Information concerning Injection Moulding Technology and the Market

ARBURG today

A publication from ARBURG GmbH+Co D-72290 Lossburg

Issue 2

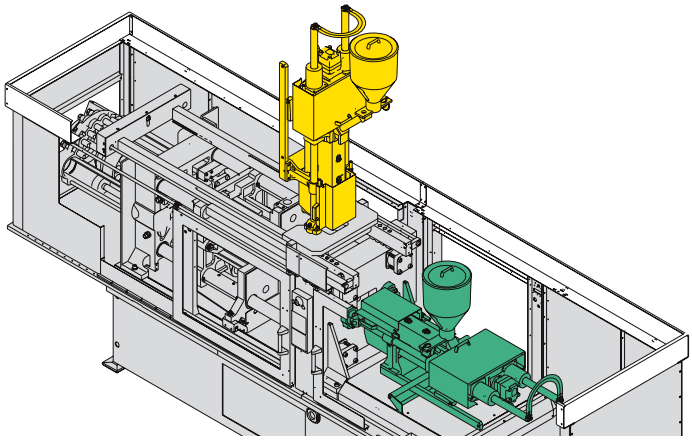
March 1996

Plasma Nitriding: Material Upgrading and Environmental Protection

CONTENTS

Safe Guarding the Future

A change of generation and safe guarding the future development of the company is currently under way at ARBURG. Details of the company initiatives on pages 4 and 5.

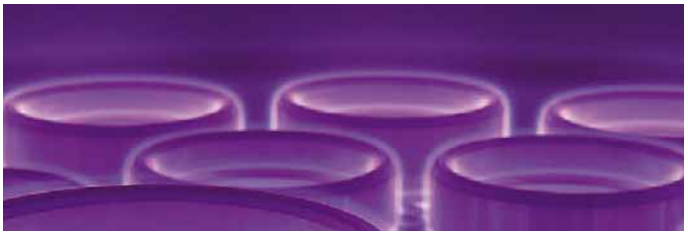


High Tech 2 Colour Production

The new V-series two component machine illustrates possibilities available in terms of size, precision and control comfort. More details available on pages 8 and 9.

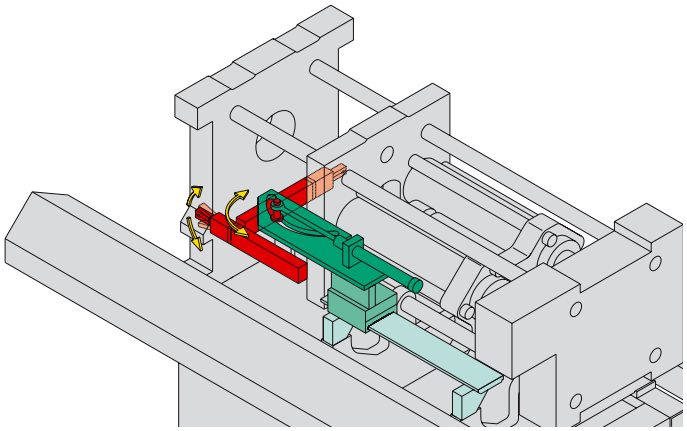
Efficiency with 2 Colour Production

Details of how ARBURG has increased the efficiency of its own production by employing multi-component techniques are presented in the report on pages 10 and 11.



Plasma Nitriding

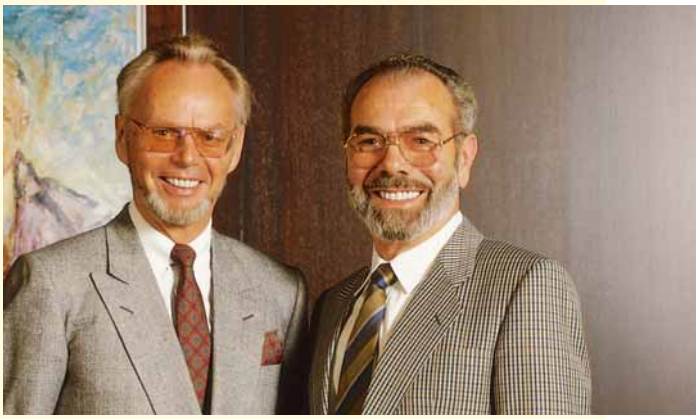
Plasma nitriding is a major plus to the ARBURG product quality as well as to the environment. See pages 12 and 13 for a full report.



A Turn for the Better

ARBURG has developed an unconventional type of Picker for the S-series machines. The space saving features and effectiveness are detailed on page 15.

EDITORIAL



Welcome to the second edition of ARBURG "today". The first special edition was primarily dedicated to our exhibition programme at the "K'95". Today we would like to present you with new developments and interesting information from the house of ARBURG.

On a personal basis, one item of information is of particular significance as far as we are concerned. What is generally referred to as a "change of generation" at the top of a company, also began at ARBURG on January 1st 1996.

This is less dramatic then it might appear at first glance. We have taken on the chairmanship of the management board and have placed the technical, administrative, organizational and sales areas in the highly capable hands of top class managers whom we fully trust, and who are intimately familiar with the company down to the finest detail.

The future of the company as a family run competitive company is secured by the involvement of Juliane Hehl as the manager in the Marketing area and Michael Hehl as assistant to the board of management.

Please place as much trust and cooperativeness in the "new ARBURG management team" as you have done with us in the past. We are positive: In the future, ARBURG technology will offer you what can best be described by the terms "longevity, economy, quality and practice related innovation".

Regards

Karl Hehl Eugen Hehl

Safe Guarding the Future

Eugen Hehl
Partner,
Chairman of
the Board

Juliane Hehl
Partner,
Head of
Marketing

Michael Hehl
Partner,
Assistant to
the Board

Karl Hehl
Partner,
Chairman of
the Board

Its official since the 1st of January: Karl and Eugen Hehl, the owners of ARBURG GmbH + Co, are withdrawing from the active day to day running of the business, after what could only be described as an exceptional career as Entrepreneurs. This however, as one would assume, does not mean the beginning of a quite private life. This is definitely not in keeping with the mentality of both Entrepreneurs: They have taken over responsibility as chairmen of the newly structured board of management and will continue to further decisively determine the fortune of the family owned company.

The company management has been divided into three areas, each assigned to a manager, since the start of the year. The technology area with its development, technical organisation, material management and production departments has been assigned to Herbert Kraibühler (Bachelor of Engineering), who joined the company 20 years ago.

The management responsibility for the financial and organisational area has been assigned to Michael Grandt (Business Economist). The entire area of information systems also comes under his control.

The management of the distribution and sales area with domestic sales, overseas sales, technical customer services, order processing and project departments, as well as the services for the worldwide sales and service companies, has been taken over by Heinrich Fritz (Bachelor of Engineering).

All three managers are familiar with the company mainly due to their long terms of service. In their current positions they will be responsible for the decisions in their own spheres of influence and will report to both partners and chairmen of the board of management, Karl and Eugen Hehl.

The succession of the next generation within the family run company also took a step in January '96. Authorized signatory and partner Juliane Hehl, took over in the marketing area. Michael Hehl, who is also an authorized signatory and partner is an assistant to chairman of the board of management Eugen Hehl. Together with Renate Keinath, five partners participate in ARBURG.

The new constellation at the top of the company represents an important step for the future, which on the one hand secures continuity of the company development and on the other hand guarantees the innovation potential.

Michael Grandt
Financial and Organisational Manager

Herbert Kraibühler
Technical Manager

Heinrich Fritz
Sales and Distribution Manager

CUSTOMER TRAINING

Detailed Know How

In the day to day running of an injection moulding company, the most comprehensive possible use of machine technology is the secret to success in the production of economically viable moulded parts. Efficient operation however requires detailed knowledge on the part of those operating and maintaining the machines. Knowledge of the technical equipment on the machines, the production process and naturally the materials being used is vital. The machine manufacturer of course possesses this specialized knowledge. ARBURG has been passing on this knowledge to its customers for more than 25 years.

Franz Beitl, the head of ARBURG customer training, has been decisively involved in the setting up of this department from the very beginning. He was also the very first to hold regular training courses in 1969 for the employees of ARBURG's swiss sales team.

At this early stage, ARBURG recognised that it was not only essential to integrate the most modern technology available into the Allrounder, but also to demonstrate to customers the best possible way to exploit these innovative technologies within a company framework.

Practice Related Training

The difficult personnel situation in the plastics area at this time where personnel from other disciplines were entering the branch was not the only problem, but rather the insufficient infrastructure: little or no technical documentation and literature was accessible to the companies processing plastics. All the more reason for the setting up of a functional training system which familiarized the customers with ARBURG machine technology.

Today's training courses have remained practice related. The best theoretical knowledge is of little use when it cannot be applied in practice. For this reason, participants in ARBURG training courses can practice the basic knowledge which they have learned directly on the machines. Special care is taken to ensure that the number of participants is kept to a minimum when holding these courses, because a pleasant atmosphere ensures optimum learning results. Every "student" must be given the opportunity to "test" what he has learned in the practice.

The success of this concept over the years was marked by the 25th anniversary of ARBURG training in 1994. Around 40.000 participants have taken part in "Information Seminars" in Lossburg, Radevormwald, Berlin and Paris up to this time.

Comprehensive Range of Courses

The range of training courses available has grown with time. Initially the courses only dealt exclusively with the machine and its functions, but in the meantime the information seminars also encompass the areas of hydraulics, control and service technology, quality monitoring and plastics technology. Special courses currently offered have been extended to include the processing of rubbers, LSR, thermoset's and ceramics as well as the ARBURG-Handling on the Allrounder V and the AQS quality control system.

In the future, it is intended to integrate information in the area of mould construction into the courses. In addition, the duration of the basic courses will be extended from one to two days to meet the ever more demanding technical requirements.

Highly Trained Course Leaders

Such a comprehensive range of courses, naturally demands a respective number of adequately trained course leaders. A total of 8 "tutors" are active at ARBURG in customer training. Naturally they must always learn new information which is beneficial to those participating in the courses. One point is absolutely clear, no question remains unanswered in these courses.

"In-House" Courses

If the customer cannot participate in the training for some reason, ARBURG training personnel are more than happy to visit the customer. External courses can be held without any problem. It is just a case of deciding on a mutually agreeable date.

Various training courses are being prepared in English for 1997, in order to simplify operation on an international level.

If you are interested in the numerous courses offered by ARBURG, simply request the "Course Plan" which appears twice a year. The entire offer of courses is listed and detailed here.

ARBURG EXHIBITION CALENDAR

Exhibitions present the best opportunities for a comprehensive look at the market. Here is a list of the most important worldwide exhibitions where ARBURG is represented.

Exhibition	Location	Dates
March		
ASEANPLAS'96	Jakarta, Indonesia	12.-15.03.96
Plastimagen '96	Mexico City	12.-15.03.96
Plastica '96	Greece	15.-19.03.96
Techni-Show	Utrecht	18.-22.03.96
Chinaplas	Peking, China	19.-23.03.96
KMO	Bad Salzuflen	20.-23.03.96
Linkage	Hong Kong	28.-31.03.96
April		
Céramique	Limoges, France	11.-12.04.96
Replitech	Utrecht, NL	16.-18.04.96
ARBURG In-House	Lossburg	18.-20.04.96
ARGENPLAS'96	Buenos Aires	18.-24.04.96
EMAQH'96	Buenos Aires	27.04-04.05.96
May		
Europlastica	Belgium	07.-11.05.96
ARBURG In-House	ATC Rednitzhembach	09.-10.05.96
Plastexpo '96	Lyon, France	21.-24.05.96
ARBURG In-House	ARBURG Italy	23.-25.05.96
June		
Replitech International	San Jose, USA	04.-06.06.96
Plastics Fair Chicago	Rosemont, USA	11.-13.06.96
ARBURG In-House	ATC Radevormwald	12.-14.06.96
PM² Powder Metal Show	Washington D.C.	16.-21.06.96
Posen MTP	Poland	16.-21.06.96
Medical Design	New York, USA	Juni 1996
July		
Koplas 1996	Seoul, Korea	29.06.-03.07.96
Feria Intern. de Bogota	Bogota, Columbia	04.-14.07.96
Plastic Fair 1996	Ho Chi Minh, Vietnam	23.-26.07.96
August		
Thaiplas 1996	Bangkok, Thailand	22.-25.08.96
September		
Intern. Messe Brün	Czech Republic	16.-20.09.96
October		
Ausplas '96	Australia	08.-11.10.96
IPF	Japan	11.-15.10.96
Fakuma	Friedrichshafen	15.-19.10.96
Equiplast	Barcelona, Spain	20.-25.10.96
Replitech Asia	Singapore	22.-24.10.96
November		
Fisa '96	Santiago, Chile	31.10.-10.11.96
Interplas '96	Birmingham, GB	10.-14.11.96
Plastics Fair '96	Charlotte, USA	12.-14.11.96
December		
Interplastica	Moscow	03.-06.12.96
TUYAP	Turkey	04.-08.12.96

ATC ARBURG TECHNOLOGY CENTER

Delivering Results to the Customer

ARBURG-Service is not just "Customer Service" in name only. All employees in this sector of the company know that fast and customer oriented service is the top priority. The parent company in Lossburg and the ARBURG Technology Center's (ATC) provide competent contact partners when it comes to advice in terms of Allrounder know how.

The ATC in Radevormwald has been active as an "ARBURG Info-Center" since 1982. With Mr. Hans Schmücker as manager, this location is run by a competent and experienced ARBURG employee. The centre in Radevormwald with its 2500 sqm floor space, also has a further 16 employees who are responsible for customer support in northern Germany.

ARBURG Radevormwald

Approximately 80 training courses are carried out here every year thus eliminating long journeys for the customers in northern Germany.

With the March 1995 official opening of the "ARBURG Technology Center" Rednitzhembach, which is located near Nuremberg, the company made a further decisive step in the area of direct customer support. ARBURG customers in south and south eastern Germany can now take full advantage of technical application support and training directly "on location".


ARBURG Rednitzhembach

Demonstration and training facilities offer sufficient space for machine testing and practice intensive courses. The newest generation of Allrounder's with their unmistakable "ARBURG-Design" are available on the premises.

Customers are welcome to experiment and undertake injection testing with their own moulds at both locations. The services are complemented by a comprehensive spare parts facility and the most modern measurement and diagnostic technology.

Three employees are based permanently at Rednitzhembach. Two applications technicians assist the manager Mr. Thomas Vieweger with professional assistance and information.

The "ARBURG Technology Center" which is an integral part of the customer oriented service is also an important component of the International ARBURG strategy. Regional ATC's have also been set up in all the important world markets where ARBURG has a subsidiary, for the benefit of you, our customer.

Using the Advantages of the High-Tech Allrounder V in the Multi-Component Area

When parts are manufactured of numerous colours or materials, the demands on the machine technology are significantly higher than with "normal" injection moulding, not only as a result of the complex moulds involved. ARBURG has reacted to the requirement in this area by developing the multi-component versions of the 420 V and 520 V. The result is two new modular and flexible machines, which enable simple and comfortable manufacture of demanding moulded parts.

The basis for simple production is problem-free control of all machine and mould functions. This prerequisite is ensured with the Selogica controller on the Allrounder V. The entire process sequence is simple to master due to the logical layout of the controller technology. The advantages of the sequence programming in relation to the extended functions in conjunction with hardware extensions, is especially clearly demonstrated with multi-component operation of the Allrounder. With the Selogica and its set up and production process orientated fully graphic editor, highly complicated process sequences such as the use of multiple core pulls etc., can be easily set up on the monitor in a short period of time.

The free programming functions as well as the extended control, documentation and help functions of the Selogica, greatly assist in simplifying the manufacture of multi-component injected parts.

Economic viability is not just a question of the production process, but also of the purchase price. The Allrounder V concept is modular, enabling application specific configuration of the machine. This presents a great advantage for the customer who can adapt the technology to his individual requirements.

Large Moulds, Larger Tie Bar Clearance

In the area of multi-component technology, the emphasis is on the completion of all production processes in the mould without the necessity for additional subordinate production stages. The moulds are becoming more complex and larger in this manner. For these reasons, ARBURG has designed the Allrounder 420 V and 520 V with multi-component technology in mind.

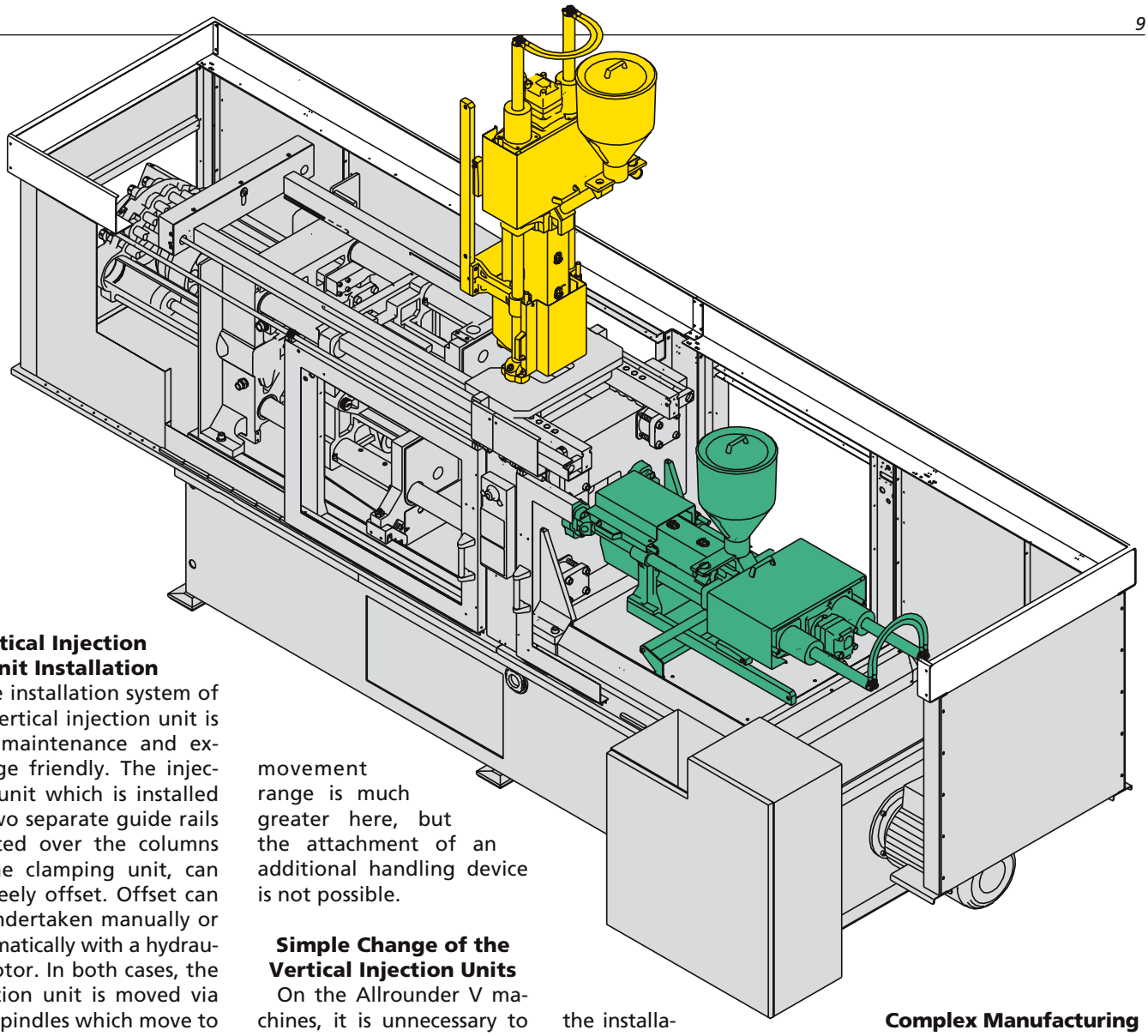
In this manner, a tie-bar clearance of up to 520 x 520 mm can be used for mould installation. The columns on the clamping side of the machine can be extended by up to 200 mm in comparison to the standard machine (option). A platen clearance of up to 950 mm with the 420 V and 1150 mm with the 520 V is possible in this manner.

Available Injection Unit

Both injection units on the machine operate as standard, vertically through the fixed platen and horizontally through the parting line. Other set ups such as horizontal side by side injection through the fixed platen are also possible. The horizontal injection unit is available as standard for central injection as well as for free offsetting by 170 mm (420 V) or 220 mm (520 V), with the ARBURG Vario principle. The same equipment features as those for comparable standard machines are valid for these components.

Injection regulation comes as standard with an optional position regulated screw. The nozzle contact force is set manually. This parameter can be programmed as an option.

The nozzle retraction stroke on the horizontal injection unit is arranged so that cylinder change is possible without the need for injection unit removal.



Vertical Injection Unit Installation

The installation system of the vertical injection unit is very maintenance and exchange friendly. The injection unit which is installed on two separate guide rails situated over the columns of the clamping unit, can be freely offset. Offset can be undertaken manually or automatically with a hydraulic motor. In both cases, the injection unit is moved via two spindles which move to the left and right of the guide rails. The automatic hydraulic drive unit is programmable on the Selogica machine controller.

In addition, two differing methods of construction allow routing of all supply lines on the one hand from the fixed side of the clamping unit and other hand from the movable side of the clamping unit. With the first variation, the vertical injection unit is parked above the horizontal injection unit with mould removal. In addition, the use of a handling device on the Allrounder is possible with injection in the parting line using this variation.

With the second alternative, the vertical injection unit is located between the cylinder and the movable clamping platen. The routing of the supply lines is also undertaken here. The movement range is much greater here, but the attachment of an additional handling device is not possible.

Simple Change of the Vertical Injection Units

On the Allrounder V machines, it is unnecessary to take down the complete injection unit when a cylinder change is necessary.

The cylinder is simply and comfortably removed with the aid of an installation aid for transport. The installation aid is comprised of two connected columns. The cylinder is lowered into the installation aid and locked into place during removal.

An additional possibility also exists of manually moving the nozzle tip central bearing shell upwards or downwards by 100 mm with a crank handle. This allows an exact support and centring of all injection cylinders during installation and removal, including the modules, which do not have the full freedom of movement with the unit retraction stroke.

During installation, the cylinder module is re-inserted in the installation aid, moved manually upwards, exactly positioned and connected.

The Hydraulics on the Multi-Component Allrounder

The large Allrounder V series two component version machines are equipped as standard with two main pumps, a high pressure pump and further pumps for circulation of the hydraulic oil. The pumps are driven as standard with a 37 kW electric motor. The closing stroke protection is undertaken by an electrical valve, the core hold pressure is set manually as standard. A programmable proportional pressure valve is available here as an option. The hydraulic drive of a mould rotary platen is driven by a machine core pull device.

Complex Manufacturing Processes are also Easy

The combination of comfortable control and cylinder change without problems makes the production of multi-component parts much easier and safer. Guaranteed transparency of the entire production process is not the only result, but also faster and economically viable manufacturing.

BASF Employs Allrounder for Two Colour Moulding

BASF AG in Ludwigshafen use an Allrounder 520 V with two injection units for material test purposes and customer mould performance testing on parts consisting of two colours or materials. The fact that the machine can produce parts from one material using its horizontal and also its vertical injection unit, is seen as a welcome plus in flexibility by the company in Ludwigshafen.

The Allrounder 520 V with two injection units is considered to be the optimum machine for largely complex and voluminous moulds which are principally used in this area.

The 520 V has a closing force of 2000 kN and is equipped with two injection units sized as a 250 unit (vertical) and a 350 unit (horizontal). It conforms to the company internal accident prevention regulations.

The critical factors which influenced BASF to purchase the ARBURG machine were based on the optimum Selogica controller technology but also on the technical equipment for the parting line unit, and the vertical injection unit which can be installed and removed. An interesting point with this technology is the parting line unit which can be freely offset by a maximum of 350 mm to simplify mould installation and removal as well as cylinder change.

In the case of BASF, the vertical injection unit is driven by the optional hydraulic motor which is programmable on the Selogica.

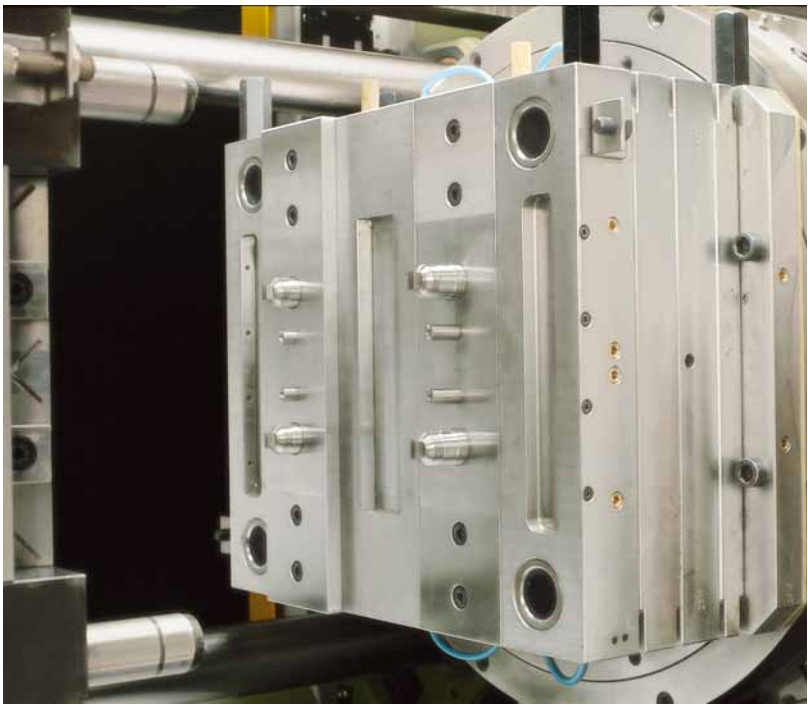
Changing a cylinder module can quickly become an especially time consuming process with a machine or injection unit of this size. ARBURG has also developed a solution for this problem which is installed on the fixed platen and is simple to operate with a crank handle.

A high performance 45 kW electric motor provides the drive for a total of 4 pumps. BASF's Allrounder 520 V is also equipped with two core pull units.

The novel Selogica controller philosophy which is especially suited for the area of multi-component injection, enhances the transparency of the manufacturing process as well as offering safety and clarity without the need for special control. Further good reasons why BASF decided on the Allrounder 520 V.

TWO COLOUR PART MOULD LAYOUT

ARBURG is not just a manufacturer of injection moulding machines, but also produces injection moulded parts. Of course these components are used for the manufacture of Allrounder's. When the company boosts efficiency using this comprehensive know how with the manufacture of injected parts for Allrounder production, there are certainly some details of this project which would be of great interest to ARBURG customers. Such a case is presented by a new two component mould used in the manufacture of valve housing's for the ARBURG water distributor.



Up to now these valve housing's were moulded and then fitted with seals in a secondary process stage. With the application of a new two component mould, the seals are applied to the housing by injection of a material directly into the mould with a second injection unit. This occurs with the aid of various slider bar and unscrewing motions, which turn the entire injection sequence into an extremely demanding process.

Manufacturing Sequence

A total of four seals consisting of three different diameters are moulded onto a raw Polyamide (PA) part. The preform is brought into the second position for injection of the seals by rotation of the movable mould half. At the second mould station, the internal thread is also demoulded and the completed part is ejected. A total of three core pulls and a pneumatic ejector are directly synchronized in addition to the other mould functions, in the sequence editor of the Selogica and united to a functioning production cycle without the need for specialized software.

The Allrounder Equipment

ARBURG manufactures the moulded part described above on an Allrounder 420 V 1000-350/60. The mould was developed in-house and manufactured by IKO Formen. The rotary unit for the mould is also an ARBURG product and operates with a fixed limit.

Boosting the Efficiency of ARBURG's Own Production with Two Component Moulding

The unscrewing unit "F" is used to demould the internal thread. The hot runner channel system is made by Männer. The material for the raw body is PA whereas the seals are TPE. The configuration is completed by a Thermolift 100-2 for drying and feeding the raw material.

Mould Functional Sequence

The core for control of the initial mould parting, moves with a synchronous speed simultaneously with mould opening. This hydraulically actuated motion is controlled via core pull 2, and opens the slider bar responsible for determining the contours of the preform with external threads. The core pull stroke monitoring occurs with the opening motion. When the mould is opened, core pull 3 commences controlled unscrewing via core pull 3. The pneumatic ejector ejects the moulded part and screws back in via core pull 3.

Rotation of the mould by 180° then occurs with the rotary plate actuated by core pull 1 on the movable platen. The mould is then re-closed. As a consequence, the pneumatic ejector as well as the first mould partition (core pull 2) are pushed back mechanically. The slider bars are closed and the external contours of the preform are formed in this manner. Moulding with both injection units can now re-occur.

Peculiarities

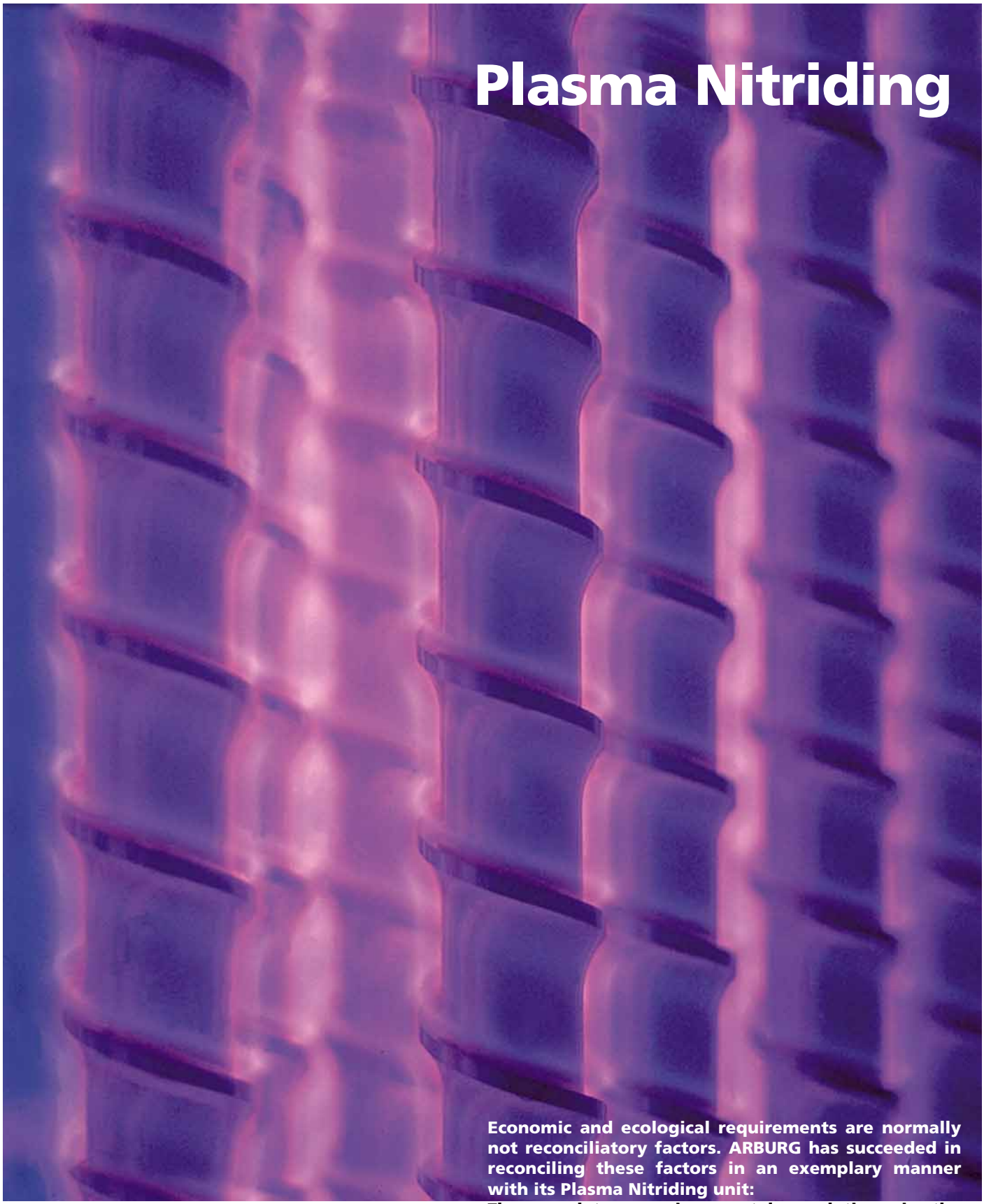
Ejection of the moulded parts occurs with a pneumatically actuated stripper plate as described. The pressurized air required is fed through the supply channels for mould temperature control in the rigid central shaft of the revolving mould, and routed through milled channels.

The hollow core and external contours are exchanged by the 180° rotary motion. However, the mould parts are centrally retained on the threaded core for unscrewing the internal thread.

The external slider bars simply protect the external contours against over injection during moulding of the seals. Unscrewing of the internal threads is actuated by a central gearbox which simultaneously transmits the screwing movements to both threaded cores. The thread drive is provided with a slot and runs in a 360° round channel in the rotary unit. When the rotary platen turns to its determined position (each time by 180°), the slot in the thread drive is automatically connected to the central rotary core of the unscrewing unit. The drive transmission is made possible in this manner and the screwing movement can be carried out.

Economic Production with the High Performance Controller

The entire production process for this part becomes truly efficient and un-problematic to use, with the central cycle programming on the sequence editor of the Selogica machine controller. Without the requirement for specialized software, the entire manufacturing process can be set up with the aid of simple representative symbols and adapted to the individual company related requirements. The Selogica con-troller technology enables economic part manufacturing in the area of multi-component injection moulding, due to its simple and efficient handling of complex manufacturing processes.



Plasma Nitriding

Economic and ecological requirements are normally not reconciliatory factors. ARBURG has succeeded in reconciling these factors in an exemplary manner with its Plasma Nitriding unit:
The mandatory environmental regulations in the area of salt bath nitriding are already fulfilled today by the introduction of this hardening process. The corrosion protection of the treated parts also undergoes a significant improvement with Plasma Nitriding.

Better Quality, Protection for the Environment

Two distinctive advantages which are affected by totally differing demands could be achieved simultaneously by the introduction of the new process for surface quality treatment.

The Conventional Process

Nitriding of the surfaces of metal machine parts subject to very demanding conditions were treated up to now using a salt bath process at ARBURG and most other companies. The surface bonding which results not only provides the treated parts with a greater resistance to abrasion, but also better corrosion proofing properties.

The main problem with this process is the resulting hardening salts which are a highly poisonous waste product. Reprocessing of this waste product is only possible on a limited basis and is extremely expensive. Further treatment of the parts was also necessary in order to compensate for the distortion caused by spontaneous addition and elimination of heat.

Plasma Nitriding

Plasma nitriding of metal parts not only offers major advantages in terms of abrasion proofing, corrosion proofing and distortion, but also offers a significant contribution to environmental protection because of the elimination of nitride salts. Because of the economic viability of the principle, components which primarily require corrosion protection can be included for treatment, thus significantly expanding the spectrum of applications of the nitriding furnace. The background being the trend towards full corrosion protection enabling machine usage independently of its ambient environment.

The Nitriding Process

From a chemical point of view, the nitriding process deals with the introduction of an additional substance into the crystalline structure of the metal being treated (formation of a nitrite layer). The treatment enhances the material surface against abrasion and increases the protection against corrosion without reducing the elasticity of the material in the core. The tenacity and impact resistance of the components is improved.

When compared to salt bath nitriding or induction hardening, a higher quality layer is formed with plasma nitriding. This layer can be characterised by an increased diffusion zone as well as a pore free compound layer, which can be varied in its thickness. Cleaning of the parts after the nitriding process as well as further treatment against heat related distortion becomes unnecessary.

System Design and Treated Parts

ARBURG uses the system to treat all tie-bars as well as piston rods, the cylinder, screw and injection unit columns; the cylinder cover, toggle joint and connection platens. The entire material throughput is in the order of 1400 tonnes a year.

The heat generated in the oven during the nitriding process is transferred to a water circuit via a cooling jacket. A reverse cycle heating system extracts the heat from the water and transfers it to the plant heating system. By specific optimization of the system, ARBURG saves approximately 40% on process energy.

Comprehensive internal tests were undertaken to study and determine the economic viability as well as the performance capacity before the system was installed.

Experience after Two Years of Operation

The experience of almost two years of smooth operation have illustrated that an increased performance of the hardening facility and a decisive improvement in quality have been the result.

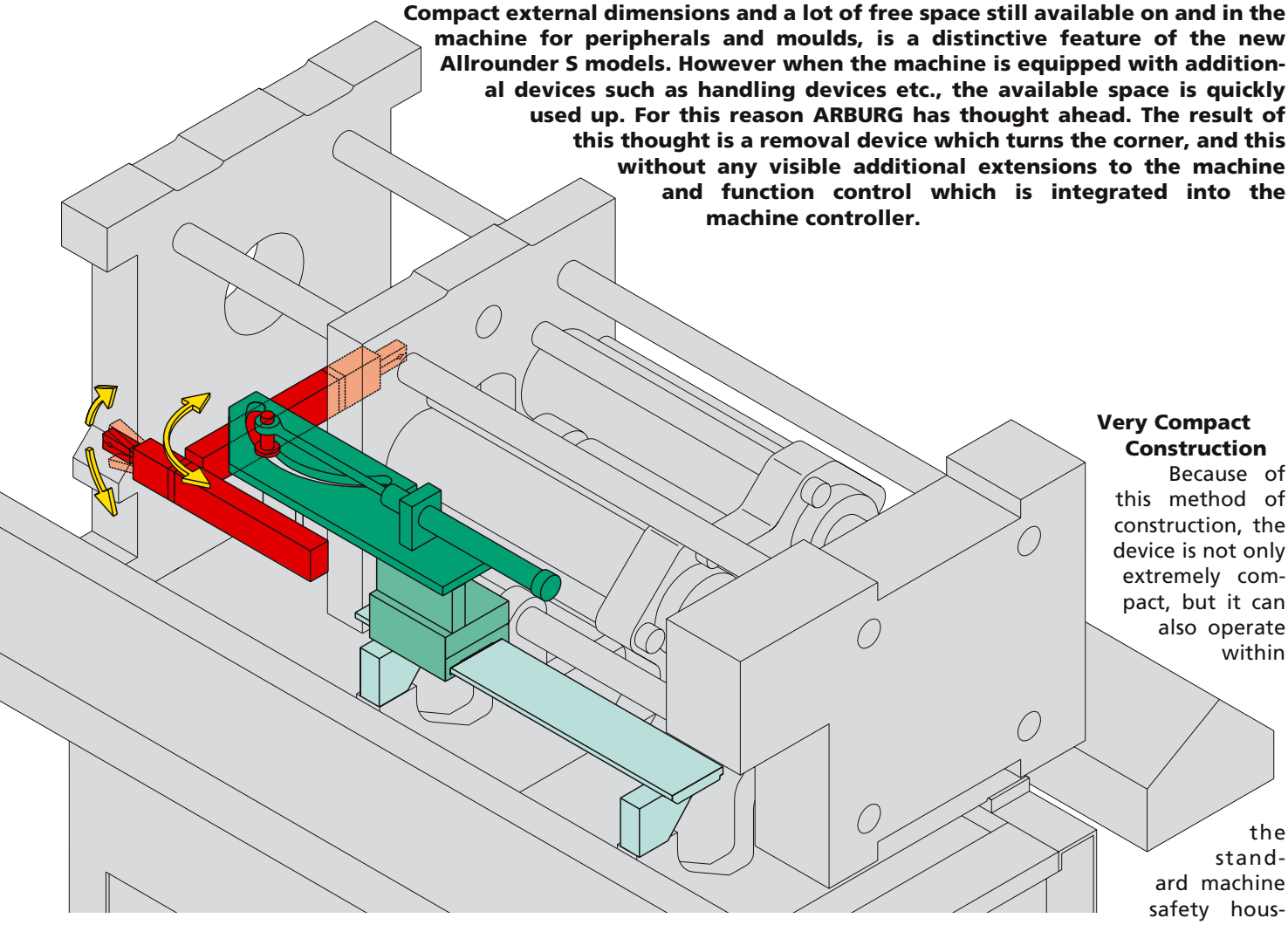
The environment has been relieved by the minimal use of gasses as well as the elimination of the requirement for highly poisonous Cyanide salts. Heat recovery has reduced the energy requirement.

Even considering the initial high level of investment involved, nitriding has certainly paid for itself at ARBURG.

PICKER ON THE ALLROUNDER S

Integrated Part Removal

Compact external dimensions and a lot of free space still available on and in the machine for peripherals and moulds, is a distinctive feature of the new Allrounder S models. However when the machine is equipped with additional devices such as handling devices etc., the available space is quickly used up. For this reason ARBURG has thought ahead. The result of this thought is a removal device which turns the corner, and this without any visible additional extensions to the machine and function control which is integrated into the machine controller.

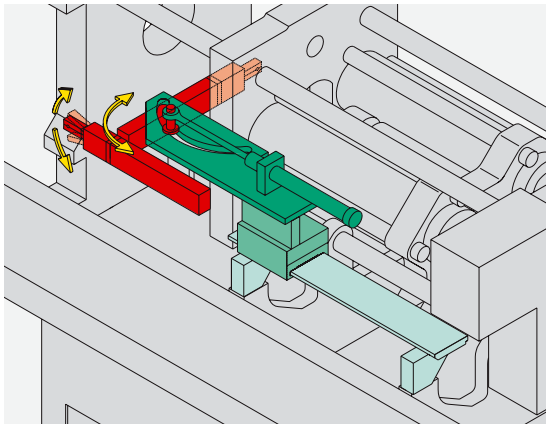


The new ARBURG integral picker really does its name justice. The adaption of the handling device into the Allrounder S machine series, requires situation of the handling as near as possible to the clamping unit in order to achieve optimum results. The priority was to achieve a space saving construction to avoid hindering access to the mould.

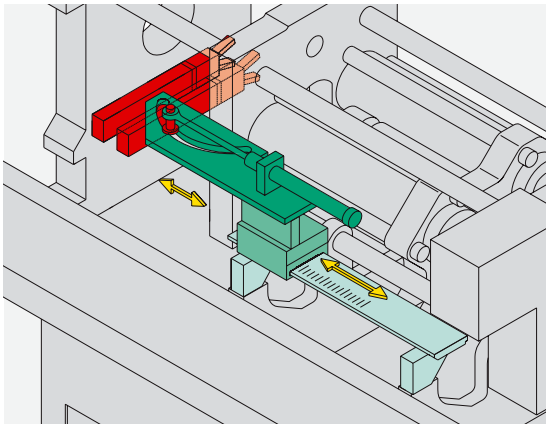
As a consequence, the special handling concept for the Allrounder S was designed as a transverse mechanism which rotates by 90° to access the open mould. The initial starting position of the grip is located parallel to the clamping unit, and the end position when the grip is inserted into the mould is positioned laterally to the clamping unit.

Very Compact Construction

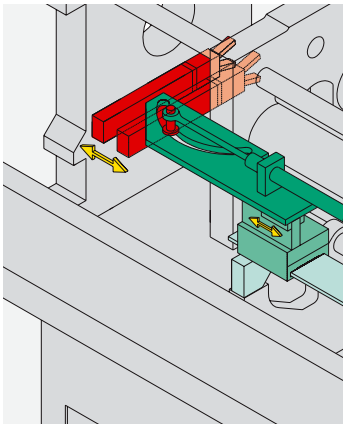
Because of this method of construction, the device is not only extremely compact, but it can also operate within the standard machine safety housing during the entire sequence of movement (removal and ejection). The design of the picker and its site of installation on the rear side of the clamping unit, does not hinder either the horizontal and the vertical mould change. The



Illus. 1: Pincer grip for part removal and horizontal swivel motion



Illus. 2: Setting of the parting line position



Illus. 3: Additional motion in the

device is inexpensive, functional, requires little maintenance and is consequently very economic. The ease of installation enables retrofitting of the picker to the Allrounder S.

Versatile Application

The integral picker is suitable for part and sprue removal. Disposal of parts in the picker grip occurs outside the mould. Separation of parts in the mould and parts in the picker grip can be undertaken without problem in this manner.

Selogica Controls Removal Process

The entire sequence of the removal device is programmed and monitored on the Selogica controller of the Allrounder S. A faster removal process is ensured by the swivel movement as well as the integrated controller.

Optimum Equipment

The standard function is comprised of a pincer type grip for part removal as well as a horizontal swivel motion of the grip for action in the mould area (Illus. 1). The demoulding stroke also occurs via the swivel motion or can be undertaken with the "mould opening with intermediate stop" function.

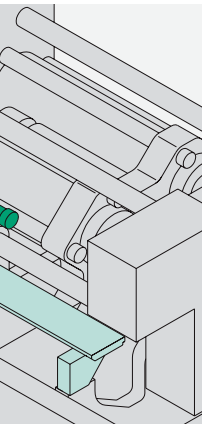
As an option, the handling can be equipped with additional motion in the demoulding direction (Illus. 3). The grip can also be equipped with an insertion and retraction motion to minimise the necessary mould opening (Illus. 4).

Pneumatic Drive

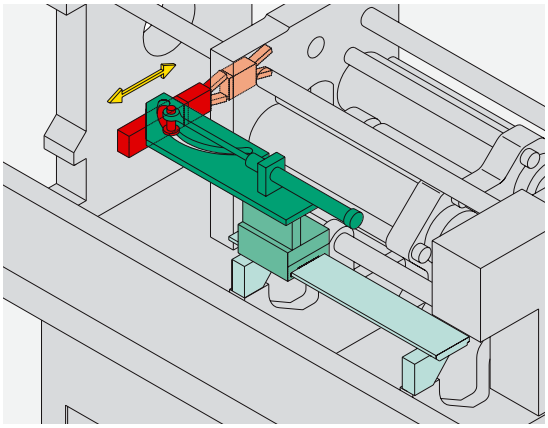
All picker elements are driven pneumatically. Supply to the unit is via the maintenance unit integrated into the machine. Motion to the end positions is dampened and electrically monitored. The parting line unit (Illus. 2) can be manually adjusted using a vernier scale. The valve and switch functions are directly integrated.

Simple Attachment on the Rear Side of the Allrounder

The picker is attached to the rear side of the machine in the clamping unit area, underneath the safety gate. No additional measures for machine safety are necessary in this manner.



demould direction



Illus. 4: Grip insertion and retraction motion

ALLROUNDER S PRODUCTION

"S" for Selective

Following the premiere of the new Allrounder S-series at the "K'95", series production of the machines got under way in Lossburg in February this year. Numerous customer orders for this machine type have already been accepted. A customer survey carried out on the ARBURG exhibition stand in Dusseldorf confirms that the selectivemodular scope for the configuration offered by the Allrounder S ideally addresses current market requirements.

Representatives from a total of 100 injection moulding companies took part in this survey, taken across the hierarchical spectrum from machine operators to managing directors. The survey covered not only information on general requirements but primarily also aspects relating to design and operation.

92% (!) of those questioned classified the styling of the new S machines as "very good" or "good", and 65% also approved of the colour scheme. The minimal space requirement of the Allrounder was a major criterion for 95% of those interviewed.

The swivel mounted control terminal with its flat screen monitor and the increased space in the clamping unit area are further Allrounder S benefits, which met with the approval of over 90% of the survey participants.

The small newcomer to the ARBURG machine range was also praised for its generous access to the most important machine components and its operating convenience. This is due largely to the consistent operator orientation of the Selogica control philosophy, which is based directly on the machines operating sequence.

The modular concept applied to the entire S-series met with a considerable degree of interest from 65% of the interviewees, while 78% considered this to be the major incentive in favour of an S-series machine purchase.

These undeniably impressive figures are a strong indication that ARBURG was right on target with its Allrounder S design concept. The market has obviously been lacking in an efficient machine concept in the low clamping force sector. Those interested in experiencing how ARBURG has filled the gap in the market should view the new Allrounder S at the ARBURG In- House exhibition which takes place from April 18th to April 20th 1996 in Lossburg.

ARBURG SUBSIDIARY

ARBURG's Italian Subsidiary on the Move

ARBURG in its function as a company operating on a worldwide basis, has build up a comprehensive web of subsidiaries which directly support the most important markets in Europe, the USA, South Eastern Asia and Japan. ARBURG S.R.L. in Peschiera Borromeo near Milan, has been supporting the important Italian market since July 1993.

The ARBURG Subsidiary in Peschiera Borromeo

Bjoern Noren, Head of the ARBURG Italian Subsidiary

An area of 750 sqm containing office space, a demonstration area, a spare parts stores and a room for training facilities make up the headquarters in Italy. This is complemented by a hall with an exhibition area, office and spare parts store in Turin as well as two demonstration rooms on the premises of the Guberti company in Tre-Venezie and the Mr. Bugli who operates on a freelance basis in Bologna.

ARBURG has been represented in Italy since 1960 by Sverital S.r.l. The head of Sverital, Mr. Bjoern Noren as well as 13 other employees were engaged by ARBURG to operate its Italian subsidiary.

The Italian subsidiary today has 20 employees to cater for its customer needs. The Italians are especially active in the area of customer service and operate with the Lossburg concept. A well functioning service network with 7 technicians is part and parcel of the After-Sales-Service. Mr. Aversa one of these technicians is based in Turin and supports customers in the Piedmont region. The customer service vehicles are equipped with a large range of spare parts to guarantee the fastest possible service and keep machine stand still times to an absolute minimum. All service technicians can be contacted with an electronic mobile paging system at any time, to ensure the fastest possible journey to the customer.

The free telephone service run by Mr. Bondioli assists the customer to quick solutions with malfunctions or machine breakdowns and often eliminates the need for a visit from a technician. Mr. Bondioli is also responsible for customer training in Italy.

Under the leadership of Mr. Noren; Ms. Svensson the head of administration, Mr. Lazarro the technical manager as well as Mr. Manzoni the commercial manager and eight further employees are mainly responsible for administration.

ARBURG also has contacts to 12 freelance sales representatives for the 10 Italian sales zones. After the recession years 1991/1992, a market share of 20% has been achieved which is exemplary considering the situation of the Italian Lira.

The goals for the future are retention and expansion of this market share. With the purchase of another building, available in 1997, which extends the available floor space by an additional 300 sqm, the prospects for the future are good.

Valentino Lazarro, Technical Manager

Giovanni Manzoni, Commercial Manager

Publisher:

ARBURG GmbH + Co
Arthur-Hehl-Strasse
D-72290 Lossburg
Tel. 0 74 46 / 33-0
Fax 0 74 46 / 33-33 65

Editorial Staff:
Dieter Dissel
Tel. 0 74 46 / 33-33 40
Fax 0 74 46 / 33-34 13