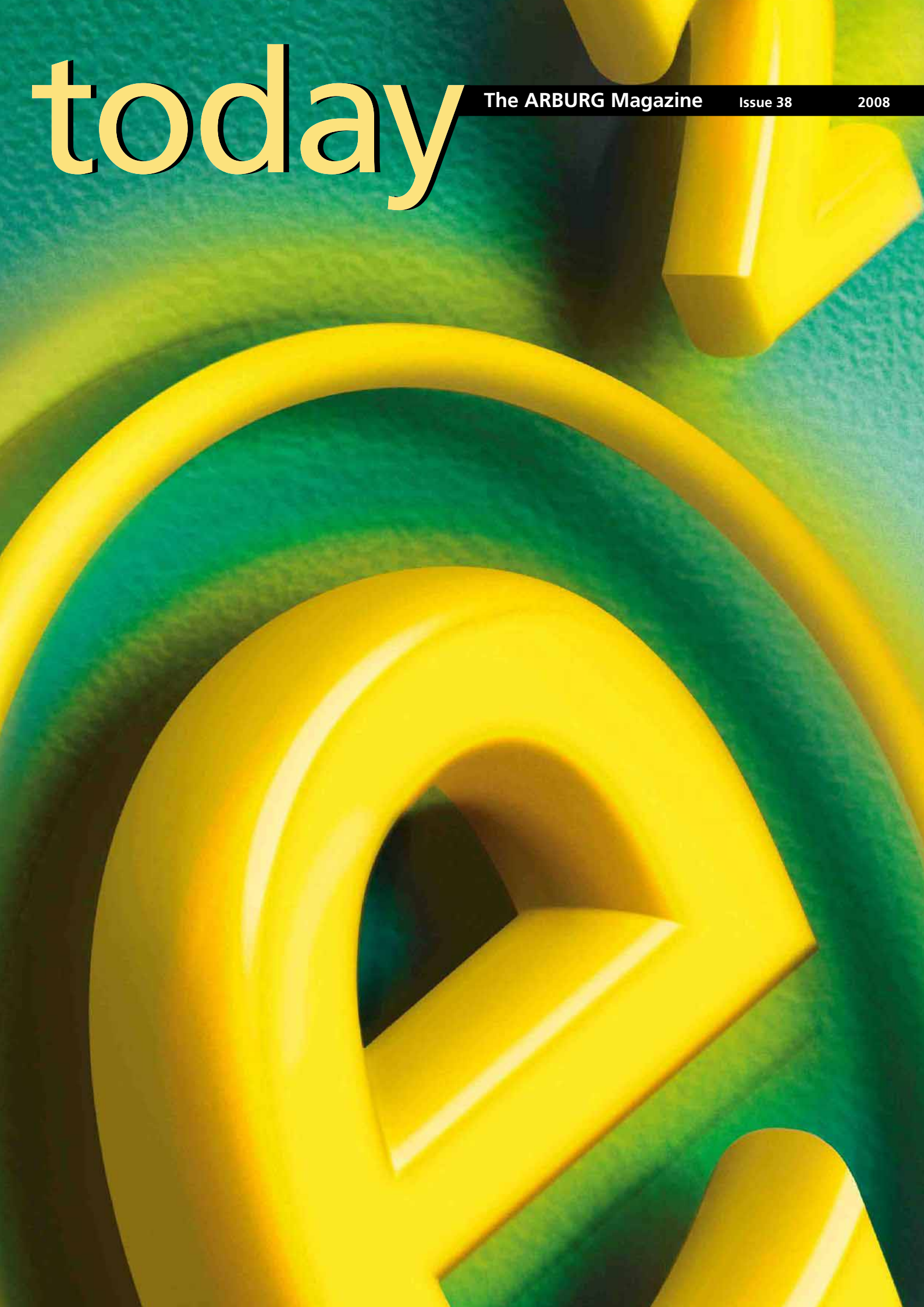
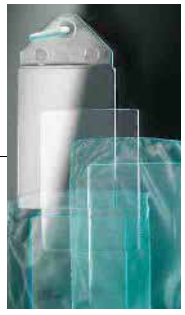
today

The ARBURG Magazine Issue 38 2008





MASTHEAD

today, the ARBURG magazine, issue 38/2008
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ARBURG distinguishes its energy-efficient products with the "e²" Energy Efficiency label, which was presented for the first time at the 2008 Technology Days.

ARBURG

Dear Readers,

With a consolidated turnover of 409 million euros, the 2007 financial year was the most successful in the company's history. On behalf of ARBURG, I would like to extend my heartfelt thanks to all our customers for this success: those with whom we have been working for some time - even decades - and also our newer arrivals.

Our customers range from small injection moulding firms with just a few machines to global players with production plants all over the world. Thanks to our worldwide sales and service network, we provide all our customers with a comprehensive on-site service package and our modular product range offers precisely the right products. One reason for this is that at ARBURG, we have always focused on the needs of our customers in all our developments.

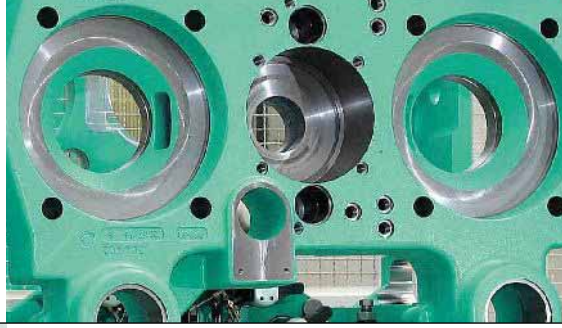
A good example of this is the vertical ALLROUNDER V series with free-space system, which we developed in response to customers' wishes and is now available in three sizes. The new ALLROUNDER 375 V was a highlight at this year's Technology Days, where it was presented for the first time.

Every year, the response to this 3-day springtime event confirms anew the enormous interest from the international plastics industry. With a proud total of over 4,100 visitors from 44 countries, the 2008 Technology Days broke all previous records and provided the perfect forum for us to present our corporate objective, "Energy Efficiency Allround", to global injection moulding circles.

You can read more about this on the following pages.

We hope you enjoy reading this new issue.

Michael Hehl
Managing Partner



Energy efficiency:

The above-average rise in the cost of energy is a hot topic both in energy-intensive branches of industry and in companies that want to produce in a more energy-efficient manner. To deal with this subject comprehensively both for our own company and for all our customers, ARBURG takes a holistic approach.

In order to comprehensively achieve our self-imposed targets for energy-efficient working, ARBURG approaches the problem from several directions: on the one hand, we are researching the potential for

saving energy in our own production and administration and, on the other hand, we are looking into the possibilities of making our ARBURG technology more energy-efficient.

This area is by no means new for ARBURG. For many years, the company has exploited all the available innovative opportunities in order to produce with greater energy efficiency and safeguard the environment. Now, however, these measures are being brought together in the all-embracing "Energy Efficiency Allround" initiative.

This package of measures constitutes an important corporate objective for 2008. ARBURG adopts a holistic approach

Hot topic of 2008

in this regard, which entails an examination of both the company itself and the subsequent use of all ARBURG products in terms of optimising and ultimately saving energy.

But this approach also creates another important precondition for truly energy-optimised action on all levels. ARBURG's objective is not simply to produce ALLROUNDER machines using as little energy as possible and to save as much energy as possible in the construction of ARBURG technology. In addition, the company also seeks to use its expertise to provide customers with on-site help to efficiently reduce their energy consumption. Customers have already enquired about an all-encompassing service of this nature on several occasions - and ARBURG is ready to provide it.

To this aim, ARBURG is taking the following steps with regard to the company and its products: Throughout the company, lower energy consumption can be achieved by optimising production with appropriate designs, for example, by reducing metal casting work, by the ongoing optimisation of production processes (replacement, centralisation and automation), by saving electricity through natural ventilation, energy-saving bulbs and green IT, by heat recovery through process heat management and by using block-type thermal power stations and renewable energy sources such as solar power systems or geothermal energy.

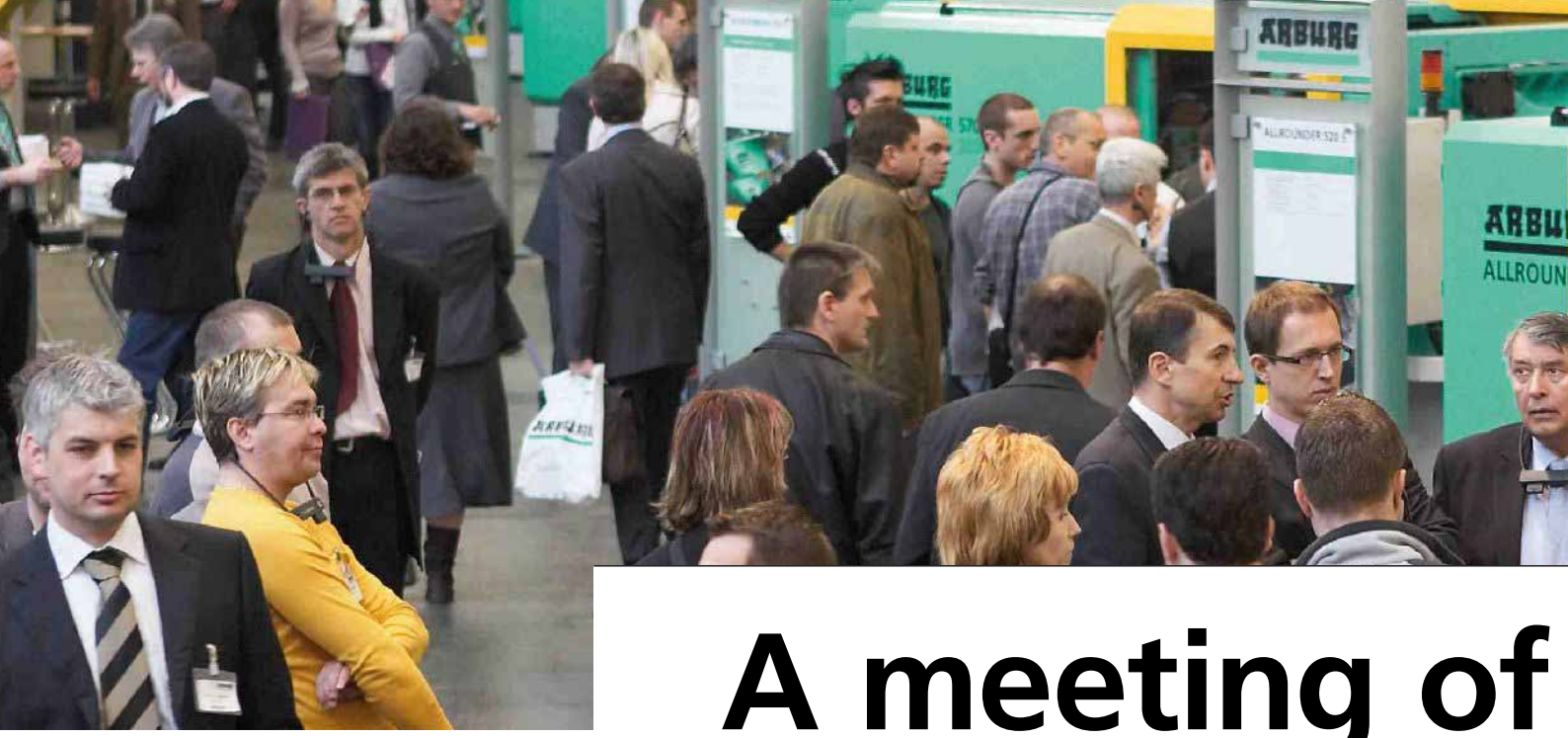
Where our products are concerned, we need to look, above all, at the overall injection moulding process, which is very energy-intensive. Here, for example, we can analyse overall energy consumption in terms of material preparation, moulding and the cooling process. But the machine's emissions into the environment (air, water), its drives and the possibilities of optimisation offered by the typical modularity of ARBURG's ALLROUNDERs are also taken into consideration. These include appropriate dimensioning of the drive system and injection unit, for example, and the ARBURG Energy Saving System (AES) and ARBURG Electro-mechanical Dosage (AED), which are available as options or with the 'advance' equipment package.

ARBURG has conducted extensive tests with ALLROUNDERs in this respect, which clearly demonstrate the effect of the various modular equipment alternatives on the machines' energy consumption.

Finally, the mould with its temperature control, cooling and heat flow and system availability, too, all exert an influence on the energy efficiency of injection moulding systems. These measures will be accompanied by a range of further actions, with the aim of making a lasting impression on the trade public with the ARBURG initiative. For example, various presentations on the subject of "Energy Efficiency" have taken and will take place during the Technology Days, for instance, and as part of the "Technology on Tour 2008" series of events (see page 10). Furthermore, energy-efficient products such as the electric ALLROUNDER A, the hydraulic ALLROUNDER S advance and ALLROUNDERs with electro-mechanical dosage drive will be clearly identified by the "e²" ARBURG Energy Efficiency label. This lets customers know that they will be working with energy-efficient technology. Finally, ARBURG will also present a customer award for special achievements with regard to energy efficiency.

Examples of efficient energy usage: reduced metal casting work (photo, top), visible due to the green and therefore unmachined areas, the use of solar power systems (photo, left), or the application of the "e²" Energy Efficiency label to the electric ALLROUNDER A (photo, right).

Additional PR campaigns and co-operation with the VDMA on a scheme for energy passports are also planned. The clear aim is to expand the proven, holistic cooperation with the customers to include the area of energy-efficient injection moulding production. "Energy Efficiency Allround" is a comprehensive campaign that will involve the company and its customers, achieving significant benefits for both parties.



A meeting of

Where can thousands of trade visitors from all over the world enjoy a unique overview of ARBURG's entire range of machines and technology, a diverse range of applications, expert presentations and a lively exchange of opinions between injection moulding specialists - all in three days? At ARBURG's Technology Days! Thanks to its successful blend of injection moulding theory and practice, every year this event is a highlight for the international injection moulding industry.

With record numbers of visitors totalling 4,100 from around the globe, the 2008 Technology Days compares favourably with many trade fairs. Between 3 and 5 April, the Lossburg parent factory was host to trade visitors from a total of 44 nations. Around 62 % of visitors came from Germany. From other countries, the largest numbers were from France and Poland, with around 160 participants. 135 guests came from the USA, about 130 from Italy, 120 from the Czech Republic and more than 100 from Switzerland. But specialists also found their way to Lossburg from China, Thailand, India, Japan, Indonesia, Malaysia, Vietnam, South Africa, Australia and Brazil.

With over 50 machine exhibits, the Technology Days offered a detailed overview of ARBURG injection moulding technology, the breadth of which cannot be matched at any other trade fair in the world.

The technology show was complemented by expert presentations on the subjects of "Energy Efficiency Allround", the ARBURG host computer system (ALS), preventive maintenance and metrotomography, which were attended by more than 1,500 visitors. In addition, a special area was set up to provide visitors with information about the company's comprehensive presales and aftersales services.

The main topic of the event was "Energy Efficiency Allround" - ARBURG's corporate objective for 2008, which was presented to the international global injection moulding industry for the first time at the Technology Days (see page 4).

In an expert presentation with the same name, the entire injection moulding process was examined from the point of view of energy. The energy flows were presented, divided into their respective elements and analysed and potential energy-saving measures considered.

The occasion also saw the first appearance of ARBURG's "e²" Energy Efficiency label, which adorned all the electric ALLROUNDER A machines, the hydraulic ALLROUNDER S advance and ALLROUNDERs with electro-mechanical dosage drive.

international industry

Every spring, thousands of trade visitors from around the globe come to the Technology Days at Lossburg. Awaiting them is not only a varied programme comprising injection moulding theory and practice, but also premieres such as the ALLROUNDER 375 V and the "e²" Energy Efficiency label.

More than 50 exhibits demonstrated the entire injection moulding spectrum from standard to high-end, all of which can be covered by ARBURG machine technology. Some of the applications presented were functional injection moulding, multi-component injection moulding, thermoset, elastomer, LSR and LCP processing, injection moulding of wood polymer and leather fibres, insert encapsulation, in-mould labelling, high-speed packaging products, medical technology, production of optical components in the clean room, precision and technical injection moulding, powder injection moulding (PIM), gas injection moulding technology (GIT) and the production of PET preforms.

In the "Automation" exhibition area, various projects demonstrated to visitors ARBURG's expertise in the field of complex production cells. Visitors were able to marvel at sophisticated applications on large ALLROUNDER S machines, with integrated production steps such as assembly or ultrasonic welding, for example. One interesting project was the production of a fully functional LED light strip on a three-component ALLROUNDER 370 S. During this process, not only were the LEDs and resistor inserted - the conductor tracks were moulded as well.

Electric ALLROUNDER A machines integrated in production cells were shown carrying out IML and the production of rulers with downstream laser labelling (see page 11).

A technological highlight was the premiere of the ALLROUNDER 375 V with a clamping force of 500 kN, which adds a higher clamping force to the series of vertical machines with free-space system. The Exjection® process from IB STEINER and Hybrid Composite Products GmbH was demonstrated on this machine. Exjection® can be used to produce long, thin-walled and structured components from viscous thermoplastics. It therefore enables large parts to be produced with small clamping forces. Processing pressure is minimal and the cost of production can be significantly reduced. The low clamping force means that the process is particularly suited for use with the vertical ALLROUNDER V. Because the mould is installed horizontally, the transfer movement during the injection process is also horizontal. And the vertical free-space system sets no limit on the mould length, the stroke and therefore the length of the component.

Thanks to their technological diversity, the ARBURG Technology Days have now established themselves as a permanent fixture on the international plastics industry's calendar and have impressively demonstrated once again that this method of passing on information is extremely well received by existing and prospective customers from around the world.

Competence in

The development and production of medical technology products requires a high degree of precision, highest quality standards and in-depth knowledge of the processing of thermoplastics and silicones, inserts and two-component injection moulding applications.

The California-based US company, APEC - a subsidiary of Helix Medical LLC since January 2008 - has been offering all this to its customers for more than ten years. APEC was established in March 1997 by Anura Welikala and Wolfgang Buehler. Together with sister company Magor Mold, a mould manufacturer, APEC can look back on a corporate success story covering more than a decade. Wolfgang Buehler was and is the owner of Magor Mold and Anura Welikala was previously a customer of this mould manufacturer. The two companies' expansive corporate history began when Anura Welikala compared the services provided by Magor Mold with those of other mould manufacturers he had previously worked with in Asia and on the West and East coasts of the USA. Owing to his immense satisfaction and their shared high quality standards, the two new partners decided to jointly set up an injection moulding company - initially for testing the moulds made by Magor Mold.

The company kicked off in 1997 in Irwindale, to the East of Los Angeles, with three employees, one customer and one injection moulding machine. The company became profitable after only two quarters and at the end of the first fiscal year, they boasted a fleet of six machines. The success story continued seamlessly, so that in 2006, a sales volume of 13.5 million dollars was achieved. Today, medical technology products account for some 99 % of APEC's turnover. Since 2005, the company headquarters, with an area of approx. 23,000 square metres and production facilities operating 24/7, have been situated in the nearby Baldwin Park. The construction of a class 10,000 clean room for the assembly of devices is underway and sufficient space remains available for a second, class 100,000, clean room. The company's successful development is also demonstrated by the fact that APEC was taken over by Freudenberg NOK on 1 January 2008 and now belongs to the Freudenberg Group.

Recently, APEC opened a second production location in Shenzhen, China. In terms of production technology and personnel, APEC ASIA has the same excellent facilities as its American parent company. "Around 12,000 square metres of production area and clean room class 100,000 prove that Asia is of vital importance for us and our customers," concludes Anura Welikala. China is becoming one of the largest markets for luxury items and high-end medical technology products fit the bill perfectly. Consequently, high growth is expected to continue.

APEC products are currently used in China, Mexico, the Dominican Republic, Puerto Rico and, of course, the USA. Turnover increased by an impressive 30 % last year, while the number of customers - most of whom are long-standing APEC customers - remained virtually static. Today APEC has 125 employees in the USA and China is also set to reach 100 employees by the end of 2008.

At Baldwin Park, 43 injection moulding machines, including 14 ALLROUNDERs, are currently in operation, covering a clamping force range from 28 to 300 US tons, including eight special silicone production

medical technology

Photos: APEC

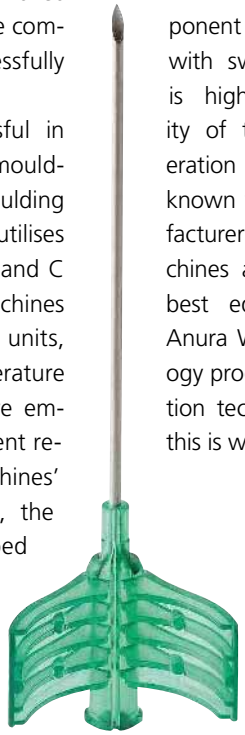
Photo, left: The ARBURG Divisional Manager responsible for APEC, Jürgen Giesow (right), congratulates Anura Welikala on his company's tenth anniversary. Photo, right: In clean conditions, APEC manufactures medical technology products on the electric ALLROUNDER A.

APEC
PLASTIC AND SILICONE MOLDING
A Division of Helix Medical

cells. APEC ASIA opened in 2007 with six injection moulding machines in a clamping force range from 550 to 2,000 kN. Catheters, haemodialysis machines, lancets and components for intravenous injections are produced to the highest quality standards, as evidenced by certification according to ISO 13485:2003 and US CDHS Licensed Medical Device Manufacturer, FDA cGMP and FDA QSR certifications. In addition to its medical technology products, APEC boasts outstanding expertise in the field of multi-component processing, so it comes as no surprise to know that other manufacturers failed in the production of many of the components before they were successfully manufactured by APEC.

APEC is particularly successful in the field of silicone injection moulding, so-called liquid injection moulding (LIM). For this purpose, APEC utilises eight ARBURG ALLROUNDER S and C type injection moulding machines with modern silicone injection units, vacuum units and closed temperature circuits. Cold runner moulds are employed, which must meet stringent requirements in terms of the machines' reproducibility. For this reason, the ALLROUNDERs are equipped with position control and the moulds are automated in order to achieve the required cycle time consistency. A further important factor for APEC was the high degree of flexibility of the ALLROUNDERs, as the machines can be quickly converted to thermoplastic injection moulding when no silicone parts are being produced. Conversion can be completed in less than two hours.

APEC has been working with ARBURG virtually from the outset of its business activities. Now, it employs electric ALLROUNDER A machines, the ALLROUNDER T rotary table, multi-component machines and ALLROUNDERs with swivelling clamping unit. APEC is highly satisfied with the quality of the machines and the cooperation with ARBURG: "ARBURG is known worldwide as a leading manufacturer of injection moulding machines and APEC only purchases the best equipment," says the owner, Anura Welikala. "For medical technology products demand the best production technology on the market - and this is what ARBURG provides!"



INFOBOX

Founded: 1997
Locations: USA, China
Turnover: 13.5 million dollars (2006)
Production area: 23,000 square metres (USA), 12,000 square metres (China)
Employees: 125 (USA), 100 by end of 2008 (China)
Machine fleet: 49 injection moulding machines (USA and China)
Products: Medical technology products of thermoplastics and silicone
Contact: APEC, 5050 Rivergrade Road, Baldwin Park, CA 91706, USA
www.apec-plastics.com

Photos: nova imagen

Technology on Tour 2008 www.arburg.com

The ARBURG world tour

With a series of international events, "Technology on Tour 2008", ARBURG visits its customers locally and presents its current corporate objective "Energy Efficiency Allround". Numerous events are being organised in cooperation with subsidiaries and trading partners, with the aim of drawing international attention to the subject of energy efficiency and presenting ARBURG's range of energy-optimising products and advice.

The aim of these 50 or so events worldwide, which include seminars, open houses and a truck tour, is to make participants aware of the subject of energy efficiency and flag up various energy-saving potentials.

With its experience and extensive process knowledge, ARBURG is its customers' point of contact for all aspects of energy-efficient production. The focal point of all events is a specialist presentation, in which the injection moulding machine, mould and overall process are examined from the point of view of energy. The overall energy consumption from material preparation, moulding and the cooling process is analysed and various optimisation possibilities in terms of the injection moulding machine, mould and system availability are presented.

At the worldwide seminars, the specialist presentation on energy efficiency is complemented by other current injection moulding topics. The open house events hosted by subsidiaries and trading partners offer an ideal platform for showing customers ARBURG'S extensive expertise on the subject of energy-efficient production and ARBURG's product range.

The third event component is the truck from the French plastics group "Destination Plasturgie", which will be touring Europe from mid-April 2008 to the end of the year. This specially equipped truck presents the fascinating world of plastics technology in combination with ARBURG's corporate objective, "Energy Efficiency Allround" in theory and practice. With this objective, the truck accommodates an electric ALLROUNDER 320 A with a clamping force of 500 kN, which demonstrates the energy-efficient production of moulded parts in everyday operations.

Photo: Berta Tiana

First stop for the truck tour was the Town Hall Square in Copenhagen (photo, top). In the truck, ARBURG experts explain energy-efficient injection moulding production (above right).

Going it together

Innovative, complex and technologically superior: these were the requirements of the French Training Centre, CFAO (Centre de Formations d'Apprentis d'Oyonnax) for the production cell that is to be used for training purposes.

A total of twelve partners were involved in this project, which was completed within 15 months. The Training Centre for Plastics Processing, CFP (Centre de Formation de la Plasturgie), was the principal coordinator of the project. And the main contractor for the complete production cell was the French ARBURG subsidiary, which worked in close cooperation with the Project Department of the parent company.

The project was conceived by an expert team of representatives from each of the cooperative partners. The aim was to produce a complex, technical moulded part with an innovative design by means of a high-tech process.

After the product - a versatile ruler with angular measurement, integrated magnifying glass and laser-printed scale - and its design had been defined, the next step was to find the most suitable production process. It was determined that the best way to manufacture this high-quality ruler would be with a single-cavity mould. Furthermore, rheological studies showed that sequential three-point injection would achieve the optimum flow characteristics and result in reduced deformation of the finished part.

The rulers cool off on the 24-station rotary table and are then conveyed to the laser-printing process.

Important features of the injection moulding process were the hot runner system with three needle shut-off nozzles with external control for sequential injection and pressure and temperature control sensors in the mould. To produce the magnifying glass during the injection moulding process, the mould was equipped with a core-pull-controlled stamp.

At the heart of the production cell was an electric ALLROUNDER 420 A with a clamping force of 1,000 kN and a MULTILIFT V vertical robotic system for removing and setting down parts. A turning unit integrated in the gripper enabled the rulers to be positioned on the 24-station rotary table in such a way as to enable the underside to be laser-printed after the appropriate cooling time.

In this project, both the material - transparent PMMA - and the quality of the moulded part meant that the laser process was subject to stringent requirements. At the end of the process, to protect the rulers they were set down in trays on the conveyor belt by the robotic system.

Pure optics

The field of optics, in particular, places very special requirements on injection moulding machines. Thanks to our large range of equipment options, we at ARBURG are able to satisfy the specific demands of our cooperative partner, Jenoptik Polymer Systems, to perfection. This is why 30 out of 50 injection moulding machines at Triptis, Thuringia and Mühlhausen, Baden-Wuerttemberg are ALLROUNDERs.

However, Jenoptik Polymer Systems sees ARBURG as more than "just" a machine supplier. Rather, we act as a strategic development partner, cooperating closely with Jenoptik Polymer Systems over the long term on questions regarding the right machines and technology to realise new processes. At the Triptis site, we have always concentrated on the manufacture of plastic optical components through injection moulding and the machining of lenses and Fresnel structures on numerically controlled diamond lathes.

Today, as a system supplier, Jenoptik Polymer Systems houses the entire process chain for the production of polymer-based opto-electronic and opto-mechanical systems under one roof. It has therefore undertaken steps towards further development: 1997 heralded the construction of an in-house mould-making shop and the establishment of component group assembly, with the launch of ultra-precision production. Now, after the integration of construction and connection technology in 2005, the value-added chain of production takes place completely under one roof. Jenoptik Polymer Systems produces items and components for the fields of medical technology, sensors, lighting and energy, in particular.

The company enjoys advantages above all in the organisation of all production processes and the resulting high product quality - quality that is largely achieved using ALLROUNDER injection moulding technology. Consequently, the optimisation and continual further development of production processes is especially important. Before and during production, the company's own measuring centre monitors processes to ensure exact compliance with product parameters.

In this way, precise optical elements weighing 0.05 to 500 grams are mass-produced with reproducible parameters. The precision of the production processes enables the use of thermoplastics for numerous innovative optical applications. Surface accuracy down to a micrometer can be achieved without problem. High-quality optical and functional coatings applied downstream further expand the range of possible applications. Production is organised so flexibly that unit numbers from a few thousand to several million a year can be produced.

Large lot sizes are predominantly produced on fully automated production lines, which carry out the automated removal, packaging and - in some cases - 100 % visual check. Jenoptik Polymer Systems makes use of two-component plastics processing to produce complex mounts containing optical elements such as lenses, prisms or plane faces in a semi or fully automatic work sequence. Multi-component machines make up 30 % of the machine fleet, with 320 S 500-60/60 ALLROUNDERs as ARBURG's principal

JENOPTIK
GERMANY

from the start

Photos: JENOPTIK/Sebastian Reuter

It's all about complex optical parts at Jenoptik Polymer Systems GmbH (photos, left). These parts, produced on ALLROUNDERs, are destined above all for the fields of medical technology, sensors, lighting and energy. Downstream checks ensure quality (photo, bottom left).

representative. In future, however, these are to be joined by ALLROUNDER 370 S 600-170/70 machines in the fully accumulator-driven version.

This technology, in particular, exploits the advantages of plastic especially well.

For example, micro-optical elements can be integrated easily in a complex component, avoiding the need for time-consuming assembly processes. Given the high lot sizes produced, the company's priorities are high moulding accuracy, precise mould opening and special devices for handling the components. Small optical components, some with several lenses, are produced, for example. The items are removed by robotic systems - including the MULTILIFT H - with 100 % monitoring by an optical measuring unit.

The ARBURG machine fleet also includes standard machines for small, optical precision components, principally the ALLROUNDER 370 C and 420 C, plus the 370 S with the smallest injection unit (100) and screw diameters of 15 millimetres. All ARBURG machines work with the option 'position regulated screw', so that reproducibility is comprehensively guaranteed.

The machine fleet in Triptis and Mühlhausen - two out of a total of three sites - has been modified for special process sequences; the control and machine designs were adapted for the production of optical equipment. Various automated production cells are equipped with special filter units to ensure especially clean production conditions. These are used primarily for components that are coated in downstream processes.

The machines cover a performance range of 50 kN to 3,250 kN and are in operation in two or three shifts 24/7. Time and again, the precision and reliability of the ALLROUNDER machines is quoted as the definitive argument in favour of this excellent partnership. And the service that ARBURG offers to Jenoptik Polymer Systems in the form of a service contract with annual machine maintenance and calibration also ranks very highly.

INFOBOX

Founded: In 1991 with the takeover of a production facility for plastic optical parts from the Carl Zeiss Jena combine, known as Jenoptik Polymer Systems since 2006
Employees: More than 200
Products: System supplier of the complete process chain for the production of polymer-based opto-electronic, opto-mechanical and micro-systems
Contact: JENOPTIK Polymer Systems GmbH, Am Sandberg 2,
7819 Triptis, Germany
www.jenoptik-ps.de

Photo: ©Picture-Alliance/ASA

Top marks for customer loyalty and image

ARBURG is known for its far-sighted, long-term strategy and company policy. It should therefore come as no surprise that even in a record year in the company's history, we commissioned a far-reaching study of our brand image and the loyalty of our customers. For there's always room for improvement!

"How loyal to ARBURG are our customers?" and "How can this customer loyalty be further strengthened in future?" These were some of the key questions to which the responsible ARBURG staff wanted answers. The study, which was commissioned in 2007, was divided into three areas: a general comparison of competitors, direct comparison with the most important individual competitors and self-assessment by ARBURG employees.

Approximately 1,200 people in three European countries were surveyed, including around 700 ARBURG customers, about 400 customers of the competition and 100 ARBURG employees who are in contact with customers.

Juliane Hehl, Managing Partner with responsibility for Marketing, is delighted: "Customer loyalty is a much more important factor than just customer satisfaction. For maximum customer loyalty to ARBURG, as shown by other research as well, you need an ideal combination: outstanding performance and an excellent image."

The study confirms most impressively that ARBURG has an excellent recognition factor and a very good image in the industry, not just among its own customers, but among customers of the competition as well. Our range of products and services is very well known and ranked highly. Professionalism and expertise were named as the company's particular strengths.

Innovation and technology are important criteria when deciding to purchase an ARBURG injection moulding machine, whereas price plays a decisive role in the case of other suppliers on the market. ARBURG is therefore recognised as a leader in terms of technology and quality. As a result of ARBURG's long-term company policy, the emotional loyalty of our customers is a great deal higher than among the competition. Customer satisfaction is manifested primarily as a result of product quality, highly developed logistics and outstanding supply capabilities.

Juliane Hehl evaluates the results as follows: "ARBURG is very pleased, but we are not about to rest on our laurels." Rather, the strategy of past years will continue: In addition to "hard factors" such as quality, price and service, in future the aspects of brand leadership and communication will continue to be regarded as vital elements in an exacting customer loyalty strategy.

A reason to celebrate, but no one can afford to rest on their laurels – this is how ARBURG interprets the results of a 2007 study on emotional customer loyalty. (photo, top) The comprehensive customer support at ARBURG includes individual application technology consulting (photo, left).

Only ARBURG service is original

If you want perfect maintenance and repairs and high machine availability, it's best to rely on ARBURG service.

What applies to ARBURG's machines and spare parts applies equally to the company's entire range of services: customers are only covered by a full warranty if their ALLROUNDER injection moulding technology is serviced by ARBURG specialists. You don't hand your car to your neighbour for an MOT, do you? You go to an authorised, specialist repair shop.

Even if you've read otherwise elsewhere, you can only get original ARBURG service from ARBURG. For of course, ARBURG cannot take responsibility for work carried out on ALLROUNDERs by unauthorised third parties. This applies both to the parts used and the service itself. But not only can inexpert repairs cause warranty claims to become invalid, they can have much worse consequences - such as machine failure. In that case, rapid assistance from ARBURG specialists cannot necessarily be taken for granted, for if service work has been handed over to third parties, then of course the service documentation supplied with every machine will be incomplete. And as a result, there may be problems with the hotline service and machine calibrations, incorrect diagnoses may be made or the wrong parts delivered. In other words, it may simply take longer to locate the fault and remedy it in the proper manner.

Basically, the road to inexpert services is extremely easy, which makes it all the more problematic: independent engineers and service technicians have not benefited from ARBURG's training in the latest injection moulding technologies and therefore cannot possibly possess the solid expertise of ARBURG specialists. So, getting repairs done in this way always entails a risk.

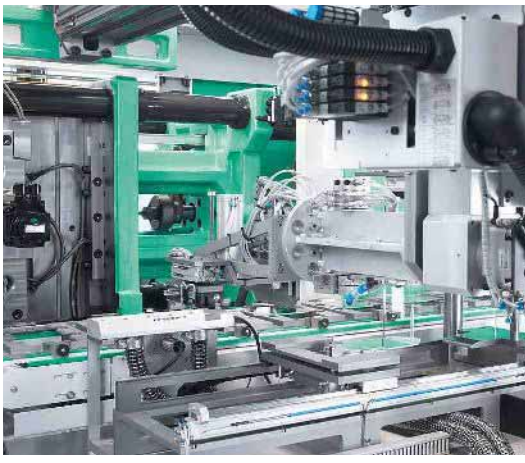
For this reason, for all ARBURG customers it really matters to whom they contract their services. For what seems cheaper at first can ultimately turn out to be an expensive mistake.

On the other hand, customers who work not just with the ALLROUNDERs but also with ARBURG's expert service can access and place their trust in an extensive range of services. Our offer ranges from a 24-hour hotline to in-depth training courses on machines and technology, preventive maintenance via service contracts, our oil service, a comprehensive spare parts service, technical advice and finally, the rapid handling of all warranty claims. In this area, too, ARBURG's good reputation didn't come about by chance. ARBURG offers Service allround - and in the long term, that always pays off!

A full line-up

Bayer MaterialScience AG now has six production cells in operation at its Thermoplastics Testing Centre and a seventh already in planning, for the fully automatic production of test pieces and test plates. The project system was installed at the beginning of this year, on the basis of an ALLROUNDER 570 C with which test plates of three different thicknesses are being produced.

Bayer MaterialScience AG belongs to the international Bayer Corporation and has a total of 60 ALLROUNDERs in operation at its production and research plants around the world. Around 20 of these are in the Thermoplastics Testing Centre (TTC) in Uerdingen. The company has worked



together with ARBURG for more than 25 years and "the cooperation is excellent," emphasises Bernd Winkelmann (Global Activities at the TTC) and he explains why: "In ARBURG, we have an extremely reliable development partner and we are very impressed with the continuity of its company development and its consistent implementation of state-of-the-art production processes."

Bayer MaterialScience

# of projects

A focal point of research at the Thermoplastics Testing Center is the development of scratch-resistant coatings for the automotive glazing sector.

The new production cell is employed for the development of optical components. "This enables us to get development projects up and running quickly and standardise our equipment worldwide," says Klaus Salewski, Processing Manager at the TTC, describing the successful teamwork thus: "ARBURG's Project Department elaborated a detailed solution corresponding to our requirements and supplied the entire system. We organised the mould construction ourselves, as we have specialist expertise in this field."

The test plates are manufactured in three different thicknesses, a process requiring very high accuracy and surface quality. The demands placed on the machine and parts handling are correspondingly high, as during the production sequence, the platen surface must not be touched at any time.

The test plates are produced on the ALLROUNDER 570 C with a clamping force of 2,000 kN by means of a flash sprue, whereby the modified ARBURG VARIO technique enables the plates to be moulded on machines with offset injection using a straight, cold runner direct sprue.

Furthermore, particle contamination of surfaces is prevented by clean-air modules above the machine's clamping unit and the robotic system and ionisation of the test plates from both sides.

Stations in the automated test piece production line (photos from left): Three-cavity mould for test plates with different thicknesses, sprue separation at the cutting station, cooling section with coded mould nests and transfer to the packaging system.

To enable the different test plates to be produced without changing the mould, the latter has three cavities with different thicknesses, of which only one is in use at a time. When changing to another cavity, the mould insert is moved on the nozzle side by a servo motor.

After the injection moulding process, the MULTILIFT H robotic system picks up the finished part, swivels it from a vertical to a horizontal position, moves the underside above an ionising unit and transfers the test plate to a pneumatic linear axis with the sprue facing upwards. The test plate travels to the cutting station to separate the flash sprue, then back into position ready for transfer by the robotic system. At the same time, the upper side of the finished part is ionised and also blown off.

The robotic system then picks up the finished part again and sets it down transversely on a workpiece carrier in the cooling section. At the end of the cooling section, the test plates are picked up by a pick & place device and are set down on the conveyor system of the film packaging machine. When packaging is complete, the bags are printed with part-specific data, which are provided by Bayer's process data system.

INFOBOX

Locations: Approx. 30 production and research locations
Employees: Around 14.900
Turnover: Approx. 10.2 billion euros in 2006
Products: High-quality materials such as polycarbonates and polyurethane, innovative system solutions such as finishes
Machine fleet: Around 60 ALLROUNDERs worldwide
Contact: Bayer MaterialScience AG, Thermoplastics Testing Center, address: R 33, Rheinuferstraße 7-9, 47829 Krefeld, Germany
www.ttc.bayermaterialscience.de

First 100 days at Irvine

Friedrich Kanz and Bill Carteaux, President and CEO respectively of the Society of the Plastics Industry, Juliane Hehl, Michael Hehl, Jürgen Giesow and Helmut Heinson (from left to right) officially open the new ATC.

Since its inauguration on 21 February 2008, the ARBURG Technology Center (ATC) California in Irvine has officially opened its doors and is now offering customers on the West Coast of the USA an extensive range of services.

During the festivities of the opening ceremony, which was also attended by ARBURG Managing Partners Juliane and Michael Hehl and Managing Director Sales Helmut Heinson, there was praise from all sides. "We truly appreciate the commitment that ARBURG and the Hehl family is making to the plastics industry on the West Coast. The Technology Center will satisfy the very latest requirements and reflects interest in local market activity," declared the representatives from the "Society of Plastics Engineers" (SPE) and the APEC, Magor and Merit companies in agreement.

In his speech, Michael Hehl, Spokesperson for the Management, stressed the importance of the new ATC California: "This gala opening is intended to emphasise the significance of customer proximity for our work as a whole."

Subsidiary Manager Friedrich Kanz has no doubt that ARBURG is right to fly the ATC flag in California.

He voices his initial conclusion after the first 100 days: "The response to the new service offering here in Irvine is thoroughly positive and we have received numerous requests for quotes on all aspects of machine and application technology."

"We are delighted that our customers are increasingly making use of the opportunities afforded by the showroom and the extended ranges of services, including consultancy on specific applications and the project planning of tailor-made, highly automated production cells," adds Jürgen Giesow, Divisional Manager responsible for ATC California.

PLAST IMAGEN MEXICO 2008

Successful debut

The new subsidiary in Mexico delivered a stunning trade fair performance at its very first public debut: it presented itself at the Plastimagen in Mexico City with great success, thereby clearly pointing the way ahead for the Central American plastics market.

Visitors to the Plastimagen were welcomed by ARBURG even at the entrance to the fair (photo, top). At the trade fair stand, they were then in the best of hands, thanks to Guillermo Fasterling (photo, centre) and service technician Juan Luna (photo, bottom).

The new ARBURG subsidiary in Mexico presented itself to the public for the first time at the Plastimagen from 8 to 11 April 2008 - and met with resounding success. "Our trade fair presentation was an allround success: firstly, we had a first-class trade fair stand in the new ARBURG design and we presented the hydraulic ALLROUNDER 470 C GOLDEN EDITION with a medical technology application. We also established many valuable contacts and took part in an extremely successful press conference," concludes ARBURG Managing Director Sales, Helmut Heinson.

There was great interest among Mexican trade visitors and the trade fair was therefore well frequented. "We had a great many technical discussions with our international and Mexican customers and spoke about future projects. But not only that, we forged numerous new links at the Plastimagen, too," declares Subsidiary Manager Guillermo Fasterling who, with his team, has been providing comprehensive support for customers in Mexico since the beginning of this year and is no stranger to the Mexican plastics market.

The pace is not about to relent after the success of the trade fair. Now it is a question of processing the numerous enquiries, drawing up quotes and further expanding the range of services.

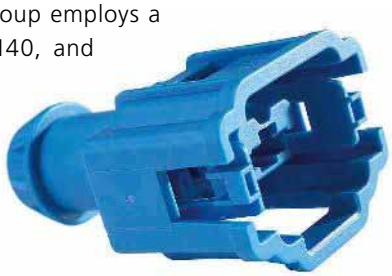
"In order to be even closer to our Mexican customers and provide even more intensive support in future, we are going to further expand our service and sales capacities and promote decentralised support by setting up stations throughout the country," announced Guillermo Fasterling at the press conference. He explained the strategy as follows: "As far as service is concerned, this will be performed exclusively with our own employees. In sales, however, we will also work with representatives - a concept that has proven its worth for years in Brazil, for example."

"Global Solutions"

The Portuguese company, Celoplás, has set out its strategy quite clearly: Celoplás utilises the very latest technology to develop and produce high-quality injection moulds and plastic components. And it does this with the ultimate in technology and automation, flexibility and quality-supported, of course, by high-quality machine technology and equipment. When it comes to injection moulding machines, the company relies primarily on ALLROUNDERs from ARBURG.

If a company's principal sales areas are in the automotive industry and medical technology, high quality standards are a matter of course. And Celoplás is no exception. Their production spectrum ranges from micro-injection moulded parts to highly complex technical items, while thermosets, BMC and LSR are processed as well as around 140 different kinds of thermoplastics.

The company was founded in 1989 and is currently owned 100 % by Portuguese proprietors. Today, several small firms make up the Celoplás umbrella company. The group employs a workforce of around 140, and regards employee qualifications and training as highly important. Approximately 13 % of employees have a university degree and local people are given preference when filling vacant positions. All new shop and office workers undergo a two-week internal training programme, to comprehensively prepare them for their new work environment.



The company's development has been highly dynamic in recent years, which is reflected by an average growth in turnover of more than 15 % a year.

On a production area covering over 10,000 square metres, Celoplás mainly produces precision components for the automotive and electrical industries, plus optical items as well, on a total of 52 injection moulding machines. The material feed to and from all machines takes place centrally, material waste is recycled close to the machines and conveyed directly back to them. Also important is the fact that Celoplás not only manufactures parts, but has also been producing the necessary moulds itself since 1992. Downstream, the parts can also be printed or hot-film laminated. High quality standards are implemented in production and the company is certified to ISO 9001:2000 and TS 16949. 95 % of the finished items are destined for export. An expanding company such as this is always prone to new, futuristic ideas: Celoplás is further expanding its activities to include part finishes and micro-injection moulding.

Cooperation with ARBURG is as old as Celoplás itself. The two companies have been working together since 1989 and Celoplás cites its two main reasons for this as the technically perfect, reliable machine technology on the one hand and the fast, reliable service on the other. With a machine fleet of 30 ALLROUNDERs, Celoplás has equipped its own production predominantly with ARBURG injection moulding technology. The performance of the machine fleet covers a clamping force range of 350 to 4,000 kN. The company produces its moulded parts with weights between 0.05 and 300 grams in three shifts, seven days a week, which explains the machines' high level of automation. The ARBURG machines are equipped with MULTILIFT robotic systems, hot

celoplás

from Portugal

Photos: celoplás

runner and core-pull control and unscrewing units. In addition, some of the ALLROUNDERs are fitted with swivelling clamping units for injecting into the parting line. The ARBURG machines are primarily employed for the production of high-quality technical items. Moulded parts that have to be produced using a vertical clamping unit are manufactured completely on ALLROUNDERs.

Preventive maintenance of the machines and minor repairs are performed by well-trained Celoplás personnel. ARBURG Service handles the more demanding tasks or special repairs. That, too, is a further indication of how the ALLROUNDERs function without problems in everyday operation. And this is one major reason why Celoplás's technical decision-makers are, now as ever, extremely satisfied with ARBURG's injection moulding technology. In their opinion, ARBURG has excellent injection moulding machines that firms in Portugal are very happy with. To sum up: ALLROUNDERs are high-performance, universal, reliable and easy to operate.

Celoplás offers its customers the entire value-added chain of plastic items: from development through mould construction to production (photos left and above).

INFOBOX

Founded: 1989 in Grimancelos, Portugal
Employees: Around 140
Products: Micro-injection moulded parts and technical precision components made from thermoplastics and thermosets, BMC and LSR with part weights between 0.05 and 300 grams.
Contact: Celoplás Plásticos para a Indústria, S.A., Apartado 9, 4775-126 Grimancelos, Portugal, peral@celoplas.pt, www.celoplas.com

TECH TALK

Dipl. Ing. (BA) Oliver Schäfer, Technical Information

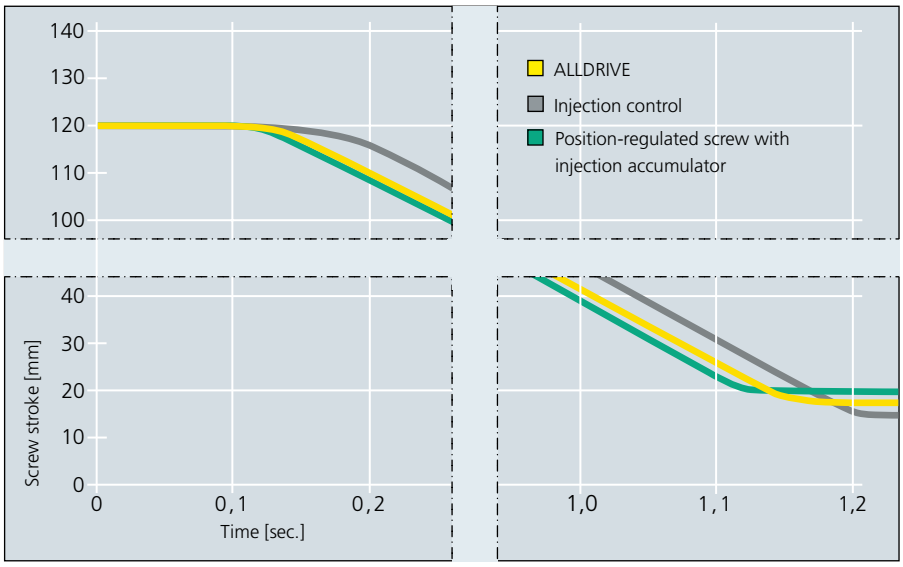
High performance

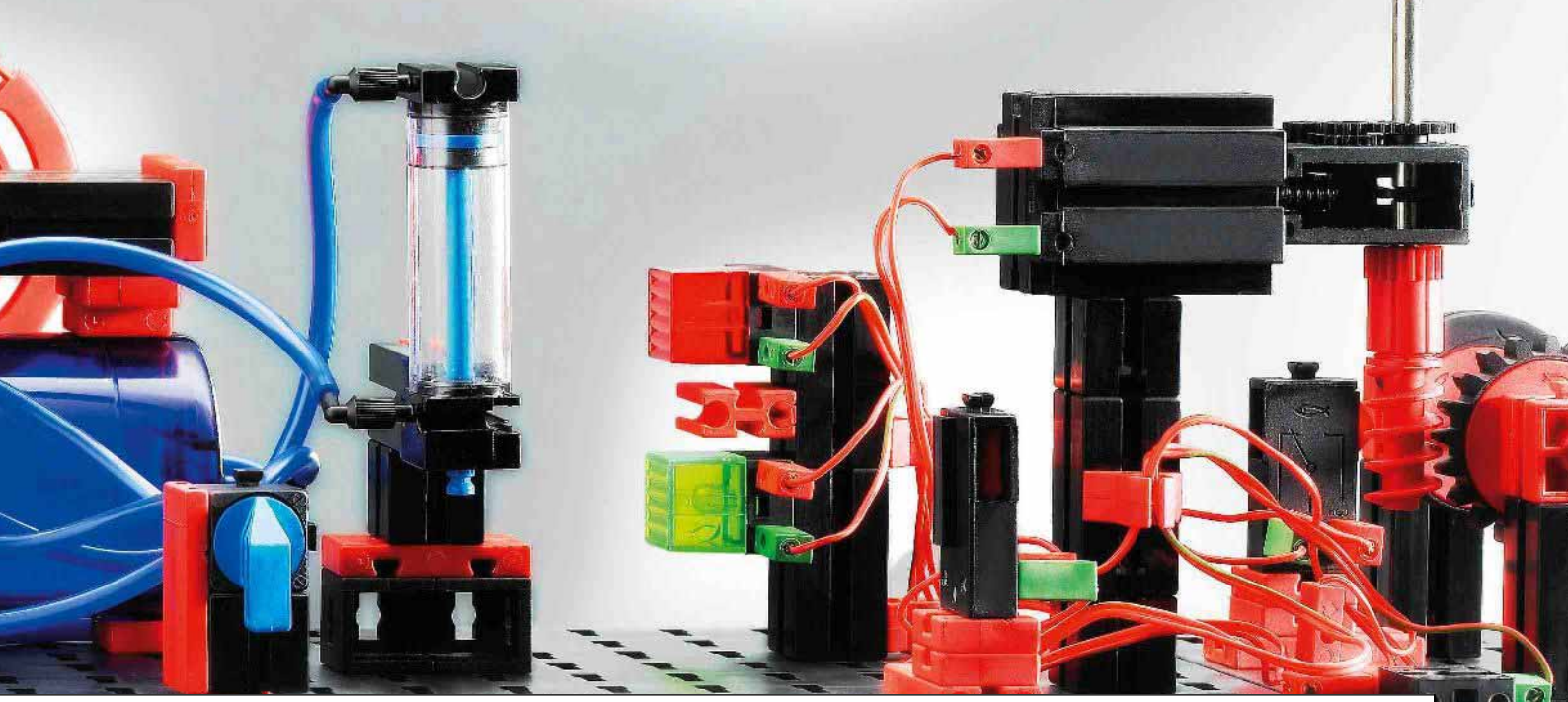
The primary objective of all developments at ARBURG is to consistently implement the company's mission statement, "Allrounders for economical injection moulding". What matters is thinking ahead and continually expanding the modular product range. A current example: a size 1300 injection unit is now available for the electric ALLROUNDER 570 A in addition to size 800. The special feature here is that the 1300 injection unit is equipped with a hydraulic injection accumulator. The result is a high-performance machine in terms of injection power, dynamics, speed and precision.

Hydraulically powered injection axes have a major advantage over electro-mechanical versions in that they offer a high force and power density combined with a compact design. At the same time, the use of hydraulic pressure accumulators enables high injection speeds to be achieved. This has a knock-on effect on the dynamics, i.e. how quickly the speed can be reached. All these characteristics are decisive factors for the filling of moulded parts with an extremely broad range of wall thicknesses and long flow paths, or thin-walled moulded parts. When the so-called injection accumulator is combined with an electro-mechanical dosage drive, the result is a high-performance injection unit that combines a high plasticising capacity with rapid cycles. This is advantageous in the field of multi-cavity applications, for example, and for packaging items and thin-walled products.

However, the reproach is often made against hydraulic injection axes that they work less precisely than electro-mechanical versions. In addition, the hydraulic cylinder responsible for the injection movement is mostly only subjected to pressure at one end. An injection system of this kind can be compared to a car without active braking. The defined speed cannot be adhered to so rapidly or precisely, because here the only control options are "Apply pressure" and "Remove pressure".

To improve the precision of hydraulic injection systems, ARBURG includes in its range an option, position-regulated screw (PRS), which is specified when injection accumulators are used. Here, the hydraulic cylinder responsible for the injection movement is subjected to pressure at both ends. With the help of pressure transducers and a dedicated, closed-loop control circuit (servo control), the injection axis can be accelerated and braked





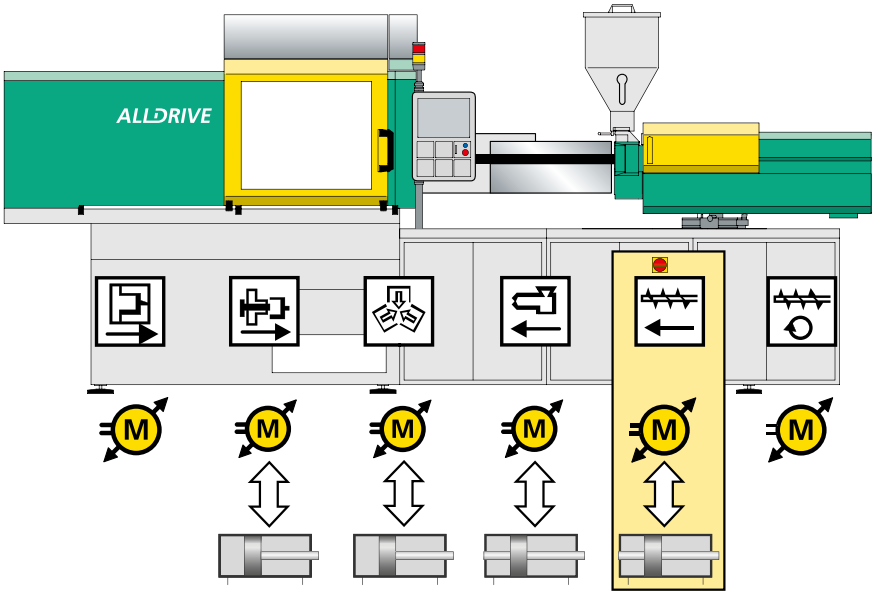
through modularity

in a precise, targeted manner. Control parameters include the screw position (stroke measurement system) and the pressure difference between the two cylinder chambers. The pressure transducers and hydraulic valves are situated close to the hydraulic consumers. This results in very short oil columns and direct control of movements. Together with the regulation of the pressure difference, extremely accurate position, speed and pressure control becomes possible.

The achievable reproducibility of a hydraulic injection system with injection accumulator and PRS is comparable to that of the electro-mechanical version. But with a system like this, considerably higher injection speeds can be attained. This, in turn, leads to higher injection power, which is necessary for high-performance applications.

The auxiliary axes "Ejector", "Nozzle Movement" and "Core Pull" were already available as hydraulic alternatives for the electric ALLROUNDER A. Now, thanks to the 1300 injection unit with hydraulic injection accumulator, the equipment of this series can become even more flexible. At the same time, its range of applications can increase. In future, it will be possible to use the ALLROUNDER 570 A for applications with performance requirements that far exceed the capabilities of the largest electric, size 800, injection unit and with comparable precision. Nevertheless, the machine still remains energy-efficient, thanks to the other electric movement axes, such as for the clamping system or dosing axis, for example.

As flexible as a modular kit: the drive technology of the electric ALLROUNDER A (graphic, right). The Dynamic of different drive concepts (graphic, left).



Internationally electric. Reproducible, precise, fast but also energy efficient.

With the fully electric ALLROUNDER A, ARBURG has just the right solution for all customer requirements. The fully electric ALLDRIVE is available with clamping forces from 500 to 2,000 kN.

Efficiency and precision, suitable for international applications.

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