

today

The ARBURG magazine

Issue 52

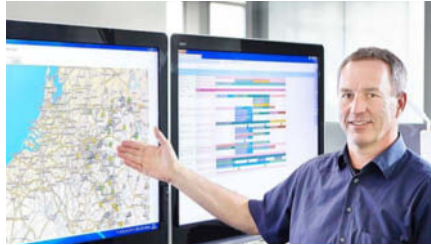
2013





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MASTHEAD

today, the ARBURG magazine, issue 52/2013

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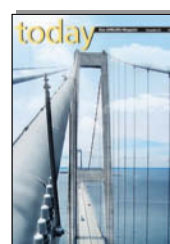
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Wherever bolts need to be protected against corrosion, Radolid and its patented bolt protection caps are present, e.g. on the Storebælt Bridge over the Great Belt in Denmark.





Dear Readers,

The leading international trade fair for our industry, the "K" in Düsseldorf, is approaching apace. Our preparations are in full swing and there will be plenty for you to be looking forward to at our exhibition stand in October.

However, numerous scheduled events have already taken place during the first half of 2013. In addition to national specialist and industry trade fairs, these include the Chinaplas in Guangzhou and the Technology Days in Lossburg, which featured the Efficiency Arena. In the present issue, we report on the feedback from some delighted visitors regarding this highlight.

Furthermore, we hosted the anniversary event "50 Years of ARBURG PIM Expertise", which included an international specialist conference, officially inaugurated the new premises for our Mexican ARBURG subsidiary, as well as celebrating the 25-year anniversary of ARBURG Singapore.

These events reflect the high priority which we have for

decades placed on our global sales and service networks, which will be continuously expanded upon into the future.

The same applies to our product offerings. In this context, there are some valuable tools which are often overshadowed by the major innovations, but which render every-day injection moulding operations significantly more reliable, simpler and more efficient. Examples include the SAFELOG software and the SELOGICA control system function packages, which are covered here.

Find out about the sometimes unusual and sophisticated product ideas that can be realised using plastics and the appropriate injection moulding technology in the following articles.

I hope you enjoy reading the new issue.

A handwritten signature in blue ink, appearing to read "J. Hehl".

Juliane Hehl
Managing Partner



Knowing wh

Efficiency Arena: Value-added chain analysed in practice

The Efficiency Arena was a highlight of the ARBURG Technology Days 2013. During a tour on the topic of production efficiency, visitors were able to receive individual advice on technical solutions. At the various stations, practical demonstrations were held on how to enhance the cost-effectiveness of injection moulding production on a sustainable basis.

A record number of more than 5,500 trade visitors from 47 countries attended the Technology Days 2013. The Efficiency Arena proved a real crowd-puller. Numerous visitors seized the opportunity to receive individual advice from ARBURG experts and partner companies on the subject of production efficiency throughout the entire value-added chain in a relaxed atmosphere. At the Product Design station, partners Men at Work and Proplas, for example, demonstrated CAD/CAM technologies and metrotomography. On the topic of Mould Technology, Männer presented the advantages of near-contour cooling and thin-wall technology. ARBURG provided tips on enhancing efficiency at the Machine Technology, Configuration, Process Control and Production Planning

stations. Here, the productivity package for hydraulic S and GOLDEN EDITION series ALLROUNDERS, as well as the cost-effectiveness calculator, optimised process settings using the SELOGICA control system and the ARBURG host computer system, for example, were presented. At the Peripherals station, ARBURG partner HB Therm presented temperature control devices, while Zahoransky presented a production cell for the overmoulding of medical syringe needles to cover the topic of Process Integration.

A practical tips brochure was also provided. This contained wide-ranging ideas on how to sustainably enhance efficiency. The aim of the tips and practical examples spanning across the entire value-added chain is to motivate injection moulding companies to identify potential improvements in a targeted manner and actively implement them in their plants.

Numerous visitors travelled large distances to Lossburg, usually with specific, albeit extremely varied objectives. We asked a few of them how they liked the Efficiency Arena.



Jürgen Rissler,
Managing Director,
Riha Plastic GmbH,
Biederbach, Germany

“The Efficiency Arena captures the spirit of the times. In addition to the machines, peripherals are becoming increasingly important in order to achieve the required quality. We have an injection moulding shop with a mould-making department and are seeking certification according to DIN EN 16247 (energy audit). In my experience, many customers are outsourcing ever more development activities to us, the suppliers. I obtained in-depth advice on product design and metrotomography, some of which we’re already applying. I also found the Machine Technology station very interesting. Here, I found out that the productivity package is now available for a variety of hydraulic ALLROUNDERS. That could also be something for us.”



Practical tips
brochure

At the Efficiency Arena (photo on left), the main focus was on production efficiency. At the Peripherals station, know-how on temperate control devices, for example, was communicated (photo on right).

at counts!

Philip A. Katen,
General Manager,
Plastikos, Inc., USA



Wilson Pavão,
Production Manager,
Spraying Systems do
Brasil Ltda., Brazil



**Uwe Rosenbauer, Head
of Plastics Processing
and Applications
Technology,
Woco Kronacher
Kunststoffwerk
GmbH, Germany**



"This is my first visit to ARBURG's Technology Days. At Plastikos, we are in the process of further automating our electric machines and production processes, so I am quite interested in ARBURG's approach to integrated production planning. I found the individual discussions with respect to a holistic approach to efficiency very informative. But it was the tour of the factory that really opened my eyes. I am very impressed with the coordination throughout ARBURG's production process and that the holistic approach to efficiency is also practiced within their own production system."

"We want to enter into ceramic injection moulding (CIM) and to identify suitable machines for that purpose in Lossburg. ARBURG's expertise is invaluable to me. Alone, it would probably have taken me five years to find out everything I learned during the in-depth discussions with the experts here. ARBURG is brimming with technology. I'm very impressed with everything I've experienced here in terms of innovative machines, applications and know-how."

"I made a point of travelling to the Technology Days because I'd read that the ARBURG host computer system (ALS) was being presented in the Efficiency Arena. Transparent production planning is an important issue for us because we want to network our 50 injection moulding machines. The ALS experts here gave me extremely competent advice. For injection moulding companies like us, production efficiency is generally an increasingly important topic."



Protection from th

Radolid: Bolt protection caps for a multitude of uses



Photos: Radolid

When the name Radolid is mentioned, only insiders will know that the company which is based in Lüdenscheid supplies bolt protection caps to a whole host of well-known companies around the globe. Protection of mountings for wind turbines from General Electric? Radolid. Corrosion protection on bolted connections for the longest cable-stayed bridge in the world, the Storebælt across the Great Belt in Denmark? Radolid. Attachment of the radio mast on the New One World Trade Center in New York? Impossible without Radolid. Everyone who needs to effectively protect bolted connections from the whims of the elements turns to Radolid. And it's all thanks to ARBURG injection moulding technology alone.

This is because all 24 injection moulding machines in Lüdenscheid are ALLROUNDERS, one of which produces two-component moulded parts. The machines cover a clamping force range from 250 to 3,000 kN. Exclusively bolt protection caps, in every conceivable shape and size, are produced on these ARBURG machines. Sales Manager Ulf Constantin explains, "We're able to offer our customers the most comprehensive range in this segment worldwide. We manufacture these products in sizes between M 3 and M 140, in compliance with all the common international standards, as our protective caps are of course used everywhere: on the water and under water, in normal as well as in aggressive or temperature-sensitive environments. Basically, wherever bolted connections have to be durably protected against corrosion."

Protection over decades

Investigations carried out by the Radolid specialists on a pipeline last year revealed that the bolted connections thus protected have held for some 30 years. The fact that the field is also highly innovative is further evidenced by the patents that Radolid holds for the protection of bolted connections. According to Andreas Thiel, second-generation owner and Managing Director of Radolid, his father's first patent is unique. It relates to the circumferential elastic rim of the bolt protection caps, which reliably prevents the ingress of humidity, even after repeated removal and re-fitting. This feature eliminates the need for adaptation of the caps to the hexagonal bolt shape, which could lead to acid corrosion due to the formation of gaps. Operations manager Christian Kotzur



e elements

knows the materials used: “Eighty-five percent of the materials we process are PE, followed by PA, PP and ETFE, and we supply our protective caps to both final customers and wholesalers. This starts at tiny production runs from 100 units upwards, through to serial production with unit volumes counted in millions. At around 25 percent, our largest share of customers is from the automotive sector, followed by wind energy at about 20 percent and then the machine and plant construction industry.”

As a system supplier, Radolid supplies its customers with complete solutions, ranging from development and mould construction through to production, which are precisely adapted to the relevant fastening application.

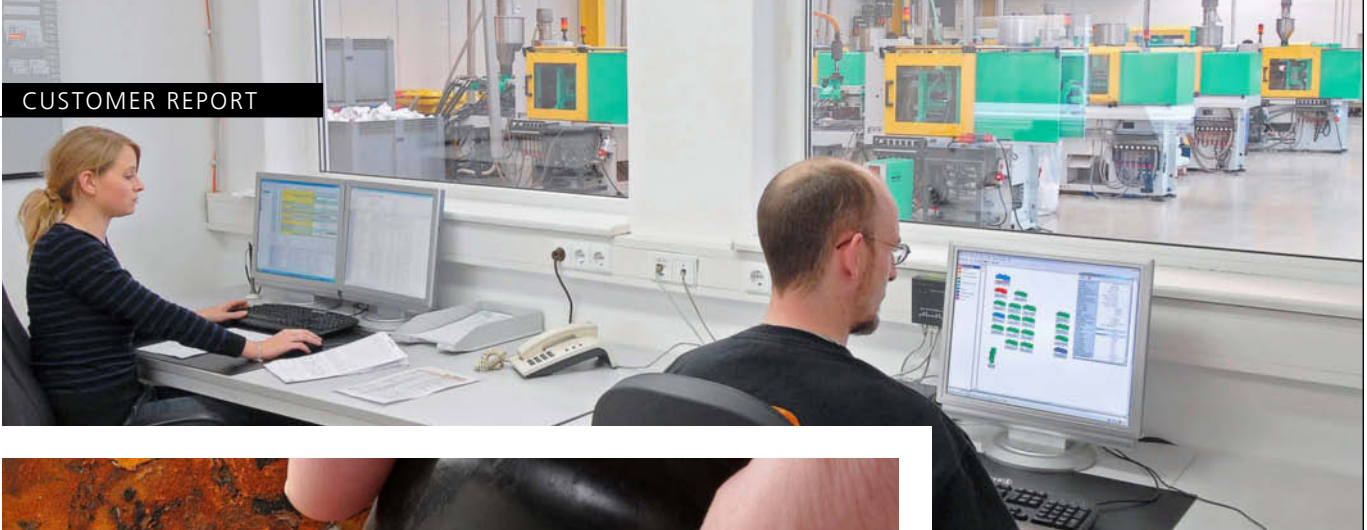
Extensive use of ALS

Owing to the high degree of flexibility required by Radolid when processing the incoming orders, the decision makers opted to invest in an ARBURG host computer system (ALS) for order planning and quality documentation purposes. This comprehensive tool has been in operation since the end of 2007. Christian Kotzur describes its range of applications as follows: “In order to respond quickly to our customers – sometimes several unplanned incoming orders have to be processed within a few days – we use ALS as a production planning system. It allows us to see which periods within the production schedule are still free so that we can squeeze in the unanticipated orders. A lot of our customers are involved in special machine construction, so ad-hoc orders of

Exposed location: Protection caps from Radolid preserve bolted connections from corrosion (bottom photo on left), e.g. on the Storebælt cable-stayed bridge (top photo on left) or on wind turbines (photo above).

this kind are a matter of course for us.” Collective orders comprising a number of individual tasks are often processed on the machines, which are in operation around the clock.

In addition to the basic ALS functions, Radolid also uses the software as a database for storing and archiving moulds, parts and control programs. The wealth of information can then be organised in a transparent manner, machine and mould histories can be seamlessly traced, e.g. for maintenance and repair activities. Reproducible quality is achieved through



Patented round bolt protection caps with a circumferential sealing lip protect bolted connectors from corrosion for a period of years (bottom photo). The ARBURG host computer system is used extensively for production planning and documentation (top photo).

storage of the parameter data for each item. For this purpose, all that is required for smooth production is to load the relevant program for the product. Thanks to data archiving, production quality can also be documented for the customer and forthcoming production activities can be planned proactively. Using the information terminal, for example, which is also displayed on operating station flatscreens, forthcoming job orders or moulds can be prepared via the ALS resource client. Faulty moulds or those undergoing maintenance can also be barred before production begins again in the next shift.

Andreas Thiel already knows about the next developments at the company: "At the end of the year, we will link our new ERP system to the ALS in order to transmit data directly and without manual intervention to the host computer. Then our complete production planning process will run automatically."

Co-operation since 1984

Radolid has been an ARBURG customer since 1984 and, in addition to the convenient location of the Technology Centre in

nearby Radevormwald, the company particularly values its machine supplier's flexibility: "ARBURG works extremely reliably and cooperates well with us," explains Andreas Thiel. "It was therefore only natural that, in addition to the machines, we also purchased our PPS system in the form of the ALS."

The decision-makers at the company are also already using an expansion to the ARBURG host computer system: ALS mobile brings specific and individually selectable machine data to the mobile-phone or tablet screen in the form of an app. "This means that I can monitor the sensitive production processes at all times and even intervene immediately as required, for example if production comes to a standstill," says a delighted Andreas Thiel. The high degree of flexibility and transparency of production thus ensure that Radolid can continue protecting bolts from the elements.

INFOBOX



Founded: 1961 by Horst Thiel; owner-managed company

Products: Protective caps for bolted connections (systems supplier)

Employees: Approx. 30

Machines: 24 hydraulic ALLROUNDERS, one two-component machine

Sales markets: Worldwide, in all key industries

Quality assurance: Certified according to ISO 9001, 14001 and 16949

Contact: www.radolid.de



Knowing where and when!

Service: Fast technician callouts thanks to modern deployment planning

Time is money. Keeping machine downtime to a minimum is therefore essential in injection moulding plants. In practice, however, this is sometimes not possible, despite preventive maintenance. This is why ARBURG continuously endeavours to improve its service worldwide. A modern international deployment planning tool ensures that service technicians are available on site even faster in the event of an emergency.

ARBURG leaves nothing to fate and plans the deployments of its service staff in great detail and with a high degree of flexibility. "Each customer is assigned to a particular service area. On their screens, the deployment coordinators can see where the various service technicians are currently working, as well as the neighbouring service centres," explains Thomas Mattes, who is responsible for technical service at the Lossburg headquarters. He explains the advantages based on a specific example: "Sometimes, a service technician in Switzerland just happens to be on

the road near the border and can reach a German customer in Weil am Rhein more quickly than his colleague who normally covers the south-western tip of Germany. In this case, the Swiss technician gets the job. The customer benefits directly here."

Almost as fast as the fire brigade

For its deployment planning, ARBURG uses an "intelligent" software which is almost on a par with that of the fire brigade. The current location of all the technicians is shown and the jobs each one is currently working on, the outstanding jobs and those which still need to be assigned are marked in different colours. "This allows us to ensure optimum team utilisation and the customer waiting times for technical support are reduced to a minimum," adds Thomas Mattes.

Better coordination of technicians

The system is also progressively being extended to the ARBURG subsidiaries worldwide. It is particularly advantageous

Thomas Mattes, Technical Service, Lossburg, appreciates the benefits of "intelligent" deployment planning.

when a large country is divided into several service centres and a large number of technicians have to be coordinated."

The software first came into use around two and a half years ago in Germany. Here, there are five service centres with more than 70 technicians in total. Today, the deployment planning tool is also used in Switzerland, Italy and the UK. This year, the ARBURG subsidiaries in Spain, Denmark, Hungary, the Netherlands and the US will follow suit.



For a perfect

Plombco: Global market leader overmoulds

Small ideas with a big impact are a constant source of fascination. One company that has used electric ARBURG injection moulding technology to implement just such an idea is Canadian company Plombco Inc. from Valleyfield/Quebec. As well as a number of undoubted benefits such as clear identification, reliable fitting and corrosion protection, the overmoulding of balancing weights for car wheels also represents a unique selling point for the company on the market.

Since it was founded in 1985, Plombco has made an international name for itself as one of the biggest manufacturers of adhesive balancing weights and weights with fastening clips. Working in two plants at the headquarters of the owner-run company, some 200 employees produce over one million of these weights – per day! As a system service provider, Plombco can offer OEMs and other end users extensive support, ranging from product development and design to the production and configuration of the relevant moulds. The company's experts also specialise in the automation of production processes and the appropriate packaging and identification of all the produced batches.

Automated overmoulding enhances quality and efficiency

In order to ensure the high quality of its plastic-coated balancing weights in large unit volumes, Plombco relies on automation and efficiency. As the machine fleet operates around the clock for five days each week, cost efficiency is a top priority – particularly when it comes to

the production of such "penny goods".

Martin Lussier, Vice-President Business Development at Plombco, puts it in a nutshell: "The overmoulding of such large unit volumes demands machines that can not only produce quickly, but also energy-efficiently. With its electric ALLROUNDER machines, ARBURG offered us both. Moreover, the integration of robotic systems, hot runners and mould temperature measurement in the SELOGICA control system is very advantageous in gaining small but significant and effective advantages in terms of productivity."

The electric ALLROUNDERS with a clamping force of 1,000 kN operate with 8-cavity moulds for a wide variety of injection volumes and shot weights from 10 to 70 grams. The size 400 injection units feature screw diameters between 30 and 45 millimetres, and can be flexibly changed from one machine to another. This provides additional flexibility which is decisive for Plombco's production. The materials used are PP and HDPE. Martin Lussier describes the level of automation in the systems: "Each machine is equipped with core-pull control, the MULTILIFT SELECT robotic system and sorter units. These are integrated in production cells onto each of which two further handling systems are connected for upstream and downstream processing.

The metal weights and fasteners are first produced separately before being joined and optically inspected in an automatic assembly machine. A pick-and-place robot picks up the components, aligns them and sets the parts down in the correct position onto a double sliding table. From here, they are moved to the working area of the MULTILIFT SELECT, picked up

balance

wheel-balancing weights efficiently and automatically



Photos: Plombco

in groups of 8 via a special gripper configuration and inserted into the mould in the appropriate alignment. The overmoulded parts are ejected via the sorter unit and are deposited in a collecting container via a conveyor belt.

Because we needed to keep costs as low as possible right from the start, production only became feasible thanks to the comparatively high level of automation. The most important effects here were achieving fast mould opening as well as pick-up of all the parts in a short cycle time. Here, ARBURG also assisted us with a wealth of automation expertise, from the design stage through to the start of production."

Reliable, protected, colour-coded

The advantages of the overmoulded Plombco weights are the way they can be reliably fastened to the wheel without damage, their corrosion pro-

tection and their clear identification through a colour-coding system for the different weights. Matching with wheel rim colours is also possible. Plombco believes that this innovation will enable it to consolidate its leading position in the market. All thanks to ALLROUNDER injection moulding technology. Martin Lussier has some honest words to say here too: "We didn't have a great deal of experience in cooperating with ARBURG. However, we were positively surprised by

the excellent level of customer advice and after-sales service. Our ALLROUNDER machines give us the confidence that comes with buying the latest technology, which no



longer needs to be optimised or improved. This means that we can focus entirely on production. In other words, production simply runs smoothly. And when you produce such high unit volumes that's what really counts!"

INFOBOX



Founded: 1985

Location: Valleyfield/Quebec, Canada

Production area: Approx. 14,000 m²

Products: Plastic overmoulded metal balancing weights for car wheels

Employees: Approx. 200

Machine fleet: Ten electric ALLROUNDER E and A machines

Turnover: CAD 30 million (approx. EUR 22.6 million) with expected growth of around ten per cent per year

Sales markets: North America, Japan, Oceania and Africa

Contact: www.plombco.com



Photo: © nivsfromspb - Fotolia.com

Celebrations in Mexico

Subsidiaries: New building inaugurated in Mexico and silver

At completely different corners of the globe, two ARBURG subsidiaries have excelled and there is plenty to celebrate: in Mexico, the inauguration of the new building at the new Querétaro location; in Singapore, the 25-year anniversary of the ARBURG subsidiary.

For the official inauguration of the new building, Managing Partner Michael Hehl travelled to Querétaro together with Managing Directors Helmut Heinson and

Jürgen Boll. This new ARBURG location is situated in central Mexico, in one of the emerging regions of the country, with a growing industrial infrastructure and a high standard of living. Subsidiary Manager Guillermo Fasterling cites a further good reason for the choice: "Our new site is located in close proximity to many of our customers and is well connected to other parts of the country and to Mexico City via motorways. Querétaro offers all the comforts of city life, without the traffic and cost issues of the huge metropolis that is Mexico City. We were therefore all looking forward with anticipation to the official opening of the new building."

Representative subsidiary

The new building meets all the requirements for a representative ARBURG location. The circa 215 square-metre showroom provides space for five ALLROUNDER machines. Guillermo Fasterling says, "Our plan is to equip at least one of these machines with a robotic system. In addition to the presentations, mould prototyping and training will thus also be possible. A canteen for our employees and visi-

tors will make working here even more pleasant."

Strong growth

The developments in Mexico are impressive: The staff has increased from six employees in 2008 to 14 today. By the end of the year, the team will comprise 16 members and will then be complete.

The steady growth of our customer base is continuing. Many companies have grown significantly – particularly those which produce for the automotive industry or manufacture technical parts. Demand for injection moulding machines and services has risen accordingly. "It's not very long ago," explains Guillermo Fasterling, "that we could only sell basic machines without any special equipment here. With the higher productivity, this has changed rapidly. Today, faster and also more energy-efficient ALLROUNDERS are in demand and half of them are equipped with robotic systems. The aftersales service has expanded accordingly. Examples include ongoing training courses, machine maintenance and calibration. With the new premises, we can now respond to the altered demands, which has had an extremely positive effect on our customer relations."



Photo: JSFoto

Ceremonial opening in Mexico (from right):
Managing Partner Michael Hehl, Managing Director
Helmut Heinson, Hugo Mandujano,
Director of Investment Promotion at Gobierno del
Estado de Querétaro, Subsidiary Manager Guillermo
Fasterling and Managing Director Jürgen Boll



Photo: © letkat - Fotolia.com

co and Singapore

anniversary in Singapore



Photo: Andrew Ang

Managing Partner Juliane Hehl congratulated the Subsidiary Manager David Chan on the 25th anniversary of ARBURG Singapore, which was celebrated in style together with customers.

Singapore: 25-year anniversary

At the silver anniversary of the ARBURG subsidiary in Singapore, the parent company was represented by Managing Partner Juliane Hehl and the Managing Director for Sales, Helmut Heinson. The subsidiary was founded on 11 May 1988, initially as a Technical Support Centre, before being transformed into an independent sales and service centre for the entire ASEAN region in 1992.

The current Subsidiary Manager for this region, David Chan, sees this development in a very positive light: "The creation of a regional sales organisation gave our business there a definite boost in terms of customer confidence. Subsequently, the regional offices in Malaysia, Thailand and

Indonesia were further developed with regard to infrastructure and personnel."

Growing medical technology segment

While, in the beginning, customers were mainly drawn from the electrical and electronics sectors, the focus is now on companies that produce precision medical technology parts. "The medical technology segment in particular has grown continuously in recent years," says David Chan, who goes on to explain the technical requirements of this challenging industry: "Singapore is a niche market for medical technology and other high-end products. This is why, here, we mainly require small and precise servo-electric machines that operate both reliably and energy-efficiently. These are precisely

the machines in ARBURG's portfolio and the company is known as a leading manufacturer in the region. "This has created the conditions for continuously growing sales in the ASEAN countries over the past 25 years.

HIDRIVE opens door to the packaging industry

"ARBURG has always responded to current market trends with the appropriate products," says David Chan proudly, naming the hybrid HIDRIVE machine series as one of many examples. "The high-performance HIDRIVE machines in particular have made a decisive contribution towards opening up the packaging market in the ASEAN region, enabling ARBURG to become a recognised partner in this industry as well."



More parts –

Teleflex: Fully-automated overmoulding of

The Teleflex Medical Group, a global leader in medical instruments, supplies a variety of products, including dilators, under the ARROW brand. These are used to dilate passageways in the body. It therefore goes without saying that the most stringent hygiene and cleanliness requirements must be met during production. For production at the Žďár nad Sázavou plant in the Czech Republic, the local ARBURG subsidiary designed a turnkey solution that meets clean room requirements. Unit volumes have been significantly increased and reject parts reduced since introduction of the production cell.

“We’ve been working with ARBURG since 2006 and, in 2012, we enquired about a turnkey solution specially designed for overmoulding dilator tubes. We needed a solution that would meet all our requirements and, at the same time, offer a good price/performance ratio,” explained Filip Linsbauer, Technical Manager at Teleflex, describing the initial situation. And he is more than happy with the results achieved: “Even the pre-sales service at ARBURG is excellent. We were quickly offered a coherent concept that was significantly more cost-effective and efficient than manual insertion. Dr. Daniel Orel from ARBURG’s Czech subsidiary in Brno acted as our central contact, coordinating all activities as the Project Manager and ensuring that our requirements were

fully met. The project has been a resounding success.” The fact that the entire solution came from a single source is another plus as far as Filip Linsbauer is concerned.

Production cell meets clean room requirements

“The centrepiece of the production cell, which complies with class 8 (ISO 14644) clean room requirements, is a vertical ALLROUNDER 275 V, complemented by a KUKA six-axis robotic system and peripherals,” says Dr. Daniel Orel. The automation expert also helped to further optimise the injection moulding process. The peripherals are integrated in the SELOGICA machine control system and all the components work in perfect harmony. These include, for example, material drying and feed, stations for positioning the tubes and removing the sprues from the finished parts, a camera system and a special conveyor belt.

The six-axis robotic system handles the operations previously performed manually, but faster, more precisely and fatigue-free. It first picks up four tubes from the positioning station and places them onto the pins of a mould insert. A camera system checks that they are positioned correctly before the insert is moved to the machine by means of a slide.

Next, the robotic system removes an insert with the finished, overmoulded tubes from the 4-cavity mould, transfers it to the station for sprue removal and places a new insert into the mould.

less rejects

medical components in clean room



Photo: © Jansenberger Fotografie

During the automated production of dilators (photo on left), Teleflex relies on a turnkey solution from ARBURG (photo on right). An ALLROUNDER 275 V overmoulds four inserts per cycle, while handling is performed by a six-axis robotic system.

The ALLROUNDER 275 V overmoulds the ends of the tubes with a PE fitting. Meanwhile, the six-axis robotic system removes the sprue and places the empty mould insert onto the slide, which returns to its original position again.

The overmoulded tubes are placed on a conveyor belt in pairs and removed before being manually assembled to produce the ready-for-use dilator. A new cycle can then start again after 15 seconds.

Capacity increased significantly

"We're highly satisfied with the turnkey solution. It's extremely precise and reliable," sums up Filip Linsbauer. "As a result, we have significantly more good parts and less rejects than before, leading to improved production efficiency and capacity utilisation." Injection moulding production is currently being expanded

on a ongoing basis at Žďár nad Sázavou. At present, two vertical ALLROUNDER 275 V machines with a clamping force of 250 kN and size 70 injection units are in use and more machines are set to follow.

ALLROUNDERS "Made in Germany" are also in use at other Teleflex locations. "ARBURG not only produces machines that set technical standards and cover all of our applications, its service offerings are also available worldwide. This enables us to use the same high-performance machine technology at all our production facilities and to receive support from the experts at local level," says Filip Linsbauer, outlining an important benefit. He adds that this also improves flexibility in production and enables know-how to be exchanged within the company on a global basis.

INFOBOX

Founded: 1975 as ARROW International; part of the Teleflex Medical Group since 2007

Location: Žďár nad Sázavou, Czech Republic

Production area: Approx. 4,500 m²

Employees: 400, 14,200 worldwide

Products: Medical instruments for intensive care, urology and surgery

Contact: www.teleflex.com



Correctly

Quality assurance: External CAQ AG module integrated in ARBURG

In a conventional Statistical Process Control (SPC) loop, operatives remove parts from the production process at cyclical intervals and check them, for example, for dimensional accuracy. In the event of deviations, an employee has to intervene in the machine and control sequence in order to correct the settings. This is often only possible with a considerable delay, during which reject parts are produced. The ARBURG host computer system (ALS) is a modular production planning and monitoring tool, which monitors and documents the production process online. The system is now also available with an appropriate connection to the external quality assurance module of CAQ AG, which is able to read in the ALS data for batch evaluation.

In its basic stage, ALS can be used in conjunction with an optional QS module for statistical process control. ALS thus offers the option of checking the process parameters at cyclical intervals. This permits the most important process parameters, and thereby the results of the process, to be monitored. Systematic process

fluctuations and parameter or process changes caused by external factors can thus be included in the monitoring. If control tolerance limits are exceeded, the responsible employee is informed either via a QS traffic light or a screen in the production hall and can respond immediately. One important advantage of the system is that the item and machine-related testing plans created are always automatically activated when the particular item is produced again. This means that when the machine has been set up and production started, process monitoring also begins automatically. The decision on which articles this function is used for is taken by the customers themselves based on their documentation obligations.

Certificates of capability from archive

In a second expansion stage, ALS is able to store the process parameters and test plans selected for the article together with the order data in an archive after the job order has been completed. This allows job orders to be deleted in the productive system. The archived values are not lost, however, as ALS continues to store them according to the order dates. This is impor-

tant, e.g., for future certificates of capability, in order to retrospectively document trouble-free processing of a job order.

Computer-aided quality control

In the third expansion stage, selected parameters can be transmitted to the CAQ system from CAQ AG via an interface module. With CAQ.Net, ARBURG's cooperation partner offers a system for computer-aided quality assurance, which is equally as modular and expandable as ALS itself. It provides effective and efficient quality management with targeted, matched segments for a customised CAQ solution. Compatibility, and therefore high performance and future-proofness, are fully ensured in conjunction with the ARBURG host computer.

In the fourth and final expansion stage of ALS, all target value changes can also be documented automatically with the aid of a setup log. This applies to all parameter changes made to the control system during a defined job order period. This feature is particularly important for GMP-oriented production processes, which are common for medical technology. Furthermore, all the recorded production run data can also



Combining ALS with CAQ-Net provides an overview of all the important parameters.

connected

host computer system

be archived via the production log in ALS. This enables separate documentation of 100 percent monitoring.

Positive customer reception

The first customers to use this system combination are highly satisfied with the results.


Werner Ströbel, Parts Production Manager at Hydrometer in Ansbach, says the following regarding performance: "For us, the combination of ALS and CAQ-Net was the ideal solution for getting to grips with the deluge of data. It's provided us with a much better overview of the collected data."

Martin Weinmann, Production Manager at Thermoplastik Erich Müller GmbH in Dieburg, adds: "The seamless networking of the ERP system, ALS and CAQ-Net ensures comprehensive and transparent documentation of the entire injection moulding production process. Up to ten injection moulding machine parameters can be logged and transmitted to the CAQ system for each production cycle relating to a job order. The machine parameters and the individual produced part results are made available in a com-

mon database and can be evaluated. With this procedure, the intervals between the measurement tests can be extended. Conversion to an automated dynamic test interval control is planned by CAQ-Net. The capital investment in the systems paid off for us in a short time. From the first day of implementation, we were able to evaluate the results and work on the principal errors in a targeted manner."

Michael Vieth,
ARBURG Control Technology

"The combination of ALS and CAQ-Compact.Net brings decisive benefits. Because CAQ AG and ourselves connect our systems via a matched interface, data transmission is fast and complete. The complete evaluation process runs via the CAQ-Compact.Net module in the form of the usual statistical checks and proof of process capability, for example via histograms, control cards, etc. The module can be used for test planning, test data recording, evaluation and analysis and operates in parallel to the running process. The long-term evaluations and process analyses are always based on the current QS specifications. An overview of the quality of the currently running production also remains available in ALS."



A thumb on the pul

Teufel Prototypen: Moulded parts for unusual products

As its name indicates, Teufel Prototypen GmbH is brought on board at a very early stage during the development of new products and knows today what will be in use tomorrow. The company also manufactures components for unusual products in small batches using injection moulding, e.g. for headsets. Those who are now picturing non-descript black earphones where functionality prevails over design have no doubt never seen the pieces of jewellery produced by the company **novero**.

The key activities of Teufel Prototypen GmbH, based in Unterfahlheim, Germany, are the construction of prototypes and rapid prototyping services. Their offerings include stereolithography, selective

ny manu-
factures pi-
lot production
moulds and op-
erates three injection
moulding machines. These
include an electric ALLROUNDER 470 A
with a clamping force of 1,000 kN and a
size 400 injection unit, equipped with a
MULTILIFT SELECT robotic system. In addi-
tion to high precision and repeat accuracy,
energy efficiency was a further deciding
criteria for investing in an electric machine
from ARBURG. The fact that the company
prioritises the conservation of resources
is evidenced by the utilisation of machine
waste heat for heating purposes.

The injection moulding of components for jewellery headsets (photos on right) represent a challenge in terms of precision and surface quality.

Renowned customers in the portfolio

Teufel Prototypen products can be found in components made by renowned companies within the automotive, medical technology and consumer goods industry. Among its customers is **novero** (www.novero.com), the product range of which also includes top-end headsets. These combine luxury, design and high-tech in a functional piece of jewellery. Materials such as gold and platinum are used, as are pearls and gemstones. Before the headsets are made into pieces of jewellery by a goldsmith, Teufel Prototypen



Photos: Novero



Photo: Teufel Prototypen

During the development of new products, company founder Karl Heinz Teufel (left) and his son Thomas Teufel are involved at an early stage.

laser sintering, coatings, vacuum casting, investment casting, high-speed milling, rapid tooling and model making.

Small batch production is a further mainstay. In order to produce plastic parts using the injection moulding process, the compa-

se of the times



manufactures the plastic components necessary for this purpose.

Functional pieces of jewellery produced on ALLROUNDERS

The base section, which is identical for all models, features delicate structures which require a high degree of mould and machine precision. On the top sections, a further challenge are the high-grade and partly high-gloss finishes.

With a polished mould built in-house by the company and an electric ALLROUNDER 470 A, complex moulded parts of this kind can be manufactured with a high degree of precision and reproducibility.

Owing to the high-gloss surfaces, the downstream handling operations are particularly important. For this purpose, the ALLROUNDER is equipped with a MULTILIFT SELECT robotic system, which ensures gentle removal and set-down of the sensitive moulded parts.

The gripper, which holds the parts via vacuum, was developed and built in-house by Teufel Prototypen. Production of the two-colour top section using two-compo-



nent injection moulding is also highly complex as the transitional areas must be extremely precise.

Expansion of injection moulding offerings planned

"Because we're thoroughly satisfied with the electric ALLROUNDER and would like to expand on our offerings in the injection moulding sector, we're currently thinking of investing in a vertical ALLROUNDER 375 V for overmoulding inserts," says Thomas Teufel, looking into the future.



INFOBOX

Founded: 1985

Location: Unterfahlheim, Germany

Employees: 45

Turnover: EUR 3.8 million

Products: One-off part solutions, rapid tooling, rapid prototyping, trade fair models, small batch production and assemblies

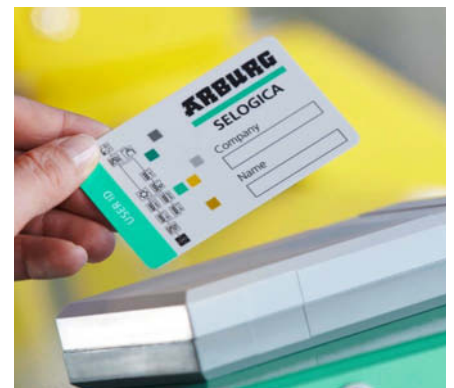
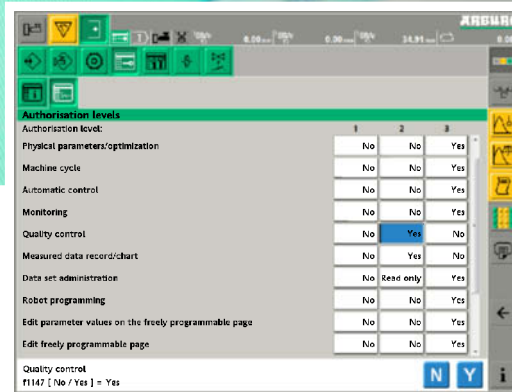
Industries: Consumer goods, medical technology and automotive industry

Contact: www.teufel-prototypen.de

Photo: ARBURG



Three authorisation levels can be individually set in the SELOGICA control system



Security first

SAFELOG: Unauthorised access excluded

Tracking and tracing (in other words: transparency) are an important aspect in the certification of automotive suppliers. In order to meet the high requirements from the very outset, access to certain machine functions must be controlled. This is where the SAFELOG software comes in, which enables the personalisation of user authorisations for ALLROUNDER injection moulding machines using transponder cards.

With the introduction of the touchscreen in 2004, a transponder card reader was integrated into the SELOGICA control system operating unit. The use of transponder cards makes it possible to enable or prevent access to certain functions in a targeted manner. For example, it ensures that changes to quality parameters

can only be made by the specialist personnel responsible for the task. Operating errors such as inadvertent deactivation of the sorting unit as a quality screening device are reliably prevented.

Company-specific configuration of access concept

The SELOGICA control system supports three authorisation levels for operators as well as a group ID for specific machines. This allows, for example, different access rights to be defined for auxiliary personnel, set-up technicians and quality officers while also limiting access to certain production halls or lines.

With the SAFELOG software, transponder cards can be activated for one of the three authorisation levels as well as for a specific group ID. Each card can

be personalised with an operator name. This name then also appears in the SELOGICA set-up log, enabling unambiguous tracing of the operating steps. Use of the card can be password protected for increased security and its period of validity can be limited. Furthermore, language assignment is possible, so that SELOGICA automatically changes language when the card is used.

In this manner, a production-wide access concept can be built up, including the personalisation of transponder cards, rendering daily practice simpler and more reliable.



Photo: Busch-Jaeger

Eagle eye from plastic

Busch Jaeger: Head module for optical motion detectors produced on flexible production cell

Those who wish to feel safe and secure in their homes will be familiar with the name Busch-Jaeger. This internationally operating company headquartered in Lüdenscheid, Germany, with a further site for production in Bad Berleburg-Aue, is a market leader in the field of electrical installation technology. A head module for the optical Busch-Watchdog® motion detector is manufactured on a complex production cell with multiple uses.

“The future is now” is the motto used by the company to advertise its products. It also points the way towards innovation, design, high quality and functionality. In order to package technology and func-

tionality in a beautiful form, plastic is the company’s material of choice. Automated production processes are standard at Busch-Jaeger. Virtually all the machines in Aue operate with handling devices, there are few free-falling parts. Stefan Klem, Plastics Production Manager in Bad Berleburg-Aue, outlines the company’s opinion on this topic: “In the case of the head module for our Busch-Watchdog® which received the red dot design award in 2012, we had to pay careful consideration to where the advantages of automation lay. Here, the return on invest (ROI) is always a decisive factor. In this particular case, we opted for an automation solution with manual loading of the part magazine as this fitted in most closely with our objectives in terms of flexibil-

ity, capacity utilisation, quality and costs. Implementation was in the hands of a very committed team, which led to extremely good results.”

Highly flexible production cell

The project facility is built around an electric ALLROUNDER 470 A (ALLDRIVE) with a clamping force of 800 kN and a size 290 injection unit. Two injection modules with screw diameters of 25 mm and 35 mm are employed. This means that several injection moulds can be used for parts with different shot weights on a single machine. The smaller of the two screws is reserved for PE processing, which is used to produce the lenses. “This protects our inserts, the optical components with a Fresnel



lens structure, from contamination during production,” explains Thermoplastics Production Manager Mike Haßler. A total of three components are produced for stock in this manner on a weekly basis. These are the front lens, the bottom lens and the previously-mentioned head module. The infrared window also required for this product is manufactured on a different machine. In total, seven moulds featuring different technologies are used. These range from a single-cavity mould which operates according to the ‘open/close principle’ featuring direct injection, through to a single-cavity mould with a direct connection, folding core and three lateral slides,” adds Haßler. “Through the different laser engravings on the finished head units and the various types of lenses, 42 different head modules are produced on the facility. The two lenses themselves are produced in six and eight different versions respectively.”

Task 1: Precise cutting

Especially important during production of the lenses is high-precision removal of the sprue from the moulded part. This takes place at a special cutting station; removal and set-down are performed by the vertical MULTILIFT V robotic system that operates in the facility. The reason for this high precision is the further processing of the inserts. They must be completely free of burrs in order to ensure flawless

overmoulding. All the moulds used are chrome plated and highly polished in order to ensure perfect demoulding of the Fresnel lens structures, but also to ensure the required high-grade surface finishes.

Effective automation

Once a sufficient stock of lenses has been produced, a further mould and injection unit change takes place in order to begin with production of the head modules. Incidentally, the lenses do not leave the building, and Mike Haßler knows why: “Due to the thin wall thicknesses, changes in the environmental variables would represent a high uncertainty factor, for example in terms of warpage, so that we store all our inserts here in Aue.”

Task 2: Efficient work sequence

Owing to the cycle time of around 43 seconds for a head module, there is sufficient scope for the operating personnel to perform a variety of manual activities such as the insertion or pressing in of adjustment shafts using devices produced in-house. Together with 100 percent visual inspection of the modules, this was the reason for the adapted automation system employed. The production sequence is as follows: The removal and insertion gripper of the MULTILIFT V is of a task-specific design. Its upper part is used for handling the lenses, the lower part, which



Stefan Klem and Mike Haßler (left to right) are thoroughly satisfied with production of the head module for the Busch-Watchdog®

swivels through 90 degrees, is designed for handling the heads. After the operator has manually filled the twelve cavities of a vertical rotary table with the front and bottom lenses, as well as the infrared window for insertion, it rotates through 180 degrees into the working area of the robotic system. From here, the gripper removes the two arranged lenses and the window and initially moves in front of the laser station in order to pick up the engraved head and set it down onto a conveyor belt according to a specific pattern. From here, the MULTILIFT moves into the single-cavity slide mould, removes the finished part from the cavity, swivels it downwards through 90 degrees and moves into



The head module for the Busch-Watchdog® is manufactured on the production cell (photo on left) and contains three different lenses. The transfer station for the lenses (photo on right) is filled manually.

a position from which the upper gripper part can insert the lenses into the mould. Precise positioning is achieved via brass locating pins. Once the MULTILIFT has retracted again, the next injection cycle begins and the robotic system moves back in front of the laser station in order to set down the head unit for inline engraving on two of its faces. The entire cycle then begins again.

Mould with folding core technology

The front lens made from PE and the infrared window made from PC are inserted vertically from above onto a folding core on the ejector side. The bottom lens (also made from PE) is simultaneously inserted, transversely to the machine axis. The folding cores are moveable in order to individually mould the internal apertures, bypasses and cavities, not all of which are level or horizontal. In this manner, protrusions and recesses in the internal profile or internal geometries can be reliably achieved independently of mould opening. The shape of the gripper also had to be adapted to this technology as there was little space available for the necessary movements.

Exemplary cooperation

Both Busch-Jaeger and the ARBURG Project department praised the cooperation during creation of this flexible production cell, describing it as exemplary.

“The competence of a reliable partner helped us a great deal here in particular,” says Stefan Klem. “The innovative strength of Busch-Jaeger Elektro GmbH meets an equally innovative machine manufacturer in ARBURG. These are the ideal prerequisites for a successful collaboration.” The cooperation also impressed in other respects: of the 72 injection moulding machines, 53, including 2-component ALLROUNDERS, are complemented by 16 Lauffer presses featuring the SELOGICA control system for thermoset applications. SELOGICA was a key purchasing incentive for Busch-Jaeger as it enables the entire machine management to be performed centrally on a screen. Production planning and control have been carried out via an ALS host computer system from ARBURG since 2012. The greatest mark of confidence, however, is revealed through an incidental comment. When asked how long Busch-Jaeger has been working together with ARBURG, Stefan Klem’s succinct answer is: “Forever!”

INFOBOX

Company: Busch-Jaeger Elektro GmbH, subsidiary of the Swiss ABB Group

Production: Electrical installation technology

Production area: Approx. 15,000 m² in Bad Berleburg-Aue

Employees: 300 in Aue and a further 700 at the Lüdenscheid headquarters

Sales markets: Mainly Germany and Europe, exports to 60 countries in total worldwide

Quality assurance: Certified to ISO 9001, 14001 and 50001, as well as BS OHSAS 18001

Contact: www.busch-jaeger.de

Efficiency meets de

Niko: Cycle time reduced by 35 percent during thermoset processing



Niko products such as switches (photo on left) and sensors (photo on right) are characterised by their design and are produced efficiently.

Since its foundation in 1919, the family-owned Belgian company Niko has specialised in the development and manufacture of products for the electrical installation segment. The company has received numerous awards for its innovative concepts and well-conceived designs.

Niko achieved its international breakthrough in 1965 with the Inter 70 luxury switch, which attracted a great deal of attention, not least for its purist design.

Over the years, the company has specialised in the development and manufacture of products and solutions for the fields of electrical installation materials, access control, light control systems and home automation. Niko is a subsidiary of the Niko

Group, which also includes the Niko Projects and fifthplay companies. While Niko is primarily aimed at private users, Niko Projects provides integrated home automation solutions for retirement homes and for outpatient home care. fifthplay, finally, is concerned with IT-based systems related to home and facility management.

At its Sint-Niklaas plant, Niko mainly produces plastic parts for the in-house assembly of finished products. Thermoplastics and thermosets are processed on around 40 injection moulding machines with clamping forces ranging from 350 to 3,000 kN. Not least due to their physical properties, thermosets continue to play an important role in electrical installations, for example as plug socket inserts, which Niko produces from urea resin (UF).

UF resins require hot moulds

The processing of pourable thermosets differs from thermoplastic processing, in particular with regard to temperature control in the plasticising cylinder and the mould. Thermosets require a completely different temperature profile to that familiar from thermoplastics. The compound is injected from a relatively "cold" plasticising cylinder into a "hot" mould. Characteristic for the processing of these pourable thermosets are the long curing times, which can take between 10 and 30 seconds per millimetre of wall thickness in individual cases. It is therefore desirable to reduce the necessarily lengthy cycle time.

Niko sought to find a suitable concept in cooperation with ARBURG. The two companies have collaborated successfully since 1981, whereby it was more than the practical and cost-effective solutions for complex application tasks which impressed Niko.

sign

System solution for efficient thermoset processing

In simple terms, Niko adapted the principle of thermoplastic processing to thermosets for the production of the components. This is based on a system solution from ARBURG comprising a hydraulic ALLROUNDER 520 S with a clamping force of 1,300 kN and the practical thermoset package. The special machine equipment includes a highly wear-resistant cylinder module for pourable thermosets, special screw geometries, precise temperature control and, not least, the process-specific equipment of the SELOGICA control system.

The plug socket inserts are produced in an 8-cavity, cold-runner mould with near-contour temperature control. The material is pre-plasticised in the cylinder at 90 degrees centigrade and injected into the 160 degrees centigrade



hot mould via the sprue bush, which is also temperature controlled to 90 degrees centigrade. The cured parts are ejected as bulk goods and deburred in a separate step.

Using this principle together with a special mould design, Niko was able to reduce the cycle time by about 35 percent. Furthermore, high stability of the production process was achieved through the use of the precise ALLROUNDER.

An additional advantage of this production process is the reduction of waste. Because the sprue is also temperature controlled to 90 degrees centigrade, no cross-linking occurs in this area. This means that the material in the sprue bush is unrestrictedly available for the next shot. The mould is heated by means of a pressurised hot-water temperature control.

The entire process is monitored and controlled via the central SELOGICA machine control system.

Exemplary use of energy and resources

As with ARBURG, the sparing use of resources plays an important role in Niko's corporate philosophy. Heat exchangers, cooling ceilings, insulating glass, automatic sunblind and energy-saving lamps at the new main building in Sint-Niklaas in Belgium, for example, ensure low-energy lighting and heating. Niko covers more than 10 percent of its power requirement with over 4,000 square metres of installed photovoltaic modules.

In 2012, Niko was bestowed the Belgian

regional "Milieucharter Oost-Vlaanderen" environmental award for the eleventh time in succession. Further awards were received for product design. For example, the renowned red dot award: in 2009 for the Niko Mysterious product range and in 2011 for the eco-display of the Niko Home Control product range.

INFOBOX

Founded: 1919

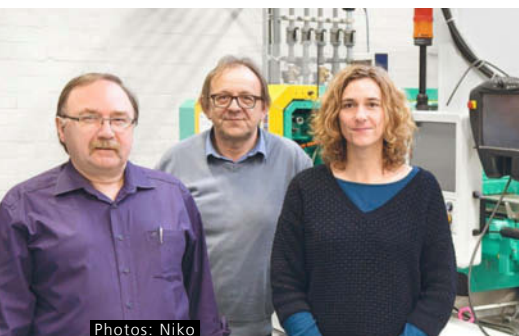
Plants: Two plants, in Sint-Niklaas and Wijnegem, Belgium; company-owned sales subsidiaries in Denmark, France, the Netherlands, Slovakia and the UK

Employees: over 700

Products: Electro-technical products for light control systems, access control and energy management for private and professional environments

Certification: ISO 9000 and country-specific marks of approval depending on the market

Contact: www.niko.eu



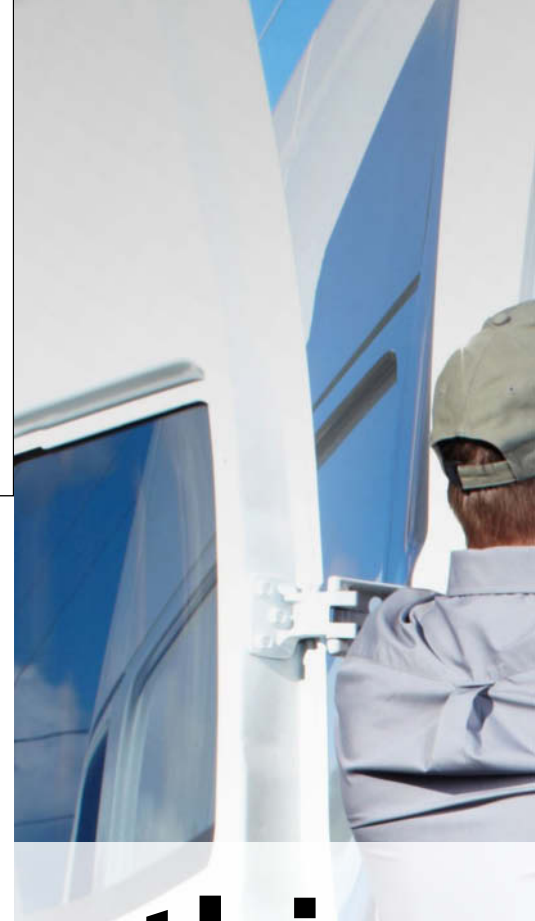
Photos: Niko

The Niko Management Team Rudy De Geest, Daniël Hofman and Goedele Heylen (from left to right) are proud of their efficient injection moulding production facility.



TECH TALK

Oliver Schäfer, Technical Information



Everything

SELOGICA function packages offer added value

In order to implement complex injection moulding processes reliably and smoothly, the SELOGICA control system offers a wide variety of options. The functional packages were put together to ensure that all the relevant features are available for the specific production requirements at hand.

There are four packages in total, comprising up to eleven different functions. But when are the respective packages appropriate and what do they include?

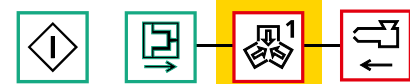
Mould temperature control

The "Mould temperature control" package is recommended where hot runners are used or for the processing of particularly sensitive materials. It includes, for example, parallel heating of the hot runner and the mould or activation of the hot runner in accordance with the mould temperature. This protects the material against thermal damage in the hot runner.

Controlled, multi-stage heat-up of the hot runner with dwell times is also useful in order to allow residual humidity in the material to escape gradually.

Axis monitoring

The "Axis monitoring" package provides significant added value in the case of moulds with core pulls, the use of brushing or demoulding devices, as well as for quality assurance. With external alarm inputs (screenshot below), the correct compressed air or granulate supply, for example, can be reliably monitored and incorporated into quality assurance. Clear fault descriptions in the case of alarms contribute to faster troubleshooting. Effective



assistance is also provided through simple deactivation of the automatic monitoring during manual operation in order to open the mould, even when the core pull is not in the end position. Actual value diagrams contribute to greater process reliability, in order to monitor closing forces online, for example.

Mould movements

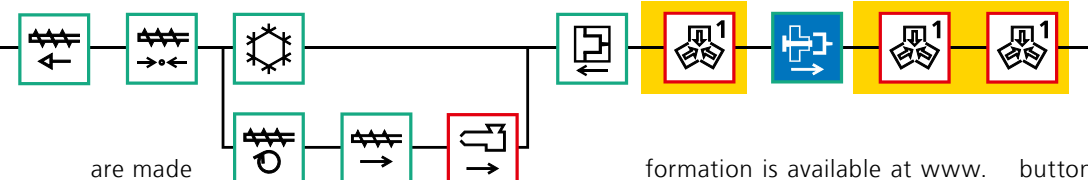
Completely new settings options during operation with complex multi-component, tandem or stack moulds

Monitoring of external alarm inputs 1 - 8					Follow-on function	Remarks:
1		S1100			Message output	Box full
2		S1100			Stop at cycle end	Hot runner device alarm
3		S1100			Immediate machine stop	Compressed air is missing
4		S1100			Immediate machine stop	Material supply disorder



Photo: © Kurhan - Fotolia.com

inside



are made possible with the "Mould movements" package. For maximum flexibility of process settings for complex sequences, the movements can be programmed completely freely. This enables, for example, implementation of ejection with the mould closed. Movements of secondary axes such as core pulls can be performed multiple times – for example in the open and in the closed mould (diagram above). A further option here is "Activate core pulls non-cyclically", which can be useful during thermoset processing in order to actuate brushing devices. The handling of moulds and peripherals is simplified considerably through partial sequences. Detailed in-



formation is available at www.arburg.com in the "Global Services > Tips and Tricks" or via the QR code.

Start-up and shutdown

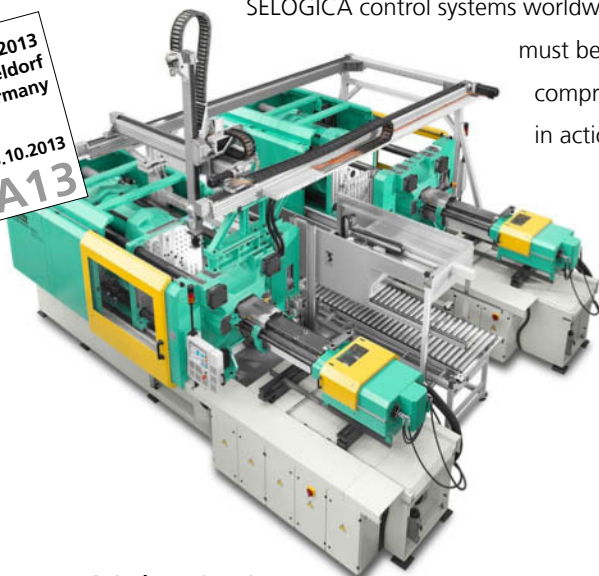
In the case of high-speed applications, multi-station moulds, the automatic feed of inserts or in the case of special production planning and monitoring requirements, the "Start-up and shutdown" package is an interesting addition. The so-called automatic start-up ensures controlled production start-up in the case of multi-component or insert parts. With this feature, sequences can also be executed without inserts, injection or part removal. The next cycle can be enabled via the start

button. The finished parts counter provides a reminder for the timely change of parts containers via a visual or audible signal. A special signal can also be output when a job order is completed. The pre-warning time can be freely programmed in both cases.

The function packages combine the SELOGICA control options in a targeted manner. This simplifies selection significantly - at an attractive price/performance ratio.



Process integration counts! 1.5 trillion signals between peripherals and injection moulding machine: this is the unimaginable number of signals processed each year by SELOGICA control systems worldwide. Integrated manufacturing processes must be controlled precisely in this manner today – comprehensively and reliably. Production efficiency in action. ARBURG for efficient injection moulding!



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