

today

The ARBURG magazine

Issue 65

2017





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IMPRESSUM

today, the ARBURG magazine, issue 65/2017

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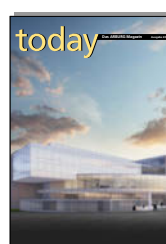
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Investing in the future: For its new training centre at the Lossburg location, which is set to open in spring 2020, ARBURG is investing a double-digit million euro amount.

ARBURG



Dear readers,

Successful entrepreneurship always means striving for growth. This growth needs to be meaningful, targeted and sustainable – with an aim to actively securing the future.

And this is what we have always done – in every domain. We have been developing our international sales and service network on an ongoing basis for decades. In 1992, we were particularly active in this regard and established fully owned ARBURG organisations in no less than four countries. And the fact that we definitely made the right move is evidenced by the four 25-year anniversaries that we are celebrating around the globe in 2017. In this issue of “today”, we report on the events in Belgium, China and Malaysia, the report on Poland will follow in the next issue.

We also continuously invest in our Lossburg headquarters. Here, in addition to production, customer support plays a vital role. We have been building, virtually

without interruption, for ten years. In 2007, the ground-breaking ceremony was held for the Customer Center and in July 2017, the foundation stone was now laid for our new training centre.

It is extremely important for us that you know our products in great detail to get the maximum out of them and produce in a highly efficient manner. For this purpose, our experts are glad to pass on their knowledge of the machines and robotic technology, materials and service to you. Find out about the advantages that the new training centre will offer you in this issue.

Furthermore, a variety of companies have once again allowed us to take a peek behind the scenes. The result: a colourful mix of exciting reports.

We hope you enjoy reading our “today”.

Juliane Hehl
Managing Partner

Foundation for the

New training centre: ARBURG invests double-digit million euro

In July 2017, ARBURG celebrated the foundation stone-laying ceremony for its new training centre. With this new multi-storey building at the central location in Lossburg, Germany, ARBURG is primarily investing in the future of its customers.

“To offer existing and prospective customers an even better instruction and training environment, we are investing a double-digit million euro amount to build a new training centre,” explains Managing Partner Michael Hehl, who is responsible for plant development.

Demand for training is increasing

The spectrum of ARBURG course offerings is diverse. The subjects range from machine and robot system technology and application technology through to service. Ten thousand specialists received training last year – and demand is increasing continuously. This does not only apply to the participants from Germany. Customers from abroad are also increasingly taking advantage of their visits to Lossburg to attend training courses in addition to their machine acceptance activities. Consequently, the team of instructors has not only been expanded, but the number of languages on offer is also increasing.

Courses on theory and practice

The training centre will cover a useful floorspace of 13,700 square metres and is scheduled to open its doors in spring 2020. For practical training courses, the ground floor will provide space for around



future

figure



15 ALLROUNDER injection moulding machines and the freeformer additive manufacturing system. Twelve rooms will be available on the first floor to provide customers with theoretical training. The three further floors are intended for the administration.

Functional, aesthetically appealing, efficient

In architectural terms, the training centre will resemble the Customer Center inaugurated in 2009. In addition to functional and aesthetic considerations, environmental protection and the conservation of resources are an important focus for ARBURG in all of its activities.

ARBURG Managing Partners Eugen Hehl, Juliane Hehl, Michael Hehl and Renate Keinath (from left to right) celebrate the foundation stone-laying ceremony for the new training centre. Here, a stainless steel capsule containing historical materials was embedded in the concrete.

Examples include the double-glazed facade, which meets with the latest requirements of the German Energy Saving Ordinance, the proven concept for building climate control utilising low temperatures and full air-conditioning, as well as the use of rainwater and waste and surplus heat from production to keep the outdoor areas in front of the building free of ice and snow in the winter.

Evidence of long-term strategy

"This new building represents a further clear commitment to our production location in Lossburg, the total usable floorspace of which will be extended to 180,000 square metres. Here, we have invested a three-digit million euro figure in new buildings alone over the past ten years. This evidences our long-term and target-oriented strategy," emphasises Michael Hehl.

Construction of the new training centre (top left photo) was officially started with laying of the foundation stone (photo on left).

This fine tradition is intended to bring good luck to the building and ensure its permanence. A further aim is to convey interesting information on the life and activities of their predecessors to future generations. For this purpose, the stainless-steel capsule embedded in the concrete contains a variety of historical material (top right photo).



System solutions fo

Jay Precision: GOLDEN EDITION produces inhaler components in

Indian company Jay Precision Products India Pvt. Ltd., places a particular focus on complete solutions for the medical technology sector. One key area here are products for asthma therapy. “We want to help people breathe more easily,” is the creed of this company, which produces many parts of its inhalers on ALLROUNDERS.

With hydraulic, hybrid and electric ALLROUNDERS, as well as vertical machines, the machine fleet at Jay Precision includes virtually the entire ARBURG machine range. The application spectrum is equally broad, including injection compression moulding, multi-component injection moulding and LSR processing. “We can use the ALLROUNDERS in many different ways and they offer us a high degree of flexibility in the area of process optimisation. Moreover, the SELOGICA control system not only enables easy operation, but also process data acquisition and traceability, which are particularly important in medical technology,” explains company founder Xerxes Rao.

He emphasises the significance of the ALLROUNDER GOLDEN EDITION series for his production: “At our plant, most of these hydraulic machines are equipped with the productivity package and, thanks

to variable-speed pump drives and water-cooled motors, they make a significant contribution to reducing energy requirements and noise levels. And all this at an outstanding price/performance ratio.”

GOLDEN EDITION in the clean room

“Thanks to the low dust, noise and heat emissions, use of these machines is possible for clean-room production. We produce the inhaler receptacles, for example, exclusively on GOLDEN EDITION ALLROUNDERS,” adds Xerxes Rao. Jay Precision has automated almost all of its injection moulding machines with three-axis robotic systems for removing and setting down the parts.

The robots on the ALLROUNDER GOLDEN EDITION machines are additionally equipped with HEPA filters to enable transport of the moulded parts to a class 10.000 clean room.

Everything from a single source

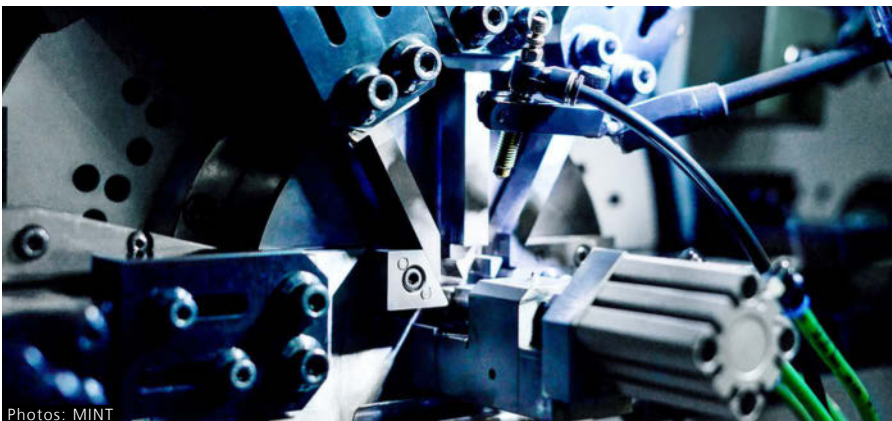
In most cases, manufacture of the customer products takes place completely at Jay Precision premises, as Xerxes Rao explains: “We produce all of the moulded parts using one to 96-cavity, full hot runner moulds from our own mould construction shop. After the injection moulding process, the items are transferred to fully automated assembly lines that we develop on a part-specific basis and which we nearly always build here in-house. Depending on the product requirements, production and assembly take place in clean rooms of different classes. In the end, our customers receive the complete components from us.”

The first ARBURG machine was integrated into the production facility at Jay Precision in Mumbai in 2007. Today, a total of 40 ALLROUNDERS are in operation here. With three seconds, the electric ALLDRIVE machines achieve the shortest cycle times. The shot volumes for the product range vary from just a few grams to around 200 grams.



r easy breathing

clean room



Photos: MINT

The materials used to produce the inhalers are engineering polymers, ABS, PP, PC and acetal.

Machines and service impress

Satisfaction with all the ALLROUNDER machine series used at Jay Precision is very high, as Xerxes Rao points out: "The ALLROUNDERS provide us with the high-end technology that we need, particularly for the medical technology sector. All machines are in operation 24 hours a day, 7 days a week. Furthermore, the application technology consulting that ARBURG provides in the areas of mould design and processing technology, has always been very helpful for our projects, for example during the injection compress-

sion moulding of special LED lenses. And then there's the first-class service that ARBURG's trading partner UNIMARK provides, so that we feel very well supported all-round. Moreover, our overall operating costs also remain in check because we can handle a wide range of materials on our ALLROUNDERS without the need for technical modifications."

The high clean-room production class is also demonstrated by the protective clothing worn by the personnel (top photo). Jay Precision not only produces complete products such as inhalers (bottom photo), but also injection moulds (centre photo).

INFOBOX



Name: Jay Precision Products India Pvt. Ltd.

Founded: 1989

Locations: Six in the greater Mumbai area, two more in Goa and one in an economic zone in northern India

Production area: 100,000 square metres

Divisions: Complete solutions, mould construction, jig manufacturing

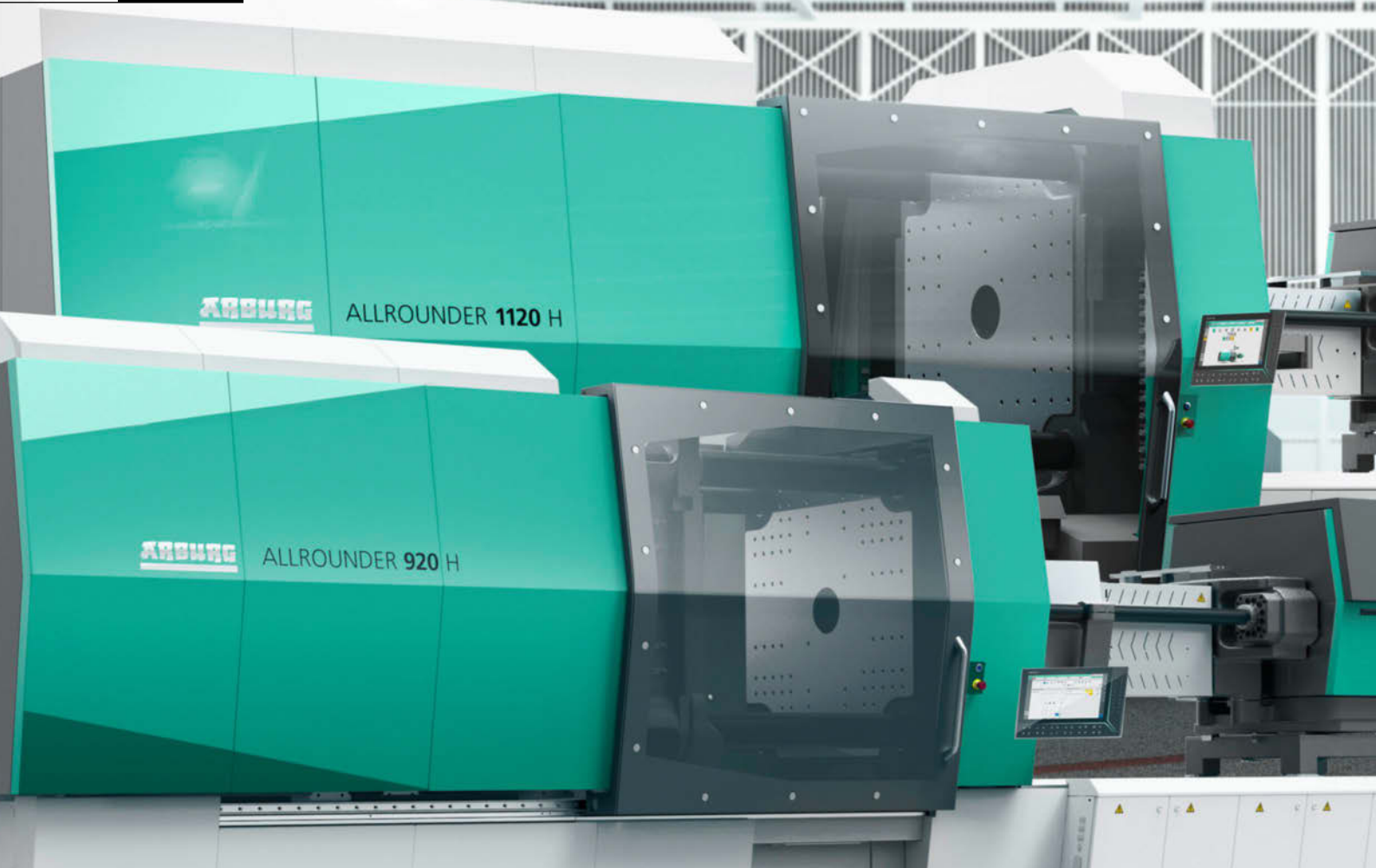
Industries: Medical technology, lighting, toys

Employees: 600

Turnover: Approx. 25 million euros (2016)

Machine fleet: 108 machines with clamping forces from 400 to 2,000 kN, including 40 ALLROUNDERS

Contact: www.jayprecision.com



Big appearance!

Fakuma 2017: New ALLROUNDER 920 H and “smart” practical so

For ARBURG, the Fakuma in Friedrichshafen, Germany, has a very special meaning. As the largest exhibitor and co-founder of this successful trade fair, which is celebrating its 25th anniversary in 2017, ARBURG is focusing on “smart” and practical solutions for production-efficient plastic part production with its ten exhibits.

The highlight of the exhibition stand are the ground-breaking large machines. The ALLROUNDER 1120 H with a clamping force of 6,500 kN celebrated its world premiere at the K 2016. At the Fakuma

2017, the next steps now follow: The global sales launch of the ALLROUNDER 1120 H and the introduction of the hybrid ALLROUNDER 920 H in a new design and with the new GESTICA control system.

Design and control system for the future

In addition to its aesthetic appeal, modern colour scheme and shape, the new design provides for enhanced functionality and significantly improved ergonomics. The innovative GESTICA control system features a high-resolution full HD screen and uses industrial multi-touch technology

to reproduce the “look and feel” of smart mobile devices (see interview on page 11).

Two large ALLROUNDERS are also integrated in production cells so that these exhibits also demonstrate ARBURG’s competency in the turnkey sector.

The turnkey system built around the ALLROUNDER 1120 H produces the well-known folding step stool in the ARBURG design, fully automated in a cycle time of 60 seconds. The eight individual parts are removed by a linear MULTILIFT V 40 robotic system and assembled ready-for-use with the aid of a six-axis robot and an assembly station. A further example of a turnkey project and of ARBURG’s



olutions

long-standing expertise in the processing of liquid silicone (LSR) is the automated production of LSR/LSR wristwatches.

New practical example of Industry 4.0

As a pioneer of "Industry 4.0", "digital transformation" and the "smart factory", ARBURG is presenting a new practical example at the Fakuma, in which customer requirements can be integrated into the running injection moulding process online.

During the manufacture of bungee cords, visitors can select both the length of the cord, as well as the combination of end pieces (hook/hook, hook/eyelet,

eyelet/eyelet) that are moulded onto the cords.

This application demonstrates the integration of IT solutions into the production process and the flexible manufacture of single-unit batches, which is predestined for cable assembly in the automotive industry.

The "smart" solutions from ARBURG also include the ARBURG host computer system (ALS) as an important component for IT-networked production for the purpose of Industry 4.0. A further component is the remote maintenance tool, which enables fast, efficient and reliable online support. Furthermore, the injection moulding

Highlights of the Fakuma 2017:
 After the ALLROUNDER 1120 H comes the ALLROUNDER 920 H in a new design and with the new GESTICA control system (photo on left).
 The freeformer processes PP and a specially developed support material (photo on right).



4.0 *industrie*
powered by Arburg



In the new Industry 4.0 example, bungee cords of varying lengths are overmoulded with different end pieces as single-unit batches (photo above). The Turnkey system built around the ALLROUNDER 1120 H produces the ready-to-use ARBURG folding step stool (photo on left).

machine is equipped with a service router and an integrated firewall.

freeformer processes PP for the first time

The processing of PP and the corresponding support material armat 12 in industrial additive manufacturing is being premiered at the Fakuma. Here, a freeformer produces complex functional parts from the semi-crystalline material using the water-soluble support material which has been specially developed for this purpose.

The fact that the freeformer is an open system gives independence to users. They can, for example, qualify their own original materials, for example those used for injection moulding, and optimise process parameters to the application at hand (see Tech Talk, page 26).

Further exhibits demonstrate the high-speed production of thin-walled IML items on an ALLROUNDER 570 H in the "Packaging" version and the injection moulding of precision parts on an ALLROUNDER from the electric entry-level GOLDEN ELECTRIC machine series.

A detailed overview of the Fakuma exhibits is available on the ARBURG website (www.arburg.com/info/fakuma2017).

Anniversary: 25th Fakuma

In 2017, the Fakuma in Friedrichshafen celebrates its 25th anniversary. ARBURG Managing Partner Eugen Hehl still remembers its beginnings well: "As an exhibitor of the first hour and co-founder, so to speak, the Fakuma was very close to our hearts from the outset. When Paul E. Schall first proposed his idea, the concept



of the trade fair convinced me immediately: practical relevance and professional competency with an almost family-like atmosphere and a strategically convenient location. Consequently, the Fakuma is highly significant for our customer contacts."



Really smart!

Gerhard Böhm and Heinz Gaub: GESTICA – our control system for the future

At the K 2016, the new GESTICA celebrated its big premiere as the control system for the future. In an interview with the “today” editorial team, Managing Directors Gerhard Böhm (Sales) and Heinz Gaub (Technology & Engineering) provide an outlook.

today: The GESTICA control system was launched a year ago at the K 2016. What happened next?

Gaub: The GESTICA, just like the ALLROUNDER 1120 H, was intensively prepared for the start of the pilot series this year. In order to meet the difficult challenge of lending our control system of the future the “look and feel” of smart mobile devices, we also brought external GUI (graphical user interface) designers on board as experts.

today: What precisely does GESTICA offer?

Gaub: Fundamentally, the aim is to integrate operating gestures into the machine control system to make operation more intuitive and efficient. With the EASYslider, movements can be simply and precisely controlled and displayed via variable-colour LED technology during setup. Acceleration and deceleration can be controlled with a “swipe of the finger”

along a bar at the edge of the touch-sensitive screen. Further highlights include the high-resolution full HD, 16:9 screen, the industrial multi-touch technology and the ergonomically inclined, pivoting and height-adjustable operating panel.

today: Does this mean that the operator has to readjust completely with regard to the control system.

Böhm: No, not at all. GESTICA is based on SELOGICA, but can be operated even more easily and intuitively, in other words: it’s smarter. Customer feedback at the K clearly showed that those already familiar with SELOGICA will also be able to reliably operate GESTICA. What’s important in this context is that the data sets of our control systems are fully compatible with one another and the hierarchical structure and graphical programming system remain unchanged.

today: Does GESTICA have all the capabilities of SELOGICA?

Gaub: It will in the medium term, yes. However, implementation of all the SELOGICA functionalities requires time and will take place thoughtfully step-by-step.

Böhm: We’re not rushing anything. We prefer to take a cautious approach for the benefit of our customers. This is more important to us than a fast transi-

With the GESTICA control system, reliable and efficient operation are the highest priority for Managing Directors Gerhard Böhm (on left) and Heinz Gaub.

tion, especially as SELOGICA remains an up-to-date control system that offers all the possibilities.

today: What does this mean for customers?

Böhm: In principle, any machine that’s been converted to the new design can optionally be equipped with the GESTICA control system. For this purpose, we’re presenting an ALLROUNDER 920 H at the Fakuma 2017 for the first time. For customers who prefer to have this machine with the full scope of SELOGICA functionalities, we’re offering an interim solution.

today: What does this consist of?

Gaub: We’re equipping the SELOGICA system with an operating panel similar to the GESTICA version. So the machine is equipped with a SELOGICA system featuring the full range of functions “in the guise” of GESTICA.

Böhm: This way, our customers have the assurance that they can always fully exploit the potential of their ALLROUNDER in the new design.

Foaming made easy

Pöppelmann: Frank Schockemöhle reports on the advantages of



Pöppelmann GmbH & Co. KG, based in Lohne, Germany, is a long-standing ARBURG customer and expert in the field of physical foaming. Since 2017, the ProFoam process has been in use for manufacturing lightweight parts. In the interview, Frank Schockemöhle, Head of Development at Pöppelmann K-TECH®, explains the benefits and application range of ARBURG's physical foaming process.

today: What role does the ProFoam process play at Pöppelmann?

Schockemöhle: For us, ProFoam is a key technology. Today, it has advanced so far that we have integrated it into our everyday injection moulding production. Like the other lightweight construction processes, we have developed ProFoam on a holistic basis with regard to part design, simulation, mould design, material selection, machine, process control and testing technology.

today: You've been using the MuCell process for some time now. Recently, you also introduced the ProFoam process. How do the two differ?

Schockemöhle: As always, both processes have their specific advantages. ProFoam is particularly well-suited for technical functional parts. A big advantage here is that standard screw geometries can be used. This means that the process can also be employed with small screw diameters and part volumes.

Frank Schockemöhle, Head of Development at Pöppelmann K-TECH® is enthusiastic about the potential of the ProFoam process.

the ProFoam process



Photos: Pöppelmann

During the physical ProFoam foaming process, the plastic material is already mixed with a gaseous blowing agent in a granulate lock upstream of the injection unit.

need to be taken into account. The disadvantages, however, include increased streak formation on A-category visible parts and difficulties in complying with the UL94 standard for components with fire prevention equipment.

today: How do the material, design and surface finishes affect the quality of the part?

Schockemöhle: Without the appropriate part design and the selection of material adapted to the process being used, high-quality parts can only be manufactured in a process-reliable manner to a limited extent. The surface texture of the moulds has a significant influence on the surface quality. Here again, the key word is "streaking".

today: What needs to be taken into account during mould design and processing?

Schockemöhle: The mould design is the same for all physical foaming processes. Today, the moulds are so sophisticated in process engineering terms that they can be used routinely for high-volume part production.

today: In your opinion, where is there the greatest demand for lightweight parts currently and in the future?

Schockemöhle: With lightweight construction processes, the aim is to reduce part weight while ensuring the same or

better mechanical properties. Lightweight construction is seen as a problem solver in many industries – from transport and logistics through to medical technology, packaging and facility management. Currently, we're observing significantly higher demand, particularly in the automotive industry, where we are increasingly using the ProFoam process.

The processing of shear-sensitive materials is also possible without difficulties. These benefits are offset by increased gas consumption in the case of larger parts due to the lock technology. With MuCell, there is no limit to machine size and the gas consumption is also lower. Owing to the screw geometries, the use of MuCell on smaller machines, however, is not meaningful.

today: How cost-effective is physical foaming compared to the standard processes.

Schockemöhle: Cost-effectiveness always depends on the part being produced. In the ideal case, the size of the machine can be halved by using the right process. Adapted part design can achieve weight reductions of between ten and thirty percent. Foaming with ProFoam or MuCell can achieve a further seven to twelve percent. Then, finally, the fewer adaptation requirements on the machine owing to the lower distortion tendency

INFOBOX

Name: Pöppelmann GmbH & Co. KG

Founded: 1949

Locations: Three in Germany, one in France and one in the US

Production area: Germany 128, 300 square metres, France 10,000 square metres, US 14,390 square metres

Employees: approx. 2,000

Industries: Renewable energies, mobility, machine and equipment manufacturing, industry, food, cosmetics, medicine and pharmaceuticals, as well as commercial horticulture

Products: Plastic protective elements, plastic technical injection moulded parts, functional parts and plastic packaging, plastic plant pots and propagation systems

Machine fleet: Approx. 550 with clamping forces from 100 kN to 9,000 kN, of which approx. 310 ALLROUNDERS

Contact: www.poeppelmann.com

Open system, fully exploited

TE Connectivity: freeformer extends range of materials to include

TE Connectivity's activities in the field of additive manufacturing are concentrated in the Netherlands. The manufacturer of high-performance parts for connectors is continuously expanding this area, relying on its innovative strengths and high technology. Since the end of 2016, the experts at the Den Bosch location have been operating a freeformer and intensively familiarising themselves with ARBURG Plastic Freeforming.

Since purchasing its first 3D printer in 1987, TE Connectivity has primarily used additive manufacturing to shorten the time from prototype to production maturity and reduce design and mould costs. Material consumption is reduced compared to

machining, as is part weight. Moreover, an important aspect is the ability to integrate more functionality into the product through complex design and reduce the amount of assembly required.

Wide range of materials

The freeformer and ARBURG Plastic Freeforming (APF) have another big advantage. The open system processes qualified standard granulates which are the same as those used for conventional injection moulding, enabling the use of a wide range of potential materials. The expectations are correspondingly high: "We have now invested many hours in understanding the APF process with a view to optimising new

materials and setting the right focus", reports Peter Okkerse, who is responsible for Advanced Manufacturing Technology at TE Connectivity. "Initially, we found it hard to really make the most of the numerous options offered by the open system. But the greater the progress we make, the more excited we are about the freeformer. This is one of the best systems in the industry."

Fully functional parts

The company's goal is to use additive manufacturing to produce fully functional parts from a wide range of technical plastics. Materials already processed include ABS, PC/ABS, PC, ASA, PA4, PA10, PA666, TPU and TPE. Primarily, prototypes for functional tests, assembly devices, robotic grippers and design samples are manufactured additively from these materials. In order to produce delicate, thin-walled parts, the process was optimised to real-





technical materials



Photos: TE Connectivity

ise a layer height of just 100 micrometres using a reduced droplet volume.

Own APF materials

“We’re working closely with raw material suppliers and the ARBURG experts to further develop the APF process and qualify our own materials,” says Peter Okkerse. The latest developments are towards high-temperature materials.

Materials such as PEI, PBT, LCP, PA6 and PA4TI are to be added in the foreseeable future. We also plan to freeform flame-retardant polymers (fire protection class UL 94-V0), for example, or even fibre-reinforced materials in the future.

“Smarter Factory” (from left to right): TE employees Johan de Puyt, Peter Okkerse and Jaco Raijmakers showed how the freeformer can be integrated fully automatically into a production line with the support of ARBURG expert Dr. Didier von Zeppelin. APF is used to individualise parts (photo on left) and to produce functional parts from standard ABS and ASA (photo at top).

“Smarter Factory”

To mark the “Smarter Factory” initiative, it was demonstrated in July 2017 that the freeformer can be integrated into an unmanned manufacturing set-up. A six-axis robot designed for autonomous human/robot cooperation and mounted on an unmanned transport vehicle delivered the part to the freeformer for individualisation with 3D lettering and then transported it on for final assembly. “The robotic system and freeformer communicate via a Euromap interface for fully automatic loading and unloading of the build chamber,” explains Peter Okkerse. “It is already working well for functional prototypes and spare parts, but we do still need to work on the speed for high-volume production.”

INFOBOX



Name: TE Connectivity

Founded: 1955

Location: Den Bosch, Netherlands, over 100 production locations worldwide

Employees: 300 (Den Bosch)

Industries: Industrial machinery, intelligent buildings, rail transport, automation & control, automotive industry

Products: Plug connectors, sensors, electronic components

Contact: www.te.com

High key shoot!

New ARBURG film: Comprehensive turnkey expertise



How do you simply and reliably obtain a complex production system? This is the question answered by the new ARBURG turnkey film. Well-known customers such as Vorwerk and ZF TRW report on their experience with sophisticated ARBURG project management for individual turnkey systems.

As a primary contractor, the ARBURG Turnkey department is at hand wherever specific expertise on automation, mould and process technology is required or when a number of operations need to be combined and the interfaces defined to realise a new product idea.

The new turnkey film offers an impression of ARBURG's project management and long-established know-how. This is available in the Media

Centre on the ARBURG website and on the ARBURG YouTube Channel.

Customised turnkey solutions

"We assume responsibility for the entire project management, contribute our overarching expertise and supply a complete turnkey solution precisely adapted to the requirements at hand," says Managing Director Sales Gerhard Böhm, listing the main advantages.

In addition to the ARBURG experts, high-profile customers also have their say and recount their experiences. At ZF TRW, the project was a new product idea for the automotive industry, as Heiko Beck, production engineer at ZF TRW, reports: "We went in search of a partner with comprehensive expertise. A decisive advantage with ARBURG

Making-of: Managing Director Sales, Gerhard Böhm, during the shoot for the new Turnkey film.

is that I only have one contact person. This makes things easier for me to organise and gives me the security I need for the project."

Martin Thalemann, plastics technology expert at Vorwerk, values the ARBURG approach of including the entire production process into the planning: "From the outset, we had a really good feeling about ARBURG's turnkey project. The fact that everything ran so smoothly in the end really delighted us."



Turnkey
film

Fast and clean dosage

Gramß: Disk-top closures produced on two interlinked ALLROUNDERS

Our topic here is disc-top closures for cosmetics bottles filled with creams and lotions and, consequently, the extremely fast and precise production of packaging items. The specialist Gramß GmbH Kunststoffverarbeitung based in Sonneberg, Germany, knows all about this and uses a fully-automated turnkey system in which two hybrid ALLROUNDER H machines are interlinked via two MULTILIFT robotic systems.

In order to produce disc-top closures for the cosmetics industry in Germany and Europe cost effectively and in high quality, Gramß was seeking an automated production solution. For this purpose,

the ARBURG turnkey experts designed a turnkey system with two interlinked machines. This outperformed a two-component solution using assembly injection moulding also under discussion by around three seconds.

Fast amortisation

With a cycle time for injection moulding of 14 seconds and an overall cycle time of 18 seconds, Gramß's acceptance criteria were met. "Thanks to the high output, the investment in a turnkey system of this type with two injection moulding machines is amortised in a relatively short time," explains Andy Bauer, Technical Director at Gramß. "Moreover, the production costs for in-line assembly are far



lower than is the case with conventional processes. Furthermore, the system is more process-reliable than separate assembly. The finished parts are immediately packaged for shipping and therefore do not require any further handling."

Flexible for product variants

The turnkey system is designed for maximum flexibility both with regard to speed of production and in terms of the 24-cavity full hot-runner moulds. A total of three of these are used for different part diameters and heights. Since all have the same distance between the cavities, they can be changed without requiring a great deal of set-up work on the machine or peripherals. The housing body features an internal thread which is unscrewed in the mould. Thanks to rotary position centring in the

mould, the grippers of the robotic system can be positioned with precision.

Fast HIDRIVE

From ARBURG's portfolio, the energy-efficient hybrid machines of the HIDRIVE machine series were selected, which, with their short dry-cycle and mould opening times, are ideally suited for the production of packaging items with very short cycle times.

The base of the closure is produced on the larger ALLROUNDER 570 H machine with a clamping force

The turnkey system comprises two linked ALLROUNDERS with MULTILIFT robotic systems (photo above). These transfer the moulded parts to the assembly station with rotary table in order to fit the two-part closures into place (photo below).

of 2,000 kN and size 800 injection unit, while the lid with the liquid feedthrough is made on the ALLROUNDER 470 H with a clamping force of 1,000 kN and size 400 injection unit. The two machines produce simultaneously and are equipped with MULTILIFT robotic systems.

These remove the base and lid made from PP on the ejector and nozzle side via vacuum grippers and set them down into their respective positions on a two-station rotary table





Managing Director Peter Gramß (on left) and Technical Director Andy Bauer are delighted with their ARBURG turnkey system.

in the assembly station. This is integrated in the SELOGICA machine control system. In order to ensure optimal assembly, the lids cool down for the duration of one cycle on their station, where they shrink to a defined degree. The transfer unit then picks up 24 lids from the part holders with contour pieces and presses them onto the bases.

Packaging in exact quantities

The fitted disk-top closures are then set down onto a conveyor belt, which also serves as a cooling line prior to packaging into cardboard boxes. Empty cardboard boxes are provided at a filling position on a transverse conveyor belt. The finished parts fall piece-count-accurately into these containers through a counting photoelectric barrier. Through a counting photoelectric barrier, the finished parts fall in exact quantities into these containers.

Andy Bauer describes the cooperation, which has been in existence since 1989: "In addition to the hybrid ALLROUNDER H

machines, hydraulic ARBURG machines of all series are in operation at our plant – monitored via the ARBURG host computer system (ALS) for machine planning and quality documentation purposes. We have already jointly implemented several projects and are thoroughly satisfied."



INFOBOX

Name: Gramß GmbH
Kunststoffverarbeitung
Founded: 1989 by Peter Gramß in Tettau, Bavaria
Locations: Lauenstein and Spechtsbrunn, Germany
Turnover: 15 million euros (2016)
Employees: Approx. 95
Industries: Cosmetics, food, medical and pharmaceutical sectors
Products: One to three-coloured flip-top and film-hinge closures, multi-part tamper-evident and child-proof closures, disc-top closures, tubs, lids, standard screw closures with DIN thread, inserts for screw closures, metering aids, tongue sanitisers, pill dispensers
Machine fleet: 73 injection moulding machines, of which 70 ALLROUNDERS, production in grey room for medical products
Contact: www.gramss-gmbh.de



From paper onto th

Stabilo: "Digipen" digitalises handwriting

STABILO International GmbH, one of Europe's leading writing instrument manufacturers, realised at an early stage that digitalisation will also extend to writing instrument and developed the STABILO Digipen. The aim during design was to accommodate a PCB, battery and refill in a plastic barrel in a space-saving manner – no problem thanks to ARBURG injection moulding technology.

The STABILO Digipen is versatile in use: It can, for example, transmit handwritten notes from the paper directly into the computer, or help learners to write in occupational therapy or primary schools by measuring their progress in the acquisition of fine motor writing skills.

Conversion of movements

A decisive advantage is that the Digipen can be used to write on ordinary paper. Here, the pen captures the handwriting by digitally converting movement data and evaluating it as plain text on a smartphone, tablet or computer. "We benefited from the fact that Bluetooth Low Energy was discontinued in 2011 and inertia sensors became cheaper thanks to their use in the mobile phone sector, which made them interesting for

us," says Peter Kämpf, Head of Special Product Development at STABILO.

200 items of data per second

Acceleration, rotation-rate and magnetic field sensors are integrated in the end of the Digipen's barrel. Moreover, the force with which the tip presses onto the paper is also measured. This data is transmitted to a co-processor 200 times per second, which combines it to determine the pen's pattern of movement. For this purpose, algorithms are used that were initially developed for calculating the position of satellites. The results are transmitted to a connected computer via a radio module and evaluated there.

The heart of the Digipen is the PCB with sensors and processors. In order to provide sufficient space for the battery, a shortened ballpoint-pen refill is used, which elicits Peter Kämpf enthusiasm. "This means that the Digipen is the first electronic pen that can be used for normal writing as well."

Grip zone as hard/soft combination

As with all STABILO pens, the barrel consists of different plastic components. A wide variety of materials have been used for this purpose. The barrel body itself consists mainly of ABS blends with PC



Photos: Stabilo

or PA, the grip zone of PP and soft SEBS, and the refill from PP and POM.

0.36 millimetre wall thickness

Peter Kämpf explains the design of the Digipen and the resulting stringent demands it places on the injection moulding process: "To make the refill as large and the pen as slim as possible, we designed the grip zone to be extremely thin. The smallest wall thickness is 0.36 millimetres. In total, including the hard/soft combination, it's only 1.2 millimetres thick. Owing



the computer



The slimline design of the Digipen (photo above) and its functionality place high demands on the production process. The Digipen transmits handwriting from the paper to the computer, as well as being an aid for learning to write (photo on left).

a clamping force of 180 kN and a size 70 injection unit in the Development department at the STABILO headquarters in Heroldsberg.

Products in use in more than 180 countries

At the Weißenburg location, further hydraulic and hybrid ALLROUNDERS, including vertical and two-component machines, produce in three-shift operation. On 1 to 64-cavity moulds, grip pieces, protectors, plugs, barrels, caps, clips and seals for STABILO products are produced, which customers in more than 180 countries use for writing, drawing, colouring and highlighting.

to the high melt flow index of PP and the high shear forces exerted on the SEBS in the gate, filling of the cavity is extremely challenging. The greatest difficulty, however, is removal from the core. Not much surface is available for this purpose because, in addition to the thin wall thickness on the inside of the grip zone, there is also a so-called 'detent bead'."

As single-cavity moulds are used during the development stage and the material dwell times need to be as short as possible, the components were produced on a hydraulic ALLROUNDER 170 U with

INFOBOX

Name: STABILO International GmbH
Founded: The company dates back to 1855 with the foundation of Großberger und Kurz, which produced pencils in Nuremberg
Locations: Production sites in Weißenburg (Germany), Český Krumlov (Czech Republic) and Johor Bahru (Malaysia)
Turnover: Writing instrument division with STABILO brand, 185.2 million euros (2015/2016), growth of almost ten percent
Employees: More than 1,500 worldwide
Products: Products for writing, drawing, colouring and highlighting
Machine fleet: 36 injection moulding machines, of which 20 ALLROUNDERS with clamping forces from 700 to 2,500 kN
Contact: www.stabilo.com

75-year success sto

Silver anniversaries: ARBURG Belgium, China and Malaysia celeb



Managing Partner Renate Keinath congratulated Zhao Tong, Managing Director of the ARBURG organisations in China, on the occasion of the anniversary on 7 July 2017 in Shanghai and presented him with the ARBURG anniversary sculpture

a dinner and cocktail party with jazz music on the roof of the hotel. In contrast, the anniversary event held on 22 September with the customers from the Shenzhen region was celebrated in the form of a traditional German Oktoberfest.

Present in China at three locations

The success story for ARBURG in China began in 1992 with the establishment of a subsidiary in Hong Kong. In 2004 and 2006, the subsidiaries in Shanghai and Shenzhen followed. Whereas initially, the customers were mostly large, globally operating companies, today, more and more Chinese injection moulding companies are taking advantage of the benefits and high performance of the high-quality ALLROUNDERS and value the first class service on offer.

In addition to a strong presence, the decision to communicate in the local language reflects the great importance of China for ARBURG. Examples here include the Chinese name for ARBURG and the corresponding logo, the Chinese-language website, the Chinese edition of "today" and the WeChat channel with more than 12,000 followers.

25 years of ARBURG in China

This year, ARBURG China even celebrated its 25th anniversary twice: on 7 July 2017 in Shanghai and on 22 September 2017 in Shenzhen – with hundreds of guests, including a high-ranking delegation from the company headquarters.

The occasion was celebrated with an evening event on 7 July 2017 at the Shanghai Peace Hotel with some 200 invited guests, representatives of the parent company and the employees from China. Managing Partner Renate Keinath thanked the employees for their fantastic dedication and presented Zhao Tong, Managing Director of the ARBURG organisation in China, with the now traditional

ARBURG anniversary sculpture in recognition of their outstanding commitment. Managing Director Sales, Gerhard Böhm, looked back at ARBURG's success story in China and thanked the customers for the trust they have placed in ARBURG.

80-strong ARBURG team

Zhao Tong joined him in expressing his thanks: "You have accompanied us along the way and have contributed to the fact that the ARBURG team in China today counts 80 employees." A further highlight were the video greetings from Senior Partner Eugen Hehl and employees from the parent company and customers. The official part of the event was followed by

ry

rate 25th anniversaries

25 years of ARBURG Malaysia



Managing Partner Juliane Hehl presented the "25 years of ARBURG Malaysia" anniversary sculpture to subsidiary manager Visu Nagappa (right) and David Chan (left), who is responsible for the ASEAN region.

On 15 September 2017, the ARBURG subsidiary in Malaysia celebrated its silver anniversary. During a festive evening event with some 150 guests, Managing Partner Juliane Hehl presented the anniversary sculpture.

Customers, employees from ARBURG

Malaysia and a high-ranking delegation from the parent company attended the exclusive event, which included a cocktail party, live music, tombola, traditional dance performances and formal dinner at the Sunway Resort Hotel & Spa in Selangor. Managing Partner Juliane Hehl and Managing Director Sales Gerhard

Böhm thanked the employees for their dedication and the customers for their many years of loyalty to ARBURG.

The first ALLROUNDER was delivered to Malaysia back in the 1980s. While the customers initially tended to be relatively small, family-run businesses, companies from the packaging and automotive industry, medical technology, as well as the electrical and electronics sector have up to 100 machines in operation today.

On the occasion of the anniversary celebrations, three customers were honoured with the "Loyal Customer Award" in bronze, silver and gold for outstanding achievements.

On the occasion of the anniversary celebrations, numerous customers were honoured in various categories with the "ARBURG Customer Awards 2017".

25 years of ARBURG Belgium

On 22 June 2017, the ARBURG subsidiary in Belgium celebrated its 25th anniversary with some 50 guests and a high-ranking delegation from the parent company at the San Marco Village event location in Schelle.

ARBURG activities in Belgium began in the early 1960s and culminated in the founding of a subsidiary in Holsbeek in 1992. During an exclusive evening event, Managing Partner Renate Keinath presented the ARBURG anniversary sculpture to subsidiary manager, Simon Bemong, and his team. Together with Managing

Director Sales, Gerhard Böhm, she thanked them and the Belgian customers for 25 successful years. "Without you, we would not be what we are today - a market leader and recognised number one in the area of customer service in Belgium."

Afterwards, Simon Bemong presented the electric GOLDEN ELECTRIC machine series to the customers. The festive anniversary event was rounded off by musical performances and a dinner.



Proud of 25 years of ARBURG Belgium (from left to right): Simon Bemong, Managing Director of ARBURG Belgium, Renate Keinath, Managing Partner and Gerhard Böhm, Managing Director Sales.



From zero to

ULTRAPLAST: Successful entry into the injec

The ULTRA Group invests in the expansion of its production facility and product portfolio on an ongoing basis. To date, ULTRAPLAST's subsidiary in Maceio, north-eastern Brazil, produced mainly disposable items such as plastic bags, food packaging and containers using the thermoforming technique. When entering into the injection moulding business, the company placed its complete trust in ARBURG and today successfully produces disposable cutlery for the Brazilian market.

"ARBURG came to our attention at the Feiplastic 2015 trade fair. A hybrid ALLROUNDER, equipped with a mould and automation technology from Brazilian partner companies, produced disposable spoons in a fully automated process," explains CEO Wellington Veiga Pessoa. "This was exactly the solution I was able to envisage for entry into the injection moulding of disposable cutlery." No sooner said than done. After RK Ferramentaria (mould),

OK Automation, as well as some suppliers had recommended ALLROUNDER injection moulding technology for its reliability, high quality and durability, ULTRAPLAST began doing business with ARBURG by the end of the same year.

Complete solution from ARBURG

The company invested in five ALLROUNDER 720 H machines with a clamping force of 2,900 kN in the "Packaging" version. These high-performance machines of the hybrid HIDRIVE series combine hydraulic and electric machine components. The combination of high-speed servo-electric toggle, electric dosing and hydraulic accumulator technology ensures production efficiency and precise, dynamic injection at a high performance level. The Packaging version can be adapted individually to the relevant applications for the mass production of packaging items.

"Naturally, the key criteria were short cycle times and high reproducibility, as well as good spare parts availability and expert service. What really swung our decision in the end was that we would get a complete solution, while also benefit-



Photos: ULTRAPLAST

With hybrid ALLROUNDERS in the “Packaging” version (top right photo), ULTRAPLAST entered into the mass production of disposable cutlery, which is packaged into tubular bags in a downstream process (lower left photos). Mould (photo on left) and automation (centre photo) come from Brazilian partners.

top speed

Injection moulding of disposable cutlery with ARBURG



ing from ARBURG’s experience in the injection moulding of packaging products, because, at the time, our range didn’t include any injection moulded products,” says Wellington Veiga Pessoa.

Delighted with the comprehensive support

Before purchasing the machines, he visited the ARBURG parent company in Lossburg, Germany, and was impressed by what he saw, particularly the profession-

al technical support and machine design expertise. Back home, application experts and service technicians from ARBURG Brazil ensured successful machine set-up and production start, from installation and commissioning of the five machines to optimisation of the process data and training of the ULTRAPLAST employees.

60 million parts per month

Since the end of 2016, the machines have been producing disposable cutlery from PS in three shifts, six days a week. Five moulds with 32 to 48 cavities are used to produce knives, forks, tablespoons, dessert forks and dessert spoons. The average cycle time is around five seconds. This corresponds to an output of some 60 million parts per month. The moulded parts are automatically removed and stacked on a conveyor belt. The packaging process is semi-automatic: an employee transfers batches of 50 parts each to the packaging system, which packs the product into tubular bags. Finally, the company delivers its products to customers with its own fleet of 45 trucks.

“We are highly satisfied with our cooperation with ARBURG. Our high

expectations have been met in full,” sums up Wellington Veiga Pessoa. “The ALLROUNDERS work reliably and offer excellent performance.”

INFOBOX



Name: ULTRAPLAST, a member of the ULTRA Group

Founded: 1984 by owner and CEO Wellington Veiga Pessoa

Location: Maceio, Alagoas State, Brazil

Production area: Approx. 45,000 square metres (from the end of 2017)

Employees: 780 (ULTRA Group)

Injection moulding technology: 14 injection moulding machines, of which five are ALLROUNDERS

Industries: Packaging industry

Products: Disposable cutlery and tableware, food packaging

Contact: www.ultradescartaveis.com.br



TECH TALK

Oliver Schäfer, Technical Information



Great freedom

Open freeformer manufacturing system

The industrial additive manufacture of functional parts is highly demanding: a wide range of original materials, flexible processing, as well as high quality and strength. Individual setting options are required during the manufacturing process. ARBURG Plastic Freeforming (APF) and the freeformer were therefore deliberately developed as an open system. But what does this mean for users in concrete terms?

Significant features of the APF process is that qualified standard granulates, which are also used for conventional injection moulding, can be processed. For this purpose, the freeformer is equipped with a material processing unit featuring a special plasticising screw. Plasticising is followed by freeforming without the use of a mould: A nozzle closure actuated

via high-frequency piezo technology discharges tiny plastic droplets, which are applied in a very precise and flexible manner by means of a moving part carrier. This enables the desired three-dimensional plastic parts to be built up layer-by-layer.

Droplets render part construction flexible

On this basis, individual setting options comparable to those for injection moulding are made possible, provided droplet size and process control can be influenced in a targeted manner.

For this purpose, various nozzle sizes with diameters from 0.15, 0.2 and 0.25 millimetres are available. The discharged droplets, however, are not round and their shape is significantly influenced by the viscosity of the material. This needs to be taken into account during layer build-

up. The droplet height determines the layer thickness. This varies between 0.14 and 0.34 millimetres. The so-called form factor is also used to determine the volume of a droplet. This describes the width to height ratio of the not-precisely-round droplets. The layer thickness and form factor therefore also depend on one another. This is taken into account by mathematical algorithms during slicing and consequently during creation of the machine-specific NC program. Doubling of the form factor, for example, results in an allowance of four times more space for a droplet.

Through knowledge of these relationships, it is possible to create different structural properties in a targeted manner. The more densely the droplets are positioned in relation to one another, i.e., the more tightly the parts are "packed", the higher the mechanical properties are. Today, depending on the material, part densi-



ties of up to 95 percent can be achieved compared to injection moulding, enabling tensile strengths of up to 97 percent to be achieved, for example (tensile test according to DIN EN ISO 527-02). With smaller layer thicknesses, finer surface finishes can be achieved. Greater layer thicknesses, in turn, shorten the build times.

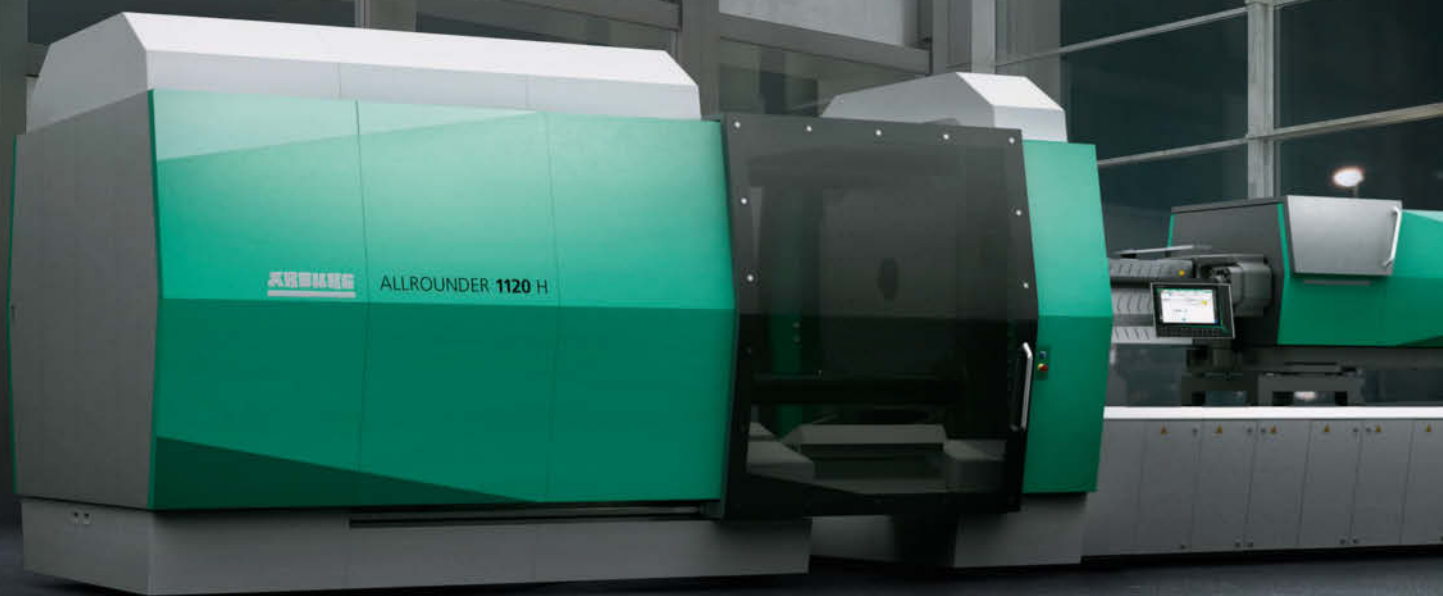
Individual part optimisation

In comparison with other standard processes on the market, it is therefore possible to optimise the quality and strength of additively manufactured parts using APF, depending on the specific material employed. A prerequisite is an "open manufacturing system". With the freeformer, all the process parameters are freely programmable – from the settings for the geometrical slicing, positioning of the droplets and temperature, through to

discharge. This great freedom, however, requires a structured procedure for qualifying materials and determining pre-optimised process settings. The material database for the APF process is growing continuously and contains setting data for a wide variety of thermoplastics. These include not only the additive standard materials ABS, PC, PA12 (amorphous), but also partially crystalline PP, as well as special plastics such as the high-temperature material PEI, elastic TPU and biopolymers. Taking these as the starting point, modified original materials can also be used quickly and easily, for example, a PC approved for the aerospace industry or a resorbable PLA for the medical technology sector.

Adapting additive manufacturing flexibly to materials and requirements and not vice-versa: The freeformer is designed as an open system, which processes qualified standard materials and for which all process parameters can be individually adjusted.

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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