

today

The ARBURG magazine

Issue 43

2010



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MASTHEAD

today, the ARBURG magazine, issue 43/2010

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Thanks to its modular ALLROUNDER range, ARBURG always provides the best solution for all injection moulding processes and industries.

ARBURG



Dear Readers,

Naturally, as an innovative company, ARBURG is involved in a continuous process of improvement, a principle that also guides the ongoing development of our products, services and organisation.

In addition to the technical innovations, continuous changes and new developments take place behind the scenes – all aimed at improving support for our customers in the future. For example, we bring together all our application and industry-related know-how in expert teams, which are made up of specialists in applications technology, development, sales and marketing. This is particularly true in the areas of powder injection moulding, LSR, clean room and medical technology. These teams have recently been joined by the Packaging expert team.

Here, you will find specialist contacts, who are extremely familiar with every detail of the relevant requirements, who will configure the appropriate machines for you, as well as jointly optimising the entire process with your

specialists. This is the only way in which we can live up to the high ideals of our company maxim "ARBURG for efficient injection moulding".

You will find more examples of the importance that ARBURG attaches to top-class, customer-specific support in several articles in the present issue of "today".

Also included is our sophisticated calculation program, which quickly works out the right ALLROUNDER injection moulding machine for producing your parts most economically, i.e. at the lowest unit cost.

I hope you enjoy reading our new issue.

Helmut Heinson
Managing Director Sales

Committed t



The “High-tech from the countryside” slogan is clearly reflected both in the products and in the environmental awareness of Wild & Küpfer AG. This family-run company develops, produces and assembles high-precision plastic parts and assemblies for demanding customers from a variety of industries at a very special location: in Schmerikon on Lake Zurich.

Thanks to its sustainable business and energy policy, the Swiss company boasts a nature reserve in its immediate vicinity. In recognition of this sustainable approach to business, ARBURG is presenting its Energy Efficiency Award 2010 to Wild & Küpfer.

This award represents a further milestone in the successful relationship between the two companies, which goes back to 1979. This is based both on the high-quality, energy-efficient technology from ARBURG, which meets the stringent requirements of Wild & Küpfer in every respect, and on the values that the two companies share. Both companies demand the best possible quality from them-

selves and their products, both are family-run, and both are characterised by above-average environmental awareness, which has been a cornerstone of their respective corporate philosophies for decades.

“We are all dedicated to observing ecological principles. This means that we can only enjoy long-term success if we avoid unnecessary consumption. In turn, this requires that energy-efficiency be valued highly,” says managing director Tobias Wild, explaining the strategy. His fellow managing director, Peter Küpfer describes how this works in practice, “Our corporate policy involves an integrated approach, based on our knowledge of our production cycles, up to and including the disposal of waste or the return of waste materials for recycling. We always choose solutions that minimize negative environmental impact, as well as the consumption of raw materials and energy.”

Accordingly, Wild & Küpfer has been investing in trend-setting technology, energy-efficient machines and environmentally oriented processes for over 30 years, as well as fostering a healthy corporate culture. The sparing use of resources

WILD & KÜPFER AG
PLASTICS TECHNOLOGY

o the environment ^{e²}

and the reduction of emissions are always important criteria. Good examples of this are the recovery of waste heat, the use of free cooling or the decision not to use heating oil. It was also important to Wild & Küpfer that specific energy-efficiency measures should be implemented when it came to the planning of their premises in Schmerikon. The company invested in the latest facility management technology, in-



Since buying the first ALLROUNDER 420 A, Tobias Wild and Peter Küpfer (left to right) have been highly impressed with ARBURG's electric machines. There are now 21 ALLDRIVE machines in the state-of-the-art, energy-efficient production facility in Schmerikon on Lake Zurich.

The fact that all the expectations have been met in this regard is demonstrated by a reduction in energy consumption by some 50 percent, which Wild & Küpfer achieved through the use of electric injection moulding machines.

Based on the positive experience with the first ALLROUNDER A, the Swiss were also pioneers with regard to two-component injection moulding on electric ARBURG machines.

Managing directors Tobias Wild and Peter Küpfer were delighted to learn that they were the recipients of the ARBURG Energy Efficiency Award 2010: "We are extremely honoured by this special award. At the same time, we see the award as proof that our strategy in relation to the environment and energy consumption has been the right choice, which encourages us to continue investing in sustainable energy-efficiency."

volving environmentally friendly heat recirculation and operating all cooling systems with ground water.

The prudent management of energy in production ranges from the automatic light control system through to the exclusive use of energy-efficient machines. These now include 21 electric injection moulding machines from ARBURG. Wild & Küpfer installed the first ALLROUNDER 420 A in 2002, becoming the very first ALLDRIVE customer. From the outset, the arguments in favour of the investment were lower noise emissions and high energy efficiency, as well as higher product quality and process reliability.



INFOBOX

Founded: 1979

Employees: Approx. 100

Products: Moulded parts, geared components, geometric objects, multi-component products, tribological parts, transparent articles, lenses, precision components and assemblies

Specialised areas: System specialist for a perfect package, including product design, product development, mould design, high-tech mould construction, lasercusing, HSC micro-milling, automation, injection moulding, robotics

Customers: Safety engineering, electrical industry, electronics, air-conditioning technology, medical, plant construction, sports articles, telecommunication, monitoring

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Allmeindstrasse 19,
8716 Schmerikon, Switzerland
www.wildkuepfer.ch



Always wor

When visiting ARBURG, even the longest of journeys pays off. The best proof of this are the Technology Days, which have attracted thousands of injection moulding specialists from around the world to the company headquarters in Lossburg for over ten years.

When asked for the secret of the Technology Days' success, Herbert Kraibühler keeps it short and to-the-point: "Our perfect mix of theory and practice, which not only showcases all the ARBURG products and services, but also highlights future market and technology trends in the injection moulding industry." To underline this point, Helmut Heinson summarises the feedback received from customers, "Our international visitors appreciate this unique opportunity to experience more than 40 ALLROUNDER machine exhibits at first hand, to meet with their contacts in person and to gather information in a relaxed atmosphere away from the hustle and bustle of trade fairs."

While energy efficiency was the main focus of the Technology Days in 2009, this year ARBURG will take things one step further, turning its attention to "efficient production". The entire production environ-

ment will be examined here, because efficient production means achieving maximum product quality at minimum unit cost. Achieving this goal calls for maximum productivity and minimum cycle times using energy-efficient systems that offer highest availability. The fact that ARBURG can offer its customers all this will be demonstrated at the Technology



Days with a comprehensive presentation of the entire range of products, applications and services.

The topic of "efficient production" will also be addressed and further explored as part of the programme of specialist presentations: In addition to innovative technical solutions, particular attention will be paid to commercial aspects in terms of the reduction of unit costs. The presentation



from BIHLER will offer a glimpse behind the scenes at a company with highly efficient production practices. In addition, there will be a presentation by the Lüdenschied Plastics Institute on how the quality and value of plastic parts can be enhanced through surface design.

Because we are never content to rest on our laurels when it comes to the success of the Technology Days, we are continuously developing the event concept, as the new Packaging Technology Forum shows. This is the first time that ARBURG has created a platform to enable it to present its products and services together with various partners from the packaging industry, covering areas such as mould technology, in-mould labelling and other



The two managing directors, Herbert Kraibühler and Helmut Heinson (left to right), explain the recipe for success of the Technology Days, which will be held from 18 to 20 March 2010 at the company headquarters in Lossburg.

th the trip

peripherals. "Here, we will show visitors how packaging items can be produced efficiently and to a high standard when all the components are perfectly matched," says Helmut Heinson, explaining ARBURG's intentions.

In order to meet the stringent requirements in terms of machine speed and productivity, the focus in the Technology Forum will be on the high-performance ALLROUNDER HIDRIVE machines. The largest machine in this hybrid series will also be presented to visitors for the first time in live demonstrations involving two exhibition machines. An ALLROUNDER 720 H with a clamping force of 3,200 kN will produce 72 screw caps, while the second model will produce thin-walled 1.2 litre containers. The cycle time of the two fast-running applications is 3.2 seconds. The third exhibit is an innovative IML system built around an ALLROUNDER 570 H (see page 8). The topic will be rounded off with a specialist presentation by Stack-Teck, describing innovative mould concepts for packaging technology.

The representative cross-section of the current ARBURG program will include complex production cells with MULTILIFT robotic systems and six-axis robotic systems featuring the SELOGICA user inter-

face. "The extremely broad range of applications demonstrated by the exhibits shows that our modular ALLROUNDER program enables us to provide the best solution for all injection moulding processes and industries at all times," emphasises Herbert Kraibühler. In addition to the packaging applications, medical technology, multi-component injection moulding, micro-injection moulding, powder injection moulding, clean room production, technical injection moulding and the processing of thermosets and liquid silicone (LSR) will also be presented. Other areas covered will include production management with the ARBURG host computer system (ALS), as well as service and product training, which also play a key role in terms of "efficient production".

Another permanent fixture at this traditional event are the product and application innovations which will be presented to the international expert community for the first time in Lossburg. For example, this year will mark the debut of the new micro-injection module from ARBURG. This combines an 8 mm injection screw with a second screw for melting the material. This means that extremely small shot weights can be achieved - even without microgranulate - and, most importantly, the quality benefits

of the first-in-first-out principle are largely preserved thanks to the screw injection technique. Tours of the premises have always proven popular with the public and this year will see the first specific presentation of efficient ALLROUNDER production and assembly at individual stations, which will be explained in detail by means of information boards. These will be left in place after the event, so that visitors to the company headquarters will also be able to learn about the efficiency of ARBURG production in future.

In this context, both managing directors emphasise that a visit to Lossburg is always worthwhile, not only during the Technology Days, and that customers and other interested parties are always welcome to drop by: "We always have a representative cross-section of the ARBURG range on show throughout the year. You are welcome to take advantage of the unique facilities available at our Customer Center and of our extensive application technology consulting service, to test the ALLROUNDERS and to carry out trials with your own moulds in order to improve your production even further.



The perfect pairing



Swiss Robotics and ARBURG - the partnership that began with a successful presentation at the Fakuma 2009 is to be continued at the Technology Days 2010: In the context of the Packaging Technology Forum, the exciting In-Mould Labelling (IML) cooperation project will be presented on a high-performance HIDRIVE machine.

The IML system for the complex packaging sector consists of the high-performance hybrid ALLROUNDER 570 H and the new Flex-Line IML robotic system from the Swiss partner Swiss Robotics.

Speed, functional reliability and cost-efficiency are the key to this application, which involves the production of high-quality yoghurt tubs with labels. These are produced on a specially configured ALLROUNDER 570 H with a clamping force of 2,000 kN equipped with a six-cavity mould. To prevent overfeed, the moving mounting platen is ground to a conical shape. The size 1300 injection unit is equipped with a barrier screw in order to

ensure a high degree of material liquefaction. The mould-based pneumatic needle shut-off system ensures precise flow of the melt. An uncontrolled exit of the material during demoulding is reliably prevented. Time-saving dosage across cycles



is ensured. The thin-walled, round-based yoghurt tubs made from PP have a filling capacity of 125 grams, the part weight is 6.3 grams and the tubs are produced in a cycle time of only 3.5 seconds. Performance in terms of material preparation is correspondingly high, at almost 40 kg/h.

The labels and the finished moulded parts are handled by the IML system from Swiss Robotics. This has compact exterior dimensions and has been specially adapted for these manufacturing requirements.

The labels are first picked up by vacuum, electrostatically charged and then transferred to the mould. Following injection, the finished parts are then removed and stacked as ready-for-use tubs. Time savings are achieved during production, not only through the rapid peripheral routines and the short injection cycle, but also due to the fact that part removal and label

**SWISS
ROBOTICS**
IML and more

The ALLROUNDER injection moulding machine and IML system are perfectly matched and work together extremely efficiently.

insertion are executed simultaneously. The IML robotic system features a new energy-saving pneumatics concept, which significantly reduces compressed air consumption. Consequently, operators can achieve massive savings in operating costs where the robotic system is concerned. A high level of reliability is ensured through connection of the system to the SELOGICA machine control system, in which the other production cell peripherals such as the suction conveyor and day bin for the required material quantity are integrated.



New products prove a real hit



Photo: Lys Fusion Poland

ARBURG introduced two energy-efficient innovations to the market in 2009: the high-performance hybrid HIDRIVE series and new machine sizes for the electric ALLROUNDER ALLDRIVE series. The fact that these exhibits perfectly meet the market requirements is evidenced by the positive response from customers.

The HIDRIVE machines combine servo-electric clamping units and hydraulic injection units with a position-regulated screw, hydraulic accumulator technology and servo-electric dosage. This results in ALLROUNDER machines that provide the highest production performance as well as short cycle times and reduced energy consumption. These benefits were enough to convince Austrian plastics technology and mould making specialists ARWÖ-PLAST, for example. This company has been using the largest hybrid machine, an ALLROUNDER 720 H with a clamping force

of 3,200 kN and a size 1300 injection unit, to produce high quality cover parts for the automotive sector since the beginning of 2010. Production manager Stefan Arvai explains the reason for the purchase: "Our complex technical components have to meet the highest customer criteria. That's why we were particularly impressed with the high production performance. Another advantage is the extremely energy-efficient way in which the machine operates, fitting in perfectly with our concept for environmentally responsible plastic injection moulding processing."

The two new electric ALLROUNDERS 270 A and 720 A machines are significant additions to the ALLDRIVE series. The clamping force range now extends from 350 to 3,200 kN. Also added to this was the new size 1300 electric injection unit, which has a maximum shot weight of 826 grams of PS. This addition was particularly welcomed by companies that already use ALLDRIVE machines successfully. These include Polish injection moulding company Lys Fusion Poland in Istebna, which has already had excellent experiences with an ALLROUNDER 520 A. A second electric machine was installed in production at the end of 2009 in the shape of an ALLROUNDER 720 A with a clamping force of 3,200 kN and a size 800 injection unit. This exhibit is also equipped with a MULTILIFT V SELECT robotic system. According to production manager Zbigniew

Electric, size 1300 injection unit (top). The current machine size range of the electric ALLDRIVE series (bottom). A moulded automotive part from Lys Fusion Poland (left).



Kukuczka, the new investment has proven invaluable to the company for its efficient, high-quality production of plastic automotive parts. "This powerful machine is the best solution for our production purposes. Reproducibility and high part quality are particularly important for our injection moulding process. The quick and easy configuration of the production parameters, the shared central SELOGICA control system for the machine and robotic system and the fault-free injection of parts after a short set-up and adjustment time made this the obvious choice for us."



One sensor, five co

The name “Weber Formenbau” has enjoyed an excellent reputation among mould makers and injection moulding businesses for many years. This is no accident. Weber stands for high-end mould and high-grade series production made in Germany. Weber and ARBURG are united by their corporate philosophies and by a cooperative partnership that goes back 40 years. This also includes the production of a combined rain/light sensor for use in the automotive sector on a linking system. This consists of two ALLROUNDER injection moulding machines and two MULTILIFT robotic systems. The moulded part consists of a total of five components, one of which is made from liquid silicone (LSR).

The two companies have been cooperating closely since 1963, when Weber started with multi-component injection moulding. Elvira Postic, the managing partner and managing director of Weber Formenbau, describes the early days of the cooperation: “Our first multi-component mould ran on an ARBURG machine and for years we have always tested our prototype moulds with ARBURG. This cooperation was further consolidated with the development of multi-component technology and then with the introduction of our indexing units.”

Weber’s business now stands on three pillars: the production of high-quality multi-component injection moulds, the production of multi-component moulded parts and the production of indexing units. Weber sees itself as a system provider that covers the entire value-added chain from development and production through to validation. Longstanding cooperation with ARBURG has not just per-

mponents



Two ALLROUNDERS were linked with a MULTILIFT V to produce the five-component rain/light sensor.

mitted turnkey solutions with shared technology for customers from both companies, but also complex injection moulding facilities for Weber's own production in Esslingen.

An example of such a configuration is the linking system that Weber has developed and installed in its parent plant with support from main contractor ARBURG going back to 2005. The Esslingen-based company now uses this production cell to produce a rain/light sensor comprising a total of five components. The system encompasses all of Weber's know-how, starting with mould design through to the use of indexing units for fully automatic part production with a liquid silicone component and comprehensive quality checks during production. "It was a major challenge for us when we received a request for these complex items in 2004," explains Elvira Postic. The rain/light sensor is mounted on the car windscreen

in the same area as the mirror mounting and consists of 'PC lenses', the 'PBT base plate' and a silicone 'pad'." The purpose of the silicone is to compensate for any irregularities in the surface of the windscreen. For this reason, the surface of the silicone must have no visible imperfections. In other words, the rain/light sensor must be completely flush with the windscreen and the entire silicone cushion must exhibit no visible imperfections, such as scratches, bubbles or spots.

In order to produce the complete plastic part of the rain/light sensor, two hydraulic ALLROUNDER 470 C machines

with MULTILIFT V robotic system were combined to produce a linked production unit. After the first production phase, the production of the thick-walled lenses from three components, the robotic system transfers the parts to the second ALLROUNDER, where they are integrated in the PBT base plate. The soft silicone pad is injected in a final step.

The lenses are produced in a mould with two cavities and an indexing unit that rotates through 120 degrees in three steps. The lenses are placed in trays following the three-component injection moulding process and are transported to the second injection moulding machine. Here, they are inserted into the second mould. This also involves a two-component mould in which the lenses are inserted into the mould by means of a MULTILIFT V in a first step, after which the base plate is injected. The mould then rotates through 180 degrees by means of a Weber indexing unit and the LSR pad is moulded onto the



base plate. The robotic system removes the finished parts and buffers them in the cooling station. The items are then set down in trays. They are then ready for final visual inspection and delivery to the customer.

The stringent quality requirements are met through direct machine monitoring and online controls, on the one hand, and through the taking of random samples at two-hourly intervals, on the other. These samples are checked for correct light values and dimensional stability by means of a visual inspection.



"Above all, at the start of pilot production, there were still numerous detail problems to be resolved," says Elvira Postic, describing the development process. "The search for suitable liquid silicone was just as challenging as the optimisation of LSR processing and the bond between the silicone and the base plate. Thanks to the perfect cooperation and in-depth expertise of our partners ARBURG, Bayer, Kiki, Plasmatrete and Schuma, we were able to deal with these problems and their effects quickly."

As the silicone component, Weber now uses an LSR with a hardness of less than eight Shore. This allows perfect surface results to be achieved. The problems with the surface tension of the LSR, which led to insufficient adhesion between the base plate and the silicone covering, were eliminated through an atmospheric plasma treatment.

The surface tension of the silicone was increased from 45 mN/m to 85 mN/m with the aid of a plasma treatment system that coats the parts directly in the mould by means of a plasma head. "At present, we coat the lenses before we inject the LSR component at the second station," says Elvira Postic, describing current practice. This has enabled us to reduce substandard parts production from 20 percent to five percent. Adhesion problems have been almost non-existent for the last six months, with a total unit output of around 6,000 articles per day." The slightly longer cycle time was quite acceptable in this context. Overall, fully automated production of the five-component rain/light sensor on the linking system with two ALLROUNDERS is now error-free and of a high quality. This is due not least to the second key technology at Weber, the use of indexing units, which have a sustained optimising effect on the cycle times in particular. "However, it is impossible to overestimate the importance of the excellent cooperation between all the partners

Technology permits perfect harmony: Weber indexing units ensure speedy advancement of the parts, while the ARBURG robotic systems handle the parts with care.

involved in the project. It was only possible to make such efficient use of time when implementing this complex project thanks to the close cooperation at the application engineering level," says Elvira Postic with conviction.

INFOBOX

Founded: 1925 by Wilhelm Weber and Ernst Eberspächer

Employees: 92

Products: Injection moulds, multi-component plastic parts production and indexing units

Quality assurance: Certified in accordance with DIN EN ISO 9001:2000 and ISO/TS 16949:2002

Contact: Wilhelm Weber GmbH & Co. KG, Otto-Bayer-Straße 8-10, 73730 Esslingen, Germany
www.weber-formenbau.de



Comparison helps reduce costs

With just a small amount of information and a few mouse clicks, the new machine comparison calculator from ARBURG provides reliable information as to which ALLROUNDER offers the lowest unit cost in conjunction with a specific application, so that parts can be produced as economically as possible.

The PC-based tool runs both on the PCs in the Sales Department at ARBURG and on field service laptops. The machine comparison calculator is an effective calculation program that permanently collates the extensive experience gathered by the company during development. The calculated evaluation is made available to the customer in the form of a well-laid-out printout that shows possible potential for optimisation and savings by comparing several machines. The key figures are the potential savings per part, the number of parts produced per year, the resulting potential savings in Euros per year, the amortisation period of the additional costs between the compared machines.

All the calculations are based on the machine-specific parameters, such as expenditure on the machines, moulds and peripherals, the number of mould cavities, the cycle time, energy and cooling water consumption and material costs. These are compared with the general business-specific parameters such as machine depreciation, the number of working days per year, the running time per day, personnel costs, media prices and the calculated profit and overheads markup. This com-

parison of data is then used to calculate the manufacturing costs. The number of parts produced per hour and machine can be determined, as can the machine-hour rate and the manufacturing costs per hour and per part. The overheads markup and profit yield a calculated price per part, which can be easily compared for each machine. Extensive comparative calculations between hydraulic and hybrid machine technologies have clearly shown that the average cycle time reductions of 20 percent achievable with hybrid machines will repay the higher investment in the space of a good year. This casts a different light on decisions based solely on the best price.

The calculations enable the customer to clearly see which machine will produce his parts most economically. Bernd Schmid, German Sales, says: "Savings of a few tenths of a cent per part can quickly mount up to a lot of money over the production year, so that what might seem like significant differences in purchasing costs can be amortised in a very short space of time."

Customer feedback confirms the benefits of the calculation tool. Thomas Lübbering, technical director at FM-Plast GmbH in Lennestadt, says, "The result of the comparison calculator analysis encouraged us to invest in an electric ALLROUNDER 570 A. All the factors that



Perfect advice: the machine comparison program quickly shows customers their individual potential savings.

play a part in such a complex investment project are made transparent by the comparative calculation."



ARBURG, ARBURG

It is always a matter of pride for ARBURG when it works with customers who are content to place all their trust in injection moulding technology from Lossburg. This is particularly the case when technical development is also involved. One of these innovative businesses is G. Junghans Kunststoffwaren-Fabrik, which is located in Hessisch-Lichtenau. The company has been collaborating with ARBURG since 1972, since which time Junghans has continuously invested both in the latest ALLROUNDER machine technology and in correspondingly high-performance peripherals.

Klaus Junghans joined the company in 1989, representing the fifth generation of his family at the head of the business. The company has continued to grow extremely dynamically ever since. This is illustrated by the growing number of employees. While the company employed 25 people in 1989, this number had grown to 95 by 2009. Junghans also expanded its premises, extending the production facilities significantly in 2005. Since then, the business has consistently been able to meet the increasingly stringent hygiene requirements of the industry. Last year, a new office block was built in Hessisch-Lichtenau, so that G. Junghans' premises grew to around 4,000 square meters. "Our plan for 2010 is to completely modernise our mould making shop," says company owner Klaus Junghans, outlining future development projects.

Since it was established in 1876, Junghans has been working on the development and improvement of a single product group: lids, closures and containers for



high-quality packaging. Production began with ointment jars, containers and lids made from earthenware and porcelain for the pharmaceutical sector, which was still in its infancy. Today, manufacturing encompasses packaging and closures made from PE, PP and PS, produced in large volumes on high-tech injection moulding systems. Klaus Junghans explains: "Product quality and quality assurance are our primary concerns. We perform continuous quality controls, thereby guaranteeing a consistently high standard of production. Our quality and hygiene management system is certified according to DIN EN ISO 9001 and BRC-loP by DQS. Finally, our in-house mould making shop, our own patents for new developments and a flexible team of qualified employees ensure the reliability and high quality of our products."

Customers for Junghans lids and closures for jars, cartons and plastic containers come from the food and animal feed industries, as well as the pharmaceuticals sector, mainly in Germany and Europe. Each year approximately 2,500 tonnes of



plastic are processed in Hessisch Lichtenau, producing approximately 300 million parts. Specialities include lids with seals for sealing jars, which are produced from two components.

In addition to the latest ALLROUNDER injection moulding technology – including several high-performance machines from the new hybrid HiDRIVE series – Junghans also uses current peripheral components in production. In view of the stringent requirements for consistently high-quality volume production, the integration of the central ARBURG host computer system (ALS) was an obvious step. "This means that we can plan our production and the capacity utilisation of our machines to perfection," says Klaus Junghans. In associa-



G. JUNGHANS
Kunststoffwaren-Fabrik



everywhere

tion with our statistical process control by means of a non-contact measuring machine, a colour measuring unit and regular visual inspections, we also guarantee our customers consistently perfect article quality."

However, excellence in production calls for the latest in machine technology. This is something of which Junghans is well aware. It explains why none of the 44 ALLROUNDERS in use is more than ten years old. In addition to the new HIDRIVE machines, production systems are mainly ALLROUNDER C models, so that the machine fleet covers a clamping force range of between 500 and 1,500 kN. Klaus Junghans has the following to say: "Our ALLROUNDER machines run in three shifts, six days per week, producing not just standard parts, but also blow moulding combinations and articles made from several components. Our machines operate both with linked robotic systems and in combination as complete production cells. The optimum solution is put together on a product-specific basis in line with individual requirements."

What Junghans values most about its cooperation with ARBURG is the fully functional overall package: "ARBURG produces precise, robust machines with an attractive price/performance ratio. We find that the SELOGICA machine control system used across the entire series to be an efficient system that works perfectly for us, particularly in conjunction with the ARBURG host computer system. The new HIDRIVE series is truly top-class and enables us to increase performance while



at the same time saving energy. We service our ALLROUNDER machines ourselves, using our own personnel, according to ARBURG maintenance schedules. In addition, the maintenance module of the ALS helps us to ensure our machine technology is always up-to-date. The continuity and reliability of the family-run business complete our positive impression. This is one of the key reasons why we have worked for so long and so successfully with ARBURG. Future challenges should therefore not prove a problem for this co-operative partnership. After all, both companies aim to develop themselves dynamically – for "quality in plastics" as the Junghans slogan so appropriately describes it.

To ensure production (top left) is always up-to-date, Klaus Junghans (right) continuously invests in modern ARBURG machines and peripherals, such as the ARBURG host computer system (centre left).

INFOBOX

Founded: 1876 by Christoph Junghans, the business is currently managed by owner Klaus Junghans and his wife Martina Junghans

Employees: 90

Products: Lids and closures for manufacturers of foodstuffs and animal feeds, as well as pharmaceutical products

Quality assurance: Certificated according to DIN EN ISO 9001 and BRC-loP by DQS, statistical process control, regular visual inspections

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Practice makes perfect

Shortly before Christmas, ARBURG offered its customers a really special treat: the "Practical Automation Forum" in Lossburg. Between 14 and 18 December 2009, 350 international guests took the opportunity to test out the programming of robotic systems for themselves and to experience innovation in the automation sector at close quarters.

Guests had the opportunity not only to test out different robotic systems on different machines and applications in specially tailored workshops on "MULTILIFT" and "six-axis robotic systems", but, more importantly, were able to try out for them-

to cycle time optimisation. The participants were particularly impressed at the fact that no extensive prior knowledge is required. In practice, this not only reduces training expenses for robotic system programming, but also set-up times. Achim Kreim, managing director of aha Kunststofftechnik GmbH in Fränkisch-Crumbach, says: "The opportunity to try out the programming of robotic processes for yourself using the teach-in function and to obtain detailed information makes ARBURG injection moulding technology even more attractive."

The focus of the second workshop was on the six-axis robotic system that can be programmed simply and reliably by the machine operator himself thanks to the SELOGICA user interface implemented. While the first station focused on the insertion and removal of an injection moulded part in a separate clamping unit, the second station looked at how to integrate downstream production steps. This was particularly interesting to Helmut Sassnowski, owner of HESA Kunststofftechnik in Horb am Neckar: "Implementation of this system enables our operators to program the complex six-axis movements within a familiar environment, allowing huge time savings."

A number of practically-based specialist presentations were also provided: FPT, which implements the SELOGICA user interface on Kuka robotic systems, described the benefits SELOGICA has to offer for the programming of complex robotic tasks.



The Practical Automation Forum featured a varied mix of workshops (top) and presentations (bottom). This was confirmed by participants such as Carmo's managing director Steen Ishøy, aha's managing director Achim Kreim and HESA owner Helmut Sassnowski (centre, left to right)

Longstanding ARBURG customer GIRA reported on the practical aspects of using ARBURG robotic systems. The ARBURG project department used a specific practical example to calculate the unit cost reduction achievable through automation. Steen Ishøy, managing director of Carmo A/S in Copenhagen, linked his visit with an investment project. He found this to be an "excellent mixture of a specific mission and a general information-gathering visit".

The "Practical Automation Forum" will go on tour in 2010, visiting the international ARBURG subsidiaries and various trading partners in order to show customers around the world how easy the robotic systems are to program.



selves the advantages of easy, convenient programming and user guidance. Personal customer support and individual consulting from the ARBURG experts was the central focus at this event.

The first workshop dealt with the entire programming spectrum for the MULTILIFT robotic systems, which are integrated into the central SELOGICA machine control system. The demonstrations ranged from the "teaching" of simple moulded-part removal via the teach-in function, through



Using a shared platform

The intuitive structure and universal uses of the SELOGICA user interface mean that they are also interesting for applications that extend beyond the direct control of the injection moulding process. The latest example of this is the implementation of graphical SELOGICA sequence programming in the control system of Kuka six-axis robotic systems. This makes the dialogue between man and machine much easier.

Six-axis robotic systems are characterised by a high degree of operating flexibility, a compact design and a small footprint. Production plants using systems of this type offer a high level of functionality in a small space. In the past, however, the programming of these robotic systems was extremely laborious and required special programming skills.

Working in collaboration with system integrator FPT, ARBURG has taken a new direction by transferring the SELOGICA user interface to the control system of the Kuka robotic systems, making it the only injection moulding technology manufacturer to offer a highly effective, universal solution. It is now possible to configure even complex movement sequences efficiently and independently. Injection moulding companies become independent of the programming service providers, making them much more flexible. All movement sequences are combined in a similar manner to the machine sequence. This allows installation technicians to pro-

gram the six-axis robotic system in their familiar environment using the simple graphical sequence. At the same time, this also effectively reduces the set-up and training requirements.

Those who are familiar with the SELOGICA will have no problems with production preparation of the robotic system. This also applies to the definition of pattern placements or the setting of gripper inputs and outputs. At the same time, communication between the SELOGICA machine control system and the robotic system has also been significantly extended to allow comprehensive synchronisation of both components. This results in greater availability and effectively reduced cycle times. This means that the robotic system can enter the mould right from the specified mark or the processes can be implemented simultaneously and stroke-dependently with respect to the core pull or ejector movements.

The robotic system is integrated in the machine sequence via freely-programmable interventions. Times between "open mould" and "close mould" can be programmed as required. There are thus no limits such as those familiar from the connection of an external robotic system via the Euromap 67 interface, for example. The higher functionality achievable in this way is apparent in how the robotic system automatically returns to the start position when production is interrupted,

The unique SELOGICA operating principle makes it easy to program a six-axis robotic system without external help.

making quick restarting easier. Moreover, it is possible to program the removal of random samples, and good and reject parts, as well as separate sequences for start-up and shut-down cycles. This is particularly important when encapsulating inserts and when processing multiple components, for example.

The robotic and machine control systems are coupled together in such a way that following creation of the robotic program, all further actions can be controlled from the ALLROUNDER injection moulding machine via its SELOGICA control panel. This makes it possible to switch the drive on and off, start and stop production, switch operating modes, acknowledge alarms and manage operating authorisations, for example. The robotic program can also be stored on the ALLROUNDER's Compact Flash card together with the machine program.





Dymotek
Dynamic Molding
Technologies



The name of the successful US company Dymotek, based in Ellington, Connecticut, is more than simply a catchy title. Dymotek is short for "Dynamic Molding Technologies" and the name was deliberately coined to highlight the company's unique advantages in terms of development, injection moulding, assembly and sales.

"Dynamic" describes the Dymotek philosophy of working as an extension of their customer's company, thanks to its expertise in the various industrial sectors. "Molding" refers to its core competence in producing moulded parts quickly, precisely and efficiently. And finally, "technologies" represents the key to achieving the high goals the company sets for itself. At its state-of-the-art injection moulding production facility in Ellington, Connecticut, Dymotek produces quality products for the consumer goods, manufacturing and medical technology sectors on high-tech injection moulding machines featuring a high level of automation. The materials processed include PVC, ABS, PEI (Ultem) and other engineering grade materials, as well as liquid silicones (LSR),

including self-adhesive and self-lubricating compounds. In order to automate assembly and functional inspections, both linear and six-axis robotic systems are used.

The requirements placed upon the moulded parts and assemblies produced by Dymotek are high, as quality and performance play a decisive role in the operability of the systems in which they are installed. Many of the products, for example, are installed in fluid or air valves and pumps, and combine thermoplastic with LSR components. The range extends from disposable products through to components with a very long service life.

In order to produce these quality parts not only to high standards, but also efficiently, Dymotek relies on both technical applications and automation solutions in particular on ARBURG's technology and competence.

Since purchasing the first ALLROUNDER injection moulding machine in 2005, co-operation between the two companies has been intensive. "Our cooperation with ARBURG arose because we are continually seeking the best technology world-wide in order to achieve our goals," said Normand Forest, Executive Vice President of Dymotek. As a result, the company's machine fleet includes a hydraulic two-component ALLROUNDER 470 C as well as four fully-electric ALLROUNDERS: two ALLROUNDER 570 As, an ALLROUNDER 520 A for LSR processing and a two-component ALLROUNDER 570 A for processing thermoplastic and LSR.



All five ARBURG machines are integrated in production cells on which complex products and assemblies are manufactured from several components and materials.

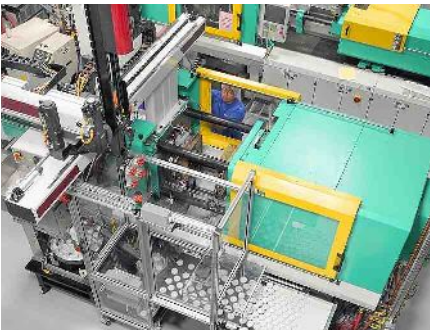
The LSR machine, for example, is part of an assembly cell used to produce a sensitive one-way air valve. The moulded LSR part is demoulded by a robot and transferred to the assembly station, where it is inserted between two thermoplastic parts. These individual parts are then automatically welded using ultrasonics before the finished article is pressure-tested, labelled and laser-engraved.



At its state-of-the-art injection moulding production facility in Ellington, Connecticut, Dymotek produces with high-tech injection moulding machines featuring a high level of automation.

Pure dynamics

An impressive example of automation is also a complex production cell comprising two fully-electric ALLROUNDERS and two six-axis robotic systems. The produced product, a safety system, consists of a group of four components, moulded from flexible PVC. These parts are demoulded robotically from the two moulds and then assembled with a total of 22 fasteners using the 6 axis robots. The robots then place the assembled parts onto a refrigerated conveyor for cooling before final packaging. Product quality is monitored through RJG's eDART System in this cell. If potential moulding issues are detected the cell's programming prevents the components from proceeding to assembly and are discarded. Overall production quality is



documented by means of numerous certifications, which Dymotek holds for the various markets: ISO, NSF, UL and many more. A comprehensive quality assurance system ensures compliance. The company

also employs a highly qualified workforce, for which training at ARBURG plays a significant role. Dymotek, for example, regularly sends its employees to the ARBURG headquarters in Lossburg to attend training courses as well as the Technology Days. The fact that the successful cooperation between the two companies exceeds the normal bounds is also evidenced by the joint presentation of an innovative thermoplastic/LSR application at the NPE or ARBURG's highly successful Technology Seminar, which the company's North American subsidiary held together with Dymotek and RJG in November 2009.

In 2010, further common projects are either planned or are in progress. During the first four months of the year, for example, three additional production lines will begin operation. These will form the basis for the expansion of Dymotek. Although turnover has remained stable during recent years, all the signs point to growth for the future. With the development of new product lines, an increase in turnover of between 10 and 15 percent is expected. The current workforce of 45 employees will be expanded and additional locations are under serious consideration.

INFOBOX

Founded: 1990 by Thomas and Steven Trueb

Surface area: approx. 30,000 sq ft (2,787 m²) in Ellington, CT

Employees: 45

Products: Complex moulded parts and assemblies made from thermoplastic and LSR for the consumer goods, manufacturing and medical technology sectors.

Markets: 13 countries, principally the US

Machine fleet: 21 injection moulding machines from 35 to 400 US tons (320 to 3,600 kN), of which five ALLROUNDERS from 170 to 220 US tons (1,500 to 2,000 kN) integrated in production cells

Contact: Dymotek, 7 Main Street, Ellington, CT 06029, USA
www.dymotek.com



An individual approach

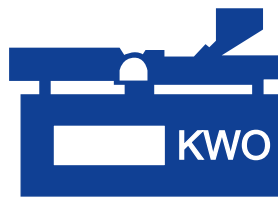
Again and again, surveys and statistics confirm what we have already known for some time in Germany and Europe: We live and work in a high-wage region and must take appropriate steps to ensure our international competitiveness. Consequently, automated production cells are increasingly being used in plastics processing in order to produce cost-effectively in large-volumes.

For this purpose, complex machine and control system technologies are required whose potential must be exploited in full in order to achieve consistent quality and efficiency. To this end, ARBURG is offering individually tailored training programs held directly at the customer's premises. Offenau-based company KWO has made extremely positive experiences with this offering to date.

Since the management buy-in in 2005, Kunststoffteile GmbH Offenau has been managed by Dr. Michael Jauss and Matthias Wendler as owners. The development of the company, which Matthias Wendler describes as an "organic growth of 60 percent between 2005 and 2008", has seen sales rise to 16 million euros in 2008. At its location in Offenau near Heilbronn, KWO deals in the manufacture of

moulds and high-volume part production. 80 percent of production is accounted for by the automotive sector, with a further 20 percent in the consumer products sector. The company's customers are located in Germany, Hungary, Czech Republic, France, Belgium, Switzerland and the UK. "KWO intends further expansion in the future," says Wendler. "At present we have a production area of 3,000 square metres and we already have building permission for a further 1,500 square metres."

The production halls house a total of 40 injection moulding machines, 30 of which are from ARBURG. These include both rotary table machines and electrical and hydraulic ALLROUNDERS, some of which are equipped with corresponding MULTILIFT robotic systems. Wendler assesses the cooperative relationship between KWO and ARBURG, which has existed since 1981 when the company first began injection moulding production, as being good and reliable: "Pricing and scheduling are reasonable and response times are pleasantly short. Injection moulding machines and robotic systems can be integrated very successfully in our production environment. We see great promise in



the technology used in the ARBURG host computer system ALS and will soon introduce this. Naturally, repairs to injection moulding machines are an ongoing issue and are always a problem. However, this is not something that solely affects ARBURG."

Because all ALLROUNDER machines are equipped with the universal high-performance SELOGICA machine control system, it quickly became clear that it would make sense to provide employees with in-depth training on making the best use of all the options provided by this control system and consequently of the machine technology as a whole. ARBURG therefore devised an individually tailored two-year training package for KWO that would each month focus on the challenges currently faced by the company and deal with them in terms of the control system and injection moulding technology.

The training days begin with a discussion on pending issues at the management level. Depending on requirements, the installation technicians who are to receive the individual training also attend. The focus is mainly on general issues relating to machine and control system technology. Among the issues discussed are the possi-



to technology training!



intensive "on the job" training. Matthias Wendler believes that this training is extremely important: "We consider this training crucial in order to exploit the full potential of ARBURG machines in practice in our company. Following the conclusion of the first year of training, we were proven right in our opinion that these courses were worthwhile, particularly in terms of the quality of parts production and the efficiencies achieved." And how do the trained employees view the program at the half-way point? The answer could hardly be more concise or decisive: "Excellent!"

bilities in relation to forthcoming operational projects with ALLROUNDERS and the options required in order to meet these requirements.

Following the meeting, the training moves into production, where the agreed agenda is gone through with the relevant training course participants and the available procedures and options with regard to the machine and control system are explained. The day ends with a final meeting in which the achieved results are discussed.

As the course progresses, all the process engineers thus receive at least one day of

Owner Matthias Wendler (centre) is delighted with the success of the ARBURG training courses, performed directly on the ALLROUNDERS (right). Detailed discussions (left) ensure that the contents are perfectly tailored to KWO production.

INFOBOX

Founded: 1971, 2005 management buy-in

Products: Engineering, moulds and parts, in particular high-precision parts, such as connectors for control system electronics, micro injection moulded parts, LSR two-component parts and complex assemblies made from PA, PBT, PPA, PPS, LSR, LCP, TPE, PC, PP

Quality assurance: ISO 9001, TS 16929, ISO 14001/EMAS in the first quarter of 2010

Employees: 140

Contact: KWO Kunststoffteile GmbH
Talweg 9 - 13,
74254 Offenau, Germany
www.kwo-kunststoffteile.de



TECH TALK

Oliver Schäfer, Technical Information

Fast set-up times –

Small series, different product versions, just-in-time production and delivery, these are the requirements which increasingly face injection moulding companies. These result in frequent changeover procedures, when machines stand idle and fail to return a profit, even though they continue to consume energy. Time literally becomes money. In order to produce flexibly, energy-efficiently and competitively, short set-up times are essential. This can often be achieved without major investment.

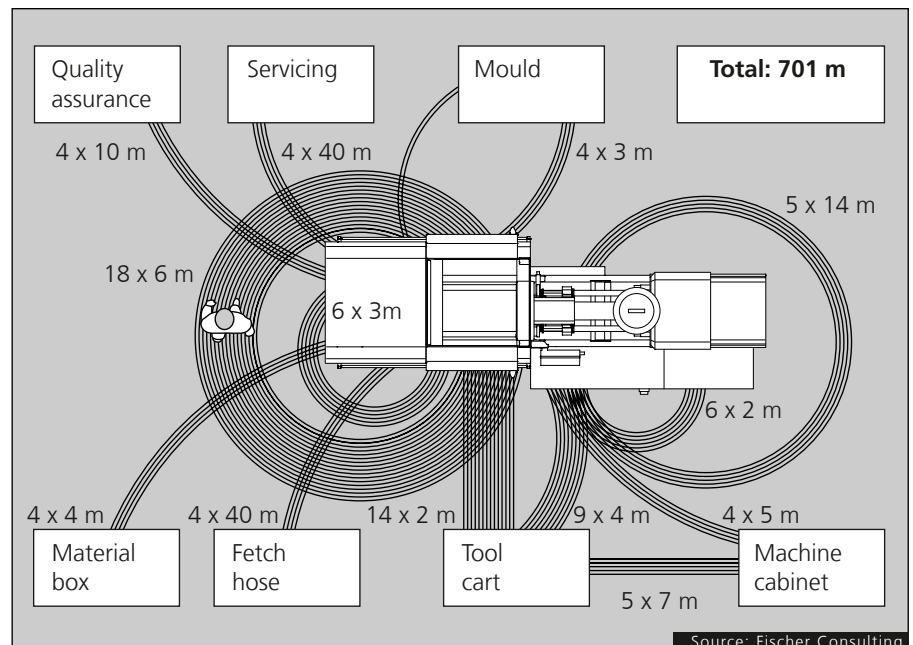
Perfect preparation as the previous job is still running is of crucial importance for a fast changeover. Checklists help ensure that nothing, for example the appropriate hoses, is forgotten. In addition, a well-organised cart with all the required tools and bolts should be available prior to every set-up. This means that everything is in place as soon as the machine stops. Nothing needs to be searched for or fetched. After all, every unnecessary journey wastes time.

A decisive time factor during the changeover procedure is the actual changing of the moulds, particularly in the case of larger machines. Distances, and therefore the time expended, can be reduced

significantly by placing one technician at the front and one at the rear of the machine. This applies particularly if you consider how often a single technician has to walk around the machine during the set-up procedure (see diagram).

A standardised clamping system should be chosen when designing the tools. It is important that the clamping platens are of the same size when the moulds are mounted directly. This allows you to use the same

bolts throughout. Work can be made even easier by using clamping elements that remain attached to the machine and that can be used flexibly for other moulds. If a large number of in-house moulds are used, it is advisable to standardise the clamping platens. In combination with mechanical rapid clamping systems such as the one provided by ARBURG, moulds can be changed in just a few minutes. Ideally, a power-adapted temperature control





efficient production

unit should be permanently assigned to a machine so that set-up can be performed in a straightforward manner in conjunction with standard rapid connect couplings.

The next step in increasing efficiency is the standardisation of the entire set-up process. After all, in the absence of a precisely defined, systematic set-up procedure, every employee will determine his own. In this case, optimisation often becomes a secondary concern. If, on the other hand, all employees follow the same standard, frequently practising and improving it, machine downtimes can be significantly minimised. Employee training is particularly important. After all, this measure will help in implementing speedy set-ups more effectively than any investment. In many cases, the intensive involvement of employees also brings about an increase in innovations, resulting in a continuous improvement process.

Forward-thinking, machine-based production planning is essential if installation technicians are to organise their work to optimum effect and achieve short set-up times. Production management systems with online entry of machine and order data such as the ARBURG host computer system (ALS) ensure the necessary transparency in production and facilitate de-

tailed planning on the basis of current, reliable data.

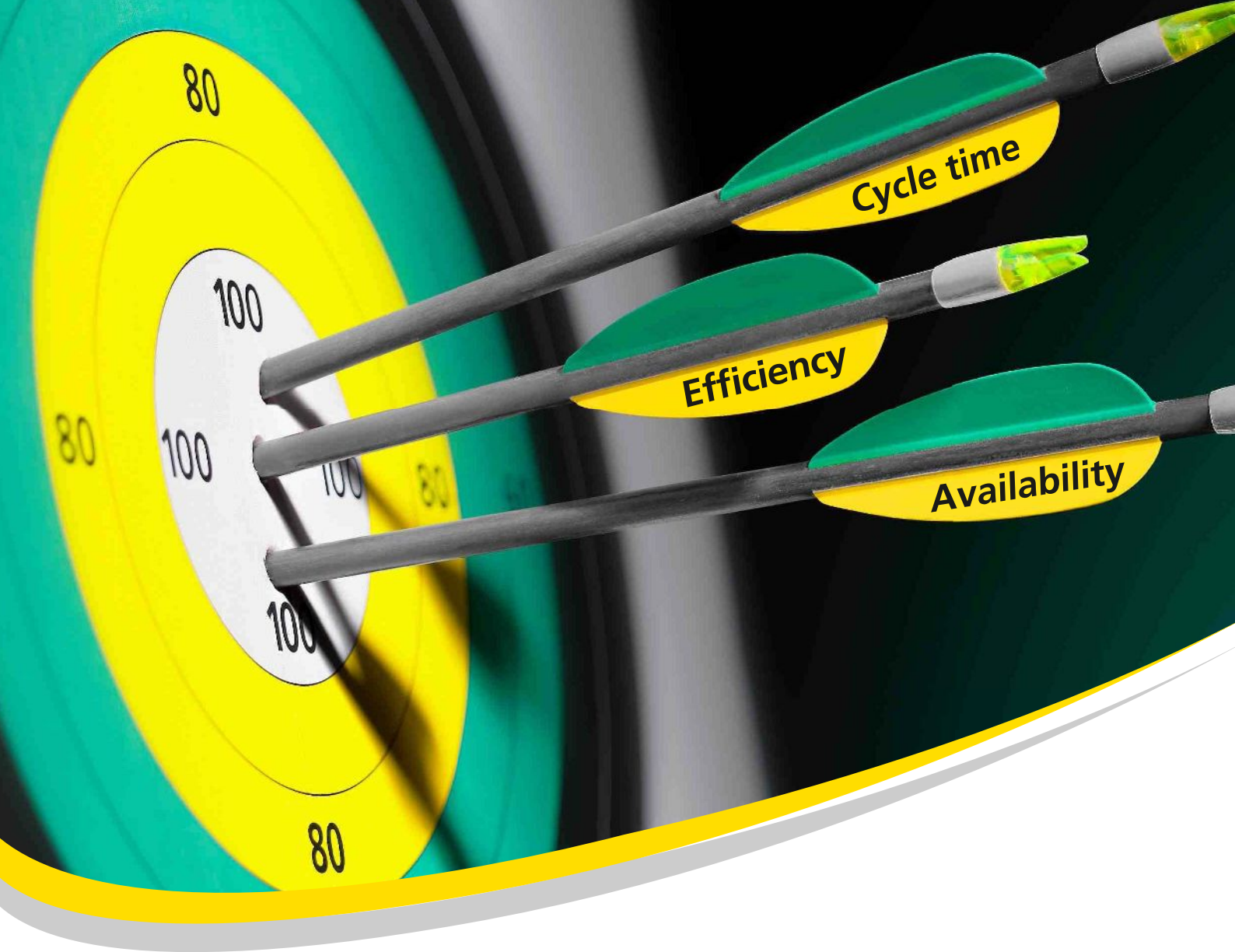
Further measures aimed at reducing set-up times include the use of a preheating station for moulds and the provision of several cylinder modules. The advantage of the latter when changing colours to a completely transparent material is that the sometimes very time-consuming cleaning work can be omitted.

ARBURG has always worked to keep set-up processes as simple as possible. This is demonstrated by several ALLROUNDER features such as the ejector rapid release coupling, media connectors positioned on the machine's clamping platens, swivelling injection units, central coupling of the cylinder module and the second program level of the SELOGICA control system.

If one considers the many opportunities for optimising the set-up process, there is still a lot of untapped potential in many injection moulding companies. Experience shows set-up time reductions of up to 50 percent are not unusual.

Investigations have revealed that the distances travelled during set-up can sometimes be considerable (see graphic on left). Minimising these distances represents a key step in reducing set-up times





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