

# today

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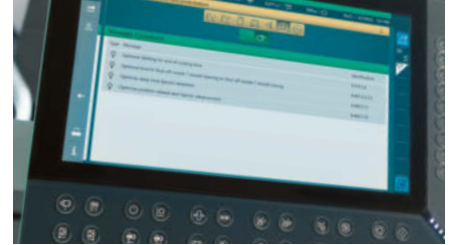
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## IMPRESSUM

today, The ARBURG Magazine, Issue 79/2022

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The high-quality CUNA cups with the striking flower symbol are reusable and recyclable. They are manufactured on an ALLROUNDER.

**ARBURG**



## Dear Readers,

After a wait of more than two years, the Technology Days have finally taken place again. Even during the preparations, it became clear how much has changed since the last event in 2019 and how our company has grown – in terms of space, staff and organisation. The Training Center and the new production hall have been added, employee numbers have grown from around 3,000 to over 3,400, and there have also been some organisational changes. innovatiQ and AMKmotion are now members of the ARBURG family and, accordingly, featured prominently at the Technology Days – AMKmotion, for example, on the subject of drive trains. You can read about the important role that the latter plays in this issue.

And the key issue of sustainability also plays a pivotal role. You will find out about an electric ALLROUNDER that has been reliably producing for 14 years and over 39.5 million cycles, about the factors that play a role in the carbon footprint of injection moulding machines, and how our customers process recyclates and bioplastics on ALLROUNDERS and the freeformer. Prof. Andreas Fath's 'cleandanube' project, which we have sponsored as part of our arburgGREENworld activities, is also extremely exciting. You can read in this issue why he swam 2,700 kilometres down the Danube to the Black Sea.

We hope you enjoy reading this issue of 'today'.

Michael Hehl  
Managing Partner

# Back again at last!

## Technology Days 2022: Enthusiasm in the industry

**Industry professionals had been waiting for this for over two years: ARBURG Technology Days as an in-person event. Everyone who was able to be there at the 'think tank' in Lossburg from 22 to 25 June 2022 was thoroughly delighted. The unique plastics industry event offered a wealth of technology highlights, hands-on innovations, and a singular spirit that could only be experienced live.**

"Our customers could hardly wait to experience our exhibits and plastics processing highlights live and in colour once again," commented a delighted Juliane Hehl, who as Managing Partner of ARBURG is responsible for Marketing and Business Development. "But neither could we! Our employees worked hard and made the first major event without strict COVID restrictions a great occasion that we will all certainly remember for a long time to come."

### **Lots of new things to discover**

Visitors could hardly help but be amazed by the many new things to discover at the Lossburg headquarters, even for 'old hands', with sister companies AMKmotion and innovatiQ appearing for the first time with new solutions for additive manufacturing and drive systems respectively (see p. 6).

The event was held throughout the entire company, including the assembly hall, which was brought into use in 2021, and the state-of-the-art Training Center. And anyone wishing to enjoy some refreshments

after a tour of the company could do so in the newly designed company restaurant.

### **50 exhibits – each one a highlight**

The Efficiency Arena with topics on arburgXworld and arburgGREENworld met with a great response. In the Arena, the production of drinking cups that can be separated by type was used as an example to provide visitors with practical information on the key topics of circular economy and digitalisation. An overview of the entire range of products and services offered by ARBURG in this respect was on display in the new, permanently installed arburgGREENworld and arburgXworld rooms. Another highlight in terms of digitalisation is the innovative interlinking of machines and communication based on 5G, which ARBURG has implemented as a campus network pilot customer of Telekom. Specialist presentations in the Training Center and around 50 exhibits and applications in the Customer Center and throughout the company covered popular topics such as turnkey, medical technology, additive manufacturing and service.

### **ARBURG think tank**

ARBURG's pioneering role in many areas was evident everywhere at the 'think tank' in Lossburg – whether in discussions on the arburgXworld customer portal, during a technical presentation on the GESTICA control system and its digital assistants, or in the context of the exhibits

which gave live demonstrations of features such as the 'smart' injection moulding of recyclates and industrial additive manufacturing with the freeformer. It was also clear that ARBURG cooperates with reputable partners from industry and research on many topics. Enthusiasm and inspiration quickly spread to the visitors, most of whom went home filled with new ideas for their own businesses.

This video has lots of impressions of the event for all those who were unable to attend. Simply scan the QR code.



Video

Highlights of Technology Days 2022:  
Efficiency Arena (1), innovative technologies (2), 5G Campus Network (3), expert talks (4), additive manufacturing (5) and more than 30 exhibits in the Customer Center alone (6).



# Our centrepiece

**Drive train: Only the best is good enough!**

**N**othing works without it. It is the central element of every injection moulding machine and has chief responsibility for quality, performance and efficiency. The higher the quality and the more individual its design, the better the machines work and the better the product manufactured with them. We're talking about the drive train. Obviously, ARBURG relies on in-house development and production here so that nothing is left to chance.

"Premium quality and specific drive train tuning are crucial factors when it comes to operating injection moulding machines economically and hence ensuring your company's long-term success," explains Managing Director Technology Guido Frohnhaus with conviction. Accordingly, the topic is a high priority at ARBURG.

## What makes up the drive train?

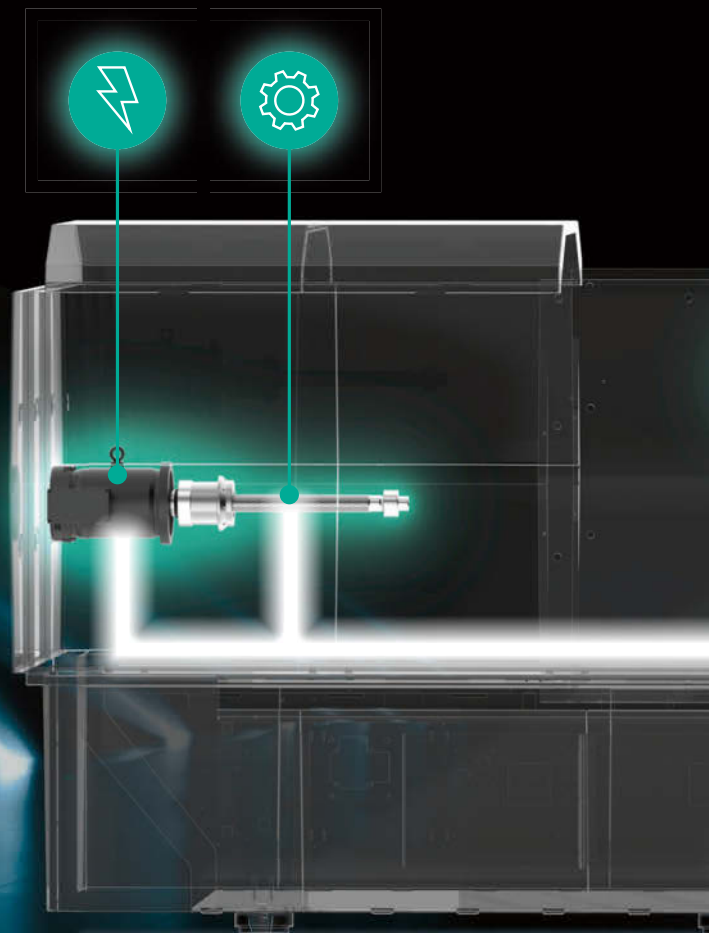
A closer look reveals its prominent role. ARBURG understands the term 'drive train' to mean all the individual electric or hydraulic lines: for moving the mould, for dosing, for injection, for ejection, for moving the nozzle, and for mould functions. Each of these consists of a drive, transmission element, automatic control technology, and control system.

A large number of patents attest to ARBURG's innovative strength in this field: for the differential piston system in 1975, the aXw Control ScrewPilot in 1983, the ARBURG energy saving system in 1993, the planetary roller screw drive in 1998, and

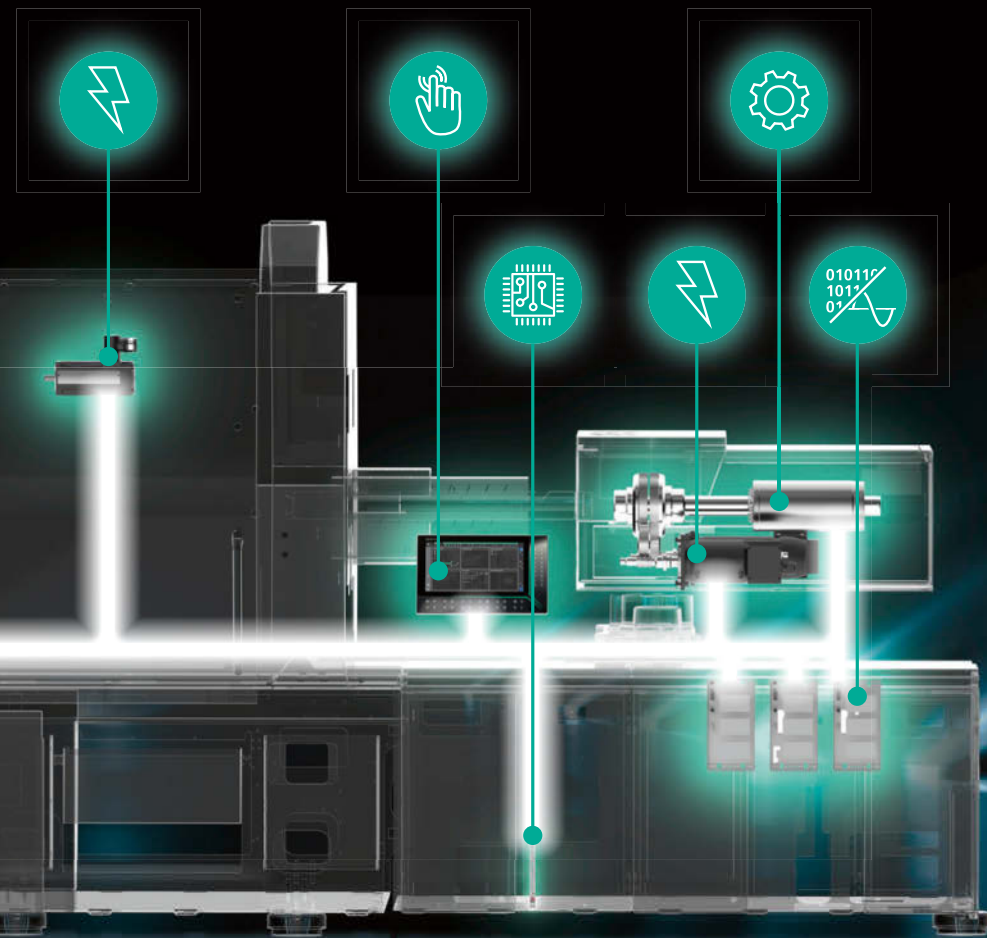
the aXw Control PressurePilot in 2017 – to name just a few examples.

## In-house production advantage

Just how important this issue is for ARBURG can also be seen by its acquisition of drive specialist and long-standing development partner AMKmotion and the latter's integration into the ARBURG family.



ARBURG's philosophy of in-house development and production is also paying off in respect of the drive train: "We are independent and have large parts of the supply chain in our own hands," says Guido Frohnhaus, adding that producing the drive train in-house also delivers a high degree of flexibility. Thanks to the modular system, it is possible to supply the ideal hydraulic or electric drive train for every requirement, every area of application and



every ALLROUNDER. “We are not tied to ‘off the peg’ standards and products, but can configure the drives individually to meet specific requirements,” says the Managing Director Technology.

**Sustainability advantage**

As a further argument, he cites the issue of sustainability where ARBURG scores highly with its single, central production site

worldwide, and also with regard to the supply of spare parts for older ALLROUNDERS, which is guaranteed over a long period of time.

“Our focus in further developing the drive train is on a high utilisation rate with stable processes, minimal maintenance and high energy efficiency,” says Guido Frohnhaus. “This is how we will continue to secure a technological lead for our customers in the future.”



# Guilt-free pleasure

**CUNA products: Reusable cups made from plant-based raw materials**

**I**t's a shocking statistic: every minute, an estimated one million disposable cups cross sales counters worldwide. In collaboration with CUNA-Products GmbH, founded in 2018, Fraunhofer IOSB-INA and SmartFactoryOWL in Lemgo, Germany, ARBURG is playing a key role in finding an environmentally friendly solution to this problem.

In this project, ARBURG took the lead in the overall design and integration of the system technology, and also contributed know-how in the areas of automation, digitalisation, and bioplastics processing. In addition, ARBURG was involved with the other partners in using AI methodologies to identify optimisation potential for achieving process reliability in injection moulding production.

In October 2021, injection moulding production of reusable cups made from CO<sub>2</sub>-negative plant-based raw materials

started at SmartFactoryOWL ([smartfactory-owl.de/cuna-real-production](https://smartfactory-owl.de/cuna-real-production)). The bio-based plastic is a bio-PE and consists of a sugar base and wood, thereby eliminating the need for petroleum.

## Teamwork is key

The coffee cups are produced in a 2-cavity mould on a turnkey system based around an electric ALLROUNDER 570 A with GESTICA control system. The cups are removed by a six-axis robot with an adapted vacuum gripper, individually finished directly in a laser cell and discharged from the turnkey system via a buffer station and conveyor belt.

All in all, CUNA and Fraunhofer IOSB-INA have worked together with ten partners to set up a data-driven production system with end-to-end digitalised documentation. The highly transparent production facility continuously provides data for the AI real lab, which can be used on open platforms for the development of

applications in the field of artificial intelligence (AI).

## Can be used and recycled for years

The high-quality cups are reusable and recyclable. This proves that, by using a deposit system, the 'cradle-to-cradle principle' works. As the term suggests, this is an approach for a continuous and consistent circular economy. The dishwasher-safe cups in various sizes can be used for years and later recycled into new products through the recycling loop organised by CUNA.

## Successful partnership

The entire project is therefore a very good fit with the arburgGREENworld programme which aims to continuously increase the production efficiency of plastics processing in order to sustainably reduce the carbon footprint of part production, for example through the use of recyclates and bioplastics. In future, customers will be able





to go online to place their orders for CUNA cups, customise the products and experience the production of their cups live.

CUNA founder and managing director Rafael Dyll is thoroughly pleased: "We produce in Germany, from renewable raw materials, reduce CO<sub>2</sub> emissions, and carry out our own recycling. These are all groundbreaking features. And with ARBURG and our other partners, we have leading technology experts for plastics production to support us. A unique configuration for exploring the future of bioplastics production."

## erials



Photos: CUNA Products

Cups on the conveyor belt: Nissrin Perez, Innovation Manager at Fraunhofer IOSB-INA, and Dr Florian Gellert, Research Team Leader, Machine Learning at Fraunhofer IOSB-INA, are thoroughly pleased with the performance of the system.

## PROJECT PARTNERS

Supported by:



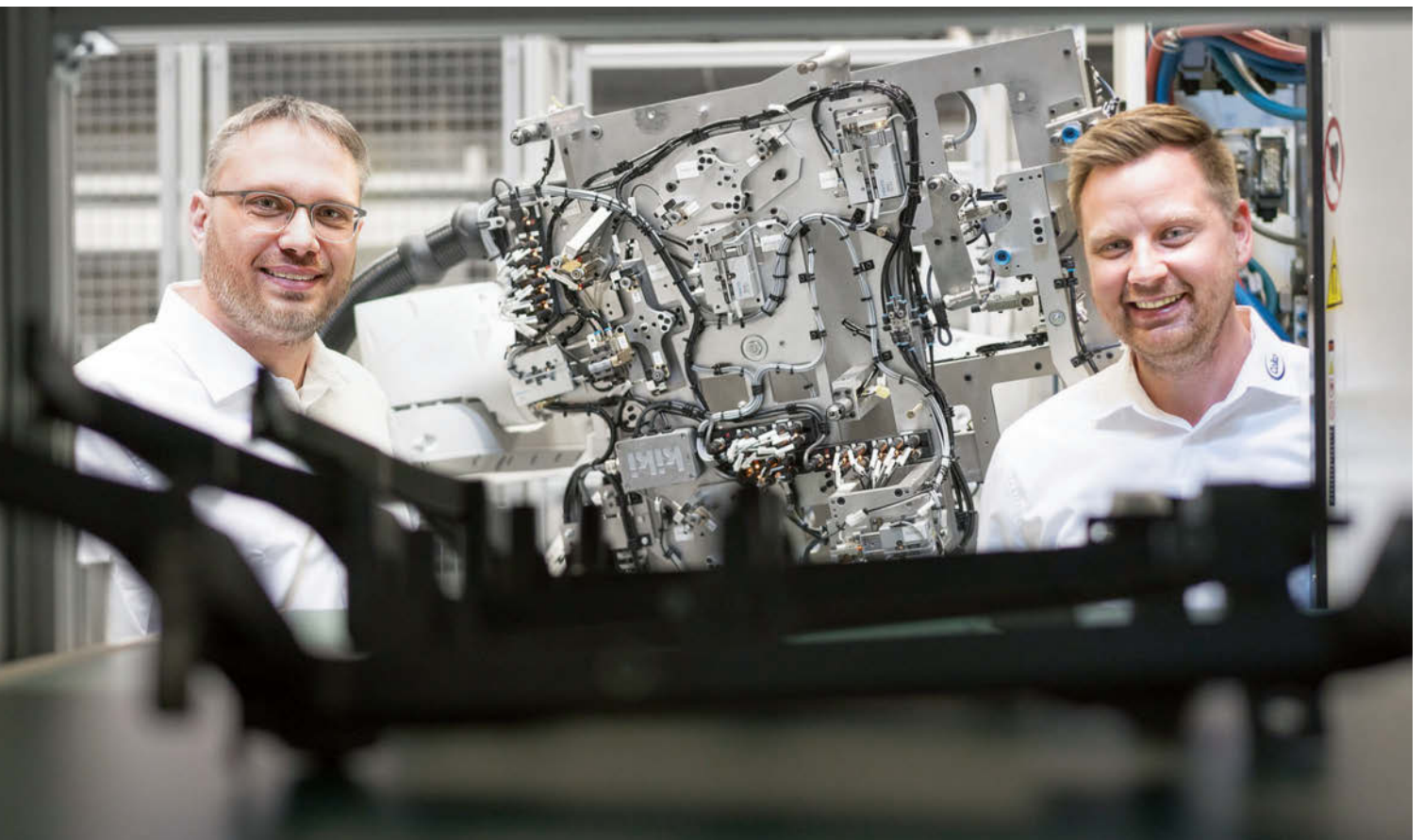
on the basis of a decision  
by the German Bundestag

The AI real lab is funded by a two million euro grant from the Federal Ministry for Economic Affairs and Climate Action and has been part of the SmartFactoryOWL since the beginning of 2020.

In addition to ARBURG, technology partners KUKA (robotics), fpt (automation), REA Jet (laser marking and labelling), BARTH Mechanik (mechanics and integration), Digicolor (material preparation and conveying), Hadi-Plast (plastics processing) and wlanus Simulation (digitalisation) are also involved in the 'CUNA Production' project.

# Sixteen in on

Coko: Different automotive parts on a single



Dominick Sudeck (l.), Global Process Management, and Sascha Boening, Industrial Engineering, in front of the ARBURG production cell's complex handling system.

**S**tructural components and visible parts in the interior of commercial vehicles in many different variants: With a fully automated turn-key system from ARBURG, plastics processor Coko from Bad Salzuflen, Germany, is now able to meet this requirement with fewer personnel and consistently high product quality. A total of 16 component variants with up to 15 inserts are produced on this system.

Coko has commissioned a fully automated production cell at its Bad Salzuflen location, the centrepiece of which is an ALLROUNDER 920 S with a clamping force of 5,000 kN. The system produces a total of 16 different components in three shifts. These include four functional or structural parts as well as twelve visible parts in the door sill area for a well-known truck manufacturer. Four of these components are made of glass-fibre reinforced PA6 and are equipped with up to 15 metal inserts

# e go

## turnkey system

that are overmoulded in the mould. A further twelve components without inserts are made of PP filled with 20 percent talc. The PP components are automatically fitted with up to eight clips after removal from the mould.

### Complex parts – attractive price

“This system is another fully automated manufacturing cell in our company, and the implementation went smoothly,” explains Sascha Boening, Industrial Engineer responsible for automation at Coko. “The

high level of automation is critical in enabling us to offer these complex parts at an attractive price.”

During production of the PA6 components, up to five different metal inserts are simultaneously separated in the feed station – a maximum of 15 inserts in total. The interchangeability of the feed systems enables the processing of seven different metal inserts at present, which are loaded into a loading plate by a KUKA robot.

### Precise insertion guaranteed

From there, another robot picks up the inserts, first removes the finished component from the mould and then positions the inserts simultaneously in both mould halves. Since the inserts are placed on the sliders at different angles, the exact gripper position is crucial. After the injection moulding process, another check is made to ensure that all inserts are properly positioned in the component. This 100 per

cent test takes place partly in the gripper and partly in an external test bay.

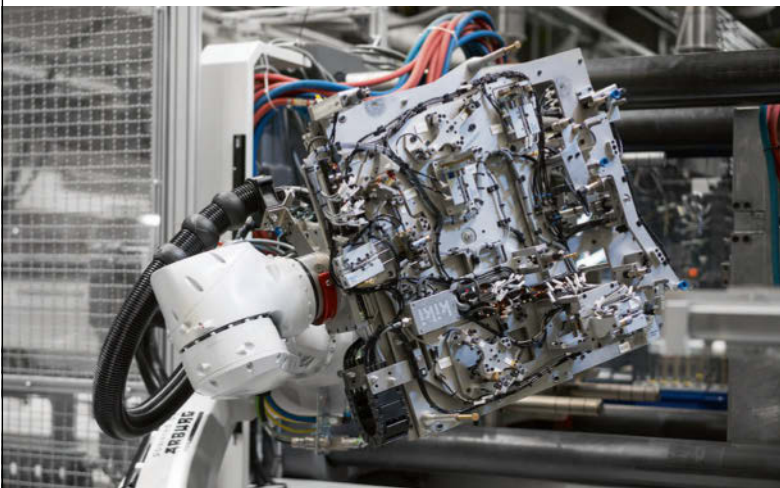
For components without inserts, the robot removes the finished parts from the mould after the injection moulding process. It then transports them to the clip assembly station, where up to eight clips that were previously separated from bulk material are individually placed on the plastic parts. The robot positions the component under the assembly head, which means it is assembled in a ‘free-floating’ manner in the gripper. Direct assembly on the injection moulded parts while they are still warm ensures that the plastic/metal composite achieves a high level of strength. Finally, the finished parts are placed on a conveyor belt with two levels. Finishing work is not necessary – the components can be sorted directly into reusable packaging by the workers. In the production cell, 16 moulds with different cycle times and injection volumes are used.

### Top quality required

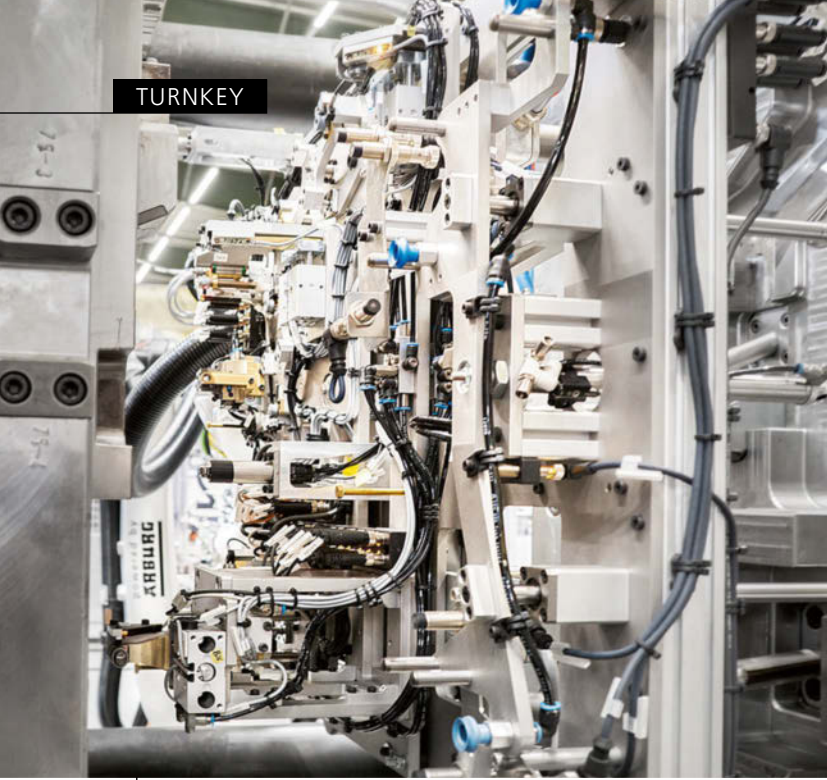
The customer’s demanding quality specifications also include ensuring the 10 ppm (parts per million) requirement is met. This had a major influence on the decision to use a fully automated process. “For first-class quality, you need first-class processes” says quality pre-planner Simon Teixeira Correia.

As a global system supplier, Coko specialises in large, complex injection moulded parts and assemblies. Bad Salzuflen is the company’s process development and innovation location. Under the maxim “Everything from a single source”, Coko

Sophisticated handling task: The gripper can pick up up to 15 metal inserts and position them in the mould in both mould halves simultaneously.

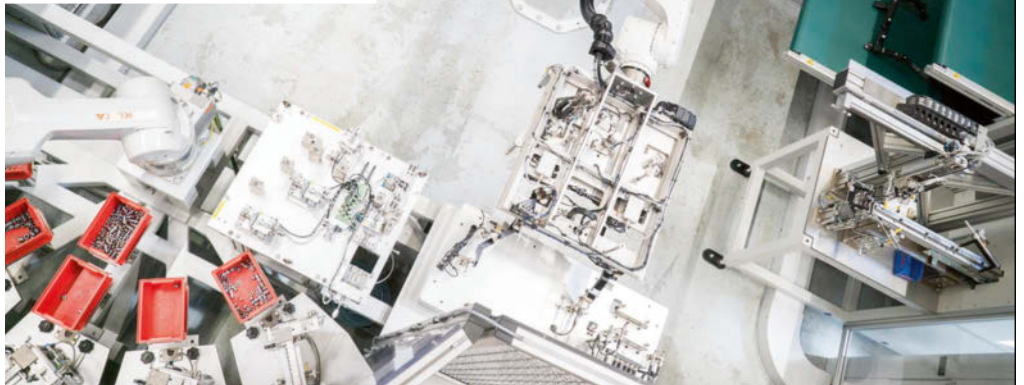


## TURNKEY



View of the production cell from above:  
on the bottom left the individual inserts, in front  
of them the insertion stations with robot and the  
central six-axis robot with insertion plate.

View into the mould (top):  
The robotic system with complex  
insertion plate for a total of  
16 component variants with up  
to 15 inserts.



offers professional advice and in-house mould construction with design as well as international purchasing. In addition to injection moulding production, the company also realises complex subassemblies, including painting and other finishing processes, with state-of-the-art logistics. Coko supplies customers worldwide, and its main sales markets are in Germany, the Netherlands, Poland and Turkey.

Strategically, the company relies on a combination of tradition and innovation. This includes continuously increasing the level of automation in all production plants in order to remain fit for the future.

### Automation takes priority

As a reliable partner, ARBURG plays an important role in the company's automation efforts. "The collaboration during the project planning and installation of the turnkey system was very constructive," says Dominick Sudeck from Global Process

Management. "Even with last-minute coordination, the ARBURG team was always there to help and advise us, so that, despite the complexity, the configuration went live without any major problems."



Film

### INFOBOX



**Name:** Coko-Werk GmbH & Co. KG

**Founded:** 1926

**Locations:** Bad Salzuflen, Germany, Lodz, Poland, Çerkezköy, Turkey

**Employees:** 1,400, of which 555 in Bad Salzuflen

**Industries:** Automotive, white goods, heating and air conditioning technology, medical technology

**Products:** Injection moulded parts including assembly and surface finishing

**Contact:** [www.coko-werk.de](http://www.coko-werk.de)

# Always at your service!

## GESTICA assistants: Added value in terms of cost-effectiveness

**W**hat are the differences between machine controllers today? The answer is obvious: their range of functions. As time pressure on operating personnel continues to grow, direct support with assistants is assuming an increasingly important role. aXw Control CycleAssist and aXw Control EnergyAssist for GESTICA can reduce cycle times and energy requirements – thereby increasing cost-effectiveness.

ARBURG’s strategy for assistants is for the machine to ‘know’ its surroundings. This approach was also the basis for the development of CycleAssist. By GESTICA ‘knowing’ the production sequence, the setter can be actively advised on how to optimise it. CycleAssist’s systematic analysis focuses on processes that run simultaneously. The result is what is known as a critical path which shows when faster sequences are held back by slower ones. This ultimately prevents longer cycle times.

Depending on the equipment of the ALLROUNDER, criteria such as delay times,

position-related starts, enable signals, and cross-cycle movements are taken into account. CycleAssist analyses the cycle during operation and provides the setter with a list of optimisation suggestions that is regenerated and prioritised from shot to shot. However, the final decision-making power for their implementation remains with the setter.

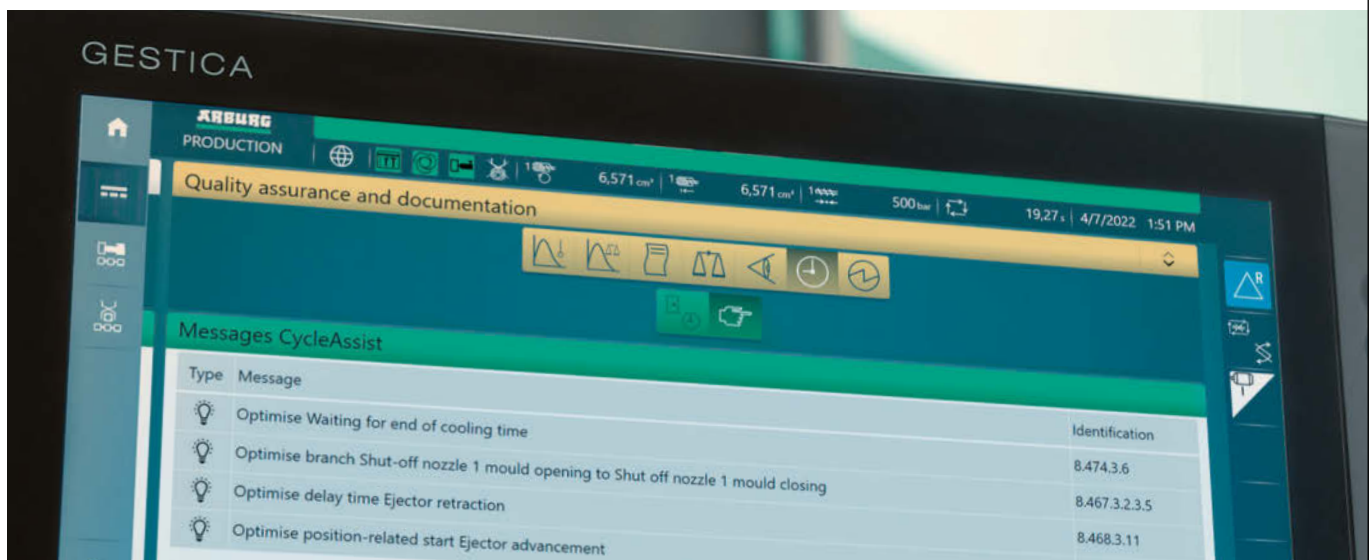
### Shorter cycles, less energy

Thanks to CycleAssist, the cycle time of an ALLROUNDER 570 A with a 4-cavity mould has been reduced by 0.15 seconds and output increased by 44,000 parts per year.

Another of GESTICA’s interesting features is EnergyAssist where all essential functions relating to an ALLROUNDER’s heating zones are grouped. EnergyAssist ‘knowing’ the heating zones makes it possible to calculate an even and controlled heat-up and deactivation – for example during standby – for the cylinder module and mould. Thermal decomposition of the material or damage to the hot runner are reliably prevented. This also creates free space

for machine operators and saves energy costs at the same time. When EnergyAssist was used on an ALLROUNDER 470 H with an 8-cavity mould, hot runner and temperature control unit, the energy requirement in the heating phase was reduced by 2.31 kW, resulting in a 34 percent saving in the energy requirement.

CycleAssist actively points out possible optimisations in the production process.



# 'Green' carbon foot

Product carbon footprint: Balancing emissions from injection mo



Photo: ©ink drop – stock.adobe.com

**C**arbon footprint' is the term on everyone's lips at the moment. But how big is this actually for injection moulding machines? ARBURG has taken a close look at this issue. For injection moulders, the first relevant question is what kind of carbon footprint a new machine has when it arrives at the plant. A 'cradle to gate' approach, i.e. from production to the factory gate, provides reliable indicators.

The arburgGREENworld programme focuses on sustainability and resource efficiency. In this context, the machine manufacturer is also actively involved in the evaluation of its customers' climate protection activities.

### Cradle to gate analysis

The ISO TS 14067:2015 standard defines a product's greenhouse gas emissions. On this basis, ARBURG has investigated how

Around 53 per cent less than the German average: the electricity-related CO<sub>2</sub> equivalent of an ALLROUNDER.

a product carbon footprint (PCF) can be determined for ALLROUNDERS, for example. The PCF is the sum of the greenhouse gas quantities emitted and removed in a product system, expressed as CO<sub>2</sub> equivalent. In its 'cradle to gate' analysis, ARBURG



# print

## oulding machines

accounts for the CO<sub>2</sub> equivalents generated by raw materials and in the manufacturing process. Only around five per cent of CO<sub>2</sub> emissions are generated here, with the large remainder occurring during the machine's service life at the customer, which in some cases spans several decades. In the operational sequence for the production of ALLROUNDERS, the raw materials used and the respective electricity requirement can be assigned to the four process steps of coating, mechanical machining and processing, electrical production, and assembly.

### Raw material-related CO<sub>2</sub> emissions

More than 55 per cent of an injection moulding machine is made of cast iron, around another 35 per cent steel and sheet metal. Based on eight raw material groups, a weighted average value [kg CO<sub>2</sub> equivalent per kg product] can be calculated. This so-called emissions factor is around 1.83 for ALLROUNDERS. Multiplied by the product weight, this amounts to raw material-related emissions of around 15,190 kilograms of CO<sub>2</sub> for a hybrid ALLROUNDER 570, for example.

### Electricity-related CO<sub>2</sub> emissions

In the manufacturing phase, the electricity requirement also contributes to the PCF. For the German electricity mix, the emissions factor is 0.366 (2020). ARBURG,

with its high production depth of around 60 per cent, has a significantly lower emissions factor of 0.17. This is because renewable energies are used at the central location in Lossburg, Germany, and externally sourced electricity comes entirely from ecological sources. In concrete terms, this means that the electricity-related CO<sub>2</sub> equivalent of the ALLROUNDER 570 H is only 1,240 instead of 2,670 kilograms, in other words around 53 per cent less than the German average.

If the emissions associated with raw material and electricity are added, a 'cradle to gate' analysis for the machine used as an example results in a total CO<sub>2</sub> equivalent of 16,430 kilograms (see table). For comparison: In Germany, each person

tenfold greater impact on the product carbon footprint than electricity consumption during the manufacturing phase.

### In-house production has advantages

Local supply chains, a high degree of in-house production depth, and the use of renewable energies can have a positive impact on the footprint. ARBURG publishes additional application examples of energy and resource efficiency in its interactive Sustainability Report. Simply scan the QR code.



Sustainability Report

Cradle to Gate			
Series*	CO <sub>2</sub> equivalent raw materials [in kg CO <sub>2</sub> ]	CO <sub>2</sub> equivalent manufacture* [in kg CO <sub>2</sub> ]	CO <sub>2</sub> equivalent "Cradle to Gate" [in kg CO <sub>2</sub> ]
ALLROUNDER 370 H	6,040	490	6,530
ALLROUNDER 470 H	8,600	700	9,300
ALLROUNDER 570 H	15,190	1,240	16,430

\* Based on an emissions factor of 0.170 (ARBURG electricity mix)

generates an average carbon footprint of around 12,000 kilograms per year, depending on factors such as consumption, mobility, housing and nutrition.

The investigations on ALLROUNDERS show that it is possible to calculate a meaningful carbon footprint for injection moulding machines. Raw materials have a roughly



# Biologically active!

## Fraunhofer IPK: freeformer processes biopolymers

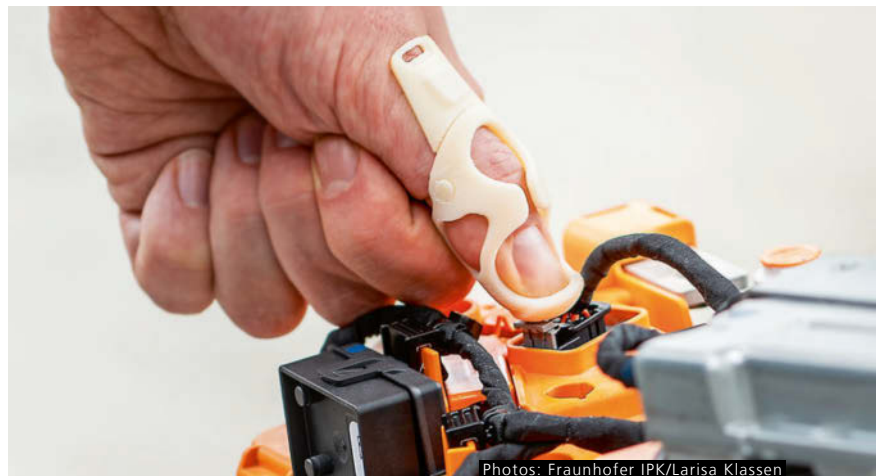
**M**any projects in plastics processing are about using products in a more sustainable way. What's new is that additive manufacturing is also increasingly becoming the focus here. As part of a research project under the overall management of the Fraunhofer Institute for Production Systems and Design Technology IPK in Berlin, Germany, a freeformer 300-3X was purchased for a project segment.

The research and development project "Biofusion 4.0: Integration of biological principles into Industry 4.0" is funded by the Federal Ministry of Education and Research (BMBF) under the umbrella concept "Research for the Production of Tomorrow" and supervised by the Project Management Agency Forschungszentrum Karlsruhe, Production and Manufacturing Technologies Division (PTKA-PFT). The project is about solutions for a sustainable biological transformation in production, and the aim is to identify principles from biology and apply them to manufacturing. Nine industrial partners are working together in the consortium, and implementation aids

that can also be transferred to other technology areas, sectors and regions are being developed for their specific projects.

### freeformer 300-3X processes PHB

"In July 2021, we commissioned the freeformer 300-3X with the aim of additively processing biopolymers in a more sustainable way," says Christoph Hein, head of the Microproduction Technology department at Fraunhofer-IPK. He describes the excellent partnership with ARBURG as



Photos: Fraunhofer IPK/Larisa Klassen

Biopolymer polyhydroxybutyric acid (PHB) in different processing states: granulate, material discharged from the nozzle and finished component (large image). One PHB application example is an orthosis for production workers (small image).

"necessary in order to be able to achieve the challenging goals of the project with regard to technology". In addition to providing an in-depth introduction to the 3D





printing system, ARBURG was also able to provide valuable assistance as a scientific/application technology advisor on material characterisation, part structure and texture, and surface quality. This intensive support made the entire processing procedure transparent and very precisely manageable right from the start.

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### Turning waste into bioplastic

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Specifically, this is about the reliable production of products from polyhydroxybutyric acid (PHB), a biopolymer that can be produced from used fats with the help of bacteria, among other things. The results will form the basis for the further development and adaptation of the freeformer to biopolymer processing. Another important aspect is the machine's integration into an IoT platform that, with the support of another project partner and ARBURG, will enable process monitoring, job storage, system availability, and the initiation of print jobs. By interrogating process data, important information can also be obtained on material use and part quality and used to optimise components, for example via a digital twin or recycling loops.

"The additive manufacturing of spare parts from bio-based material in our Production Technology Centre was a specific case of application for the use of the freeformer," summarises Annika Brehmer, research assistant in the Microproduction Technology department at IPK. "Among other things, this involved producing and isolating the PHB from the bacteria by fermentation, compounding the material, developing application-specific parameters for additive manufacturing, and balancing the CO<sub>2</sub> emissions of the process chain."

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### Orthotics made of PHB

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Meanwhile, there are also other components made of PHB, such as orthotics for production workers.

Christoph Hein, Head of Microproduction Technology at IPK, says of the project: "Producing bioplastics from waste and then simply composting them again is a new, important approach in the field of sustainable recycling. This process is still in the trial phase with initial printing and optimisation processes. However, since PHB has similar properties to PP, this material should hold considerable potential for the future."

### INFOBOX

**Name:** Fraunhofer Institute for Production Systems and Design Technology IPK

**Founded:** 1976

**Location:** Berlin

**Employees:** 358 (2021)

**Activities:** Applied research and development for the entire process chain of manufacturing companies, market- and practice-oriented R&D

**Contact:** [www.ipk.fraunhofer.de](http://www.ipk.fraunhofer.de)

39.5

# Strong performance

## HEINE Optotechnik: ALLDRIVE with 39.5 million cycles

**I**t was a real veteran, with 14 years and 39.5 million individual cycles under its belt. We're talking about an electric ALLROUNDER 470 A that was in use at HEINE Optotechnik in Gilching, Germany. In 2021, it was replaced by an ALLROUNDER 370 A to produce ear funnels from recycled material. But anyone thinking the 'old boy' has now been scrapped is mistaken. It is still in production, in another company in Germany.

The purchase of the new ALLROUNDER 370 A was due to further product development. Along with the new moulds, the decision was made to create a new machine. "We use a high-precision mould operating at speeds of a few seconds. A new mould on a machine that had already been run in would not have been ideal," says Thomas Albert, Head of Production at HEINE. The reason for this is also revolutionary: for the first time in medical technology, HEINE, a leading global manufacturer of primary diagnostic instruments, states that it is processing a plastic recycle to produce ear funnels.

According to Thomas Albert, the ALLROUNDER 470 A is "a real long-distance runner. It reliably completed its 14 years in

production with us without any noteworthy malfunction or major defect. During this period, we also produced ear funnels for our otoscopes on this ALLROUNDER – on various moulds, in some cases also on multiple moulds. In fact, we only parted company because our product had been changed." In this respect, too, the long service life of the ALLROUNDER 470 A can be considered sensational.

### "It's a great match"

Family-run, owner-managed, independent – HEINE Optotechnik has a lot in common with ARBURG, which was indeed one of many criteria when both the old and the new machine were purchased. "That's what I look for," says Thomas Albert, explaining his decision to opt again for a machine from ARBURG. And it is also the people who make the af-

ter-sales service the crucial differentiator. "It's a great match," he says, explaining the start of the new ALLROUNDER era.

### Ear funnel made from recycle

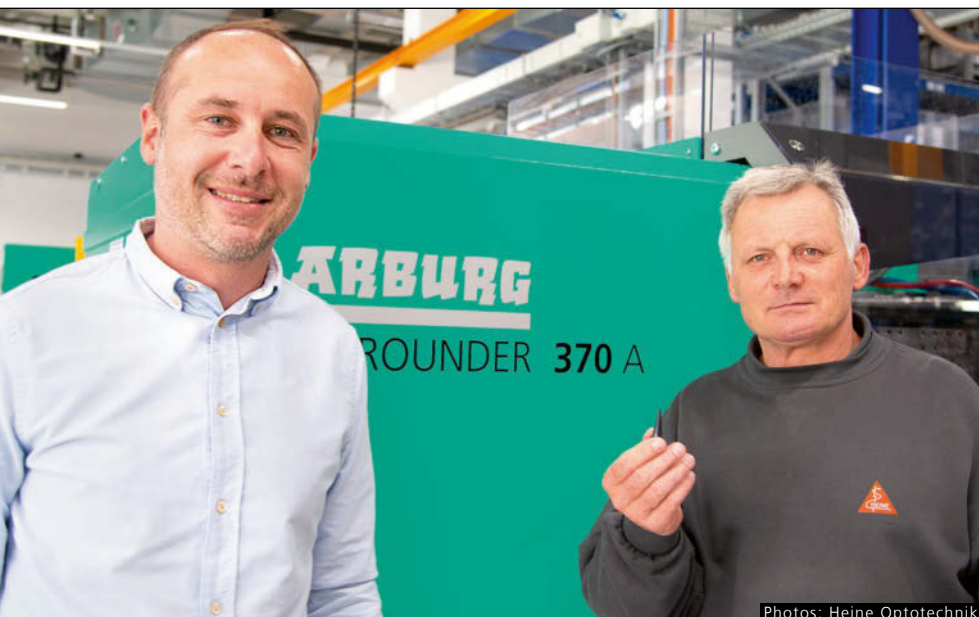
HEINE has made a sustainable decision for upcycling in medical technology with its latest product, known as the EcoTip. This is because the plastic comes from discarded refrigerators which now live a second life in the ear funnels. "We generally prefer reusable items. However, for reasons of hygiene, it had to be a disposable item in this case," says Albert, describing the requirement for doctor and patient safety. The requirements in medical technology are extremely strict. The fact that it is now

To manufacture the ear funnels for otoscopes, HEINE processes a plastic recycle that comes from discarded refrigerators.



# million cycles

# e!



Photos: Heine Optotechnik

refrigerators whose granulate is used on the new ALLROUNDER 370 A also pleases Albert given the CO<sub>2</sub> impact of the refrigeration units. After all, this will save the environment around 2,000 tonnes of CO<sub>2</sub> per year – which corresponds to 62 million kilometres of rail travel per person, or about 1,400 times around the world. “It was a very courageous step,” says the Head of Production in summary, “but it was worth it.”

Swearing by ALLDRIVE machines:  
Thomas Albert (l.), Head of Production, and  
Peter Ritschel, Head of Plastics Production.

## INFOBOX

**Name:** Heine Optotechnik GmbH & Co. KG

**Founded:** 1946 by Helmut A. Heine

**Location:** Gilching, Germany

**Employees:** 500

**Products:** Primary diagnostic instruments and accessories

**Industries:** General medicine, anaesthesiology, dermatology, loupes and lights, ophthalmology, veterinary medicine

**Machine fleet:** 14 ALLROUNDERS

**Contact:** [www.heine.com](http://www.heine.com)



# Spectacular project

## cleandanube: ARBURG is a key sponsor

**No one will be able to repeat this feat in a hurry. From April to June 2022, Andreas Fath, the ‘swimming professor’, put his wits and physical strength to the test in a sustained effort to draw attention to the pollution of waterways with microplastics: He swam the entire length of the Danube from Ulm to the Black Sea – a distance of an incredible 2,700 kilometres. At the stage destinations, he and his team still had energy for many activities and interactive events.**

ARBURG is one of three main sponsors of the transnational cleandanube project. “We put our heart and soul into the project because sustainability and a careful approach to the environment and water resources are enormously important,” explains Bertram Stern, Sustainability Manager at ARBURG. “Also and particularly in our capacity as a manufacturer of machines for plastics processing, we want to draw attention to the fact that plastic is not

waste, but a valuable material that must be collected, recycled, and reused.” The Danube alone washes over four tonnes of plastic into the Black Sea every day, much of it in the form of microplastics.

### Ten countries – one goal

The ‘swimming professor’ traversed ten countries during his enormous 2,700-kilometre swim. At many stations along the route, his team used group learning activities and a mobile knowledge workshop to draw attention to the Danube’s pollution.

There was also a variety of campaigns such as clean-ups, swim-alongs and paddling activities, and presentations. Water samples were regularly analysed in a mobile laboratory and published on the project website [www.cleandanube.org](http://www.cleandanube.org).

In addition to providing financial support, ARBURG was also present at the stage destinations in Linz (Austria), Bratislava (Slovakia) and Budapest (Hungary). In Linz, Professor Fath gave the keynote

In Ulm and at the numerous other stage destinations, there was a great deal of media interest in Professor Andreas Fath and the cleandanube project.



Photo: cleandanube



1 Photo: ARBURG/Christian Streili



2 Photo: Mario Kuemmel/AWP

speech at the 'Ten Years of ARBURG Austria' anniversary event and in Hungary, an employee of the ARBURG subsidiary there accompanied him part of the way by canoe.

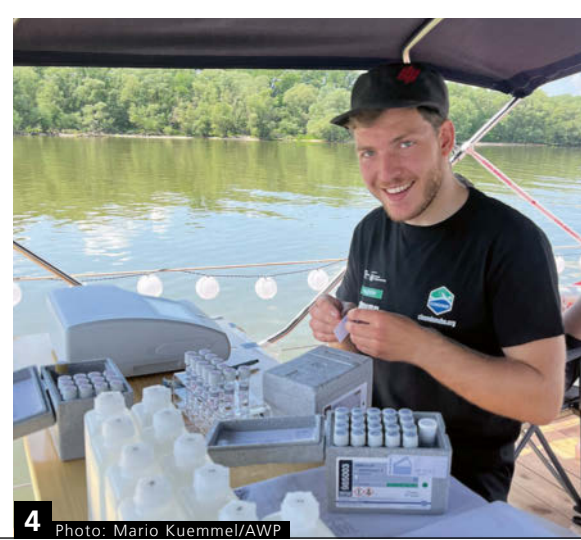
### Injection moulding machine on tour

In the run-up to the start of the project, a team of five apprentices had spent around 1,000 working hours at the company headquarters in Lossburg recreating a small single-lever injection moulding machine, which went 'on tour' in the boat accompanying Professor Fath. This meant that participants could injection mould their own shopping tokens from recycled plastic (PP) as part of the riverside activities. The example showed that plastic products such as cups, bottles and packaging can be collected by type after use, recycled and ultimately find a new use as durable products. Incidentally, this also applies to the machine, which is now in use for teaching purposes at the university in Furtwangen.

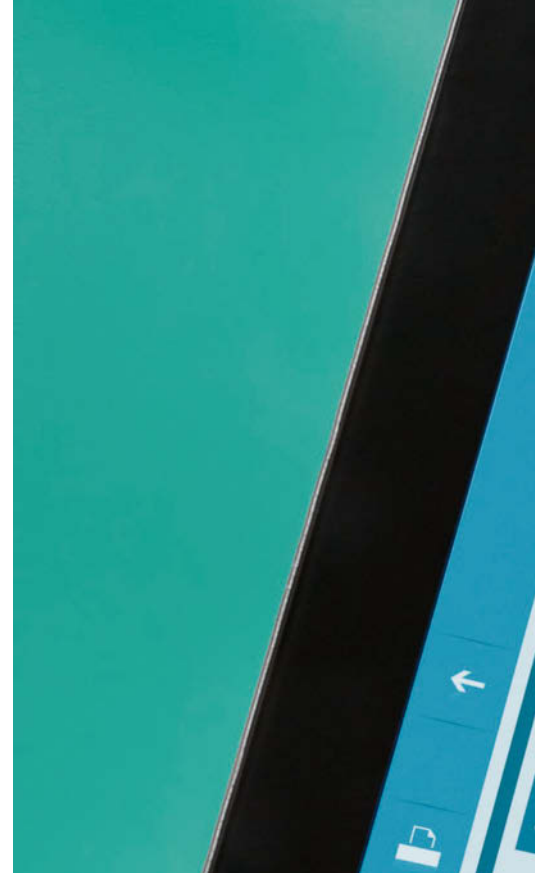
- 1: Coveted giveaway: The official bathing cap of the cleandanube project.
- 2: Professor Andreas Fath (r.) was presented with the injection moulding machine by Michael Vieth (centre), ARBURG Training Manager, and Bertram Stern, ARBURG Sustainability Manager.
- 3: Athletic and dynamic: Professor Andreas Fath swam 2,700 kilometres of the Danube to the Black Sea.
- 4: Water samples were taken throughout the tour and analysed in the mobile laboratory.



3 Photo: Mario Kuemmel/AWP



4 Photo: Mario Kuemmel/AWP



# Breaking down virtual walls!

## Cooperation: Injection moulding simulation integrated into machine controller

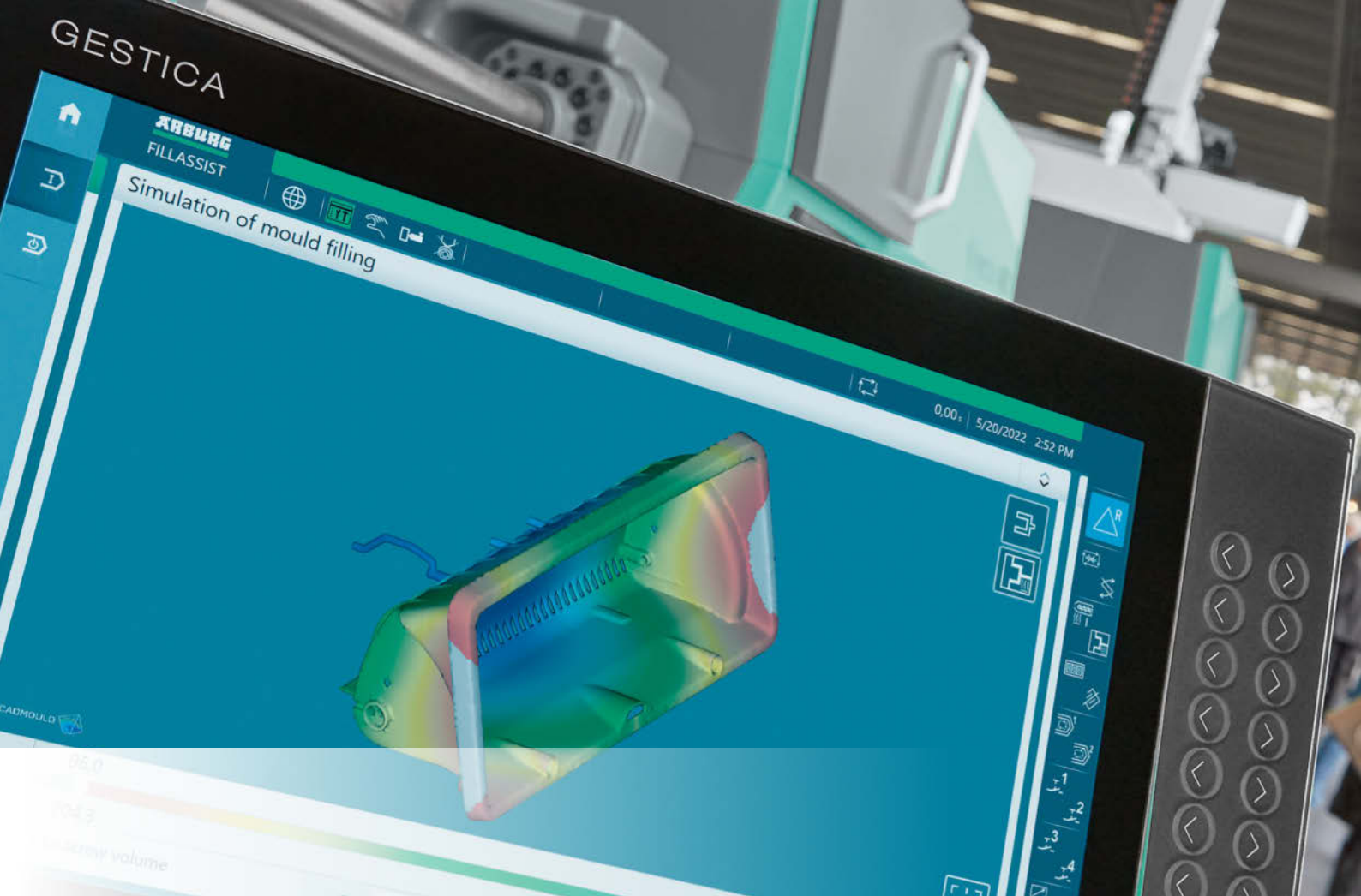
**S**imulation specialist **SIMCON**, working with **ARBURG** experts, has developed a solution for optimising filling simulations and hence for generating even more precise machine parameters by interlinking and integrating **CADMOULD** simulation software and the **GESTICA** control system via the **VARIMOS** plug-in and **aXw Control FillAssist**. The result: improved quality, fewer mould corrections, and faster time to market.

VARIMOS, a plug-in for variant analysis in CADMOULD software, systematises and automates injection moulding simulation. Instead of manually setting up variant after variant, the software is told which variables are to be varied and within which limits, e.g. wall thicknesses, gate positions, or injection parameters. Based on this, VARIMOS automatically creates suitable simulation variants, plays them through simultaneously at high speed, and extracts insights across the simulations. By

considering several variants in parallel, the design of the moulded part and mould can be shortened from weeks to a few days. Another result is a complete simulation data set containing, among other things, an initial starting point for the machine parameters. The results can be transferred digitally and thus paperlessly to

Proud of the joint development:  
Dr Paul F. Filz (right), Managing Director at SIMCON, and Werner Faulhaber, Head of Development at ARBURG.





the machine and used for mould sampling – without any tedious manual conversion of simulation parameters. As a result, the sampling process begins directly from a sensible starting point.

#### **Huge added value can be unlocked**

The GESTICA control system's aXw Control FillAssist assistance function ensures that the simulation results are transferred without errors or losses and that this data is incorporated into the injection moulding machine's data set. As a starting point for the first shot tests, a centred operating point is calculated in the machine controller for this specific process with the selected material on a defined machine. GESTICA converts input values and results from the filling simulation into suitable machine parameters. The visualisation of the filling process helps to determine the first shot volume so precisely that the product can be reliably demoulded without flash formation. The parameters are

then refined and finalised by the machine setter. In practice, the defined data interface between CADMOULD and GESTICA unlocks a huge amount of added value. The integrated filling simulation ensures improved part quality, cost reductions, a shortened time to market, and altogether more sustainable and improved injection moulding processes.

Optimised filling simulations:  
The CADMOULD simulation software and GESTICA control system are interlinked and integrated via the VARIMOS plug-in and aXw Control FillAssist.

# Happy Birthday!

**Anniversaries: Four ARBURG locations celebrate a century of co**

**A**RBURG is currently represented worldwide by 34 of its own organisations. Its oldest subsidiary, the ARBURG Technology Center (ATC) in Radevormwald, Germany, celebrated its 40th anniversary in June! In Denmark, the family business has maintained a presence with its own subsidiary for 25 years. This year, ARBURG Turkey and Austria also belatedly celebrated their 25th and tenth anniversaries, respectively. The delay was due to the coronavirus pandemic.

The four anniversaries alone add up to a whole century of presence in Europe: a great reflection of ARBURG's focus on proximity to its customers and their markets.

## 40 years in Radevormwald

It was back in 1982 that ARBURG opened the Technology Center (ATC) in Radevormwald – the first organisation of its own outside the company headquarters in Lossburg. Today, under the management of Ulf Moritz, the location is a sought-after contact point for customers from all over northern and western Germany. In the ATC, service, spare parts supply, application technology consulting, and training are united under one roof. The team currently consists of 33 employees, who provide customers with decentralised, comprehensive pre-sales and after-sales service for injection moulding technology, additive manufacturing and digitalisation. Comprehensive consulting on products and applications in a modern technical environment creates a high quality of customer support. The concept in the Oberbergischer Kreis region was so successful that ARBURG established a number of other ATCs in America, Asia and Europe.



40 years of ATC Radevormwald (from right): Partners Juliane and Michael Hehl, Guido Frohnhaus, Managing Director Technology, Ulf Moritz, ATC Manager Radevormwald, and Oliver Giesen, then Division Manager Germany/Austria.

## 25 years in Turkey

On the Bosphorus, ARBURG has been building a bridge between the Occident and the Orient since 1996 with its own subsidiary in Istanbul. Since 2001, Managing Director Engin Malcan has been driving forward the dynamic development and positioning ARBURG Turkey as the market leader for premium injection moulding machines in the country. To mark the 25th anniversary, a COVID-compliant open house was held in December 2021. In June 2022, the anniversary was officially celebrated in

the presence of high-ranking representatives from the parent company.

## 25 years in Denmark

ARBURG delivered its first injection moulding machine to a Danish customer way back in 1959. To significantly expand the company's presence in Scandinavia, the previous trading partner with Eddie Oswald at the helm was taken over in 1997 and a subsidiary was founded in Denmark. Michael Kylling has been Managing Director of ARBURG A/S in Greve since 2018. Today, his team comprises twelve employees and offers a wide range of services, including automation and turnkey expertise.

## Ten years in Austria

ARBURG has been represented by its own organisation in the demanding Aus-



## mbined presence in Europe

25 years of ARBURG Turkey: Partner Renate Keinath, Engin Malcan (r.), Managing Director ARBURG Turkey, Gerhard Böhm (2nd from right), Managing Director Sales and Service, and Adem Vardar, Service Manager ARBURG Turkey.

25 years of ARBURG Denmark: Michael Kylling (2nd from right), Managing Director ARBURG Denmark, Guido Frohnhaus (right), Managing Director Technology, and Steffen Eppler, Division Manager Sales Europe.

Ten years of ARBURG Austria: Partner Juliane Hehl, Jerome Berger (2nd from right), Managing Director ARBURG Austria, Gerhard Böhm (l.), Managing Director Sales and Service, and Oliver Giesen, then Division Manager Sales Germany/Austria.

trian market since 2010. Since 2018, the ATC in Inzersdorf has been the central location in Kremstal, Austria's very own Silicone Valley. This is where Managing Director Jerome Berger and his team support customers with their extensive expertise in technical consulting, automation, service, sales, and training. The ARBURG experts are also valued as innovative partners in training and research. Due to COVID, the anniversary event and open house had to be postponed until May 2022.





# Partners against gri

## Lercher Werkzeugbau: Family business from Austria produces

**N**ot precise but super-precise; not hygienic but ultra-hygienic. When it comes to products for medical technology, precision and technical excellence are crucial. This is something that Lercher Werkzeugbau GmbH & Kunststoffspritzguss from Klaus in Vorarlberg, Austria, knows only too well. The company is currently moving into medical technology with its own clean room production. And ARBURG is an essential partner here.

The company produces plastic dental parts with a machine that is directly connected to a clean room. These are then combined to form an assembly. The hybrid ALLROUNDER 520 H with clean room equipment transports the encapsulated items to another, larger clean room where part inspection and packaging take place. At the end of this clean room, the goods are packed ready for delivery. The products are made of PBT and PE. A total of four machines are planned for the final expansion of the system. "ARBURG has a great deal of experience and knowledge in all areas, and

especially in automation and medical technology. We notice this again and again," says Sandra Ender-Lercher, Managing Director of the family business, praising the cooperation and support in general.

### Hybrid ALLROUNDER first choice

After the first hybrid ALLROUNDERS were purchased and subsequently the first successful turnkey project with an ALLROUNDER 520 H, the cooperation continued with the clean room project. For the automated production of the dental components – three different items in multiple moulds – the hybrid ALLROUNDER HIDRIVE series was also the obvious choice, as it combines the speed of the servo-electric toggle with a dynamic, hydraulic injection unit for maximum precision and performance. As Sandra Ender-Lercher says: "The catalogue of requirements for these plastic dental parts calls for precision so that there are no problems for the end customer with regard to quality or sterile packaging, for example." Due to this machine characteristic, larger multi-cavity moulds can also be used in

combination with smaller machine sizes. Ultimately, this is also a question of costs. Series production started in the first half of 2022.

Two clean rooms work in combination to produce the dental technology components. The machine, which is docked directly to the Class 8 clean room, is equipped with a KUKA six-axis robot equipped with the SELOGICA user interface on its control system. This robot removes the moulded parts which are transported to the second clean room via a conveyor belt. Two clean-air modules with main and pre-filters are fitted above the ALLROUNDER clamping unit and the robotic system housing. Lercher builds its own moulds. Robot systems with removal hands and grippers were independently commissioned directly on site. All machines are equipped with a host computer connection via OPC-UA as well as reject switches to ensure accurate tracking and quality of the manufactured parts.

### More than just a partnership

"We have been exchanging information with ARBURG on clean room technology



The ALLROUNDER is docked to a clean room in which moulded parts are tested and assembled (left image).

Two clean rooms are combined in the turnkey system, and parts handling is performed by a six-axis robot integrated into the machine controller (image below).

me

## dental technology components



Photos: Lercher/Patrick Saely

since 2019. And since we have now also successfully introduced the medical standard after IATF 16949, there was nothing standing in the way of the clean room facility,” comments Sandra Ender-Lercher.

ARBURG’s pre-sales and after-sales service is particularly impressive. As Sandra Ender-Lercher says: “We are taken seriously as a customer. The right contact persons are always there for us, and so we always get to a practical solution quickly.”

### INFOBOX



**Name:** Lercher Werkzeugbau GmbH & Kunststoffspritzguss

**Founded:** 1979

**Location:** Klaus, Vorarlberg, Austria

**Production area:** approx. 8,000 square metres

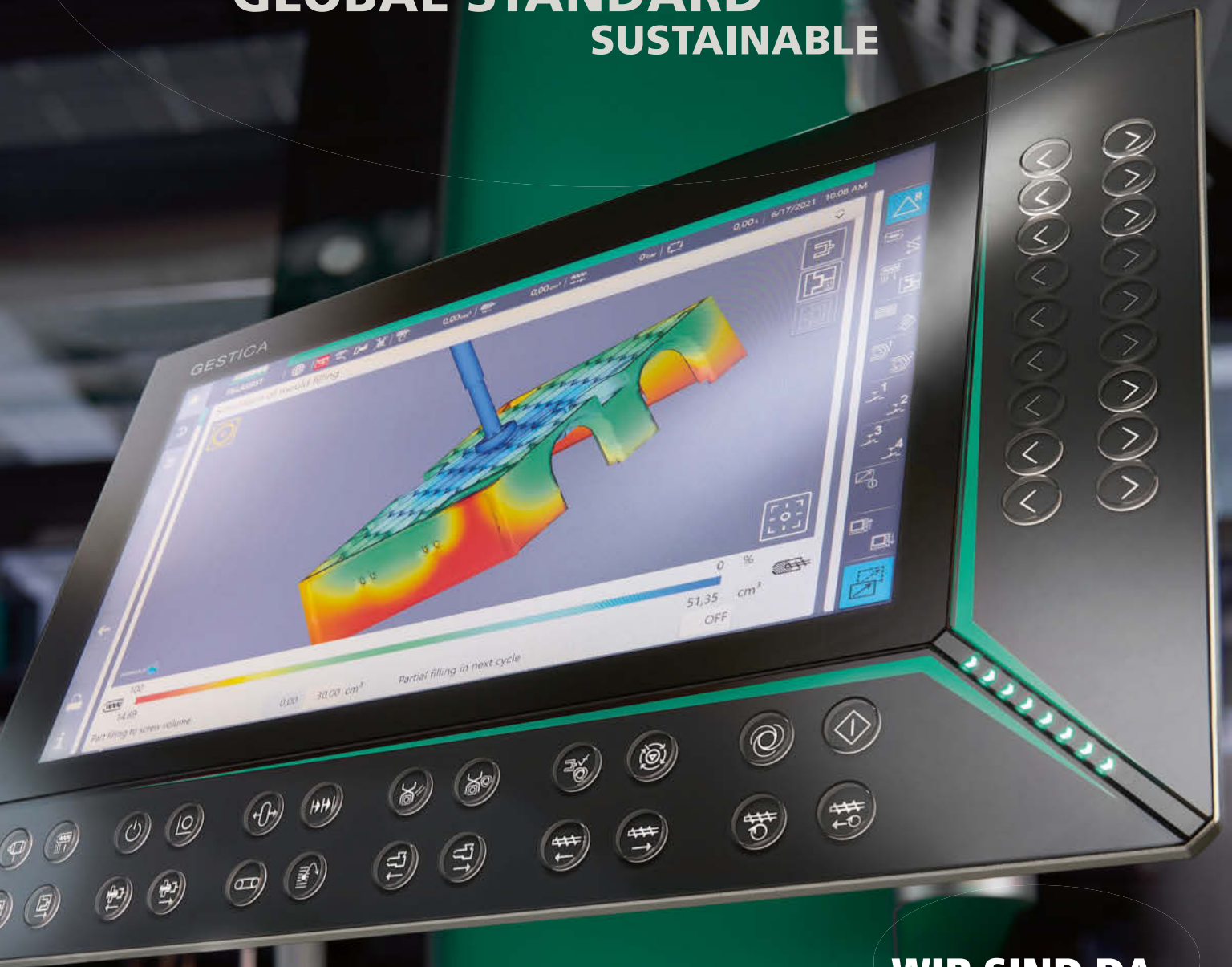
**Employees:** approx. 140

**Industries:** Medical technology, automotive, fittings, packaging, electrical industry, renewable energies, consumer products

**Machine fleet:** More than 40 injection moulding machines, five of them ALLROUNDER HIDRIVE

**Contact:** [www.lercher.at](http://www.lercher.at)

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