

today

The ARBURG magazine

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IMPRESSUM

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Published by: Dr. Christoph Schumacher
Editorial Advisory Board: Juliane Hehl, Martin Hoyer, Roland Paukstat, Bernd Schmid, Jürgen Schray, Renate Würth **Editorial team:** Uwe Becker (text), Markus Mertmann (photos), Vesna Sertić (photos), Marcus Vogt (text), Susanne Wurst (text), Peter Zipfel (layout)
Editorial address: ARBURG GmbH + Co, PO box 1109, 72286 Lossburg,
Tel.: +49 (0) 7446 33-3149, **Fax:** +49 (0) 7446 33-3413,
e-mail: today_kundenmagazin@arburg.com, www.arburg.com



It's all down to the right finish. As is the case in the assembly of the ALLROUNDER, for which about 60 percent of the components are manufactured in Lossburg and which is assembled there by trained personnel.





Dear Readers,

in our media-driven society, we are absolutely swamped with countless advertising messages, slogans and slick statements on a daily basis.

It is also ARBURG's intention to stand out from the crowd in this field. And that should be achieved to the benefit of our customers by deliberation and strategy and on a reasonable time scale.

Therefore, after three years we have decided to adapt our motto "ARBURG - the New Dimension" to the new situation, following completion of the clamping force expansion: following the successful establishment of the New Dimension at ARBURG, we are now faced with other tasks.

With the motto "MODULARITY ALLROUND", we are emphasising our intention to apply the worldwide renowned ARBURG qualities with regard to modularity and customer-oriented development to our entire, greatly expanded product range. One of the important topics in this context is certainly the

question of the correct drives for your injection moulding machines. Detailed information on the new motto can be found in this issue of "today".

Economically, we are unfortunately looking forward into an uncertain future: economically and politically, there are simply too many uncertain global factors to be able to make reliable prognoses with confidence. But one thing is clear: the hoped for recovery, on a worldwide basis, did not occur.

There are however reasons for hoping that 2003 in its entirety, will usher in a reversal of the trend.

Once again in "today", we present you with a wealth of interesting topics: from factual to colourful, from informative to interesting. Metaphorically speaking, it is also our wish here to fully live up to the motto "MODULARITY ALLROUND".

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

Yours,

Michael Grandt

Improvement potential thanks to intelligent utilisation



The market introduction of fully-electric injection moulding machines around 15 years ago gave rise to some controversy regarding this technology.

Above all, the low energy requirements, reduced noise emission, fully independent axes and significant improvements in the precision of machine movements as well as clean room suitability were the main arguments in favour of this new technology. Significantly higher investment costs as well as higher service costs are arguments against machines with electric drive axes. Because none of the technologies under comparison has a clear overall advantage over the other, most injection moulding machine manufacturers meanwhile also offer hybrid drives in their product ranges. These range from hydraulic injection moulding machines with a simple electric dosage drive through to entirely electrically-driven machines.

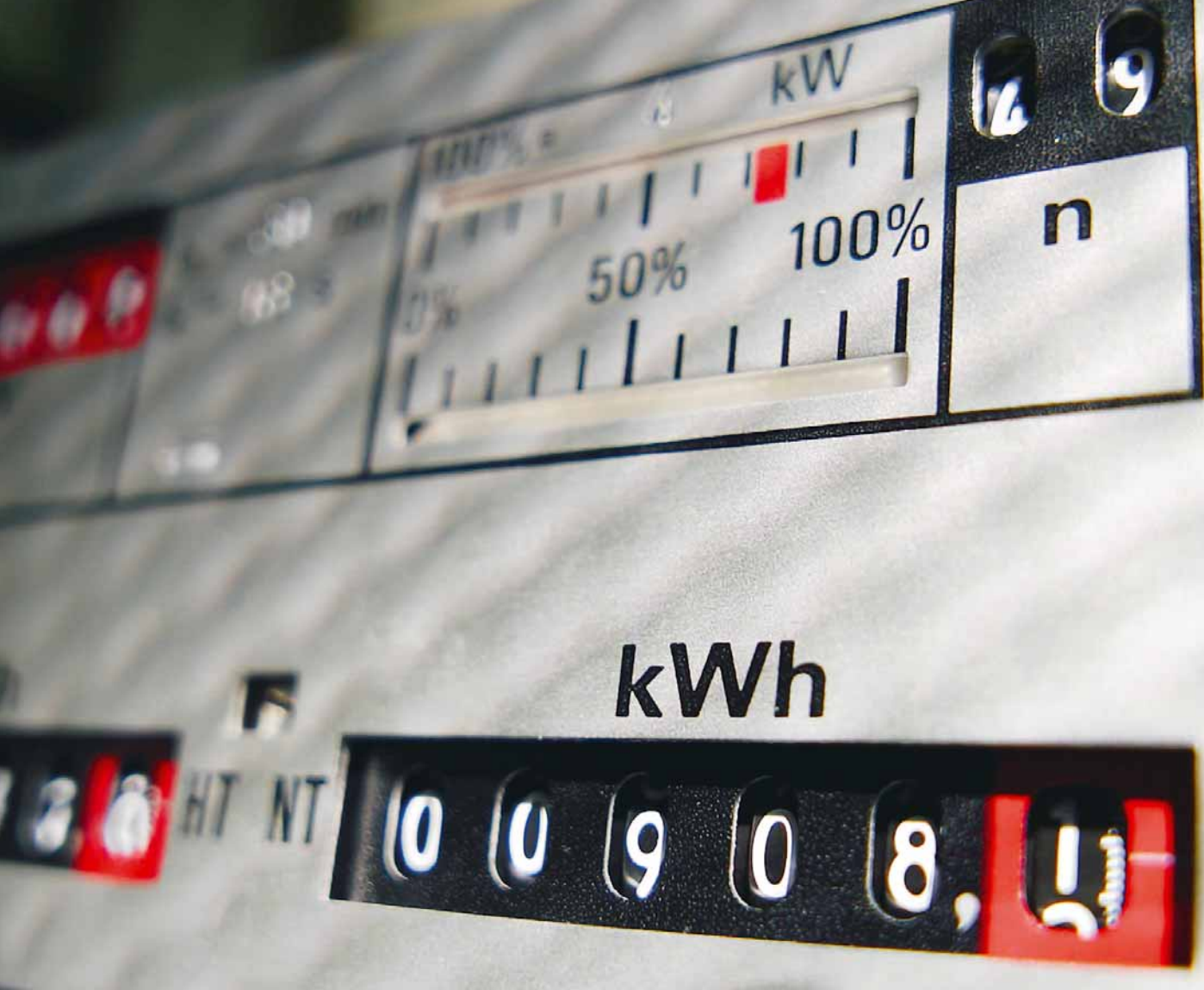
In order to provide customers with a comprehensive range and to completely fulfil all

product requirements, ARBURG offers two solutions:

- The optimisation of the basic hydraulic ALLROUNDER C machine in terms of energy consumption, noise reduction and precision in the form of the special "advance" model with electric dosage and speed-regulated hydraulic pump drive.

- Based on the electric ALLROUNDER ALLDRIVE (A), hydraulically driven auxiliary axes are optionally available to allow different moulds to be used with hydraulic drive components without difficulty, thus achieving a reduction of capital expenditure costs.

Comprehensive test series carried out at ARBURG on comparable machines with differing drive technologies provide a reliable basis for an objective evaluation of the systems. The advantages of electric axes are evident in terms of reductions in the consumption of energy and of noise emission levels. For instance, the energy saving in the case of an ALLROUNDER "advance" with respect to a comparable fully-hydraulic version without the "advance" package over the entire output



range is approximately 20 to 25 per cent and that for an ALLROUNDER ALLDRIVE is approximately 40 to 50 per cent. With regard to noise reduction, the benefits of electric drives prove to be even more significant. The ALLROUNDER "advance" is around 50 per cent and the ALLROUNDER A practically 75 per cent quieter than a comparable standard fully-hydraulic standard machine.

Energy prices, however, make it difficult to amortise additional costs for a fully electric machine purely through energy savings.

The utilisation of the further amortisation potential of electric drive technology, such as the reduction of cycle times thanks to independent machine movements, is closely associated with mould and process technologies.

Consequently, it makes sense to select the suitable drive technology based on the mould requirements in order to achieve the best possible cost-value ratio.

If, for instance, the mould technology enables the electric ejector to move simultaneously with the opening of the mould, a reduction in cycle time is often achievable as the

high dynamics and precision of the movement allow for very uniform ejection and dropping of the products.

With the modular concept of the ALLROUNDER C and ALLDRIVE machines, ARBURG enables the targeted selection of a suitable machine combination, not least from a cost-benefit point-of-view. The ALLROUNDER C with the "advance" package – energy optimised hydraulic drive, electro-mechanical dosing and position-regulated screw – for instance, can be additionally equipped with an electric unscrewing unit. With the ALLROUNDER A, it is possible to use a hydraulically operated ejector, nozzle "advance" movement, core pull and unscrewing unit.

By virtue of this consistently implemented modular approach, ARBURG sees the various drive versions as complementing rather than competing with one another. In other words, at ARBURG, the various ALLROUNDER machine versions can be selected and equipped in accordance with the requirements at hand, in order to fulfil your operational needs to the best possible effect.

The modular expansion options in the servoelectric drive field allow for pinpoint-accurate adaptation of the ALLROUNDER C "advance" and the ALLROUNDER A to existing operational production requirements, thereby utilising the potential for individual savings.



MODULARITY ALLR

Proud of the new slogan: Juliane Hehl, member of the management team and Head of Marketing, Herbert Kraibühler, Technical Director (from right to left), and Michael Grandt, Sales and Controlling Director.

The new annual slogan "MODULARITY ALLROUND" replaced the old slogan "ARBURG – the New Dimension" at the start of 2003. In the following interview, the message behind the new slogan is explained by Juliane Hehl, member of the management team and Head of Marketing, Michael Grandt, Marketing and Controlling Director, and Herbert Kraibühler, Technical Director.

today: For three years, the slogan "ARBURG – the New Dimension" characterised the company and its programme.

Since January 2003, the company has been using "MODULARITY ALLROUND". Why has the slogan been changed precisely now?

Herbert Kraibühler: A new motto has been chosen because we have entered a new phase of business with our company. The international launch of the ALLROUNDER 820 S at the Fakuma 2002 marked the close of an important phase of our development. Our objective was the expansion of our range to include machines with a clamping force of up to 4000 kN. We have achieved this goal. We have also completed work on our MULTILIFT



robot systems with horizontal and vertical models, as well as on a structured range of drive versions. The ALLROUNDER range now includes fully-hydraulic machines, the ALLROUNDER "advance" with a combination of drives and the ALLROUNDER A, which can be progressively equipped to create a fully electric machine. Not forgetting our special machines, which represent optimally adapted production systems for all the specialised sectors of the plastics processing industry from a single source.

today: What will the major task be for the coming years?

Michael Grandt: With the completion of the extension of our range, all our customers can individually combine the ALLROUNDER technology to suit their company and production requirements. Thus, the development stage of the expansion of the ALLROUNDER and MULTILIFT product range, as already mentioned, is now completed for the time being. What this means, is that from this year onwards, we will focus



Juliane Hehl: We wanted to emphasise these changes effectively to the public with a new motto. That's why we decided to create a new motto that was more suitable. The new slogan "MODULARITY ALLROUND" aptly describes how the ARBURG range of machines and peripherals have developed.

today: So "MODULARITY ALLROUND" means that all ARBURG products are of a modular design so that the customers can configure "their" machines according to their own requirements?

Herbert Kraibühler: ARBURG simply wouldn't be ARBURG if our modular systems weren't geared towards practical utility. Modularity is only advantageous if the combinations make practical sense. For this reason, we now offer our customers modular technology components in the fields of drive concepts, processing procedures, control and handling - which are perfectly matched and can be operated via a central control system.

Michael Grandt: On the one hand, our new slogan reflects the fact that our focus remains with the tradition of the ALLROUNDER injection moulding technology, but it also indicates that we have reached a consolidation period in terms of technical development, which will enable our customers to tailor the advantages of a comprehensive and practical overall system adapted precisely to their individual applications. We also offer a support and service system which utilises all the modern means of communication such as the Internet or training courses in order to be able to assist the customer on-site with the planning and use of all aspects of injection moulding technology.

today: How will the new slogan be implemented internationally?

Juliane Hehl: Our global communication activities mean that the combination of the slogan and signet will be used both in the German original and translated into English. In this way, by grouping our communication activities and our medium-term planning under the new slogan we will once again achieve an edge in terms of market profile. In economically weaker times in particular, ARBURG has always succeeded, by means of targeted



OUND



more on maintaining our products and on developing our service – in a certain sense, on consolidating our expansion activities.

today: And these new activities also require a new slogan?

activities, in gaining publicity and in breaking new ground in the injection moulding market. The use of our new slogan is, of course, aimed towards this end.



MODULARITY ALLROUND
MODULARITÄT ALLROUND



From idea to r

As far as the injection moulding of liquid silicone rubber (LSR) is concerned, the family-owned Swedish group Medical Rubber counts among its European pioneers. The service offered to its customers by the medical technology specialist reaches far beyond design, prototype, initial batch and series production; it includes comprehensive consultation from the choice of materials through to suitable packaging solutions.

Dialysis, anaesthetics, drug delivery systems, orthopaedics, nutrition or cardiology – products by Medical Rubber can be encountered everywhere. More than 20 years ago, the company was among the first in Europe to begin processing LSR using injection moulding technology. As a pioneer in the field, Medical Rubber today commands comprehensive expertise regarding LSR. Moreover, thermoplastic elastomers (TPE) and thermoplastics are also processed into customer-specific precision parts. Regardless of whether these are small-volume individual moulded parts or high-volume series products, Medical Rubber develops the appropriate complete solution in close collaboration with its customers.

The bulk of its customers are from the medical technology field, but others belong to industrial sectors such as food or electronics, which have comparably high product requirements with regard to hygiene and precision.

Today, Medical Rubber counts among the leading medical

technology manufacturers in Europe, with an export rate of over 70 per cent. The company, however, does not rest on its successes, but continues to develop, be it in terms of hygiene, precision or materials.

At all three of its production plants, Medical Rubber maintains a modern machine park with a high degree of automation, whereby speed, precision and cost-effective production are ensured. The medical products are exclusively produced at the two Swedish plants, where stringent hygiene and cleanliness requirements are fulfilled by means of class 100,000



and 10,000 clean rooms. The manufacture of industrial products is located at the company's Polish plant.

As the key to its success, Medical Rubber cites its proven project management model, which enables the customer to remain constantly up-to-date with the development status of its product – from design to realisation.

Medical Rubber implements all manner of



Photos: Medical Rubber

reality

customer ideas during this process, whereby the support provided ranges from the selection of materials and machines through to injection moulding and packaging. The close collaboration maintained by Medical Rubber with regard to its customers also applies to its suppliers. Whether in terms of material handling –(no easy matter in the case of LSR)– or of the finished moulded parts, the company relies on its own expertise and develops systems tailored to the requirements at hand jointly with the relevant manufacturer.

In the injection moulding machine sector, Medical Rubber has collaborated successfully with ARBURG for more than 20 years. Contacts are maintained both via the Swedish ARBURG agent Rafo AB as well as via the Lossburg headquarters, the latter particularly when highly technical issues need to be resolved with the aid of the technical experts.

The machine park of the three Medical Rubber plants totals more than 25 injection moulding machines, all of them ALLROUNDERS, with clamping forces from 200 kN to 1000 kN. The majority of the machines process LSR, so that these ALLROUNDERS are equipped with cold-runner moulds as well as the ARBURG LSR equipment package consisting as standard of a highly wear-resistant silicone cylinder with liquid temperature control, a compression-free dosing screw and conveyor screw, a non-return valve and a hydraulic needle shut-off nozzle. The hydraulic system with two pumps ensures regulated machine movements. Furthermore, the SELOGICA control system features symbols adapted to LSR processing in the sequence editor, interfaces for mixing and dosing units



as well as blow-out units and the capability of controlling a total of six mould heating circuits.

And because the pioneer of LSR processing is entirely satisfied both with ALLROUNDER machine technology and SELOGICA control technology, Medical Rubber will continue to rely on ARBURG injection moulding technology in the future.

As hygiene and precision play a decisive roll, the quality is stringently monitored during the entire production process.



INFOBOX Medical Rubber

Founded: 1973

Plants: Sweden, Poland

Production area: 5000 square metres (S), 1000 square metres (PL)

Employees: 125

Products: LSR and TPE moulded parts, mainly for medical technology but also for the food and electronics sectors

Company headquarters:

Medical Rubber, SE-242 93 Hörby, Sweden,
www.medicalrubber.se

ALLROUNDER: range complete!



The huge task towards which ARBURG has been consistently working over the past years, has been achieved: with the world premiere of the ALLROUNDER 820 S, the machine range was successfully completed. The performance scale of the ALLROUNDERS now ranges from clamping forces of 150 to 4000 kN. The fact that such an introduction was made in the context of the Fakuma confirms the high esteem in which ARBURG holds this event.

From its beginnings 15 years ago in 1981 to 2002, Fakuma has developed from a regional into an internationally renowned and respected plastics trade fair. This was supported last year, owing not least to the move of the Friedrichshafen trade fair to new exhibition halls.

As a result, the platform for new launches could not have been better: ARBURG has utilised this platform in order to present the complete machine and technology range surrounding the highlight, the ALLROUNDER 820 S.

The biggest ARBURG machine impressed not only thanks to its performance

capability of 4000 kN with a clamping face of 820 x 820 millimetres, but also thanks to the injection unit size of 3200 with a maximum moulded part weight of 1860 g in polystyrene. The available screw diameters are 70, 80 and 90 millimetres. The modular concept also enables the use of both the 1300 and 2100 injection units on the 820 S.

The machine was equipped with a new MULTILIFT HV. The combination of a vertical MULTILIFT V and a horizontal MULTILIFT H has been specially designed for use with the big ALLROUNDERS and is designed as an overhead structure. Mould entry is effected horizontally from the rear of the machine.

All the machine and robot processes are controlled and monitored via the central SELOGICA control unit. The MULTILIFT symbols can easily be integrated at the appropriate position in the overall cycle.

The two-storey ARBURG stand, of approximately 940 square meters, was a real crowd puller, not least due to the exhibited ALLROUNDER "advance" and the ALLROUNDER A with modular, upgradeable servo-electric drive axes. The success was evident from the very first day of the trade fair.

Strategically well placed: in close proximity to the central quadrangle, the visitors were able to view the new 820 S.

Numerous visitors came to discuss technical matters in detail with ARBURG experts and to experience the technical innovations at first hand.

Following the successful expansion phase of the past years, the principal objective now is to technically perfect what has been achieved and also to further expand on the service for the entire product range. Accordingly, a new slogan has been devised: "MODULARITY ALLROUND" clearly indicates the direction in which ARBURG will develop from 2003 onwards.

Trade Fairs in 2003: Internationally Challenging

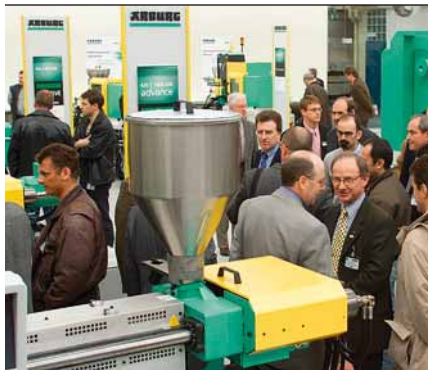
Always well attended: whether nationally at the Technology Days or internationally at the Brasilplast and NPE.

During 2003, ARBURG will be represented at a total of 39 national and international trade fairs and information events - a mammoth programme, with a number of highlights deserving special attention in the run-up.

ARBURG, having always maintained a high profile at both national and international trade fairs, will once again participate in all the important exhibition events this year. Moreover, some activities will also be initiated by ARBURG itself, with the customary Technology Days in the spring. Customers will not only be shown what the machines are capable of, but also what other technologies the company has on offer.

From 10 to 14 March, the Brasilplast trade fair will cater for the huge South American market, in which Brazil alone turns over more than 15 bn Euro with some 5000 plastic processing companies. During the fair, around 1000 exhibitors from over 25 countries around the globe will present their products to a number of expected visitors exceeding 75,000 for 2003. The main focus of the ARBURG exhibit will be a multi-component version of the ALLROUNDER 420 C 1000-150/60, an ALLROUNDER 420 C 1300-675 and an ALLROUNDER 720 S 3200-2100, predominantly market-oriented on the S machine series.

The ARBURG Technology Days, an exhibition aimed primarily at the German-speaking and European markets will immediately follow the Brazilian fair, from 20 to 22 March 2003. The motto for the event will of course be the new company slogan, "MODULARITY ALLROUND", which shows what can be achieved in injection moulding production with individually-customised



technology components. A new record was set in 2002, with 3000 visitors from 29 countries. It is notable that the number of foreign participants is growing steadily.

The major plastics event this year, however will doubtless be the NPE in Chicago. More than 2000 companies will exhibit their products between 23 and 27 June at McCormick Place, which spans over 100,000 square meters. Here, ARBURG will be represented with its current product range – altogether ten ALLROUNDERS including the 820 S with MULTILIFT HV, the 470 C and 570 C "advance", as well as the 420 A 800-400.– More than 90,000 visitors – 20 per cent from outside the USA – make the event the second largest international plastics exhibition after the "K" in Düsseldorf.

All important trade fair dates can be found on our internet page under www.arburg.com.



BRASIL²⁰⁰³ PLAST

INFOBOX FAIR HIGHLIGHTS

Brasilplast

10. to 14. March 2003, São Paulo
ARBURG stand in Hallão Oeste
Rua E - No. 101

ARBURG Technology Days 2003

20. to 22. March 2003
ARBURG Headquarters, Lossburg

NPE 2003

23. to 27. June 2003, Chicago
ARBURG stand at McCormick Place South
A1/A2, Level 3,
Stand number 1860



No matter whether customer or supplier, PEHA is a proficient partner for the realisation of innovative ideas. "The innovative shaping of the future without losing sight of our past and our values"; this describes one of the basic principles of medium-sized family business which began 80 years ago with the production of Bakelite switches and sockets.

PEHA has remained faithful, not only to the principles, but also to the products. Today, the product range encompasses high-quality household installation technology in the switch and socket sector. Furthermore, PEHA has meanwhile established itself as a leading supplier in the building systems technology sector, whose contacts are planners, craftsmen and electrical wholesalers. The company markets its products mainly in the European countries

Teamw

(including Eastern Europe) and is regarded as a proficient outfitter for hospitals and cruise ships etc.

PEHA attributes its success to "the fact that we have always oriented ourselves to the expectations of our customers in our product development and that we have innovatively combined proven technology with modern developments for over eight decades." As far as quality is concerned, the company which has been certified to DIN EN ISO 9001 since 1998, makes the highest demands of itself. In the personnel field, this is ensured on the one hand, by the training of its own apprentices and on the other hand, by internal technical training of employees to specialist status.

An additional guarantee for the absolute quality of the PEHA products are the modern production systems. In this field, PEHA has successfully co-operated with ARBURG for about 20 years and always applies the latest technology.

Photos: PEHA

Thus, not only has PEHA acquired the prototype of the ALLROUNDER 420 C with INTEGRALPICKER but, in 2001, was also the first customer to use four ALLROUNDERS with MULTILIFT H and palletising station. "The decisive factor for the joint implementation of this project was the great trust in ARBURG's specialist expertise", according to Gerd Jansen, operations manager at PEHA.

The task for the ARBURG project department was to design a production cell with tray feeder, on which about 30 different products switches and sockets of various geometries can be manufactured with a high degree of automation. As parting line injection is partly used in the manufacture of the PEHA products, it was of advantage to use the horizontally-operating MULTILIFT H as robotic system, with whose electric axis a whole tray row can be filled at once. For the next cycle, the tray is automatically indexed to the next position in the

A further challenge in the set-down of moulded parts was ultimately that, depending upon the type of mould, the distance between cavities differs. The solution was a linear axis in the gripper, by which the cavity distance is adapted to the distance in the trays.

The entire palletising unit is mounted on steel rollers and is thus moveable, which is not only an advantage when reconfiguring the machine, but also means that it can easily be used

A high degree of automation is achieved with the palletising unit, via which the trays are fed (bottom right). The moulded parts are deposited in the trays in rows (bottom left).



ork required

palletising unit, via a servo axis. As the various trays must be indexed differently, they are differentiated via binary codes and are controlled via SELOGICA. With this palletising unit, it is possible to load up to four tray stacks with a maximum height of approximately 700 millimetres. The empty trays are separated from the stack, filled, re-stacked on top of one another and transported away.

Within the scope of the overall project, new trays were also designed by PEHA and the ARBURG project department in co-operation with the manufacturer Söhner-Kunststofftechnik, so that it is now possible to cover the entire product range with only three different trays, including transportation and storage of the moulded parts. Gerd Jansen says, "positive side effects of the introduction of trays in plastic processing were the resulting additional rationalisation effects in the fields of assembly and storage."

in conjunction with different ALLROUNDERS.

"The successful implementation of this project can be attributed to the excellent co-operation with ARBURG at all levels", says Gerd Jansen. An additional reason for the proven co-operation between ARBURG and PEHA over several decades, is certainly the shared philosophy of the two companies for practise-oriented product development, in accordance with customer requirements.

INFOBOX PEHA

Founded: 1922

Plants: Lüdenscheid (Head Office with Development and Production), Halver (new Logistics Centre with training room and plastics manufacture), Werne (Assembly), Neuenrade (Electronics Development with Production)

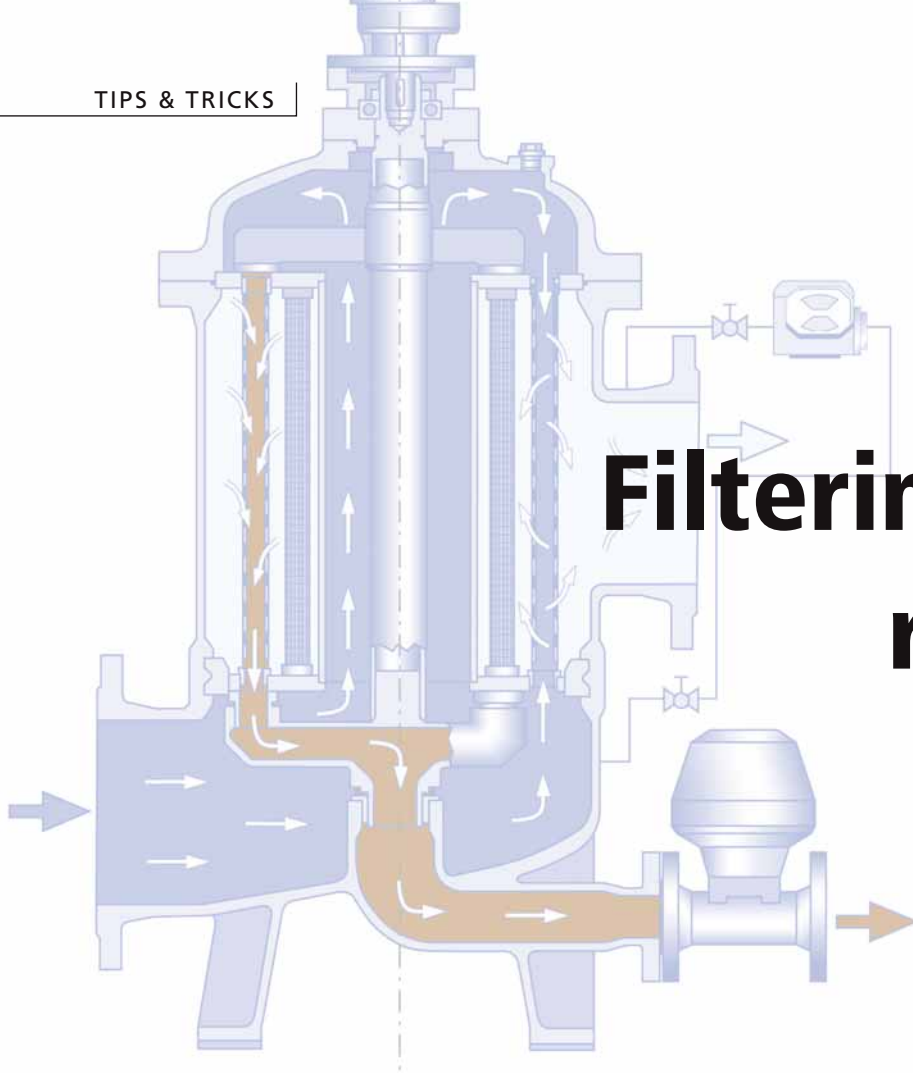
Corporate group: PEHA Paul Hochköpfer GmbH & Co. KG, Infratec-Datentechnik GmbH and BK-Elektronik GmbH

Employees: 360

Products: high-quality household installation technology in the switch and socket sector, building systems technology sector (BST)

Company headquarters:

PEHA Paul Hochköpfer GmbH & Co. KG, Gartenstraße 49, D-58511 Lüdenscheid, www.peha.de



Filtering brings results!

Central water filter systems (diagram) such as the device by Boll & Kirch Filterbau GmbH and water filters directly fitted to special ALLROUNDERS (below) both ensure failure-free machine cooling.

It is usually small details that lead to great problems. In injection moulding, some detail problems can get out of hand if not attended to quickly. One of these is the quality of the cooling water.

Using unfiltered cooling water during the injection moulding process may mean the risk of long-term damage and failure through leaking seals or valves becoming blocked over a period of time. On closer inspection, the reasons for the use of filter systems in production plants soon becomes evident. The more complex the machines and facilities are, the more worthwhile it is to invest in better filtering, in order to protect against wear. Filtered media increase the operational reliability of machines continuously and long-term. This not only reduces costs, but saves resources and protects the environment.

ARBURG undertakes preventative measures with regard to the problems outlined above, both in-house and on the multi-component ALLROUNDERS.

During in-house production, only water is used which has previously been cleaned via a



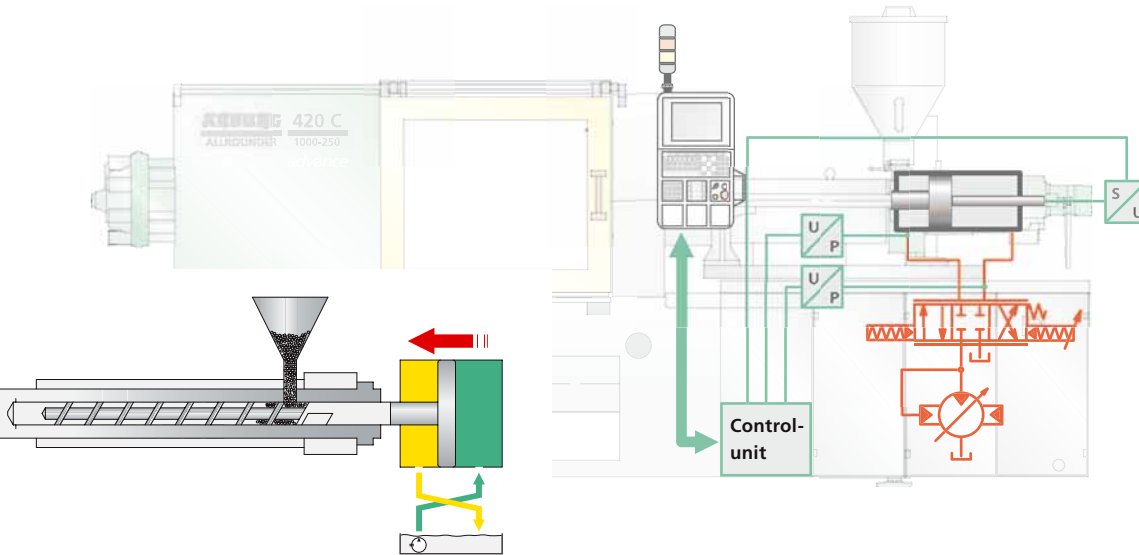
central automatic filter system which is maintenance-free thanks to return flushing. The defined degree of cleanliness of the water is guaranteed by specially calibrated filters. The system works reliably and has a long service life thanks to interruption- and failure-free operation.

The design of the filters is determined principally by operational factors. Flow rate, degree of contamination, filter mesh and permissible pressure loss have the most direct influence on the size of the filters.

The ARBURG two-component machines with rotating platen are equipped with a water filter as standard in order to protect the sensitive rotary unit and particularly the swivel connections from soiling, for instance

through rust particles or sand. This measure protects against excessive wear, which can lead to leaks and finally to failure of the rotary unit. The filter mesh is 105/135 μm , in order to offer sufficient long-term protection, even under continuous operation. This filter, however, offers no protection against calcification.

Although no general information is available regarding dirt particles in unfiltered cooling water and the continuous operation of injection moulding machines, positive effects on e.g. the cleanliness of cooling circuits and the blockage of injection nozzles have been demonstrated by manufacturers of filter systems. The control lines for the shut-off valves can also be protected long-term from blockage and consequently from failure. It is in any case advisable to at least obtain information on the benefits and costs of a media filtering system from the relevant manufacturers so that minor problems do not lead to severe ones.



Regulated injection axis

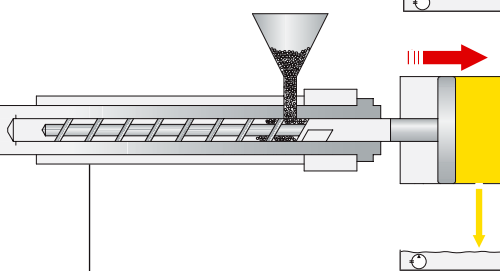
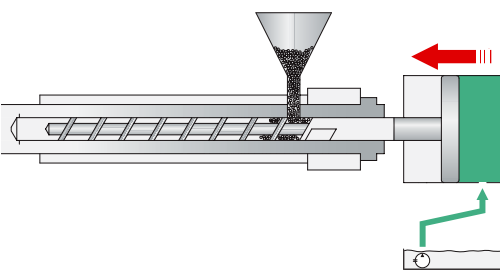
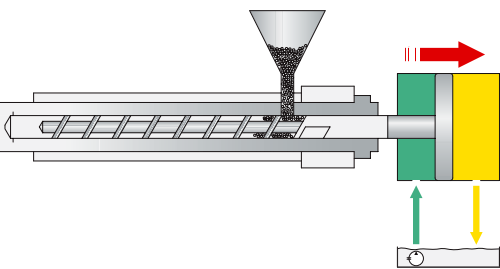


Diagram 1 and 2 from the top: axis regulation via "restrained system" with the position-regulated screw.

Diagram 3 and 4 from the top: standard, single-acting cylinder with return-flow throttle.

In the injection moulding process, precision bears a direct relation to the dynamics and reproducibility of the injection movement. The independently-regulated injection axis of the position-regulated screw (PRS), which is optionally available for all fully-hydraulic ALLROUNDERS, offers optimum process reliability.

As a standard feature of hydraulic drives, the injection axis – as with all the other movement axes – is driven via the regulating pump. Pressure is applied to one side of the hydraulic cylinder, while the return of the fluid to the tank is throttled during the change in the direction of movement (plasticising procedure). The injection speed is regulated via the stroke measurement system and the time, enabling a highly accurate speed profile to be achieved. The injection piston can however only be actively accelerated and not decelerated. The inertia of the injection axis and the resistances in the plasticising cylinder thus inevitably influence the dynamics and reproducibility of the system.

The position-regulated screw (PRS), which is optionally available for the fully-hydraulic ALLROUNDER, can "brake" with pinpoint accuracy. This high degree of positional accuracy is achieved by means of a differential cylinder. Pressure can be actively applied to both sides of the injection piston, enabling the screw to

be accelerated and also decelerated rapidly – for this reason, such a system is sometimes called a "restrained system". Precise braking is effected by means of pressure applied to the opposite side of the piston via the valve when a specified mark or "position" is reached. The regulation parameters are the screw position (stroke measurement) and the pressure difference between the injection and retraction side of the piston, whereby highly accurate operation with regard to position, speed and pressure is possible.

The control circuit and sensor system are located directly at the injection axis and are completely independent of the regulating pump. The valve, which is mounted directly to the injection unit, reacts accordingly rapidly and the short column of oil from the valve to the cylinder leads to significantly better switching dynamics. When the valve opens, a high power density is immediately available to the hydraulics as the system is pre-loaded by means of the pump. This results in short pressure build-up and reduction times, which in conjunction with the pressure differential regulation, ensure accurate injection speed and holding pressure profiles.



Photo: Ulrich Zipfel

Other dimensions

Individually meeting country-specific requirements and conditions – this is the ARBURG formula for offering the best service to customers. This is often achieved through co-operation with trading partners. Successful examples for this include the companies Comtec IPE in Australia and Aotea Machinery Ltd. in New Zealand, which have both been representing ARBURG for decades.

Local contact persons are available for ARBURG customers both in Sydney (top left) and Auckland (top right). The Australian plastics industry meets every three years at the Expoplas in Melbourne (below).



Photo: Comtec IPE

Australia: A surface area of 7,741,220 square kilometres extending 4500 kilometres along the east-west axis and 3,900 kilometres along the north-south axis and only 19.5 million inhabitants – these statistics best illustrate the dimensions of this large but sparsely populated continent.

This results in relatively small industrial locations situated at large distances from one another. And as service plays a decisive role both in the run-up to and after the sale of the machines, several branch offices are necessary in order to maintain customer proximity at all sites. For this reason, ARBURG's Australian agent, Comtec IPE, strives to establish service centres in all the important states.

In addition to its headquarters in Adelaide (South Australia) with seven employees, the company has branch offices in Melbourne (Victoria) and Sydney (New South Wales) with eleven and four employees respectively.

Here too, figures best illustrate the necessity of maintaining several locations: the distance between Adelaide and Melbourne is 750 kilometres, between Adelaide and Sydney 1400 kilometres and between Melbourne and Sydney 870 kilometres.

Comtec IPE pursues a strategy of co-operation with the global market leaders for the various product categories.

In addition to electrical accessories, household goods, packaging, medical technology, white goods and irrigation systems sectors, many plastics processors supply the automobile industry. These include Schefenacker Vision Systems Australia, a leading global manufacturer of rear vision mirrors. In the electrical accessory sector, Gerard Industries was the first company in Australia to use the MuCell process for their production, using ARBURG ALLROUNDERS.

Comtec IPE was founded in March 2001 with the acquisition of the former ARBURG trading partner Comtec Australia by IPE, previously the company's subagent responsible for the sale of ARBURG machines in Southern Australia.



Photo: Aotea Machinery Ltd

What sounds complicated in fact proved quite simple and advantageous for the Australian injection moulding market: with Comtec IPE Managing Director Bob Parrington and his team, the customers have contact to a great deal of expertise regarding ALLROUNDERS.

1600 kilometres south-east of Australia, ARBURG has also been represented for decades in New Zealand. Right from the start, this task has been performed by the same trading partner, which has operated under the name of Aotea Machinery Ltd. since 1985. The company, based in Auckland, conducts all activities under one roof in its new building: exhibition space, warehouse and service and support centre.

Under the direction of Peter Thompson, a well established ARBURG clientele has been

developed, some 80 per cent of which produce technical parts under licence.

The product line ranges from moulded parts for New Zealand's important dairy and agricultural industry through to the pharmaceutical and electronics sectors. Short product cycles are typical for New Zealand's injection moulders, so that one or two mould changes per day are not unusual.

The pioneering spirit of bygone days is often reflected in New Zealanders' attitude to life. Thanks to their motto "Everything is possible!" they are extremely inventive. Consequently, all manner of conceivable materials and applications are employed by the customers, which according to Peter Thompson, is one of the main reasons for ARBURG's popularity thanks to its modular and flexible products.

INFO TRADE FAIRS

Expoplas

Melbourne, Australia, 2005

Open House AOTEA Machinery Ltd.

Auckland, New Zealand, May 2003

EMEX 2004

Auckland, New Zealand, May 2004

ADDRESSES

Australia

Comtec IPE

Headquarters (Adelaide):
1084, South Road
Edwardstown, South Australia 5039

Tel.: +61 8 8374 4633

Fax: +61 8 8299 0892

Branch office (Melbourne):

1 Shearson Crescent,
Mentone Victoria 3194

Tel.: +61 3 9583 9700

Fax: +61 3 9583 9711

Branch office (Sydney):

21/52 Holker Street
Silverwater, NSW 2128, Sydney

Tel.: +61 2 9648 4844

Fax: +61 2 9648 2564

New Zealand

AOTEA Machinery Ltd.

10E Maurice Road
Penrose Auckland 6

Tel.: +64 9 6345 940

Fax: +64 9 6345 459

MILESTONES



The development of the unscrewing unit, which has gained considerable significance for the automated production of moulded parts with internal and external threads, began rather unspectacularly according to reports in 1968 at ARBURG as an “unscrewing device for unscrewing single or multiple threaded parts in the mould”.

This first universal hydraulic unscrewing unit was used for the first time in the ALLROUNDER 200S. It was a great success from the very beginning. With this peripheral device, ARBURG was able to once again provide decisive innovative input in the automation of injection moulded plastic parts.

The procedure for demoulding internal threads prior to the development of hydraulic unscrewing units made the use of rack and pinion devices, tapered threaded spindles, sometimes with very high transmission ratios, or slides and followers necessary. A manual finishing stage was also sometimes necessary for the parts. Threaded cores had to be removed in a separate operation. However, working with two-part slide or split moulds was also problematic owing

to the resulting mould seam on the thread. The use of unscrewing units not only meant significantly more precise thread profiles, but also time and cost savings in production.

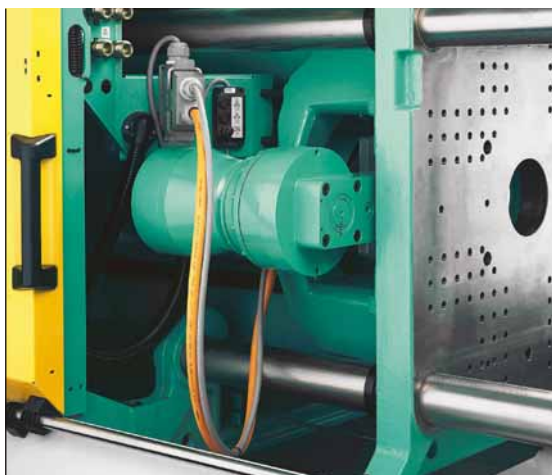
In 1977, the ARBURG range already included unscrewing units on the fixed and moving mould halves for all fully-hydraulic, centrally-closing ALLROUNDERS. This meant that numerous situations and problems with regard to the unscrewing of threads were solved. During the same year, an unscrewing unit for use in machines with core pull control was introduced.

Even the first unscrewing units were universally adaptable. Further developments enabled, for example, unscrewing in the mould parting line, transverse to the demould direction and direct mounting of the unscrewing units to the moulds. Advantage: the mould and unscrewing unit were always precisely matched, and the mould could also be easily changed together with the unit.

In order to enable path-limited unscrewing, two cams were adjusted on a vernier graduated dial; time-controlled unscrewing via machine control programming was a later development.

In addition to time and stroke-controlled unscrewing via the machine control and various unscrewing programs, current units can also be driven in with a fixed end stop. Advantages here include increased mould reliability and improved reproducibility of thread depth.

Of course, the development of unscrewing units continues. “High-precision electrical unscrewing” is the term that best describes the current status of development in this field.



Servo-electric: The latest generation of ARBURG unscrewing units is driven electrically, either directly at the mould or on the machine.



TECH TALK

Dipl. Ing. (FH) Marcus Vogt Technical Information

Hydraulic filter elements for long service life

Hydraulics is regarded as an extremely reliable technology. It is no accident that hydraulic injection moulding machines with a daily operating time of 24 hours have a service life of more than 30 years – provided careful maintenance is observed.

Hydraulic fluid deserves special mention in this context, as the most frequent causes of failure of hydraulic components can be attributed to solid particle contamination in the hydraulic fluid. These particles principally affect the fit of certain components such as valve seats or piston clearance in the cylinder. In addition to the risk of total failure of a component, increased

wear of the fit clearances is a serious problem as this jeopardises process reliability. The more a system is subjected to abrasive wear, the more the hydraulic fluid is contaminated with particles so that the problem of contamination and wear is exacerbated.

In order to improve the ultra-fine filtration of the central hydraulic system, ARBURG has for some time been using filter elements for a particle size of 3 µm as standard. The glass-fibre fleece is significantly more effective than the 10 µm paper filters used to date. This increased performance is particularly evident during installation and commissioning of new machines: the interval for the first replacement of the filter element has been increased from 300 to 5000 operating hours.

The advantages of the improved ultra-fine filtration are significant long term. Reduced wear to the hydraulic system increases the service life of the components and guarantees a higher degree of process reliability. Costly machine downtime is reduced.

Of course, the filter elements are not exclusively for use in new machines. As genuine ARBURG spare parts, they can be retrofitted to existing series of ALLROUNDER models already in production.

Quality has its price!

Genuine: ARBURG ensures the highest quality for its spare parts.



Of course, it is possible to purchase cheaper, copied spare parts. The question is, however, for how long they remain satisfactory and production remains trouble-free. Purchasing from ARBURG means being confident of receiving quality based on well-founded expertise.

A good example is the spare and replacement parts for plasticising units. Screws, screw tips, non-return valves, cylinders, heater bands – all these components are specially adapted to their respective applications in the case of genuine ARBURG spare parts. The development chain “Problem – Planning – Design

– Production – Field Testing” is pursued consistently, resulting in the corresponding product quality and service life.

Certainly, genuine spare parts are a little more expensive owing to this continuous and consistently systematic development approach. Nevertheless, the extra cost is always offset by the generally longer service life of the high-quality components as through the demand for subsequent service. Highest spare part quality at a matching price/performance ratio with expert consultation, individually tailored spare part packages and immediate delivery for the shortest possible downtimes are only available from ARBURG. Regular maintenance proposals and the low-cost ordering option via

the Internet complete the ARBURG service. On no account should this wealth of expertise be dispensed with, even in the spare parts sector. The question to be asked – particularly with regard to the sensitive plasticising process – is whether savings are achieved in the long term through the installation of non-genuine parts, thereby not only risking the possibility of quality loss, but also of consequential damage, the repair of which can prove very expensive.



ARBURG modularity makes it happen! The right size, indi-



vidual model and appropriate drive type to suit every requirement. Whether it be the ALLROUNDERS with clamping forces of 150 to 4,000 kN or the MULTILIFT robotic systems – all our products are of modular construction and can be individually configured. And with the universal SELOGICA user interface you have everything safely under control. Take advantage of our modular range.

ARBURG GmbH + Co
Postfach 11 09 · 72286 Lossburg
Tel.: +49 (0) 74 46 33-0
Fax: +49 (0) 74 46 33 33 65
e-mail: contact@arburg.com

ARBURG