

Information on
Injection Moulding
Market and Technology

ARBURG

today

A publication of the
ARBURG Group

Issue 17

Summer 2001



**ARBURG
Technology Days**

Huge success

ARBURG Switzerland

Ceremonious opening

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If you didn't visit our Technology Days yourself, you've almost certainly already heard the story of their amazing success: around 3,100 experts over three days spells out a very clear message – particularly as this is also a K year!

It is reassuring for us to see: the interest shown by our customers in our company and our innovative technology has not waned, indeed appears to carry on growing, if that is still possible. It appears then that our pursuit of practical orientation is also paying off for our customers.

But it's not only in Germany where such brilliant events are taking place: We also celebrated the opening of a new subsidiary building in Switzerland, which reveals a very obvious connection with our headquarters even when seen from outside.

The K exhibition draws closer and closer: at this point we would very much like to invite you to come and visit us on our stand 13 A 13. It will be worth your while!

Happy reading!

Juliane Hehl

Eugen Hehl

IMPRINT

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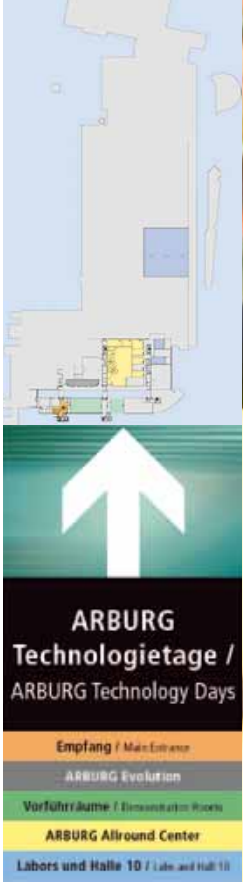
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Rush hour in the ARBURG demonstration room – filled to the brim with ARBURG technology:

One of the focal points at the Technology Days in March 2001 was the demonstration room, where 21 of the 40 high tech exhibits were on display.



The concept takes off

The ARBURG Technology Days were visited by 3.100 experts from around the world this year. They traditionally take place at the end of March in Lossburg. That means attendance was up around 50 percent on the previous record set last year.

The huge numbers of visitors to the Technology Days was clear evidence that the concept of the three-day event, providing a comprehensive overview of the ARBURG range and excellent presentations by experts, was very well received - even in a year when K is due to take place. It also shows how great the appeal of open house at ARBURG is for customers.

Overall, 3,100 visitors made their way to Lossburg from a total of 23 different countries, including such far away places at Bulgaria, Romania, Hong Kong and Taiwan. Overall, guests from abroad constituted around one third of all visitors.

Just as in previous years, Friday saw the biggest crowds: a total of 1,400 visitors beating the attendance record for a single day, which



Operation is child's play.

was also set last year, by over 50 percent. The fact that things didn't get too crowded was largely thanks to the diverse range of information sources.

A packed programme

These enabled visitors to see the ARBURG technology in action on 40 exhibits, spread throughout the demonstration rooms, laboratories and the exhibition area in Hall 10. They could also find out more through presentations given by experts and special shows taking place in the training rooms. Factory tours

were available as well, taking guests through the various areas of production, and when all this proved too much, they could take a well-earned break in the ARBURG Allround Center.

ing force of 150 kN, right up to the largest currently available, the ALLROUNDER 630 S with 2,500 kN of clamping force. ARBURG's robotic system, MULTILIFT H, was



On all three days there were huge crowds in the demonstration room.

The 40 machine exhibits gave trade visitors a complete overview of the whole range of ARBURG products and, using a variety of different applications, demonstrated what can be achieved with ARBURG technology.

All products at a glance

The whole line-up of machines was on display: from the smallest ALLROUNDER 220 S with a clampi-

also shown in various applications. In addition to demonstrations of multi-component injection moulding, optical disc application, smart card and PET pre-moulded part production, and thermoset, elastomer and silicone processing; special Gram mould technology was on display, as was the Mucell® process, which has been available from ARBURG for some time now.

INTERVIEW



Wilhelm Kaiser Sr.

Herr Kaiser, at 90 years old you are our eldest visitor. It is a great pleasure for ARBURG to welcome you here.

W.K.: The feeling is quite mutual. It is also a great pleasure for me to be here to share with you such a splendid event. Over time, I have witnessed quite a few of the events at ARBURG.

How far back do your ties with ARBURG go?

W.K.: Well, I did buy my first machine back in 1959 – when Arthur Hehl was still at the helm – at the Hanover exhibition, after originally becoming involved with thermoset presses in 1936. Today our company, with its 40 members of staff, is a supplier to Ford and VW amongst others.

That also makes you one of our longest-standing customers. Why are you so attached to ARBURG?

W.K.: I have always regarded ARBURG as a highly reputable company and a leader in terms of technology, which has meant that all the machines we have bought in the last ten years have been ALLROUNDERS.

That means ARBURG has accompanied and helped you through more than 40 years of your professional life?

W.K.: Yes, you could certainly say that. And as a ten year old my son, Wilhelm Kaiser Jr., also spent many an hour in production, in front of this first ARBURG machine. You see then, our whole family is tied up with ARBURG.



ARBURG Technology Days 2001: The three-day event brought in the crowds with the varied programme of 40 high tech exhibits, presentations by experts, technical discussions and factory tours. Young and old came along to Lossburg.



Additionally, visitors had the chance to familiarise themselves with the SELOGICA graphical user interface on simulators during the special shows, or take a closer look at the various different spare parts.

Huge crowds for the factory tours

The factory tours proved particularly interesting for guests visiting ARBURG for the first time: it was a chance to see how and where their ALLROUNDERS are produced. But even the regulars, those who come to Lossburg for the Technology Days every year, took the opportunity to see what goes on behind the scenes at ARBURG, in the

course of one of the tours. Throughout the three days, factory tours conducted in German and foreign languages were taking place continually. Overall, more than 80 percent of the guests took part in the factory tours, and in the case of the foreign visitors, this figure was close to reaching 100 percent.

As last year, the highlight was the assembly hall at newly built ARBURG II, with its 3000 square metre façade made entirely of glass. Visitors were astonished to think of how much had been achieved there in the course of the last year: what last year had been an empty hall had now come to life: ALLROUNDER production was in full swing.



ARBURG Project Group makes itself known

A source of great interest to many of the trade visitors were the displays of two customer projects in the field of complete production cells, on display in Hall 10. Developing the theme of production cells - currently a hot topic at ARBURG - was a specialist presentation entitled "ARBURG – Projects from one source", which introduced the new ARBURG Project Department itself and gave details of various customer projects.

Also on the programme of presentations to be given by experts was one on "Combining hard/soft



INTERVIEW



Markus Zäch, Technoplast

What was the feedback like from the visitors?

M.Z. Very positive. The questions were largely about missed opportunities in the past, but also about the work time model we chose, which enabled us to increase our capacity significantly. There were a few interesting discussions about the methodology of how we've gone about things, which began with a very time-consuming analysis of PPS and ALS. Unfortunately, most companies are put off by the effort involved, although this opens up a wealth of potential.

What was the response like after the event?

M.Z. There were about 20 interested parties, to whom we provided a written copy of the seminar paper. Numerous people were interested in taking a tour of the factory. The industry press are also set to run two specialised articles about Technoplast Engineering and the ALS system used.

What experiences did you take away with you?

M.Z. The discussions with other ALS users showed me that, by using the ALS data, we have achieved considerable time-management and economic advances. We also appear to be on the right tracks in terms of using our internal capacity to the full, the availability of installations and exploiting all the potential available. We have to ensure we continue along this path and constantly develop our methodology.



computer system (ALS). Providing background information was an expert from ARBURG, who went online during his presentation to log into production taking place in the ARBURG demonstration room, thereby providing a practical illustration of the benefits of ALS.

ALS as seen by the customer

Providing the customer's perspective was Markus Zäch from the Swiss company, Technoplast. He described how ALS has helped his company optimise production. During his very well attended presentation, Zäch explained that his company's investment in an ARBURG host computer system had paid for itself within seven months. He thereby disproved the popular misconception that production control systems are too expensive and that their use

is therefore uneconomical. Both of these presentations were complemented by the special show on ALS/AQS.

Thanks to these presentations by specialists, given in both English and German languages, trade visitors could take home with them a great deal of detailed theoretical information.



materials with thermoplastic elastomers", a report given by Uwe Stenglin from the German company PTS.

The topics of two further presentations focused on ARBURG's host

Injection unit puts the lid on carton

Tetra Pak integrates ARBURG injection units in



Both the injection moulding of the top and the screwing on of the cap is integrated in the Tetra Top system.

In its Tetra Top product line, Swedish company Tetra Pak has a packaging system in its range requiring a further operating stage, taking place after the drinks carton is manufactured but before the carton then goes on to be filled: injection moulding of the polyethylene "top" using an ARBURG injection unit that is integrated into the complete system.

At the start of the 1950s, Tetra Pak started out as one of the first companies involved with packaging milk. Since then, it has become one of the world's biggest suppliers of packaging systems for milk, fruit juices and other liquid or viscous products. In 1991, Tetra Pak extended its fields of operations to include process systems for processing liquid foodstuffs, system construction, and equipment for producing cheese. Today, it is therefore

the only company in the world that can offer integrated solutions and systems for processing, packaging and distributing liquid and viscous foodstuffs.

Tetra Pak worldwide

Currently around the world there are 77 Tetra Pak marketing companies, 68 production plants for packaging material, including franchises, and twelve assembly plants for packaging machines. In the year 2000, the company employed 18,900 workers and had a turnover of 7.3 million Euro. Tetra Pak products are sold in more than 165 countries. In the year 2000, Tetra Pak produced 89 billion packages throughout the world.

Tetra Pak's products can be separated into the following categories: carton packaging systems and carton material, plastic packaging systems, distribution systems, and

processing lines from product receipt to processing and packaging.

The Tetra Top product line

For its Tetra Top product area, the company's range includes the TT/3 processing line. This line takes care not only of manufacturing the drink carton, but also the injection moulding of the PE top and the filling process.

The sequence of procedures involved breaks down roughly into the following stages:

First of all, a cut-out of the shape required for the packaging is cut from the paper-polyethylene binder material, which reaches the machine in the form of rolls. This is then shaped into the body of the packaging – a drinks carton that is open at both top – and bottom. The cross-section is a square with rounded edges. In the next stage, the PE top is injected onto the body of the carton from beneath. There is an overlap of around five millimetres between plastic and carton, which is sealed tightly. Then the product is poured in and the base is sealed.

The first Tetra Top machine of the 1980s was the single-tracked TT/1, which was joined in 1992/93 by the two-tracked TT/3. Production of the TT/1 was discontinued in 1997. The ad-

vantages of the TT/3 lie in the two, separate packaging lines and the double product tanks. This arrangement allows simultaneous filling with two different products on a single machine. As well as this, two different volume sizes with different top and base formats can be put through the system at the same time.

Last year, Tetra Top brought a revised version of the system onto the market, the TT/3 ESL. The particular advantage here lies in the sterilisation of the cartons, meaning that



t rtons

its packaging systems



fresh milk packed in the cartons keeps longer.

Integrated injection unit

The injection units used for injection moulding in the Tetra Top systems are supplied exclusively by ARBURG. These were modified specially for this application: for example, they have longer guide rods and purpose made non-return valves. Otherwise, the injection units used are the standard versions

that can be found on ALLROUNDER machines. For the purposes of testing, Tetra Pak also has an ALLROUNDER that is used for the test injection of newly developed tops, prior to producing them on the TT/3 machine.

9,000 pieces per hour

When a new machine is installed, the user must decide which packaging family – Base, Mini or Midi – is to be used on the individual lines. Using the full capacity of both lines on the TT/3, it is possible to produce up to 9,000 Tetra Top packages per hour, or 4,500 per line.

The cooperation between Tetra Pak and ARBURG has been going on for many years, since the mid 1980s when the first Tetra Top machines, the TT/1s, came onto the market. From the very first version of the Tetra Top machine to the current TT/3, the injection units used have been supplied solely by ARBURG.

Three sizes – six tops

The Tetra Top product portfolio is made up of three families of packages: Base, Mini and Midi. These cover volume sizes at capacity intervals ranging between 250 and 1,000 millilitres. The areas of the bases, and therefore the injection moulded tops, come in 70 x 70, 47 x 47 or 57 x 57 millimetre sizes. In terms of the tops, six different variations are available: the range of options available comprises various different sizes of screw caps (central ScrewCap, off-centre or stackable), ring pull openers (RingPull and GrandTab with straw hole) and completely removable tops (Total Tab). In the case of the screw caps, the top is injected together with the outer thread. The screw-on cap with its inner thread is screwed on in a separate machine, the so-called "Cap Applicator".

The products in Tetra Top drink cartons are sold in 19 countries, with the main markets being found in Great Britain, Greece, Norway, Brazil, Korea and Japan.



On the TT/3 system it is possible to produce up to 9,000 Tetra Top packages per hour. Photos: Tetra Pak



Extremely practical: milk in the Tetra Top pack with ring-pull top.



Lots of interest in the showroom.

The new look for Switzerland

A glass façade, well-defined shapes, modern design in sophisticated ARBURG style: No, we're not talking about ARBURG's headquarters in Lossburg here but about the new building at the subsidiary in Switzerland.

In mid May, ARBURG AG marked the opening of its new building in Münsingen with two lavishly-organised events which were attended by well over a hundred guests. On the Friday Eugen Hehl, the chairman of the management team, was present to carry out the official opening of the architecturally adventurous new construction. The following day, which was declared

new building was gleaming out, a marquee had been put up in the grounds outside, all the assembled guests and employees were rounded up – and just in time for the hoisting of the ARBURG flag in front of the building which marked the start of the official opening, the dark rain clouds, which had been lurking ominously in the sky previously, dispersed.

And lending his own hand at the base of the flagpole was Eugen Hehl: the ceremony had been planned by Peter Moser as a surprise for the chairman of the management. Thereafter, the guests released a large number of white balloons they had been given previously, all marked with the ARBURG logo, into the sky. Eugen Hehl cut the traditional opening ribbon and stepped through a row of staff members standing in front of the entrance portal. He was accompanied by his son Michael, by the director of sales Michael Grandt



Peter Moser, Michael Grandt, Eugen Hehl, Stephan Doehler and Michael Hehl (l. to r.).

and by the head of European sales, Stephan Doehler.

ARBURG has been represented in Switzerland by its own subsidiary since the start of 1994. For the first seven years, the Swiss subsidiary operated out of a rented building in Belp. Münsingen lies in the centre of Switzerland, close to Bern, and is therefore strategically in a better location. The first cut of the spade came on 14 March 2000, signifying the official start to construction of the ARBURG Technology Center (ATC) on the 3,000 square metre site.

On the one hand, by seeing examples of applications, they can gain a useful insight into the machine and control system technology as well as the various applications for which the ALLROUNDER can be used. At the same time, though, the demonstration room also serves as a place where customers can carry out tests: try out a new mould for example, or receive practical assistance to deal with injection moulding problems arising in practice.

On Saturday, hoards of people turned up, basking in the glorious weather of early summer: Accompanied by the uplifting tones of a Dixieland band playing in the marquee, the new building was given a close inspection. Peter Moser and his team had taken the day's motto quite literally so it really was a case of the whole building being left wide open to all.

ARBURG invested more than four million Swiss Francs in constructing the two-storey building. Alongside the modern offices, the 1,070 square metres of floor-space also accommodate a well-stocked spare parts warehouse and a demonstration room as a forum for presenting all the ARBURG products. Equipped with the latest generation of ALLROUNDERS, it gives customers the opportunity to see ARBURG technology in action. On



Exquisite architecture.

an open day, customers, Münsingen residents, and anybody else who might be interested were invited to visit.

The festivities had been perfectly prepared by Peter Moser, the manager of the subsidiary: The



Speakers: Eugen Hehl (l) and Peter Moser (r).

The perfect twist:

Unscrewing using the electric core pull control

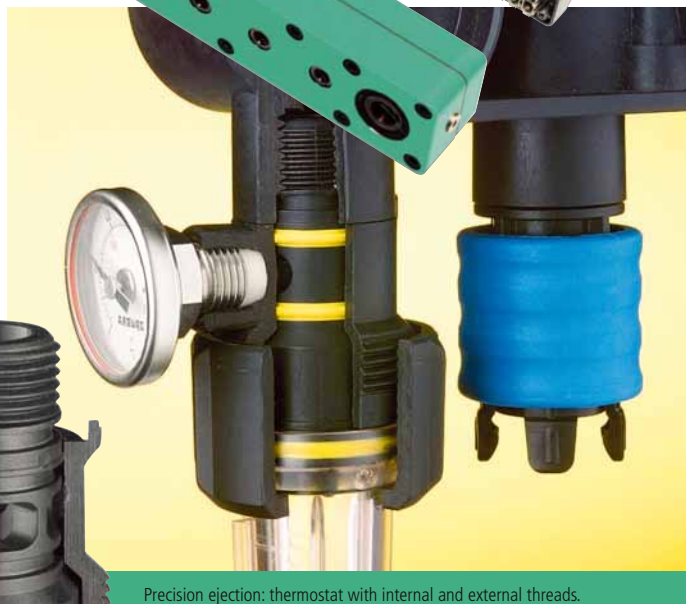
Precision and repeatability are in constant demand, especially when unscrewing high quality threads on technical injection moulded parts. Using unscrewing units with servo-electric drive mechanisms, it is possible to achieve very precise position regulation in all ejection movements.

The basis for this is the electric core pull control, which can be used for all applications that are traditionally associated with the hydraulic core pull. The main difference lies in each movement being controlled servo-electrically. In conjunction with the absolute system of measuring used, it is possible to achieve substantially better positioning accuracy. As well as this, drive is possible independently of the hydraulic axes on the machine, meaning it can be operated at the same time as all other machine movements.

Complete integration in the SELOGICA machine control system via a standardised interface makes the combination look even more interesting. The individual movements can be programmed in directly and precisely using the system's own screen displays – no mechanical adjustment on the mould itself is necessary. The type of axis movement required can be switched between linear and rotating movement, that is between power, speed and path or torque, rev speed and rotation. Even if the user installs an additional, intermittent linkage, the SELOGICA



Unscrewing unit with servo-electric drive: precisely programmable using the electric core pull control.



Precision ejection: thermostat with internal and external threads.

machine control system recalculates all the parameters involved once the transmission ratio has been input.

As well as the very precise position regulation and repeatable accuracy, there are other beneficial factors to its use in unscrewing units: a higher maximum torque rating and the option of trouble-free programming for various different steps. That means that intermittent stops, etching of the thread with the mould closed or continuous rotation can be programmed directly.

All functionalities are stored together with the corresponding mould data record, meaning that when a mould is changed, all the relevant data is immediately available. Improved operator comfort, shorter set-up times and better security against operating errors are the immediate advantages of this shared data record.

The big question: how is the 630 S getting on?

It was hoped that a follow-up telephone campaign by ARBURG, aimed at customers already using the 630 for production in their machine shops, would shed a little light on this question. "The reason is simple," as Eberhard Lutz, head of domestic sales, says: "Prior to this, we had received no feedback from the customers about our big ALLROUNDER or customer's experiences of its use in the field. And that can be positive as well as negative!"

To clear this up straight away: the results of the representative ARBURG survey were very nearly all positive. The machines are either being used for testing purposes or are already fully integrated and being fully exploited in production. The companies reported no problems with the basic machine technology or the special features such as the platen adjustment.

Apart from two very minor leaks there were no complaints whatsoever. These difficulties can be put down to "teething troubles" and could be rectified very swiftly as a result. This reassuringly very positive first feedback suggests that even the biggest machine ever from the "S Class" has been received extremely well by the market.

It should be even more interesting when additional processing procedures and new features are added, making its application even more universal. The keywords in this context are "multi-component injection moulding" and "optimised hydraulics for faster drive movements".

Cooperation on

Festo AG & Co. and ARBURG: two companies that can look back on cooperation stemming back around 25 years. The cooperation becomes even more special due to the fact that both companies are doubly connected with one another. Because Festo is both a customer of, and a supplier for ARBURG. So logically it follows that the reverse is also true.

The Festo Group, which incorporates not only Festo AG + Co, but also Festo Didactic & Co. as a training and education facility, Beck IPC



Teamwork plays a major role in developing and implementing new ideas at Festo.

GmbH and FCC GmbH, the latter helping the group out in matters relating to marketing, advertising and exhibition management; is active in the business sector of automation using pneumatic components and systems. The Didactic branch looks after the training and education with a focus on industrial automation.

The company's main product groups are drive units, handling accessories and vacuum technology, valves, sensors and push switches, and tubing, screw fittings, and both pneumatic and electronic control system technology. Festo does not only manufacture standard products in these areas, but also solutions for specific fields and applications. They also provide combinations of pneumatic and electronic

components which are used for mechanical engineering and handling technology applications.

Impressive figures

A look at its homepage at www.festo.com reveals some impressive figures about the company: In the year 2000, the group's turnover amounted to 1,200 million Euro, accumulated by 10,050 employees across the globe. The Festo Group is represented by its own locations in 176 countries around the world, and its international client base numbers 300,000. Global production sites are found in Brazil, Bulgaria, India, Korea, Mexico, Ukraine, Hungary and in the USA, in addition to which there are customer specific manufacturing plants in 27 countries.

Returning to Germany. Festo headquarters has been located in Esslingen Bergheim since the company was founded in 1925. As well as this site, there is also the customer service centre, the Festo's learning centre in Saar and the cylinder production plant, all



The right tool for the job: an ALLROUNDER 420 C for three-component processing: integrated into a production cell for manufacturing pistons for cylinders.

of which are in St. Ingbert-Rohrbach. The current product range comprises 16,400 components, the numbers of variants of which run into hundreds of thousands. Cooperation based on personal esteem.



The enterprising families Stoll and Hehl have known and valued each other for years. This then became the basis for all the commercial links between the companies which have developed over the years. ARBURG sources various different pneumatic components from Festo, to be used in its own production as well as on

led to very close, exclusive collaboration between the two companies, to deal specifically with this project. Festo components are integral parts of both the pneumatic and the servo-electric drive train, with parts such as valves, pneumatic cylinders, pneumatic sliding units or axles for toothed belts. Screw fittings and piping complete the list of items included in the supply arrangement.

In fact, the level of cooperation looks set to increase still further in the future as the MULTILIFT range of robotic equipment is extended and enlarged.

As far as cooperation working in the other direction is concerned, there is plenty of clear evidence referring to the customer Festo in ARBURG's machine history. Ever since the 1960s, the company has relied upon the ALLROUNDER for manufacturing its own injection moulded parts for its extensive range of products. According to Michael Maas, head of production at the plastic injection plant in St. Ingbert-Rohrbach, these have been technical parts in the main.

Using 980 injection moulding moulds, around 1,200 items are

several levels



Pneumatic components supplied by Festo set the ARBURG MULTILIFT in motion (left).

Neat: a view of injection moulding production in St. Ingbert-Rohrbach (right). Photos: Festo



Showing the way: the Festo production site in St. Ingbert-Rohrbach, Saarland

now manufactured for the company's own production. As well as plastic production at the St. Ingbert site, they also undertake their own mould construction and mould manufacture.

The machine line-up that Festo has built up over the course of time includes ALLROUNDER 220 and 270 models, the 305 ECO and a few CMD models, right up to the latest ALLROUNDER C and S models. Furthermore, three ALLROUNDER T rotary table machines have also been integrated into production, these being used mainly for injecting around inserts or multi-component injection moulding applications. Since the collaboration with ARBURG began, Festo has used 43 ALLROUNDERS in its production.

At the present time, one 320 C, three 420 C, two 420 S and three THERMOLIFT granule dryers and conveyors are at the delivery stage. This machine fleet is supplemented with two ALLROUNDERS in the Bulgarian branch of Festo and two further machines can be found at the learning centre in St. Ingbert-Rohrbach.

Festo also entrusts its production monitoring and quality control to ARBURG products. In these areas, the company uses an ALS master computer system in conjunction with an AQS quality assurance system and a machine-based AQC quality control system connected to an ALLROUNDER 420 S. Working with ARBURG, Festo has also developed

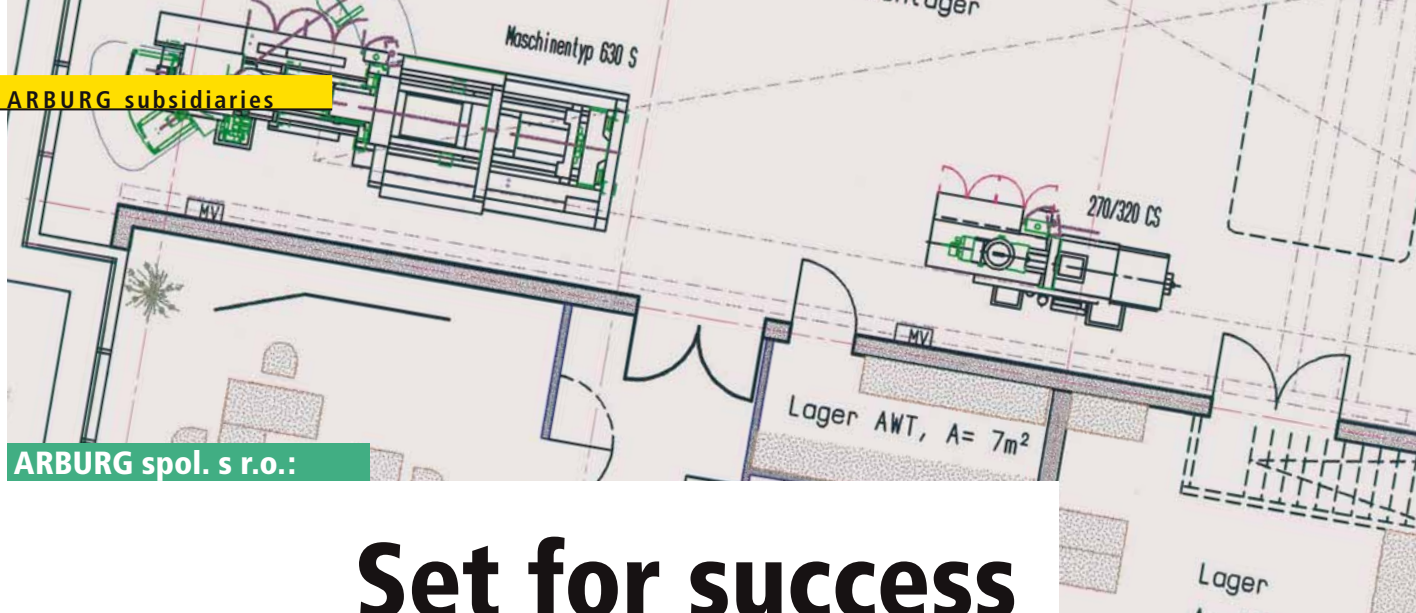
and produced manufacturing cells, specially adapted for their manufacturing needs. An example of this: The production cell built around an ALLROUNDER 420 C for three-component processing, comprising material preparation and feeding using THERMOLIFT, removal by a robotic system, and coordinated placement in appropriate trays prior to further processing. Pistons for pneumatic cylinders made of magnetic material are manufactured using this configuration, with a thermoplastic being used as a carrier.

Benefits of ARBURG injection moulding technology

According to Michael Maas, the benefits of using ARBURG and ALLROUNDER injection moulding technology are primarily the uncomplicated cooperation, the excellent cost-effectiveness, the speedy delivery of replacement parts, even other than ARBURG's own components, and the thoroughly competent staff for consulting about all matters involving plastic.

Cooperating is always a fruitful exercise if it benefits both sides involved. It really comes into its own,

however, when both sides involved receive excellent support as both a customer of, and supplier to the other partner. If a further consequence of this cooperation then leads to further links on other levels as well, there is real justification for describing this as a truly universal partnership. This is certainly the case with Festo and ARBURG. Another example is Festo's training centre in St. Ingbert-Rohrbach: for several years, ARBURG has been able to take advantage of these facilities to run its own training courses for customers in the local area. The two companies are already planning further cooperation in this sector. A clear indication that this full-scale cooperation is well and truly on the right tracks.



Set for success



Team talk: currently still based at rented premises in Prague.

The story of success just continued to snowball: eight years ago, ARBURG was almost unheard of on the injection moulding machine market of what was then the Republic of Czechoslovakia. Nowadays, this mechanical engineering company is at number 1 on the list of importers with its own subsidiary in Prague, ARBURG spol. s r.o.

For the first three years, ARBURG's affairs in the Republic of Czechoslovakia were still conducted by a trading partner. Because of the success the ALLROUNDER was having on the market in Czechoslovakia, however, a new ARBURG subsidiary - ARBURG spol. s r.o. - was founded in Prague. As achieved very successfully when establishing other ARBURG subsidiaries in the past, members of staff from the previous trading partner were taken over into the new company, making the transition as seamless as possible.

Because the division of the Republic of Czechoslovakia into two independent states – the Czech Republic and the Slovak Republic – resulted in a number of administrative and organisational difficulties, particularly with regard to supplying spare parts and support ser-



Jaroslav Novak (3rd from right), manager of the Czech subsidiary of ARBURG, with his team.

vices, a regional office was originally set up in Brno in the Czech Republic, close to the border with Slovakia. This was followed by the creation of an independent organisational section at Vrutky in Slovakia.

There, one service engineer is solely responsible for the support of the Slovak customers while the other four look after the Czech customers. Sales is also divided up into two areas, with Michal Slaba taking over the western area including Bohemia and the western part of Moravia, and Jiri Zelma looking after the remainder of Moravia and the Slovak Republic.

Overall, the team at the Czech subsidiary arm of ARBURG is made up of the subsidiary manager Jaroslav Novak and eleven members of staff looking after Administration, Accounts, Sales, Service and the Spare Parts section.

After eight years of having a presence on both the Czech and Slovak markets – including five years as the official company subsidiary – the Czech ARBURG subsidiary has

more than 100 companies with over 800 injection moulding machines on its list of customers, and the trend is continuing. The majority of these customers are from the automotive and electronics industry.

With ARBURG's continued growth and success – number one importer of injection moulding machines for the last three years – gradually things are becoming a little cramped in the existing, rented premises. However, the solution to this problem of space is close at hand: an area of land in Brno has already been bought, where a new building for the Czech subsidiary is soon to be built. The architecture will follow the familiar ARBURG

style. By bringing the two Czech sites together, this will establish a central port of call. The new building, consisting of two storeys providing usable floorspace of 900 square metres, offers plenty of space to accommodate offices, a well-equipped spare parts store-room and a demonstration room. On a 230 square metre exhibition area, the customers will be able to gather information about the latest ARBURG technology; test out an ALLROUNDER with their own mould, if required; or receive further training in one of the sessions organised.

A lot of customers make their way to Germany, however, to attend the ARBURG Technology Days in Lossburg for example, where they can also find out more about the latest developments in injection moulding technology as well as taking a look behind the scenes at how the company works. Some also come along to visit ARBURG at the Fakuma exhibition in Friedrichshafen or K in Düsseldorf.

The most important national exhibitions as far as the Czech subsidiary is concerned are the international machine exhibitions at Nitra in Slovakia and Brno in the Czech Republic, where the ALLROUNDER was awarded a Gold Medal in both 1998 and 2000.



Projects from one source!

More and more companies are demanding automated manufacturing cells for producing injection moulded parts, which are tailor-made for their specific needs and available from a single source. This gives a main contractor full control to provide support to customers from planning the whole system to being put into service and looking after all the servicing and aftercare arrangements.

ARBURG has taken these requirements on board, as demanded by the market, by establishing a specialised project department, which is headed by Oliver Giesen. The department is assigned to the Sales division and has at its disposal all the technical and business management know-how that it needs to provide comprehensive support to all project customers.

Good examples of the kind of complete projects carried out in this way are, amongst others: combined part removal and placement, injecting around inserts, repositioning of moulded parts within the mould for multi-component applications, or even further processing after removal by downstream stations for printing or ultrasonic welding.

Ideas soon become a reality

Altogether six members of staff look after bringing project related tasks into reality. Once field servicing has determined the principle difficulties involved, the project group comes up with the necessary concepts and hardware layouts, providing different variations where necessary. The financial transparen-



New perspectives: Group leader Oliver Giesen (centre) with his staff Sandra Geiss, Gerd Ruoss, Jörg Heinzelmann, Christoph Hipp and Martin Neff (left to right).

In conjunction with customers, the project group develops, plans and produces complex manufacturing cells, complete with downstream peripheral components. The support provided covers everything from commissioning and CE certification to after sales service.

cy demanded by the customer is made available from the very start, as short-term statements relating to the costs involved are supplied by a budget proposal, the details of which are discussed with the customer afterwards as well as at subsequent meetings. Once the customer has given his consent, the actual work can begin. The peripheral components have to be coordinated with the various different suppliers, interfaces synchronised and the whole installation put together under production conditions at the company, in preparation for official

acceptance by ARBURG and the customer.

Cost-effectiveness is vital

Oliver Giesen admits there are long-standing project partners, but they would also be open to any requests from customers that are appropriate. In terms of choosing the technology, the primary concern is not to get the best price but to find the best cost-benefit ratio. The project team makes full use of the extensive knowledge within the company when trying to make the best

use of the synergies between machine, mould and technology for automation and simplifying the process as a whole.

In any case, the customers can be sure they have a solution that is perfectly adapted to the needs of their production. The heart of all these projects is always the SELOGICA machine control system which is used to operate the whole installation. ARBURG's own MULTILIFT robotic systems are always integrated into the control sequence: in the case of other components, the same occurs by adapting the interface technology. Detailed safety engineering does not only provide the necessary procedural and therefore production security, it also ensures the safety of the whole installation using the appropriate protective guarding.

After acceptance at ARBURG, the production unit is put into action at the customer's plant and, if required, the appropriate CE certification can also be provided. And even after production has begun, customers will still have the right contact in ARBURG: maintenance and spare part supplies for all parts of the equipment is carried out through ARBURG. Even the engineers from suppliers can be brought into action if the situation requires it. Total support from a single source: ARBURG now offers its customers this complete service through its own project team!

MILESTONES

Electro-mechanical dosing - a milestone at ARBURG? But that's only been available from ARBURG since 1997, some of you may be thinking. Well not quite because there was a dosing system, powered by an electric motor, back in the early 1960s on the ALLROUNDER 200, the first ARBURG injection moulding machine equipped with a screw.

The ALLROUNDER 200 with electric dosing drive was part of ARBURG's range for around ten years, from the start of the 1960s to the start of the 1970s. Back in the beginning, a D.C. motor was used for the dosing drive - something of an innovation back then. The big advantage of the D.C. motor was that the rev speed could be varied.

But, as is often the case with new ideas, although the principle of the D.C. motor was good, the technology wasn't quite sophisticated enough. The control system was very intricate - it required a large, additional control box - and was therefore prone to disruption, so the costs were relatively high as a result.

For this reason it was decided that an A.C. motor should be used for the dosing drive, the controls for which were far simpler. The change, however, brought with it the disadvantage that the rev speed could no longer be varied, unlike the D.C. motor, but was constant instead.

To provide an alternative for those users who didn't want to lose their variable rev speed facility, two versions of the ALLROUNDER 200 were made available: customers could choose between

the D variant with the A.C. motor, or the H version with hydraulic motor, on which the rev speed was infinitely variable.

Even in those days, ARBURG was using its familiar modular component system. The injection unit was equipped with a flexible interface, to which both A.C. and hydraulic motors could be connected. Over time, the hydraulic motor became the norm, so the electric motor used for dosing was dropped from the range.

Until in 1997, ARBURG extended its modular machine concept to include electro-mechanical dosing, initially on the C machines, sizes 420 C, 470 C and 520 C with injection units 350 and 675. Today, an electro-mechanical dosing unit is available for all ALLROUNDERS used in conjunction with the 350, 675 and 1300 injection units.

At the same time, the SELOGICA machine control system provides a simple

sequence display and easy programming even where there are simultaneous drive moments.

Using the electro-mechanical system makes the dosing axis independent of the machine hydraulic supply. This makes for better material preparation because when movements take place concurrently, it is possible to operate using a lower rev speed for the screw. This in turn is beneficial to the overall process: Although throughput stays the same, the level of material shearing is lower, melting homogeneity improves and the material temperature can be lowered. That reduces the time needed for cooling and therefore the overall cycle time. Consequently, using electro-mechanical dosing drive, productivity is effectively increased because of the reduction in cycle time, giving an energy saving at the same time, which could be as much as 20 percent over the whole cycle.



Increased production by reducing the cycle time and energy savings of up to 20 percent: strong arguments for an electro-mechanical dosing unit.

ALLROUNDER for TU in Clausthal

The Institute for Polymer Materials and Plastics Engineering (PuK) at the Technological University in Clausthal uses two ARBURG ALLROUNDERS for teaching and research purposes. To gain an insight into the enormous scope for using and processing polymer materials, the head of state for Lower Saxony, Sigmar Gabriel, visited the institute at the beginning of March.

For its work in single and multi-component injection moulding, the institute has turned to the ARBURG ALLROUNDER. ARBURG supplemented their purchase of an ALLROUNDER 420 C 1000-150/60, used to produce injection moulded parts using two components, with the loan of a type 320 C 600-250 machine to cater for conventional injection moulding of plastics. At the institute, the two ALLROUNDERS are used in all the different areas such as multi-com-



Lower Saxony's head of state, Sigmar Gabriel (3rd from left), gave the signal to start production using the ALLROUNDERS. Joining him in the celebrations were (from the left): Michael Bosse and Prof. Gerhard Ziegmann (from the PuK), and Haiko Tessoroff and Wolfgang Knop (from ARBURG).

Founded in the winter semester of 1998/99, the director of the institute, Prof. Dr. Ing. Gerhard Ziegmann, has managed to establish impressive working structures, even in terms of the equipment available to them, in quite a short space of time.

ponent injection moulding, including for hard-soft combinations, ceramic and powder injection moulding or for processing polymers filled with magnetic powder.

The state president appeared impressed by the institute's capabilities, its facilities and the variety of technology used. He was also very impressed by the material itself and the number of applications that can be found for it in everyday life.



Optimising production with the ARBURG host computer system ALS 4.0

TECH TALK

Dipl.-Ing. (FH) MARCUS VOGT Technical information

Making best use of the capacity and flexibility of an existing machine fleet can give even the small injection moulding company that competitive edge. This necessitates the increased use of data processing systems such as the ARBURG host computer system ALS 4.0, which records machine and batch data and thereby makes the whole manufacturing sequence more transparent.

ics, meaning that ALS data can be used as the basis for analysing production over the long-term. The capacity and availability of machines and moulds – and therefore how efficiently the tasks are managed – can be established over a long period of time using actual production data. Analysing all the data that is gathered will then reveal how much potential exists for optimising current manufacturing procedures.

Starting with this ALS base platform, the system can then be adapted to the specific requirements of a particular company using additional component modules. Other system components such as task management based on a schematic planning chart, order transfer from existing production planning systems, quality data recording and management of configuration data records can be added to the base platform stage by stage.

To exploit the potential for optimising production, it is vital to establish effective monitoring and documentation of the whole production process. Even the basic platform of the modular host computer system provides an up-to-date overview of the production currently taking place, being connected to the machines via the recognised world standard of Ethernet cabling network.

Using the machine and plant data acquisition facilities of this basic system, the user of an ALS Workstation can keep constantly up-to-date on production within the company. Starting with a graphic representation of the machine hall, it is possible to call up detailed information such as status data, plant data and process parameters at any time by simply clicking on the appropriate machine symbol. Where process fluctuations or interruptions in production may arise, it is possible to take preventative action. In addition, this data is continuously recorded in different data pools, allowing statistical analysis of the machine data over various different time periods. At the same time, all results can be printed and exported in the form of tables or graph-



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