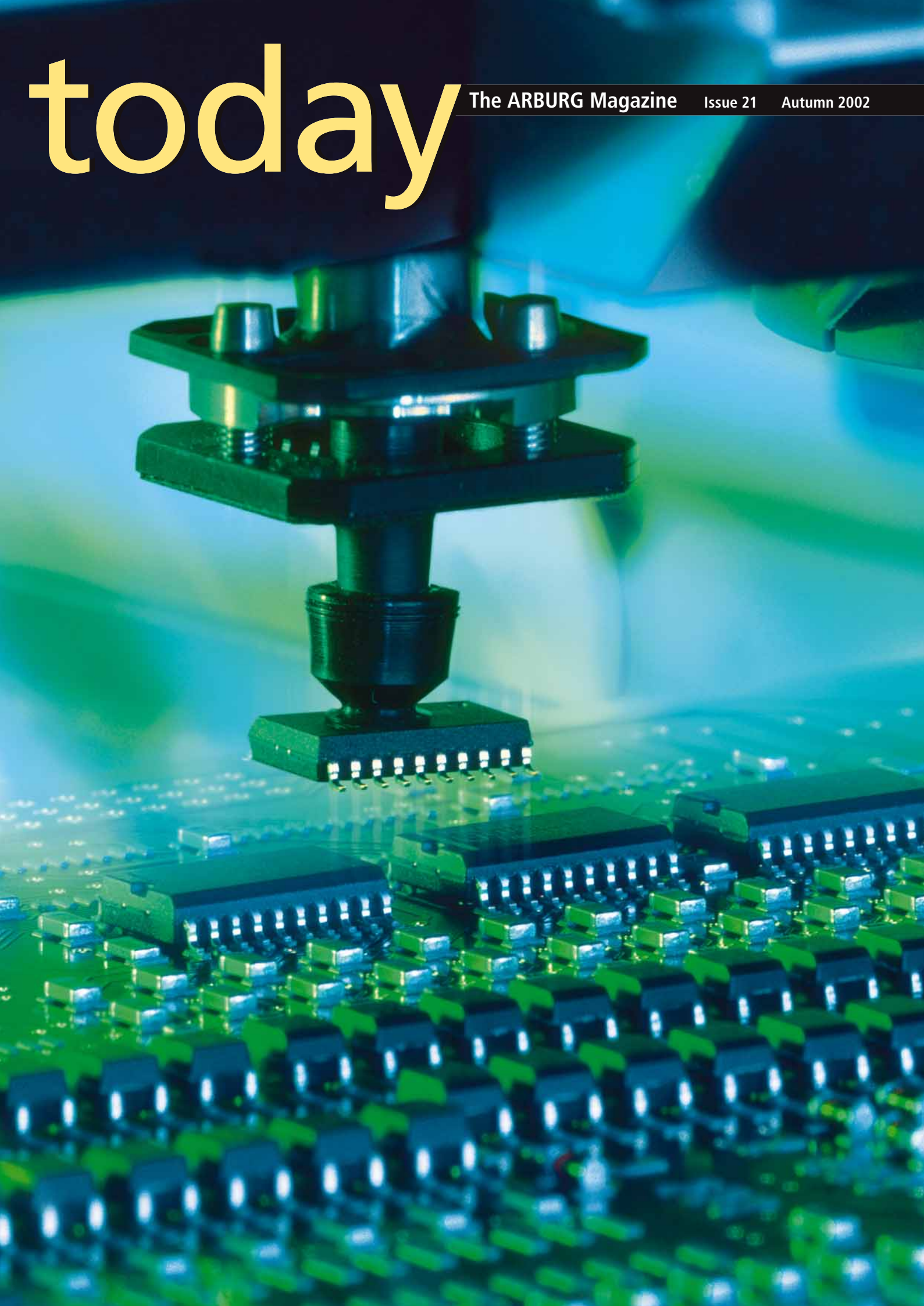


today

The ARBURG Magazine

Issue 21

Autumn 2002



- 4** **Fakuma 2002**
New ALLROUNDER, new exhibition
- 6** **Customer Report**
Oskar Voltz GmbH: Precision - part for part
- 8** **Tips & Tricks**
Be better prepared!
- 9** **PRELINERs**
Simply horizontal
- 10** **Trade fairs**
Double success
- 12** **Customer Report**
Essel Propack Ltd.: Tubes for the world
- 14** **Service**
Satisfied customers
- 15** **Electronics**
Doing it yourself makes sense!
- 16** **Eastern Europe**
Eastern Europe - the market of the future
- 18** **History**
Milestones
- 19** **Tech Talk**
Hard - soft compounds of thermoplastics and liquid silicones (LSR)



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Circuit board production in our own SMD plant. ARBURG ensures the high quality of its electronic components through in-house production.

ARBURG



Dear Readers,

We've done it! The extension of the ARBURG machine range to include clamping forces of 4000 kN will be completed after a three-year period with the introduction of the ALLROUNDER 820 S. Thus, the "ARBURG—The New Dimension" campaign has achieved its objectives. An extensive machine range with clamping forces from 150 to 4000 kN and a wide range of modular concepts are now available. Whether it relates to the construction of the machine or the injection system, the robotic system or the drive technology—the options available allow the design of a machine to be tailored to your specific requirements. Those who now continue to refer to ARBURG as a producer of small injection moulding machines are either behind the times—or they have not had any contact with the company for a long time. But of course it goes without saying that in integrating the larger clamping forces into our programme we are not going

to neglect our traditional range of clamping forces. Due to substantial depth in in-house production and its hard work in the field of production, ARBURG can do one thing without having to neglect the other.

And the ALLROUNDER ALLDRIVE (known under the abbreviation "A"), which was first introduced at the K 2001, is a good example of this. Modular drive systems take the production requirements of our customers seriously and provide ideal optimisation.

If you know our company well you will already be aware that the ALLROUNDER 820 S won't be the only innovation which ARBURG is going to introduce at the Fakuma, Europe's largest plastics trade fair. Because the motto "doing one thing without having to neglect the other" also applies here too.

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

Yours,



Herbert Kraibühler



New ALLROUNDER, n



Photo: Messe Friedrichshafen

The new exhibition center in Friedrichshafen - more room for exhibitors and visitors, more convenient to get to.

The Friedrichshafen exhibition centre will be presenting its new look at the Fakuma 2002. There are superlatives everywhere you look. And ARBURG has also made plans for a presentation of the superlative kind for the first Fakuma in the new centre. This is because the company has achieved its aim of extending the machine range to a clamping force of up to 4000 kN with the world premiere of the ALLROUNDER 820 S from 15th to the 19th October.

With a completely new design and only two kilometres away from the old exhibition centre, the new halls in Friedrichshafen, near to the airport, now provide a total area of 62,300 square meters, a 12,000m² outdoor area, 5000 parking spaces for visitors and around 12000 for exhibitors.

The newly designed, 940m² ARBURG exhibition stand in Hall A 3, stand number 3035,

which, with numerous other exhibits and innovative applications, will present the extensive performance spectrum of the ARBURG product range, will be the appropriate backdrop for the ALLROUNDER premier.

The expansion of the machine range to incorporate clamping forces up to 4000 kN has been driven forward with determination over the last three years under the slogan "ARBURG— The New Dimension".

In addition to the proven components of the S machines, the ALLROUNDER 820 S has mould

INFOBOX ALLROUNDER 820 S

Clamping force: 4000 kN

New unit size: 3200

Maximum shot capacity: 1860 g PS

Screw diameter: 70, 80 and 90 millimetres

Distance between tie bars: 820 millimetres



ew exhibition

height adjustment and fixed-routed cooling water circuits on the fixed and movable mould platens. The fully-automatic mould height adjustment allows the entire clamping unit to be adjusted to suit the relevant mould height. With the new ALLROUNDER 820 S the maximum mould/ platen distance is infinitely adjustable between 1050 and 1550 millimetres and the stroke path can be programmed using the SELOGICA control system.

Rapid-connect couplings are used to connect the temperature control circuits to both clamping platens. The entire injection unit is supported on a central, rotating turret to allow the cylinder or the screw to be changed and cleaned without difficulties.

In addition to this, ARBURG will use other exhibits to demonstrate the numerous applications which the company's injection moulding technology can be utilised for.

● With the smallest ALLROUNDER 220 S with a clamping force of 150 kN in the field of micro injection moulding

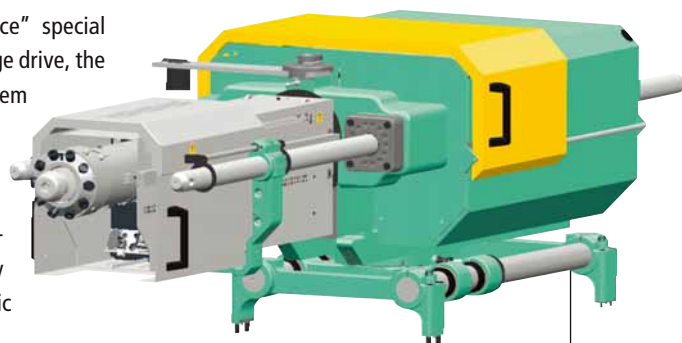
● With an ALLROUNDER 630 S for economical multi-component injection moulding

● With entire production cells for processing LSR or thermosets

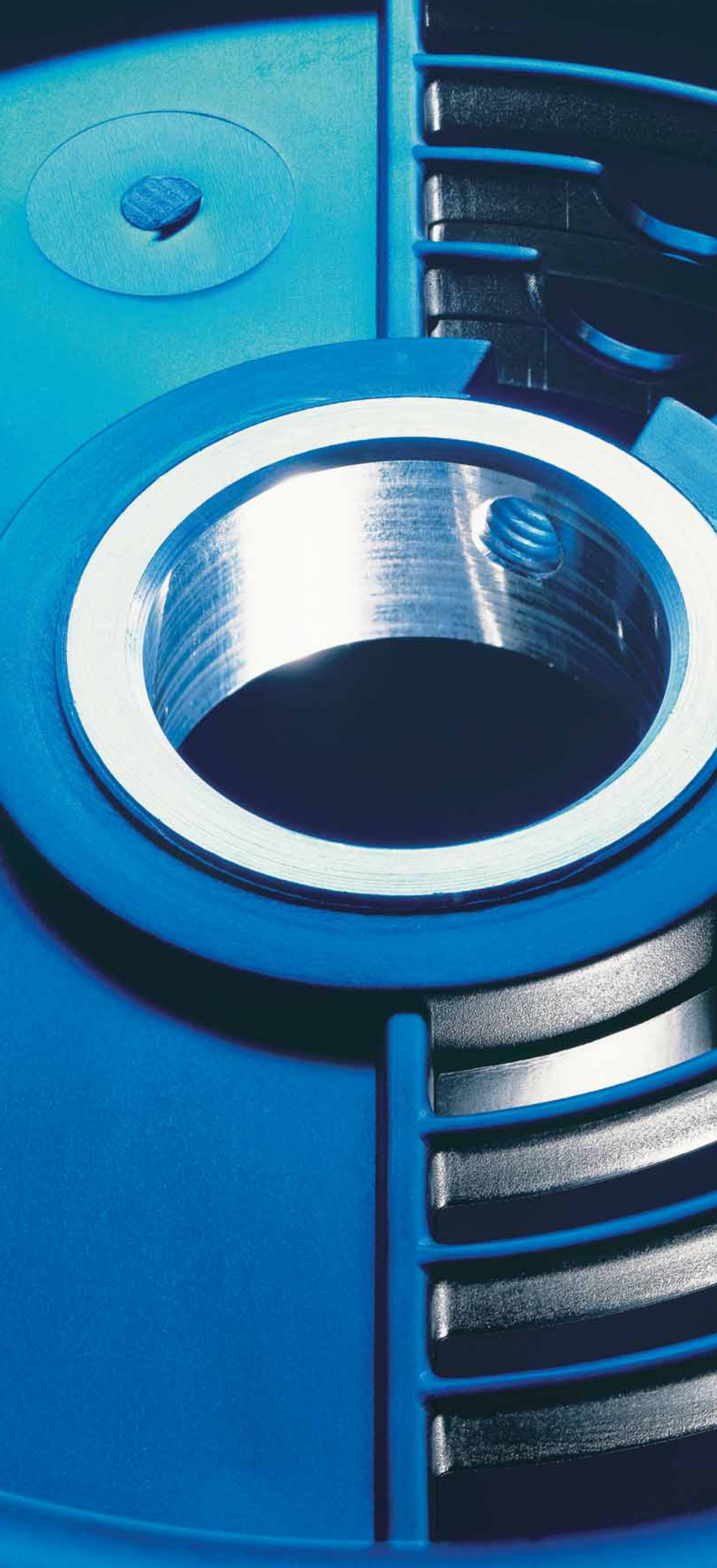
● On the topical issue of "modular drives" with the ALLROUNDER C "advance" special model with electro-mechanic dosage drive, the ARBURG AES energy saving system and position regulated screw

● With the ALLDRIVE series and its modular drive technology, for which the three main axes have servo-electric drives and the auxiliary axes that have hydraulic and electric options.

The presentation of the horizontal and vertical ARBURG robotic systems MULTILIFT H and V rounds off the ARBURG exhibition programme in the peripherals sector.



Moulded parts with weights of up to 1,860 g of polystyrene can be produced with the new size 3200 injection unit.



Plastics injection moulding: precision - part for part - this is the company slogan of Oskar Voltz GmbH. And a great deal is done to live up to these high standards, from the selection of the machines, which the employees are asked for their opinion on, and the development of new products and their series production in the highly-modern production site in Hungary, to long-term planning for the future.

Precision



More than 50 years ago Oskar Voltz, the father of the present managing directors, Joachim A. Voltz and Günter Voltz, founded a turning shop in Reichenbach/Fils. The plastics division, which was added later, grew continually and today comprises the sole business sector for Oskar Voltz GmbH.

Most Voltz products find application in the automotive sector - mainly in the interiors and sun protection fields, but recently in the exterior sector too with parts for wing mirrors and complete indicators. Other sectors are electronics, with plugs for the automotive and electronics industries as well as the aeronautical and space branches, and consumables sector, including white goods, as well as the machine construction branch. Thermoplastics are used for technical parts, including TPE, however reinforced polyamides are used predominantly.

An important milestone was the founding of the subsidiary Voltz Hungária Bt. in Györladamer, Hungary, approximately 50 km from the Austrian border. In 1997 the company moved into the new building with a production area of 1000m². This area was quadrupled as early as the year 2000. Today, 170 people are employed there in a three-shift system with a machine fleet which currently includes 24 injection moulding machines, 17 of which are ALLROUNDERS with clamping forces of between 150 and 1600 kN. Both sites are certified in accordance with DIN EN ISO 9002, certifica-

tion in accordance with TS 16949 is in the preparation phase.

Joachim A. Voltz told us why the company in Hungary is so successful. "In Hungary we have provided a state-of-the-art production plant with the best equipment, brand new machines and modern moulds in order to produce quality products." The concept has been a great success and so a large proportion of the series production has been moved to Hungary where complete assemblies are mounted in addition to the injection moulding activities.



Filigree construction -
a section of a high-speed turbine.



on - part for part



Photo: Voltz

INFOBOX Voltz

Founded: 1949

Plants: Oskar Voltz GmbH in Reichenbach/Fils, Germany, and Voltz Hungária Bt., Hungary

Corporate group: Has been integrated into the BOS Group since 2002

Employees: 60 (GER), 170 (HU)

Core areas of expertise: Automotive (mechanical parts and electrics), machine construction, technical consumer goods, the electrical industry, the fittings industry, electronics, as well as the mountings and pharmaceutical industries.

Production area: 1,500 m² (GER), 4,000 m² (HU)

Company headquarters: Leintelstraße 1, D-73262 Reichenbach/Fils, www.voltz-plastics.de

The vigorous growth in Hungary led to a structural change at the German site. Although Management and Sales are still located there, the focus is changing from traditional series injection moulding towards technological sectors. At this site, products are prepared for series production, including all the development, pre-testing and sampling. 21 injection moulding machines are employed, 16 of which are ALLROUNDERS. Therefore the fleets of machines available at both sites are almost identical in terms of size and equipment. In conjunction with the provision of moulds and the appropriate data records, the requirements for optimised series production in Hungary are therefore being met.

In addition to this, the Voltz staff are included in decision making for the purchase of new machines. This is mirrored in the product quality and in the extremely low level of staff fluctuation. ARBURG has proved to be the desired machine manufacturer time and time again in these surveys, which Joachim A. Voltz puts down to the standardised, convenient SELOGICA control system as being one of the main factors. Furthermore, he welcomes ARBURG's entry into the higher clamping force

range, as well as developments with respect to robotic systems which will certainly be used in the future.

The long term planning with regards to the company's survival and safeguarding jobs shows that the future is a major area of focus at Voltz. The long-standing Voltz customer BOS, global leaders for sun protection systems and cargo room coverings has found an ideal solution in the fact that there are no successors from within the family - the company was integrated into the BOS Group in January 2002. "Under the umbrella of the BOS Group, synergies can be exploited, orders can be placed strategically and new sectors can be opened up, such as the use of two-component injection moulding machines or in gas injection moulding technology," stated Joachim A. Voltz, explaining the advantages.



Be better prepared!

On site service inspection - an ARBURG service engineer checks the quality-relevant machine and control parameters.



When nothing can be done because the production process has been brought to a standstill by an unexpected machine shutdown, not only do extra costs arise, but the entire production plan is thrown into confusion as well. In order not to leave anything to chance ARBURG offers its customers the opportunity of achieving maximum machine availability by means of service inspection contracts—at a calculated price.

The basic requirement for reliable machine technology is maintenance in accordance with the machine's manual. Oil and filter changes, as well as lubricating the movable machine parts can be carried out by the users themselves. In addition to this ARBURG offers its customers the opportunity to have the actual condition of their ALLROUNDER regularly

checked over via service inspection contracts. Within the framework of these annual checks, an ARBURG service engineer tests and assesses all the important machine elements for wear and tear, function and safety. These preventative maintenance measures can make sure that shutdowns and subsequent damage are detected early, thus ensuring maximum availability of the injection moulding machine.

Also during the inspection, all quality-relevant machine and control parameters are defined, they are then compared with the target values in the plant acceptance documentation and recalibrated by the ARBURG engineer if required. This also ensures long-term repeatability. An important benefit if moulds are changed often is that the mould data records remain valid and the parameters do not have to be adapted due to the change in the machine's current condition. If several identical ALLROUNDERS are being employed the moulds

can be used on different machines without the need to adapt the data record significantly—thus planning the production capacity becomes considerably more simple and flexible.

And of course, all inspection activities and measurement values are logged and documented so that the customer is regularly provided with verification of the quality status of his ALLROUNDER. For instance, this machine "CV" can be used as evidence of preventative maintenance within the framework of certification. The same applies to the assessment of the process capability, whereby the injection moulding machine becomes a reliable constant within the process chain.

The inspection contracts ensure safeguards during planning in two respects - firstly, the fixed costs can be planned and secondly, the annual inspection date can be included in the production planning. And moreover, the ARBURG service engineer offers advice on maintaining and caring for the ALLROUNDER during the inspection.



Optimised for producing small series -
PRELINER production cells.

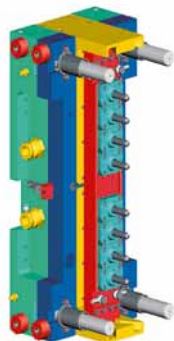
Simply horizontal

Anyone in Production instructed to produce small-series performs must also be able to modify them with appropriate speed and ease. This requires a high degree of system flexibility.

With the PRELINER H, ARBURG can provide complete systems which integrate all the stations, from material preparation to injection moulding, placement and finishing, and which can be operated via the central SELOGICA machine control system.

The technology is based on the conventional ALLROUNDER 420 C which is appropriately adapted. The fact that customers only have one point of contact as the primary contractor from the planning stage, through the design and implementation to commissioning and service, is of great benefit.

In the medical and cosmetics sectors in particular, flexible production of smaller lot sizes is becoming more and more in demand. Customer inquiries in the household cleaner bottle production sector are also increasing appreciably. The more important a role design assumes in these sectors and the shorter product life-cycles become, the more important production plants will be-



come which can easily adapt to new production conditions, not only with respect to moulds but to the entire operation as well.

The PRELINER H is also distinguished by optimum cost-effectiveness. As the systems are of a low design, they can be set up almost anywhere. Any amount of cavities can be achieved, from single to 16 cavity moulds.

Careful, homogenous material preparation is achieved by means of specially designed plasticising screws and the electro-mechanic dosage drive. Simultaneous dosage together with hydraulic machine movements allow shorter cycle times and have a positive effect on energy usage.

The modular mould construction with a mould base and cavity inserts ensures that changing preforms is simple. Threaded slides can be used for several perform geometries in some cases.

A robotic system on the basis of the MULTILIFT H, optimised specifically to meet the requirements of perform production, ensures fast removal and intensive post cooling of the preform. Quick adaptation to other preform geometries as well as different numbers of cavities can also be achieved with this system. The design of the PRELINER H clearly shows that ARBURG has a practise-oriented view of preform produc-

tion, thereby proficiently simplifying the customers' work in the factory.

PRELINER



A gripper guide (top) ensures accurate positioning of the removal robot.

The preforms are removed and cooled at the cooling station (bottom) and then transported for further processing.

A great deal of interest in the ALLROUNDER 720 S during the Europlast in Paris.

Serge Cannito, Subsidiary Manager, ARBURG S.A.S.



Serge Cannito, ARBURG S.A.S., on the Europlast -

"The Europlast is the first port of call to find out about the newest technological developments, especially for injection moulding companies from France and the North African countries. Around 85 percent of the trade visitors came from France. Other important facts and figures on Europlast 2002: 25,000 visitors, 3,800 of which came from 77 countries, 917 exhibitors from 40 countries who presented their products and services in an area of 55,000m², as well as 129 journalists from 16 countries.

But let's get back to ARBURG - the exhibition was a great success for our company. Al-

We were especially pleased that we were not only able to welcome many of our regular customers to our stand, but that we also had the possibility to establish new and interesting contacts.

I was involved in the conference presenting a paper on the subject of leasing machines and I attended the conference on electrical injection moulding machines together with Eduard Stücker, employed in International Technical Support (ITS), who gave the participants a graphically illustrated presentation on the ARBURG modular concept during the visit to our stand which followed.

A summary of the Europlast - the thoroughly positive feedback and interest shown by our

Double success



In June, ARBURG recorded successes at both the Europlast trade fair in Paris, which has been established for a number of decades and first took place in 1962, as well as at the Scandinavian Open in Hvidovre/ Copenhagen, the in-house event organised for the first time by the Danish subsidiary and the Scandinavian trading partners. The two subsidiary managers provided reports on the events.

though the 444 visitors to our stand was less than we recorded for the last Europlast in 1999 we were nevertheless extremely satisfied with the response. Despite the current difficult market situation our customers showed a great deal of interest in both the ALLROUNDER 720 S, which was sold during the fair along with other machines, and the ALLROUNDER 420 A. Several customers have already expressed an interest in carrying out trials on this machine in order to put the 420 A to the test.

customers, above all in the large ALLROUNDER and the ALLDRIVE series with modular drive technology, demonstrated that ARBURG's concept is taking off and that we can look forward to a positive future."



Eddie Oswald,
subsidiary manager,
ARBURG A/S

with 600 m² in which to display 7 exhibits representing a cross section of the ARBURG product range.

The concept really took off. Our customers had not expected such a wide variety of machine technology—ALLROUNDERS from the S, C, K and A series as well as the MULTILIFT H robotic system—and they were therefore suitably impressed. And it was not only the exhibits which made an impact on the 358 visitors which we received during the show, including our largest customers from Denmark and Sweden, but also our two experts Karl Epting, from ITS, and Renate Würth, from the Export department, who gave presentations on the topics of the ALLROUNDER ALLDRIVE and

the seating areas for discussions were almost continually occupied. In addition to the customers, journalists from Sweden and Denmark were also present on the first day. Among other topics they listened to an explanation of the ARBURG Scandinavian network. A good example of how this network can work was an enthusiastic customer from Finland who used the visit to take a first hand look at the production site of one of his Danish customers. Our summary of the event - the Scandinavian Open was a great success!"



Photos right: M. Hjulær

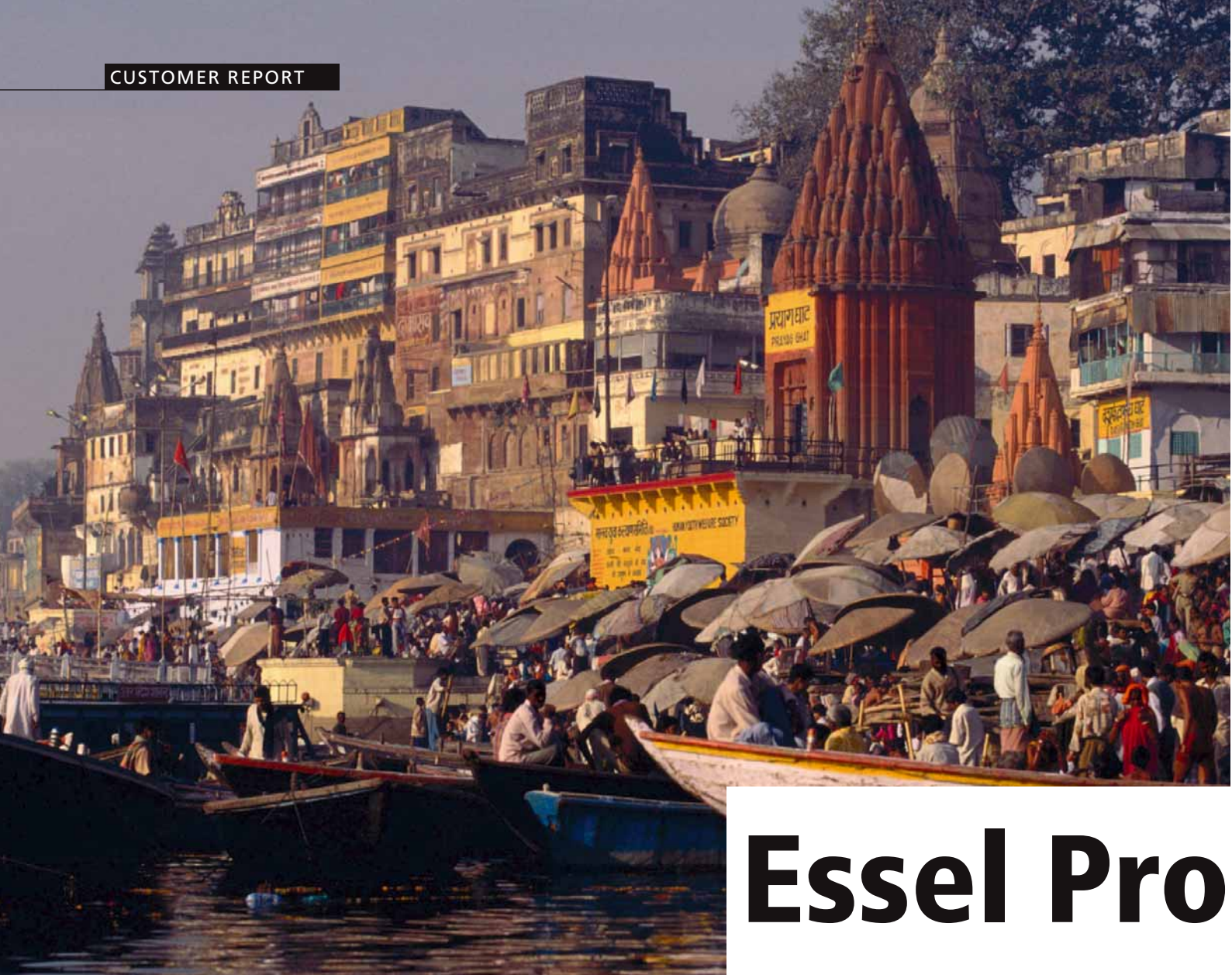


Eddie Oswald, ARBURG A/S, on the Scandinavian Open -

"As there was no large-scale plastics trade exhibition in Scandinavia this year, we immediately decided to organise our own in-house exhibition, the Scandinavian Open, together with our trading partners from Finland, Sweden and Norway. The date was strategically advantageous as the Scandinavian economy is experiencing an upturn. We were able to hire suitable premises in the near vicinity. This provided us

ALLROUNDER C advance. This figure is particularly remarkable at the present time. But it was not only the number of visitors which provided evidence of the success of the Scandinavian Open, but also the feedback which was positive throughout. A few customers even telephoned us in the evening to congratulate us on a successful event. Further evidence of success was the fact that the entire sales team from Denmark, Finland, Norway, Sweden and Germany hardly had a moment's rest and that

As there was not a suitable regional trade exhibition in Scandinavia, ARBURG organised the Scandinavian Open in Denmark as an in-house exhibition.



Essel Pro

Tubes for the world

Essel: the world's largest manufacturer of non-metal packaging tubes has its headquarters in India, from where global production is coordinated.

If you can dream it, you can do it! Walt Disney's famous saying is also the motto of Essel Propack Ltd. (Essel), a company owned by the globally operating Essel Group of Industries. Essel, the world's largest manufacturer of laminated tubes, produces these and other packaging solutions primarily for the cosmetics and pharmaceutical industry, but also for detergent and cleaning agent producers as well as large producers of food stuffs. Under the leadership of Cyrus Bagwadia, Essel has developed into a multinational enterprise.

Tubes for tooth paste, cosmetics, medicines

and creams— Essel produces this and much, much more for companies such as Colgate, Unilever, Smith Kline Beecham and Procter & Gamble.

The company became the world's largest manufacturer in its sector due to the acquisition of the tube production of the Propack group in the year 2000. In addition to the site in India, this also provided them with factories in the Philippines, Columbia, Venezuela, Indonesia, China, Mexico and Germany. Essel U.S.A. is scheduled to begin tube production within the first three months of next year.

The Essel Propack philosophy is consistent with the rapid growth of the company as well as the environment in which it operates.



Customer satisfaction is of utmost importance and this is achieved through an unwavering focus on their requirements, no-compromise on quality control and cost effectiveness through strategic partnerships with suppliers and customers. Trust, brought about by operating transparently in accordance with the motto "We do what we say we're going to do", teamwork and a secure working environment characterised by motivation are the other key points of the strategic business orientation which allows the development of a solid basis between the company and its customers.

Technical equipment at the Essel sites all around the world played a significant part in Essel Propack's rise to become the world's



use of machines, faster throughput times and mould changes, improved efficiency, lower production and material costs as well as reduced material consumption. In order to achieve this, internal and external benchmarks are used and maintenance systems

are implemented, the purpose of which is to discover where potential savings are possible under "real conditions". Essel also produces lids and sealing systems for their tubes. Essel Propack have good reason to put their trust in the ALLROUNDER injection moulding technology too. The reliability, economy and long service life of the machines and aggregates are attributes which this company also places its faith in. All seal production is carried



Photo: Essel

propack Ltd.:



Photo: Essel

leading "non-metal tube manufacturer". The company places great importance on the use of the most up-to-date machine technology and on a high level of automation in production. This "hardware deployment" goes hand in hand with a targeted product and process development policy. Two independent Essel teams are working simultaneously in this department. One in close contact with the customers in order to be able to bring new products onto the market with additional, interesting specifications. The second team carries out checks with a focus on more effective

tems are implemented, the purpose of which is to discover where potential savings are possible under "real conditions". Essel also produc-

es lids and sealing systems for their tubes. Essel Propack have good reason to put their trust in the ALLROUNDER injection moulding technology too. The reliability, economy and long service life of the machines and aggregates are attributes which this company also places its faith in. All seal production is carried out on 17 ALLROUNDERS from the H and M series in Mumbai/ India as well as on two additional 520 M 2000-675s in the Chinese manufacturing site near Guangzhou. In addition to this many of the tube production lines in operation worldwide have been equipped with injection units 55 from the ALLROUNDER 221 K. In this way ARBURG has played an important role in the Essel Propack Ltd. global success story.

INFOBOX Essel Propack Ltd.

Market share: 28%, the world's largest manufacturer of laminated, non-metal packaging tubes

Development: 1984 The beginning of tube production in India, 1993 Entry into the international market, 1997 Formation of a production plant in Guangzhou, China, 1999 Joint venture in Dresden (D), 2000 Take-over of Propack's tube production

Business presence: Eleven countries, 16 production sites

Output: 2.7 billion tubes/ year

Employees: 1000 +

Info: www.esselpropack.com



Satisfied customers

© (Alexander Walter)/Getty Images.

Who does not say this is one of their objectives, or so you may think. However at ARBURG this sort of lip service has never been important, but the genuine satisfaction of the ALLROUNDER users. And we are trying to achieve this with all the means at our disposal because customer-oriented activities are not just a marketing trend but a necessary factor for a successful company.

In order to discover how customer satisfaction with the ARBURG service provision is developing a series of investigations are carried out at regular intervals. An important tool are the reports on the market situation which are provided by the field workers in which the basic data from ARBURG is determined and the competition is monitored. Aspects which

are compared are quality, service and delivery times as well as cost-effectiveness. The Marketing department systematically analyses the data and passes them onto the company managers responsible.

The results of independent market studies, which are carried out at regular intervals, supplement our own findings and are incorporated into strategic decision-making at ARBURG.

The third component used in assessing customer satisfaction is the evaluation of customer training courses. This is investigated in the training centers and the subsidiaries by means of an in-house questionnaire. This ensures that the training program can be perfectly adapted to suit customer requirements. Other assessment factors are press reports, the product failure rates, the frequency of complaints and the number of contracts not awarded to us.

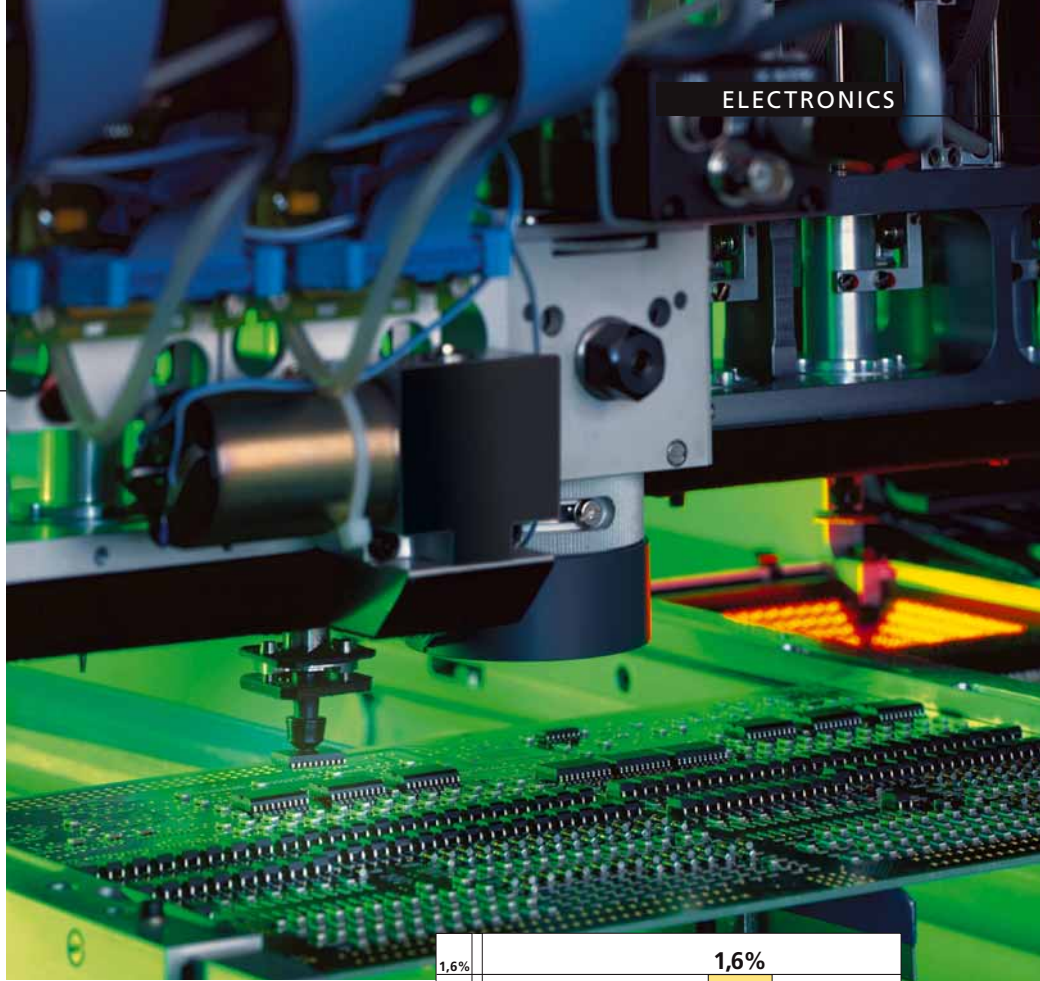
An internal audit on establishing and quantifying customer satisfaction, which was carried out in the spring, provided further information. In future, customer survey campaigns online or within the framework of trade exhibition activities will be intensified. Production problems arising will be dealt with pragmatically with the aim of finding the quickest possible solution. All our customers should feel that they have received the best possible service from ARBURG concerning these types of questions.

The delivery service, the training courses on offer and the availability and expertise of the service department received predominantly positive evaluations. Central recording, assessment and processing of customer complaints by a department especially set up for this purpose will accelerate the implementation of improvements and will further increase customer satisfaction in the future.

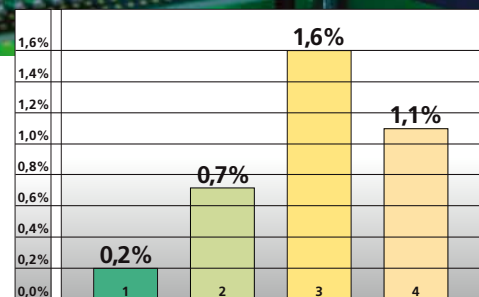
Photo, right: In-house circuit boards are produced at ARBURG using the most up-to-date machine technology and the process is primarily automatic. Statistics prove their high quality.

Photo, bottom: An extensive quality control ensures that only perfect electronic parts are used in the machine.

In addition to the mechanics, the machine control system is one of the most important know-how components of an injection moulding machine. Its complexity demands continual development with respect to both the hardware and the software. ARBURG has been developing and manufacturing these components themselves for many years in order to be able to act quickly and on a customer-oriented basis.



Failures with ARBURG circuit boards (1) in comparison to external producers (2,3,4).



Doing it yourself makes sense!

A development team, comprising of 50 staff members, are responsible for hardware and software for the ALLROUNDER injection moulding technology. They focus not only on



developing new components but also on customer-specific adaptations as well as extensive quality and safety tests. The most up-to-date findings can be implemented practically in a very short time, as close cooperation between Development, Purchasing, Quality Assurance and Production has been ensured. In this way, a modular system has been created which provides customers with exactly the right hardware for the machine and which is needed to produce their parts. Retrofitting is always possible - this is achieved with the aid of new hardware and not only via enhancements by activating software functions. This has a significant effect on the cost.

In the last few years our focus has been the machines' immunity to interference. With the aid of field tests and tests at the customers ARBURG has been working on making

the machines insensitive to electrostatic charges (granulate), voltage fluctuations (power network) or power surges (lightening). An ALLROUNDER supplied today is around four times more immune to interference than the preceding generation. Therefore the company has chosen the correct route - we have the statistics to prove it. Example - failure probability of circuit boards: the suppliers' rates were between 3.7 and 5.4 percent. Our in-house boards have a failure probability of only 1.5 percent. And we were also able to reduce the production costs.



Eastern Europe - the market

Since the opening up of Eastern Europe high-potential future markets have developed in this area. Germany is one of the most important trading partners and direct investors for Eastern European countries. Entry to the European Union is being aimed at under the motto of "Enlargement". Due to the great importance which these countries have for ARBURG, the company was involved very early on through co-operations with representatives and the formation of its own subsidiary.

As a bridge, ARBURG was initially able to take advantage of its many contacts with internationally operating customers from the automotive supplier, electronics and IT sectors, who had formed production sites in the Eastern European countries. The privatisation of former state-owned companies, as well as newly established local companies opened up new potential for customers. ARBURG is working intensively to realise this potential. An important factor to be borne in mind in this respect is that although the countries can be grouped under the collective term "Eastern Europe", they are in fact very different. Therefore, what is important for ARBURG is to take all the local needs and conditions into account and to offer support to the countries on an individual basis. The long-term target from the very beginning was the

formation of a strong service and distribution network. This includes fast, proficient customer service, which is ensured by means of intensive training for all service engineers on site and in Lossburg, a competent sales team, an applications technology consultation service, optimum supply of replacement parts and training adapted to suit the customers' requirements. In addition to this there is also the opportunity to test ALROUNDER technologies on site using demonstration machines. In some of the countries close contact has been established with the universities, which have been supplied with machines.

Expansion was and is undertaken on two fronts, in the tried and tested ARBURG way. ARBURG subsidiaries have been formed in some countries, such as Poland, the Czech Republic and Hungary. The oldest subsidiary in Eastern Europe is in Poland, which will celebrate its 10th anniversary this year and which supports the Polish injection moulding market from its base in Michalowice, near Warsaw.

The second subsidiary in Eastern Europe was founded in 1996 in the Czech Republic with sites in both Prague and Brunn, where a new building is currently being built under the well-known ARBURG design. The subsidiary also has a branch in the Slovak Republic. In 1998 Hungary was added as the newest subsidiary in Eastern Europe with its headquarters in Budapest.

In Slovenia, Russia, the Baltic States and Rumania customers are supported by trade

INFO TRADE EXHIBITIONS

Plagkem

Celje, Slovenia
21st to 24th April 2003

Chemexpo

Budapest, Hungary
23rd to 26th April 2003

Plastpol

Kielce, Poland
20th to 23rd May 2003

International Engineering Nitra

Nitra, Slovak Republic
27th to 30th May 2003

Rosupak

Moscow, Russia
June 2003

International Engineering Brno

Brno, Czech Republic
15th to 19th September 2003

Taropak

Posen, Poland
16th to 19th September 2003

TIB

Bucharest, Rumania
07th to 12th October 2002



Photo: Turismus Büro Hu.

Photo: Siroma Plast

Market of the future

partners. A cooperation contract with Tera in Slovenia was sealed as early as 1997. In the year 2000 partnerships were formed with Transtech in Moscow, which supports customers from the Russian Federation, and Pata, who are responsible for the Baltic customers from their base in Riga/ Latvia.

All Plast Technologies is the newest trading partner and has been representing ARBURG in Rumania since the beginning of 2001. The representative office has operated with great success from the very beginning. A great deal of interest was shown by the Rumanian customers at this year's Technology Days - 50 visitors travelled from Rumania, enduring a coach journey of approximately 40 hours, in order to take a look at the ALLROUNDER production on site in Lossburg.

The trading partners usually provide peripherals for injection moulding machines as well so that entire, individual packages can be put together. In the meantime all the sectors are covered in Eastern Europe, so that there is not only a demand for all the machine sizes, but also for robotic systems as well as two-component injection moulding, the processing of thermosets, elastomers and LSR, gas injection moulding and sandwich technology and the MuCell process.

Examples of budding economic landscapes in Hungary and the Czech republic - Siroma Plast and TRW Carr s.r.o.



Photo: R. Neilley



Photo: R. Neilley

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MILESTONES



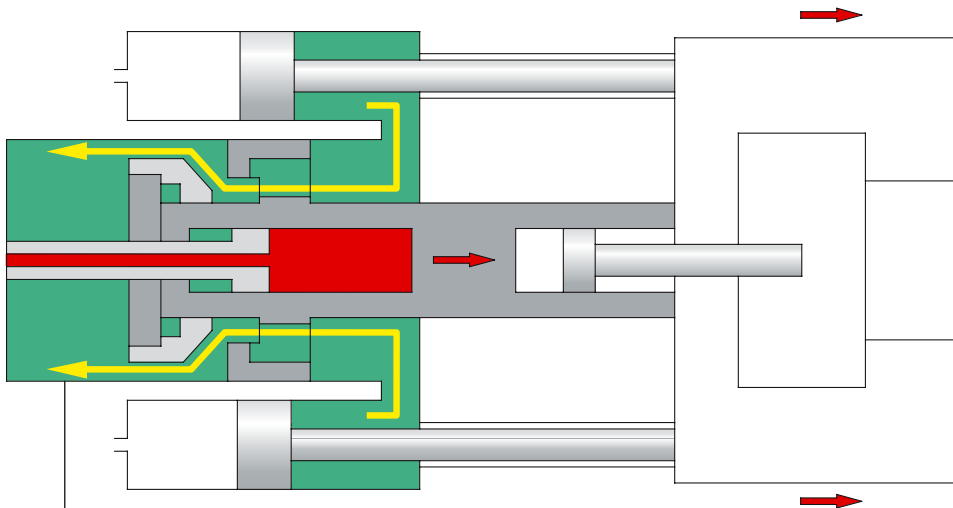
The ALLROUNDER H series, which were the first injection moulding machines in the world to be equipped with the HYDRONICA micro-processor control system in the 1970s, were a quantum leap for the company with respect to technology. Not only

but only a small proportion of it in order to allow fast movements. This makes the system extremely efficient.

For example, when the clamping unit is closed only the small quick-motion piston area is pressurised. This starts the piston rod and the main piston moving. Most of the oil in the main cylinder is moved from one cylinder side to the other via the ring piston.

A sufficiently large area must be pressurised for the subsequent high-pressure build-up. In order to achieve this the ring piston is first closed so that hydraulic oil can no longer escape from the closing side to the opening side of the main piston. Then, pressure is applied to the closing sides of the quick-motion and main piston areas at the same time ensuring that the largest possible area is available to build up the pressure.

Finally, the clamping unit is reopened. This is carried out by the quick-motion piston, ensuring that high opening speeds are possible due to the small amount of oil which has been moved. The principle involved is as follows. Pressure is put on the opening side of the quick-motion piston. The ring piston is opened, which ensures that oil can flow again from the opening side to the closing side of the main piston. The internal oil exchange means that fast movements can be achieved without difficulties. A summary of the fast, low-loss and energy saving clamping system movements on the ALLROUNDER H - the ring piston system on the hydraulic clamping system which only needs the minimum required amount of oil to be exchanged with the oil container. A system that even today is still secured for ARBURG through a patent.



Basic work - most ALLROUNDERS in the ARBURG machine range now operate with the double diameter piston system for high speeds with low pump output. As can be seen above - a schematic diagram of the principle of the Allrounder C functions.

was the machine control system a tasty new technical treat but also the machine's hydraulics. One of the most interesting features of this system was the double diameter piston system on the clamping unit. It sounds extremely complicated but it saves energy and has a positive effect on the speed and accuracy of all machine movements.

Most of today's ALLROUNDER clamping systems work on this principal which allows high movement speeds and clamping forces with low pump output. The oil is exchanged via a ring piston system which does not use the entire amount of oil for the pressurisation



TECH TALK

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

Hard - soft compounds of thermoplastics and liquid silicones (LSR)

Due to increased demands on material properties, thermoplastic elastomers (TPE), which are used in a variety of ways as the soft component in multi-component technology, are sometimes taken to their limits.

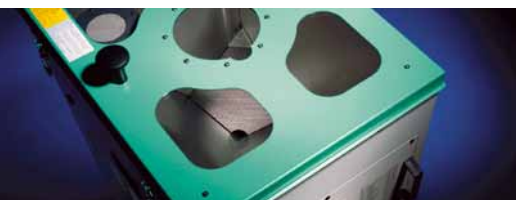
Therefore silicone rubber is increasingly being used as the soft component in many applications due to its excellent properties. LSR can be used even at high temperatures and is characterised by outstanding electrical properties, a high level of resistance to many chemicals and a high level of aging stability. In order to achieve a permanent bonding of the thermoplast and silicone components for the

two component parts, interlocking compounds are mainly used. Another option is to apply a bonding agent to the thermoplast preforms, which can produce a chemical compound of both materials. However in this case fully-automatic production is hardly possible as the process has to be interrupted to apply the bonding agent. In contrast, adhesion-modified silicone types, which already contain a bonding agent, allow uninterrupted operation.

With chemical compounds, mechanical anchoring of the soft component, for example through undercuts or perforations, is not needed, thus simplifying the designing of parts and moulds in many cases. Partner components for silicone with respect to bonding include PA, polyester, PBT, and PPS.

The combination of thermoplast and liquid silicone processing demands a sophisticated mould design. Particular attention must be given to temperature control - at high temperatures LSR cross-links in the mould whereas a much lower temperature level is needed on the thermoplast sections. In some cases each section of the mould must therefore be separated from one another by means of insulation.

Combined drying and transporting



THERMOLIFT 100-2 - powerful, reliable and aesthetic.

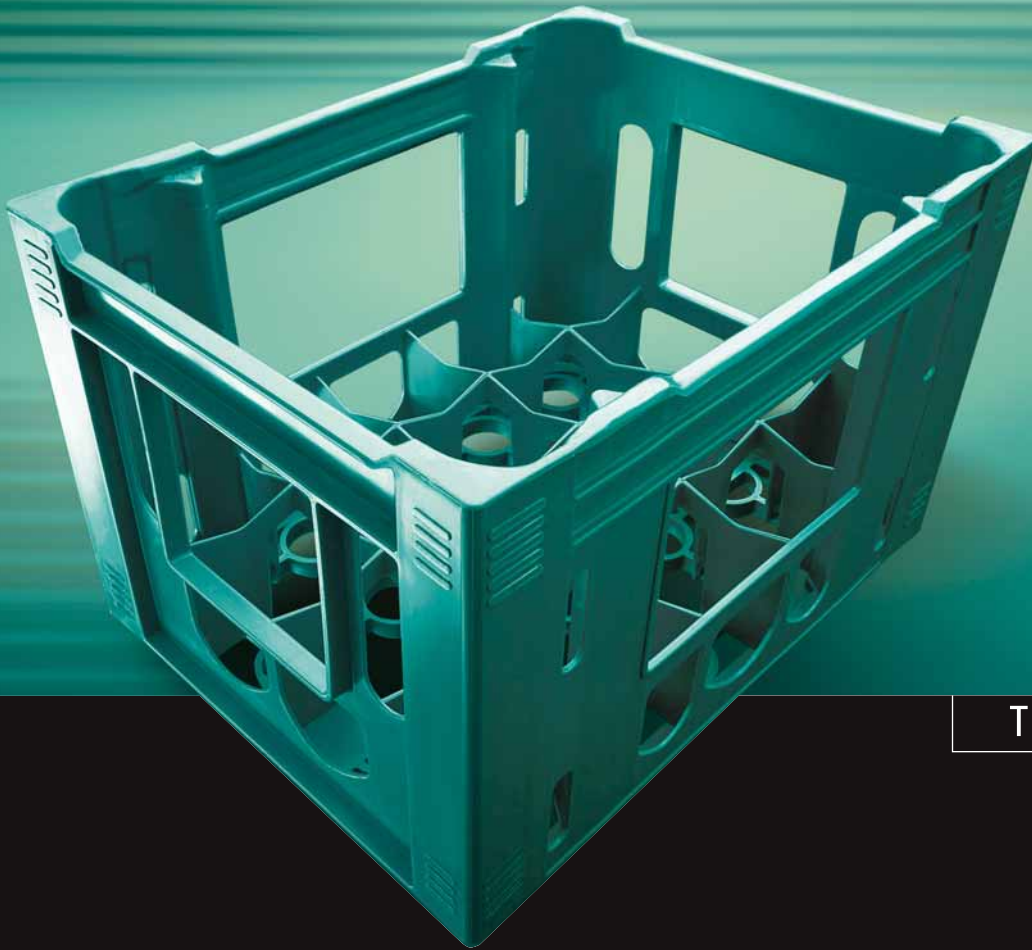
One of the fundamental requirements for a high-quality moulded part is the reduction of residual moisture in the plastic granulate and the prevention of water addition on it before processing. Use of the ARBURG THERMOLIFT 100-2 meets these requirements. With this combined drying and transporting unit, plastic granulate can be ideally prepared for production.

The THERMOLIFT works on the basis of convection drying, whereby fresh air, re-circulat-

ing air or optional dry air mode can be selected. Fresh air and re-circulating air mode come as standard. In fresh air mode, ambient air is drawn in from the surroundings and brought to the pre-set temperature. In contrast, re-circulating air mode operates with closed air circulation, i.e. the air is fed directly into the fan again after the drying process. In dry air mode the air drawn in is fed through an optional dry air module with a silica gel rotor, which increases the water absorption capacity, and therefore the drying performance, considerably. The compact construction, the small area

needed for the device and the options which can be integrated make it easy and safe to operate.

As standard the dried granulate is fed to the machine by means of pressure using dry air. As an option one can also work with suction feed from the connected machine. The THERMOLIFT control's automatic on/ off and the interval mode can be programmed. Programming can be carried out directly from the machine control system via an interface. The settings data can be saved on a diskette together with the machine data record.



The New

4000 kN! *

*A major goal has been achieved. With a clamping force of 4000 kN, a maximum shot capacity of 1860 g PS and proven ARBURG technology, the ALLROUNDER 820 S opens up a whole new dimension. It is now ready and able of working wonders in your production facility.



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