

today

The ARBURG magazine Edition 23 Summer 2003



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IMPRESSUM

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820 mm distance between tie bars, a clamping force of 4000 kN and a maximum moulded part weight of 1860 g polystyrene - these are the impressive key data for the largest ARBURG ALLROUNDER.





Dear Readers,

Once again, this year is very special for our company: in addition to ten years of our subsidiaries in Great Britain, Italy and the Netherlands, we are also celebrating

the ten year anniversary of our SELOGICA control system.

We have offered a real technological edge for ten years now, thanks to this modern control philosophy: with the graphic sequence editor, the logical selective operating controls, completely cycle-integrated peripherals and plausibility check, all the instruments for state-of-the-art production are at your disposal.

The increasing role the SELOGICA control system plays in the integration of sophisticated peripherals within the context of modern projects will be described in detail in the present edition of today.

It goes without saying that in all modesty, we are proud of this performance: once again, ARBURG set the standard for the global market and in our industry at an early stage.

A standard that was gladly adopted thanks to its convincing

practical advantages. This pioneering role is a thoroughly familiar one in the history of ARBURG.

We are pleased to adopt the pacemaker role: in keeping with this year's motto, "MODULARITY ALLROUND", we will continue to press on with technological advances for the benefit of our customers. That our modular approach is not restricted to our machine technology is an aspect we have always emphasised. Only when all factors, from sales to service, from technology to applications consulting are right can you be successful and consequently satisfied with our performance. And this, after all, is our ultimate objective.

We wish you a great deal of enjoyment while reading the latest issue of "today".

Yours,

Herbert Kraibühler



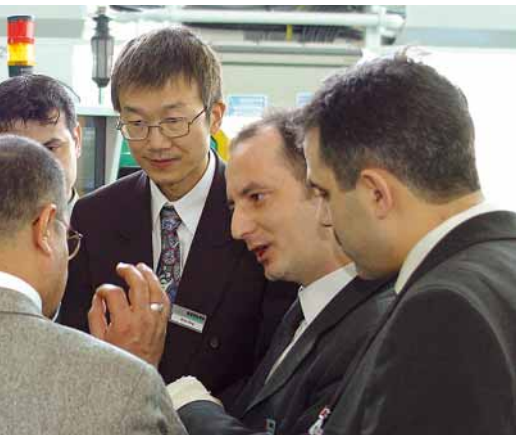
Perfect inj



It is no coincidence that the ARBURG Technology Days continue to draw plastics specialists to Lossburg: At this open house event not only are customers able to admire the entire product range along with all the innovations at a glance, but they can also meet their contacts, get information about the latest trends in injection moulding and take a peek behind the scenes of production.

The Technology Days 2003, which were held under the new motto of MODULARITY ALLROUND, enabled guests to get a taste of the legendary ARBURG modularity thanks

Injection moulding technology



to over 40 machines, robotic systems and the wide range of applications on display.

This year, around 2850 visitors took advantage of this opportunity, with 1010 of them even coming from abroad. But even though some of the journeys had been particularly long, for example in the case of travellers from the USA, Australia, New Zealand and Taiwan, it was well worth the journey, as this year the Technology Days again featured some important innovations.

For the first time ever the ALLROUNDER 820 S was presented as a two-component machine, producing parts for a briefcase with the ARBURG logo. For the removal of moulded parts, the exhibit was equipped with the MULTILIFT HV robotic system. The single cavity mould has been designed to enable a briefcase shell, a hinge pin, and a closing bolt to be produced within each cycle so that a complete briefcase can then be assembled after every second cycle.

Another first was the presentation of the ALLROUNDER 420 A as a fully-electrical machine. Also new this year was the additional large exhibition area, which was created along one of the HGV access roads. Here the entire spectrum of ALLROUNDER machine sizes was put on show, represented by 13 machines from the smallest ALLROUNDER 220 S (clamping force: 150 kN) to the largest ALLROUNDER 820 S (clamping force: 4000kN).

And there was even something new awaiting our guests at the production facility: the new column-type production facility and the two new large component machining centres, in which around 15 million Euros have been invested, both of which are still under construction.

The capabilities of the ALLROUNDER machines was demonstrated via a correspondingly wide range of applications, which included multi-component injection moulding, liquid silicone (LSR), thermoset and elastomer processing, water and gas injection technology, powder injection moulding, PET preforms and CD production, as well as precision injection moulding.

A major focus of the event was the concept of drive modularity. Consequently, as well as the ALLROUNDER 420 A, various sizes of the special 'advance' model were on display, whose equipment package includes an electro-mechanical dosage drive; AES, ARBURG's

energy-saving system; and a position regulated screw.

Those wishing to have a closer look at the concept of drive technology attended the presentation by Martin Hoyer, Manager of Applications Development, who highlighted the advantages and disadvantages of the various types of drive, which he backed up with test results.

In his presentation Oliver Giesen, Manager of the Project Department, provided an overview of the MULTILIFT robotic systems and their use specifically on large machines.

The presentations given by two external experts were also extremely well received: Tim Jüntgen from the Institut für Kunststoffverarbeitung (Institute for Plastics Processing) in Aachen covered the fundamentals of water injection technology (WIT) and Burkhard Nöth from the Süddeutsches Kunststoffzentrum (Plastics Centre of Southern Germany) in Würzburg presented a paper on the subject of "quality control within the Injection Moulding Industry".

In total the specialist presentations were attended by over 1000 participants creating a forum for continuing discussions. This clearly demonstrates that alongside practice, theory also continues to play an important role at the Technology Days.

All the ALLROUNDER machine sizes (left), the technical discussions with experts (top centre, right), innovations such as the ALLROUNDER 820 S as a two-component version (centre bottom left) and numerous applications such as the production of PET preforms (centre bottom right) brought visitors from all around the globe flocking in droves to Lossburg.





Thoroughly tried and

Following the successful launch of the ALLDRIVE machine series, whose electrical main axes can be combined with either electrical or hydraulic auxiliary axes, the people responsible for implementing this technology at Bericap GmbH & Co., with the fischer Group and at Wild & Küpfer Client report back on their practical experiences of the first machine to represent this series, the ALLROUNDER 420A with its 800 kN clamping force.

Norbert Dick, Head of Production and Authorised Signatory, Bericap GmbH & Co.:

"When it came to electrical machines our strategy consisted of finding out what the advantages would be for our products by using test machines. Following positive initial trials involving other electrical machines, a fully-electric ALLROUNDER 420 A was installed at our plant in Budenheim in July 2002, which was tested and further developed in close collaboration with ARBURG. The current field of application for electrical machines at our facility relates to technical products



within the area of special caps and closures, where the electrical injection moulding machine can be of benefit for around 80 per cent of all applications. Our trials demonstrated that the outstanding degree of repeatability across all tests enabled a higher quality of product to be achieved. Using this machine it was possible to achieve faster cycle times where the mould design allowed scope for this. From a business perspective these two advantages justify the higher cost of purchasing this machine compared with a fully hydraulic machine. The reduction in noise emission is an added bonus which only becomes noticeable once you have several electrical machines. Similarly, the lower energy consumption must be viewed in association with the product and process. Moreover, we have been able to extend the maintenance intervals of our moulds, thereby increasing the availability of the machines considerably. It is on the basis of all these positive results that we have decided to invest in electrical machines for use in the area of technical caps/closures over coming years. I am also thoroughly convinced that 'the electrical machines' will increase their market share in the future. Before this becomes a reality, customers will have to be convinced, which is only possible by demonstrating the advantages of

an electrical machine and the benefits associated with their respective products. "

Roland Graf, Head of Plastics Product-Centre, the fischer Group:

"With assistance from the University of Duisburg, the electrically driven ALLROUNDER 420 A was tested and compared with a hydraulically driven ALLROUNDER 420 C." All the tests were conducted on the two machines in parallel using moulds of identical construction. The parts produced were fischer S 8 plugs and fischer FU 6 x 35 universal plugs. The energy savings obtained represent the biggest advantage of the electrically driven machines. The energy savings regarding current consumption were around the 50 % mark, those for cooling water were between 35 and 40. Additionally, there was a reduction in part weight deviation. The planned cycle reduction could not be achieved, as faster mould movements were not possible because of the sliding cores and as the gripping times of the sprue picker were unable to influence the injection moulding machine's performance. Since fischer makes use of numerous moulds with hydraulic core pulls for performing





Foto: fischer

tested

sliding movements, the option provided by the ALLDRIVE series of combining electrical and hydraulic drives is ideal. A further advantage of the 420 A is the SELOGICA control system, which is tried and tested on hydraulic machines. The electrical machines have a bright future ahead. Nevertheless, the advantages have to be weighed against the fairly high purchase price compared with a hydraulic machine and the current lack of data relating to the costs of wear, maintenance and repair."

Tobias Wild and Peter K pfer, Directors of Wild & K pfer AG:

"After we had found out about electrical injection moulding machines and had browsed the market, ARBURG launched the ALLROUNDER 420 A, which we were really impressed with right from the start. And so we rapidly took the decision to install this clean, forward-looking and technically advanced machine into our production plant. We collected the first two in person from Lossburg in December 2002. On our machines, in addition to the electrical main axes, 'ejection' is also performed electrically; by contrast, the nozzle and both core pulls are moved hydraulically.



The ALLDRIVE machines are used for the production of precision parts. The decisive factors for choosing these are, higher product quality and process reliability, as well as lower energy consumption and noise emission. It is because of these advantages that we are clearly tending more and more towards this technology. We have set ourselves the goal of increasing the number of electrical machines to 30 over the next 3 to 5 years, i.e. 50 % of the total number. We took our first step towards achieving this when we acquired the first two electrical 420 A's and we ordered the next two just 3 months later at the Technology Days 2003."



Norbert Dick of Bericap, Roland Graf of the fischer Group and Tobias Wild and Peter K pfer of Wild & K pfer AG (from left to right) are thoroughly satisfied with the ALLROUNDER 420 A.

INFOBOX

Bericap GmbH & Co.

Kirchstr. 5, D-55257 Budenheim
www.bericap.com

The fischer Group

Weinhalde 14-18, D- 72178 Waldachtal
www.fischerwerke.de

Wild & K pfer AG

Allmeindstrasse, CH-8716 Schmerikon
www.wildkuepfer.ch



Cars – a

TRW Automotive can trace back its founding over 100 years to Cleveland/Ohio in the year 1901. In the first few years lid screws and fixing systems were produced. This soon changed with the development of the automobile industry. Valves for car engines and later for aeroplane engines were then produced. As early as 1915 TRW became the leading US producer of engine valves.

Just as its customer, ARBURG is represented in the TRW injection moulding production all over the world. In the USA strong business connections are held with the TRW Engineered Fasteners and Components subsidiary in Westminister/Massachusetts. The plant is part of the Engineered Fasteners and Components Division with its head office in Enkenbach/Germany, and 450 injection moulding machines operating world-wide. The major part of these machines are ARBURG ALLROUNDERS. Whereas the automobile industry used to be the dominating production sector for this division, this has changed over the years. Today TRW Westminister also produces parts for medical technology, as well as the consumer goods and electronics industries. Technical plastics such as TPE and PA in particular are processed in Westminister, whereby their customers are offered all-in-one solutions. 40 engineers are employed in Product Development alone, the affiliated mould manufacture produces the moulds for both the prototype and series production.

TRW's machine park features a wide range of technologies such as parting line injection, GIT processing, machines with accumulator for thin-walled parts and multi-component injection moulding. Tests with MuCell technology have also been carried out.

and more



Ten ARBURG parting line ALLROUNDER machines alone are currently in production in Westminster, alongside another nine multi-component ALLROUNDERS.

In 1999, TRW ordered its first ALLROUNDER with the SELOGICA machine control system. Persons in charge were particularly impressed by its high degree of flexibility, especially with the core pull control. Since this date 20 additional machines with this control system have been purchased. Two rotary table machines have also been supplied to their production site in Mexico. In Westminster the ALLROUNDER machines operate 24 hours a day, 7 days a week.

ALLROUNDERS are in use at TRW wherever universal application and reliability are important. For example for a part which is integrated into car doors to compensate the pressure when the door is closed. The so-called »PRV« (pressure relief valve) consists of a PP housing, on to which a seal of TPE is injected. The moulded part is removed automatically and transferred to an assembly system where it is installed in a further functional component. Flexibility is a word always used at TRW, when speaking of the ALLROUNDER. This applies

also to the equipment of the machines, which, due to their modularity, can be adapted to suit each customer's individual requirements. Especially when machines are required with a large tie-bar clearance, and low clamping forces. Comparisons of machines have further shown that a 30 percent higher part output can be achieved as against prior products. This was realised by shorter cycle times and a reduction of the machine's failure and downtimes.

TRW Fasteners Westminster is very satisfied with ARBURG – not least because the total package is good. Not only do the ALLROUNDERS function, but also the support in the spare parts, service and training sectors. TRW regards ARBURG as a true partner to be relied upon in all situations. This applies also to the latest machine, which is currently operating in Westminster for test purposes: an ALLDRIVE, distinguished by its high degree of repetition accuracy, thanks to which the good part output could be increased to almost 100 percent. A further business card for ARBURG, which leads to hopes for continued fruitful co-operation in the future.



Photo: J. Giesow

At TRW in Westminster (right), "PRVs" (left), for relieving pressure inside vehicle doors, gas assisted grab handles for vehicle interiors (centre) and integrated coat hooks (bottom) are injection moulded.

INFOBOX TRW

TRW Production Westminster:

7800m² production area, 229 employees, additional production facility in Queretaro/Mexico and sales and project office in Farmington Hills/Michigan

Certification: certified to QS 9000 ISO 9000/9001, currently working towards 14001

Machine fleet: 25 ALLROUNDERS in Westminster, 4 ALLROUNDERS in Queretaro/Mexico

Company headquarters:

180 State Road East,
Westminster, MA 01473-5163, USA



Photo: M. Jönson-Dijnér

ARBURG's biggest for B&O

The greatest highlight at the well-attended ARBURG stand at the Scanplast (bottom) was the ALLROUNDER 820 S for B&O (top) with the unique mould which was used to produce the chassis for the "Beosound 3000 audio system," which Eddie Oswald, Head of the Danish subsidiaries ARBURG A/S, proudly presented (right).



in June 2002 (the in-house event run by ARBURG's Danish subsidiary and trading partners in Finland, Norway and Sweden) efforts to implement it had begun.

As a result, the B&O mould used for producing the highly complex chassis (weighing around 460 g) could be tested earlier than expected on the ALLROUNDER 820 S. Its performance data mean that it fulfils the criteria required to manufacture parts of this kind.

The robotic system used here is the vertically gripping MULTILIFT V, which is installed transversely and is equipped with a servo-electric horizontal axis in addition to the three standard servo-electrically driven axes.

The customer was responsible for supplying the mould, the gripper and other peripherals such as the sprue separating equipment, turning unit and cooling station, the control of which was integrated into the SELOGICA user interface. Thanks to their flexibility, the extensive gripper, sprue separation, turning unit and cooling station functions were completely covered by the SELOGICA control system.

This complete production cell was designed and realised by the ARBURG Project Department in close collaboration with B&O.

This complete production system for B&O consisting of an ALLROUNDER 820 S, a vertically gripping MULTILIFT V robotic system and numerous peripherals proved to be a powerful attraction for the public at the Scanplast. This was partly due to the precise matching of the individual components, which function simultaneously and are fully integrated into the central SELOGICA user interface. It was also attributable to the sheer dimensions of the exhibit, which at 7.5 m long, 5.7 m wide and 5.15 m high was extremely impressive.

This project represents another successful outcome of the B&O / ARBURG relationship, which extends back to 1967. As soon as the idea of the Scandinavian Open was conceived



In the truest sense of the word, the ALLROUNDER 820 S for Bang & Olufsen (B&O), which was equipped with the unique mould and was used to produce the chassis for their "Beosound 3000" audio system, proved to be a huge attraction at ARBURG's exhibition stand at the Scanplast.

Celebrating ten years of our British subsidiary

Although ARBURG has maintained a presence in the British Isles for almost 40 years, May 21st 2003 proved a special occasion for celebration, for it was the 10th anniversary of our subsidiary in Warwick near Royal Leamington Spa. And of course it was celebrated accordingly.

In 1993, the decision was taken to establish an ARBURG subsidiary in Britain. The thinking behind this was that the machine and peripherals market had grown quite considerably in the preceding years and so customers should be offered the same comprehensive level of service that was available in Germany.

The 14-member team responsible for handling ARBURG products at that time was taken over from the original representative in England, Hahn & Kolb. Initially, the new ARBURG employees were relocated within Rugby. However, this was only to be for six weeks, as the next move was already on the cards. In July 1993 the entire operation

moved to Warwick, where the subsidiary remains happily located to this day. With regard to transport, this area is conveniently located close to key motorway junctions and is only 20 minutes away from Birmingham International Airport in close proximity to the National Exhibition Centre.

It was here at its leased premises that the new subsidiary also held its festivities in honour of the family-owned enterprise, Hehl, when celebrating its 75th anniversary in the year 1998.



In the interests of improving efficiency for customers in Great Britain and Ireland on the receiving end of products and services, it was not long before the ARBURG management team decided that not only would it have its own subsidiary, but that this subsidiary would have its own premises. After extensive research, Frank Davis and his team finally stumbled— and isn't it always the way with these things— across a site barely 300 metres away from the offices they were leasing.

Not only is Warwick an ideal location for customers, because it is central and easily accessible, but it is also perfect for employees, who are just as keen to get to work quickly and on time. 2.5 million pounds sterling were invested so that a complex could be constructed that would capture the company's image, but more importantly would be purpose-built. After a two-year construction period it was officially opened on the 2nd March 1999 in the presence of Eugen and Michael Hehl. However, the person actually responsible for cutting the ribbon – and this

was an honour not merely for the British people attending – was HRH The Princess Royal, Princess Anne. Frank Davis, whose comments are normally characterised by that familiar British reserve, describes the day being most memorable for the public present as well as for ARBURG Ltd.

Today the British ARBURG subsidiary boasts a total of 25 employees— and it is already being extended and enlarged to create room for the new large ALLROUNDER S generation of machines.



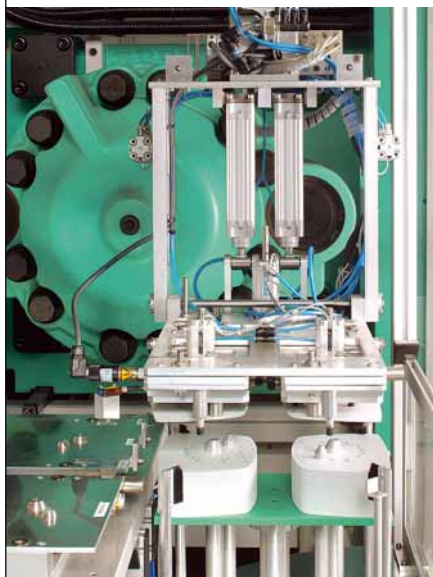
Photo: I. Pickering

Celebrating the ten year anniversary together: Frank Davis, General Manager of the ARBURG Ltd. subsidiary and Eugen Hehl, Chairman of the ARBURG management board (l to r).

Not surprisingly, Frank Davis sometimes finds himself wondering where on earth the last ten years have gone. As for the customers, Davis asserts that their acceptance of Warwick as the location for the subsidiary could not have been better and that they are delighted with both the purpose-built facilities and the superb services and professional support it provides. This is also crucial for the future, particularly because ARBURG has a long history in Britain. All Davis is willing to say about this future— again with his British reserve – is that he expects it to be better than anything ARBURG has experienced in the UK to date.



IML production



Whenever injection moulding calls for something specialised, you will inevitably encounter ARBURG's ALLROUNDERS. This is certainly true when it comes to BÖ-LA Siebdruck- und Kunststofftechnik, based in Radevormwald; the specialised area in question being... In-Mould Labelling (IML)

BÖ-LA Siebdruck- und Kunststofftechnik is a European leader in the field of technical screen printing applications. Its range of products encompasses high quality engineering films and plastic injection moulded parts decorated with film for leading manufacturers within the automotive, domestic appliance and telecommunications industries. The IML manufacturing process rounds off the portfolio of the company, which has many years' technical experience in this specialised field.

But just what is in-mould labelling? During the IML process, films produced using screen-printing technology are inserted into the mould and plastic is injected either behind or in front of it. This enables a finished decorated moulded part to be produced in a single operation. The decorated plastic parts that result are characterised by their high level of quality, functionality and immense variety of designs. The decorative films, which are pre-printed with special colours, are produced prior to the actual injection moulding process. The cost of

the parts and logistics are reduced by cutting down the production time (fewer operations), eliminating the need for intermediate storage and cutting transportation costs. New 3D effects can be achieved, and the variety of printing methods available increases the design possibilities.

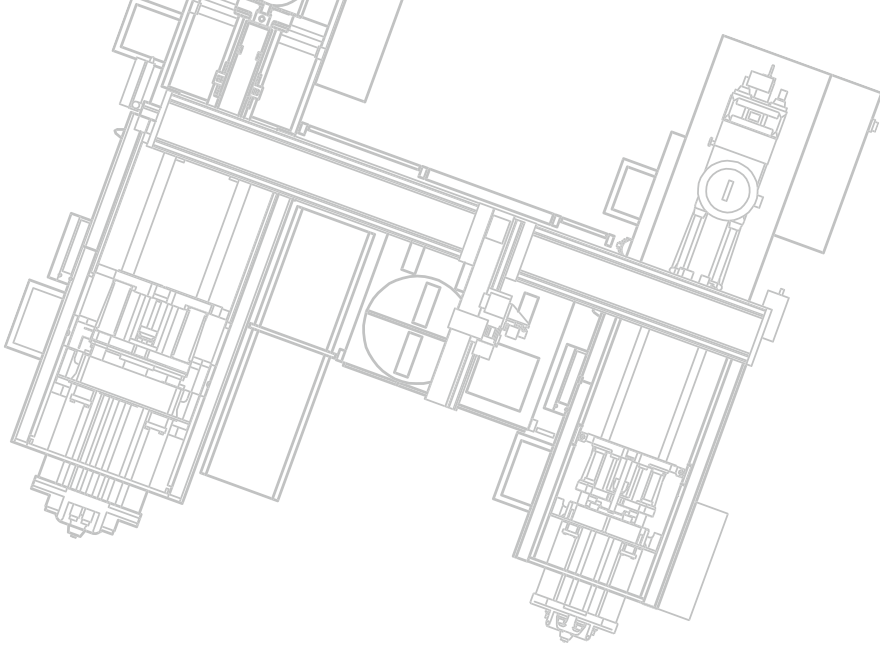
It is possible to alter designs rapidly during the production process; the pre-printed colour film is placed in an untouchable position either between the decorative film and the plastic that is injected behind it or behind the plastic that is injected in front of it. As a result, there is a multiple increase in the mechanical and chemical resistance of the parts.

The association between screen-printing and injection moulding technology is therefore obvious. Consequently, BÖ-LA has opened up a new market segment and is now able to offer its customers a comprehensive one-stop shop, from film production right through to the finished moulded part. As a result of its many years of experience and participation in the development and introduction of IML technology, in 1997 BÖ-LA succeeded in constructing and establishing its own injection moulding plant specialising in film-decorated plastic parts.

BÖ-LA produces such parts according to individual requirements. The film printing procedure used by BÖ-LA is fully patented down to the very last detail. The possibility also exists of shaping these films into three-dimensional

At BÖ-LA, an IML production cell operates with an ALLROUNDER 520 C and MULTILIFT V robotic system in transverse design (top left). The films are loaded and made available via a rotary table (centre) and picked up by the gripper of the robotic system (left).

A facility is currently being planned with two ALLROUNDERS linked via an ARBURG robotic system (top right).



n cell



forms before bonding them with the plastic. BÖ-LA currently has several IML systems in operation, one of which is a fully automated production cell supplied by ARBURG, which above all else is characterised by its rapid production cycles thanks to the integrated control technology, its high degree of process reliability and top quality of the parts produced. The ARBURG system, used to manufacture front panels for the industrial equipment sector, is capable of producing two different versions – e.g. for use in washing and drying machines. Version one basically works as follows: The films are placed inside a film separating station in pairs. They are piled up onto a rotary table in such a way that there are always two piles within reach of the robot.

The MULTILIFT robotic system removes the top two films from each pile and, using the gripper's removal device, moves to a cleaning apparatus. It is there that all dust is removed from the films. After that they are deposited in the alignment station and are picked up by the gripper's insertion device.

The robotic system then moves above the mould. Once this has opened, the robot enters it and removes the finished parts. The arm of the robot penetrates deeper into the mould and the cavity is simultaneously cleaned



using a built-in cleaning device. The gripper then moves its insertion device in front of the cavity and places the films inside the mould. Next the robot exits the mould at the top so that it is able to close. The robot moves lengthways over the top of the machine and sets down the finished parts onto a conveyor belt. The complete operation is managed via the machine's SELOGICA control system.

In order to produce the second type of panel it is simply necessary to switch the insertion and removal plates on the gripper and the fixtures of the film separating station. Those in charge of injection moulding at BÖ-LA are extremely satisfied with the results of the close co-operation with the ARBURG Project Department, with the speedy commissioning and with how well the ARBURG production cell works. Another ARBURG system is already in the planning phase: the idea here is to have two ALLROUNDERS, linked via an ARBURG robotic system, operating in unison. One will be used to fully-automatically produce the pre-moulded part and the other the finished moulded part.

INFOBOX BÖ-LA

Founded: 1975 in Wuppertal, 1986 relocated to newly-built premises in Radevormwald

Employees: total of 275 working at two different plants

Production area: 8000 m² production area

Areas of competence: Product advice, development and implementation, various customer service awards and prizes for quality, production certified to ISO 9002 and German standard VDA volume 6.1

Location: Dahlienstraße 33,
D-42477 Radevormwald,
www.boela.de



The principal focus at the conference organised by Roland Paukstat (centre) Customer Service Manager, was spare parts.

Enhancing our spare parts supply

On 7 February 2003 the time had come again: the conference for subsidiaries dealing in spare parts was on the agenda. This involved 23 participants from 12 countries gathering at ARBURG in Lossburg to find out the latest about machines and spare parts, services and training as well as further their own knowledge and exchange opinions.

ARBURG spare parts dealers from all around Europe have now been meeting annually since 1999 in order to harmonise their common procedures and processes and to optimise these wherever possible. Depending on their level of knowledge and any country-

specific issues, the participants are also offered a broader individual learning experience designed to further their expertise.

This year, the main focus of the event was on the controlling and optimisation of the spare parts warehouses on-site at the subsidiaries. In this context, the availability of the parts, referred to as "first pick availability", is to be further increased. The logic behind this: if the number of expensive individual consignments going from Germany to foreign customers can be cut to a minimum, then there will be cost savings for both parties.

The measures for achieving this range from defining common target specifications and metrics to producing a guide to warehouse controlling and optimisation, developing

statistical aids aimed at ensuring that the stock is continually being matched to consumption, right through to regular reorganisation of the warehouse.

Another of the conference's main themes was the return of parts destined for repair and other consignments to Lossburg. To ensure that the problem as a whole would be addressed appropriately, the Spare Parts Conference was combined with the Subsidiary Managers Conference so that the Subsidiary Managers could be sufficiently sensitised to it.



Silver instead of white

When ARBURG Service technicians visited customers they could easily be identified from a distance: White vehicles with the characteristic ARBURG lettering in the familiar colours - an unmistakable design. But times change. And so too does the company's vehicle fleet.

Both the national and international vehicle fleet is being given a new, dynamic exterior which lives up to the ARBURG corporate image as part of the ongoing optimisation measures

being implemented in the Corporate Identity and Corporate Design Departments. Consequently, management and the partners chose "Reflex silver metallic" as the new base colour for all vehicles.

The switch immediately prompted the Corporate Communications Department to come up with a new design for the lettering on the vehicle.

On all estate vehicles, a slanting decorative stripe in ARBURG yellow and green runs along the side of the vehicle and the white ARBURG lettering with a green bar is applied to the rear window. New additions include the company's Internet address, "www.arburg.com" on both rear doors and at the rear end, a small yellow and green logo and the Internet address on

the left and right below the vehicle model. The service vehicles can easily be recognised by means of white lettering in a green bar on the side of the vehicle.

Once the management team had approved the designs and decorative elements, they were implemented on the vehicles, and more and more of them are now starting to arrive at customers' premises in their new ARBURG livery.

Little by little, all the vehicles – around 250 world-wide – will be converted to the new colour and vehicle design.

Demoulding of soft sprues

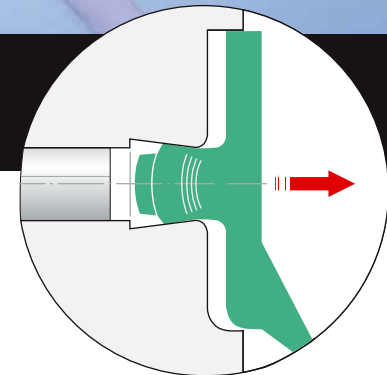
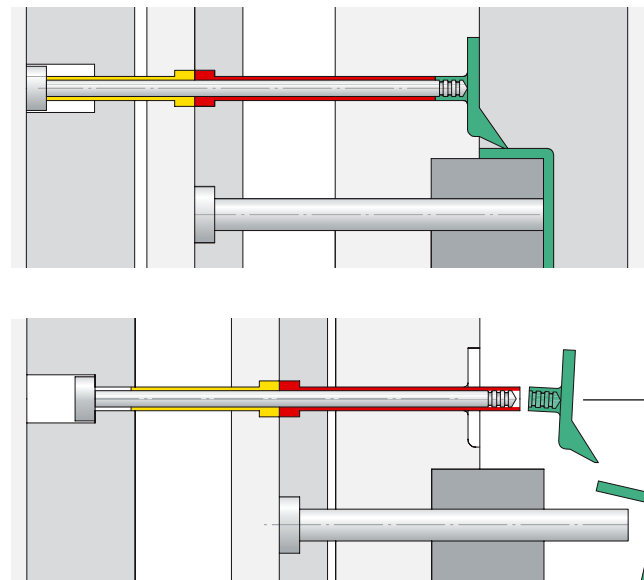
Whenver flexibility and elasticity are required, recourse is made to thermoplastic elastomers (TPE) or liquid silicone rubbers (LSR); the difficulty being that if a conventional tunnel gate is used, these flexible materials can pose problems when it comes to demoulding the sprue.

Tunnel gates are the most widely used variety for separating the sprue automatically from the moulded part. A conical bore runs diagonally to the parting line, which connects the moulded part and the sprue system together. This connection to the moulded part is severed automatically when the mould is opened. Normally, that is to say in the case of dimensionally stable, "hard" thermoplastics, the runner is held in place by means of an undercut in the movable mould half and is withdrawn from the sprue lining when the mould is opened. The entire runner is then demoulded independently of the part by means of a separate ejector.

However, soft materials can be a problem: if adhesion inside the sprue cone or the tunnel is excessive, the elastic material will be stretched out from the cone when the mould is opened. The entire sprue will then remain stuck inside the sprue bush on the nozzle side and will have to be laboriously removed by hand. By simply enlarging the undercut it is possible to ensure that the soft material is compressed by the ejector and that the sprue cone is cut off.

This can be facilitated by using an ejector

pin with perforated grooves in combination with an ejector sleeve. The material is firmly held in place between the undercuts on the pin and the bore. Even elastic materials cannot be pulled away from the ejector pin because the



Top: With the standard solution, the elastic material is stretched out of the conical undercut.
Bottom: The combination of ejector pin and sleeve ensures successful demoulding.

external profile is secured by the bore. It is only once the sprue becomes free at the external diameter that demoulding is possible.

During ejection, the ejector pin is also dragged out to begin with. As soon as the external profile of the sprue cone has been freed, the pin is stopped by a limit stop. The actual demoulding operation is performed by means of the sleeve, whose continued movement is controlled by the ejector plate and which pushes the sprue over the grooves of the ejec-

tor pin. Both the part and the sprue are thereby reliably removed and a continuous production process is guaranteed. This ejector system can also be used for "hard" thermoplastics when a curved tunnel gate is to be demoulded.



Spotlessly cle



Toha plast has become synonymous with plastic products that have to be produced in clean-room conditions. This sector accounts for the lion's share of the company's production output. Of the 27 injection moulding machines that it has in total, 18 are ALLROUNDERS, clearly demonstrating that ARBURG machine technology is successfully being applied in extremely specialised sectors.

In 1975, just 2 years after the company was established, initial contact was made with ARBURG. From these beginnings, a solid and enduring relationship has been built which, amongst other factors, has resulted in the fact that the vast majority of machines used at toha's production facilities are ALLROUNDERS. In addition to its injection moulding production facility, the company also manufactures, assembles and packages larger components.

Entirely proprietary products are manufactured under the brand name toha med® for the medical and biotechnology markets. To enable it to provide customer support from product design, construction, prototype and series production through to quality assurance and logistics, toha has added its own mould construction workshop to its produc-

tion facility. Here, all the necessary processing machines are available for constructing moulds that will subsequently be used within the company's own production.

In addition to its main source of business drawn from the areas of medical and biotechnology, toha also works for customers in the food, electronics and automotive industries. toha's customers come from all over the world but its principal markets are Europe and the USA. Products are supplied there by its subsidiary company, Plastic Parts Corp. Another big market is Japan, where toha sells around 60 % of its skin staple products.

Medical technology in particular is such a sensitive sector that evidence can be demanded at any time regarding the manufacturing environment. This involves very little discussion about the product itself. Moreover, other crucial factors such as the assembly of components into complex mechanical instruments or the making available of certified just-in-time parts for further processing within just a few hours mean that the products may only register defects in the ppm range, if at all. Christian Pradel, Technical Director at toha, expresses it as follows: "The overall concept must be right. Our customers' demands often extend far beyond what is possible in terms of plastics. Of course, we are pleased to take on this challenge because we can fully rely on our ALLROUNDERS."



Stringent hygiene and safety standards must be maintained during the assembly (top) and production of medical technical products. Here, the ALLROUNDERS operate to the customers' complete satisfaction (centre).

The skin stapler (below) belongs to toha med's product range® (Photo: toha).



an

The ALLROUNDERS used at toha cover a clamping force range of between 150 and 1600 kN and are operated in three shifts, if necessary also at weekends.

What those in charge of production value most about the machines are their availability, the cost effectiveness of the basic equipment package, their flexibility, the breadth of the machine range, their stability and the repeatability of the processes. On top of that is the provision of fast and competent service.

The ALLROUNDERS are used to manufacture technical parts that will have heavy demands placed upon them in terms of dimensional stability and tolerances. Very often this comes down to mere hundredths of a millimetre.

Another specialist application involving the ARBURG machines, in addition to the components for the skin staplers and needleless injection systems, are disposables. These are produced at high speed in cycle times of less than 6.5 seconds. Christian Pradel places special emphasis on the fact that the ALLROUNDERS have no problem handling all the materials from PP to PEI and PEEK and that they can be used in the clean room without any need for upgrading. As a supplier, toha is positioned at the start of the value-added chain, the cost situation must therefore be examined in extremely critical terms according to Pradel. Therefore, it is necessary to have recourse to reliable and low-priced machines that can be integrated directly into production without the need for expensive additional equipment. Furthermore – and this is absolutely essential when it comes to using machines in clean rooms – the ALLROUNDERS are so easy to clean and their particle emission so low that in this respect too the arguments are in ARBURG's favour.



Quality assurance at toha: Optical inspection by employees at the light table (top) and measurement station for the optical measurement of the products (bottom).



INFOBOX toha plast

Founded: 1973, by Thomas Hackel

Employees: 58 employees

Plants: Göttingen (D), Puerto Rico

Products: Plastic parts and components from 0.1 to 350 grams, principally under clean room conditions (ISO Class C & D) for the medical and biotechnology sectors

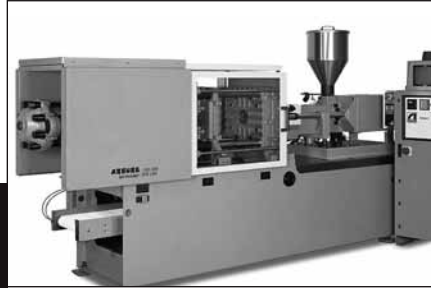
Production In-house mould construction, assembly and packaging lines; construction of 2,000 m² of clean-room production area

Quality: Automated quality control, ISO 9001 and EN 46001 since 1994, CE certificate for medical products since 2001

Company headquarters:

Gustav-Bielefeld-Str. 8, D-37079 Göttingen, www.toha-kunststofftechnik.de

MILESTONES



ARBURG has always been renowned for being a precursor in injection moulding technology. The ALLROUNDER CMD machines represented a real milestone at the start of the 80s.

THE CMD series machines were first presented at the K in '83. The initials CMD stood for "Computer Monitor Dialog", whereby the computer was responsible for the control, adjustment and monitoring of the machine, while the monitor served as a display for data and functions. Users were guided through the machine functions via the dialog and were able to read, enter, edit and store data using both the keyboard and screen.

Initially the machines available ranged from the 120 CMD up to the 470 CMD in increments of 50; by the end of the 80s only the 170, 270, 370 and 470 models were still being produced.

However, the appeal of these machines was not merely due to the Computer Monitor Dialog system, which revolutionised machine operation in a similar manner to the introduction of the SELOGICA, but also to the peripherals developed by ARBURG in the interests of automation, which were specifically tailored to the CMD series. Once these were completed, it was possible to assemble an automatic production cell which, in addition to several machines, also consisted of a central

transportation system, automatic changing of the mould and container with paternoster, hydraulic quick clamping of the moulds and automatic material supply. A special highlight here was the automatic Rapidomat mould changer featuring preparation and tempering

of the moulds at a second changing station. The entire system was controlled via a host computer, the basic functions of which can still be found on the current ALS system.

Even then, the CMD machines themselves could be expanded in a modular fashion. The hydraulics with their main and pressure retaining pumps controlled the most important pressures and speeds, open loop control was via position-regulated proportional valves. The injection unit was designed as a self-contained, compact module which could be coupled and uncoupled in its entirety. All the connections were made using central plug connectors, the method still employed today on the ALLROUNDER injection units. The DIALOGICA control system featured a colour monitor with a keypad and an arm that allowed it to swivel, which was a real first. At the time, the manner in which the screen display was divided into zones was a pioneering innovation, as was the entry of all data in absolute values. It was possible to store all the settings data records using a data cassette and you could even prepare subsequent production cycles on a second and third programming level. The conveyor belt was also supplied as standard and was contained lengthways inside the machine base for transporting parts after ejection through the chute.

Many ARBURG developments that can still be found on today's ALLROUNDERS are based on the CMD machine series. In this respect, the ALLROUNDER CMD machines were the forerunners of technologies that are now produced in series and are in operation everywhere.



A sight from the past: ARBURG automation as a showpiece of the CMD era with several ALLROUNDERS, in fully-automated operation, controlled via a host computer.



TECH TALK

Dipl. Ing. (FH) Marcus Vogt Technical Information

SELOGICA: evolution of the tried-and-tested control philosophy

If "evolution" is taken to mean continuous adaptation to changed environmental conditions, this could equally be applied to the SELOGICA machine control system. The control system is constantly evolving to cope with the new challenges it has to face, which are currently mainly those that involve the integration of robotic systems and peripherals.

The main focus of added functions on the new SELOGICA machine control system therefore resides in the area of programming robotic systems and peripheral devices. The operating philosophy of the robotic systems was matched even more closely to the machine's systematic processes. Simultaneous move-

ments of the robotic system's axes or of the start of the travel path, which is dependent on the positioning axis, can now be programmed directly into the sequence. Operations such as "rotational gripper" can be defined and stored with their own icons in the sequence editor list. Programmable in/outputs that are important for the integration of peripheral devices can even be selected according to pre-defined choices or alternatively programmed specifically in relation to individual customers. The individual functions are selected with ease via the Info key on the control system.

As is the case with the machine processes, there are now a total of four different basic processes for the robotic system sequence, which are available for selection when undertaking customer-specific programming.

Defining pattern placements, e.g. for parts on a conveyor belt or in trays, has also been simplified and rendered more transparent within the sequence. The end result is a significant time saving when creating new data records and a sequence that is easy to follow at any time, even when highly complex production processes are involved.

Flood aid

The terrible images of the flood disasters that occurred in the summer of 2002 are still firmly planted in our minds, when the former East German states were struck totally unexpectedly. ARBURG was keen to oblige and offered assistance where it was needed most.

Amongst those companies affected who owned ARBURG equipment were ECW in Eilenburg, W. Mende in Höckendorf, Ditter Plastic in Meißen and the firms Plitz and Quinger, which are both located in Flöha. In these locations the machine shops were partially or totally submerged. Written-off machines had to be replaced as quickly as possible once the floods had subsided, and repairs completed without delay so that the damage suffered

and any resultant problems could be brought immediately under control.

Burghardt Klöditz, the sales consultant responsible for Saxony, immediately visited all the companies affected and surveyed the damage. Then all the necessary measures were immediately implemented. This not only entailed the delivery of spare parts, but also services and repairs to machine control systems. The total costs incurred ran to approximately 80,000 Euros, of which ARBURG paid around half.

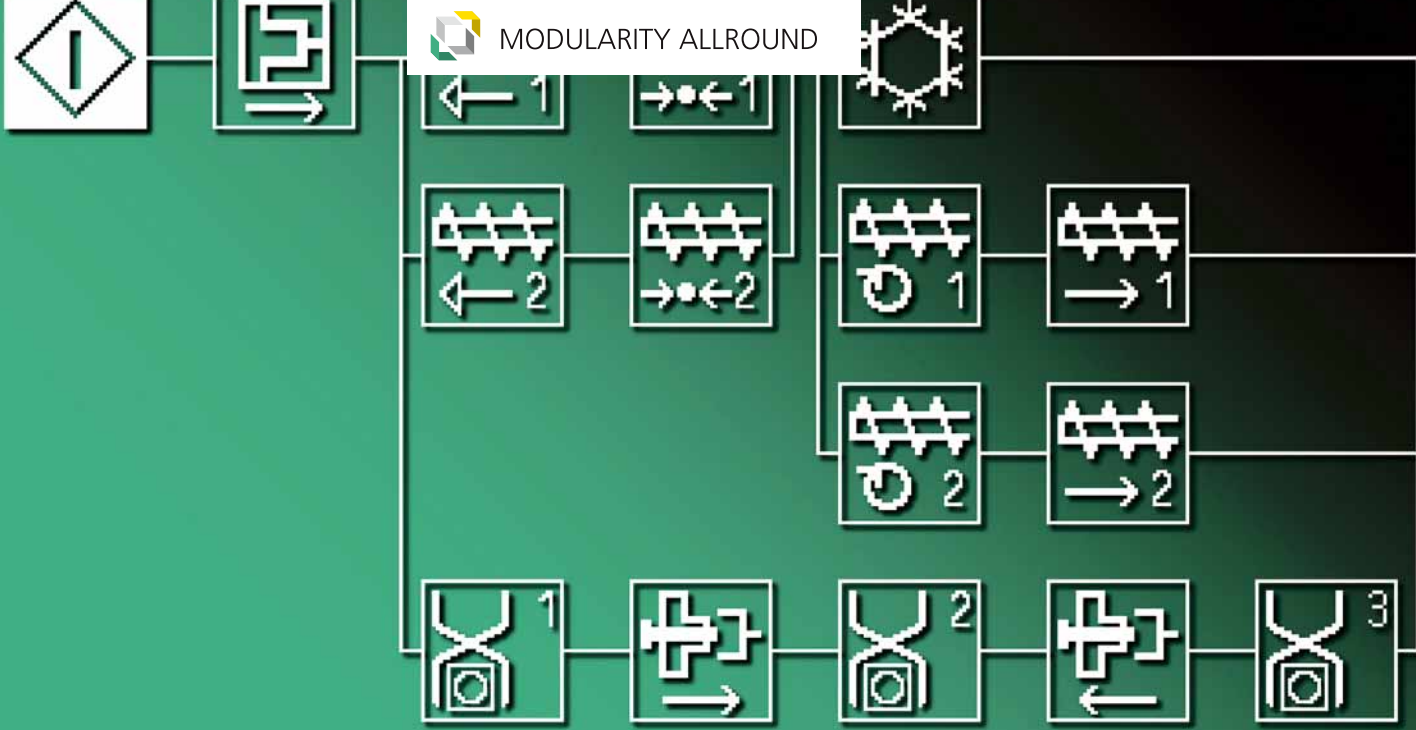
Quinger GmbH contacted the ARBURG management team to say thank you on behalf of all the companies. At Quinger the water had reached a height of 75 cm in all the ground-level rooms. It was the rapid and boundless intervention of the ARBURG employees, emphasised Joachim Quinger in his letter, that helped

ALLROUNDERS under water:
effects of flooding at Quinger.



Photo: Quinger

the flood damage to be overcome so quickly. A thank you to be truly happy about.



10 Years of SELOGICA



We are celebrating a very special anniversary - ten years of technological advantage provided by our SELOGICA control system. With our graphical sequence editor and logical, selective operating controls, we have been able to

provide you, for many years now, with the most advanced technology available with respect to the user interface and the control system. And it goes without saying that all ARBURG robotic systems are also fully integrated into the SELOGICA. Modular quality from ARBURG - your technological advantage!



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