today

The ARBURG magazine Edition 27 Autumn 2004

MASTHEAD

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A very special kind of signpost - on billboards or "in the flesh", the friendly mime artist will point the way to the ARBURG exhibition stand 13 A 13.

ARBURG

Dear Readers,

Amazing things are happening at ARBURG. This is not only evident from the cover picture of "today", on which the new mascot for this year's trade fair communications concept is unveiled for the first time. The mascot will help you find your way through the exhibition centre in Düsseldorf to the ARBURG stand, which bears the easy-to-remember stand number "13 A 13".

What we really want to amaze you with is the range of products which we will be presenting at the world's leading plastics processing trade fair in Düsseldorf. With a total of ten ALLROUNDERs, we will present all the product innovations in the ARBURG range over a floor space of 1,100 m^2 at our stand. These include a new electric machine in the ALLDRIVE machine series, a larger ALLROUNDER U and the "SELOGICA direct" touch-screen option from our SELOGICA control concept. As well as seeing these products at the trade fair, you will of course also be able to read all about them in this issue of the "today".

From small to large, from multi-component processing through to PET and LSR, from robotic systems to the SELOGICA control system – with our product range, we meet all demands with regard to modern cost-effective injection moulding processes.

Why not find out for yourself? Our extensive interview with the company's managing partners Juliane Hehl and Michael Hehl illustrates ARBURG's continued commitment to its quest to remain a family business which combines reliability with continuity. It is entirely in the interest of our customers that we draw on the achievements of the past in order to secure the successes of the future. You can put your trust in ARBURG for the future.

The two interesting customer reports researched by the editorial team for this issue of the "today" illustrate the success that can be achieved by working in partnership. It is not only at trade fairs that ARBURG presents its good image, but on a day-to-day basis at its customers'.

A reminder: please don't forget – our stand number at the K 2004 is "13 A 13".

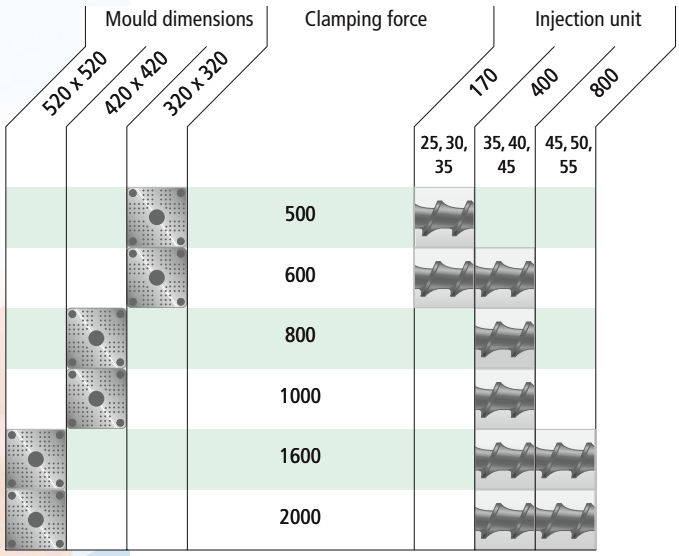
We look forward to your visit and hope you will enjoy reading the latest edition of "today".

Yours,

Herbert Kraibühler

Thre

There is nothing which can better show off the performance capabilities of a machine than a practical application. This is exactly what the new ALLROUNDER 320 A will be doing at K 2004, producing a GSM module for the wireless transfer of data. Production of this thin-walled technical moulded part places high demands on the injection moulding machine. It demands, for instance, high injection speeds – no problem for the electrical 320 A.



With the ALLROUNDER 420 A display machine, the ALLDRIVE concept – the combination of electrical and hydraulic axes – was first introduced at the K 2001. The ALLDRIVE line has been expanded continuously since then due to the great success of this machine on the market. The ALLROUNDER 320 A is new, as well as the new clamping force of 2000 kN

e times ALLDRIVE

for the ALLROUNDER 520 A. Thus, the three 320 A, 420 A and 520 A machine sizes cover a range of clamping forces from 500 to 2000 kN. Thanks to ARBURG's typical modularity, a variety of clamping force, injection unit and screw sizes are available for every machine size. But with the ALLDRIVE machines the modular concept is taken one step further - electrical and hydraulic drive axes can be combined on an individual basis.

The main functions of the machine, "opening and closing the mould", "injection" and "dosing", have been designed with electric drives as standard. They are location and position regulated and work independently of each other with a high degree of precision, high dynamics and low noise emissions. In addition to energy savings, simultaneous movements also mean that cycle times can be reduced.

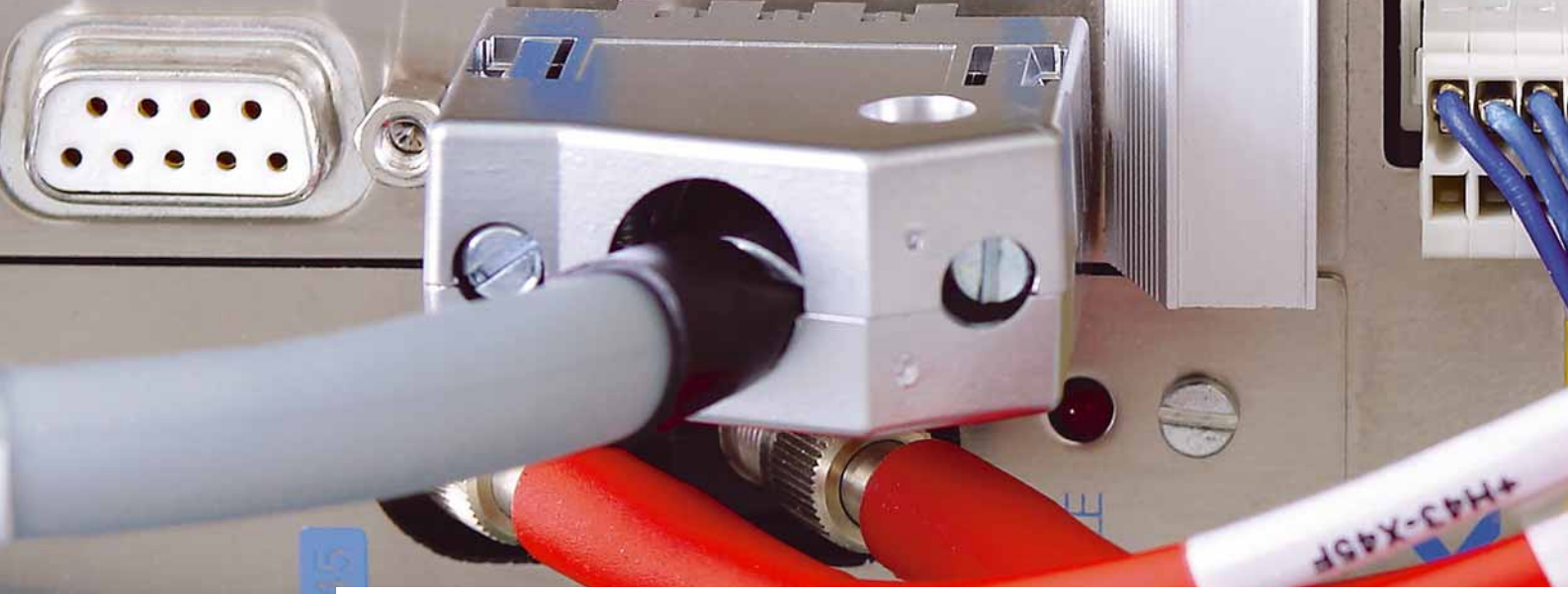
The other movements such as "ejection", "moving the nozzle" and "mould functions" can be operated either hydraulically or electro-mechanically, depending on requirements.

This concept allows the advantages of both systems to be combined. The machines have the highest level of electro-mechanical accuracy coupled with economic energy consumption wherever this is desirable for the production task at hand and have sufficient hydraulic power at their disposal precisely where it is needed.

In addition to the ALLROUNDER 320 A 500-170 with 500 kN of clamping force and a 170 injection unit, an ALLROUNDER 520 A 1600-800 will be exhibited at K 2004. This ALLDRIVE machine, with a clamping force of 1600 kN and the 800 series injection unit, is equipped with a four-cavity lid mould, into which a label is inserted which is then in-mould laminated. An In-Mould Labelling (IML) system from Systec transfers the films into the mould, removes the parts after the injection phase and then sets them down on a conveyor belt.

The main axes of the two exhibition machines are electrical as standard. Whereas the ejector is also electric, the nozzle movements are hydraulically operated.

With the new 320 A, the modular ALLDRIVE range now includes three machine sizes and offers numerous combination options, not exclusively involving the drives themselves (left).



The universal ma

Exactly one year after the premiere of the ALLROUNDER 170 U, ARBURG is introducing a second machine size, the ALLROUNDER 270 U. Both machines will be on display at K 2004 and they will prove that their "U" code, which stands for universal, is more than justified.

The new ALLROUNDER 270 U features an internal distance of 270 millimetres between tie bars and is available with clamping forces of 250 kN, 350 kN and 400 kN. Injection unit sizes of 70, 100 and 170 are available. The screw diameter of the smallest unit is a minimum of 18 millimetres and the largest is a maximum of 35 millimetres.

The ALLROUNDER 170 U has an internal distance between tie bars of 170 millimetres and is specially designed for the micro injection moulding sector. Three different clamping force sizes are also available for this machine: 125 kN, 150 kN and 180 kN. As far as the injection units are concerned, the 30 series unit can be used as well as the 70 series unit. The 30 series unit can be equipped especially for the very smallest moulded part weights and an optimum dwell-time range, with a screw diameter of 15 millimetres. It is possible to inject very small shot weights of a few hundredths of a gram.

In terms of control and regulation, the ALLROUNDER Us are equipped in the same manner as all ARBURG machines and operate via the universal SELOGICA control system. It can be employed according to individual requirements thanks to its modular design and offers advantages such as a graphic sequence editor, logical selective operator controls, quality monitoring and program storage.

All the important cycle sequences are hydraulically controlled. Even position-regulated screws and internal mould pressure control are available for the injection unit. Injection into the parting line is possible.

The ALLROUNDER Us are equipped with a compact mould clamp with a central drive unit. The centrally arranged clamping system ensures symmetrical force characteristics in the in mould clamping unit and guarantees highest precision, even during pressure reduction and demoulding.

The single-piece, rigid machine base, with an integrated oil tank is mounted on four vibration-absorbing metal feet, creating a stable base for the injection and mould clamping unit. The user-friendly hydraulic system on both the injection and clamping sides also ensures optimum control of the drive axes, resulting in utmost precision.

As an option, the ALLROUNDER U machines are available with pivoting clamping units, which allow for flexible operation in four different working positions.

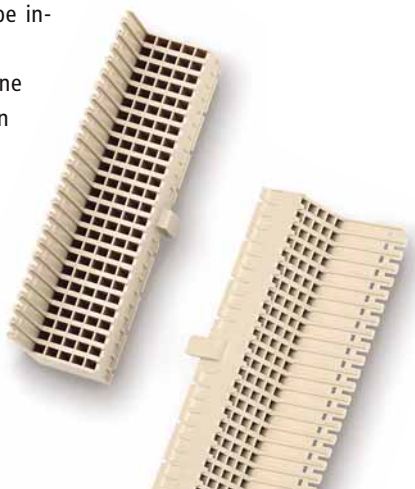
chine now even bigger

With the production of plug connectors and internal plug components made from LCP, the two exhibits, the ALLROUNDER 270 U (left) and 170 U, will be demonstrating their high performance. The centrally arranged clamping system ensures symmetrical force characteristics in the mould clamping unit and guarantees utmost precision (r.).

The newly-designed mould clamping unit ensures that the mould platens are always perfectly parallel. Injection into the parting line is possible with the vertically configured injection moulding unit. This provides advantages such as easy lateral connection, the production of low-stress moulded parts, improved mould utilisation and linear mould filling.

The vertically-swivelled clamping unit is particularly well suited for the encapsulation of inserts because the mould clamp, which moves from below, ensures that the parts can be inserted easily.

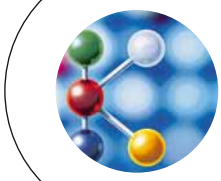
Both U machine sizes will be on show at the K 2004 - the new size will be represented by an ALLROUNDER 270 U 350-100.



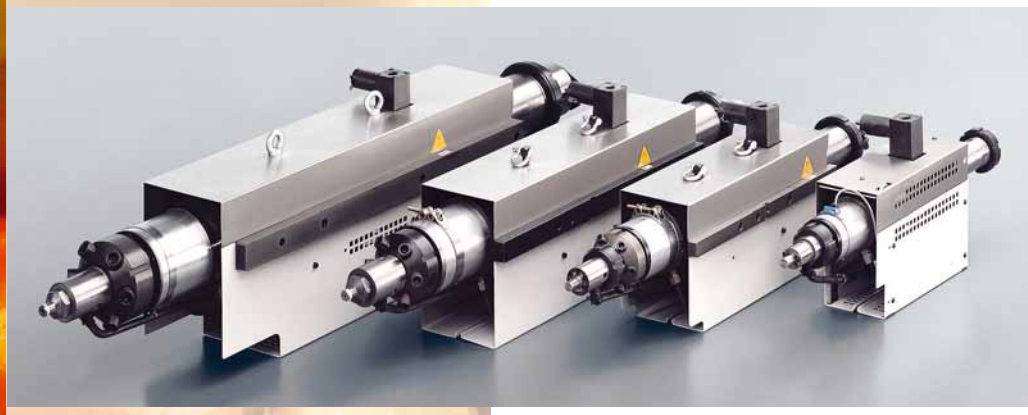
The exhibit with a clamping force of 350 kN and a 100 series injection unit also has an optional, pivoting clamping unit.

The machi-ne will be on display in the standard working position with a horizontal injection and clamping unit for the production of internal plug components made from LCP.

The ALLROUNDER 170 U 150-30 with a clamping force of 150 kN and a 30 series injection unit will demonstrate its high performance with an application from the field of precision injection moulding. A plug connector will be produced from LCP.



The perfect com



Plastic and ketchup? No need to worry, this isn't a new material combination, but rather a sealed diaphragm, such as those used in ketchup bottles in order to prevent afterdripping. These will be produced on a machine configuration from the Austrian LSR specialist and system supplier Rico, one of ARBURG'S partners in the field of LSR processing. This is only one of the highlights from the area of multi-component processing, which ARBURG will be displaying in great depth at K 2004. A total of four ALLROUNDERs will produce moulded parts in a variety of materials and/or colours.

Rico is one of the leading mould manufacturers on the international market. Its core competencies include the manufacture of elastomer moulds and the implementation of multi-component solutions combining thermoplast and elastomers. ARBURG's ALLROUNDERS and efficient SELOGICA machine control system mean that it is ideally placed to provide solutions for industrial plants. Even complex manufacturing processes with all the associated peripherals can be managed via SELOGICA without the need for separate control systems. This advantage will be in evidence on the trade fair machine.

The exhibit demonstrates the combination of a polyamide (PA) and an LSR component on an ALLROUNDER 570 C 2000-350/350. The two injection units are set up together in an L-configuration, in which one injection unit injects through the fixed platen in the standard manner and the second injects from the rear of the machine into the cold-runner. The cylinder modules can be exchanged individually. All the system peripherals – in addition to the robotic system, there are also temperature control units, the THERMOLIFT dryer and conveyor, the dosage systems, the mould heating system and the core pulls – are integrated into the machine control system and can therefore be operated centrally.

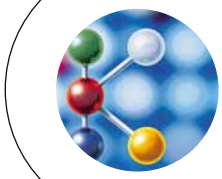
The removal robot is set up with an extension arm at right angles to the machine axis. A hinged axis is also mounted on the gripper for the execution of 90-degree movements along with a rotation module for 180-degree movements.

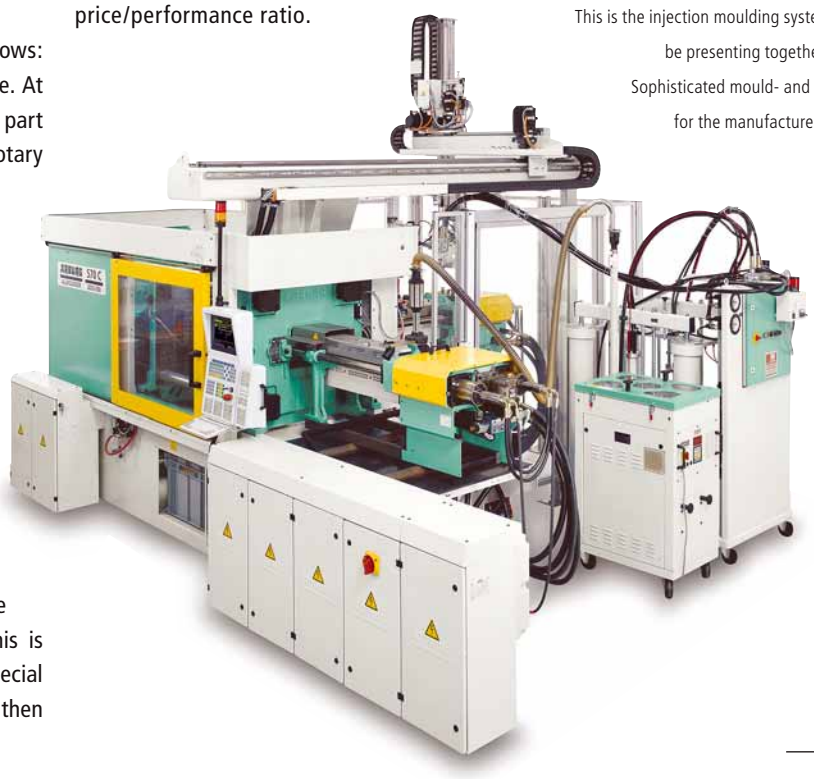
bination for LSR and PA

The mould details are of special interest. The mould is a two-cavity mould with an eight-cavity hot-runner system and 32-cavity cold-runner system, i.e. a 32+32-cavity mould. Each of the four PA components is injected with a hot-runner nozzle via a subsidiary distributor. In contrast, the LSR component is injected directly into the cavities via separate cold-runner nozzles (one for each cavity) in order to ensure waste-free production.

The moulded parts are produced as follows: first, the central unit injects the polyamide. At the same time, a pre-manufactured PA part is encapsulated with LSR. Next, the rotary mould transports the pre-moulded part to the LSR side for final injection. When the mould opens, the finished parts and PA sprue are ejected and separated simultaneously. The sprue drops into a container underneath the machine. The finished parts are picked up by the robotic system and removed from the mould area in order that the latter can close again and production can continue. During subsequent closing and injection, there is enough time to apply a cross recess to the LSR diaphragm outside the machine. This is performed by the removal robot and a special cutting and sinking device. The parts are then set down on a conveyor belt.

The sealed diaphragm for disposable bottles effectively prevents afterdripping of the contents. It is used in ketchup and condensed milk bottles and also in shampoo bottles, as is the case on the machine demonstrated by Rico. What is special about this moulded part is that the LSR component, i.e. the diaphragm, is injected onto a PA ring, making post-injection assembly significantly easier. The finished part is manufactured entirely in the production cell without the need for downstream processing operations. In this context, Rico's system is another example of how intelligent mould design can be combined with practical automation solutions and appropriately high levels of autonomy even in multi-component applications to meet the most exacting production requirements at the best possible price/performance ratio.





Compact high performance.
This is the injection moulding system which ARBURG will be presenting together with Rico at K 2004.
Sophisticated mould- and production technology for the manufacture of sealed diaphragms.

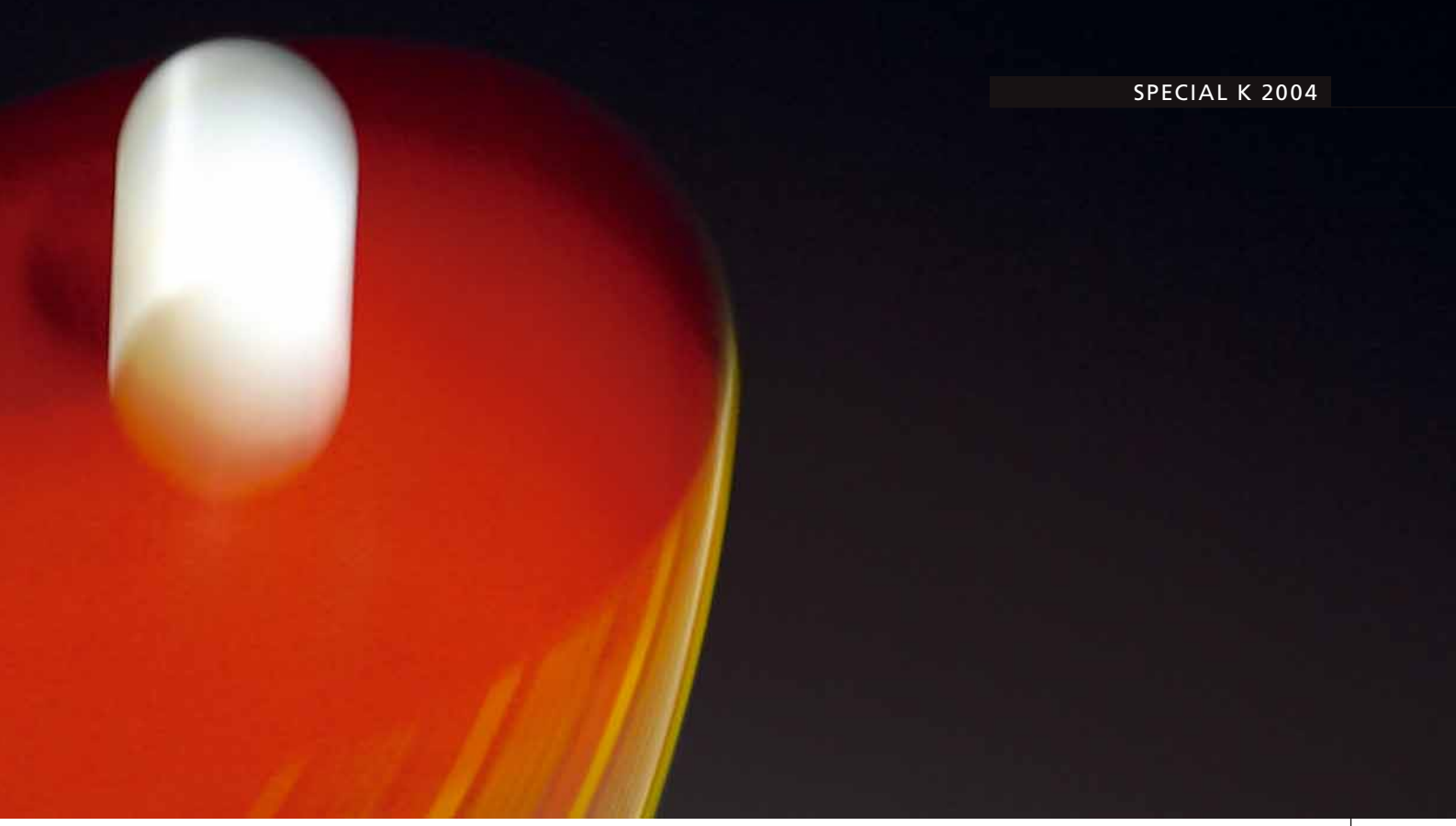
Sports equipment manufactur

All too often, the true nature of complex moulded parts cannot be appreciated from their outward appearance. This is certainly true of the table tennis bat ARBURG is producing on an ALLROUNDER 630 S as a demonstration of a multi-component part on its stand at K 2004.

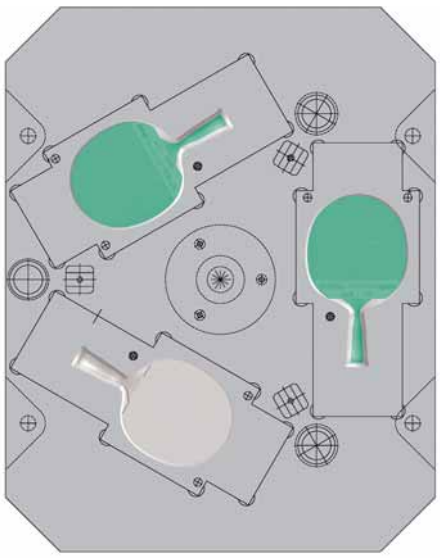
The dimensions are exactly the same as those of a standard bat. The ARBURG bat will be produced entirely at the exhibition in cooperation with Weber Formenbau (mould technologies), Herrmann Ultraschalltechnik (ultrasonic welding technology) and Kiki Ingenieurgesellschaft (gripper technology). A three-station mould with a third open station for part removal, similar to the one ARBURG used in the production of its famous mobile phone shell, is used in the process.

One half of the bat is produced at a time. The basic body is injection-moulded from ABS in the first station. The mould then rotates by 120 degrees to reach the second position, in which the TPE coating is moulded on. At the same time, the next basic body is injection moulded at the first station. At the third station, the finished shell half is removed by a MULTILIFT H robotic system (with the mould closed and continuing to operate). This minimises cycle times to a constant level, while achieving moderate handling rates and maximum quality.

The ultrasonic welding system welds two shell halves together at a time to create the finished bat. During ultrasonic welding, mechanical vibrations of 20 kHz are transmitted to the plastic parts under pressure. A specially-designed seam on the two shell halves enables the ultrasonic waves to be focused using what are known as directional energy sensors. This means that the plastic melts onto the weld seam quickly and precisely. Following application of the sound waves, the part must be allowed to cool briefly at jointing pressure in order that the previously-plasticised material solidifies homogeneously.



ed as a high-tech moulded part



The parts are produced on an ALLROUNDER 630 S 2500-1300/150 set up for multi-component production. The entire system is automated and operates with maximum autonomy. The first shell half removed by the adjustable MULTILIFT H with customised gripper is transferred to a turning and rotating station which rotates the bat halves by 180 degrees and turns them 90 degrees into a horizontal plane, so that the lined side faces down and the second half of the moulded part, with the outside facing up, can then be set down directly on top of the first by the robotic system. A sliding table then guides the two halves of the moulded part to the ultrasonic welding system, where they are joined to create the finished bat as described above. The finished bat is then removed from the sliding table with the MULTILIFT H and set down on a conveyor belt.

Like many ARBURG demonstration parts, the bats produced are sure to be very well received by visitors to the stand during the exhibition.

The table tennis bat (l.) consists of two halves, which subsequently undergo ultrasonic welding. While the ABS basic body and TPE coating are being injected on the first two mould stations, the moulded parts are removed on the third with the mould closed (r.).

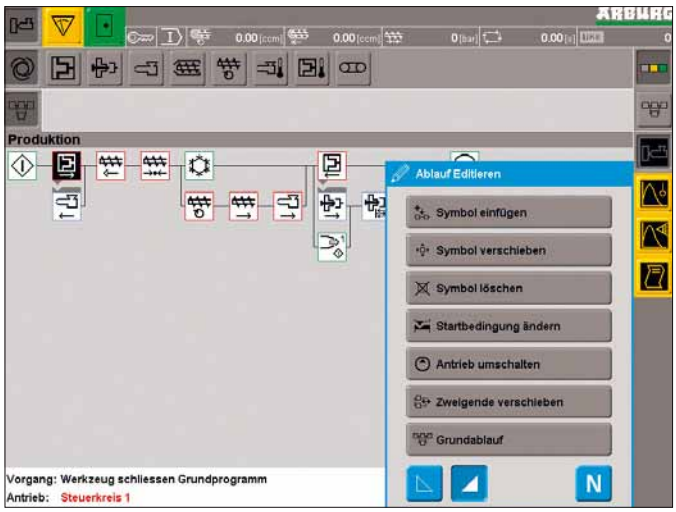
Program

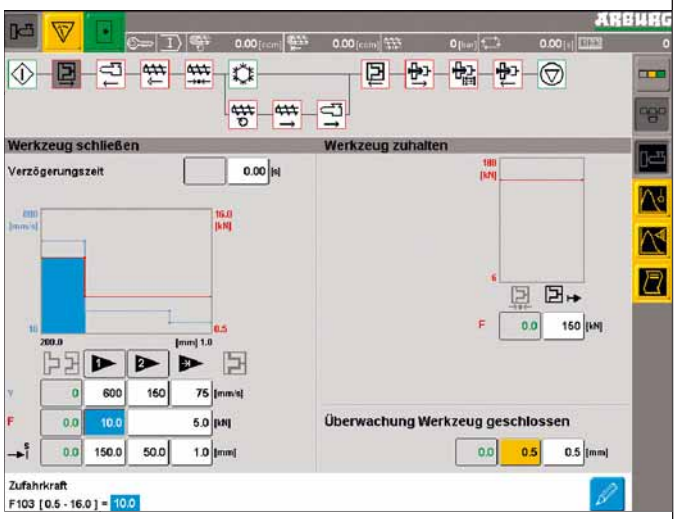
SELOGICA direct" is the name of the new operating program which can be purchased as an option for all ALLROUNDERS. It will be presented for the first time at K 2004 in Düsseldorf on two ALLROUNDERS as well as on a number of control panels. The most obvious change is the 15" control display with touch screen, which supports direct operator intervention via the touch-sensitive screen and replaces the conventional keyboard.

In terms of process technology, the program supports the same control functions as the latest version of the SELOGICA control system. The "SELOGICA direct" is therefore not a new generation of control system but rather a practical operating alternative which can be purchased as an option for all ALLROUNDERs. Quick and efficient navigation is supported by tapping the corresponding element on the screen. Users familiar with the conventional SELOGICA system will feel at home immediately – a design priority – as simplified versions of the screen selection keys from the control panel have been included on the touch screen.

Access to individual parameter pages really is direct and intuitive, as users can see the navigation structure in "path" format at all times in the navigation area above the parameter screen. In "SELOGICA direct", navigation keys and function keys are clearly delimited by means of static screen layout, thereby simplifying operation. Screen selection and parameter entry via the touch screen are ergonomic and straight-forward processes. For the purpose of navigation, several levels are displayed in the form of a hierarchy, ensuring maximum clarity.

by name





Different parameter screens or sets of screens can be accessed directly as "starting points". In practice, this means that when optimising machine settings, for example, users can toggle between a number of selected screen pages simply by touching the screen once or twice.

Direct links set up by default to pages containing important parameters for process optimisation are a new feature. They are generated automatically on the basis of the last parameter pages used. The sections of the SELOGICA interface which were previously text-based now appear in improved graphics-based format in order to meet requirements for an up-to-date display format. Parameters are entered in tables based on the direction of movement of the axis. The pages for configuring axis parameters are a good example of how users can benefit from the graphics-based features. The pages contain graphics showing installation technicians how the machine converts the values entered into setpoints. Any incorrect values are immediately obvious.

Menus only appear where they are of real benefit. Particular emphasis has been placed on ensuring the touch panels are of a user-friendly size.

The customised technical features and functions are complemented by new hardware. The screen has been enlarged to support touch screen operation. Other new features supplied with "SELOGICA direct" include user authorisation via a chip card, additional interfaces for connecting standard peripherals such as printers and a powerful data memory in Compact Flash format.

"SELOGICA direct" is available now and is an optimised operating alternative designed to reflect the latest technological developments.

It can be integrated seamlessly into existing operating concepts, improves operating ergonomics still further and helps to reduce set-up times.

Clearly structured: direct access to function and parameter buttons via touch screen is what gives this new, optionally-available operating program its name: "SELOGICA direct".

Self-contained and i

ARBURG's managing partners Juliane Hehl (centre) and Michael Hehl (left) talk to Dr. Christoph Schumacher about their strategic visions.

ARBURG is, was and always will be a family business!" This fundamental statement clearly reflects how ARBURG's managing partners Juliane and Michael Hehl, who take an active role in day-to-day operations, see the future development of the company. They spoke to Dr. Christoph Schumacher, ARBURG's Head of Marketing and Corporate Communications.

How will ARBURG develop in the years to come? Technologically? Economically? Organisationally?

MH: We will all be making the most of the opportunities offered to us to grow the company in terms of globalisation, technology, commerce and organisation but we will not be changing our established approach.

JH: We have a huge number of visions. As always, we will not be revealing them in advance. Unlike many others, we act first and talk later. It's more fun that way!

What will be ARBURG's most important goal in the next ten years? What about in the next 20 years?

MH: To internationalise our family business whilst maintaining high levels of quality in terms of customer support. People have to be able to rely on ARBURG. We can prove that they can.

Will ARBURG remain a family business?

JH: Absolutely!

MH: ARBURG was, is and always will be a business owned by our families.

How are the regional and technological growth markets looking?

JH: Well, I find little interest in talking about the growth markets we are already familiar with, such as the People's Republic of China. What interests us as partners is of course our company in terms of its short-term economic position and, primarily, its economic position in the medium and long term. Where will we be in ten, twenty, thirty years? We believe that it is our responsibility to offer planning reliability and continuity to our customers, the companies with whom we work and our employees.

What does the key phrase of your corporate philosophy, "Allrounders for economical injection moulding" mean to you?"?

MH: Exactly what my sister has just alluded to. In the business world of today, our customers have to be Allrounders, as do our machines and our employees. The trend is obvious. Application technology consulting and process-based support are gaining in importance all the time. We wanted to come up with a slogan which encapsulated the human, machine and process elements – and then meet the challenges it set us.

How do you assess the current situation on the global injection moulding machine market?

MH: That's very difficult to answer in just a few words. You have to assess each aspect separately and increasingly look at individual markets in very specific and ever shorter intervals. However, one thing we can perhaps say is that the upturn we have all been waiting for seems to be on its way.

ndependent

How will the market change in the next five to ten years?

JH: The stiff competition, which has seen some companies collapse, will lead to market rationalisation in terms of a reduction in the number of suppliers in the medium term. Pursuing a policy of cutting prices is one side of the coin, whether these prices can actually be supported is the other. Anyone can sell cheap. Long-term strategies require real business sense.

How are things looking for ARBURG nationally and internationally?

MH: We have a firm and healthy foundation on which we plan to build. We value healthy growth which unsettles neither the company nor its customers.

Have ARBURG's efforts to expand its range of products and services been worth it?

JH: Most definitely, this is evident in terms of quantity in our figures and in terms of quality in our customer satisfaction analyses. Even in the very recent past, this decision has already proved very beneficial for our company.

MH: Yes, and for me, it's an excellent example of how the company is growing healthily.

Has clamping force reached a peak or do you have something else up your sleeve?

MH: As always, customer requirements are our ultimate guide. If we can identify technological and commercial potential, we implement our visions – and talk about them afterwards.

What does K 2004 mean for your company and what do you expect from it?

JH: It's a major focus point which provides us with an opportunity to show what we can do both technically and in terms of image. Although the challenges we set ourselves in the years in which the K does not take place get more ambitious all the time, the high point for our company, and the entire industry, is and always will be the K.

MH: I personally am really looking forward to the K. There we have the unique opportunity of being able to address the entire worldwide industry in a very compressed amount of time. I consider these few days in Düsseldorf to be an extremely positive event: we want to do business and the K is an excellent platform for this.

If you had one wish as a businessman, what would it be?

JH: To use our own means to achieve a life's work like Karl and Eugen Hehl.

MH: Without ever giving up our autonomy and independence.

Prepare to be amazed!

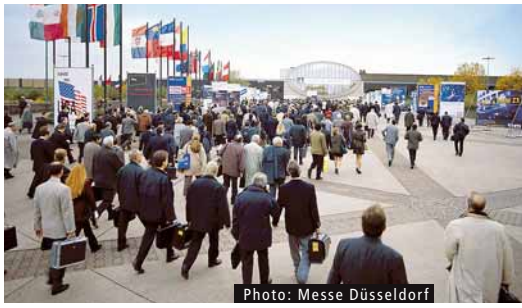


Photo: Messe Düsseldorf

How do I find the ARBURG stand at the K 2004? Simple: either remember the catchy stand number "13 A 13" or follow the friendly mime artist decked out in ARBURG's house colours.

This distinctive man will be found everywhere during the "K". You'll see him smiling at you from many walls and billboards, on ARBURG invitations, in trade fair literature and even on the redesigned trade fair stand.

With this new "Allrounder", ARBURG has chosen an image which is entirely unique, known in the trade as a key visual. Usually, you would expect to be bombarded with images of machines, control systems, robotic systems and plastic granulates. As well as being unique and instantly recognisable, this integrated communication concept, which is new to the field of plastics processing machine construction, conveys the promise that visitors to the ARBURG stand will be amazed.

"A similar concept we used at K 2001 went down very well" Dr. Christoph Schumacher, Head of Marketing and Corporate Communications, told us. An image of a huge pair of eyes, which was particularly well received, was used in 2001. "It was therefore only logical to tip the wink to this approach again", concluded Schumacher.

Amongst so much technology, a subject which raises a smile yet is uniquely associated with ARBURG should work wonders. "After all, even in machine construction, you are allowed to smile!"

It does of course go without saying that the mime artist will also be appearing live at the stand to amaze visitors...

Paradoxically, something that appears to be so simple involves very hard work – this means photo shoots which can last all day.

Global service at your doorstep

ARBURG's sales and service philosophy is based on the principle of being able to provide customers with comprehensive service of the best quality worldwide. In other words, this means that we must be able to supply sales and service functions quickly, comprehensively and at the best price/performance ratio, be it in Stuttgart or Kuala Lumpur.

The only way to ensure company growth is to make sure your customers are completely satisfied. It is for this reason that customer wishes and the total quality philosophy are of paramount importance to ARBURG. It's all about developing the best possible solution to suit the customer's needs.

In order to be able to implement these principles in reality, which are firmly anchored in the company's philosophy, ARBURG has set up 19 wholly-owned international subsidia ries and two representative offices in Europe, North America, South America and Asia. In addition, representatives on all continents ensure comprehensive support, established service, seamless customer service and detailed training.

ARBURG's subsidiaries are connected via an IT network to ensure rapid spare parts delivery all over the world. Orders can be placed either through subsidiaries or representatives directly, or via an interactive catalogue on the Internet.

An effective telephone diagnosis service also provides quick assistance in the event of minor production problems. The latest communication technology always ensures that service technicians in their state-of-the-art vehicles take the quickest route to the locations where they are needed. Thanks to a remote diagnosis module, it is possible to gather information about a given machine over long distances. This information then helps the experts in Lossburg to identify problems quickly and to resolve them by calibrating data via the machine control system. Detailed training courses for customers also provide invaluable knowledge about every aspect of ARBURG technology.

Advice on applications helps with specific problems, for example in the area of part design or mould configuration. There are specialist teams to look after PET or PIM customers, for example. There is also an in-house project group to coordinate orders for entire production solutions involving robotics, part placement and downstream processing systems. A fully equipped technical centre is available at nearly all subsidiaries, allowing customers to conduct part and mould prototyping. They can also produce a pilot batch or make appropriate modifications to the components used in production. Complementary services, such as studies on filling patterns or 3D part drawings round off the range of ARBURG services.

The Service Allround offer, which is available in Germany, is to be rolled out internationally. Since January 2004, in addition to a 24-hour hotline providing telephone support, we have been offering an on-call service for service technicians to respond to emergencies at weekends and on public holidays.

Photo: R. Faisst

The company acknowledged the special significance of the Chinese market by opening a wholly-owned subsidiary in Shanghai in mid-2004. Along with the Hong Kong subsidiary, it will work on the accelerated development of this upcoming market. If you would like to know more about support and service at ARBURG, simply visit us on the Internet at **www.arburg.com**. The latest figures, data and facts about support and service can also be accessed on the site.

Optimal customer care worldwide is ensured by ARBURG's efficient network of production locations and subsidiaries: a current example: our Shanghai subsidiary (above).

High-tech from a ne

Photo: Wild & Küpfer

Set in an idyllic location at Schmerikon on Lake Zurich, one of the companies at the cutting edge of plastics processing in Switzerland is Wild & Küpfer AG, who, in their own words, want to shape the future of this sector with innovation and creation. With its ALLROUNDERs, ARBURG is working in partnership with the company.

The company started out with 100 m² of production space and three employees, producing accessories for the textiles industry and components for fire alarms. With an annual growth rate of about 10%, continuous expansion in every direction was practically unavoidable.

Today, from its headquarters in Schmerikon covering an area of 12,000 m², the company produces technical applications and custom products for the HVAC, safety, medical, electrical and electronics, telecommunications and automotive industries. Their "custom products" service the lens, terminal strip and multi-component sectors in particular.

Wild & Küpfer's products are sold primarily on European markets, making it necessary for quality documentation reasons for the company to gain certification to ISO 9001/2000 and 14001 early in its development.

Like many other processors, Wild & Küpfer AG sees itself as a system supplier. What's more, the company can support this statement with hard facts. As a general contractor, its advanced design, production and supply process features elements including mould flow analysis, in-house mould construction with FMEA, QFD (Quality Function Deployment) and TC (Target Costing), five-axis milling, HSC milling and laser cutting as well as product design and, not least, experts who are able to provide their customers with the most suitable automation options.

As you will have realised by now, there are a number of parallels between Wild & Küpfer and ARBURG. These include quality, dynamic engineering, a central production location in a charming rural setting and comprehensive ISO certification. It was therefore logical that these commonalities should be proven in a partnership. Both companies have been working together successfully - not only on a conventional technical basis - since 1971. The Swiss company has also been heavily involved with the ALLROUNDER A, on which the electric main axes can be combined individually with electric or hydraulic auxiliary axes or both the main axes and all the auxiliary axes can be electric. Of the total of eight ALLROUNDER As, the first were integrated into production at the end of 2002. Even at that early stage, the

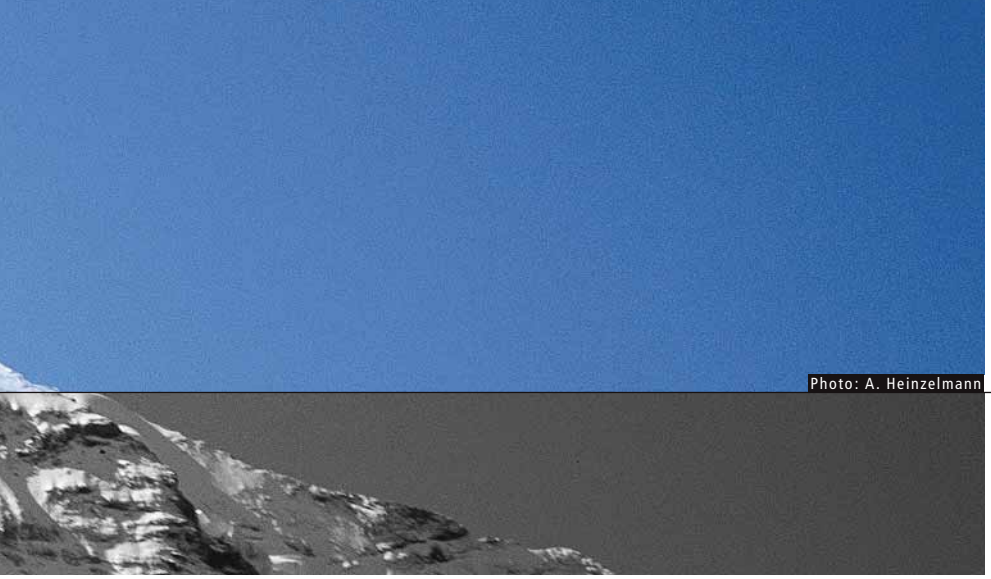


Photo: A. Heinzelmann

arby recreation area

company's two owners, Tobias Wild and Peter Küpfer, had nothing but praise for ARBURG's modular electric machine concept. "We were very impressed with the ALLROUNDER 420 A from the start." We wanted to integrate this clean, future-oriented and technically innovative machine into production as soon as possible. On our machines, in addition to the main axes being electrical, "ejection" is also performed electrically; by contrast, the nozzle and both core pulls are controlled hydraulically. Improved product quality, process reliability, reduced energy consumption and noise emissions are convincing arguments in favour of the use of ALLDRIVEs in the production of precision parts. The aim is to increase the share of electrical machines by up to 50% and higher in the medium term."

Of the total of 47 injection moulding machines in Wild & Küpfer's production halls, 24 are now ALLROUNDERs and also operate on a shift basis. We simply had to ask the company's decision-makers what they appreciate about ARBURG. As well as the capacity to innovate, the state-of-the-art technology and willingness to work in partnership were singled out for particular praise. In their own words: "We simply couldn't be happier, both generally and in terms of custom solutions!" The ALLROUNDERs at Wild & Küpfer are all highly automated, host-computer-compatible and can be integrated into central quality assurance. A final decision still has to be made on whether and how ARBURG's ALS host computer system is to be used at Lake Zurich.

The ALLROUNDERs are the solution of choice for this Swiss company because they are user-friendly, space-saving, powerful and offer an excellent price/performance ratio. The technology is considered to be very modern and the SELOGICA control system is well-designed and intuitive in terms of its operation. With specific reference to the ALLROUNDER A, Wild & Küpfer's engineers cite the high precision and reproducibility of the moulded parts. However, they also mention its speed, cleanliness and cost-effectiveness. As both Wild & Küpfer and ARBURG demonstrate, a sprawling metropolis doesn't have to be the natural habitat of cutting edge technology. It can be just at home on idyllic lakes and at densely wooded hills, particularly if a partnership gives rise to productive synergies.

Swiss precision: in Schmerikon (above, left) high-precision technical parts are produced on ALLROUNDERs in a state-of the art fashion. For this, electric ALLROUNDER As are used extensively (r.). The first 420 A was picked up personally in Lossburg, which the management teams of Wild & Küpfer and ARBURG celebrated with a champagne reception (left, below).


Photo: Wild & Küpfer

INFOBOX

Founded: 1979 by Tobias Wild and Peter Küpfer
Employees: approximately 90
Machine fleet: 47, of which 24 are ALLROUNDERs
Clamping force: 150 to 3200 kN
Products: High-precision technical parts, custom geared components, tribological parts, highly translucent transparent parts, precision components and modules, including multi-component technology
Location: Wild & Küpfer AG, Allmeindstraße 19, CH-8716 Schmerikon, Switzerland, www.wildkuepfer.ch

The magnificent seven

There were seven reasons to celebrate in the Swiss subsidiary in 2004. As well as ARBURG AG celebrating its tenth anniversary, believe it or not, six employees were celebrating their tenth year with the company. This event was marked by a celebration held on 25 June to which some 90 guests were invited, including a high-ranking delegation from the German parent company.

Subsidiary manager Peter Moser and his team had come up with something very special to mark this milestone for ARBURG AG. After a welcome accompanied by the sounds of alphorns at the Münsingen subsidiary, the party travelled to Thun in typically Swiss yellow post buses. There, the guests boarded the MS "Schilthorn" and, after about an hour's pleasurable boat trip on Lake Thun with exceptionally nice weather, landed in Merligen from where they proceeded to Hotel Beatus, the venue of the actual festivities, where the anniversary addresses, the presentation of a sculpture commemorating the anniversary and lunch were held. From the parent company, three of the owners took part in the celebration of this significant anniversary. They were

Eugen Hehl, chairman of the management team, Juliane Hehl and Michael Hehl, both senior members of the management team.

In his anniversary address, Eugen Hehl congratulated the entire Swiss team and praised them for their years of outstanding work. "Our Swiss subsidiary is looked upon as a pearl in our organisation, and justifiably so. The Swiss market, which is so important for us, is being looked after in outstanding fashion."

Eugen Hehl thanked Peter Moser, Head of Sales Markus Stadelmann, Head of Finance Luciano Petri, Sales Consultant Aldo Ravedoni, Head of Customer Service Hartmut Meysahn and Thomas Joerg from Spare Parts Service in particular for their ten years of committed service to the subsidiary.

Peter Moser, representing the entire team, accepted a large modern sculpture made of steel and glass in commemoration of the anniversary as well as a certificate from Eugen Hehl following the end of the speech. In future, these will occupy a place of honour in the subsidiary building.

"ARBURG will continue to uphold its ten-year old tradition in the Swiss market into the future", says Eugen Hehl. In this regard, the Swiss customers can continue to count on the outstanding work of the ARBURG AG team, just as the German headquarters does.

Towards evening, the jovial party returned by boat to Thun. "We're going to remember this wonderful, unforgettable day for a long time!", was the unanimous response from the guests.

Following his speech (photo, left), Eugen Hehl passed (right, photo top right.) presented Peter Moser with the certificate marking the anniversary. The guests at the anniversary celebration were greeted by the sounds of alphorns. (photo, bottom right)

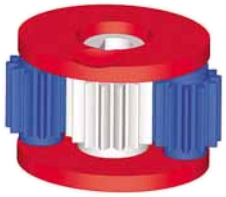
Assembly included

In recent years, multi-component injection moulding has developed into one of the most innovative injection moulding technologies. Usually, this process is used to make the bonding between the individual components of a part as inseparable as possible. Conversely, however, plastics that are not compatible can also be combined by assembly injection moulding in order to create components which are attached to one another in such a way that they can move.

In assembly injection moulding, an intended adhesive incompatibility as well as the different shrinkage properties of two materials are utilised, for example to integrate joints into a component. The geometry in the vicinity of the joint is specifically designed so that the two components form a defined amount of play in the joint.

Component parts can also be joined independently of this and purely mechanically through movements inside the mould. Both components are first injected separately into the mould cavities on a two-component machine and then positioned towards one another by mould transfer using well-known mould concepts for multi-component technology

An innovative combination of these technologies has been realised in the production of a planetary preliminary stage for a micro gear, in which both of these processes are used in a synergetic fashion. The chair of plastics technology at the University of Erlangen, Oechsler AG, Ansbach and ARBURG developed the concepts of the mould and the process as part of a joint project funded by the Bavarian Research Foundation.



The so-called "sun wheel" of the planetary gear is first injected on a mould set up on a two-component machine. In a second station of the mould, the planet wheels are injected using a plastic which cannot adhere to the sun wheel.

Internal movements in the mould then push the planet wheels onto the sun wheel and set them down in exactly the required position.

In the third step of the process, the joined cogwheels are encapsulated with the cover plates and axes. The geometry and shrinkage properties of the components assembled last ensure that the cogwheels are able to move on the axes. All stages of the process take place simultaneously in the individual mould stations. The planetary gear is finished and ready for immediate use on ejection from the mould.

This concept is of interest primarily because of the very compact dimensions of the individual parts which, if assembled outside the machine manually or automatically, require a great deal of time and effort.

Photo, top: movable joint of a housing component
Photo, left: processing stages of the planetary gear (Oechsler AG, Ansbach).

Down-to-earth

The story of the company known as PEKA started in Velbert almost exactly 16 years ago. Lutz Karrenberg had completed his moulding apprenticeship in his early twenties and Ralf Peter had graduated from business school when an unusual opportunity came their way. Karrenberg's employer at the time no longer needed the ALLROUNDERs and moulds used for the production of end caps for cardboard shipping tubes (you know, the white things at each end). Peter and Karrenberg wasted no time. They secured the necessary start-up capital and began producing the cardboard-tube end caps on an ALLROUNDER 221.

Ralf Peter (top left) and Lutz Karrenberg (top right), owners of PEKA (bottom), produce technical parts primarily for the automobile industry. ARBURG ALLROUNDERs are used exclusively for production.

What started in a production area measuring 300 m² in a house in the centre of Velbert now accounts for 4500 m² of an industrial park in the open countryside. PEKA has become one of Europe's largest manufacturers of end caps for shipping tubes. In spite of this, the business is now dominated by orders from the automotive supply industry. This was one of the decisive factors in the company changing its quality assurance methods, and it now holds all the certifications required in this sector. Otherwise, plastic components for all Germany's well-known automotive manufacturers, and for others like Bentley and Rolls Royce, would not be being produced in Velbert.

"In collaboration with our network partners, we are able to supply a complete range of system supplier products and services for plastic parts", says Lutz Karrenberg, explaining the activities of PEKA. "We gain the respect of our customers by working closely and openly with them from the very beginning. This starts during the planning phase and continues through the design and construction of the parts, the making of the mould, injection moulding and assembly, and beyond to finishing and JIT delivery." Although Karrenberg is a qualified mould maker, he prefers to subcontract the making of customer moulds to one of his network partners. "I can rely on the work being done well, quickly and at a reasonable price. We can then focus our concentration on the high-quality production of plastic parts and components."

Just six machine installation technicians work on the injection moulding machines, every one of which bears the ARBURG ALLROUNDER logo. This indicates not least the high degree of automation throughout the company. For example, there is high rack storage for the injection moulds required and paternoster storage for the vendor products and preliminary products required in finishing processes. Computer-aided production planning with materials management and automated purchase order processing is currently being introduced. Redundant systems for process-sure working such as fused electrics, two compressors for sufficient compressed air, two refrigerating sets and even two separate crane rails, are in place. They provide exactly the production reliability that is required for the automotive sector.

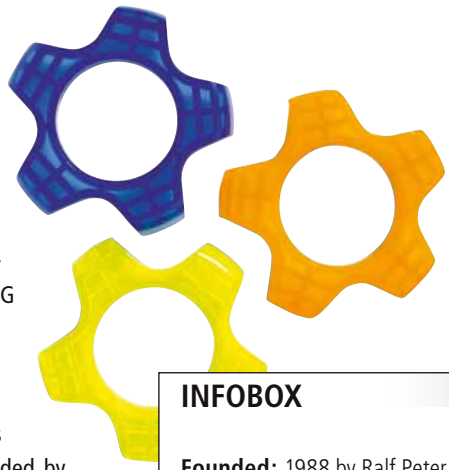
The majority of PEKA's customers are based in Europe, and requirements in terms of technical part manufacture and the variety of plastics to be processed are accordingly high. When asked about PEKA's limitations in terms of process technology, the two owners responded "Together with our customers, we are prepared to consider absolutely anything."

from the start

PEKA's production expertise ranges from the processing of polyamides with 60% glass-fibre content, to the production of GIT parts and the use of multi-component technology, and beyond to hard/soft combinations with TPE content.

PEKA has used the same machine supplier since its foundation. The latest system for manufacturing an emergency key for BMW is therefore also being supplied by Lossburg. The production cell comprises an ALLROUNDER 1200 T 800-150 with MULTILIFT V robotics and downstream assembly station for springs and buttons. The metal key blank is first separated, set in a platen and rotated. Next, the four inserts are positioned in the first mould half (four-cavity hot- runner) of the ALLROUNDER's rotary table and rotated for encapsulation in the mould clamp. The second mould half is retracted simultaneously and the robot removes the parts and sprue before separating them. It then sets down the moulded parts on the assembly station's rotary table. In an intermediate stage, two buttons and springs for the movable parts in the key are automatically preassembled and made available for the next, action of putting together the key and buttons using a clip connection. Testing equipment verifies the presence of the buttons in the key and the finished keys are then set down on a conveyor belt and collected in storage containers, sorted according to cavities. The rotary table machine reduces cycle times because parts can be inserted and removed during the production process.

This system is a typical example of how PEKA and ARBURG work together. In a close and committed partnership, they work together to provide solutions for production applications of this type. "The support provided by ARBURG, the seamless and comprehensive service and the optimum price/performance ratio are reason enough for us to keep going back to ALLROUNDER injection moulding technology", the company's mangers told us. This is very unlikely to change in the future. As well as in new technologies, PEKA also intends to invest in highly-automated production systems to provide high-tech end products directly on the machine. This is how the inhabitants of Velbert intend to retain their vital competitive edge on the international market in the years to come.



INFOBOX

Founded: 1988 by Ralf Peter and Lutz Karrenberg (PEKA)
Production: 3,400 m2 converted floor space, expandable modular production hall with central underground media supply
Employees: 32
Machine fleet: 38 ALLROUNDERs with clamping forces between 250 and 3000 kN
Products: Technical parts, primarily for the automotive industry, end caps for shipping tubes
Location: PEKA Spritzguss GmbH, Konrad-Zuse-Strasse 2, D-42551 Velbert, Germany, www.peka-spritzguss.de

Perspectives

Many of us know Tunisia simply as a holiday destination with dream-like beaches and a romantic desert landscape. Very few of us know that the country is active in the technical sector. In ATI, ARBURG has an exclusive trading partner wishing to make its mark on the regional market for plastics processing.

Serge Cannito, Subsidiary Manager in France and therefore also responsible for the Tunisian market, is particularly pleased that we have been able to find a representative in the country with solid knowledge working exclusively for ARBURG and its injection moulding technology. "This has enabled us to hold sound sales and technology discussions with our international customers and therefore offer an optimum pre-sales and after-sales service for our ALLROUNDER injection moulding technology. We are now able to provide a reliable and comprehensive service to meet the most exacting of quality requirements in this region", continued Cannito.

Having moved to new premises and struck up partnerships with a number of educational institutions, ATI is now able to offer several regional training courses for plastics processors. As well as being able to access a SELOGICA simulator on the ATI site, customers can also gain practical experience on two ALLROUNDERs, which have been installed in the technical universities at Tunis and Sousse. These partnerships mean that ATI is able to use an ALLROUNDER 320 K in Tunis and an ALLROUNDER 320 C in Sousse for technical training purposes.

Another important installation is to be commissioned at ATI before the end of the year. An on-site spare parts warehouse will help to ensure that customers can obtain parts quickly and efficiently without customs formalities and additional charges. In addition to Sales Engineer and Agency Manager Khaled Arifa, the ATI team comprises another office-based sales representative and two service technicians. All are qualified plastics processors and have expert material knowledge. According to Serge Cannito, ARBURG's regional staff make it one of the best injection moulding manufacturers in the area.

The increasing importance of this in Tunisia is evidenced by the examples of companies in the area who are manufacturing high-tech moulded parts with state-of-the-art systems. The company UATS-ELDRA uses injection moulding technology to produce polymer lenses which are integrated into the gear-shift mechanisms of motor vehicles as shift gates. ARBURG's Project Department set up the production facility based on an ALLROUNDER 370 C 600-100 with MULTILIFT V robotics. The MULTILIFT gripper removes the components from the mould and sets them down on the deep-drawn trays supplied prior to merging on a palletising station.

In addition to two ALLROUNDER 320 S with removal robotics, Diamed Tunisia, a subsidiary of the Swiss company Diamed,

Photo: PhotoDisc

for the future

also works with an ALLROUNDER 520 C 2000-675 in conjunction with a MULTILIFT H. The robotic system is fitted with an additional B axis and a servo-electric Z axis on the rear of the machine for removing the part and setting down the pattern on a conveyor belt. A special enclosed guarding for the robotics and conveyor belt ensures the necessary clean room conditions during production. The part manufactured on the system is known as an "analysis plate" and runs on a four-cavity mould.

IMTEC Tunisia was founded near Tunis at the end of 2003 as a subsidiary of the French company of the same name. Four ALLROUNDERs, including a 720 S, have already been integrated into production. The aim is to run 30 machines on the site.

Like IMTEC, the subsidiary of the French company Dromoise Des Plastiques works primarily for the automotive sector. The new factory is located near to Sousse.

Already a major customer of ARBURG in France, EBENOID has opened a Tunisian facility at Zaghouan. Three ALLROUNDERs, including an ALLROUNDER 320 C, are in operation there.

So, for anyone who might have thought otherwise, Tunisia is clearly much more than beaches and dunes. Tunisia is also at the cutting edge of plastics processing. It is for this reason that ARBURG is working particularly hard in this region together with its exclusive trading partner ATI. This is extremely good news for the numerous French and German investors relying on local professional support.

IMTEC (photo, left), UATS-ELDRA (2nd photo from left) and Diamed (photo, right) are only three of many companies that have built state-of-the-art production facilities in Tunisia. 2nd Photo, from right.: the companies are assisted on-site by Khaled Arifa (centre), head of ARBURG's representative ATI, and his knowledgeable team.

INFOBOX

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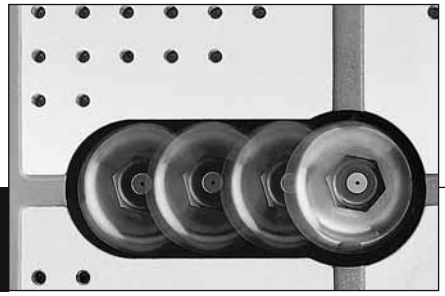
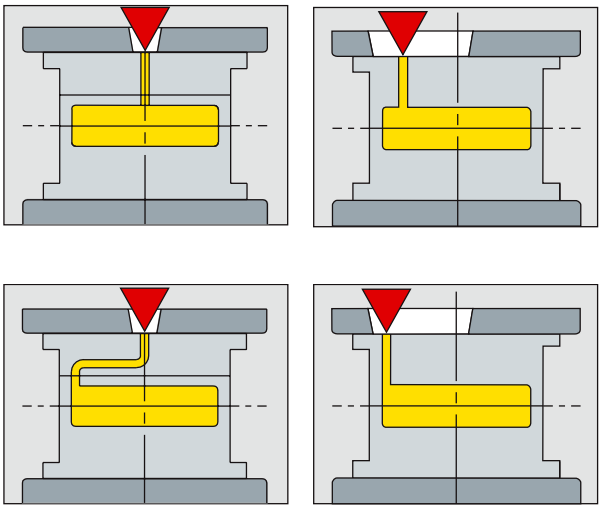
MILESTONES



How can linear form filling be achieved without having to inject into the parting line via a vertical injecting unit? This was one of the major challenges for ARBURG's technicians during the eighties. Of primary importance at the time were issues concerning problem-free automation and minimum footprint in production.

At "K'89", ARBURG unveiled the ALLROUNDER 470 V, the first machine with custom moulds able to achieve linear form filling, even with long, flat moulded parts, due to the horizontal shifting of the injection unit. The basic position of the unit in the horizontal axis was not changed. The injection unit could therefore not only approach the central injection position but also any other injection position in the traversing range and even supported linear injection. An integral slot in the fixed machine platen limited the traversing range.



Simplified mould configuration: because of the introduction of the VARIO principle with free-sliding injection unit, complex sprue designs, for instance, could be avoided.

With different cylinder sizes and displacement distances, the VARIO principle was used as standard for the M, C and V series ALLROUNDERs. In addition to problem-free automation and consequential unrestricted use of removal systems, the shorter set-up times, reduced space requirement, retention of the central moment of force in the mould and improved optical properties of the moulded parts were also decisive plus points. Sprue channels in the mould were easier to construct and lay out, significantly reducing the amount of plastic required and post-processing on the moulded parts. Clear advantages could also be utilised due to the specific influencing of the direction of flow of the plastic which improves strength in fibre-glass-reinforced plastics, for example. Savings were able to be made in the production of parts made from expensive base materials due to the sprue-free injection with hot-runner nozzle, which is simple to realise throughout the entire VARIO range.

Last but not least, the introduction of the VARIO principle brought advantages in terms of part design. Computer-optimised part designs could be transferred intact to the injection moulding process and the designers' ability to select injection points increased the scope for mould design There were practical benefits, too. Optimum accessibility to the mould in the event of additional options being added remained unaffected. At the time of "K '89", the VARIO principle was integrated successively into all current machine series at ARBURG and could be ordered as an alternative to conventional central injection without additional charge.

TECH TALK

Dipl.-Ing. (FH) Marcus Vogt, Technical Information

Optimisation potential in micro injection moulding

The miniaturisation of components and modules is leading to ever decreasing shot weights for injection moulded parts. At shot weights below one gram, the dwell time of the plastic in the cylinder can be very long under certain circumstances and the displacement distance of the screw very short due to the low injection volume.

Frequently optimised injection units and screw diameters are therefore required for micro injection moulding. The aim of optimisation is to reduce dwell time and retain an acceptable screw displacement in order to be able to precisely control the injection process.

A possible solution is the further miniaturisation of the proven three-zone plasticising screw, with realistic screw diameters currently in the region of 15 mm. However, the sizes of granulate currently available (minimum diameter 2 mm), prevent any further reduction in screw diameter. The reason for this is the required depth of the screw channel in the inlet zone (minimum 3 mm). The core diameter of the screw would be reduced to such an extent that the torques generated during plasticising could no longer be tolerated.

However, the opposite approach is possible. Grains of granulate could be reduced to create micro granulates with grain diameters of less than 1.5 mm. ARBURG has developed a modified screw for the injection unit 30 with a diameter of 12 mm specifically for processing micro granulate. A reduced screw channel depth in the inlet zone ensures the required mechanical stability of the screw.

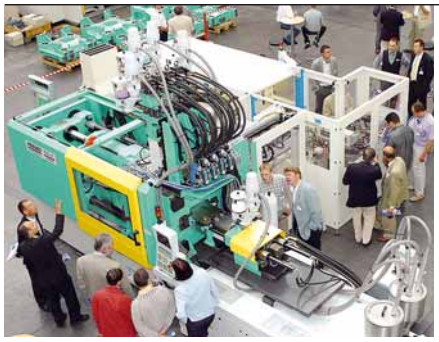
Experiments carried out in the ARBURG research centre with this 12 mm screw and granulates with grain diameters between 0.5 and 1.5 mm have shown that the dwell time, which is often critical in micro injection moulding, can be almost halved. The results obtained also demonstrate significantly better reproducibility.

New event is a real hit

Some 560 trade visitors from 19 countries over six days – the first ARBURG Multi-Component Days proved a resounding success. In order to be able to look after all its visitors personally and make them aware of ARBURG's many years of wide-ranging expertise in the field of multi-component injection moulding, there was a full program on each of the days.

After a short theoretical overview, attention quickly turned to practical applications. On a total of seven different exhibition machines, visitors had the opportunity to take a detailed look at the possibilities currently offered for the manufacturing of multi-component parts.

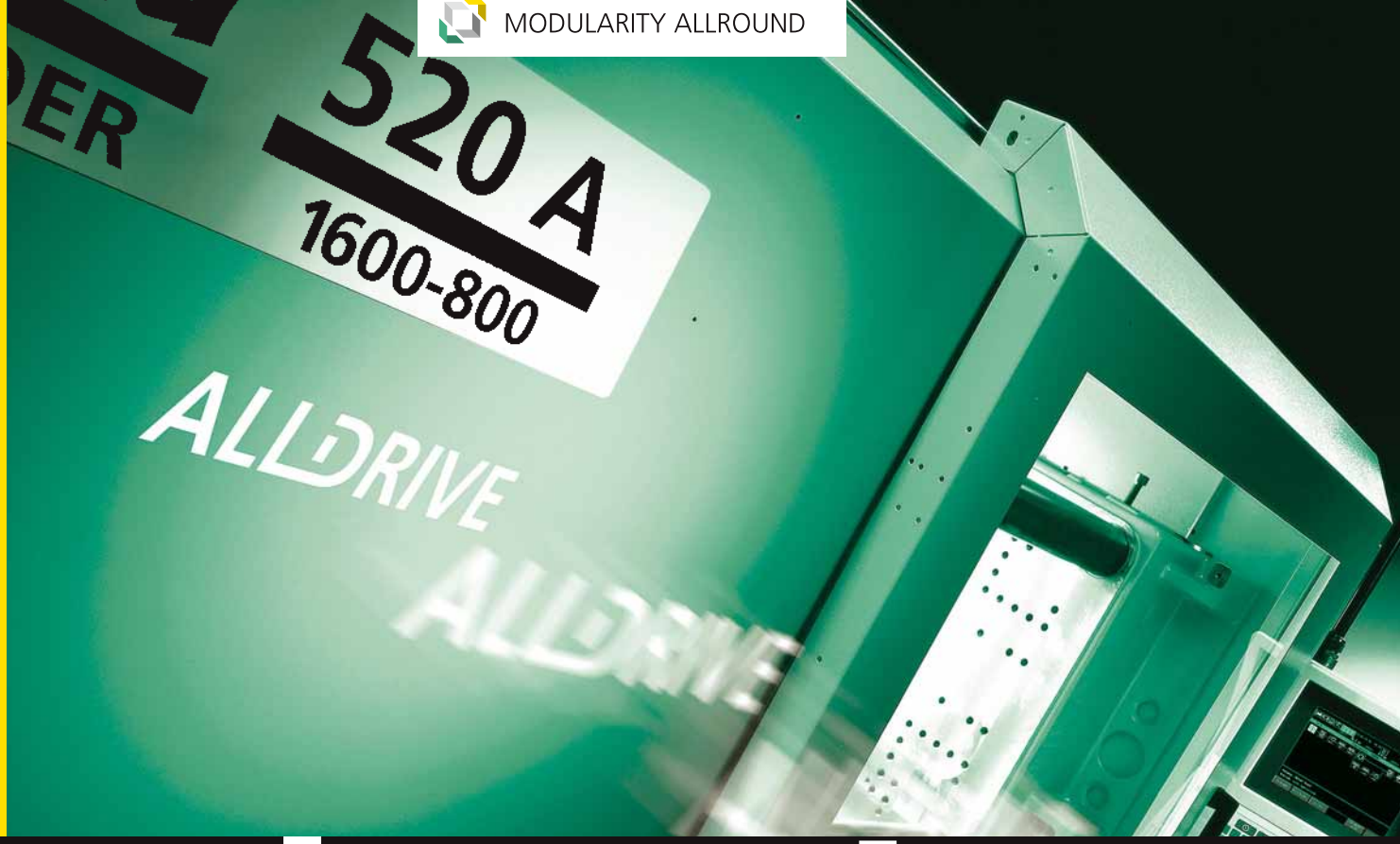
The absolute highlight was the five-component machine from Zahoransky with one horizontal and four vertical injection units for the multi-colour injection moulding of toothbrushes with soft-touch surfaces.



Also on show were two other hard/soft applications with LSR and TPE respectively as soft components, gram technology in the production of screw caps, interval and sandwich injection moulding and the large ALLROUNDER 630 S and 820 S as two-component machines.

As all the visitors were impressed with the compact and comprehensive event format, this successful premiere will doubtless be followed in the future by other small in-house exhibitions for specialised injection moulding topics using the successful "Technology Days" format.

The crowd magnet was the five-component machine for the colour-sorted injection moulding of toothbrushes.



Electric!

Electric or hydraulic drives? Either – or? Not with us because our ALLROUNDER A is modular! The concept: Servo-electrically driven main axes as standard with optional hydraulically or servo-electrically driven auxiliary axes. This combines the advantages of both systems. Sufficient hydraulic power, high levels of electro-mechanic accuracy and optimum energy consumption. Experience the future of electric drives!

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