: “ARBURG is now marketing six assistance packages that will generate even more profit,” says Gerhard Böhm.

“for assistance” – six new assistance packages

Heinz Gaub, Managing Director Technology & Engineering at ARBURG, adds, “The centrepiece is the ‘smart’ injection moulding machine and its control system, which makes available the assistance systems to operators. This enables them to reliably produce high-quality plastic parts highly efficiently, regardless of their qualifications. The machine is also ‘smart’ because it is connected to its environment

via multiple connectivity modules and continuously transmits and receives data. It also monitors its own processes and maintains itself in a stable state via dedicated control circuits.” The objective for the future, he says, is that the user receives maximum assistance – as with autonomously-driven vehicles. The prerequisite for this is a high-performance control system geared towards the future.

“for control” – future-oriented GESTICA

All the familiar SELOGICA functionalities are being integrated in the new control system generation on a step-by-step basis. Significant in this context: The choice of control system has no effect on the per-





Six digital assistance systems



"4.set-up" is the assistance package for guided set-up. Machine operators receive active support during set-up and parameter input, leaving them more time for productive tasks.



"4.production" gives experienced operators greater flexibility and freedom when programming functions. In particular, it facilitates work with non-standard sequences and complex mould technology.



"4.start-stop" facilitates production start-up, reduces the number of start-up parts and increases production capacity. This package is particularly suitable for demanding applications with multi-component and hot runner moulds.



"4.monitoring" is the assistance package for detailed process and quality monitoring, as well as seamless process documentation. It monitors the system status and detects process deviations promptly.



"4.optimisation" enhances part quality and lowers unit costs. Features for individual process and efficiency optimisation include injection during mould closing, dosage across cycles and extended mould locking.



"4.service" makes it possible to provide remote assistance to customers via online support, thus increasing machine availability. The new ARBURG Remote Service ARS is now a permanent fixture.



formance of the machine. The difference between the current SELOGICA and the future-oriented GESTICA control system only lies in the Human Machine Interface (HMI). The GESTICA reproduces the look and feel of smart mobile devices. A mobile version of the GESTICA control system was also on view for the first time. At a further station, the options on offer for using the ARBURG host computer system (ALS) to achieve IT-networked injection moulding production were presented. The focus here was on mobile applications.

“for visions” – into the future with augmented and virtual reality

The “for visions” exhibition area offered a glimpse into the digital future. “At ARBURG, we don’t relate digitalisation merely to products and services, but would like to place the entire company on a new footing,” says Jürgen Boll, Managing Director Finance, Controlling & IT at ARBURG. “For this purpose, we’ve established a core team at the highest management level.” He explains that with specialists from Engineering, Sales and IT, ARBURG is driving this topic forward in a concerted and targeted manner. Also likely to be of interest in the future is the opportunity to work with a “digital twin” – a virtual simulation of a real machine.

Furthermore, ARBURG is focusing on the digitalisation of its products and services to further enhance production efficiency for its customers.

Under the heading of Augmented Reality (AR), an example of how service can be improved in future using computer-enhanced reality with the virtual additional information or objects was presented at the Efficiency Arena. In the Virtual Reality (VR) area, visitors were able to “actually” explore the digital iteration of the ALLROUNDER 1120 H to understand its complex interactions. Here, details of the clamping unit are rendered visible, which cannot be seen in the real world.

“for connection” – Innovations relating to the OPC UA and EUROMAP interfaces

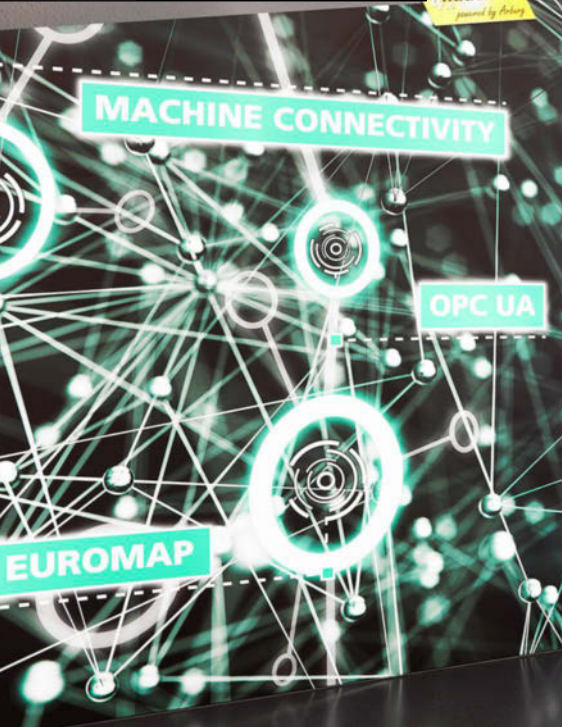
At the “Connectivity Café”, numerous visitors took advantage of the opportunity to learn about the state-of-the-art of OPC UA and EUROMAP under the slogan of “for connection” during personal conversations with the ARBURG experts. “We explained the operating principle and benefits of OPC UA and the new EUROMAP interfaces to numerous interested parties,” summarises Jürgen Peters, Head of Software Development at ARBURG. “We were also able to show the new solutions that we

ARBURG presented numerous innovations at the Efficiency Arena 2018: these included the visionary GESTICA control system, the six new assistance systems, as well as practical examples of Virtual and Augmented Reality (from left to right).

also offer in this context in conjunction with Industry 4.0.”

Since back in 2010, ARBURG has been working with the open OPC UA communication platform, which enables defined data exchange between various control systems via Ethernet networks. This is to become the international standard for the communication and networking between injection moulding machines, robotic systems and peripheral equipment. OPC UA forms the basis for connectivity modules, including, for example, the ARBURG host computer system (ALS) and the new ARBURG Remote Service, ARS.

Currently, there are a multitude of manufacturer-specific interfaces. Jointly with experts from other machine manufacturers, ARBURG is already working on implementation of EUROMAP 77 (MES systems) and, over the next one or two years, the implementation of EUROMAP 79 (robotic systems) and EUROMAP 82 (peripheral equipment). Furthermore,



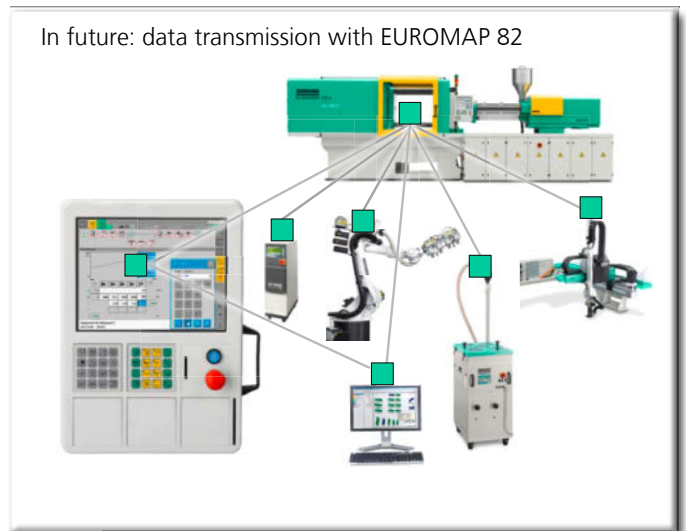
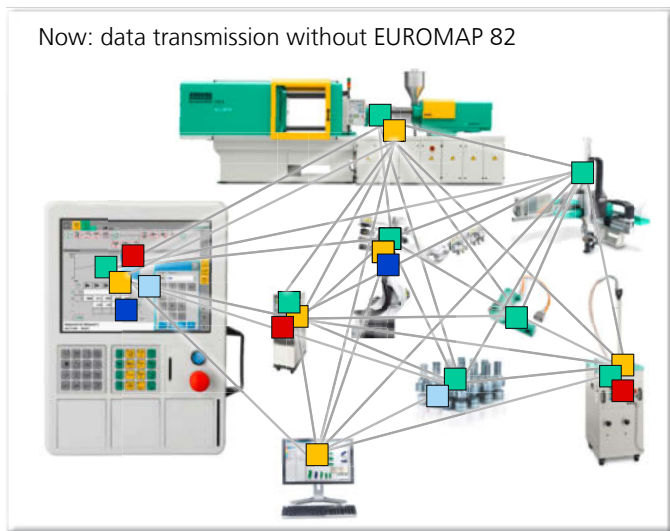
Under the slogan "for connection", ARBURG provided information on the topic of interfaces and EUROMAP (left). The advantages of OPC UA in the networking of peripheral equipment are made evident when comparing the current and future data transmission without and with EUROMAP 82 (bottom).

ARBURG is working closely with peripheral equipment suppliers and has already developed solutions based on OPC UA. One of these relates to hot-runner controllers from Gammaflux. These can now be actuated directly via the SELOGICA control systems – for up to 120 channels, which is particularly interesting for temperature-controlled multi-cavity moulds. A further example are LSR dosing units from Reinhardt Technik. Here again, the parameters of the peripheral device are called up via the SELOGICA and the data set saved there. It therefore al-

ways fits directly to the mould.

"Those who prepare their injection moulding machine with OPC UA, will in future be in a position to use many interesting connectivity modules as well as exchanging, analysing and archiving large data volumes in a standardised manner.

They will consequently be ideally prepared for the requirements of Industry 4.0 and the digitalisation of production," believes Jürgen Peters.





Digitalised processes

Service: Efficient coordination of deployments world-wide

The new SAP-supported “mobileX” tool enables even more individualised and faster coordination of the worldwide ARBURG service technicians. Thanks to the digitalisation of the service processes, deployments can be planned even more flexibly, proactively and efficiently. This means that machine availability can be further increased for customers.

“When working with the new tool, the aim is always a prompt, comprehensive and solutions-oriented service to the benefit of the customers,” explains Thomas Mattes, Head of Technical Service Lossburg at ARBURG regarding its advantages. “With the cross-platform service app, our service technicians can quickly and simply update their status during the course of the day via smartphone or tablet. Our planners can thus schedule the day and weekly tours of the service technicians for commissioning, conversions and repairs more flexibly, proactively and efficiently.” Customer calls are taken by the hotline and recorded in SAP, whereby international orders are also possible.

Detailed planning for fast deployments

The deployments are coordinated with the customer over the phone and communicated to the service technicians in accordance with their urgency, availability of the spare parts required and the available resources. The technician can thus immediately identify the customer, task and machine concerned. He can then inform himself about the technical details in advance and be guided to the deployment location via the navigation system. If spare parts are required, the service order is linked to the spare parts order and the planner and service technician can see the parts ordered and their delivery status at a glance. The objective is for the spare parts and the service technician to arrive at the customer’s premises simultaneously. Finally, the customer receives the signed service report as a PDF via e-mail. Thomas Mattes describes the new system as follows: “The benefits for our customers are self-evident: an even faster service through improved planning and shorter driving times, as well as direct

The ARBURG service technicians are always kept up-to-date via tablet or smartphone.

availability of all order-relevant data and spare parts. This makes our service even more individual and cost-effective – for all customers, worldwide.”

Available worldwide by 2019

The software is already in use in Germany and at most of the subsidiaries worldwide. China will follow in July 2018, before Singapore, Malaysia, Thailand and Indonesia in 2019.



Successes with spec

PPC Moulding Services: ALS enhances production efficiency

PPC Moulding Services PTY LTD in Sydney, Australia, has been developing and producing precision medical technology parts from thermoplastic and LSR since 1989. Following an ownership and management shake-up in 2007, sales revenues have increased tenfold. An important role here is played by the high level of expertise in the production of sophisticated products and also the ARBURG host computer system (ALS) in which the machines at the two production sites in Australia and Malaysia are integrated.

The reason for this huge growth is explained by Grahame Aston, Managing Director of PPC Moulding Service: "We focus on difficult tasks and applications that may be too great a challenge for others."

Successful partnership

"Our partnership with ARBURG has been decisive for our success," adds Grahame Aston. "We value the expert consulting regarding the machine specifications, moulds, accessories and automation. Further factors are the reliability, precision and process stability of the ALLROUNDERs, as well as the comprehensive application



Photo: PPC Moulding Services

expertise that we receive from ARBURG and its Australian trading partner Comtec."

One example of success is the automated moulding of LSR seals onto metal plates. Plasma treatment and laser marking are integrated in the production process here. A MULTILIFT robotic system and a six-axis robot work hand-in-hand during part handling. The overmoulding of electric connection terminals, which are welded to a flexible breathing tube with copper wire inserts is also a highly complex application. PPC uses vertical ALLROUNDER 375 V machines with shuttle tables for this purpose.

Greater efficiency thanks to ALS

Since 2007, use of the ARBURG host computer system (ALS) has been of central

PPC Managing Director Grahame Aston inspects the product quality at the plant (top, 2nd from left). Thanks to ALS, he can monitor his production via smartphone at any time (bottom).

significance for efficient production at all the PPC plants. One of the principle advantages that Grahame Aston names is the status query via laptop and smartphone: "Because I travel regularly worldwide, it's great to be able to call up detailed information at any time. As an entrepreneur, this gives me confidence and is an important decision-making aid." Thanks to ALS, the available capacities can be precisely determined to enable optimal planning of production times as well as mould and

Quality products



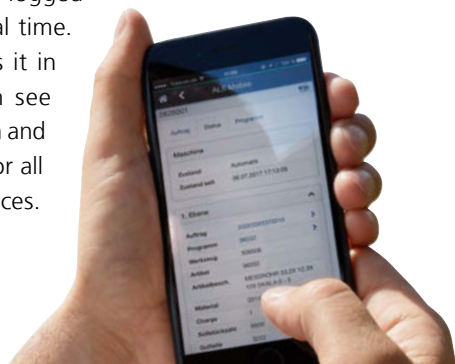
If something isn't quite right, we can respond immediately in order to bring production back on track as fast as possible." All this contributes, according to Aston, towards on-time delivery of the high-quality products, not only meeting the customers' expectations, but even exceeding them.

Future-proof

"For the future, we aspire to even greater traceability and are planning to integrate further peripherals such as laser marking devices into the ALS," says Grahame Aston. "The continuous further development of the ALS towards Industry 4.0 ensures that we will continue to receive the support that we require along our growth path."

machine maintenance activities.

The data sets with all mould and automation information are directly transmitted by the planning department into the "preparation level" of the SELOGICA control system. This enhances reliability, shortens changeover times and facilitates set-up. This has already significantly increased the OEE (Overall Equipment Effectiveness) indicator. A further advantage is seamless traceability. Everything that happens at the machine and in the production environment is recorded, logged and monitored in real time. Grahame Aston puts it in a nutshell: "We can see every press of a button and all alarms, and monitor all the important tolerances.



To ensure the quality of the sophisticated LSR products (top) one-hundred percent visual inspection is performed (left).

INFOBOX



Name: PPC Moulding Services Pty Ltd
Founded: 1989, ownership change in 2007
Locations: Sydney, Australia, and Johor Bahru, Malaysia
Turnover: between 50 and 70 million euros annually
Production area: 7,500 square metres (Australia) and 3,000 square metres (Malaysia)
Employees: approx. 340
Products: Medical technology products made from thermoplastic and LSR
Machine fleet: 50 ALLROUNDERS
Contact:
www.mouldingservices.com.au

TRADE FAIRS



NPE

A presence at the triennial plastics trade fair in Orlando, USA, reflected the significance of ARBURG's strongest export market. The literally biggest highlight was the hybrid ALLROUNDER 1120 H, which successfully celebrated its American premiere.

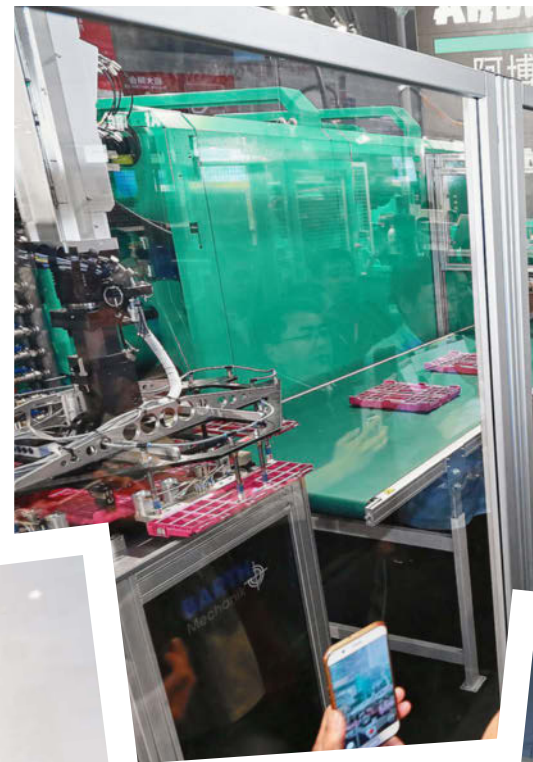
Global presence

Trade fairs: successful appearances in China,



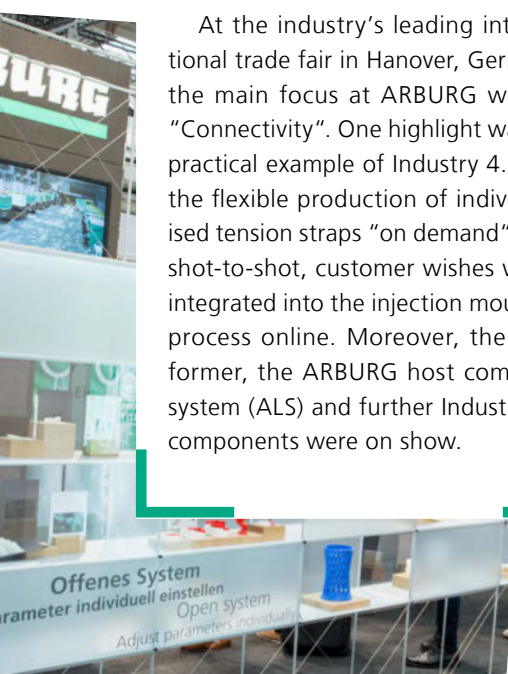
Photos: Christian A. Werner

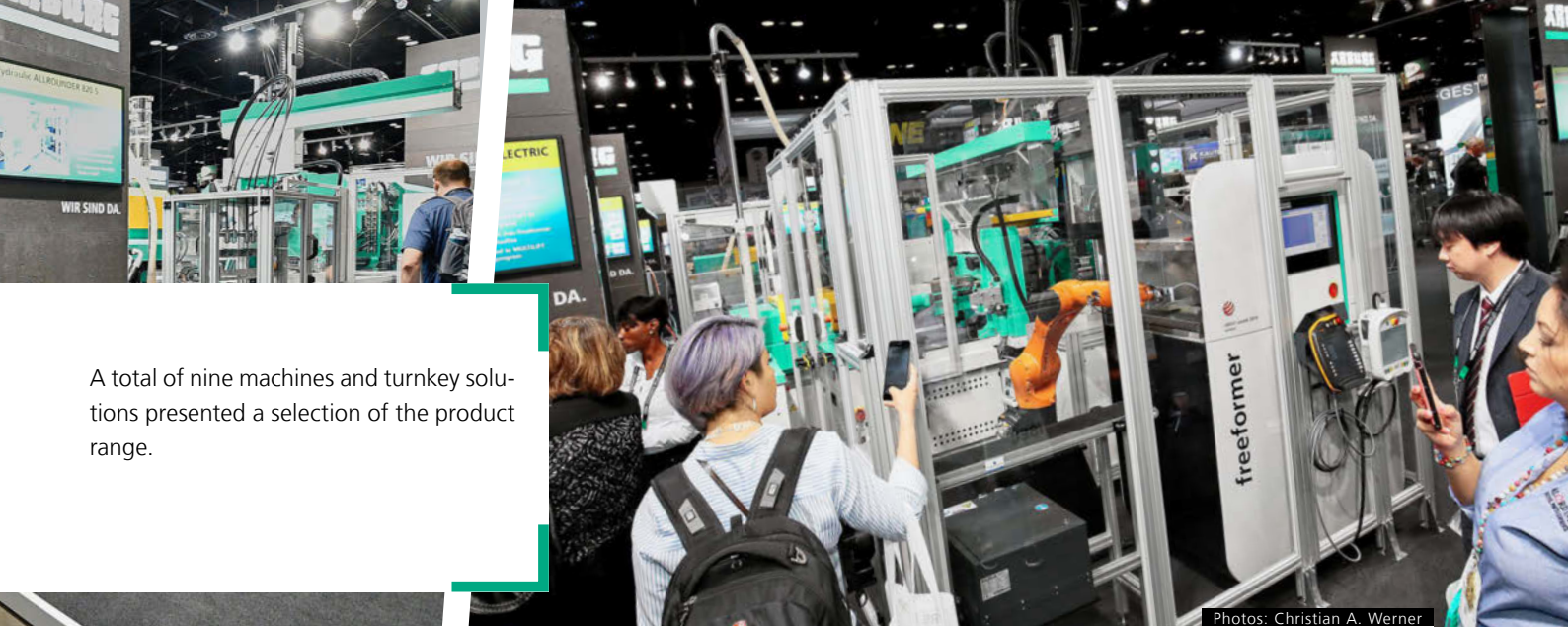
ARBURG's trade fair schedule was extremely full in the first half year of 2018. The Technology Days in March was followed by the Chinaplas and Hannover Messe in April as well as the NPE and Plast in May – plus numerous local trade fairs. The response was excellent throughout: machine premieres, innovative applications and turnkey solutions, as well as the topic of "Industry 4.0 and digitalisation" attracted trade visitors worldwide to the ARBURG exhibition stands.



Hannover Messe

At the industry's leading international trade fair in Hanover, Germany, the main focus at ARBURG was on "Connectivity". One highlight was the practical example of Industry 4.0: For the flexible production of individualised tension straps "on demand" from shot-to-shot, customer wishes were integrated into the injection moulding process online. Moreover, the free-former, the ARBURG host computer system (ALS) and further Industry 4.0 components were on show.





A total of nine machines and turnkey solutions presented a selection of the product range.

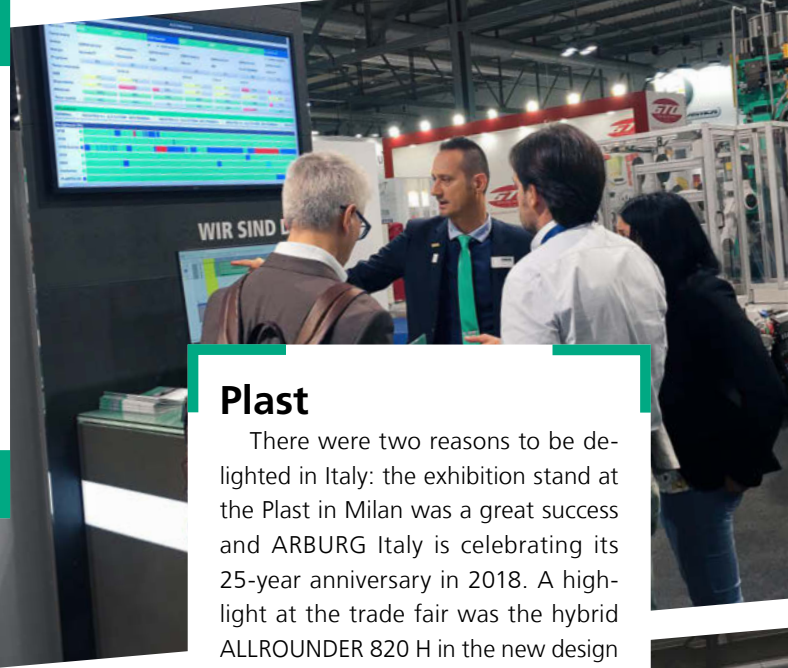
Photos: Christian A. Werner

Germany, Italy and the US



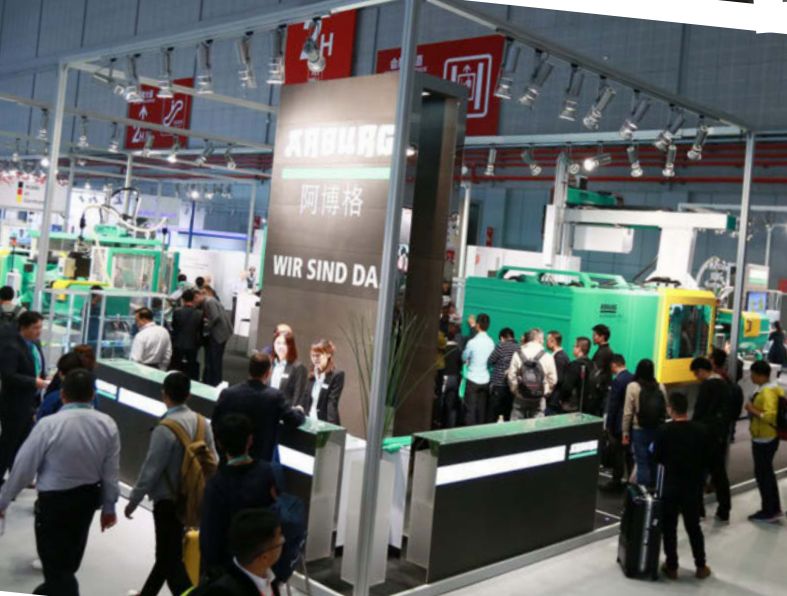
Chinaplas

The most important trade fair for the plastics industry in Asia was held for the first time at the new exhibition centre in Shanghai, China this year. ARBURG enlarged its exhibition stand significantly and presented five exhibits, including, for the first time, a large machine, the ALLROUNDER 920 S. Another highlight was the ProFoam physical foaming process for lightweight construction, which was also on view in Asia for the first time.



Plast

There were two reasons to be delighted in Italy: the exhibition stand at the Plast in Milan was a great success and ARBURG Italy is celebrating its 25-year anniversary in 2018. A highlight at the trade fair was the hybrid ALLROUNDER 820 H in the new design and with the forward-looking GESTICA control system, which was on show for the first time outside the ARBURG parent factory. The offerings relating to Industry 4.0, including the ARBURG host computer system (ALS), were also in demand.



Prod shor

Procter & Gam



Production-ready in a short time

Freeformer speeds up prototype production

The German Innovation Center (GIC) is the Procter & Gamble (P&G) hot-house for new ideas. At its Kronberg location in Germany, consumer products, e.g. for grooming and dental care are developed and brought to production readiness. Back in 2014, P&G was one of the first customers to work with ARBURG as a development partner in the field of additive manufacturing with the freeformer. One goal has been to significantly reduce the number of prototype moulds.

P&G has also been involved in the area of Additive Manufacturing (AM) in plastics processing since 2006. To date, design samples have mostly been produced using conventional AM processes, as well as robotic grippers for assembly and handling tasks within in-house production.

“At our Technical Center, we now have two freeformers in operation to manufacture functional prototypes from original materials,” explains Franziska Kaut, who plans to complete her dissertation on the topic of “Interfaces and fracture mechanical properties of additively manufactured parts” with the freeformer in 2018. “We

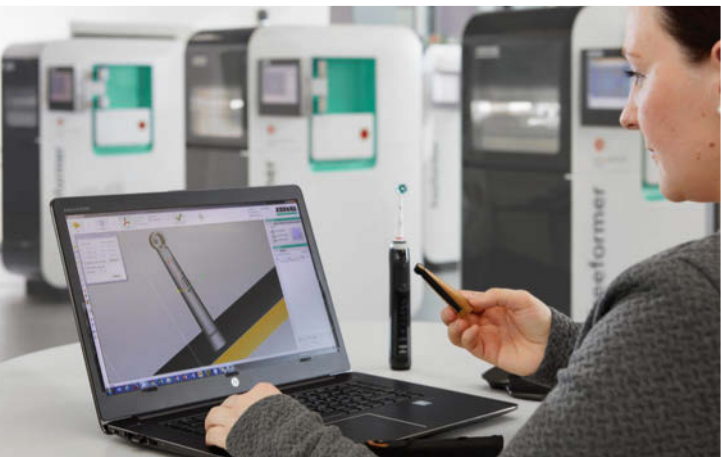
use special plastics which are FDA approved and chemically resistant for our shavers and electric tooth brushes, for example. From these, the freeformer produces functional parts, the mechanical properties of which we further optimise and investigate.” Using high-speed video, for example, the development engineer visualises how the melt temperature influences the droplet discharge and structural form.

Functional parts significantly optimised

To determine the tensile strength of test pieces, she has produced numerous CT scans and tensile specimens. Through process optimisations, she has succeeded in significantly improving the quality of parts made from original PP (Moplen). The result is a density of 99.8 percent and an improvement of the mechanical strength in the y build direction by around 30 percent. These values for additively manufactured parts with regard to the build-up in the y-direction correspond almost to that of injection moulded parts.

Previously, the GIC needed around 100 prototype injection moulds per year for the development of new products. Their production is not only costly, but also very time intensive. ARBURG Plastic Freeforming (APF) with the freeformer can contribute significantly towards speeding up the time from prototype to production part because constructive improvements, design optimisations and new ideas can be implemented immediately. This is because rather than building a mould or exchanging inserts, all that is required is

P&G development engineer Franziska Kaut worked with the freeformer in conjunction with her dissertation (left). During the development of a shaver cleaning system, for example, she significantly improved the quality of prototype parts thanks to process optimisations.



to generate a new STL file and read it into the slicing software.

Prototypes from original PP

A current example are parts for brush heads for electric toothbrushes. Here, the freeformer is used during the development of new products in order to produce initial prototypes for development testing. Like the “real” part, these must withstand high mechanical loads. “One successful project example is a prototype part in the cleaning station for electric shavers,” adds Franziska Kaut. “With the freeformer, we have speeded up the development time and produced functional parts from original PP and a special support material, which display the required mechanical strength and chemical as well as thermal resistance.” Because a shaver is made from up to 70 plastic parts and spare parts have to be available for ten years, additive production will in future also be an important topic with great potential for industrial additive manufacturing. “To begin with, we focused intensively on the fundamentals of the APF process and built up know-how in order to understand precisely how the system works. Now, we have reached a

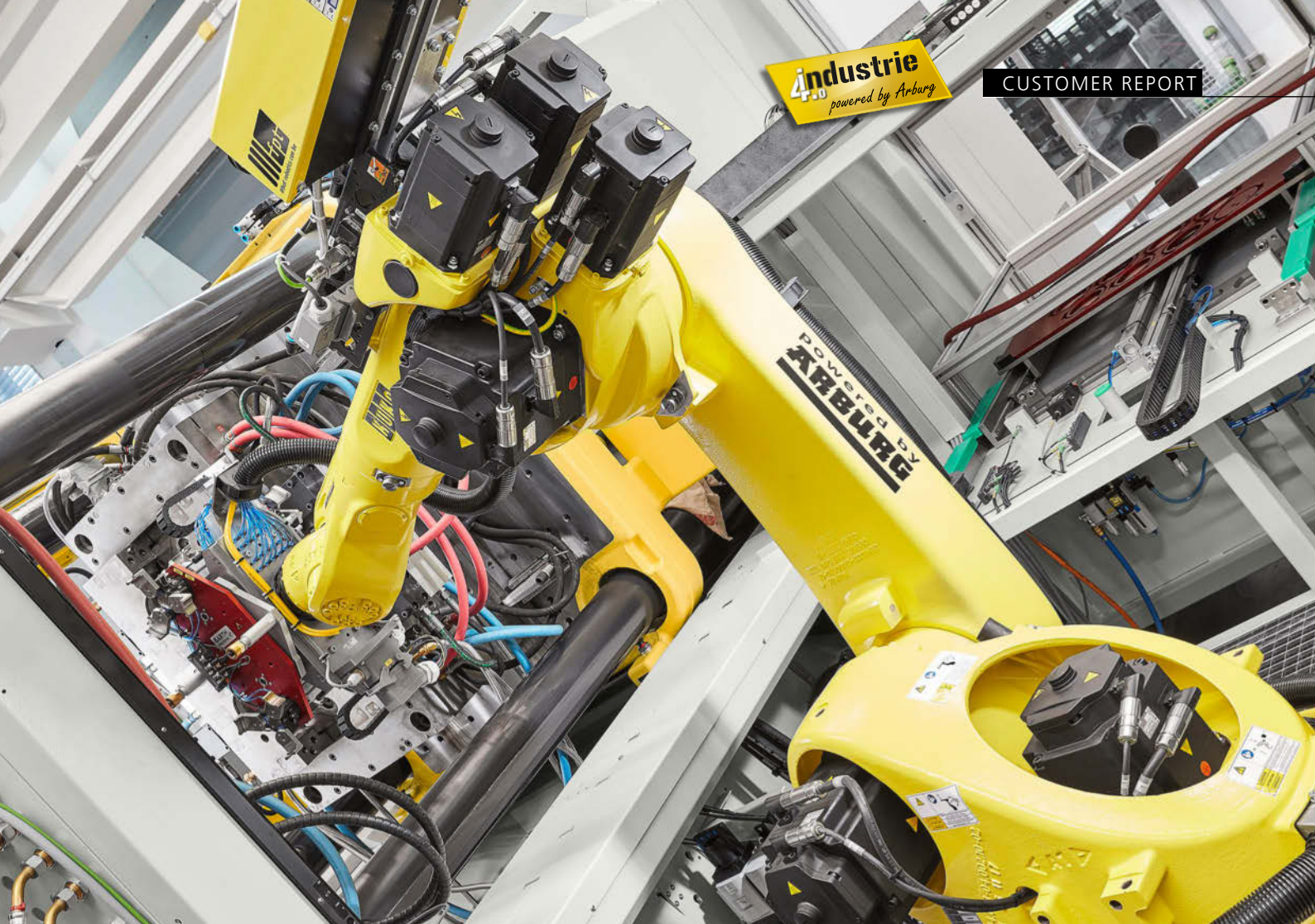
point where we can produce good parts with defined properties quickly using some of our original materials,” summarises Franziska Kaut. The initial objectives have thus already been achieved. She sees her next challenge in qualifying the material POM.

Kaut advises newcomers to begin with simple materials or gain process experience using the existing ARBURG material database. In future, joint development projects with ARBURG are intended to open up further fields of applications for the freeformer at P&G.

Examples in which the freeformer has been used for the additive manufacturing of functional prototypes made from original PP are brush heads for electric Oral B toothbrushes (left) and parts used in cleaning stations for Braun shavers (right).

INFOBOX

Name: Procter & Gamble German Innovation Center (GIC)
Location: Kronberg im Taunus
Divisions: Principally grooming, oral care, hair care
Employees: approx. 900 (GIC)
Brands: e.g. Braun® and Gillette® (shavers), Oral-B® (toothbrushes), Head&Shoulders® and Pantene® (shampoo)
Contact: <https://de.pg.com>



Light suspension

LKH: Turnkey system for traceable part variants

For the production of plastic components for an automotive air suspension system, LKH Kunststoffwerk Heiligenroth GmbH & Co. KG uses two flexible turnkey systems from ARBURG. These produce up to six part variants and, thanks to an integrated laser station, each part is traceable via an individual data matrix code (DM code).

As the centre of excellence for plastics of the Friedhelm Loh Group based in Haiger, LKH has its central manufacturing headquarters in Heiligenroth, Germany. Here, it produces plastic parts, not only for the companies within the Group such as Rittal, but also for its own customer portfolio. These include

renowned domestic and international buyers from the automotive, electrical engineering and machine manufacturing industries.

Specialist in GFRP

One of LKH's specialties is the processing of glass-fibre reinforced plastics (GFRP) for the production of high-strength parts for the automotive sector. Examples include air suspension system components for installation in luxury class vehicles.

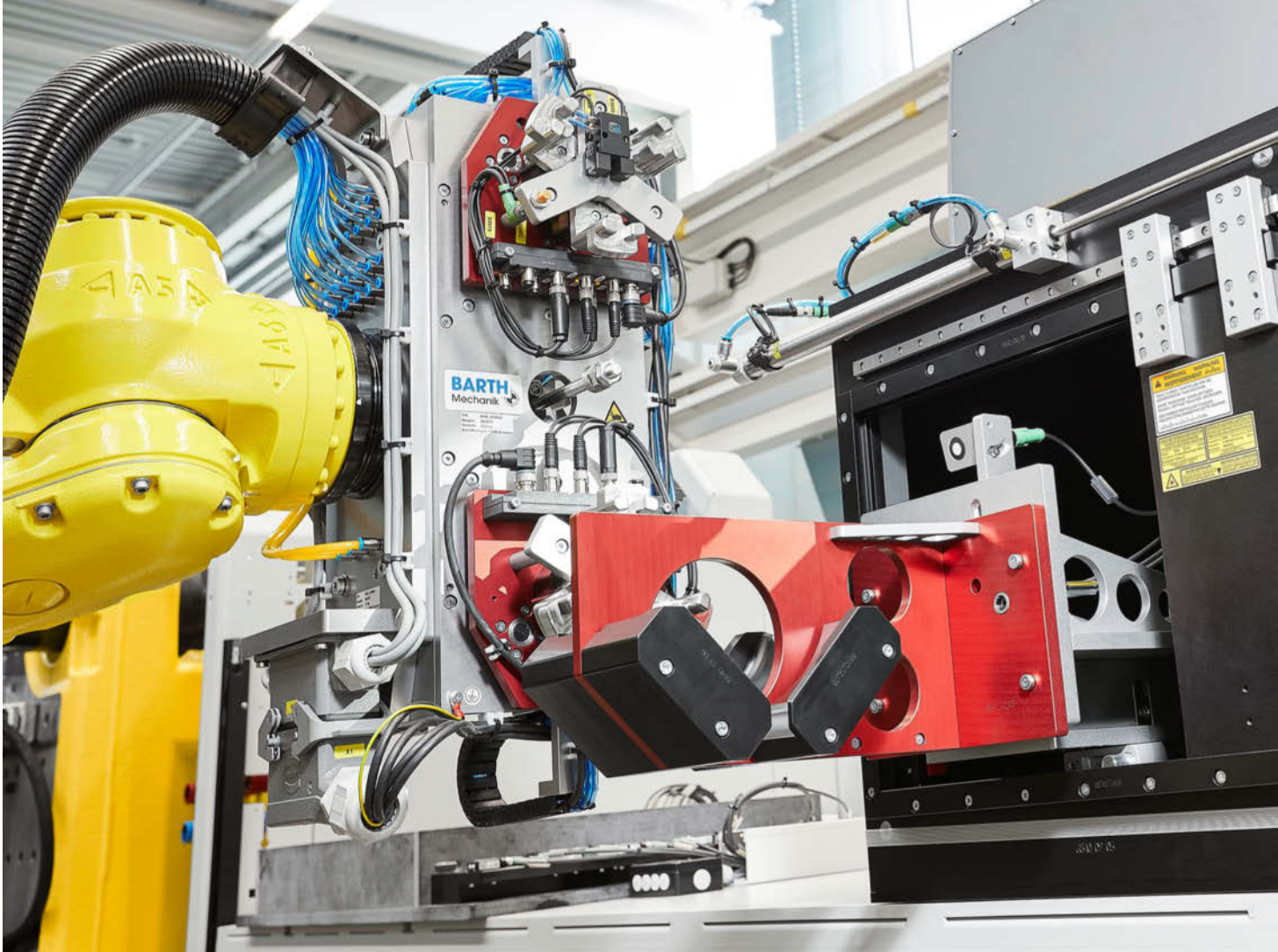
Two systems, six versions

For this purpose, LKH uses two identical turnkey systems to produce the six part vari-

ants in a flexible manner. These are air-spring pots and connectors with high wall thicknesses made from GFRP – partly with an aluminium flange or steel ring as a reinforcing insert.

The upper and lower air chamber pots, which also accommodate the switching valves, are supplied by LKH to an OEM, where the parts, together with further components such as bellows, are welded together to form the finished unit for delivery to the vehicle manufacturers.

Thomas Ritter, head of process management at LKH comments as follows on the turnkey systems: "In addition to the price/performance ratio, we were primarily interested in the automation and ergonomics of the systems during selection.



Automatability the main priority

Owing to the unit volumes required, we wanted to automate the production, which we would not have been able to achieve using conventional methods. With both systems, we produce semi-finished goods in a great variety of variants from polyamide with a high glass-fibre content." This and further requirements made collaboration with a primary contractor able to coordinate all aspects of the project and provide LKH with comprehensive consulting the ideal option, according to Ritter. "For these complex tasks, we found just such a contractor in ARBURG. And that the cooperation has worked out extremely well is evidenced by the fact that we've already ordered a further system with a larger injection unit after once again having elaborated a detailed benefit analysis with all the relevant departments," adds Thomas Ritter.

The turnkey systems were set up in a mirror arrangement in the machine hall. The parts are produced on hydraulic ALLROUNDER 920 S machines with a clamping force of 5,000 kN and size 2100

injection unit featuring highly wear-resistant screws. The entire part handling is performed by a six-axis robot on each machine.

Integrated application of the DM code via laser

After mould opening, the gripper of the six-axis robot first removes the finished parts from one of the mould halves. It then places the pre-heated inserts into the opposite mould half. Next, the robotic system ejects the sprues onto the conveyor belt in a defined pattern and transfers the finished parts to a laser station, where a DM code is applied and checked. In the meantime, the gripper picks up inserts from the drawer system and places them into the pre-heating station. Two pre-heated inserts are then picked up. The robot removes the finished laser-marked parts from the laser station and sets them down onto the conveyor belt.

The laser marking renders the parts uniquely traceable, which is compulsory in the automotive sector owing to liability issues. Furthermore, part production can



be clearly documented and thus automated via the MES system. Previously, the codes were applied to each part manually. Sophisticated sprue solutions are used in the moulds. In order to prevent any mix-ups, the grippers, which are adapted to the various moulds, are colour-coded.



Project manager Frank Lörchner (left) and process technician Dieter Schneider from LKH were already delighted with the high performance of the turnkey system during the acceptance process for the turnkey system in Lossburg. Their initial impressions have been confirmed in practice.

At the integrated laser station (top left), each moulded part receives an individual DM code (bottom left), rendering it traceable at all times.

mation because we're convinced that output and precision can be further increased in our high volume production. We will of course once again be talking to ARBURG in this regard."

Even greater automation in future

The entire removal, testing and set-down procedure takes place within the cycle specified by the injection moulding machine with a high level of process reliability and precision. The turnkey systems are designed for multiple operation.

Thomas Ritter sees even greater potential for further automation in the future: "We already have a large number of machines with robotic systems that remove and set down the parts, as well as linked systems, e.g. for the production of electric components with foamed-on seals. But we will be further increasing the level of auto-

INFOBOX

Name: LKH Kunststoffwerk Heiligenroth GmbH & Co. KG

Founded: 1983

Location: Heiligenroth, Germany

Industries: Automotive, electrics and electronics

Products: Technical components such as GFRP and flame-retardant parts

Employees: Approx. 200

Machine fleet: Approx. 50 injection moulding machines, of which more than 20 ALLROUNDERS

Contact: www.lkh-kunststoff.de

Our success stories

Subsidiaries: Inauguration and anniversaries celebrated in style



New location in Austria

On Friday, 9 March 2018, ARBURG officially inaugurated its new Technology Center (ATC) in Inzersdorf im Kremstal, Austria. With 100 guests in attendance, ARBURG Managing Partner Renate Keinath symbolically handed over the keys to Eberhard Lutz, Managing Director of ARBURG Austria.

“The inauguration of the new ATC is an important milestone for our presence in Austria and underscores the high importance of this very challenging market for us,” emphasised Renate Keinath in her inauguration speech. “In recent years, we have strengthened our Sales and Service team in Austria, and have successfully implemented numerous projects,” said

the Managing Partner. Next, ARBURG Managing Director Sales Gerhard Böhm turned his attention to the steadily growing customer base: “Across all industries in Austria, our entire portfolio is in great demand – increasingly also automation solutions and turnkey projects.” On an area of around 300 square metres, the new ATC offers the ideal conditions for expanding the technical consulting, spare-parts logistics and training offerings.

The Managing Director Sales also used the occasion of the inauguration event to announce a personnel change: “Effective from 1 July 2018, Oliver Giesen will assume the management of the Austrian subsidiary because Eberhard Lutz is going to retire. The new Managing Director of ARBURG Austria is a proven expert in injection

Oliver Giesen will be the Managing Director of ARBURG Austria from July 2018.



moulding and automation, and has been with the company for more than 30 years. He has successfully built up and developed the turnkey area and assumed the position of Sales Director Germany as successor to Eberhard Lutz back in 2017.”

25 years of ARBURG UK



Managing Partner
Juliane Hehl presents
the ARBURG anniversary
sculpture to
subsidiary manager
Colin Tirel.

On the occasion of its silver anniversary, ARBURG Ltd. organised a two-day event with around 90 guests. The evening event on 15 May 2018 was attended by Managing Partners Juliane and Eugen Hehl as well as Managing Director Sales Gerhard Böhm.

The beginnings of ARBURG's activities in the UK go back to 1967 when the first ALLROUNDER was sold to R A Labone. After many years of operating on the market via a trading partner, a fully-owned subsidiary was founded 25 years ago because both the market in the UK and Ireland, as well as ARBURG's share in them, had grown

significantly over the years. One milestone in the subsidiary's history was the construction of the ARBURG building in Warwick, in the opening of which Her Royal Highness Princess Anne participated as a representative of the British crown.

At the new location, the subsidiary was able to significantly expand its service offerings. The customers, who produce for the automotive, electronics, packaging and medical technology industries, range from locally-producing SMEs through to major global players with production facilities around the globe. These companies receive support from subsidiary manager Colin Tirel and his 25-strong team.

Ten years of ARBURG Mexico

On 10 April 2018, the Mexican ARBURG subsidiary celebrated its ten-year anniversary with around 150 guests. Also in attendance were Managing Partner Juliane Hehl and Managing Director Sales Gerhard Böhm.

ARBURG has been operating in Mexico since the 1980s. Initially, trading partners looked after the mainly domestic customers. Over the years, the plastics industry has been steadily growing and more and more international companies built production

sites in Mexico. Owing to the great market potential, ARBURG decided to found a fully owned subsidiary in 2008, the management of which was assumed by Guillermo Fasterling. Today, the ARBURG Team has 25 employees, who support customers from the automotive, electronics, toy and packaging industries from its Querétaro location.



Managing Partner Juliane Hehl congratulates
subsidiary manager Guillermo Fasterling on the
ten-year anniversary of the Mexican ARBURG
subsidiary.

Big numbers for the

Evenflo Mexico: ALLROUNDERS produce around the clock, 365

The Evenflo brand's excellent reputation as a manufacturer of baby care products is no coincidence: the company has been a member of the Kimberly-Clark de Mexico Group since 2012 and specialises in the manufacture of products for babies, including milk bottles and dummies. When it comes to injection moulding, the company relies exclusively on hydraulic and hybrid ALLROUNDERS.

The way sales have developed since the acquisition indicates that the merger has been a success: from 2012 to 2017, the market share of Evenflo products rose from 48 to 68 percent in Mexico alone. The market for Evenflo products covers Mexico, Central and South America and extends to the US and Canada.

Large hybrid ALLROUNDERS

The ALLROUNDERS are used in various areas at the Evenflo production facility. Flip-top closures for wet wipe boxes are produced for a number of Kimberly-Clark brands as conventional packaging articles on two large hybrid ALLROUNDER 720 H and 920 H machines. Moreover, eleven hydraulic ALLROUNDERS are used to manufacture various LSR products, as well as parts made of PP and different copolymers for baby bottles. Due to hygiene requirements, the LSR machines produce in clean rooms.

Furthermore, Evenflo produces blow-moulded parts such as baby bottles, which are printed, for example with Disney motifs under licence, and assembled in a highly automated downstream production area.



Photo: Evenflo

Multi-cavity moulds, most of which feature hot-runner systems, are used exclusively on the ALLROUNDER machines. The PP screw closures of the baby bottles are produced, for example, on 16-cavity and the flip-top lids on 24-cavity hot runner moulds. In order to increase output, the two large hybrid machines are equipped with stack moulds. Benjamin Cardoso, Operations Manager at Evenflo Mexico, is delighted with the performance of the 13 ALLROUNDERS: "The ARBURG

machines are among the fastest and most efficient injection moulding machines on the market and also have an excellent price/performance ratio."

The cycle times for the screw closures and the flip-top lids are around 14 seconds.



little ones

days a year

The ALLROUNDER 920 H (left) offers sufficient space for displaying important production information.

In addition to flip-top lids for wet-wipe boxes, Evenflo also produces a variety of baby bottles (bottom).

Fast and efficient

The daily production volume for the closures is 100,000 units and 150,000 units for the flip-top lids. The LSR dummies, which are also available in a special anatomical form, are produced on hydraulic ALLROUNDERS. Most of the moulds from Emde have 16 cavities and are equipped with special cold runner nozzles. A silicone dosing system from Elmet is also used. The daily production volume is around 32,000 parts at a cycle time of around 16 seconds. "In order to offer Evenflo turnkey LSR sys-

tems, all components have been specially optimised and matched by ARBURG," explains Pedro Mora, Sales Adviser at ARBURG S.A. de C.V. in Mexico.

According to Benjamin Cardoso, in addition to the technology, it is particularly the personal contact between the Evenflo specialists and ARBURG Mexico that is valued with regard to the cooperation, which has existed since 2006: "That's also why we can afford to have our machines producing around the clock, seven days a week, 365 days a year. In the pre- and after-sales sector, too, we feel in safe hands with ARBURG. All our questions are answered promptly by the Technical Service or Application Technology departments.

This means that we usually obtain comprehensive solutions in response to the first enquiry."



INFOBOX



Name: Evenflo Mexico, S.A. de C.V.

Founded: 1920 in the US, in Mexico since 1956

Location: Cuautitlán Izcalli, Estado de México as one of eleven locations belonging to Kimberly-Clark de Mexico

Production area: 5,900 square metres plus 9,600 square metres of warehouse space

Industry: Baby care

Products: Bibs, carriers and walking aids, bottles and dummies, sterilisers, bottle warmers, cups and toys, as well as flip-top lids for wet wipe boxes

Employees: 400

Machine fleet: 13 ALLROUNDER injection moulding machines with clamping forces from 70 to 5,000 kN

Contact: www.evenflofeeding.com.mx



TECH TALK

Oliver Schäfer, Technical Information



More added value

Cost-effective, multi-variant, high-volume production

Increasing variant diversity, shorter product life cycles, growing desire for individualised products: The cost-effective, serial production of plastic parts in small unit volumes down to single-unit batches is one of the challenges currently facing the injection moulding industry. This requires highly flexible automated production “on demand”. Just how this can be achieved is demonstrated by the example of a smart turnkey system for producing elastic tension straps in a number of variants.

The starting point for the most flexible production possible is the integration of customer wishes, online in the running injection moulding process. How this can be implemented in practice has been demonstrated by ARBURG on an Industry 4.0 example of a “tension strap”. Here, the

combination of length/colour and end-pieces (hooks or eyelet) is freely selectable. The relevant desired variant is entered via a terminal on the production cell. This order data is transmitted directly to the central SELOGICA control system via OPC UA.

Flexibly automated production

In the following cycle, the process sequence is already adapted and the required product is manufactured “on demand” by the turnkey system using a vertical ALLROUNDER 375 V – flexibly, from shot-to-shot, without any need for conversion. For this purpose, the elastic strap is cut to the selected length from a roll and the ends are spliced using a plasma process. The automated preparation of the various inserts is performed by a suspended six-axis robot. This is ideal for the flexible handling of the flexible parts, while also offering high func-

tionality in a confined space. This makes it possible to integrate the complete automation solution compactly within the machine installation space. Compared to a solution using linear robots, the space requirement for the turnkey system was almost halved. At the same time, a change of location is significantly simplified as alignment of the individual components can be dispensed with.

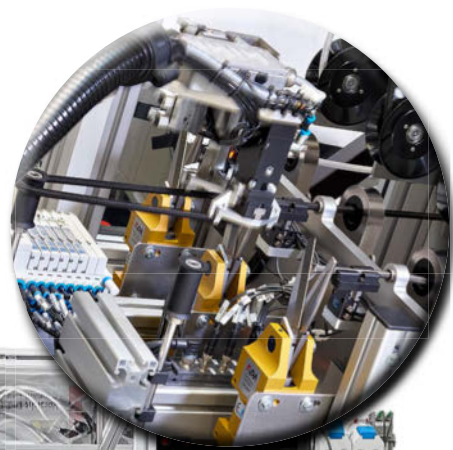
Versatile overall concept

The selection and arrangement of the automation solution also offers further advantages: because the robot enters the mould from the rear, the mould area is freely accessible from the front. This means that the vertical machine can additionally be used for manual operations. Production processes, for example, can run manually during the day shift and then in a highly

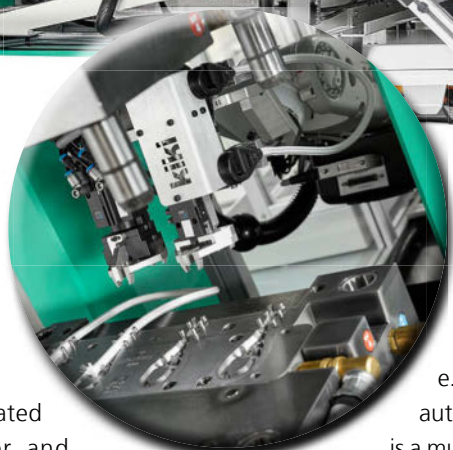
1



2



4



3



automated manner – and consequently un-manned during the night shift.

New variant from shot-to-shot

For variant changes without conversion, a combination mould with four cavities is used: two for the eyelets and two for the hooks.

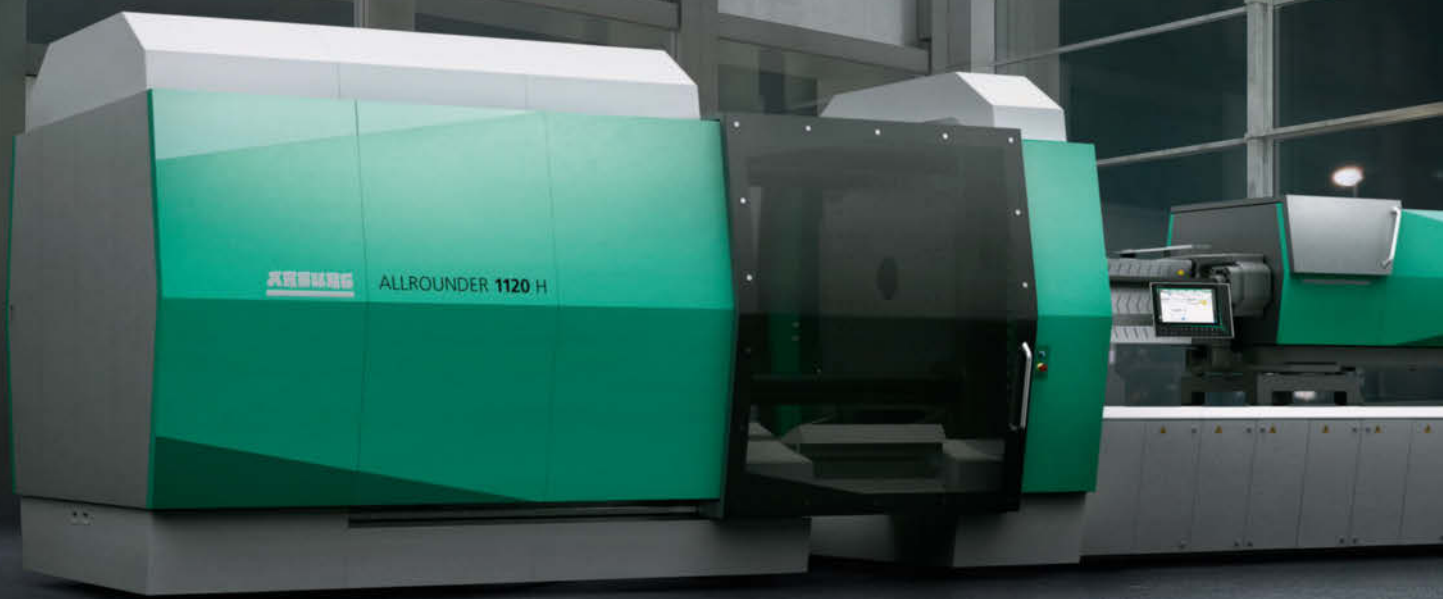
The strap ends are placed into the relevant cavities, which are actuated via the SELOGICA for overmoulding by means of hot-runner nozzles. The finished tension strap is then taken out of the mould by the robot and removed from the system.

Rather than producing plastic parts in large unit volumes, the efficient implementation of multi-variant series will be of increasing importance in the future –

e.g. for cable assembly in the automotive industry. Flexibility is a must here. Ingenious concepts for product design, mould and automation are just as important as comprehensive data exchange and the integration of customer wishes into the manufacturing process. The example of the “tension strap” demonstrates the significance and potential of Industry 4.0 in a highly practical manner.

During manufacture of the individual tension strap variants, the customer wishes are entered online (1), the strap is cut accordingly (2) and its ends spliced using a plasma process (3). After insertion into the mould (4), the ends are finally overmoulded with the selected end pieces.

INTUITIVE AND SMART
FAST AND PRECISE
ERGONOMIC AND FUNCTIONAL
**LARGE AND
EFFICIENT**
APPEALING AND EMOTIVE
VISIONARY AND BOLD
POWERFUL AND DYNAMIC



WIR SIND DA.

Large and efficient? It's possible with us! Our ALLROUNDER 1120 H combines electric speed and precision with hydraulic power and dynamics. And with our innovative GESTICA control system, operation is even more intuitive and smarter – this is high-end technology that's fun to work with!

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